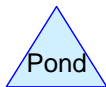
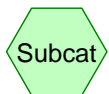
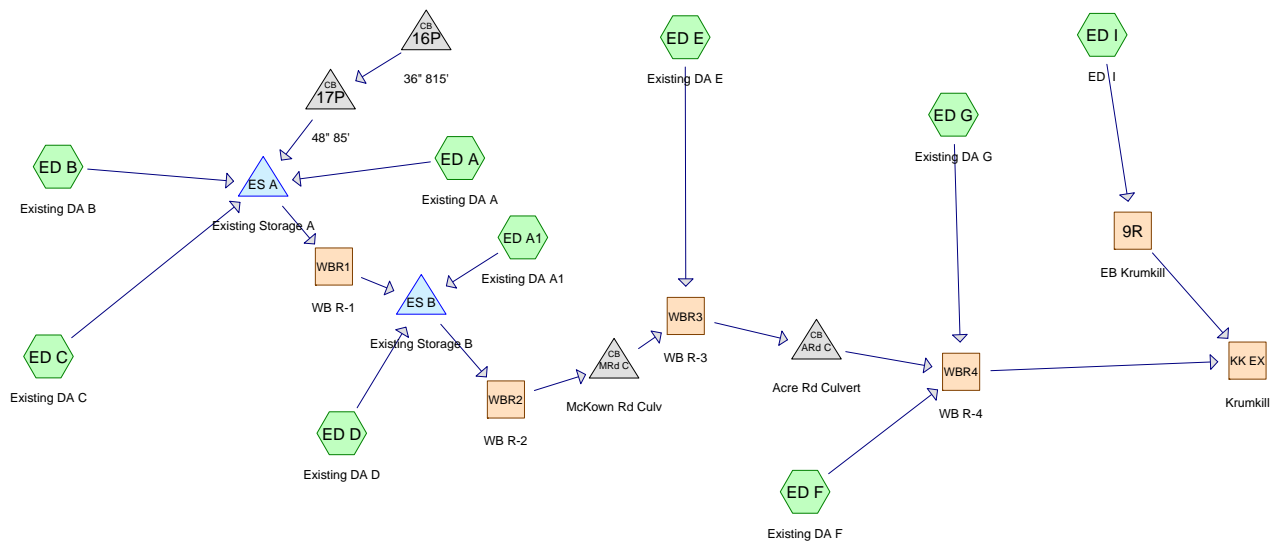


APPENDIX D
Hydrological Study

Existing Conditions



Drainage Diagram for Existing Drainage McKownville RT 20 Area
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Existing Drainage McKownville RT 20 Area

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.300	43	Woods/grass comb., Fair, HSG A (ED G)
12.700	55	Woods, Good, HSG B (ED I)
20.440	57	1/3 acre lots, 30% imp, HSG A (ED G)
18.160	58	Woods/grass comb., Good, HSG B (ED D)
65.010	61	1/4 acre lots, 38% imp, HSG A (ED I)
4.780	69	50-75% Grass cover, Fair, HSG B (ED A,ED A1)
36.500	70	1/2 acre lots, 25% imp, HSG B (ED C)
15.170	72	1/3 acre lots, 30% imp, HSG B (ED E)
6.950	76	Woods/grass comb., Fair, HSG C (ED F)
9.430	81	1/3 acre lots, 30% imp, HSG C (ED F)
19.400	98	Paved parking & roofs (ED A,ED A1,ED B,ED D)
214.840		TOTAL AREA

Existing Drainage McKownville RT 20 Area

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Soil Listing (selected nodes)

Area (acres)	Soil Goup	Subcatchment Numbers
91.750	HSG A	ED G, ED I
87.310	HSG B	ED A, ED A1, ED C, ED D, ED E, ED I
16.380	HSG C	ED F
0.000	HSG D	
19.400	Other	ED A, ED A1, ED B, ED D
214.840		TOTAL AREA

Existing Drainage McKownville RT 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ED A: Existing DA A Runoff Area=8.170 ac 70.75% Impervious Runoff Depth=3.11"
Flow Length=1,334' Slope=0.0100 '/' Tc=28.1 min CN=90 Runoff=22.72 cfs 2.117 af

Subcatchment ED A1: Existing DA A1 Runoff Area=8.170 ac 70.75% Impervious Runoff Depth=3.11"
Flow Length=1,334' Slope=0.0100 '/' Tc=28.1 min CN=90 Runoff=22.72 cfs 2.117 af

Subcatchment ED B: Existing DA B Runoff Area=7.240 ac 100.00% Impervious Runoff Depth=3.96"
Flow Length=363' Slope=0.0275 '/' Tc=4.0 min CN=98 Runoff=45.99 cfs 2.392 af

Subcatchment ED C: Existing DA C Runoff Area=36.500 ac 25.00% Impervious Runoff Depth=1.46"
Flow Length=1,133' Slope=0.0335 '/' Tc=25.6 min CN=70 Runoff=48.94 cfs 4.456 af

Subcatchment ED D: Existing DA D Runoff Area=18.760 ac 3.20% Impervious Runoff Depth=0.81"
Flow Length=1,139' Slope=0.0237 '/' Tc=40.7 min CN=59 Runoff=8.16 cfs 1.265 af

Subcatchment ED E: Existing DA E Runoff Area=15.170 ac 30.00% Impervious Runoff Depth=1.60"
Flow Length=1,334' Slope=0.0150 '/' Tc=41.3 min CN=72 Runoff=16.18 cfs 2.025 af

Subcatchment ED F: Existing DA F Runoff Area=16.380 ac 17.27% Impervious Runoff Depth=2.13"
Flow Length=661' Slope=0.0290 '/' Tc=13.8 min CN=79 Runoff=47.00 cfs 2.903 af

Subcatchment ED G: Existing DA G Runoff Area=26.740 ac 22.93% Impervious Runoff Depth=0.57"
Flow Length=1,244' Slope=0.0160 '/' Tc=60.3 min CN=54 Runoff=5.09 cfs 1.261 af

Subcatchment ED I: ED I Runoff Area=77.710 ac 31.79% Impervious Runoff Depth=0.86"
Flow Length=3,076' Slope=0.0160 '/' Tc=106.9 min CN=60 Runoff=18.41 cfs 5.582 af

Reach 9R: EB Krumkill Avg. Depth=0.90' Max Vel=2.04 fps Inflow=18.41 cfs 5.582 af
n=0.040 L=1,755.0' S=0.0046 '/' Capacity=293.49 cfs Outflow=17.86 cfs 5.577 af

Reach KK EX: Krumkill Inflow=393.19 cfs 216.474 af
Outflow=393.19 cfs 216.474 af

Reach WBR1: WB R-1 Avg. Depth=3.40' Max Vel=6.24 fps Inflow=788.81 cfs 202.962 af
n=0.040 L=300.0' S=0.0100 '/' Capacity=966.62 cfs Outflow=428.26 cfs 202.879 af

Reach WBR2: WB R-2 Avg. Depth=2.34' Max Vel=10.97 fps Inflow=429.55 cfs 205.735 af
n=0.040 L=150.0' S=0.0467 '/' Capacity=2,088.13 cfs Outflow=437.17 cfs 205.711 af

Reach WBR3: WB R-3 Avg. Depth=2.97' Max Vel=7.54 fps Inflow=440.13 cfs 207.736 af
n=0.040 L=230.0' S=0.0170 '/' Capacity=1,258.70 cfs Outflow=423.98 cfs 207.683 af

Reach WBR4: WB R-4 Avg. Depth=3.98' Max Vel=4.30 fps Inflow=432.41 cfs 211.847 af
n=0.040 L=2,510.0' S=0.0040 '/' Capacity=610.12 cfs Outflow=375.76 cfs 210.897 af

Pond 16P: 36" 815' Peak Elev=3,719.19' Inflow=694.79 cfs 194.473 af
36.0" x 815.0' Culvert Outflow=694.79 cfs 194.473 af

Existing Drainage McKownville RT 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Pond 17P: 48" 85'

Peak Elev=341.52' Inflow=694.79 cfs 194.473 af
48.0" x 85.0' Culvert Outflow=694.79 cfs 194.473 af

Pond ARd C: Acre Rd Culvert

Peak Elev=342.99' Inflow=423.98 cfs 207.683 af
36.0" x 30.0' Culvert Outflow=423.98 cfs 207.683 af

Pond ES A: Existing Storage A

Peak Elev=198.49' Storage=57,579 cf Inflow=709.58 cfs 203.438 af
Outflow=788.81 cfs 202.962 af

Pond ES B: Existing Storage B

Peak Elev=191.68' Storage=61,135 cf Inflow=432.23 cfs 206.261 af
Outflow=429.55 cfs 205.735 af

Pond MRd C: McKown Rd Culv

Peak Elev=345.36' Inflow=437.17 cfs 205.711 af
36.0" x 30.0' Culvert Outflow=437.17 cfs 205.711 af

Total Runoff Area = 214.840 ac Runoff Volume = 24.118 af Average Runoff Depth = 1.35"
68.93% Pervious = 148.099 ac 31.07% Impervious = 66.741 ac

Existing Drainage McKownville RT 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED A: Existing DA A

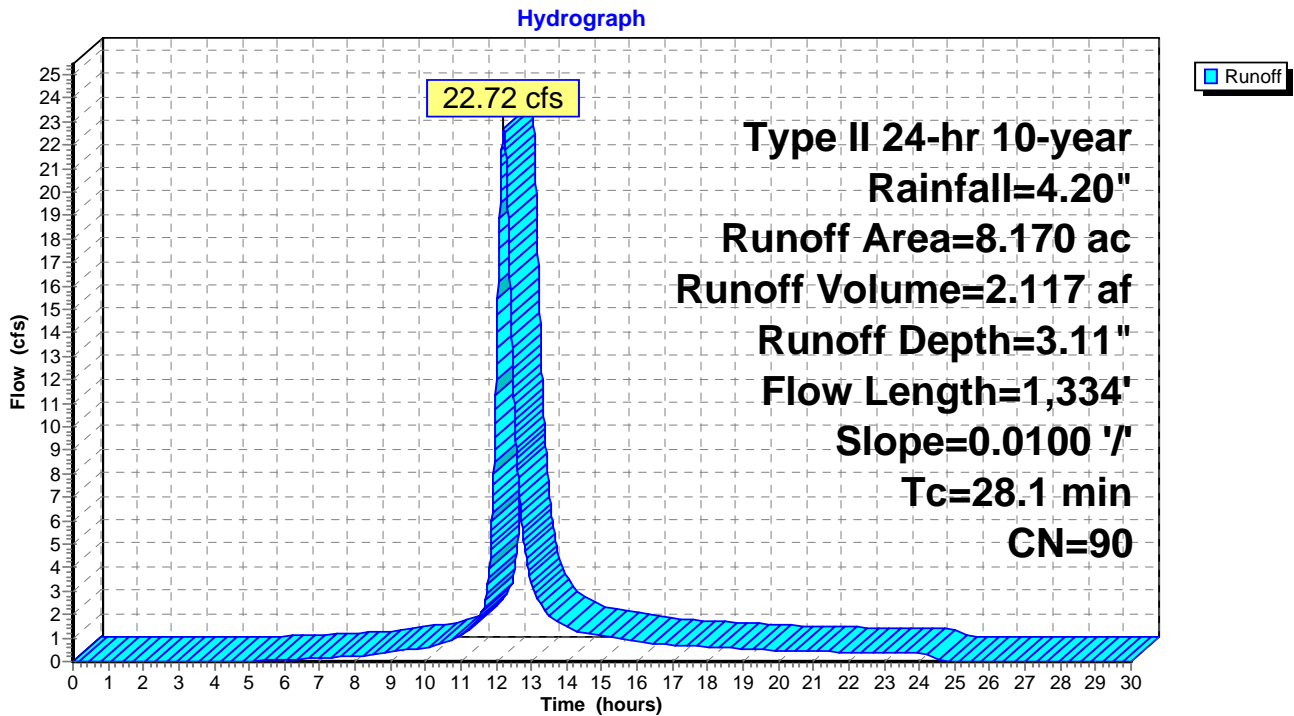
Runoff = 22.72 cfs @ 12.21 hrs, Volume= 2.117 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
5.780	98	Paved parking & roofs
2.390	69	50-75% Grass cover, Fair, HSG B
8.170	90	Weighted Average
2.390		Pervious Area
5.780		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	1,334	0.0100	0.79		Lag/CN Method,

Subcatchment ED A: Existing DA A



Existing Drainage McKownville RT 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED A1: Existing DA A1

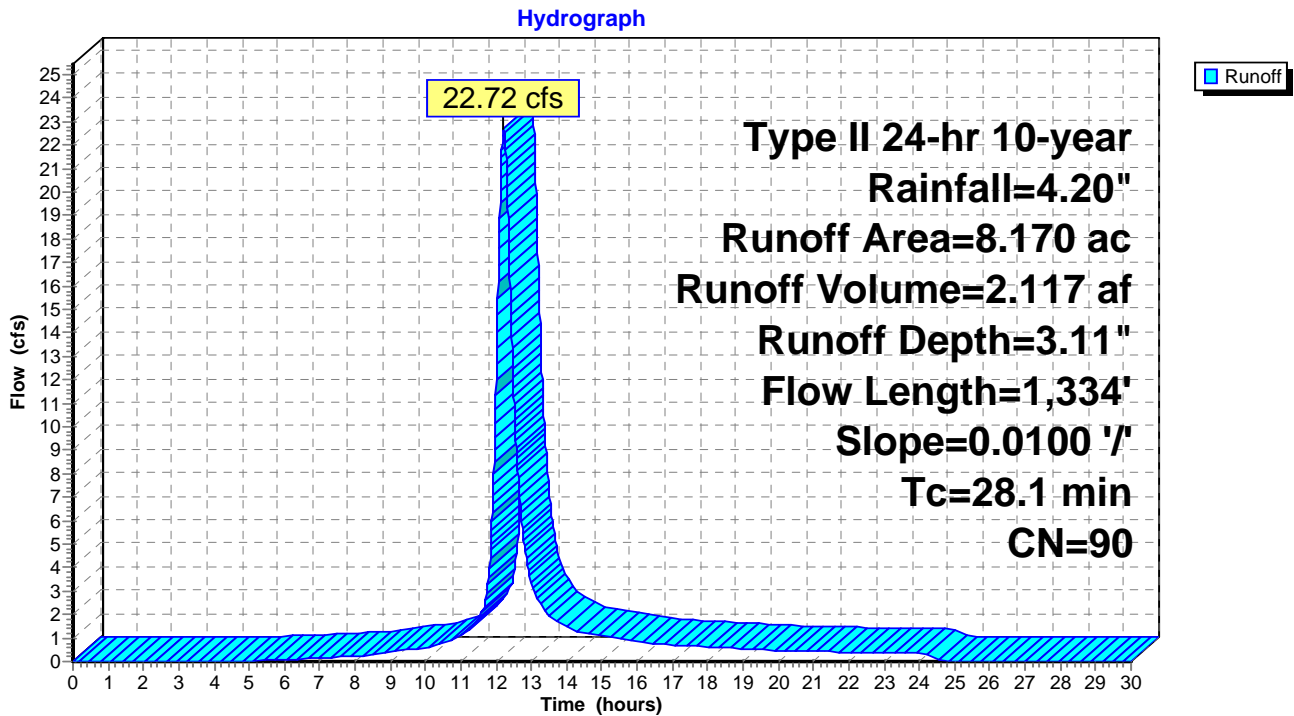
Runoff = 22.72 cfs @ 12.21 hrs, Volume= 2.117 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
5.780	98	Paved parking & roofs
2.390	69	50-75% Grass cover, Fair, HSG B
8.170	90	Weighted Average
2.390		Pervious Area
5.780		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	1,334	0.0100	0.79		Lag/CN Method,

Subcatchment ED A1: Existing DA A1



Existing Drainage McKownville RT 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED B: Existing DA B

Runoff = 45.99 cfs @ 11.94 hrs, Volume= 2.392 af, Depth= 3.96"

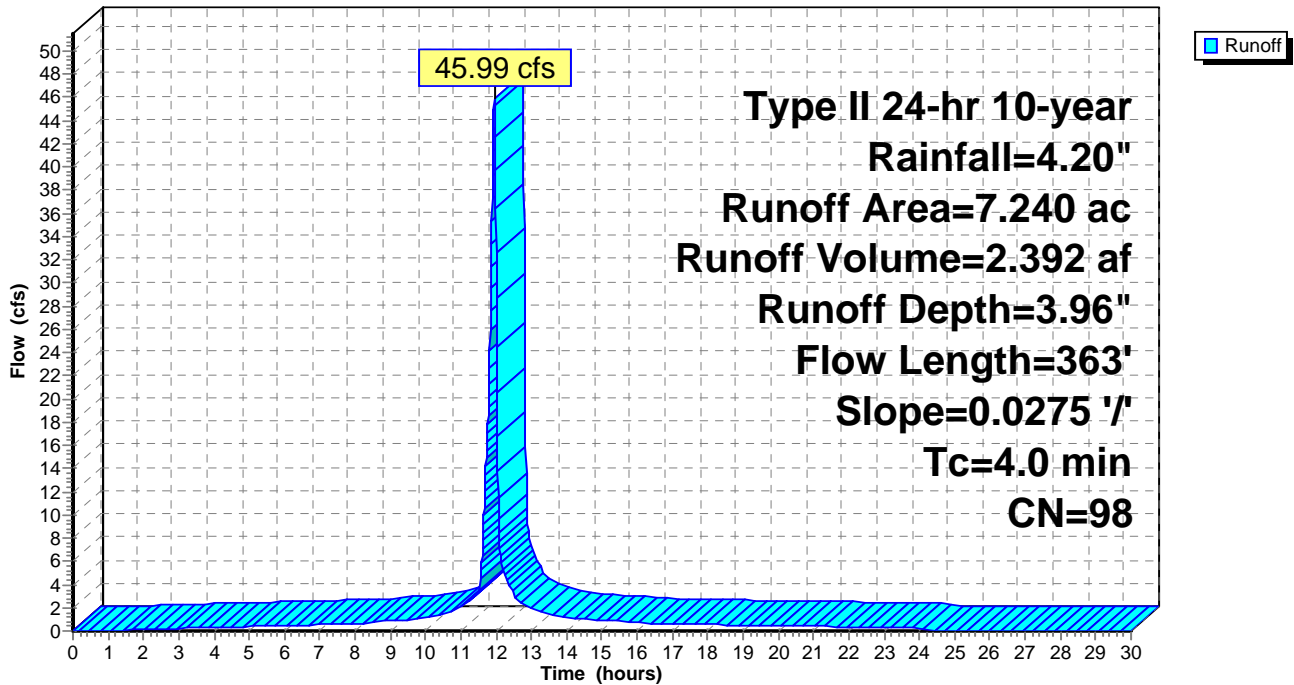
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
7.240	98	Paved parking & roofs
7.240		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	363	0.0275	1.50		Lag/CN Method,

Subcatchment ED B: Existing DA B

Hydrograph



Existing Drainage McKownville RT 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED C: Existing DA C

Runoff = 48.94 cfs @ 12.20 hrs, Volume= 4.456 af, Depth= 1.46"

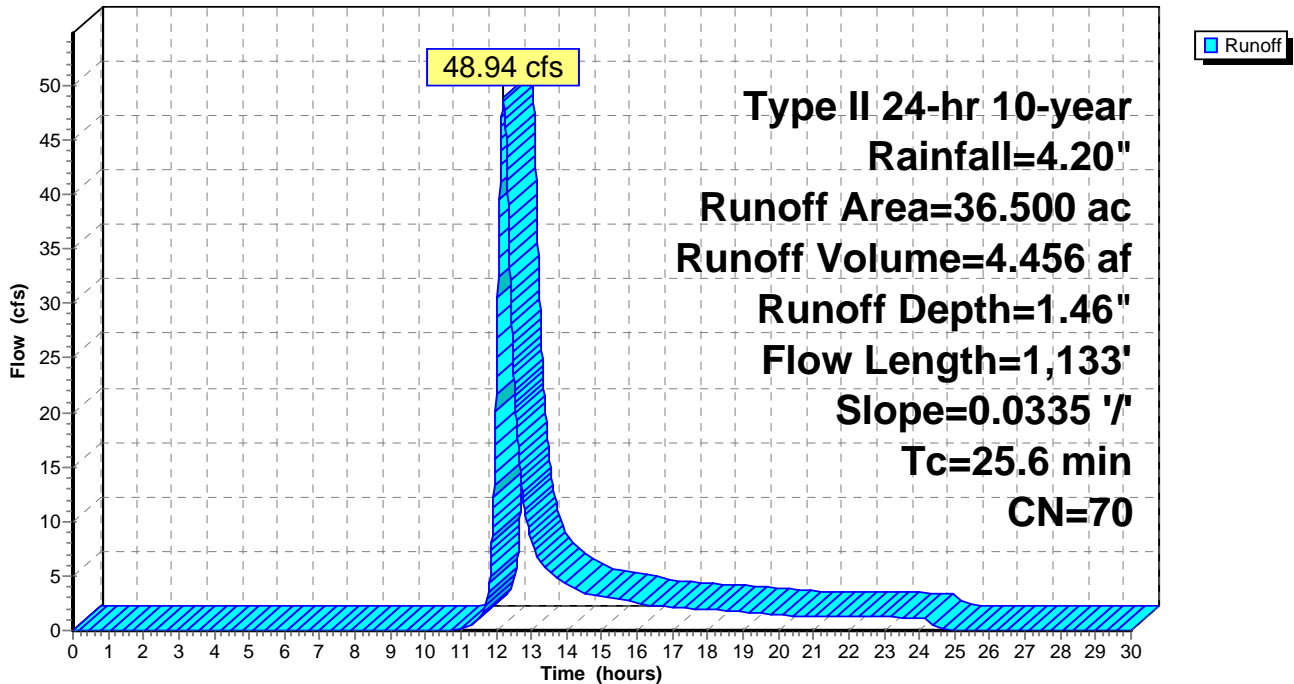
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
36.500	70	1/2 acre lots, 25% imp, HSG B
27.375		Pervious Area
9.125		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	1,133	0.0335	0.74		Lag/CN Method,

Subcatchment ED C: Existing DA C

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED D: Existing DA D

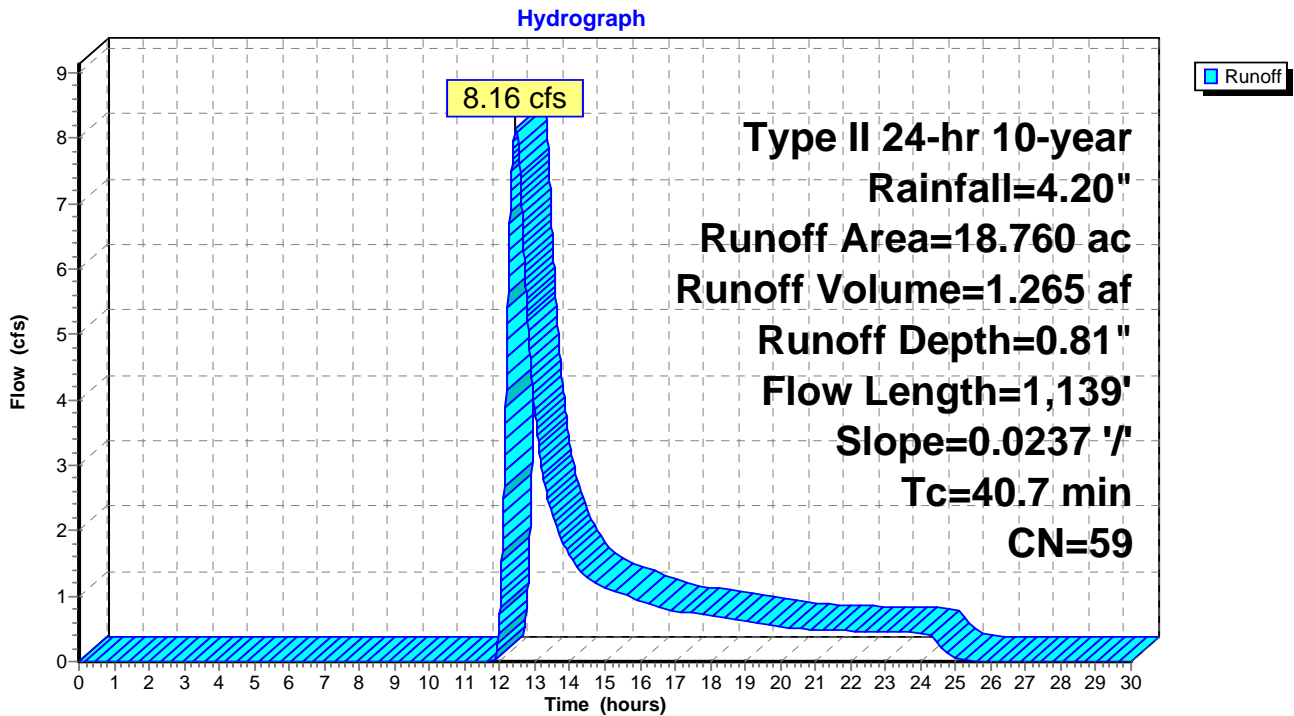
Runoff = 8.16 cfs @ 12.44 hrs, Volume= 1.265 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
18.160	58	Woods/grass comb., Good, HSG B
0.600	98	Paved parking & roofs
18.760	59	Weighted Average
18.160		Pervious Area
0.600		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.7	1,139	0.0237	0.47		Lag/CN Method,

Subcatchment ED D: Existing DA D



Existing Drainage McKownville RT 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED E: Existing DA E

Runoff = 16.18 cfs @ 12.40 hrs, Volume= 2.025 af, Depth= 1.60"

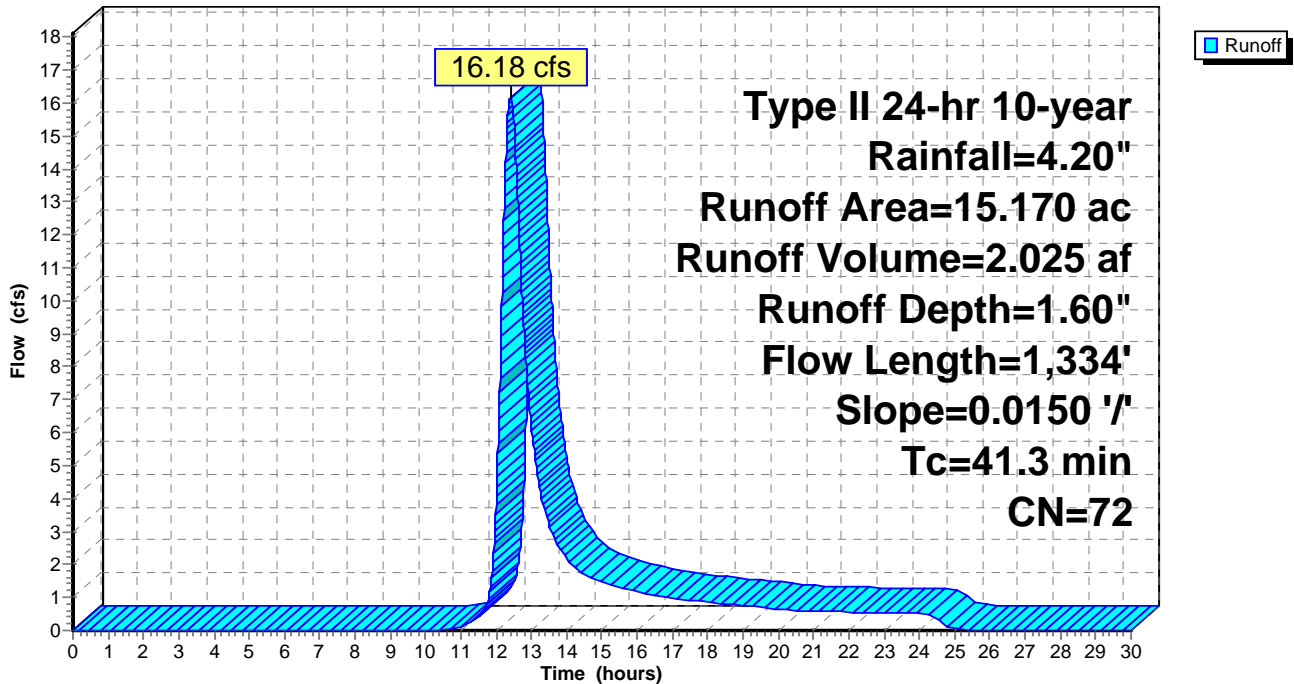
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
15.170	72	1/3 acre lots, 30% imp, HSG B
10.619		Pervious Area
4.551		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.3	1,334	0.0150	0.54		Lag/CN Method,

Subcatchment ED E: Existing DA E

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED F: Existing DA F

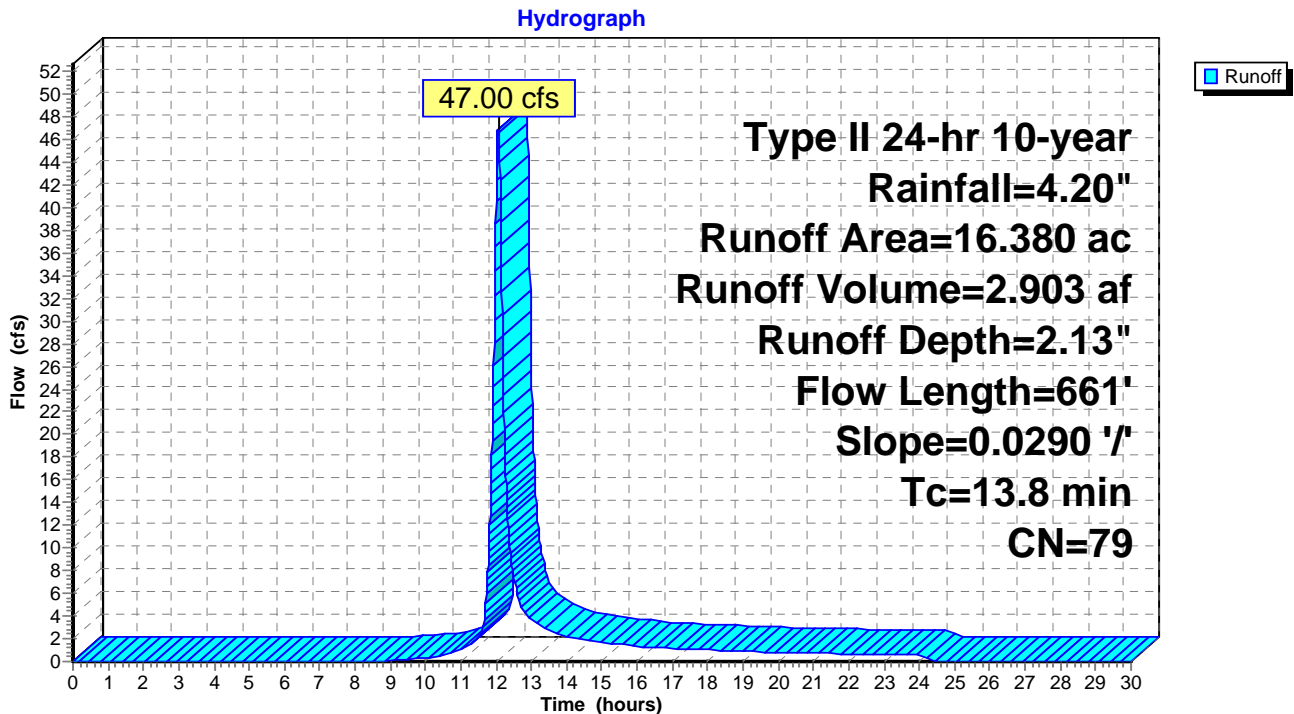
Runoff = 47.00 cfs @ 12.06 hrs, Volume= 2.903 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
9.430	81	1/3 acre lots, 30% imp, HSG C
6.950	76	Woods/grass comb., Fair, HSG C
16.380	79	Weighted Average
13.551		Pervious Area
2.829		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	661	0.0290	0.80		Lag/CN Method,

Subcatchment ED F: Existing DA F



Existing Drainage McKownville RT 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED G: Existing DA G

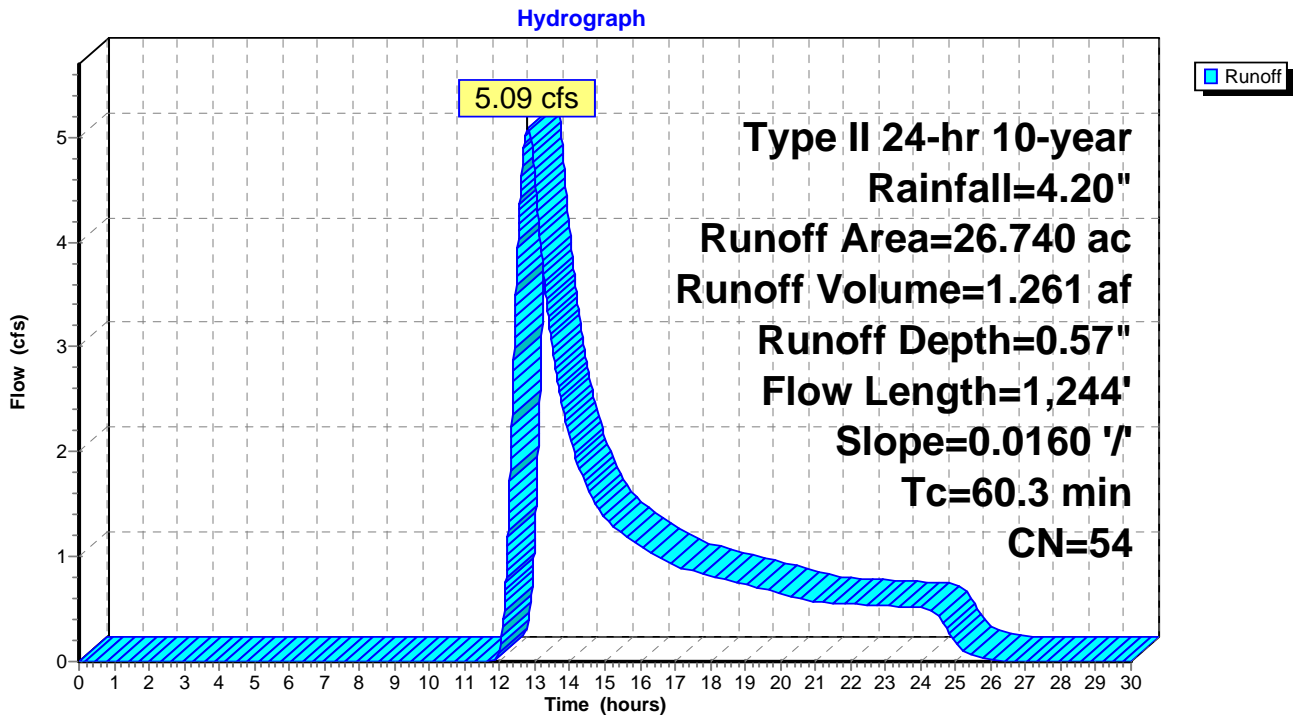
Runoff = 5.09 cfs @ 12.80 hrs, Volume= 1.261 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
20.440	57	1/3 acre lots, 30% imp, HSG A
6.300	43	Woods/grass comb., Fair, HSG A
26.740	54	Weighted Average
20.608		Pervious Area
6.132		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.3	1,244	0.0160	0.34		Lag/CN Method,

Subcatchment ED G: Existing DA G



Existing Drainage McKownville RT 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED I: ED I

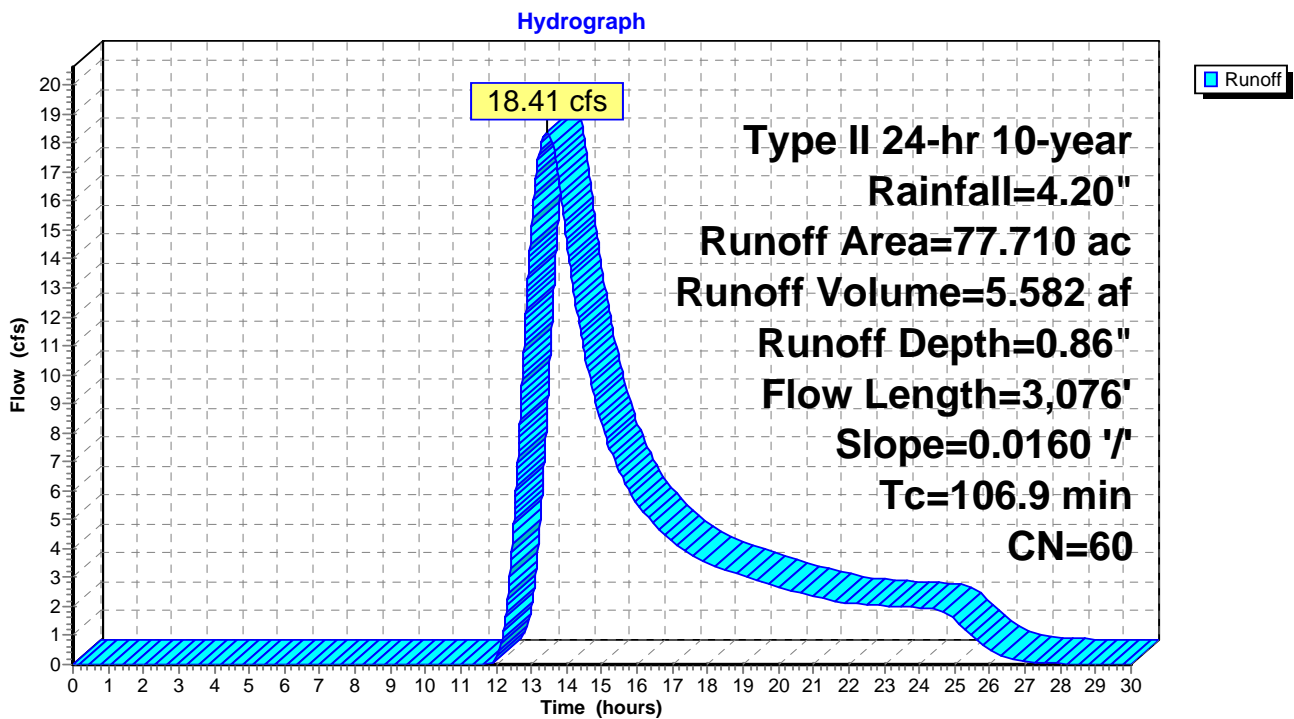
Runoff = 18.41 cfs @ 13.42 hrs, Volume= 5.582 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
65.010	61	1/4 acre lots, 38% imp, HSG A
12.700	55	Woods, Good, HSG B
77.710	60	Weighted Average
53.006		Pervious Area
24.704		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
106.9	3,076	0.0160	0.48		Lag/CN Method,

Subcatchment ED I: ED I



Existing Drainage McKownville RT 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Reach 9R: EB Krumkill

Inflow Area = 77.710 ac, 31.79% Impervious, Inflow Depth = 0.86" for 10-year event
Inflow = 18.41 cfs @ 13.42 hrs, Volume= 5.582 af
Outflow = 17.86 cfs @ 13.61 hrs, Volume= 5.577 af, Atten= 3%, Lag= 11.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.04 fps, Min. Travel Time= 14.4 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 29.0 min

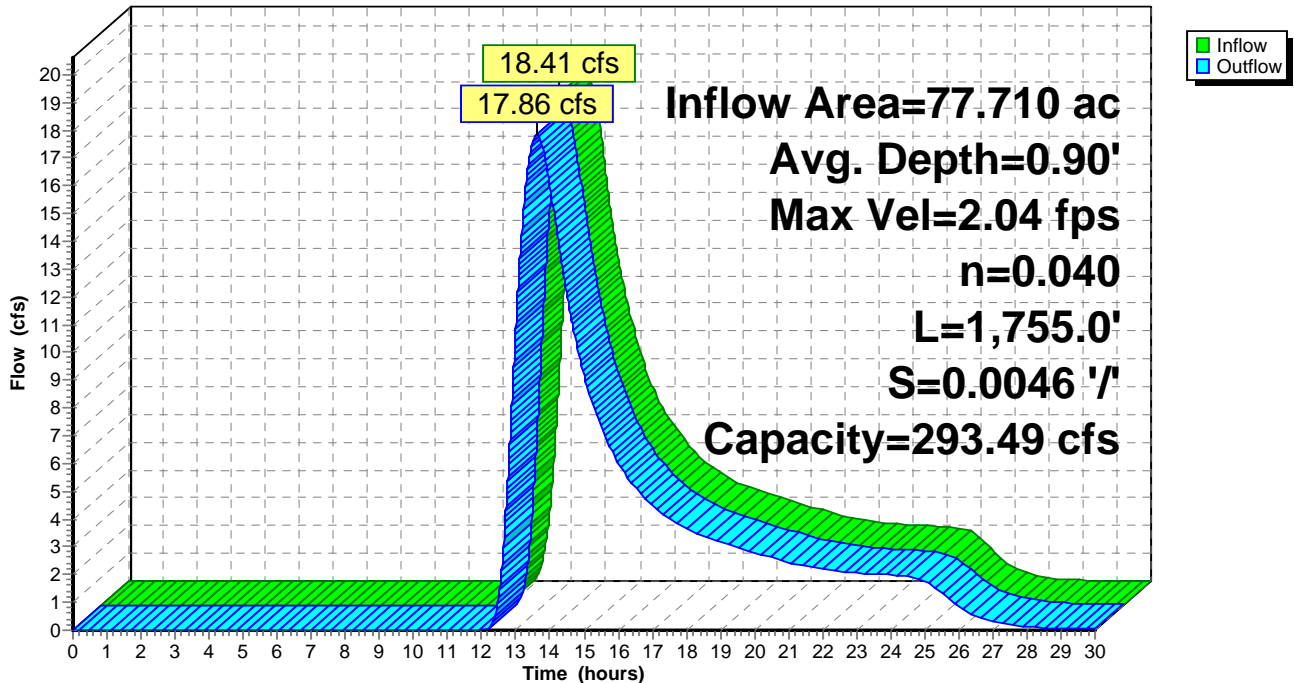
Peak Storage= 15,399 cf @ 13.61 hrs, Average Depth at Peak Storage= 0.90'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 293.49 cfs

8.00' x 4.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 1,755.0' Slope= 0.0046 '/'
Inlet Invert= 186.00', Outlet Invert= 178.00'



Reach 9R: EB Krumkill

Hydrograph



Existing Drainage McKownville RT 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Reach KK EX: Krumkill

Inflow Area = 1,100.500 ac, 34.10% Impervious, Inflow Depth > 2.36" for 10-year event

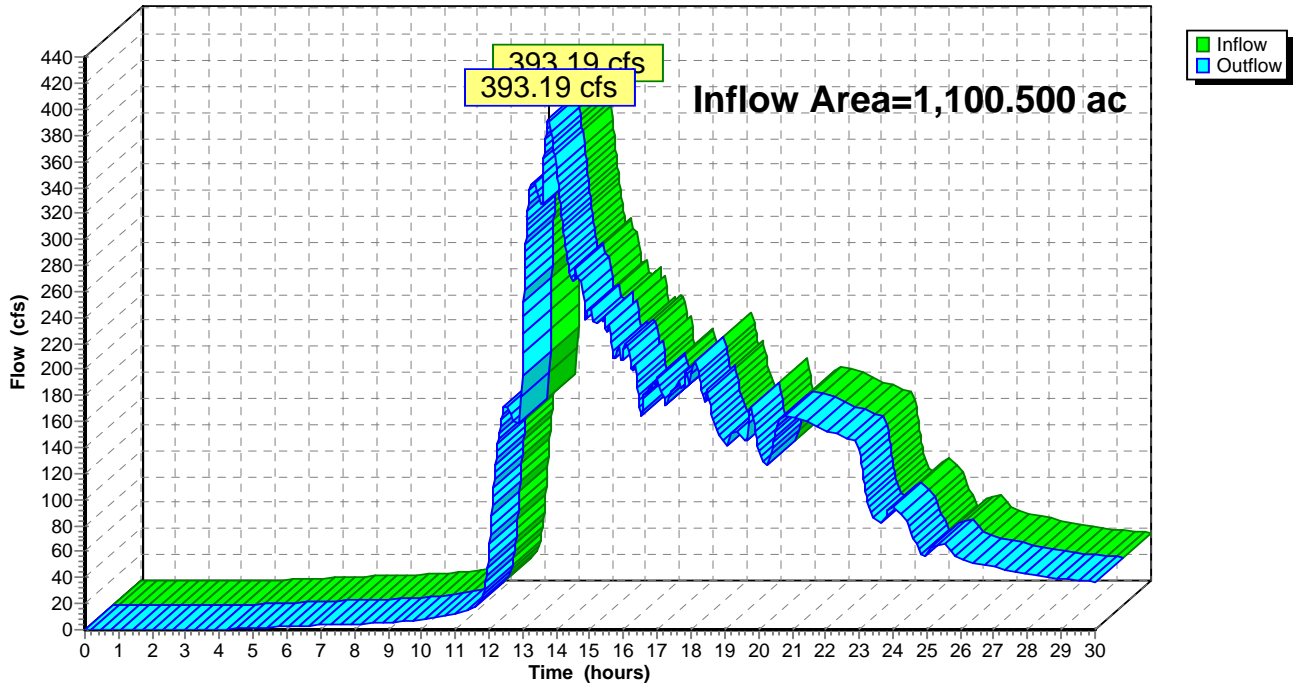
Inflow = 393.19 cfs @ 13.79 hrs, Volume= 216.474 af

Outflow = 393.19 cfs @ 13.79 hrs, Volume= 216.474 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Reach KK EX: Krumkill

Hydrograph



Existing Drainage McKownville RT 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Reach WBR1: WB R-1

Inflow Area = 937.570 ac, 35.27% Impervious, Inflow Depth > 2.60" for 10-year event
Inflow = 788.81 cfs @ 13.57 hrs, Volume= 202.962 af
Outflow = 428.26 cfs @ 13.58 hrs, Volume= 202.879 af, Atten= 46%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 6.24 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 3.22 fps, Avg. Travel Time= 1.6 min

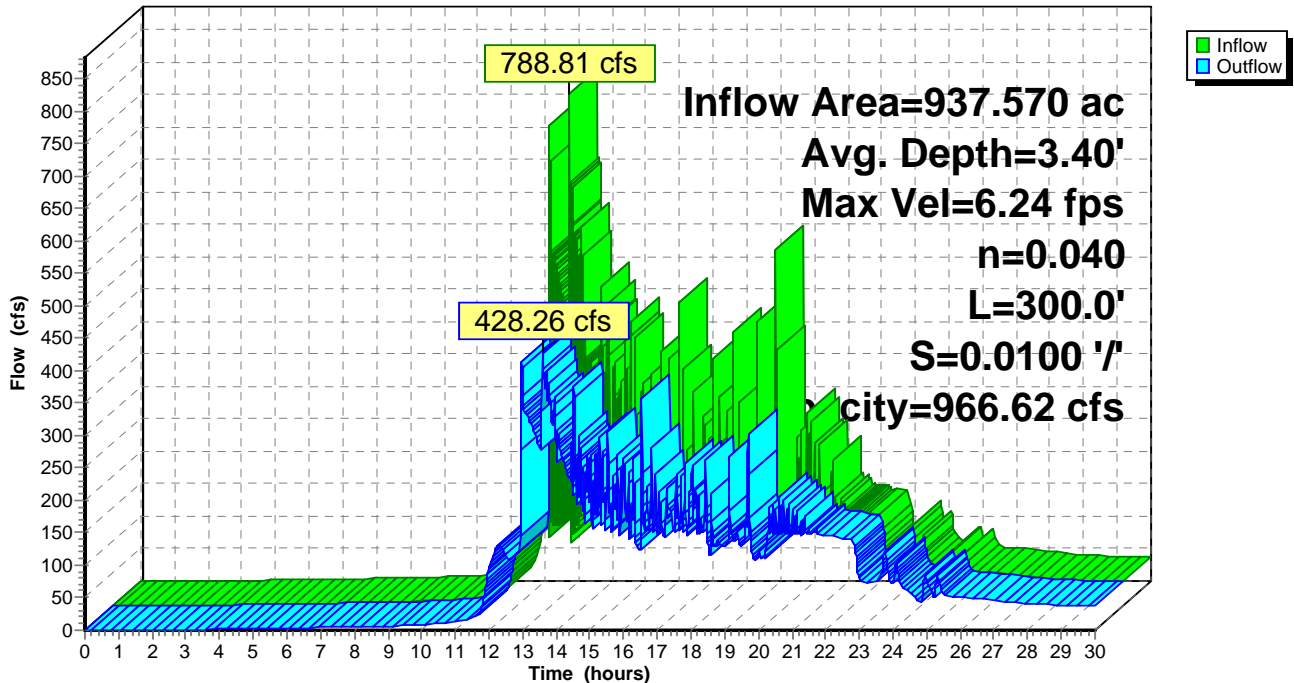
Peak Storage= 20,579 cf @ 13.58 hrs, Average Depth at Peak Storage= 3.40'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 966.62 cfs

10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 ' / ' Top Width= 40.00'
Length= 300.0' Slope= 0.0100 ' / '
Inlet Invert= 189.00', Outlet Invert= 186.00'



Reach WBR1: WB R-1

Hydrograph



Existing Drainage McKownville RT 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Reach WBR2: WB R-2

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 2.56" for 10-year event
Inflow = 429.55 cfs @ 13.58 hrs, Volume= 205.735 af
Outflow = 437.17 cfs @ 13.58 hrs, Volume= 205.711 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 10.97 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 5.58 fps, Avg. Travel Time= 0.4 min

Peak Storage= 5,964 cf @ 13.58 hrs, Average Depth at Peak Storage= 2.34'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 2,088.13 cfs

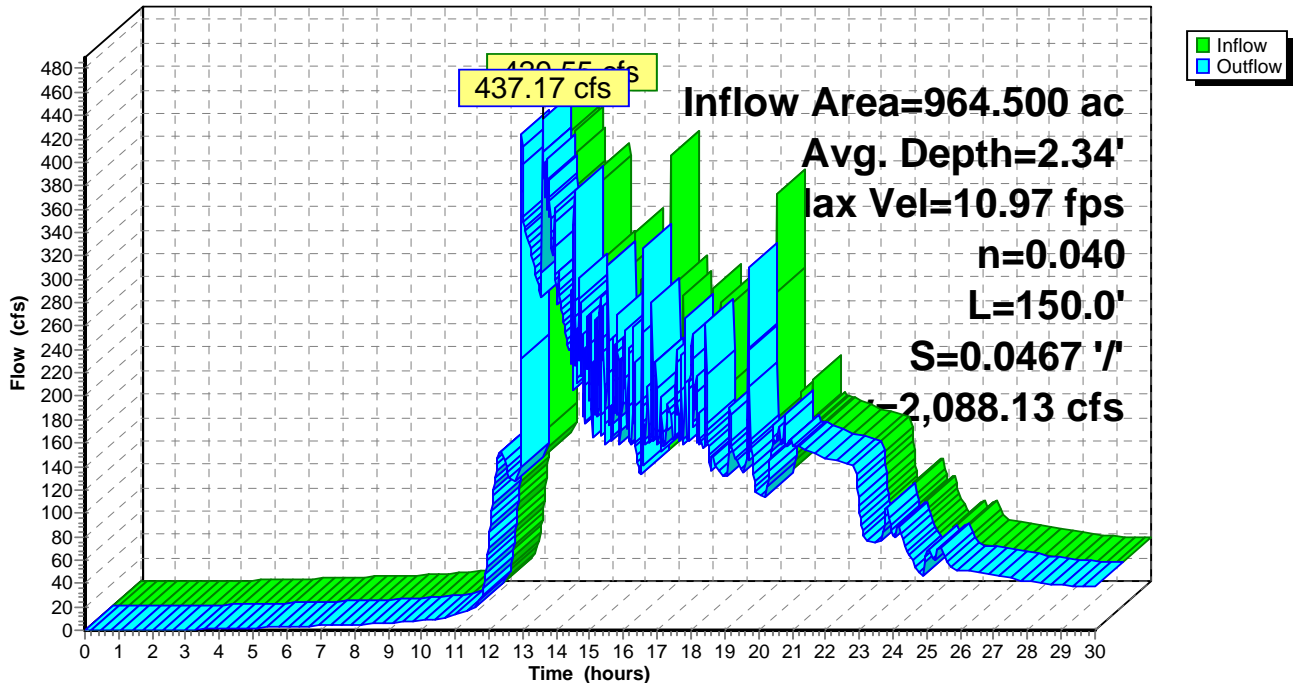
10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/' Top Width= 40.00'
Length= 150.0' Slope= 0.0467 '/'
Inlet Invert= 185.00', Outlet Invert= 178.00'



‡

Reach WBR2: WB R-2

Hydrograph



Existing Drainage McKownville RT 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Reach WBR3: WB R-3

Inflow Area = 979.670 ac, 34.87% Impervious, Inflow Depth > 2.54" for 10-year event
Inflow = 440.13 cfs @ 13.58 hrs, Volume= 207.736 af
Outflow = 423.98 cfs @ 12.99 hrs, Volume= 207.683 af, Atten= 4%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 7.54 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.94 fps, Avg. Travel Time= 1.0 min

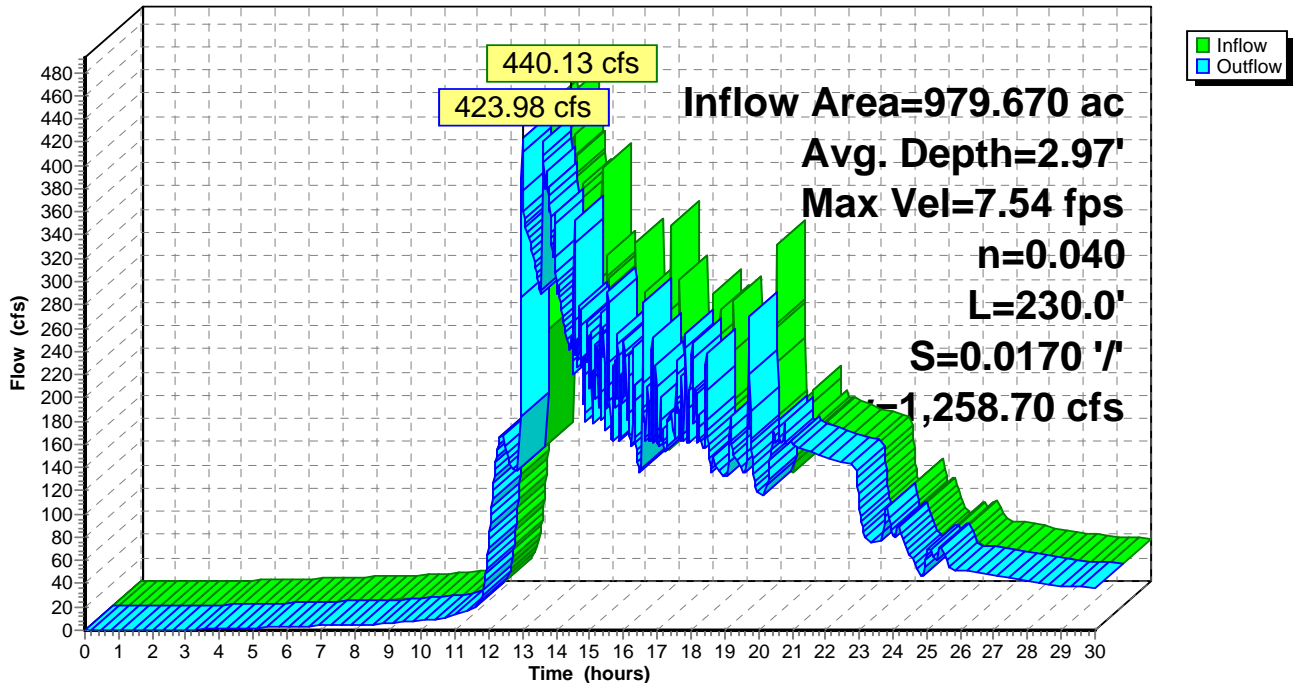
Peak Storage= 12,912 cf @ 12.99 hrs, Average Depth at Peak Storage= 2.97'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 1,258.70 cfs

10.00' x 5.00' deep channel, n= 0.040 Mountain streams
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 230.0' Slope= 0.0170 '/
Inlet Invert= 177.90', Outlet Invert= 174.00'



Reach WBR3: WB R-3

Hydrograph



Existing Drainage McKownville RT 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Reach WBR4: WB R-4

Inflow Area = 1,022.790 ac, 34.28% Impervious, Inflow Depth > 2.49" for 10-year event
Inflow = 432.41 cfs @ 12.99 hrs, Volume= 211.847 af
Outflow = 375.76 cfs @ 13.79 hrs, Volume= 210.897 af, Atten= 13%, Lag= 47.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.30 fps, Min. Travel Time= 9.7 min
Avg. Velocity = 2.37 fps, Avg. Travel Time= 17.7 min

Peak Storage= 219,316 cf @ 13.79 hrs, Average Depth at Peak Storage= 3.98'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 610.12 cfs

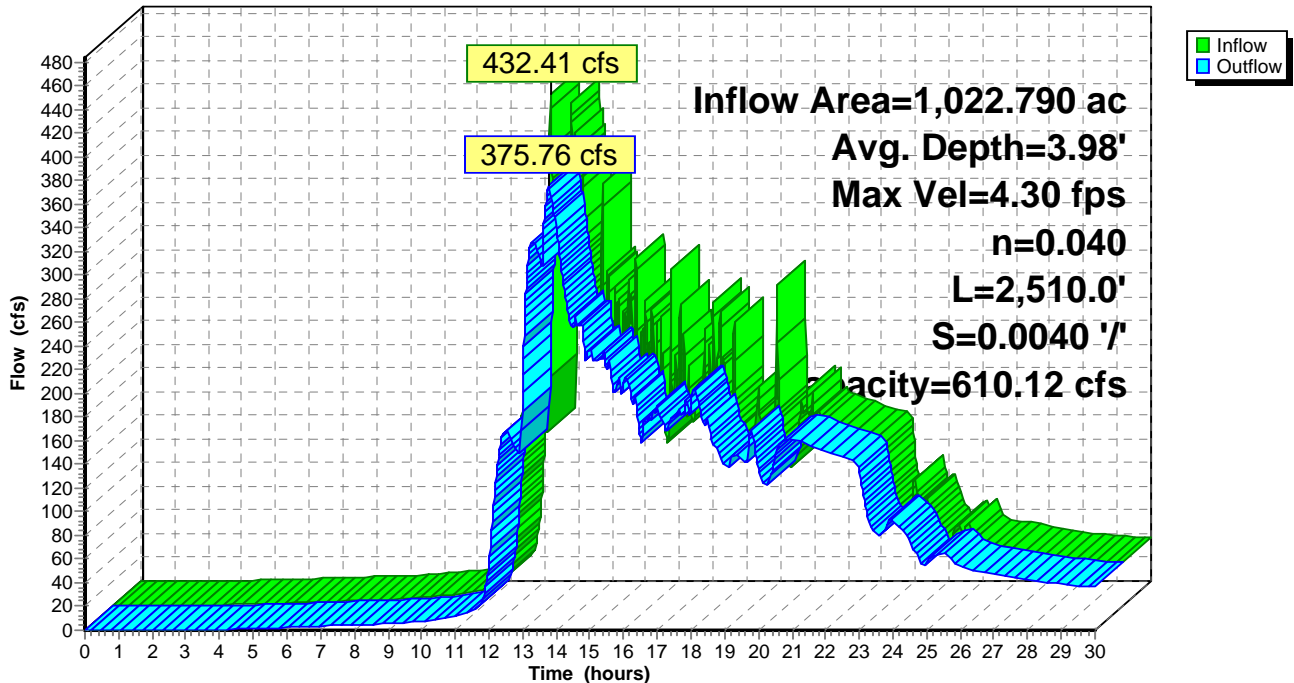
10.00' x 5.00' deep channel, n= 0.040 Mountain streams
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 2,510.0' Slope= 0.0040 '/
Inlet Invert= 186.00', Outlet Invert= 176.00'



‡

Reach WBR4: WB R-4

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Pond 16P: 36" 815'

Inflow Area = 885.660 ac, 34.84% Impervious, Inflow Depth > 2.63" for 10-year event
 Inflow = 694.79 cfs @ 12.94 hrs, Volume= 194.473 af
 Outflow = 694.79 cfs @ 12.94 hrs, Volume= 194.473 af, Atten= 0%, Lag= 0.0 min
 Primary = 694.79 cfs @ 12.94 hrs, Volume= 194.473 af

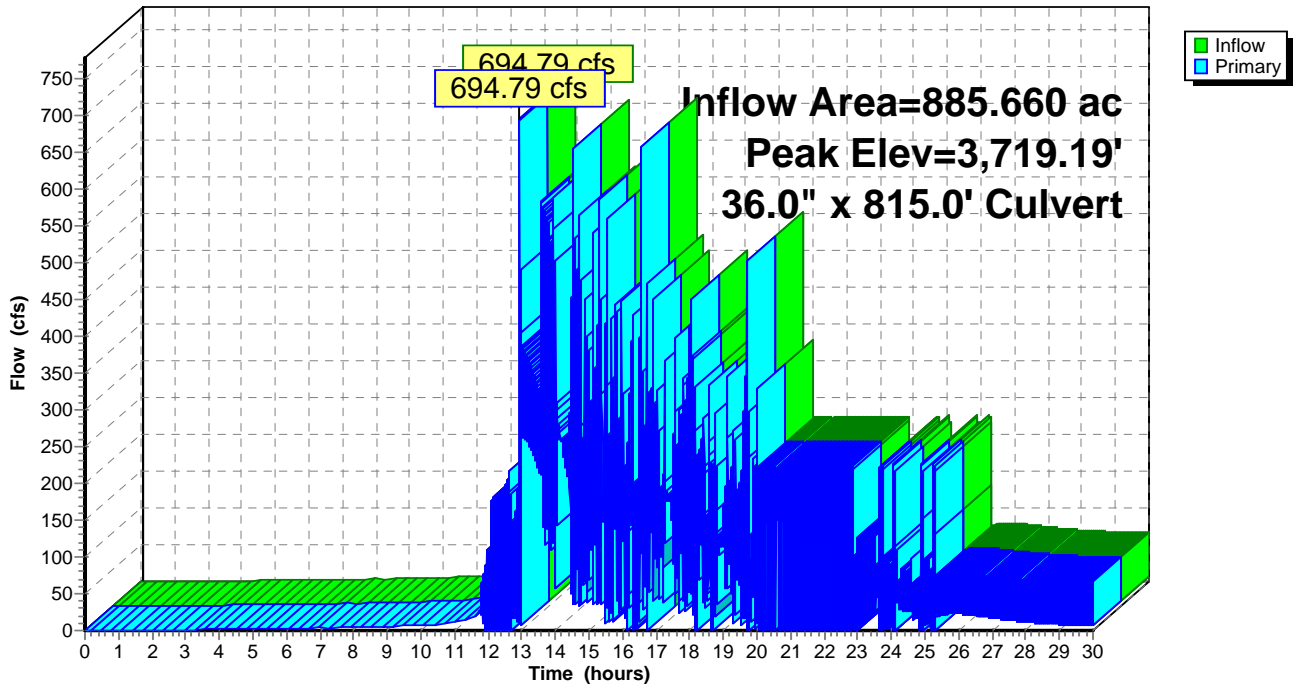
Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 3,719.19' @ 12.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	196.46'	36.0" x 815.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 194.00' S= 0.0030 '/ Cc= 0.900 n= 0.025 Corrugated metal

Primary OutFlow Max=666.98 cfs @ 12.94 hrs HW=3,567.65' TW=335.30' (Dynamic Tailwater)
 ←**1=Culvert** (Outlet Controls 666.98 cfs @ 94.36 fps)

Pond 16P: 36" 815'

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Pond 17P: 48" 85'

Inflow Area = 885.660 ac, 34.84% Impervious, Inflow Depth > 2.63" for 10-year event
 Inflow = 694.79 cfs @ 12.94 hrs, Volume= 194.473 af
 Outflow = 694.79 cfs @ 12.94 hrs, Volume= 194.473 af, Atten= 0%, Lag= 0.0 min
 Primary = 694.79 cfs @ 12.94 hrs, Volume= 194.473 af

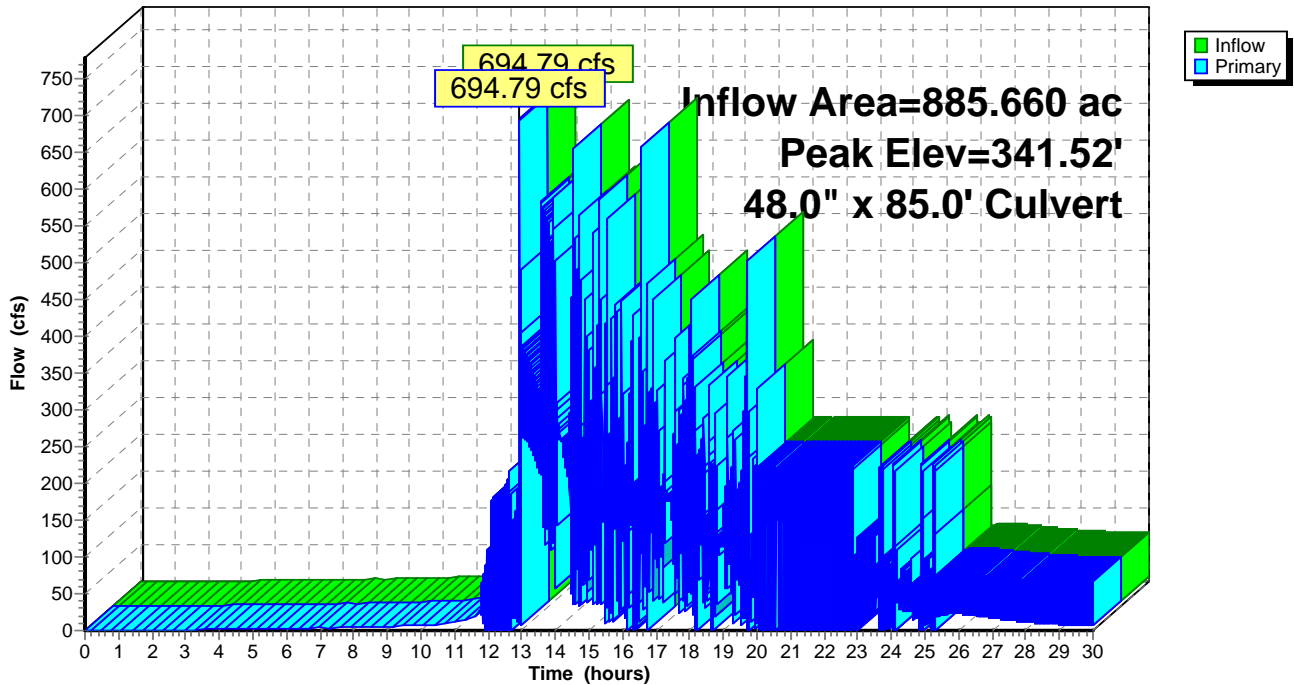
Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 341.52' @ 12.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	194.00'	48.0" x 85.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 193.00' S= 0.0118 '/ Cc= 0.900 n= 0.025 Corrugated metal

Primary OutFlow Max=678.49 cfs @ 12.94 hrs HW=335.30' TW=195.11' (Dynamic Tailwater)
 ↳=Culvert (Barrel Controls 678.49 cfs @ 53.99 fps)

Pond 17P: 48" 85'

Hydrograph



Existing Drainage McKownville RT 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Pond ARd C: Acre Rd Culvert

Inflow Area = 979.670 ac, 34.87% Impervious, Inflow Depth > 2.54" for 10-year event
Inflow = 423.98 cfs @ 12.99 hrs, Volume= 207.683 af
Outflow = 423.98 cfs @ 12.99 hrs, Volume= 207.683 af, Atten= 0%, Lag= 0.0 min
Primary = 423.98 cfs @ 12.99 hrs, Volume= 207.683 af

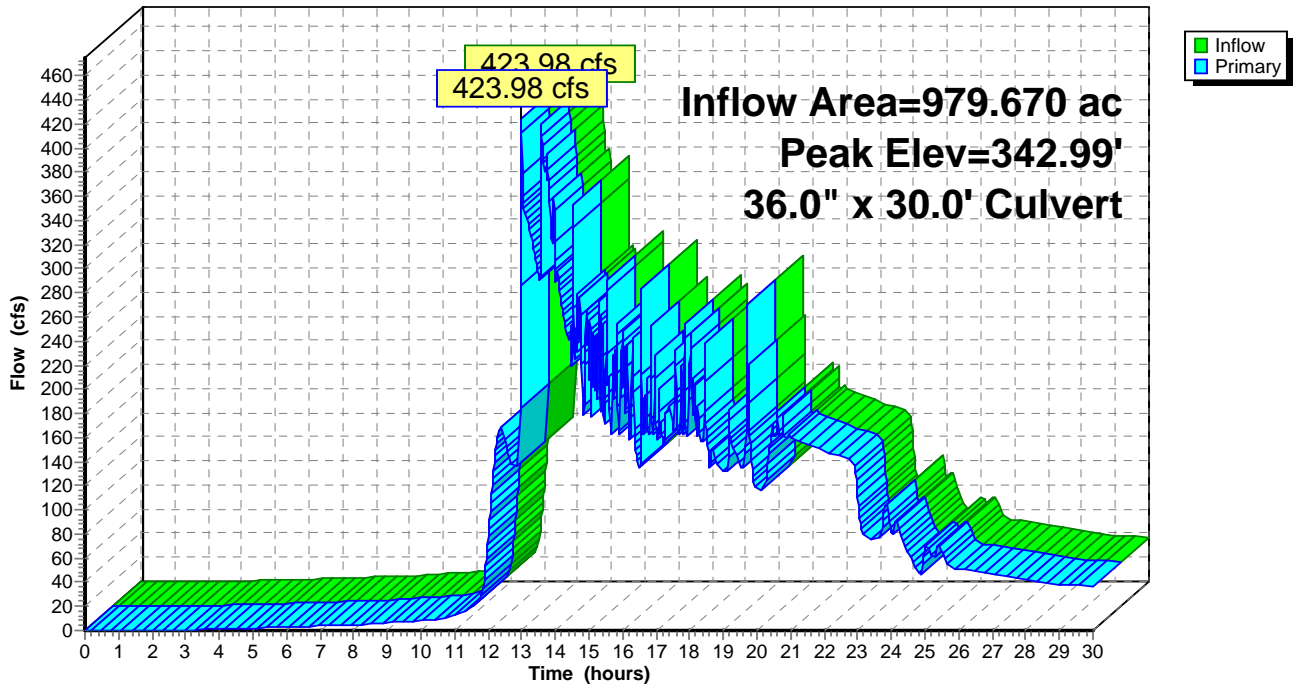
Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 342.99' @ 13.59 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	174.00'	36.0" x 30.0' long Culvert CPP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 173.90' S= 0.0033 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=419.83 cfs @ 12.99 hrs HW=341.03' TW=188.87' (Dynamic Tailwater)
↑=Culvert (Inlet Controls 419.83 cfs @ 59.39 fps)

Pond ARd C: Acre Rd Culvert

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Pond ES A: Existing Storage A

Inflow Area = 937.570 ac, 35.27% Impervious, Inflow Depth > 2.60" for 10-year event
 Inflow = 709.58 cfs @ 12.94 hrs, Volume= 203.438 af
 Outflow = 788.81 cfs @ 13.57 hrs, Volume= 202.962 af, Atten= 0%, Lag= 37.8 min
 Primary = 788.81 cfs @ 13.57 hrs, Volume= 202.962 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 198.49' @ 13.57 hrs Surf.Area= 22,244 sf Storage= 57,579 cf

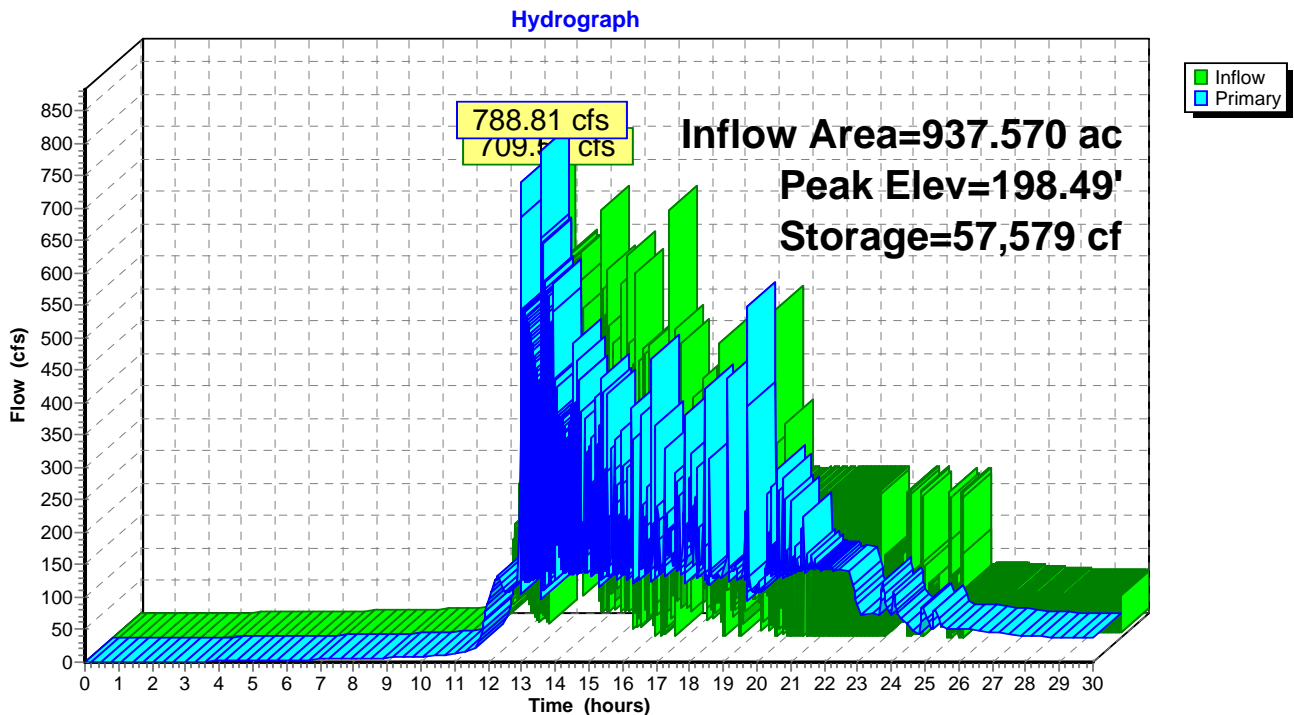
Plug-Flow detention time= 5.8 min calculated for 202.962 af (100% of inflow)
 Center-of-Mass det. time= 4.1 min (1,086.0 - 1,081.9)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	57,579 cf	65.00'W x 250.00'L x 3.00'H Prismatic Z=3.0

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=763.77 cfs @ 13.57 hrs HW=198.41' TW=192.27' (Dynamic Tailwater)
 ↳ **1=Broad-Crested Rectangular Weir** (Weir Controls 763.77 cfs @ 9.08 fps)

Pond ES A: Existing Storage A



Existing Drainage McKownville RT 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Pond ES B: Existing Storage B

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 2.57" for 10-year event
 Inflow = 432.23 cfs @ 13.58 hrs, Volume= 206.261 af
 Outflow = 429.55 cfs @ 13.58 hrs, Volume= 205.735 af, Atten= 1%, Lag= 0.0 min
 Primary = 429.55 cfs @ 13.58 hrs, Volume= 205.735 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 191.68' @ 13.58 hrs Surf.Area= 23,122 sf Storage= 61,135 cf

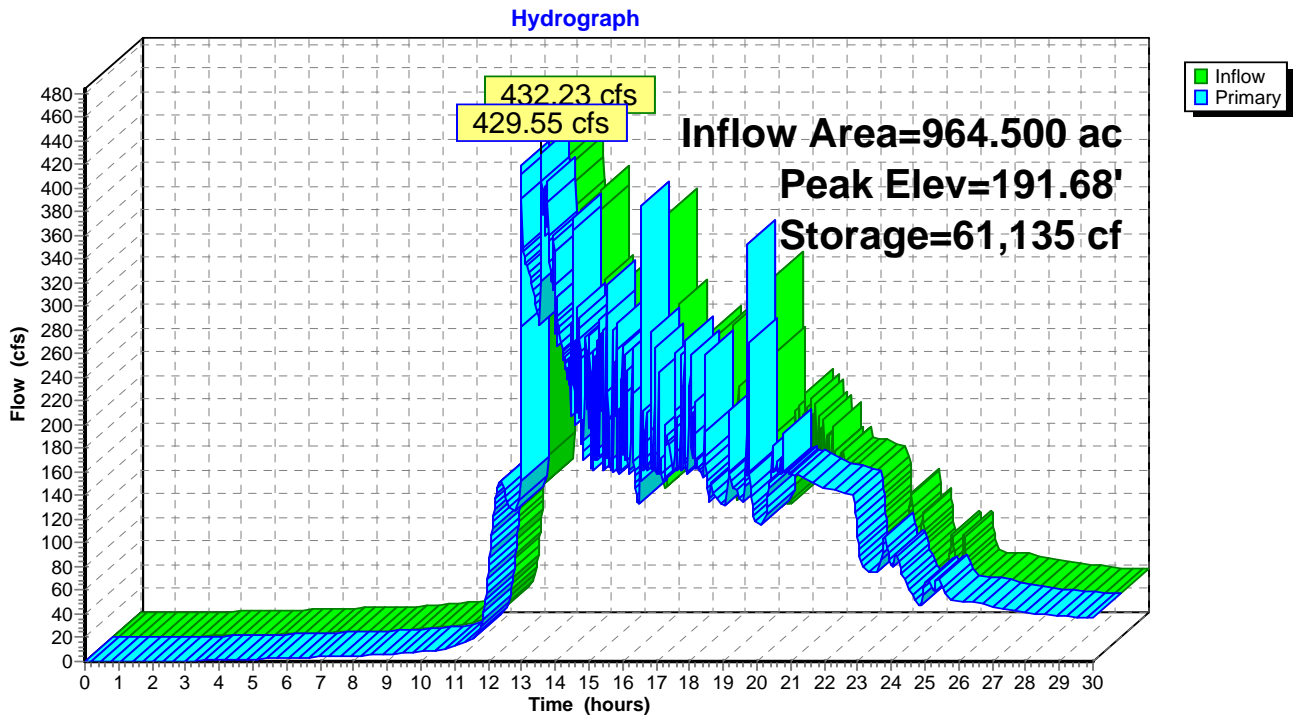
Plug-Flow detention time= 6.0 min calculated for 205.667 af (100% of inflow)
 Center-of-Mass det. time= 4.2 min (1,087.3 - 1,083.1)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	61,135 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
186.00	17,576	0	0
188.00	21,332	38,908	38,908
189.00	23,122	22,227	61,135

Device	Routing	Invert	Outlet Devices
#1	Primary	186.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=428.02 cfs @ 13.58 hrs HW=191.67' TW=187.32' (Dynamic Tailwater)
 ↑1=Broad-Crested Rectangular Weir (Weir Controls 428.02 cfs @ 7.55 fps)

Pond ES B: Existing Storage B



Existing Drainage McKownville RT 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Pond MRd C: McKown Rd Culv

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 2.56" for 10-year event
Inflow = 437.17 cfs @ 13.58 hrs, Volume= 205.711 af
Outflow = 437.17 cfs @ 13.58 hrs, Volume= 205.711 af, Atten= 0%, Lag= 0.0 min
Primary = 437.17 cfs @ 13.58 hrs, Volume= 205.711 af

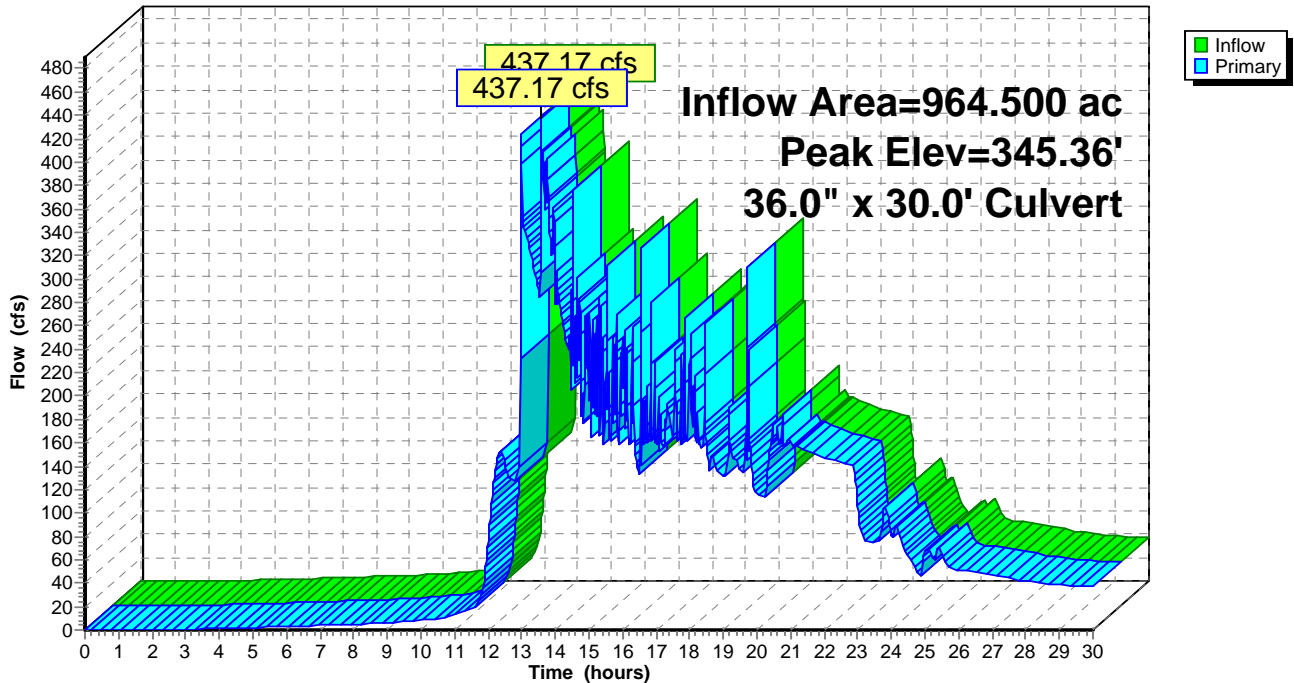
Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 345.36' @ 13.58 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	36.0" x 30.0' long Culvert RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 177.00' S= 0.0333 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=427.59 cfs @ 13.58 hrs HW=338.60' TW=180.77' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 427.59 cfs @ 60.49 fps)

Pond MRd C: McKown Rd Culv

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ED A: Existing DA A Runoff Area=8.170 ac 70.75% Impervious Runoff Depth=2.21"
Flow Length=1,334' Slope=0.0100 '/' Tc=28.1 min CN=90 Runoff=16.35 cfs 1.508 af

Subcatchment ED A1: Existing DA A1 Runoff Area=8.170 ac 70.75% Impervious Runoff Depth=2.21"
Flow Length=1,334' Slope=0.0100 '/' Tc=28.1 min CN=90 Runoff=16.35 cfs 1.508 af

Subcatchment ED B: Existing DA B Runoff Area=7.240 ac 100.00% Impervious Runoff Depth=3.02"
Flow Length=363' Slope=0.0275 '/' Tc=4.0 min CN=98 Runoff=35.43 cfs 1.820 af

Subcatchment ED C: Existing DA C Runoff Area=36.500 ac 25.00% Impervious Runoff Depth=0.86"
Flow Length=1,133' Slope=0.0335 '/' Tc=25.6 min CN=70 Runoff=26.63 cfs 2.608 af

Subcatchment ED D: Existing DA D Runoff Area=18.760 ac 3.20% Impervious Runoff Depth=0.39"
Flow Length=1,139' Slope=0.0237 '/' Tc=40.7 min CN=59 Runoff=2.99 cfs 0.614 af

Subcatchment ED E: Existing DA E Runoff Area=15.170 ac 30.00% Impervious Runoff Depth=0.96"
Flow Length=1,334' Slope=0.0150 '/' Tc=41.3 min CN=72 Runoff=9.16 cfs 1.215 af

Subcatchment ED F: Existing DA F Runoff Area=16.380 ac 17.27% Impervious Runoff Depth=1.37"
Flow Length=661' Slope=0.0290 '/' Tc=13.8 min CN=79 Runoff=30.18 cfs 1.876 af

Subcatchment ED G: Existing DA G Runoff Area=26.740 ac 22.93% Impervious Runoff Depth=0.24"
Flow Length=1,244' Slope=0.0160 '/' Tc=60.3 min CN=54 Runoff=1.40 cfs 0.529 af

Subcatchment ED I: ED I Runoff Area=77.710 ac 31.79% Impervious Runoff Depth=0.43"
Flow Length=3,076' Slope=0.0160 '/' Tc=106.9 min CN=60 Runoff=7.63 cfs 2.772 af

Reach 9R: EB Krumkill Avg. Depth=0.53' Max Vel=1.51 fps Inflow=7.63 cfs 2.772 af
n=0.040 L=1,755.0' S=0.0046 '/' Capacity=293.49 cfs Outflow=7.32 cfs 2.768 af

Reach KK EX: Krumkill Inflow=153.11 cfs 110.662 af
Outflow=153.11 cfs 110.662 af

Reach WBR1: WB R-1 Avg. Depth=2.44' Max Vel=5.19 fps Inflow=270.34 cfs 105.519 af
n=0.040 L=300.0' S=0.0100 '/' Capacity=966.62 cfs Outflow=219.91 cfs 105.349 af

Reach WBR2: WB R-2 Avg. Depth=1.37' Max Vel=8.21 fps Inflow=158.88 cfs 106.419 af
n=0.040 L=150.0' S=0.0467 '/' Capacity=2,088.13 cfs Outflow=158.79 cfs 106.369 af

Reach WBR3: WB R-3 Avg. Depth=1.80' Max Vel=5.75 fps Inflow=159.86 cfs 107.584 af
n=0.040 L=230.0' S=0.0170 '/' Capacity=1,258.70 cfs Outflow=159.21 cfs 107.475 af

Reach WBR4: WB R-4 Avg. Depth=2.52' Max Vel=3.35 fps Inflow=161.23 cfs 109.880 af
n=0.040 L=2,510.0' S=0.0040 '/' Capacity=610.12 cfs Outflow=147.75 cfs 107.895 af

Pond 16P: 36" 815' Peak Elev=1,522.10' Inflow=423.25 cfs 100.642 af
36.0" x 815.0' Culvert Outflow=423.25 cfs 100.642 af

Existing Drainage McKownville RT 20 Area

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Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED B: Existing DA B

Runoff = 35.43 cfs @ 11.94 hrs, Volume= 1.820 af, Depth= 3.02"

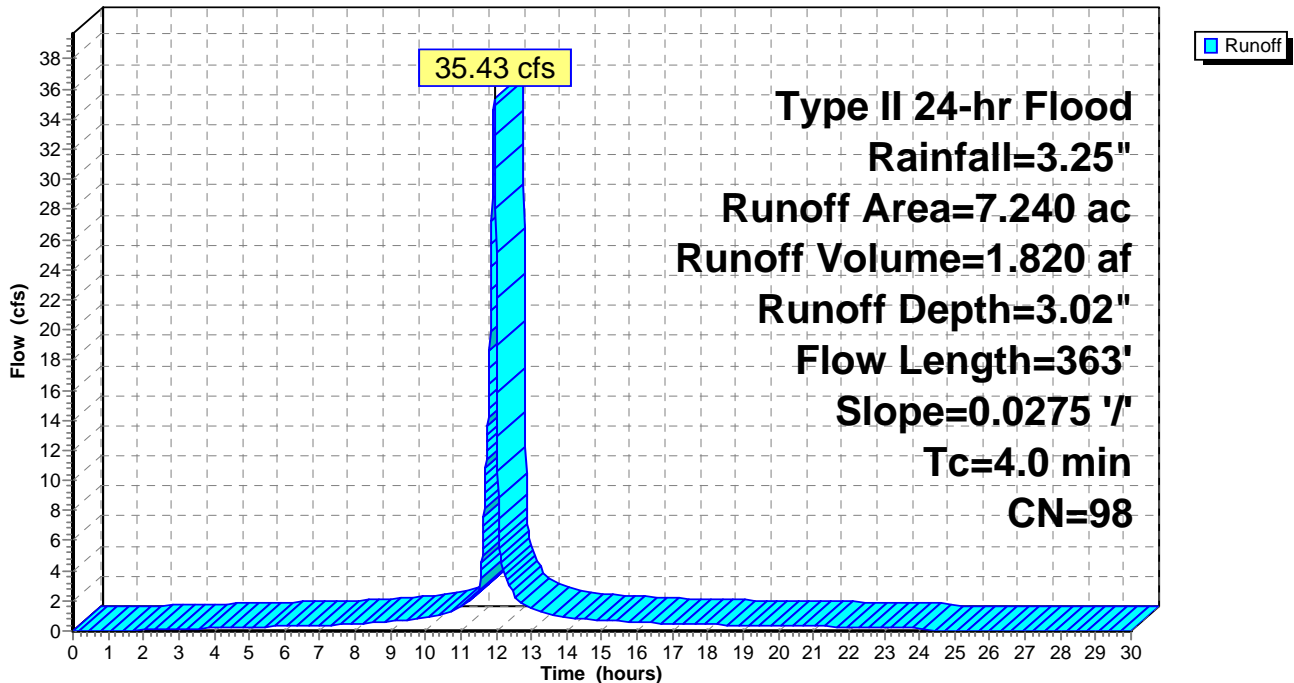
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
7.240	98	Paved parking & roofs
7.240		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	363	0.0275	1.50		Lag/CN Method,

Subcatchment ED B: Existing DA B

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED C: Existing DA C

Runoff = 26.63 cfs @ 12.21 hrs, Volume= 2.608 af, Depth= 0.86"

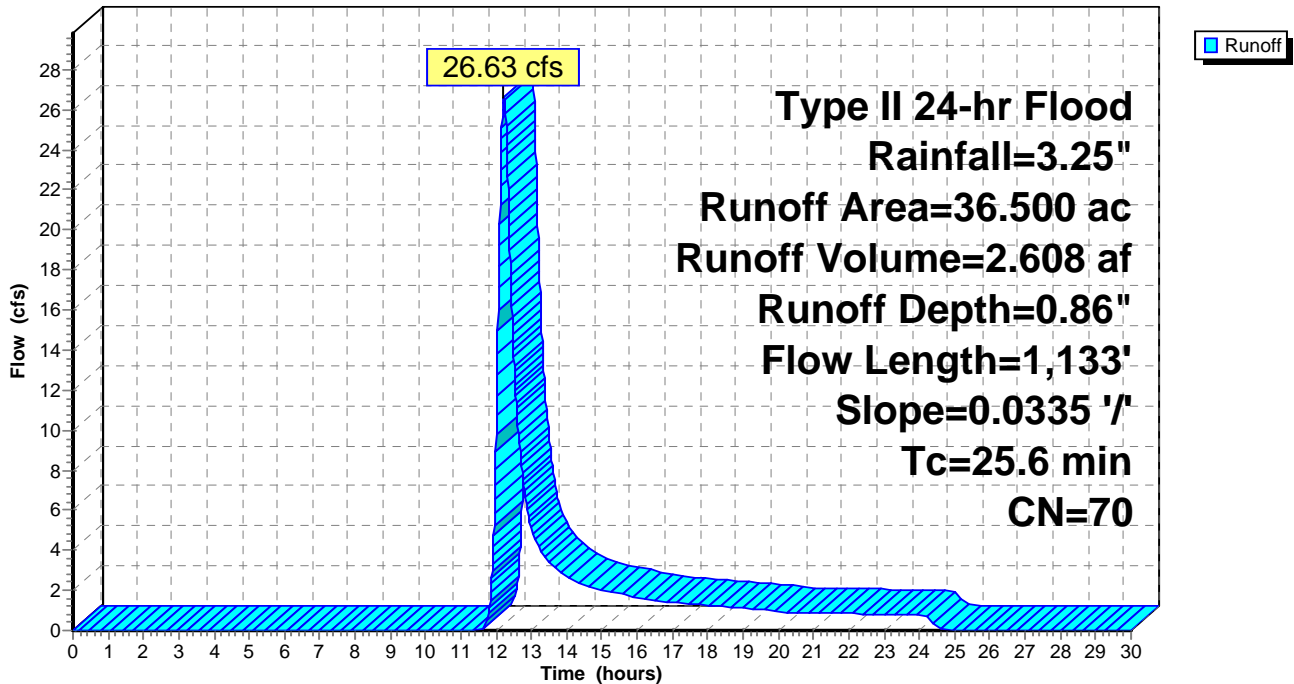
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
36.500	70	1/2 acre lots, 25% imp, HSG B
27.375		Pervious Area
9.125		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	1,133	0.0335	0.74		Lag/CN Method,

Subcatchment ED C: Existing DA C

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED D: Existing DA D

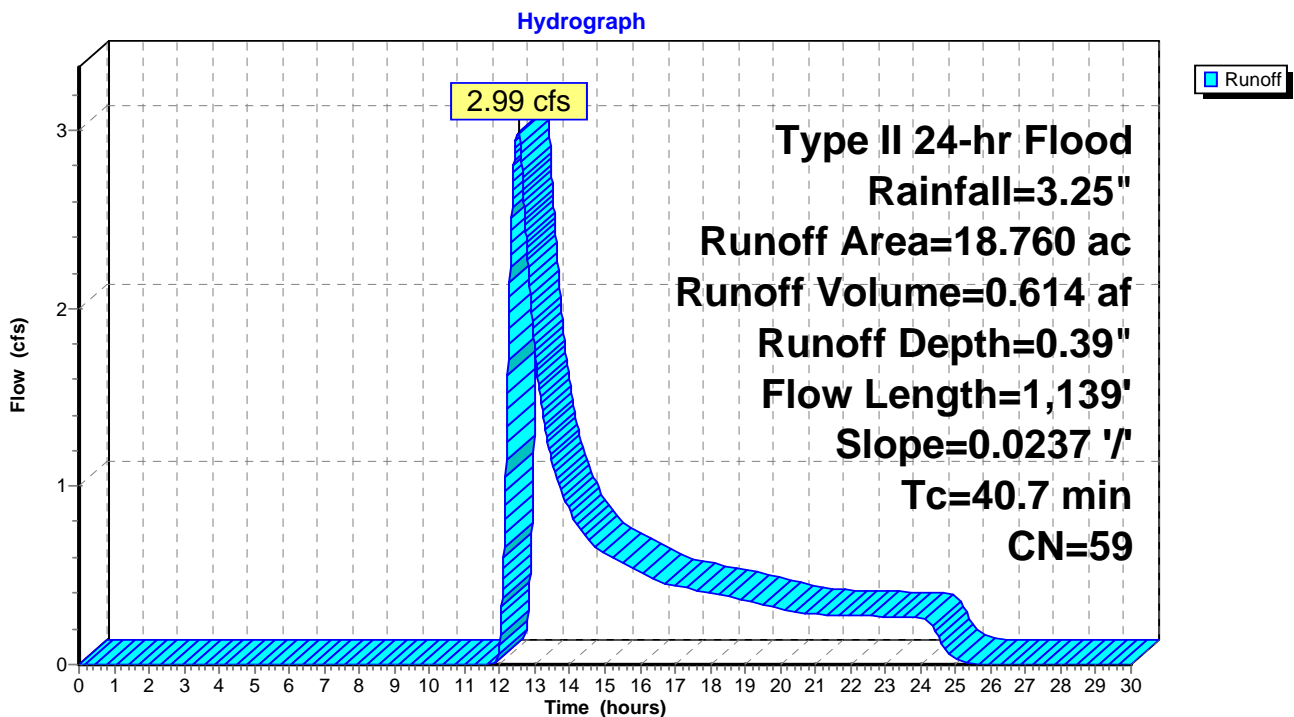
Runoff = 2.99 cfs @ 12.52 hrs, Volume= 0.614 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
18.160	58	Woods/grass comb., Good, HSG B
0.600	98	Paved parking & roofs
18.760	59	Weighted Average
18.160		Pervious Area
0.600		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.7	1,139	0.0237	0.47		Lag/CN Method,

Subcatchment ED D: Existing DA D



Existing Drainage McKownville RT 20 Area

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Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED E: Existing DA E

Runoff = 9.16 cfs @ 12.43 hrs, Volume= 1.215 af, Depth= 0.96"

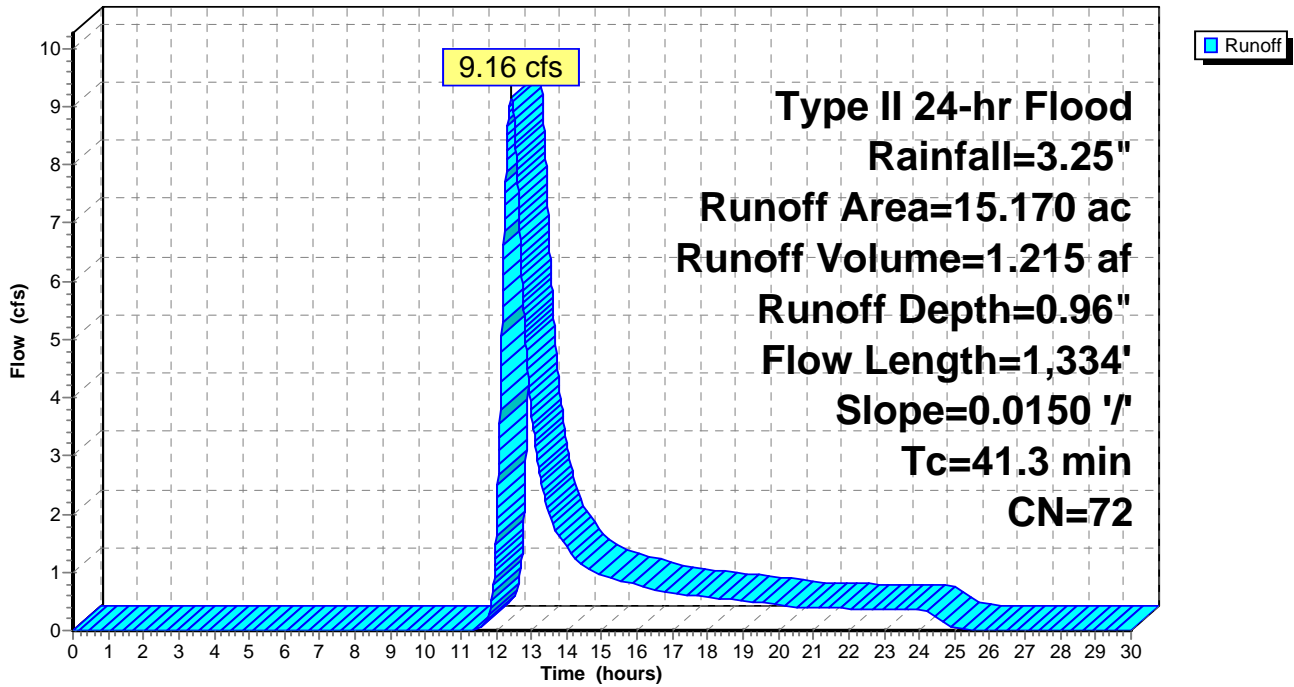
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
15.170	72	1/3 acre lots, 30% imp, HSG B
10.619		Pervious Area
4.551		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.3	1,334	0.0150	0.54		Lag/CN Method,

Subcatchment ED E: Existing DA E

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED F: Existing DA F

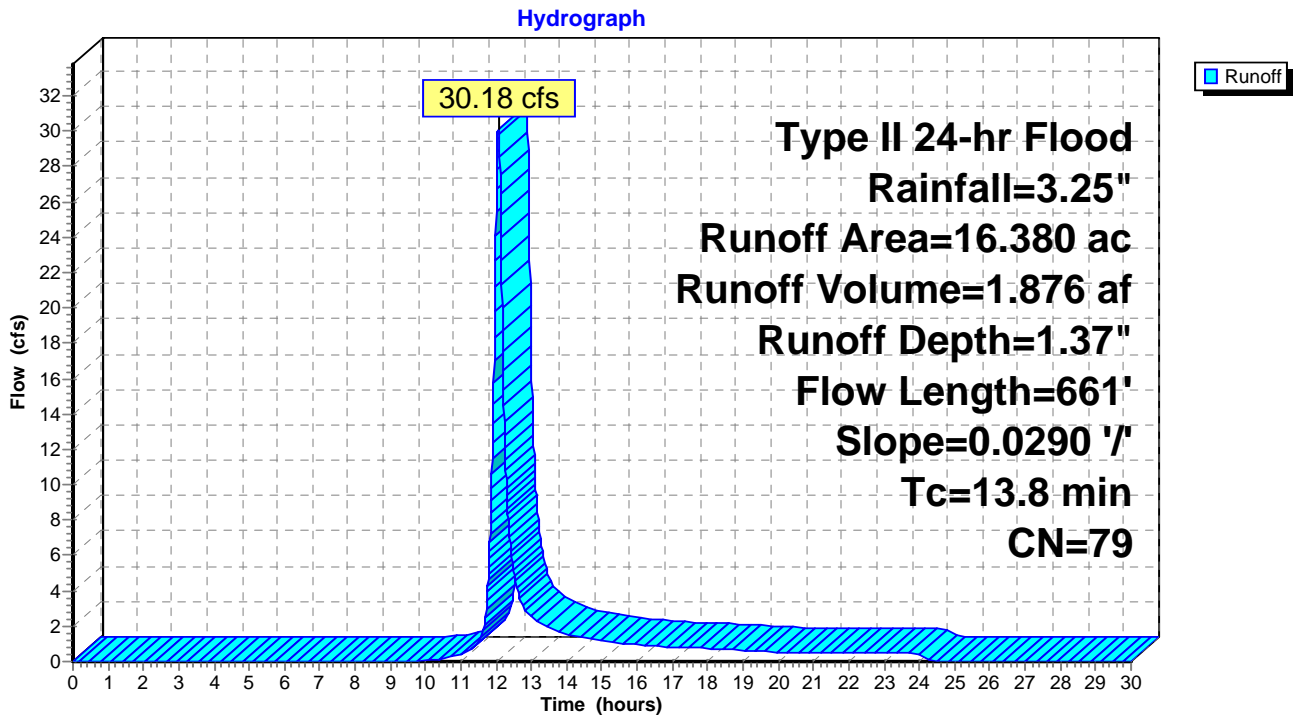
Runoff = 30.18 cfs @ 12.06 hrs, Volume= 1.876 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
9.430	81	1/3 acre lots, 30% imp, HSG C
6.950	76	Woods/grass comb., Fair, HSG C
16.380	79	Weighted Average
13.551		Pervious Area
2.829		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	661	0.0290	0.80		Lag/CN Method,

Subcatchment ED F: Existing DA F



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED G: Existing DA G

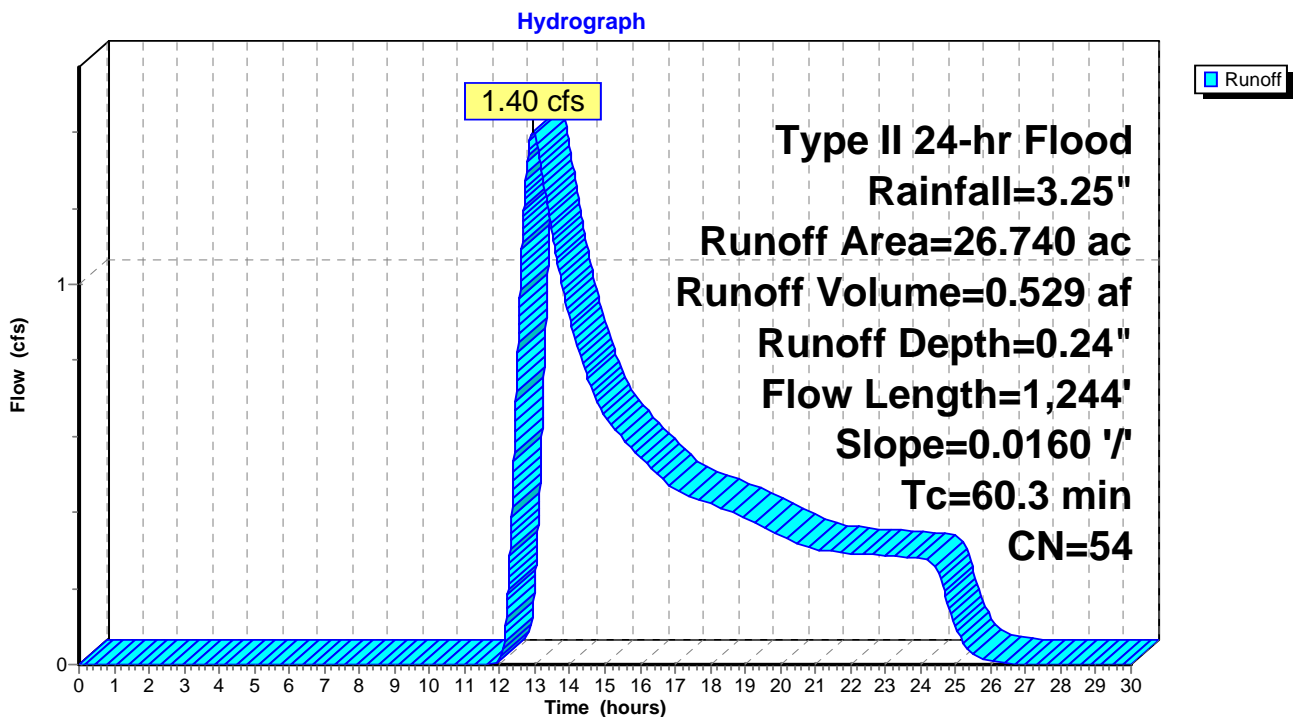
Runoff = 1.40 cfs @ 12.94 hrs, Volume= 0.529 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
20.440	57	1/3 acre lots, 30% imp, HSG A
6.300	43	Woods/grass comb., Fair, HSG A
26.740	54	Weighted Average
20.608		Pervious Area
6.132		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.3	1,244	0.0160	0.34		Lag/CN Method,

Subcatchment ED G: Existing DA G



Existing Drainage McKownville RT 20 Area

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Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED I: ED I

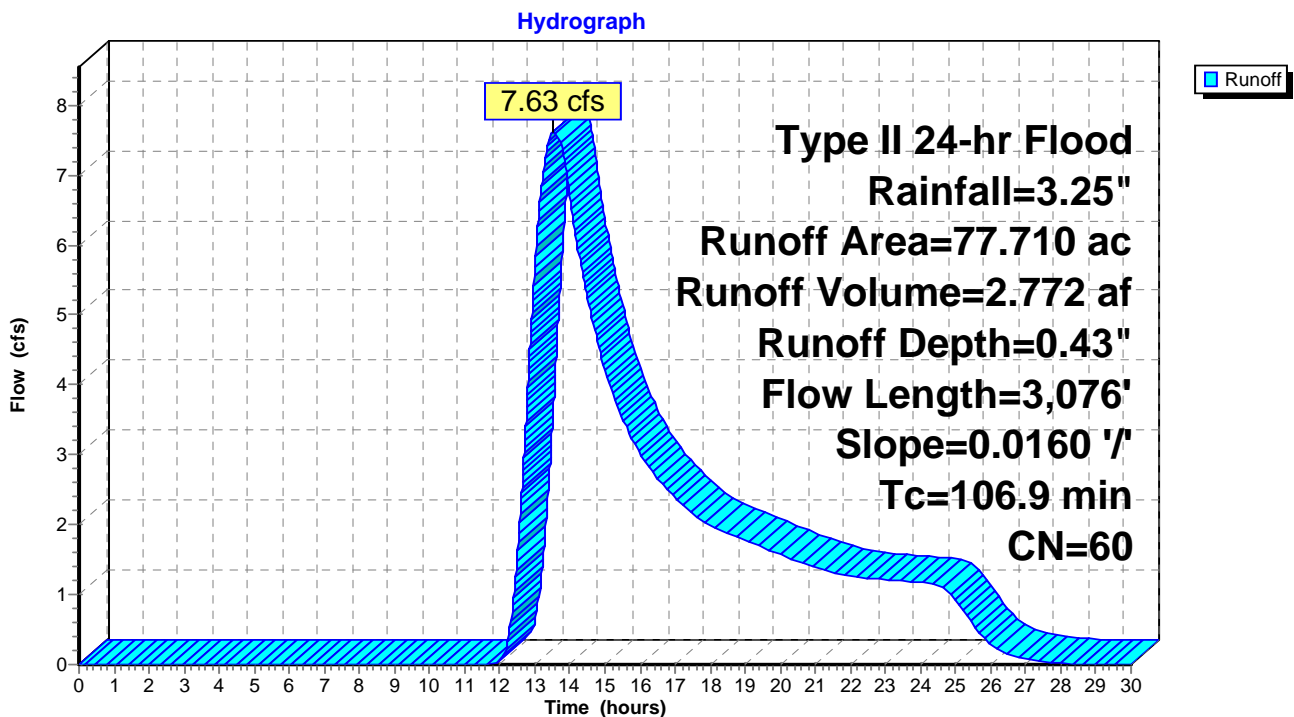
Runoff = 7.63 cfs @ 13.54 hrs, Volume= 2.772 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
65.010	61	1/4 acre lots, 38% imp, HSG A
12.700	55	Woods, Good, HSG B
77.710	60	Weighted Average
53.006		Pervious Area
24.704		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
106.9	3,076	0.0160	0.48		Lag/CN Method,

Subcatchment ED I: ED I



Existing Drainage McKownville RT 20 Area

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Type II 24-hr Flood Rainfall=3.25"

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Summary for Reach 9R: EB Krumkill

Inflow Area = 77.710 ac, 31.79% Impervious, Inflow Depth = 0.43" for Flood event
Inflow = 7.63 cfs @ 13.54 hrs, Volume= 2.772 af
Outflow = 7.32 cfs @ 13.80 hrs, Volume= 2.768 af, Atten= 4%, Lag= 15.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.51 fps, Min. Travel Time= 19.4 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 36.2 min

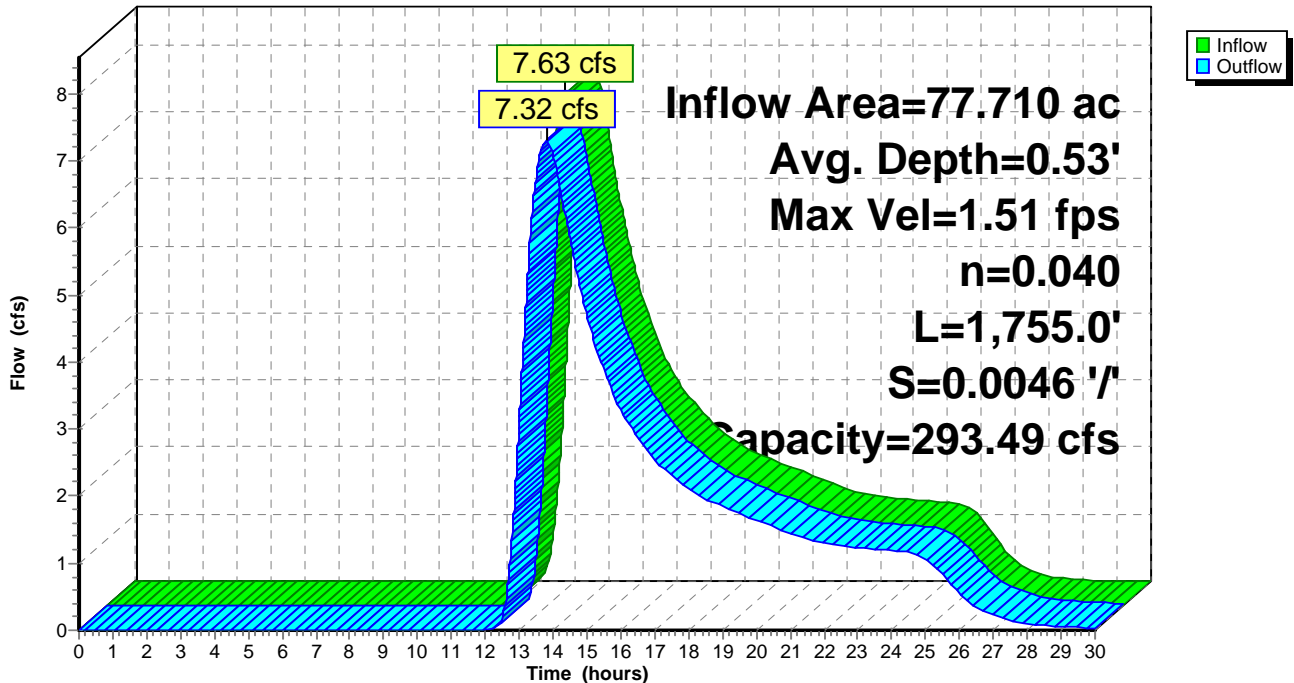
Peak Storage= 8,508 cf @ 13.80 hrs, Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 293.49 cfs

8.00' x 4.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 1,755.0' Slope= 0.0046 '/'
Inlet Invert= 186.00', Outlet Invert= 178.00'



Reach 9R: EB Krumkill

Hydrograph



Existing Drainage McKownville RT 20 Area

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Type II 24-hr Flood Rainfall=3.25"

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Summary for Reach KK EX: Krumkill

Inflow Area = 1,100.500 ac, 34.10% Impervious, Inflow Depth > 1.21" for Flood event

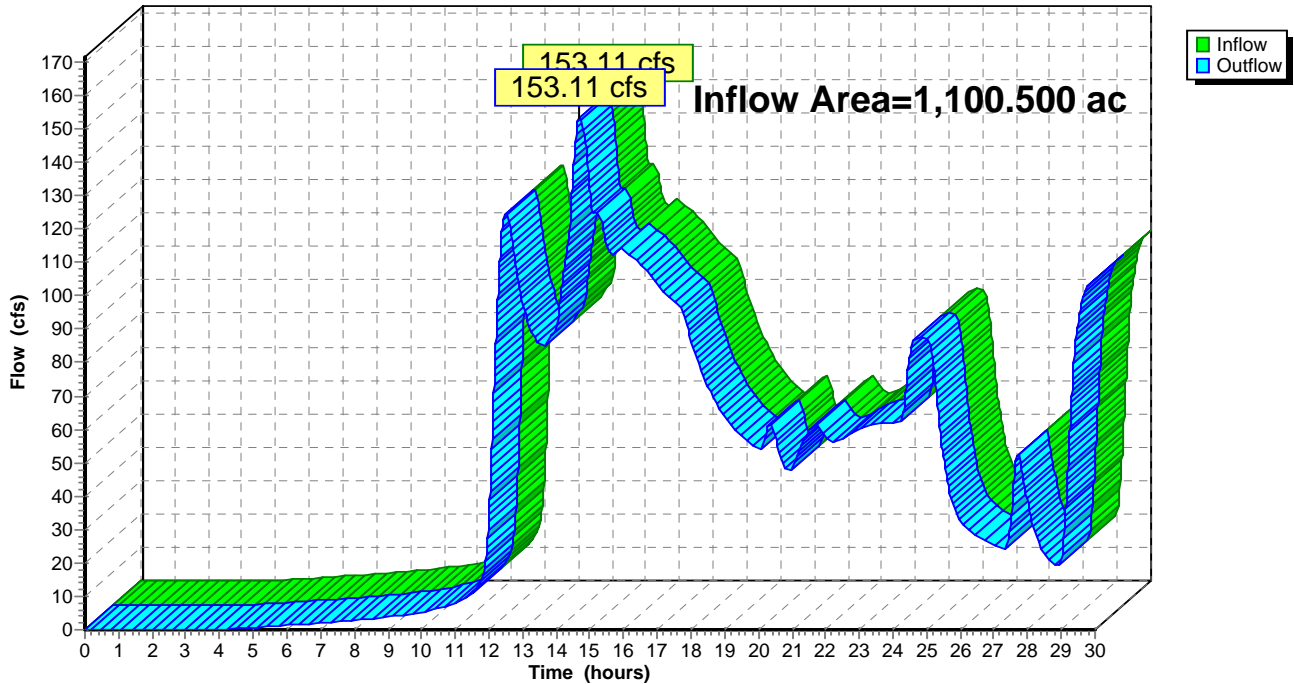
Inflow = 153.11 cfs @ 14.69 hrs, Volume= 110.662 af

Outflow = 153.11 cfs @ 14.69 hrs, Volume= 110.662 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Reach KK EX: Krumkill

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Reach WBR1: WB R-1

Inflow Area = 937.570 ac, 35.27% Impervious, Inflow Depth > 1.35" for Flood event
Inflow = 270.34 cfs @ 14.40 hrs, Volume= 105.519 af
Outflow = 219.91 cfs @ 14.40 hrs, Volume= 105.349 af, Atten= 19%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.19 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 2.74 fps, Avg. Travel Time= 1.8 min

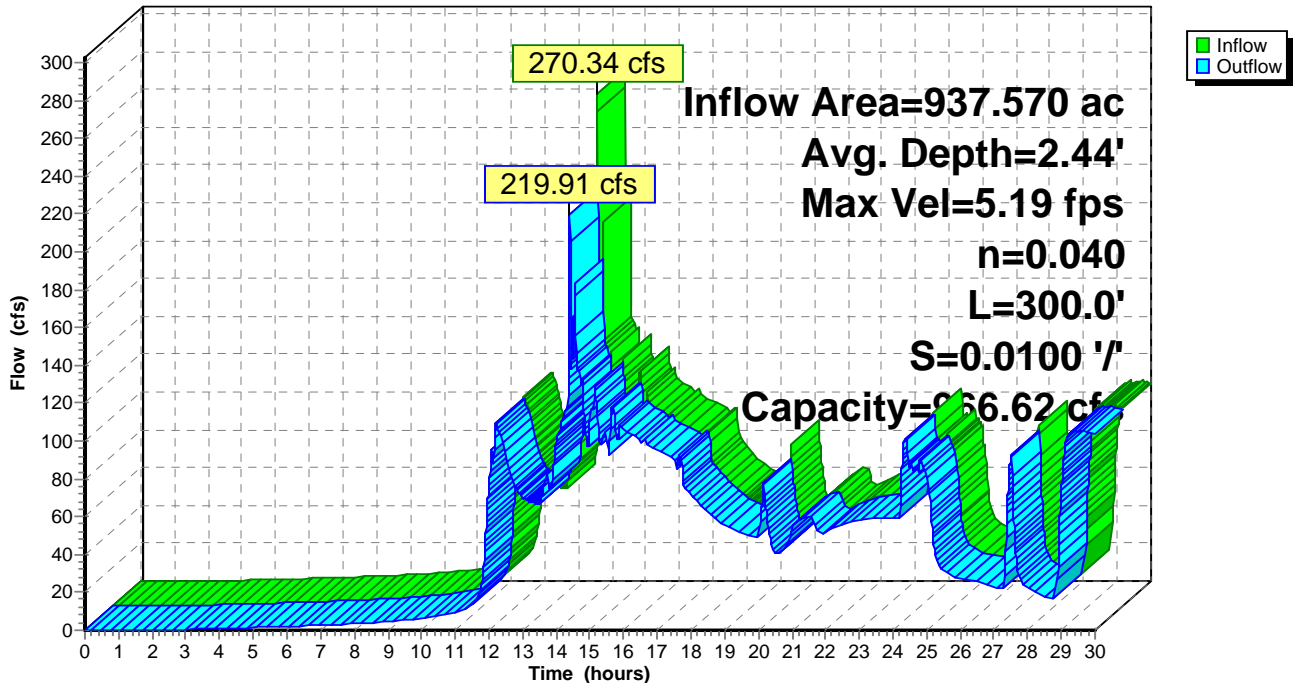
Peak Storage= 12,669 cf @ 14.40 hrs, Average Depth at Peak Storage= 2.44'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 966.62 cfs

10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/' Top Width= 40.00'
Length= 300.0' Slope= 0.0100 '/'
Inlet Invert= 189.00', Outlet Invert= 186.00'



Reach WBR1: WB R-1

Hydrograph



Existing Drainage McKownville RT 20 Area

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Type II 24-hr Flood Rainfall=3.25"

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Summary for Reach WBR2: WB R-2

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 1.32" for Flood event
Inflow = 158.88 cfs @ 14.58 hrs, Volume= 106.419 af
Outflow = 158.79 cfs @ 14.58 hrs, Volume= 106.369 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 8.21 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 4.70 fps, Avg. Travel Time= 0.5 min

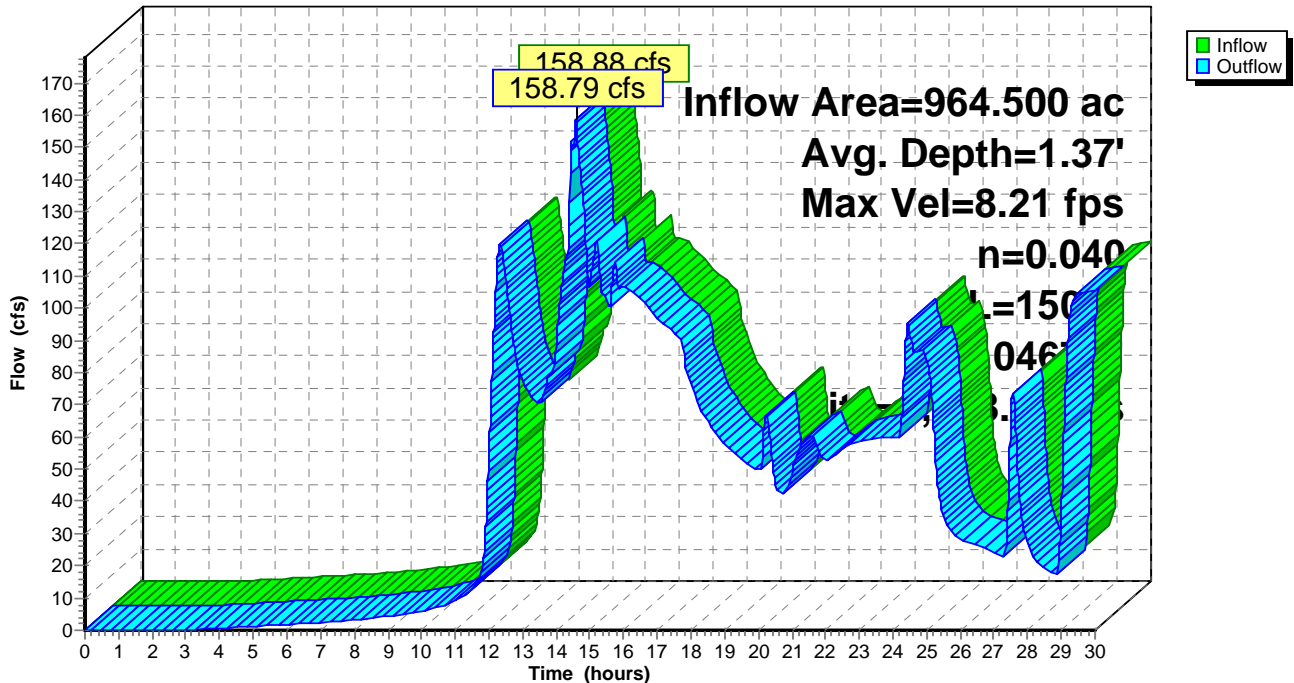
Peak Storage= 2,899 cf @ 14.58 hrs, Average Depth at Peak Storage= 1.37'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 2,088.13 cfs

10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 150.0' Slope= 0.0467 '/
Inlet Invert= 185.00', Outlet Invert= 178.00'



Reach WBR2: WB R-2

Hydrograph



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Type II 24-hr Flood Rainfall=3.25"

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Summary for Reach WBR3: WB R-3

Inflow Area = 979.670 ac, 34.87% Impervious, Inflow Depth > 1.32" for Flood event
Inflow = 159.86 cfs @ 14.58 hrs, Volume= 107.584 af
Outflow = 159.21 cfs @ 14.59 hrs, Volume= 107.475 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.75 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 3.33 fps, Avg. Travel Time= 1.1 min

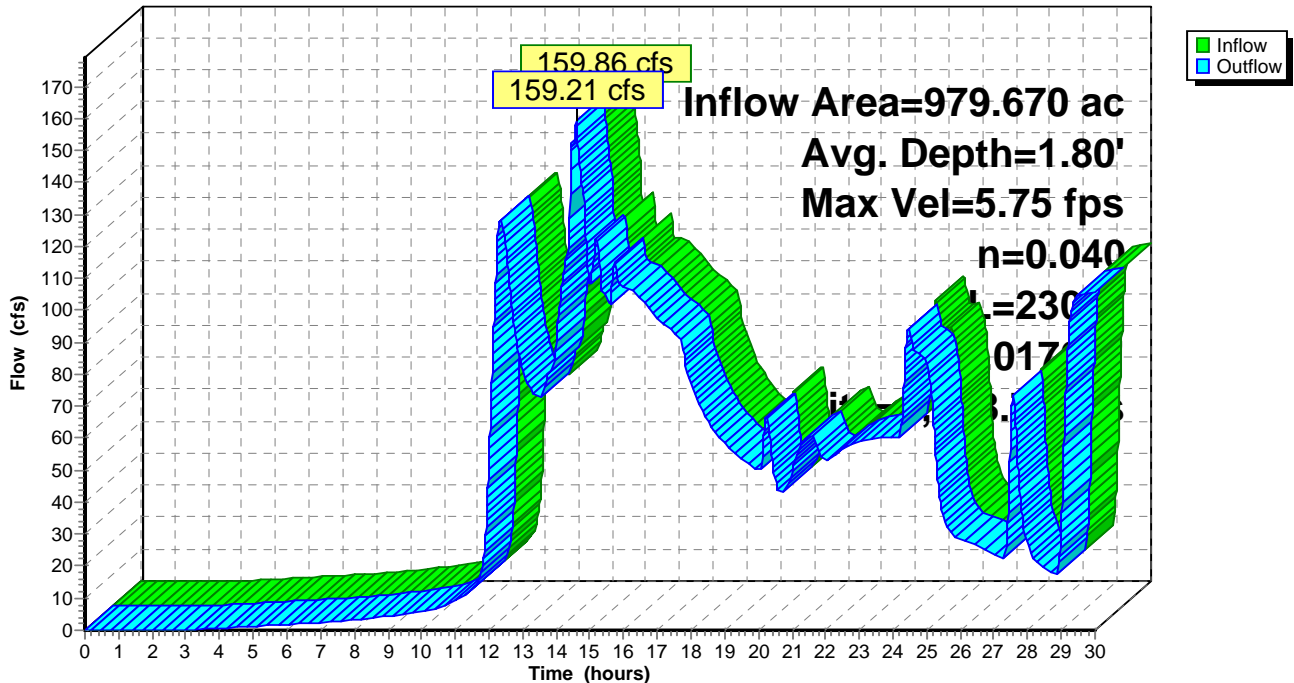
Peak Storage= 6,370 cf @ 14.59 hrs, Average Depth at Peak Storage= 1.80'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 1,258.70 cfs

10.00' x 5.00' deep channel, n= 0.040 Mountain streams
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 230.0' Slope= 0.0170 '/
Inlet Invert= 177.90', Outlet Invert= 174.00'



Reach WBR3: WB R-3

Hydrograph



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Type II 24-hr Flood Rainfall=3.25"

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Summary for Reach WBR4: WB R-4

Inflow Area = 1,022.790 ac, 34.28% Impervious, Inflow Depth > 1.29" for Flood event
Inflow = 161.23 cfs @ 14.59 hrs, Volume= 109.880 af
Outflow = 147.75 cfs @ 14.69 hrs, Volume= 107.895 af, Atten= 8%, Lag= 5.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.35 fps, Min. Travel Time= 12.5 min
Avg. Velocity = 2.01 fps, Avg. Travel Time= 20.8 min

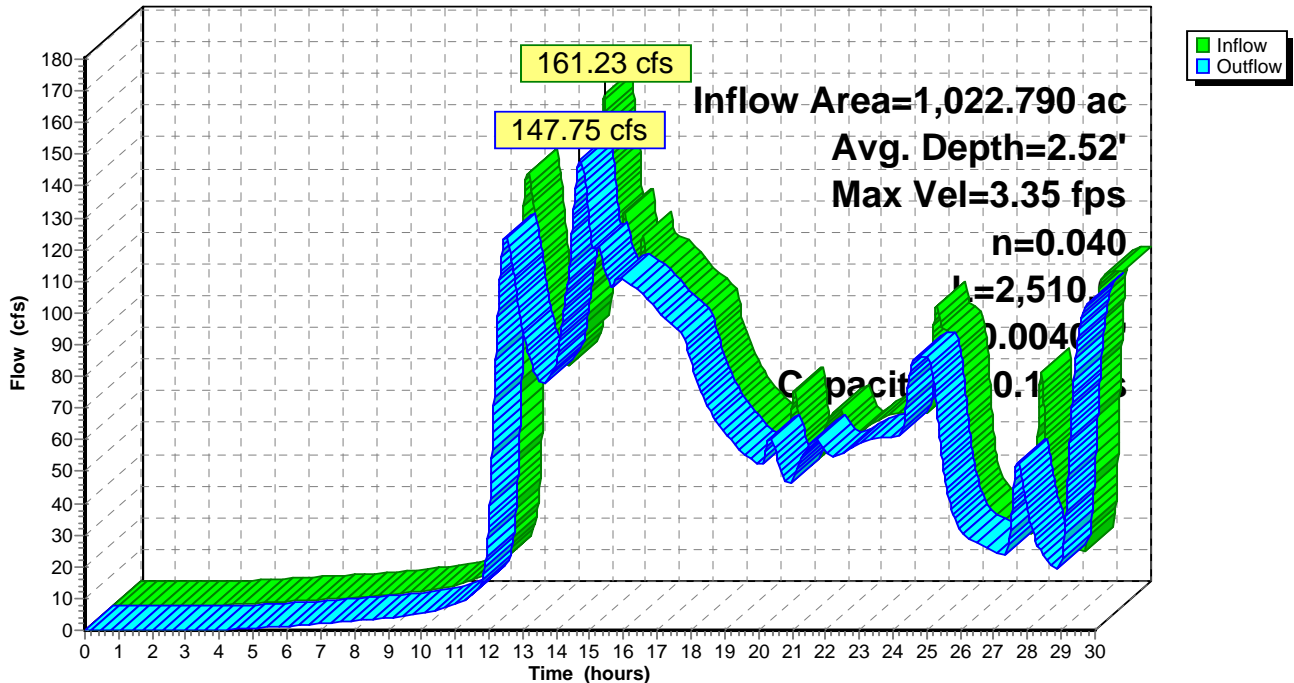
Peak Storage= 110,849 cf @ 14.69 hrs, Average Depth at Peak Storage= 2.52'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 610.12 cfs

10.00' x 5.00' deep channel, n= 0.040 Mountain streams
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 2,510.0' Slope= 0.0040 '/
Inlet Invert= 186.00', Outlet Invert= 176.00'



Reach WBR4: WB R-4

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Pond 16P: 36" 815'

Inflow Area = 885.660 ac, 34.84% Impervious, Inflow Depth > 1.36" for Flood event
 Inflow = 423.25 cfs @ 14.39 hrs, Volume= 100.642 af
 Outflow = 423.25 cfs @ 14.39 hrs, Volume= 100.642 af, Atten= 0%, Lag= 0.0 min
 Primary = 423.25 cfs @ 14.39 hrs, Volume= 100.642 af

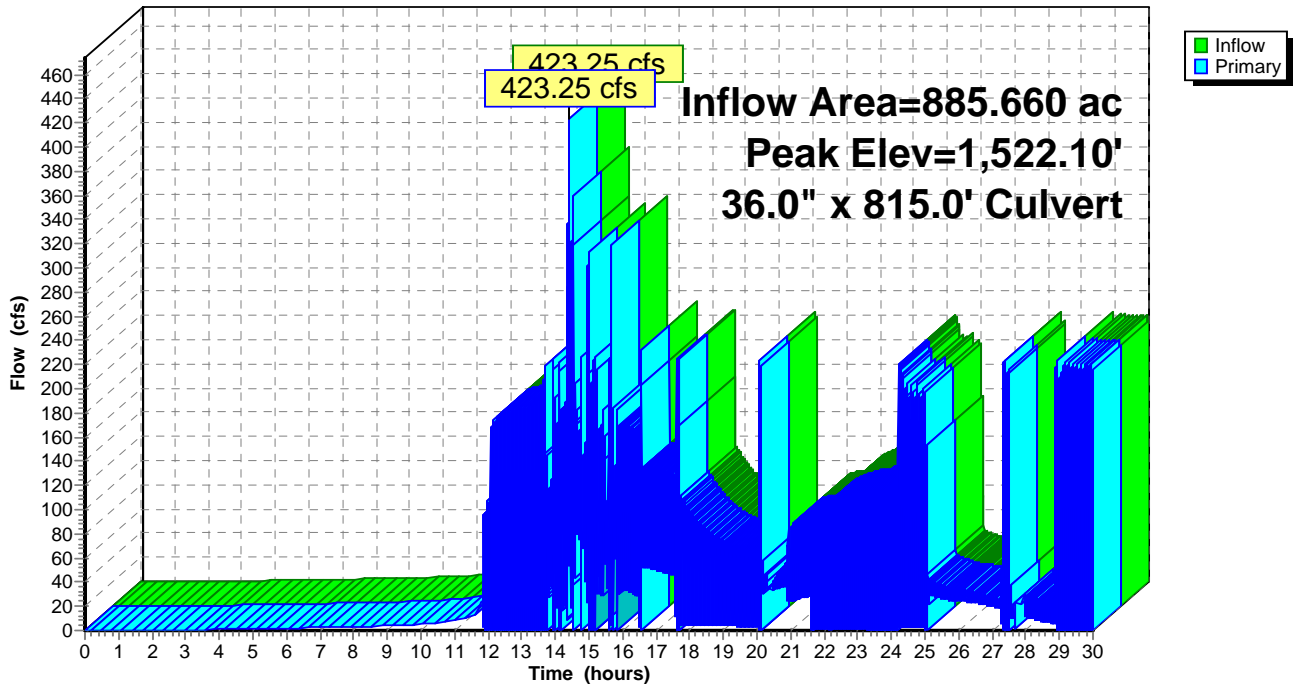
Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 1,522.10' @ 14.39 hrs

Device #1	Routing	Invert	Outlet Devices
	Primary	196.46'	36.0" x 815.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 194.00' S= 0.0030 '/' Cc= 0.900 n= 0.025 Corrugated metal

Primary OutFlow Max=416.09 cfs @ 14.39 hrs HW=1,508.20' TW=250.24' (Dynamic Tailwater)
 ←=Culvert (Outlet Controls 416.09 cfs @ 58.86 fps)

Pond 16P: 36" 815'

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Pond 17P: 48" 85'

Inflow Area = 885.660 ac, 34.84% Impervious, Inflow Depth > 1.36" for Flood event
 Inflow = 423.25 cfs @ 14.39 hrs, Volume= 100.642 af
 Outflow = 423.25 cfs @ 14.39 hrs, Volume= 100.642 af, Atten= 0%, Lag= 0.0 min
 Primary = 423.25 cfs @ 14.39 hrs, Volume= 100.642 af

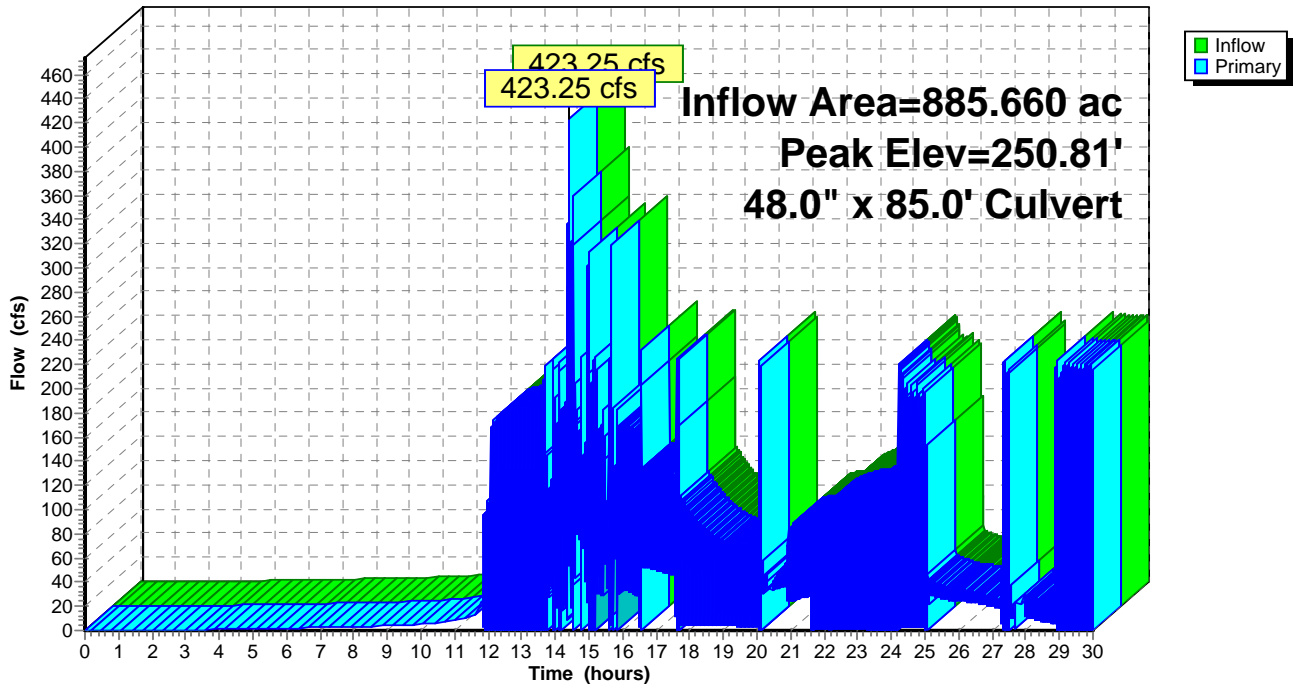
Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 250.81' @ 14.39 hrs

Device #1	Routing	Invert	Outlet Devices
	Primary	194.00'	48.0" x 85.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 193.00' S= 0.0118 '/' Cc= 0.900 n= 0.025 Corrugated metal

Primary OutFlow Max=420.97 cfs @ 14.39 hrs HW=250.24' TW=193.87' (Dynamic Tailwater)
 ↳=Culvert (Barrel Controls 420.97 cfs @ 33.50 fps)

Pond 17P: 48" 85'

Hydrograph



Existing Drainage McKownville RT 20 Area

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Type II 24-hr Flood Rainfall=3.25"

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Summary for Pond ARd C: Acre Rd Culvert

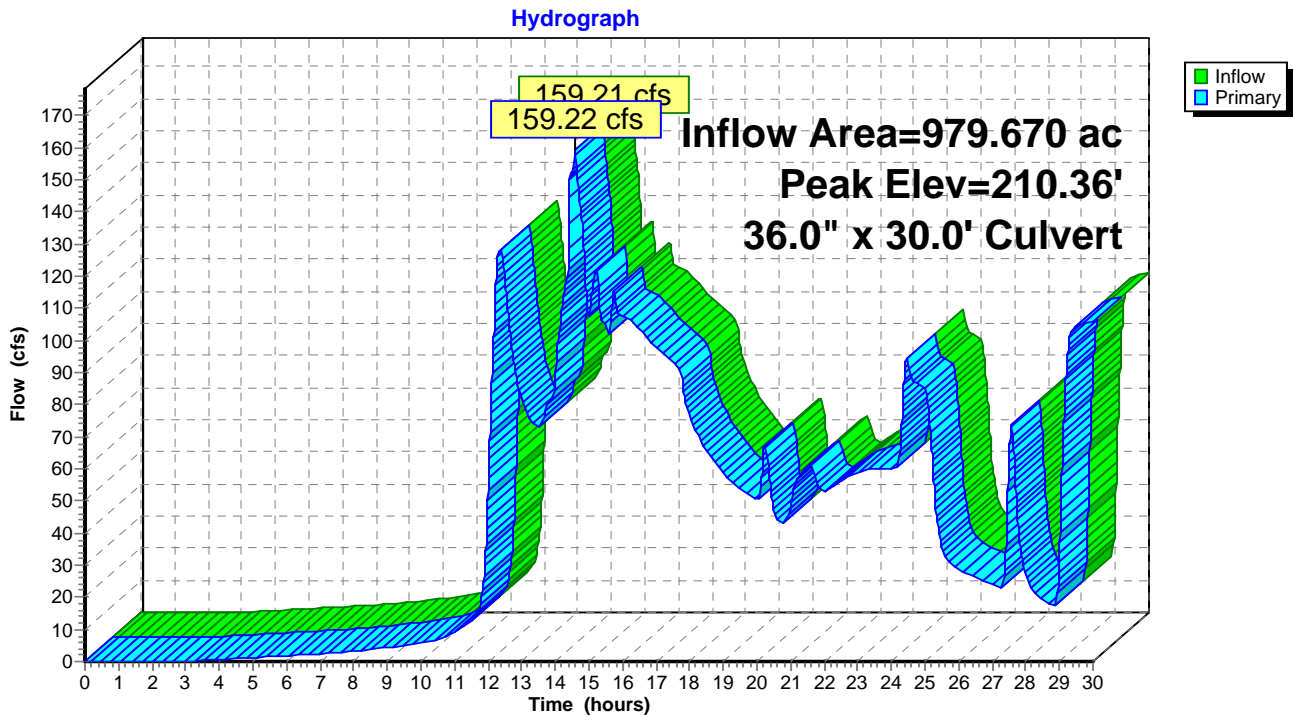
Inflow Area = 979.670 ac, 34.87% Impervious, Inflow Depth > 1.32" for Flood event
Inflow = 159.21 cfs @ 14.59 hrs, Volume= 107.475 af
Outflow = 159.22 cfs @ 14.59 hrs, Volume= 107.475 af, Atten= 0%, Lag= 0.0 min
Primary = 159.22 cfs @ 14.59 hrs, Volume= 107.475 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 210.36' @ 14.59 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	174.00'	36.0" x 30.0' long Culvert CPP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 173.90' S= 0.0033 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=159.02 cfs @ 14.59 hrs HW=210.30' TW=188.47' (Dynamic Tailwater)
↑=Culvert (Inlet Controls 159.02 cfs @ 22.50 fps)

Pond ARd C: Acre Rd Culvert



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Pond ES A: Existing Storage A

Inflow Area = 937.570 ac, 35.27% Impervious, Inflow Depth > 1.36" for Flood event
 Inflow = 427.30 cfs @ 14.39 hrs, Volume= 106.578 af
 Outflow = 270.34 cfs @ 14.40 hrs, Volume= 105.519 af, Atten= 37%, Lag= 0.4 min
 Primary = 270.34 cfs @ 14.40 hrs, Volume= 105.519 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 194.24' @ 14.40 hrs Surf.Area= 22,244 sf Storage= 57,579 cf

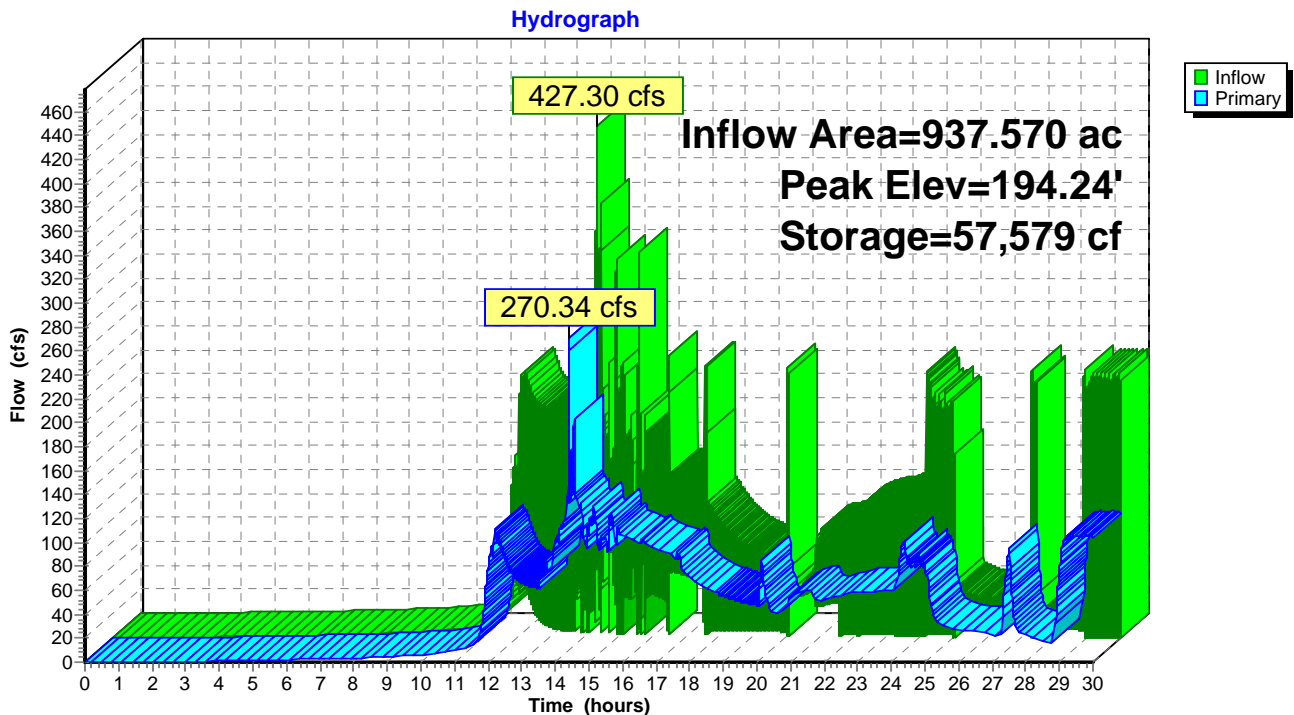
Plug-Flow detention time= 8.1 min calculated for 105.519 af (99% of inflow)
 Center-of-Mass det. time= 1.7 min (1,161.4 - 1,159.7)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	57,579 cf	65.00'W x 250.00'L x 3.00'H Prismatic Z=3.0

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=250.30 cfs @ 14.40 hrs HW=194.05' TW=191.32' (Dynamic Tailwater)
 ←1=Broad-Crested Rectangular Weir (Weir Controls 250.30 cfs @ 6.18 fps)

Pond ES A: Existing Storage A



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Pond ES B: Existing Storage B

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 1.34" for Flood event
 Inflow = 221.56 cfs @ 14.40 hrs, Volume= 107.471 af
 Outflow = 158.88 cfs @ 14.58 hrs, Volume= 106.419 af, Atten= 28%, Lag= 10.7 min
 Primary = 158.88 cfs @ 14.58 hrs, Volume= 106.419 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 188.95' @ 14.58 hrs Surf.Area= 23,036 sf Storage= 60,027 cf

Plug-Flow detention time= 8.4 min calculated for 106.419 af (99% of inflow)
 Center-of-Mass det. time= 2.1 min (1,157.9 - 1,155.8)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	61,135 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
186.00	17,576	0	0
188.00	21,332	38,908	38,908
189.00	23,122	22,227	61,135

Device	Routing	Invert	Outlet Devices
#1	Primary	186.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=158.79 cfs @ 14.58 hrs HW=188.95' TW=186.37' (Dynamic Tailwater)
 ↳1=Broad-Crested Rectangular Weir (Weir Controls 158.79 cfs @ 5.38 fps)

Existing Drainage McKownville RT 20 Area

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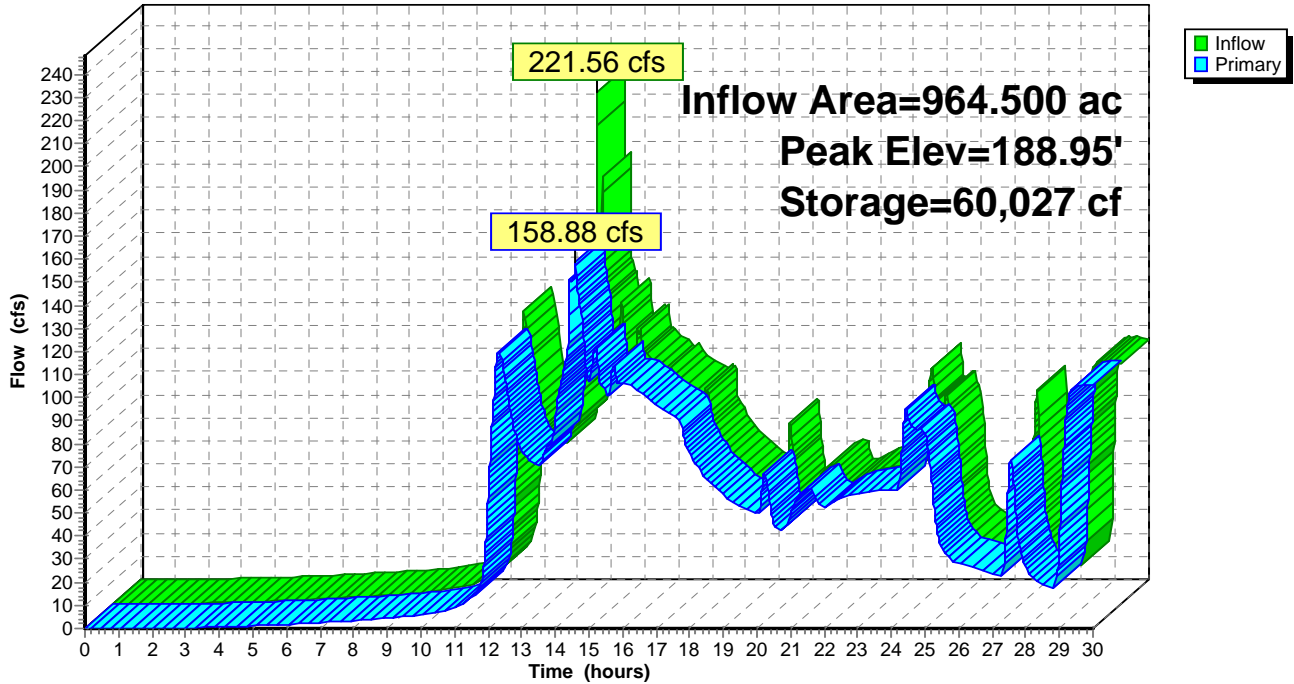
Type II 24-hr Flood Rainfall=3.25"

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Pond ES B: Existing Storage B

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Pond MRd C: McKown Rd Culv

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 1.32" for Flood event
Inflow = 158.79 cfs @ 14.58 hrs, Volume= 106.369 af
Outflow = 158.79 cfs @ 14.58 hrs, Volume= 106.369 af, Atten= 0%, Lag= 0.0 min
Primary = 158.79 cfs @ 14.58 hrs, Volume= 106.369 af

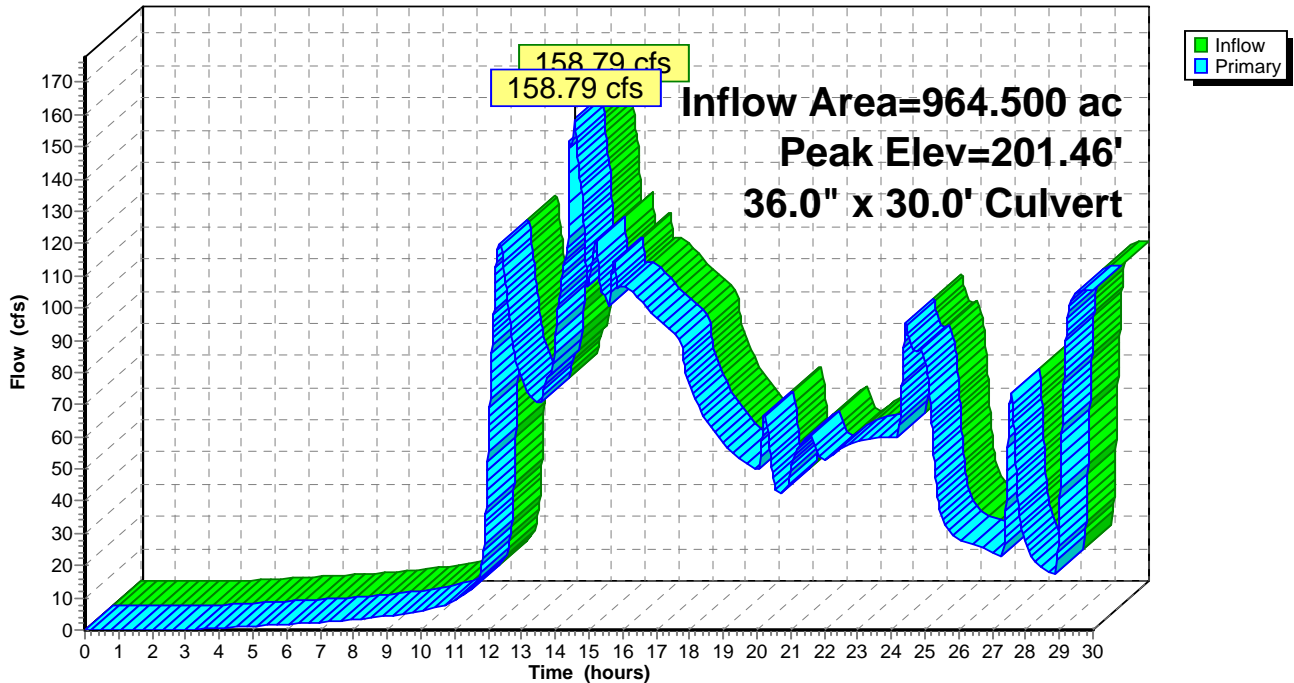
Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 201.46' @ 14.58 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	36.0" x 30.0' long Culvert RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 177.00' S= 0.0333 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=158.49 cfs @ 14.58 hrs HW=201.38' TW=179.69' (Dynamic Tailwater)
↑=Culvert (Inlet Controls 158.49 cfs @ 22.42 fps)

Pond MRd C: McKown Rd Culv

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ED A: Existing DA A Runoff Area=8.170 ac 70.75% Impervious Runoff Depth=2.55"
Flow Length=1,334' Slope=0.0100 '/' Tc=28.1 min CN=90 Runoff=18.76 cfs 1.737 af

Subcatchment ED A1: Existing DA A1 Runoff Area=8.170 ac 70.75% Impervious Runoff Depth=2.55"
Flow Length=1,334' Slope=0.0100 '/' Tc=28.1 min CN=90 Runoff=18.76 cfs 1.737 af

Subcatchment ED B: Existing DA B Runoff Area=7.240 ac 100.00% Impervious Runoff Depth=3.38"
Flow Length=363' Slope=0.0275 '/' Tc=4.0 min CN=98 Runoff=39.44 cfs 2.037 af

Subcatchment ED C: Existing DA C Runoff Area=36.500 ac 25.00% Impervious Runoff Depth=1.08"
Flow Length=1,133' Slope=0.0335 '/' Tc=25.6 min CN=70 Runoff=34.69 cfs 3.275 af

Subcatchment ED D: Existing DA D Runoff Area=18.760 ac 3.20% Impervious Runoff Depth=0.54"
Flow Length=1,139' Slope=0.0237 '/' Tc=40.7 min CN=59 Runoff=4.69 cfs 0.840 af

Subcatchment ED E: Existing DA E Runoff Area=15.170 ac 30.00% Impervious Runoff Depth=1.19"
Flow Length=1,334' Slope=0.0150 '/' Tc=41.3 min CN=72 Runoff=11.71 cfs 1.509 af

Subcatchment ED F: Existing DA F Runoff Area=16.380 ac 17.27% Impervious Runoff Depth=1.65"
Flow Length=661' Slope=0.0290 '/' Tc=13.8 min CN=79 Runoff=36.42 cfs 2.255 af

Subcatchment ED G: Existing DA G Runoff Area=26.740 ac 22.93% Impervious Runoff Depth=0.35"
Flow Length=1,244' Slope=0.0160 '/' Tc=60.3 min CN=54 Runoff=2.53 cfs 0.777 af

Subcatchment ED I: ED I Runoff Area=77.710 ac 31.79% Impervious Runoff Depth=0.58"
Flow Length=3,076' Slope=0.0160 '/' Tc=106.9 min CN=60 Runoff=11.24 cfs 3.753 af

Reach 9R: EB Krumkill Avg. Depth=0.67' Max Vel=1.73 fps Inflow=11.24 cfs 3.753 af
n=0.040 L=1,755.0' S=0.0046 '/' Capacity=293.49 cfs Outflow=10.85 cfs 3.749 af

Reach KK EX: Krumkill Inflow=234.26 cfs 134.471 af
Outflow=234.26 cfs 134.471 af

Reach WBR1: WB R-1 Avg. Depth=2.89' Max Vel=5.70 fps Inflow=481.58 cfs 126.984 af
n=0.040 L=300.0' S=0.0100 '/' Capacity=966.62 cfs Outflow=308.70 cfs 126.812 af

Reach WBR2: WB R-2 Avg. Depth=1.95' Max Vel=9.92 fps Inflow=320.87 cfs 128.337 af
n=0.040 L=150.0' S=0.0467 '/' Capacity=2,088.13 cfs Outflow=308.97 cfs 128.287 af

Reach WBR3: WB R-3 Avg. Depth=2.50' Max Vel=6.87 fps Inflow=310.37 cfs 129.796 af
n=0.040 L=230.0' S=0.0170 '/' Capacity=1,258.70 cfs Outflow=300.76 cfs 129.686 af

Reach WBR4: WB R-4 Avg. Depth=3.11' Max Vel=3.75 fps Inflow=303.46 cfs 132.718 af
n=0.040 L=2,510.0' S=0.0040 '/' Capacity=610.12 cfs Outflow=225.76 cfs 130.722 af

Pond 16P: 36" 815' Peak Elev=2,158.25' Inflow=519.37 cfs 121.008 af
36.0" x 815.0' Culvert Outflow=519.37 cfs 121.008 af

Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Pond 17P: 48" 85'

Peak Elev=277.65' Inflow=519.37 cfs 121.008 af
48.0" x 85.0' Culvert Outflow=519.37 cfs 121.008 af

Pond ARd C: Acre Rd Culvert

Peak Elev=267.11' Inflow=300.76 cfs 129.686 af
36.0" x 30.0' Culvert Outflow=300.75 cfs 129.686 af

Pond ES A: Existing Storage A

Peak Elev=196.10' Storage=57,579 cf Inflow=524.25 cfs 128.057 af
Outflow=481.58 cfs 126.984 af

Pond ES B: Existing Storage B

Peak Elev=190.62' Storage=61,135 cf Inflow=312.04 cfs 129.389 af
Outflow=320.87 cfs 128.337 af

Pond MRd C: McKown Rd Culv

Peak Elev=262.31' Inflow=308.97 cfs 128.287 af
36.0" x 30.0' Culvert Outflow=308.97 cfs 128.287 af

Total Runoff Area = 214.840 ac Runoff Volume = 17.919 af Average Runoff Depth = 1.00"
68.93% Pervious = 148.099 ac 31.07% Impervious = 66.741 ac

Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED A: Existing DA A

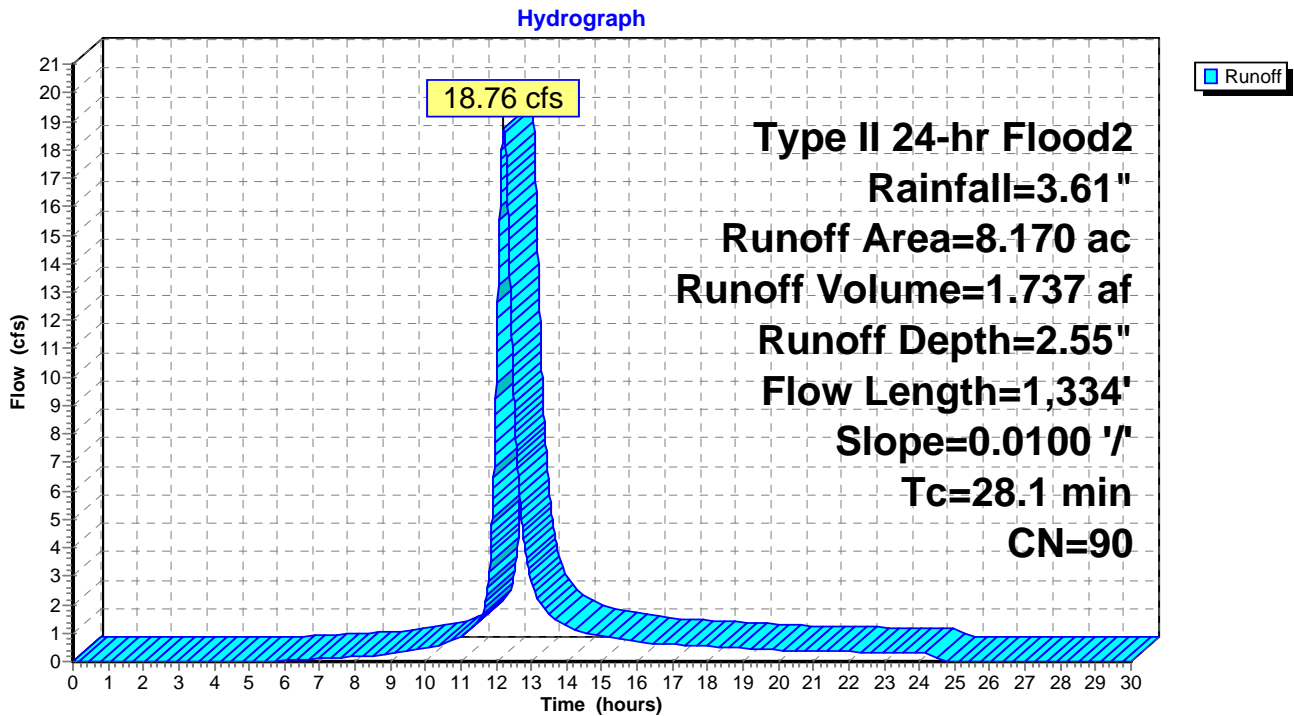
Runoff = 18.76 cfs @ 12.21 hrs, Volume= 1.737 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
5.780	98	Paved parking & roofs
2.390	69	50-75% Grass cover, Fair, HSG B
8.170	90	Weighted Average
2.390		Pervious Area
5.780		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	1,334	0.0100	0.79		Lag/CN Method,

Subcatchment ED A: Existing DA A



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED A1: Existing DA A1

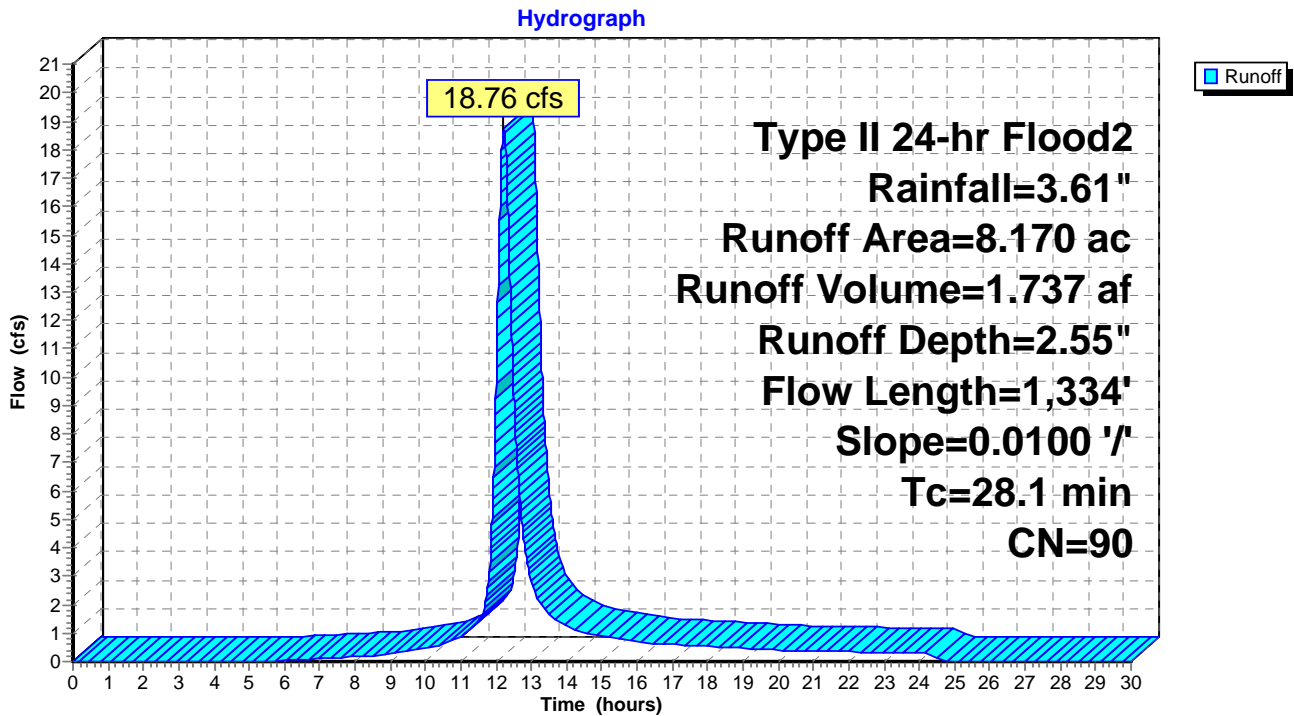
Runoff = 18.76 cfs @ 12.21 hrs, Volume= 1.737 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
5.780	98	Paved parking & roofs
2.390	69	50-75% Grass cover, Fair, HSG B
8.170	90	Weighted Average
2.390		Pervious Area
5.780		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	1,334	0.0100	0.79		Lag/CN Method,

Subcatchment ED A1: Existing DA A1



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED B: Existing DA B

Runoff = 39.44 cfs @ 11.94 hrs, Volume= 2.037 af, Depth= 3.38"

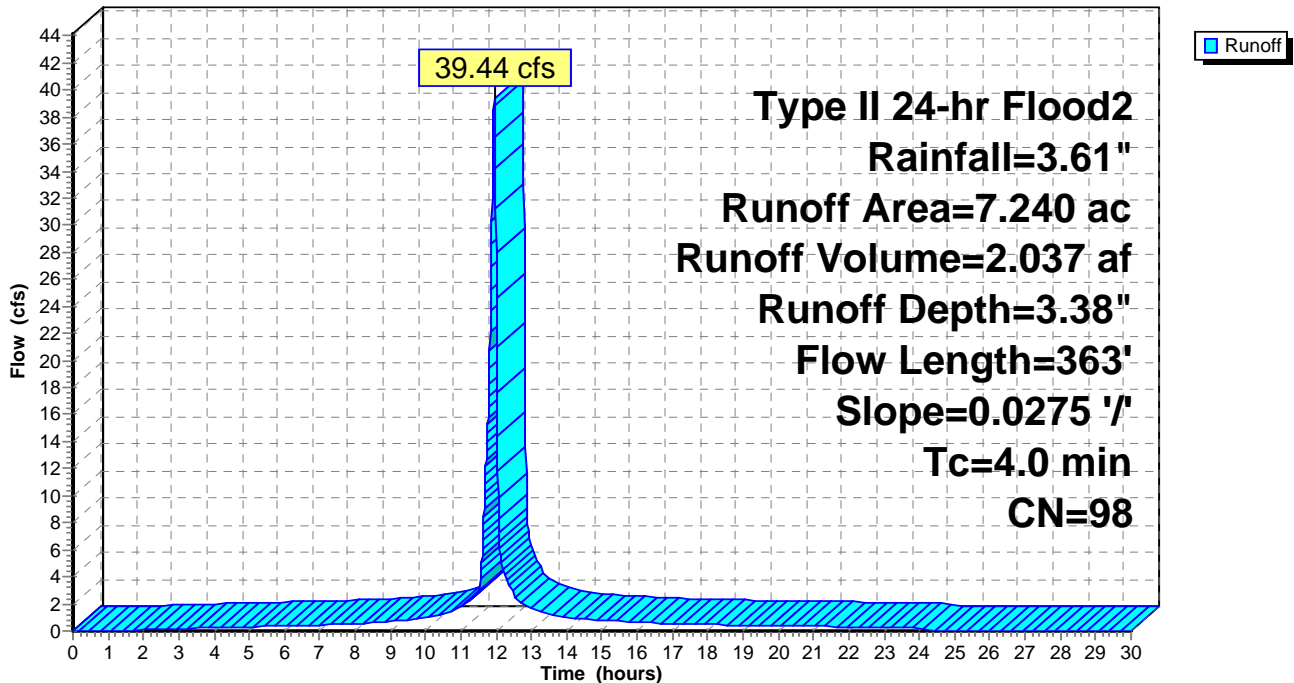
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
7.240	98	Paved parking & roofs
7.240		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	363	0.0275	1.50		Lag/CN Method,

Subcatchment ED B: Existing DA B

Hydrograph



Existing Drainage McKownville RT 20 Area

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Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED C: Existing DA C

Runoff = 34.69 cfs @ 12.21 hrs, Volume= 3.275 af, Depth= 1.08"

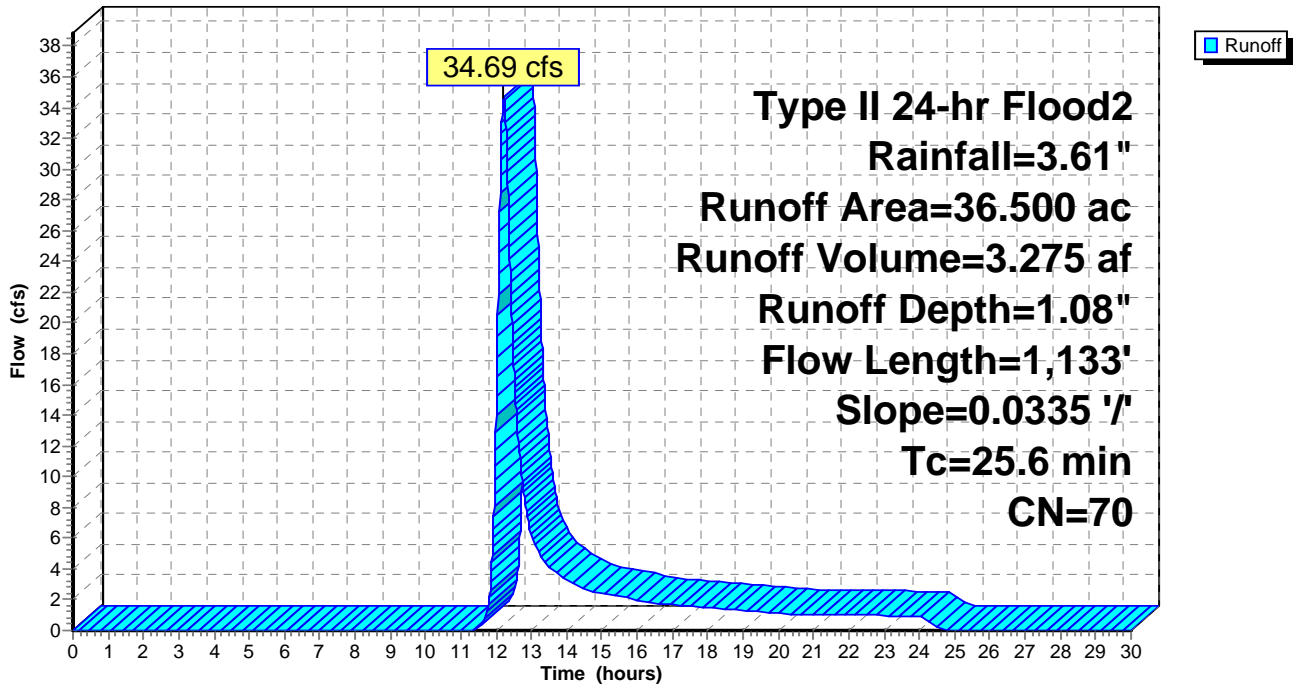
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
36.500	70	1/2 acre lots, 25% imp, HSG B
27.375		Pervious Area
9.125		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	1,133	0.0335	0.74		Lag/CN Method,

Subcatchment ED C: Existing DA C

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED D: Existing DA D

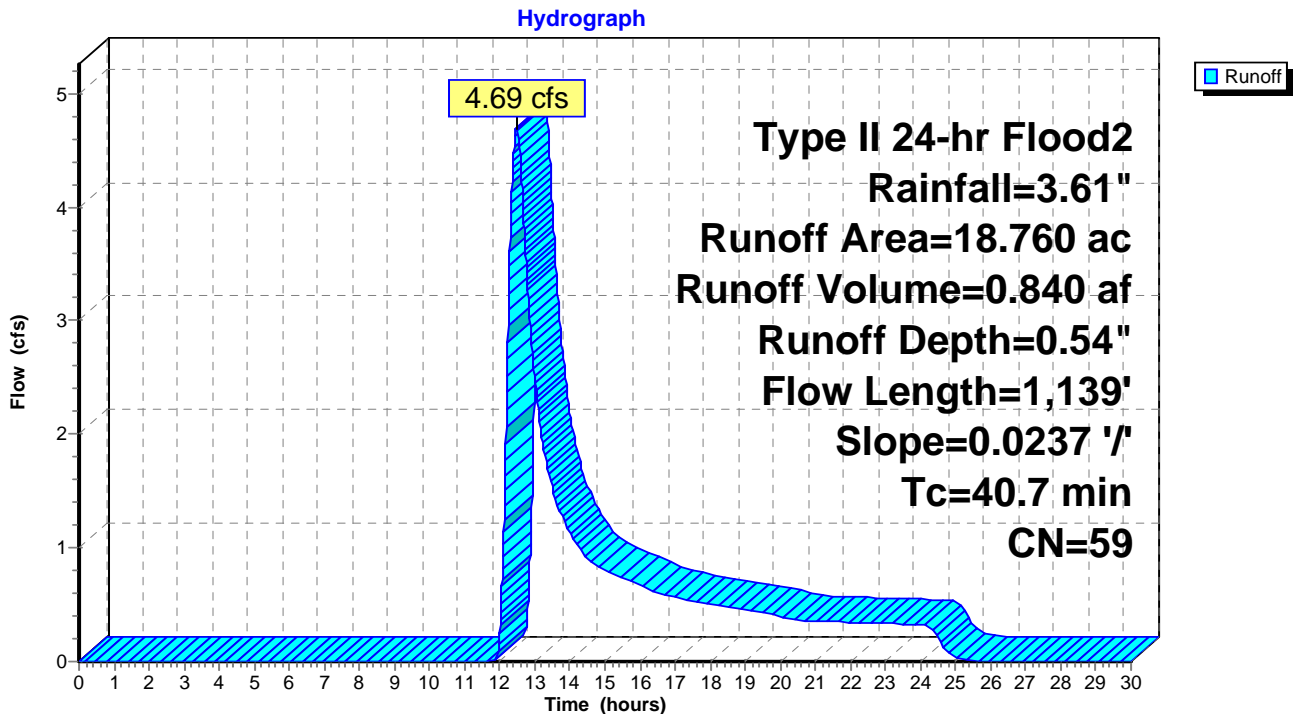
Runoff = 4.69 cfs @ 12.48 hrs, Volume= 0.840 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
18.160	58	Woods/grass comb., Good, HSG B
0.600	98	Paved parking & roofs
18.760	59	Weighted Average
18.160		Pervious Area
0.600		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.7	1,139	0.0237	0.47		Lag/CN Method,

Subcatchment ED D: Existing DA D



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED E: Existing DA E

Runoff = 11.71 cfs @ 12.43 hrs, Volume= 1.509 af, Depth= 1.19"

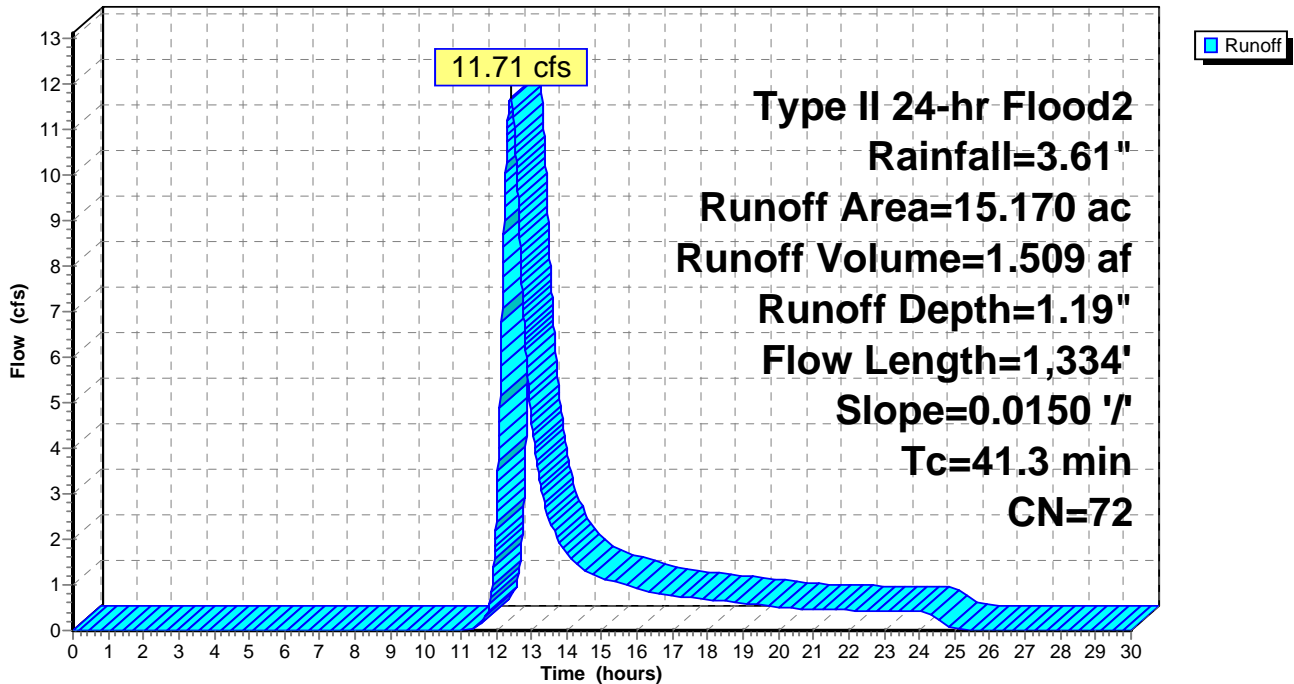
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
15.170	72	1/3 acre lots, 30% imp, HSG B
10.619		Pervious Area
4.551		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.3	1,334	0.0150	0.54		Lag/CN Method,

Subcatchment ED E: Existing DA E

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED F: Existing DA F

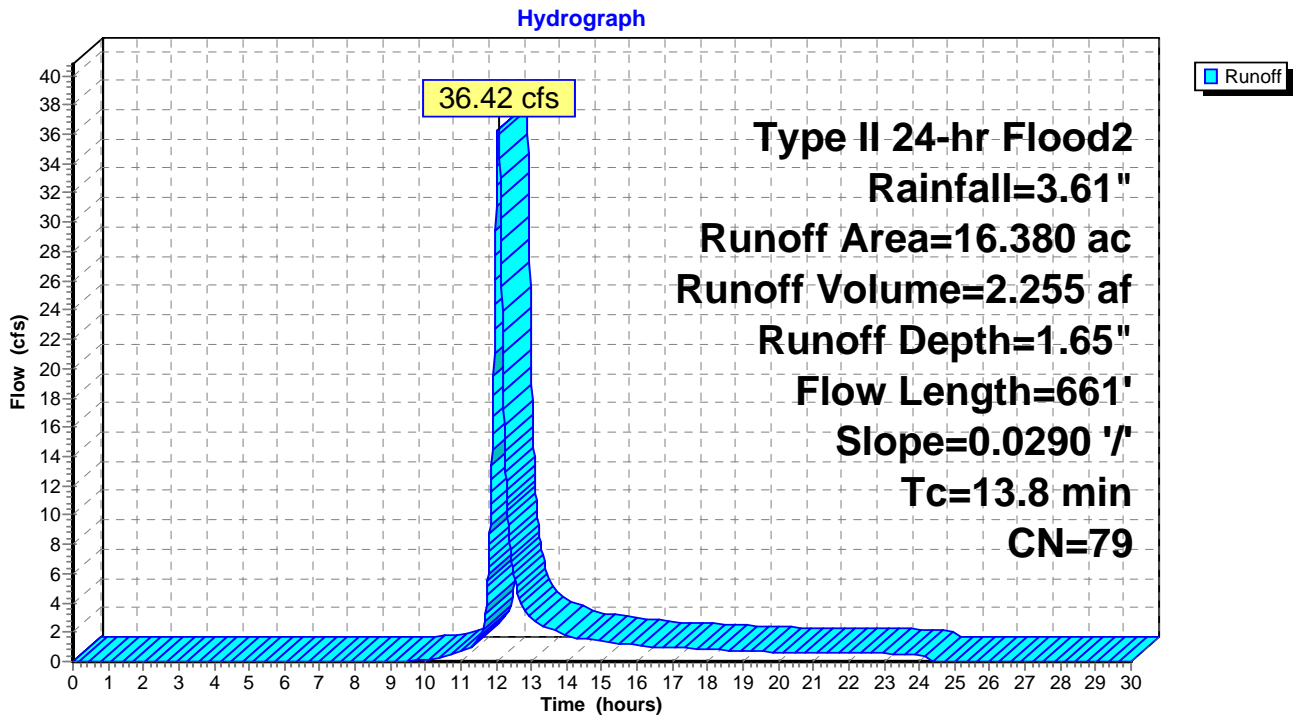
Runoff = 36.42 cfs @ 12.06 hrs, Volume= 2.255 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
9.430	81	1/3 acre lots, 30% imp, HSG C
6.950	76	Woods/grass comb., Fair, HSG C
16.380	79	Weighted Average
13.551		Pervious Area
2.829		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	661	0.0290	0.80		Lag/CN Method,

Subcatchment ED F: Existing DA F



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED G: Existing DA G

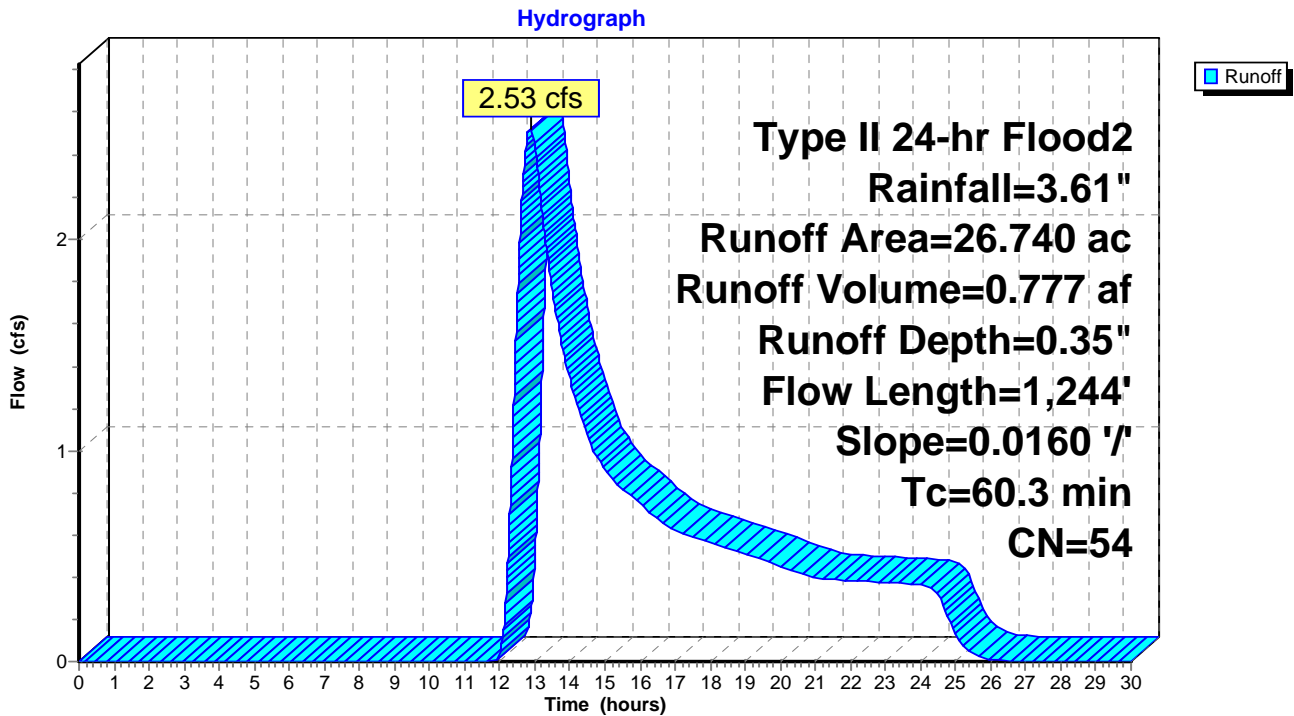
Runoff = 2.53 cfs @ 12.87 hrs, Volume= 0.777 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
20.440	57	1/3 acre lots, 30% imp, HSG A
6.300	43	Woods/grass comb., Fair, HSG A
26.740	54	Weighted Average
20.608		Pervious Area
6.132		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.3	1,244	0.0160	0.34		Lag/CN Method,

Subcatchment ED G: Existing DA G



Existing Drainage McKownville RT 20 Area

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Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED I: ED I

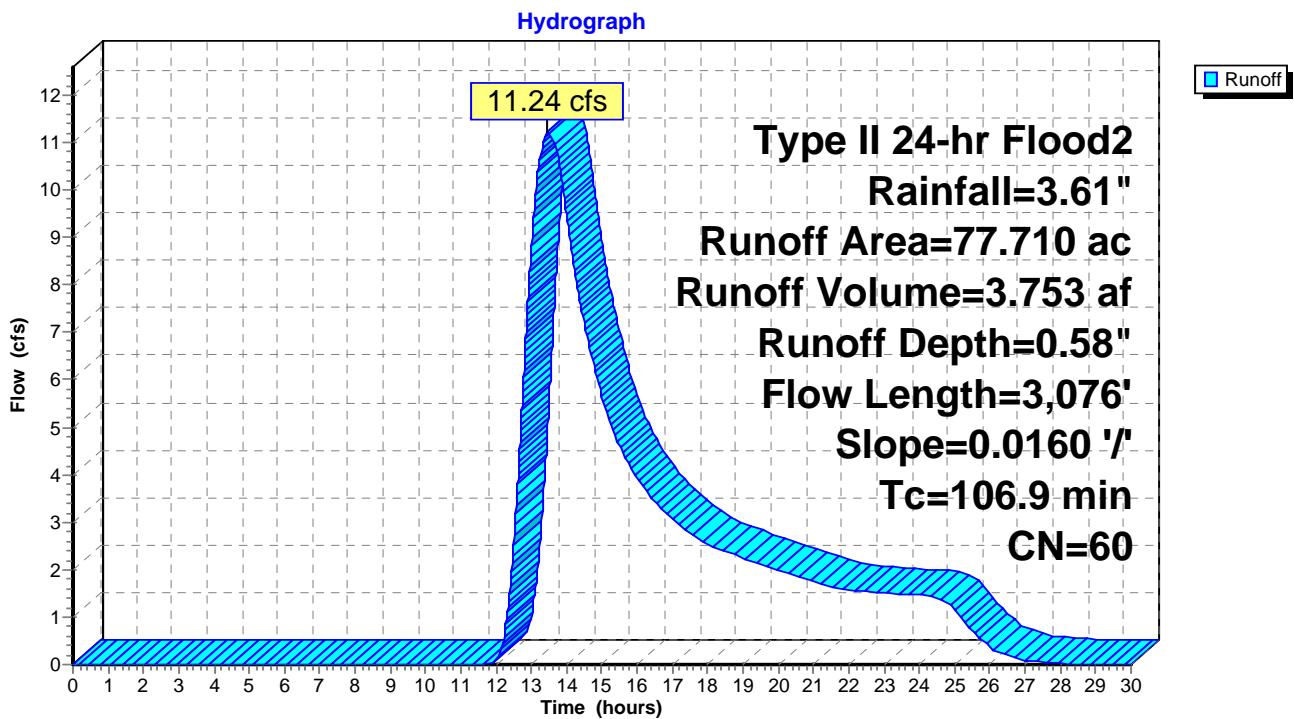
Runoff = 11.24 cfs @ 13.43 hrs, Volume= 3.753 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
65.010	61	1/4 acre lots, 38% imp, HSG A
12.700	55	Woods, Good, HSG B
77.710	60	Weighted Average
53.006		Pervious Area
24.704		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
106.9	3,076	0.0160	0.48		Lag/CN Method,

Subcatchment ED I: ED I



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Reach 9R: EB Krumkill

Inflow Area = 77.710 ac, 31.79% Impervious, Inflow Depth = 0.58" for Flood2 event
Inflow = 11.24 cfs @ 13.43 hrs, Volume= 3.753 af
Outflow = 10.85 cfs @ 13.71 hrs, Volume= 3.749 af, Atten= 3%, Lag= 16.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.73 fps, Min. Travel Time= 16.9 min
Avg. Velocity = 0.89 fps, Avg. Travel Time= 32.9 min

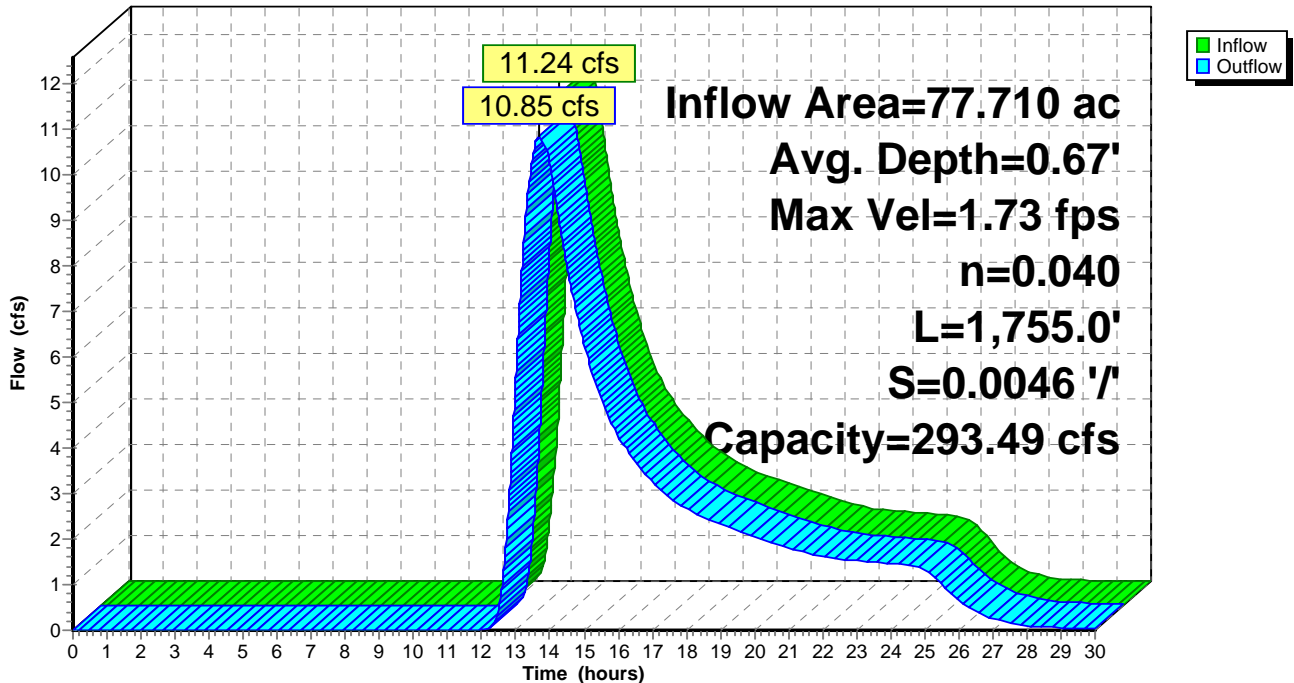
Peak Storage= 11,028 cf @ 13.71 hrs, Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 293.49 cfs

8.00' x 4.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/ Top Width= 24.00'
Length= 1,755.0' Slope= 0.0046 '/
Inlet Invert= 186.00', Outlet Invert= 178.00'



Reach 9R: EB Krumkill

Hydrograph

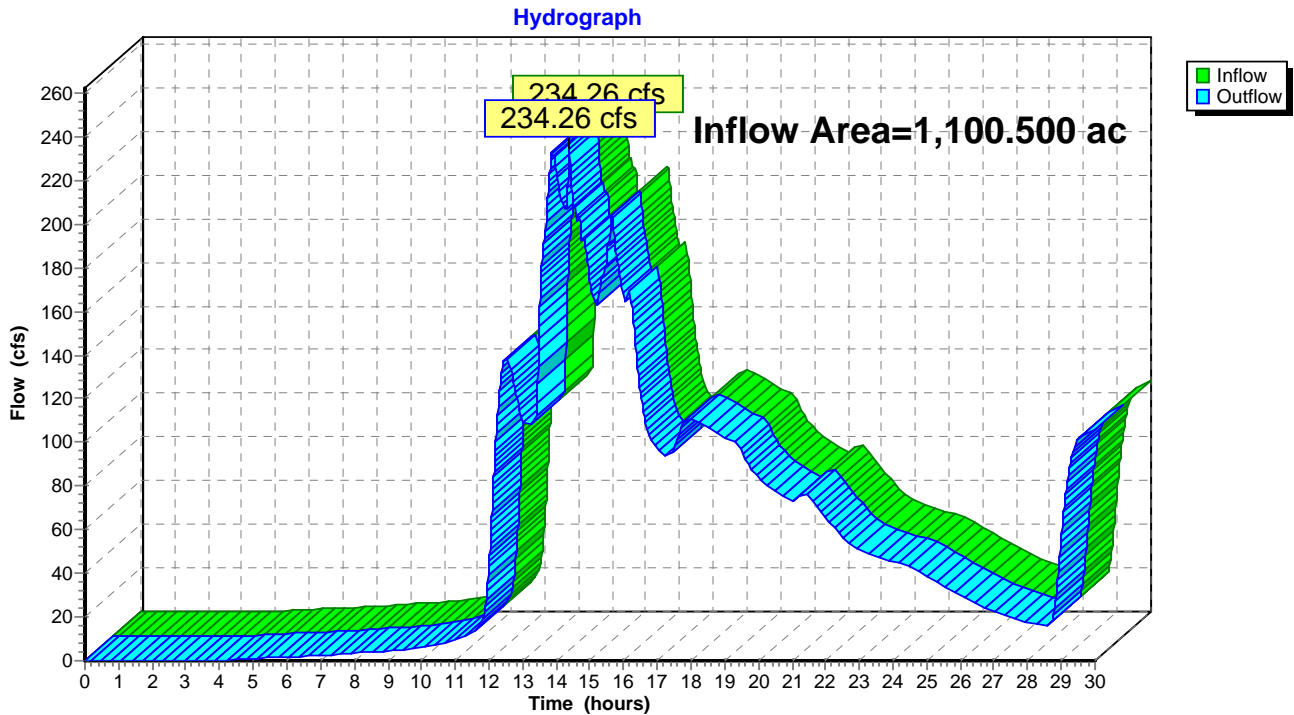


Summary for Reach KK EX: Krumkill

Inflow Area = 1,100.500 ac, 34.10% Impervious, Inflow Depth > 1.47" for Flood2 event
Inflow = 234.26 cfs @ 14.38 hrs, Volume= 134.471 af
Outflow = 234.26 cfs @ 14.38 hrs, Volume= 134.471 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Reach KK EX: Krumkill



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Reach WBR1: WB R-1

Inflow Area = 937.570 ac, 35.27% Impervious, Inflow Depth > 1.63" for Flood2 event
Inflow = 481.58 cfs @ 14.33 hrs, Volume= 126.984 af
Outflow = 308.70 cfs @ 13.43 hrs, Volume= 126.812 af, Atten= 36%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.70 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.83 fps, Avg. Travel Time= 1.8 min

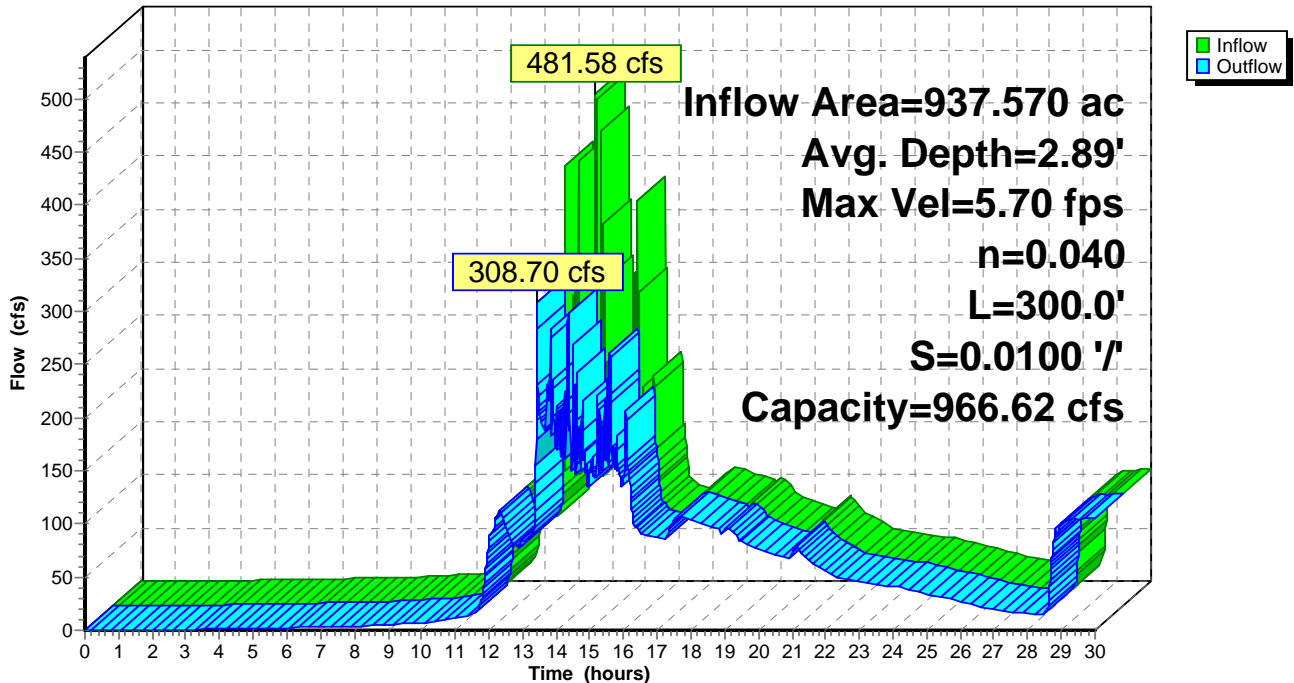
Peak Storage= 16,209 cf @ 13.43 hrs, Average Depth at Peak Storage= 2.89'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 966.62 cfs

10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 300.0' Slope= 0.0100 '/
Inlet Invert= 189.00', Outlet Invert= 186.00'



Reach WBR1: WB R-1

Hydrograph



Existing Drainage McKownville RT 20 Area

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Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Reach WBR2: WB R-2

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 1.60" for Flood2 event
Inflow = 320.87 cfs @ 13.44 hrs, Volume= 128.337 af
Outflow = 308.97 cfs @ 14.36 hrs, Volume= 128.287 af, Atten= 4%, Lag= 54.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 9.92 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 4.86 fps, Avg. Travel Time= 0.5 min

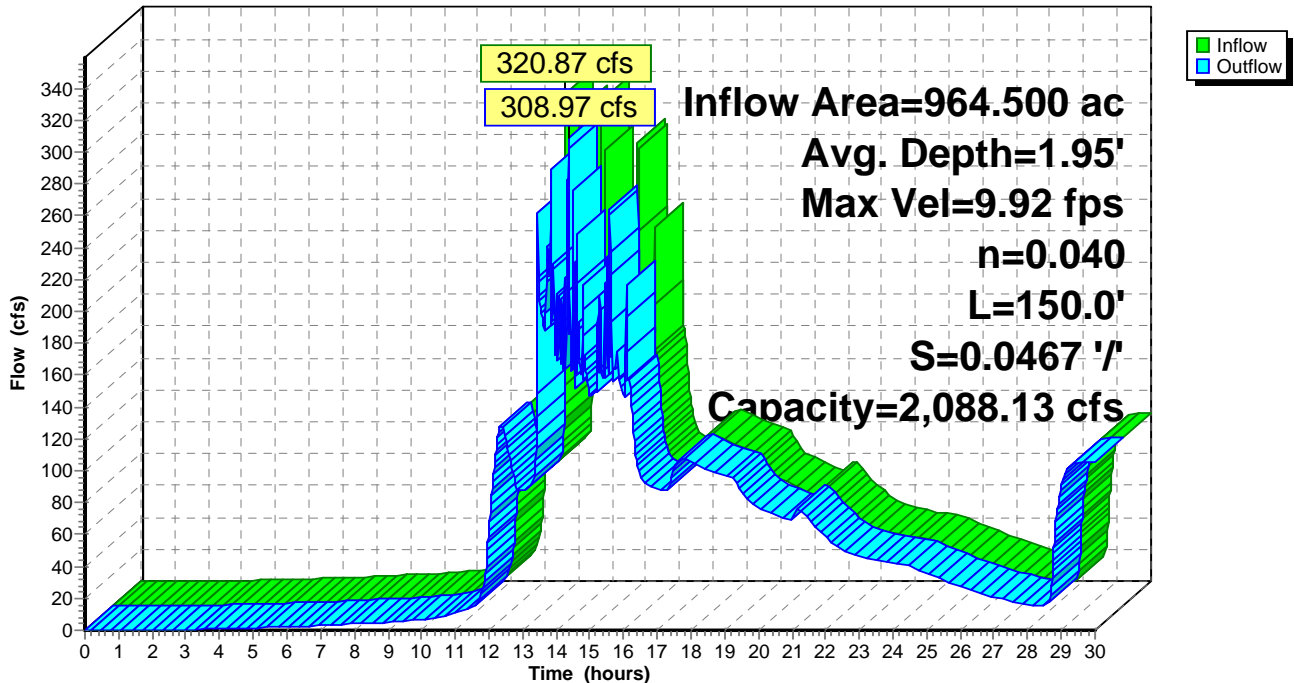
Peak Storage= 4,649 cf @ 14.36 hrs, Average Depth at Peak Storage= 1.95'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 2,088.13 cfs

10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 150.0' Slope= 0.0467 '/
Inlet Invert= 185.00', Outlet Invert= 178.00'



Reach WBR2: WB R-2

Hydrograph



Existing Drainage McKownville RT 20 Area

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Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Reach WBR3: WB R-3

Inflow Area = 979.670 ac, 34.87% Impervious, Inflow Depth > 1.59" for Flood2 event
Inflow = 310.37 cfs @ 14.36 hrs, Volume= 129.796 af
Outflow = 300.76 cfs @ 14.36 hrs, Volume= 129.686 af, Atten= 3%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 6.87 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 3.45 fps, Avg. Travel Time= 1.1 min

Peak Storage= 10,060 cf @ 14.36 hrs, Average Depth at Peak Storage= 2.50'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 1,258.70 cfs

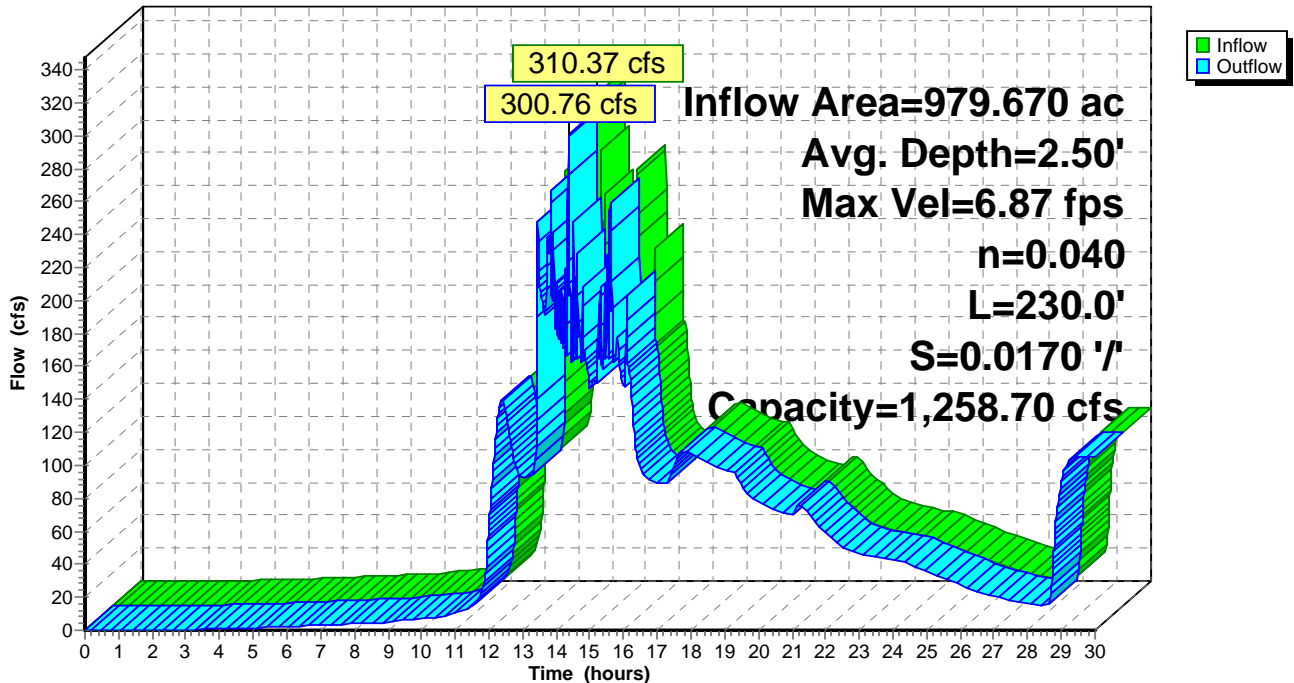
10.00' x 5.00' deep channel, n= 0.040 Mountain streams
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 230.0' Slope= 0.0170 '/
Inlet Invert= 177.90', Outlet Invert= 174.00'



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Reach WBR3: WB R-3

Hydrograph



Existing Drainage McKownville RT 20 Area

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Summary for Reach WBR4: WB R-4

Inflow Area = 1,022.790 ac, 34.28% Impervious, Inflow Depth > 1.56" for Flood2 event
Inflow = 303.46 cfs @ 14.36 hrs, Volume= 132.718 af
Outflow = 225.76 cfs @ 14.38 hrs, Volume= 130.722 af, Atten= 26%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.75 fps, Min. Travel Time= 11.1 min
Avg. Velocity = 2.08 fps, Avg. Travel Time= 20.1 min

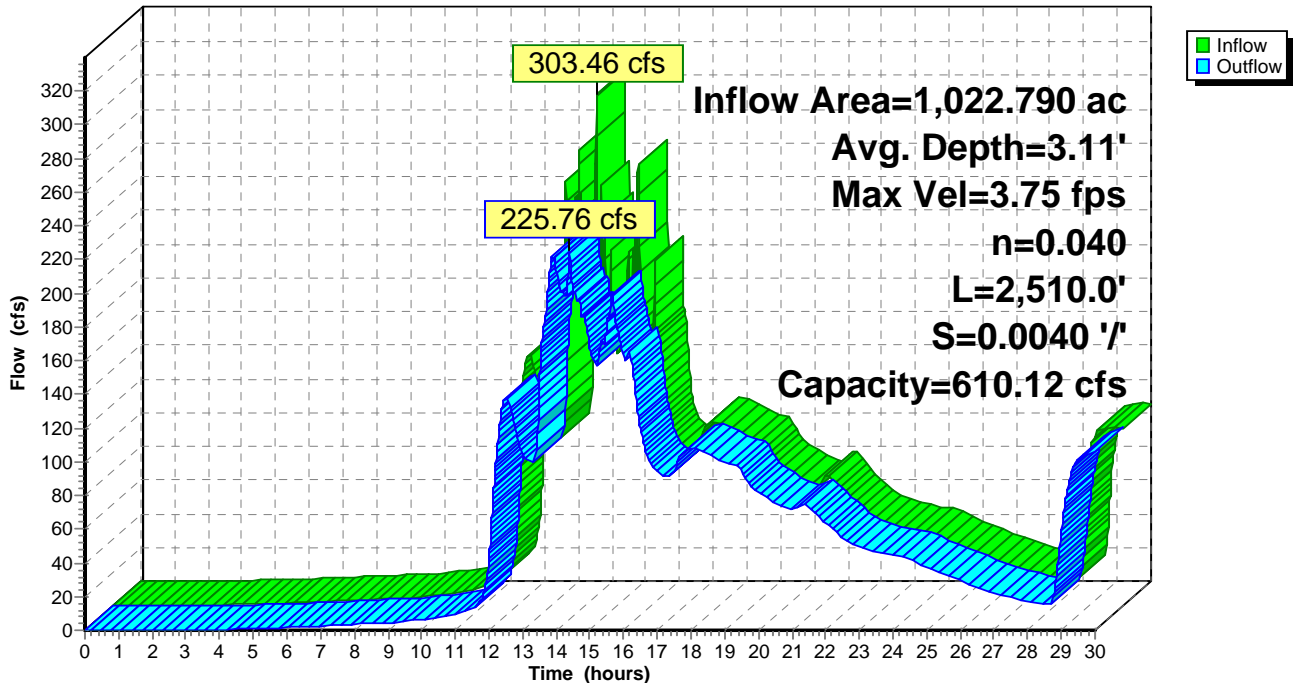
Peak Storage= 150,911 cf @ 14.38 hrs, Average Depth at Peak Storage= 3.11'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 610.12 cfs

10.00' x 5.00' deep channel, n= 0.040 Mountain streams
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 2,510.0' Slope= 0.0040 '/
Inlet Invert= 186.00', Outlet Invert= 176.00'



Reach WBR4: WB R-4

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Pond 16P: 36" 815'

Inflow Area = 885.660 ac, 34.84% Impervious, Inflow Depth > 1.64" for Flood2 event
 Inflow = 519.37 cfs @ 14.30 hrs, Volume= 121.008 af
 Outflow = 519.37 cfs @ 14.30 hrs, Volume= 121.008 af, Atten= 0%, Lag= 0.0 min
 Primary = 519.37 cfs @ 14.30 hrs, Volume= 121.008 af

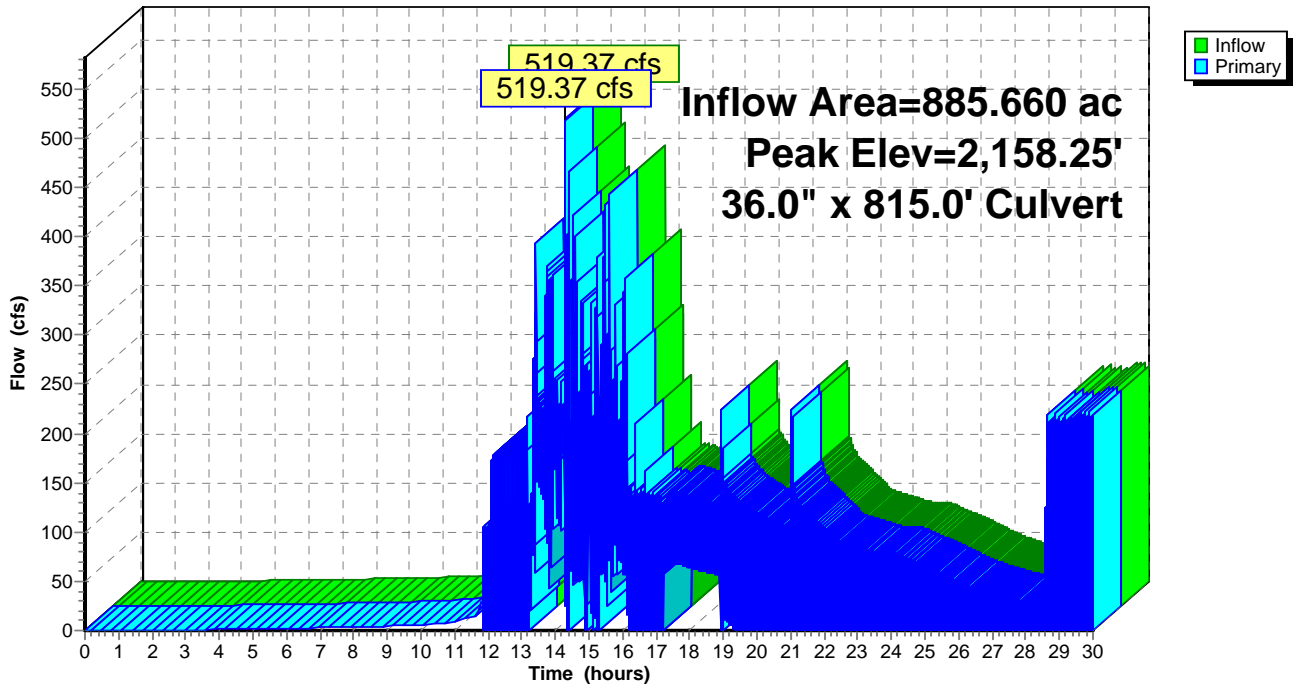
Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 2,158.25' @ 14.30 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	196.46'	36.0" x 815.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 194.00' S= 0.0030 '/ Cc= 0.900 n= 0.025 Corrugated metal

Primary OutFlow Max=495.54 cfs @ 14.30 hrs HW=2,057.74' TW=273.51' (Dynamic Tailwater)
 ↳=Culvert (Outlet Controls 495.54 cfs @ 70.10 fps)

Pond 16P: 36" 815'

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Pond 17P: 48" 85'

Inflow Area = 885.660 ac, 34.84% Impervious, Inflow Depth > 1.64" for Flood2 event
 Inflow = 519.37 cfs @ 14.30 hrs, Volume= 121.008 af
 Outflow = 519.37 cfs @ 14.30 hrs, Volume= 121.008 af, Atten= 0%, Lag= 0.0 min
 Primary = 519.37 cfs @ 14.30 hrs, Volume= 121.008 af

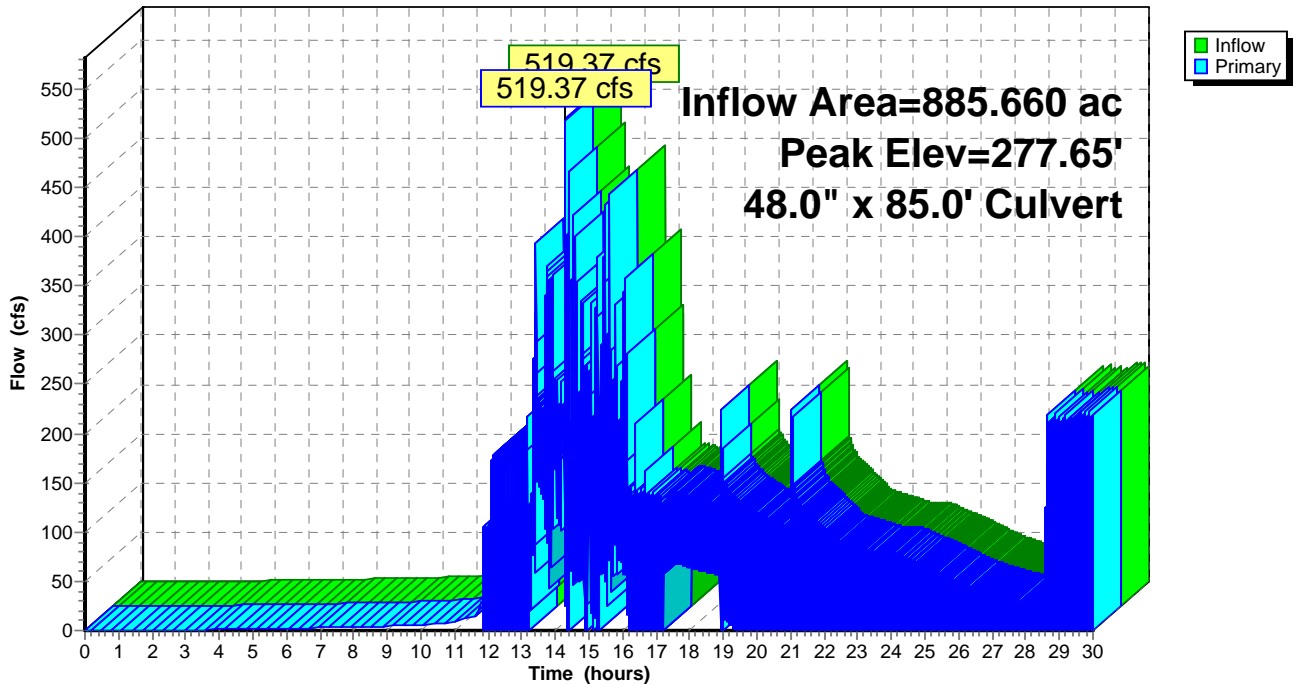
Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 277.65' @ 14.30 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	194.00'	48.0" x 85.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 193.00' S= 0.0118 '/ Cc= 0.900 n= 0.025 Corrugated metal

Primary OutFlow Max=504.67 cfs @ 14.30 hrs HW=273.51' TW=195.87' (Dynamic Tailwater)
 ←**1=Culvert** (Barrel Controls 504.67 cfs @ 40.16 fps)

Pond 17P: 48" 85'

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Pond ARd C: Acre Rd Culvert

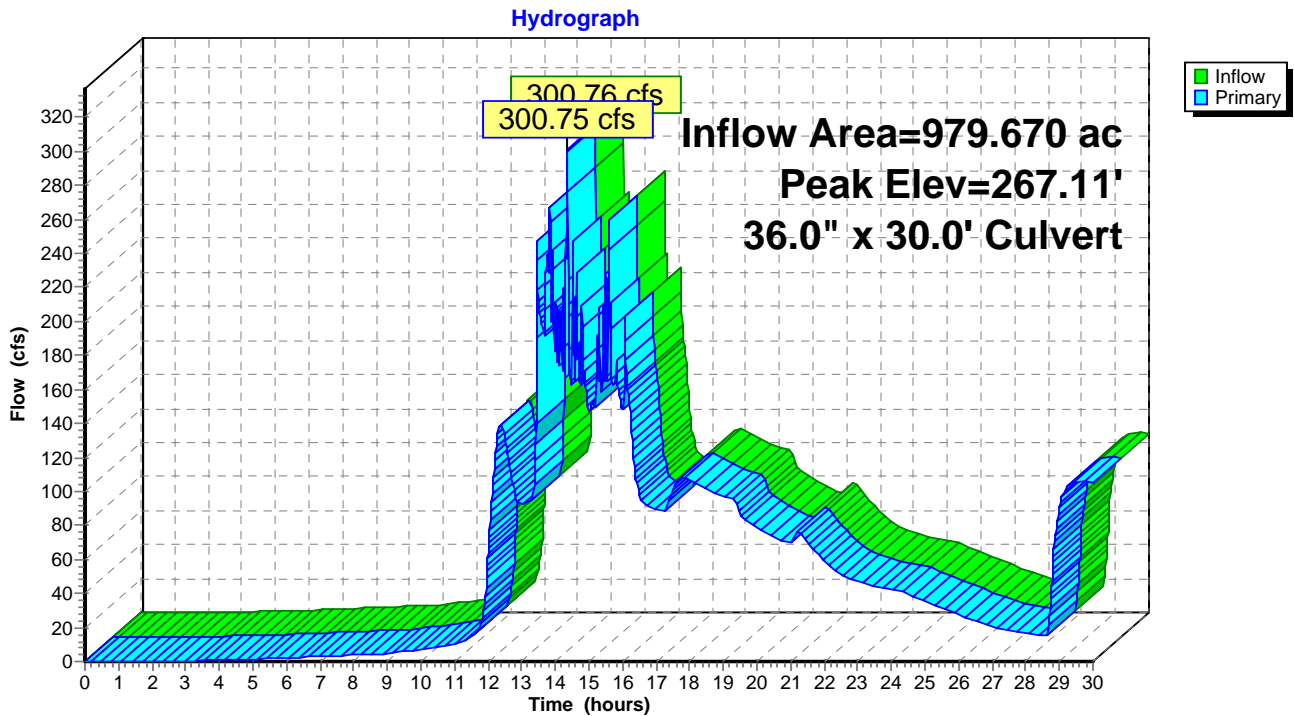
Inflow Area = 979.670 ac, 34.87% Impervious, Inflow Depth > 1.59" for Flood2 event
Inflow = 300.76 cfs @ 14.36 hrs, Volume= 129.686 af
Outflow = 300.75 cfs @ 14.36 hrs, Volume= 129.686 af, Atten= 0%, Lag= 0.0 min
Primary = 300.75 cfs @ 14.36 hrs, Volume= 129.686 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 267.11' @ 14.36 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	174.00'	36.0" x 30.0' long Culvert CPP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 173.90' S= 0.0033 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=297.99 cfs @ 14.36 hrs HW=265.71' TW=189.05' (Dynamic Tailwater)
↑=Culvert (Inlet Controls 297.99 cfs @ 42.16 fps)

Pond ARd C: Acre Rd Culvert



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Pond ES A: Existing Storage A

Inflow Area = 937.570 ac, 35.27% Impervious, Inflow Depth > 1.64" for Flood2 event
 Inflow = 524.25 cfs @ 14.30 hrs, Volume= 128.057 af
 Outflow = 481.58 cfs @ 14.33 hrs, Volume= 126.984 af, Atten= 8%, Lag= 1.8 min
 Primary = 481.58 cfs @ 14.33 hrs, Volume= 126.984 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 196.10' @ 14.33 hrs Surf.Area= 22,244 sf Storage= 57,579 cf

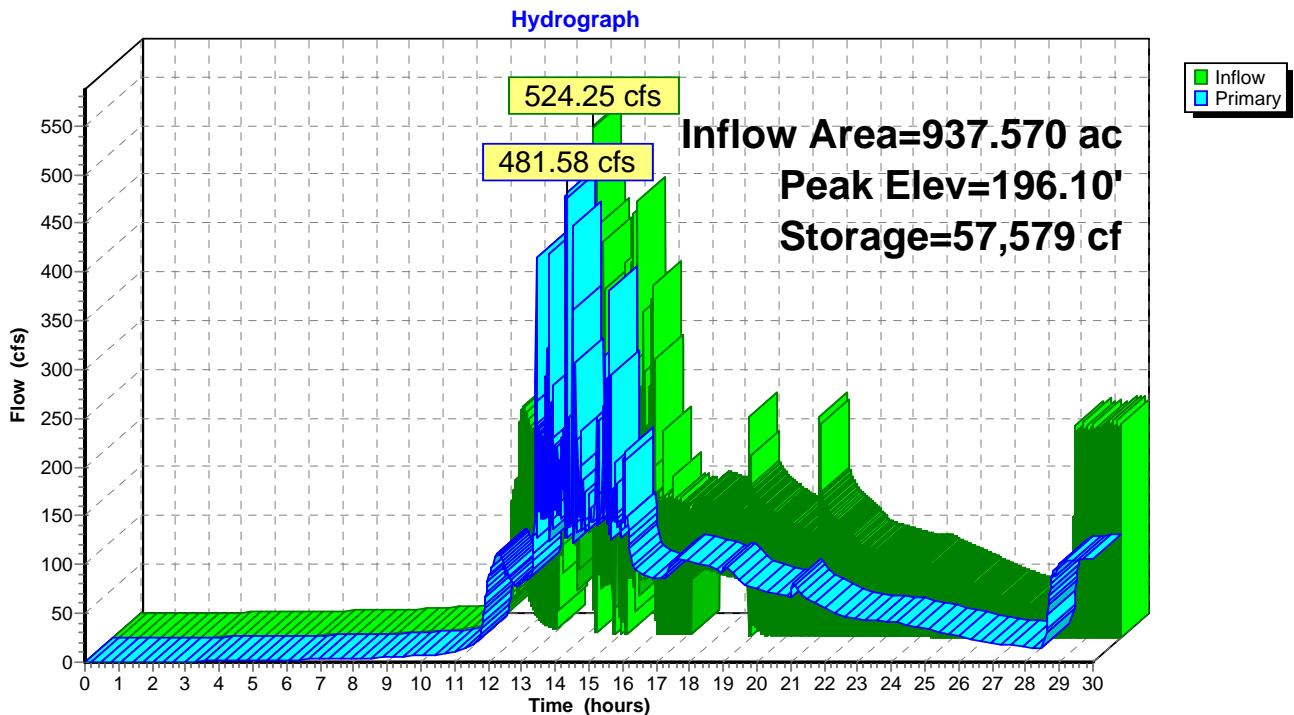
Plug-Flow detention time= 7.3 min calculated for 126.942 af (99% of inflow)
 Center-of-Mass det. time= 1.4 min (1,101.5 - 1,100.1)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	57,579 cf	65.00'W x 250.00'L x 3.00'H Prismatic Z=3.0

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=470.93 cfs @ 14.33 hrs HW=196.10' TW=191.69' (Dynamic Tailwater)
 ↳ **1=Broad-Crested Rectangular Weir** (Weir Controls 470.93 cfs @ 7.72 fps)

Pond ES A: Existing Storage A



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Pond ES B: Existing Storage B

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 1.61" for Flood2 event
 Inflow = 312.04 cfs @ 13.43 hrs, Volume= 129.389 af
 Outflow = 320.87 cfs @ 13.44 hrs, Volume= 128.337 af, Atten= 0%, Lag= 0.5 min
 Primary = 320.87 cfs @ 13.44 hrs, Volume= 128.337 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 190.62' @ 13.44 hrs Surf.Area= 23,122 sf Storage= 61,135 cf

Plug-Flow detention time= 7.6 min calculated for 128.294 af (99% of inflow)
 Center-of-Mass det. time= 1.9 min (1,098.9 - 1,097.0)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	61,135 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
186.00	17,576	0	0
188.00	21,332	38,908	38,908
189.00	23,122	22,227	61,135

Device	Routing	Invert	Outlet Devices
#1	Primary	186.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=309.68 cfs @ 13.44 hrs HW=190.51' TW=186.77' (Dynamic Tailwater)
 ↳1=Broad-Crested Rectangular Weir (Weir Controls 309.68 cfs @ 6.86 fps)

Existing Drainage McKownville RT 20 Area

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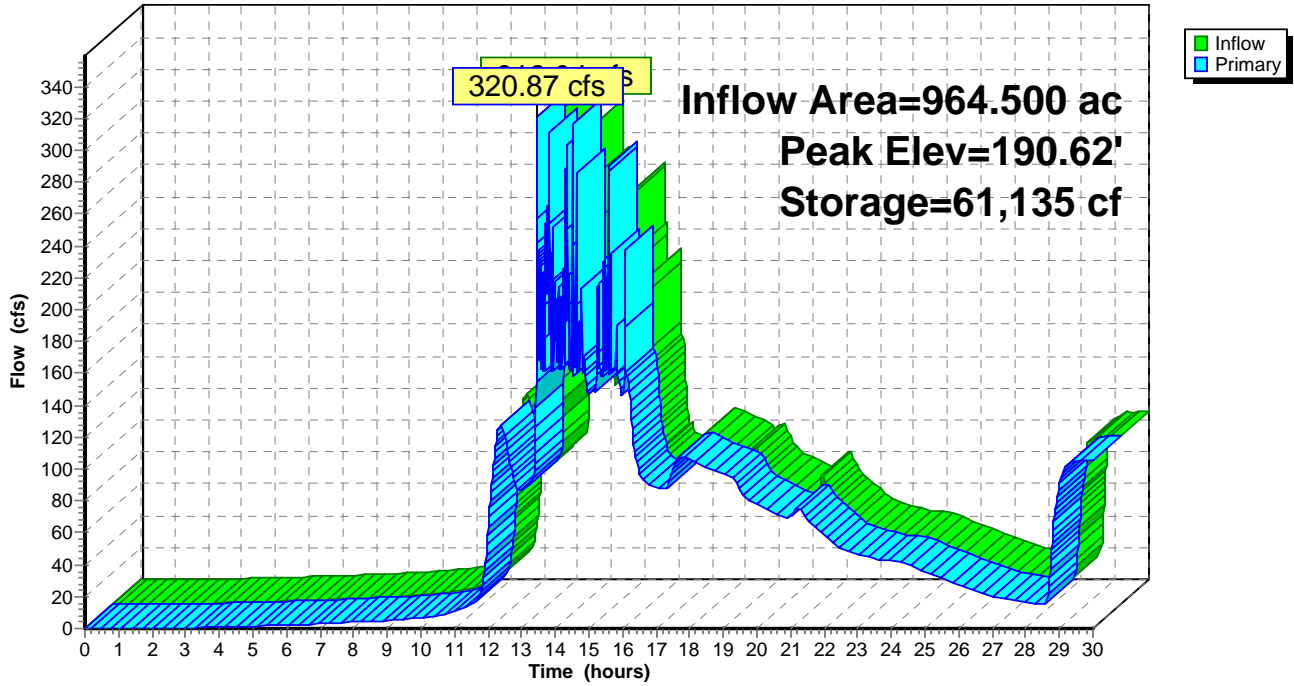
Type II 24-hr Flood2 Rainfall=3.61"

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Pond ES B: Existing Storage B

Hydrograph



Existing Drainage McKownville RT 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Pond MRd C: McKown Rd Culv

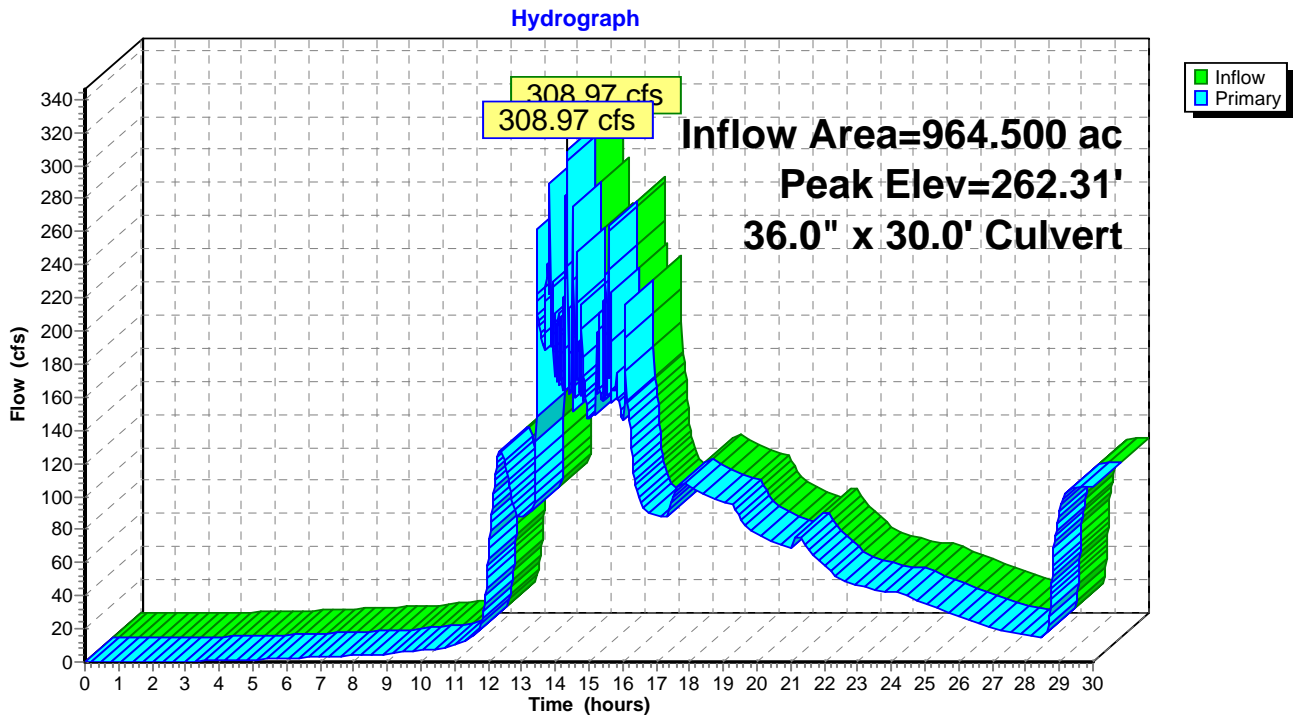
Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 1.60" for Flood2 event
Inflow = 308.97 cfs @ 14.36 hrs, Volume= 128.287 af
Outflow = 308.97 cfs @ 14.36 hrs, Volume= 128.287 af, Atten= 0%, Lag= 0.0 min
Primary = 308.97 cfs @ 14.36 hrs, Volume= 128.287 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 262.31' @ 14.36 hrs

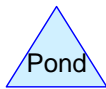
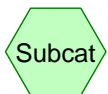
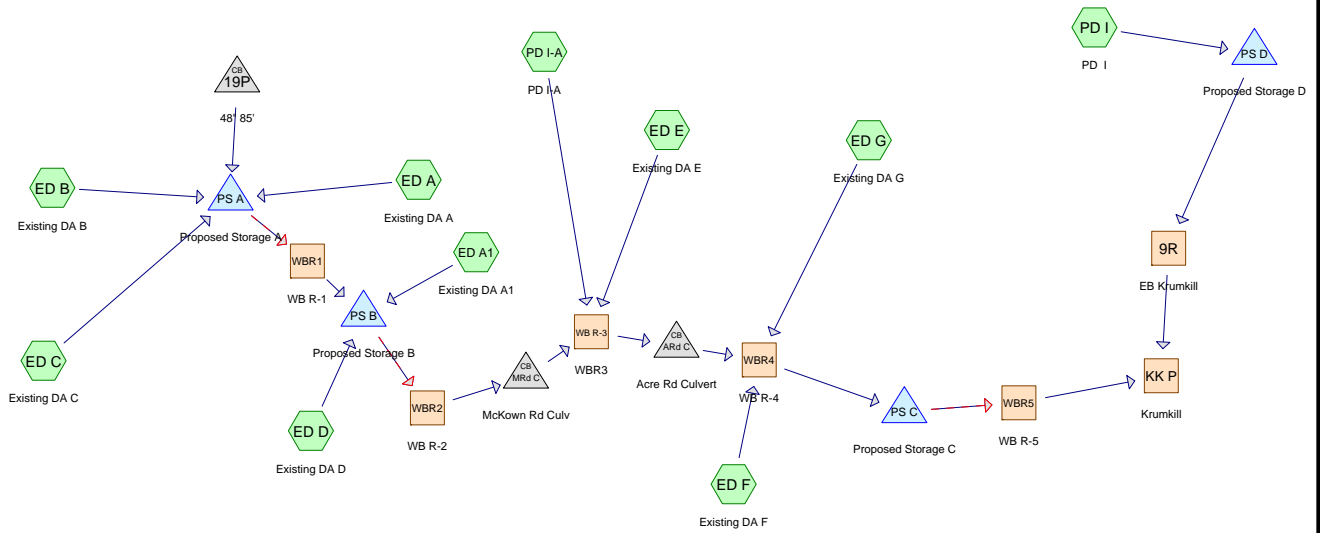
Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	36.0" x 30.0' long Culvert RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 177.00' S= 0.0333 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=300.49 cfs @ 14.36 hrs HW=258.33' TW=180.38' (Dynamic Tailwater)
1=Culvert (Inlet Controls 300.49 cfs @ 42.51 fps)

Pond MRd C: McKown Rd Culv



Proposed Conditions



Drainage Diagram for Proposed Drainage McKownville Rt 20 Area
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Proposed Drainage McKownville Rt 20 Area

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.300	43	Woods/grass comb., Fair, HSG A (ED G)
12.700	55	Woods, Good, HSG B (PD I)
20.440	57	1/3 acre lots, 30% imp, HSG A (ED G)
18.160	58	Woods/grass comb., Good, HSG B (ED D)
65.010	61	1/4 acre lots, 38% imp, HSG A (PD I,PD I-A)
4.780	69	50-75% Grass cover, Fair, HSG B (ED A,ED A1)
36.500	70	1/2 acre lots, 25% imp, HSG B (ED C)
15.170	72	1/3 acre lots, 30% imp, HSG B (ED E)
6.950	76	Woods/grass comb., Fair, HSG C (ED F)
9.430	81	1/3 acre lots, 30% imp, HSG C (ED F)
19.400	98	Paved parking & roofs (ED A,ED A1,ED B,ED D)
214.840		TOTAL AREA

Proposed Drainage McKownville Rt 20 Area

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Soil Listing (selected nodes)

Area (acres)	Soil Goup	Subcatchment Numbers
91.750	HSG A	ED G, PD I, PD I-A
87.310	HSG B	ED A, ED A1, ED C, ED D, ED E, PD I
16.380	HSG C	ED F
0.000	HSG D	
19.400	Other	ED A, ED A1, ED B, ED D
214.840		TOTAL AREA

Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ED A: Existing DA A Runoff Area=8.170 ac 70.75% Impervious Runoff Depth=3.11"
Flow Length=1,334' Slope=0.0100 '/' Tc=28.1 min CN=90 Runoff=22.72 cfs 2.117 af

Subcatchment ED A1: Existing DA A1 Runoff Area=8.170 ac 70.75% Impervious Runoff Depth=3.11"
Flow Length=1,334' Slope=0.0100 '/' Tc=28.1 min CN=90 Runoff=22.72 cfs 2.117 af

Subcatchment ED B: Existing DA B Runoff Area=7.240 ac 100.00% Impervious Runoff Depth=3.96"
Flow Length=363' Slope=0.0275 '/' Tc=4.0 min CN=98 Runoff=45.99 cfs 2.392 af

Subcatchment ED C: Existing DA C Runoff Area=36.500 ac 25.00% Impervious Runoff Depth=1.46"
Flow Length=1,133' Slope=0.0335 '/' Tc=25.6 min CN=70 Runoff=48.94 cfs 4.456 af

Subcatchment ED D: Existing DA D Runoff Area=18.760 ac 3.20% Impervious Runoff Depth=0.81"
Flow Length=1,139' Slope=0.0237 '/' Tc=40.7 min CN=59 Runoff=8.16 cfs 1.265 af

Subcatchment ED E: Existing DA E Runoff Area=15.170 ac 30.00% Impervious Runoff Depth=1.60"
Flow Length=1,334' Slope=0.0150 '/' Tc=41.3 min CN=72 Runoff=16.18 cfs 2.025 af

Subcatchment ED F: Existing DA F Runoff Area=16.380 ac 17.27% Impervious Runoff Depth=2.13"
Flow Length=661' Slope=0.0290 '/' Tc=13.8 min CN=79 Runoff=47.00 cfs 2.903 af

Subcatchment ED G: Existing DA G Runoff Area=26.740 ac 22.93% Impervious Runoff Depth=0.57"
Flow Length=1,244' Slope=0.0160 '/' Tc=60.3 min CN=54 Runoff=5.09 cfs 1.261 af

Subcatchment PD I: PD I Runoff Area=49.920 ac 28.33% Impervious Runoff Depth=0.81"
Flow Length=1,990' Slope=0.0340 '/' Tc=53.1 min CN=59 Runoff=17.83 cfs 3.366 af

Subcatchment PD I-A: PD I-A Runoff Area=27.790 ac 38.00% Impervious Runoff Depth=0.92"
Tc=0.0 min CN=61 Runoff=54.20 cfs 2.122 af

Reach 9R: EB Krumkill Avg. Depth=0.81' Max Vel=1.92 fps Inflow=16.43 cfs 3.363 af
n=0.040 L=1,755.0' S=0.0046 '/' Capacity=293.49 cfs Outflow=14.98 cfs 3.359 af

Reach KK P: Krumkill Inflow=383.98 cfs 212.835 af
Outflow=383.98 cfs 212.835 af

Reach WB R-3: WBR3 Avg. Depth=2.84' Max Vel=7.37 fps Inflow=388.71 cfs 207.229 af
n=0.040 L=230.0' S=0.0170 '/' Capacity=1,258.70 cfs Outflow=387.59 cfs 207.160 af

Reach WBR1: WB R-1 Avg. Depth=3.32' Max Vel=6.17 fps Inflow=569.77 cfs 201.320 af
n=0.040 L=300.0' S=0.0100 '/' Capacity=966.62 cfs Outflow=409.04 cfs 201.166 af

Reach WBR2: WB R-2 Avg. Depth=2.19' Max Vel=10.61 fps Inflow=383.72 cfs 203.115 af
n=0.040 L=150.0' S=0.0467 '/' Capacity=2,088.13 cfs Outflow=383.81 cfs 203.082 af

Reach WBR4: WB R-4 Avg. Depth=3.95' Max Vel=4.52 fps Inflow=392.94 cfs 211.324 af
n=0.040 L=450.0' S=0.0044 '/' Capacity=644.41 cfs Outflow=391.24 cfs 211.125 af

Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Reach WBR5: WB R-5 Avg. Depth=4.29' Max Vel=3.84 fps Inflow=406.47 cfs 210.071 af
n=0.040 L=2,050.0' S=0.0029 '/ Capacity=522.94 cfs Outflow=376.34 cfs 209.477 af

Pond 19P: 48" 85' Peak Elev=341.52' Inflow=694.79 cfs 194.320 af
48.0" x 85.0' Culvert Outflow=694.79 cfs 194.320 af

Pond ARd C: Acre Rd Culvert Peak Elev=319.89' Inflow=387.59 cfs 207.160 af
36.0" x 30.0' Culvert Outflow=387.97 cfs 207.159 af

Pond MRd C: McKown Rd Culv Peak Elev=307.91' Inflow=383.81 cfs 203.082 af
36.0" x 30.0' Culvert Outflow=383.81 cfs 203.082 af

Pond PS A: Proposed Storage A Peak Elev=199.37' Storage=128,832 cf Inflow=709.58 cfs 203.284 af
Primary=156.24 cfs 134.116 af Secondary=413.54 cfs 67.205 af Outflow=569.77 cfs 201.315 af

Pond PS B: Proposed Storage B Peak Elev=191.66' Storage=123,570 cf Inflow=412.96 cfs 204.548 af
Primary=114.20 cfs 112.502 af Secondary=269.61 cfs 90.612 af Outflow=383.72 cfs 203.115 af

Pond PS C: Proposed Storage C Peak Elev=191.60' Storage=135,312 cf Inflow=391.24 cfs 211.125 af
Primary=81.16 cfs 87.890 af Secondary=327.32 cfs 122.181 af Outflow=406.47 cfs 210.071 af

Pond PS D: Proposed Storage D Peak Elev=192.18' Storage=0.233 af Inflow=17.83 cfs 3.366 af
Outflow=16.43 cfs 3.363 af

Total Runoff Area = 214.840 ac Runoff Volume = 24.023 af Average Runoff Depth = 1.34"
68.93% Pervious = 148.099 ac 31.07% Impervious = 66.741 ac

Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED A: Existing DA A

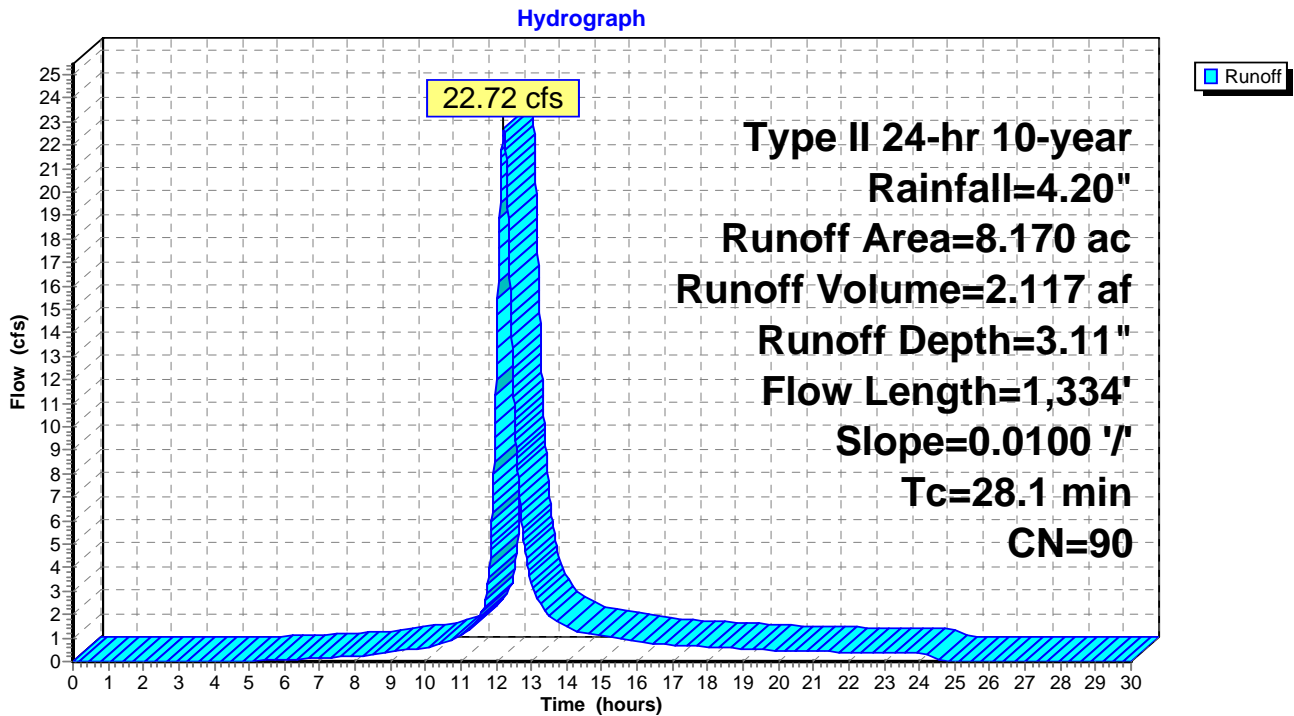
Runoff = 22.72 cfs @ 12.21 hrs, Volume= 2.117 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
5.780	98	Paved parking & roofs
2.390	69	50-75% Grass cover, Fair, HSG B
8.170	90	Weighted Average
2.390		Pervious Area
5.780		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	1,334	0.0100	0.79		Lag/CN Method,

Subcatchment ED A: Existing DA A



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED A1: Existing DA A1

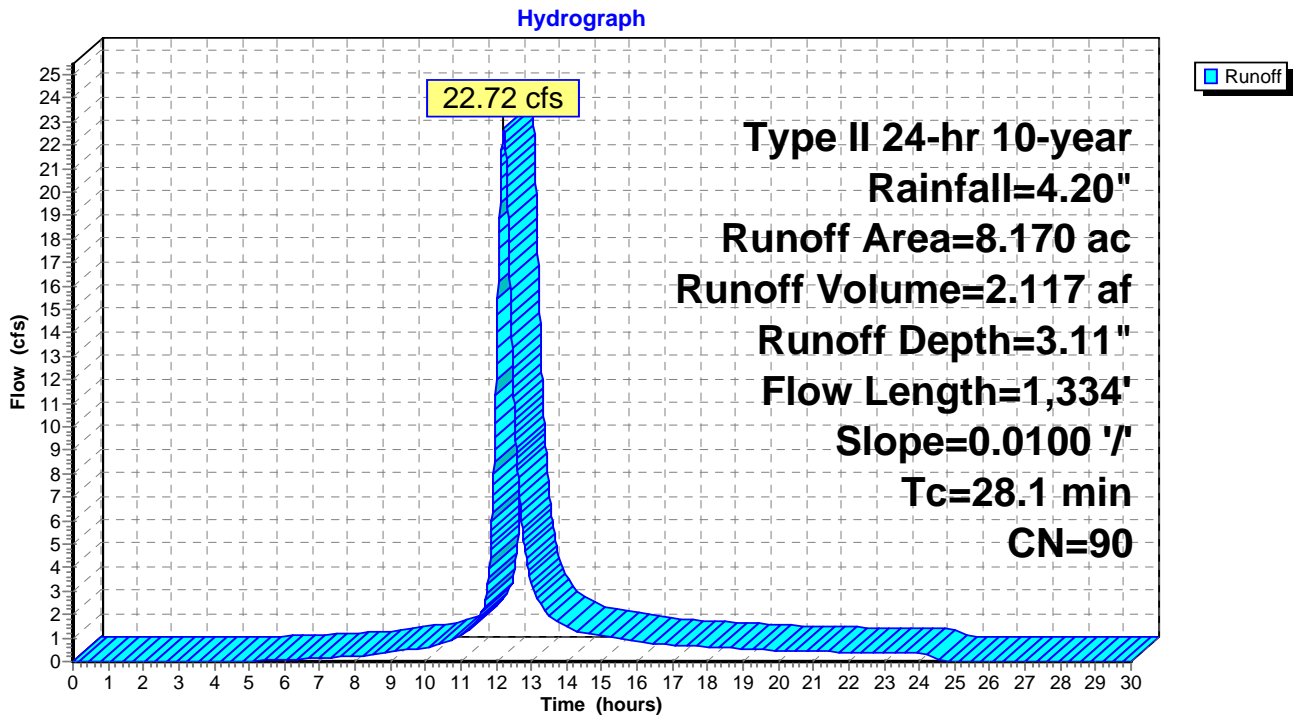
Runoff = 22.72 cfs @ 12.21 hrs, Volume= 2.117 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
5.780	98	Paved parking & roofs
2.390	69	50-75% Grass cover, Fair, HSG B
8.170	90	Weighted Average
2.390		Pervious Area
5.780		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	1,334	0.0100	0.79		Lag/CN Method,

Subcatchment ED A1: Existing DA A1



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED B: Existing DA B

Runoff = 45.99 cfs @ 11.94 hrs, Volume= 2.392 af, Depth= 3.96"

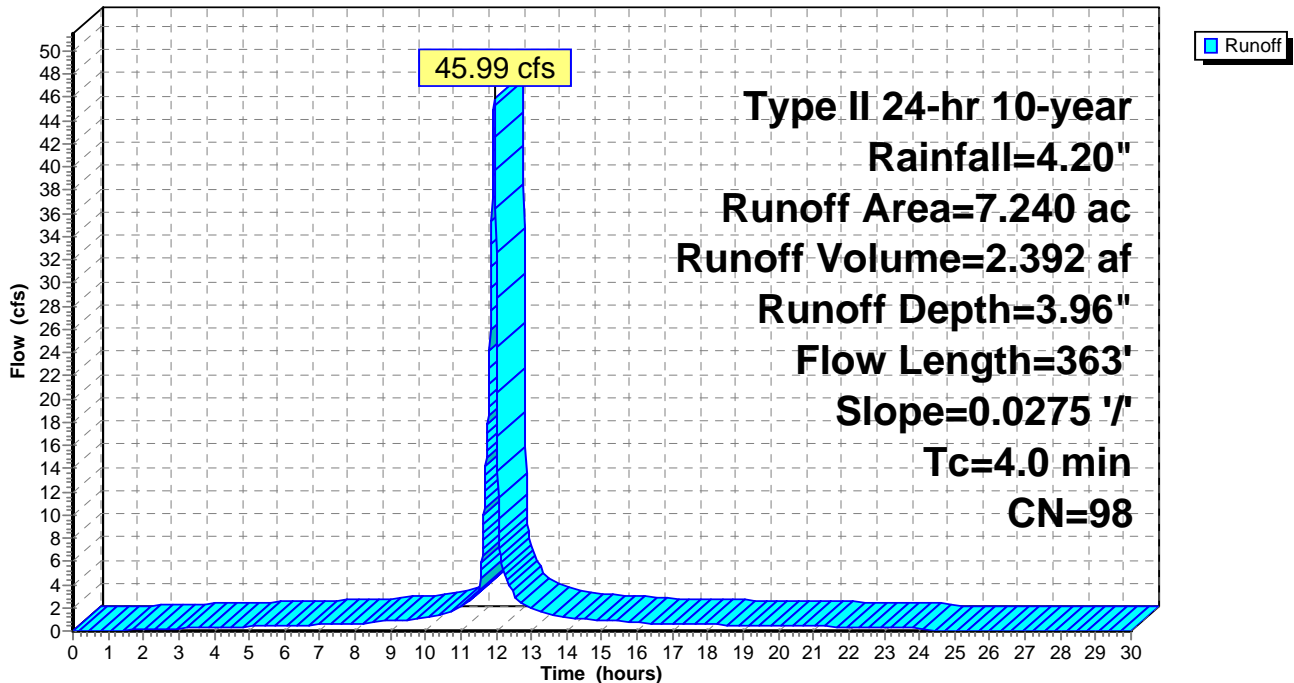
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
7.240	98	Paved parking & roofs
7.240		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	363	0.0275	1.50		Lag/CN Method,

Subcatchment ED B: Existing DA B

Hydrograph



Proposed Drainage McKownville Rt 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED C: Existing DA C

Runoff = 48.94 cfs @ 12.20 hrs, Volume= 4.456 af, Depth= 1.46"

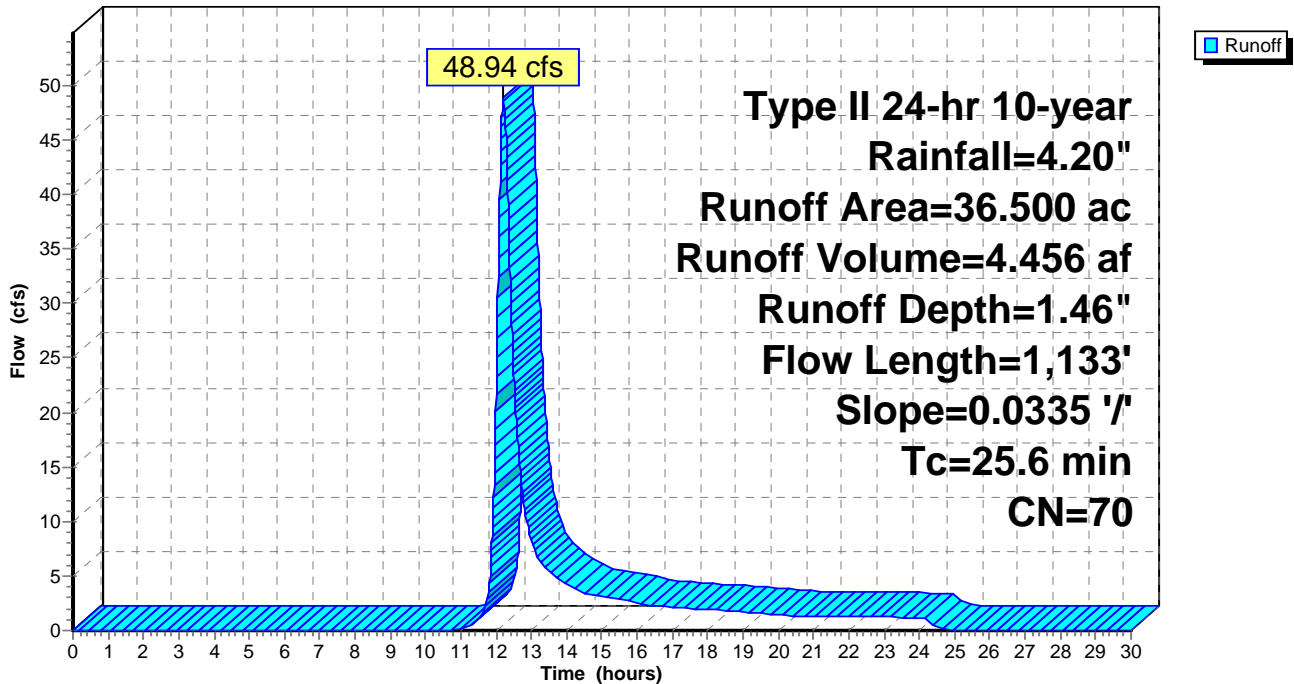
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
36.500	70	1/2 acre lots, 25% imp, HSG B
27.375		Pervious Area
9.125		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	1,133	0.0335	0.74		Lag/CN Method,

Subcatchment ED C: Existing DA C

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED D: Existing DA D

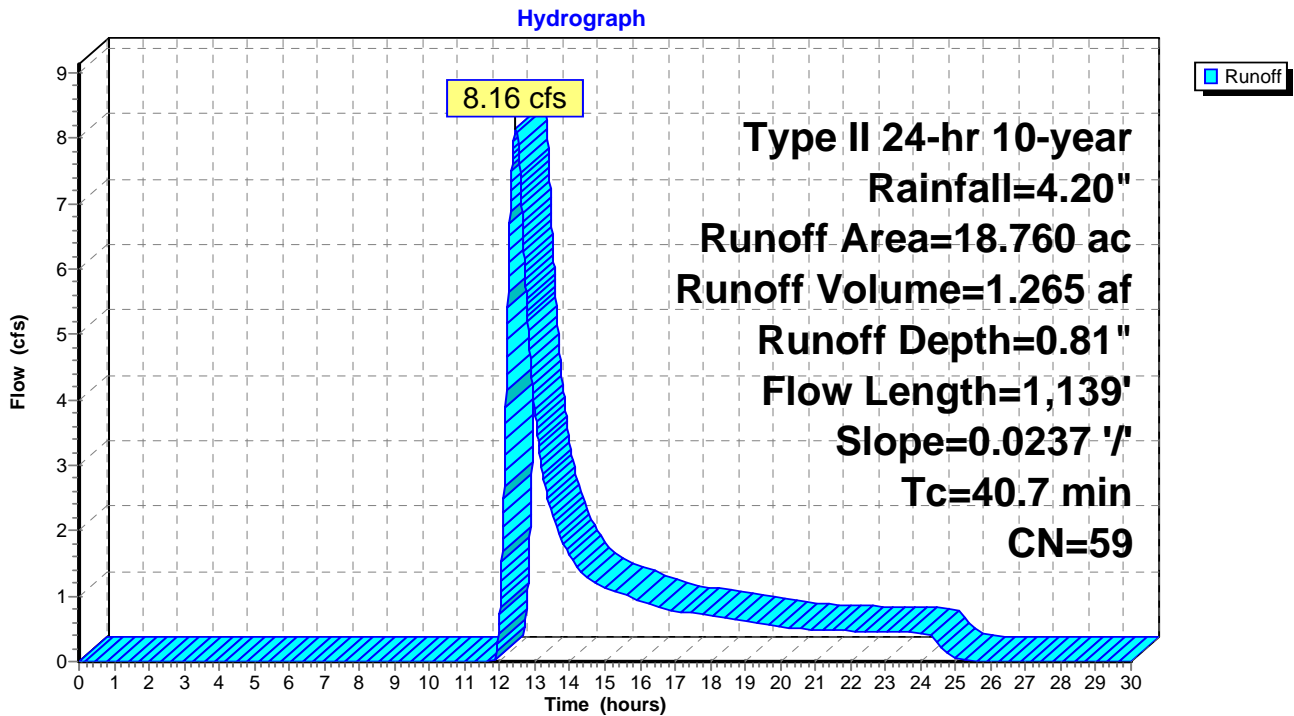
Runoff = 8.16 cfs @ 12.44 hrs, Volume= 1.265 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
18.160	58	Woods/grass comb., Good, HSG B
0.600	98	Paved parking & roofs
18.760	59	Weighted Average
18.160		Pervious Area
0.600		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.7	1,139	0.0237	0.47		Lag/CN Method,

Subcatchment ED D: Existing DA D



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED E: Existing DA E

Runoff = 16.18 cfs @ 12.40 hrs, Volume= 2.025 af, Depth= 1.60"

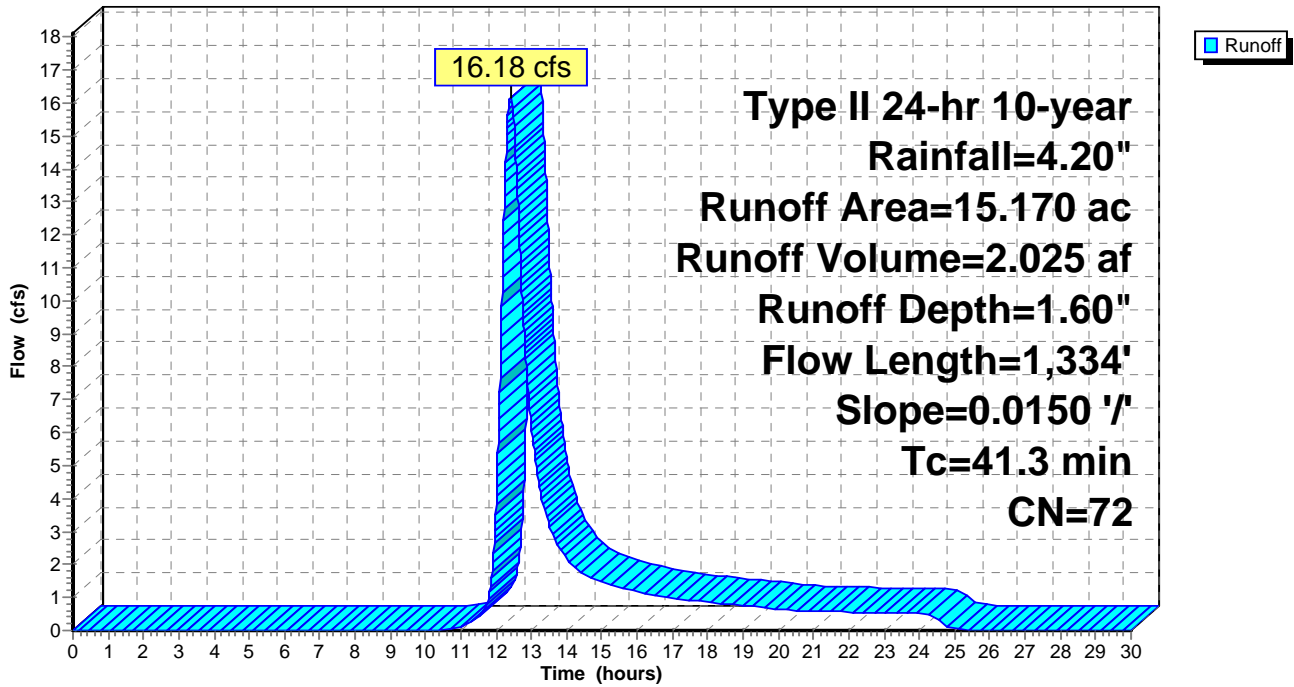
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
15.170	72	1/3 acre lots, 30% imp, HSG B
10.619		Pervious Area
4.551		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.3	1,334	0.0150	0.54		Lag/CN Method,

Subcatchment ED E: Existing DA E

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED F: Existing DA F

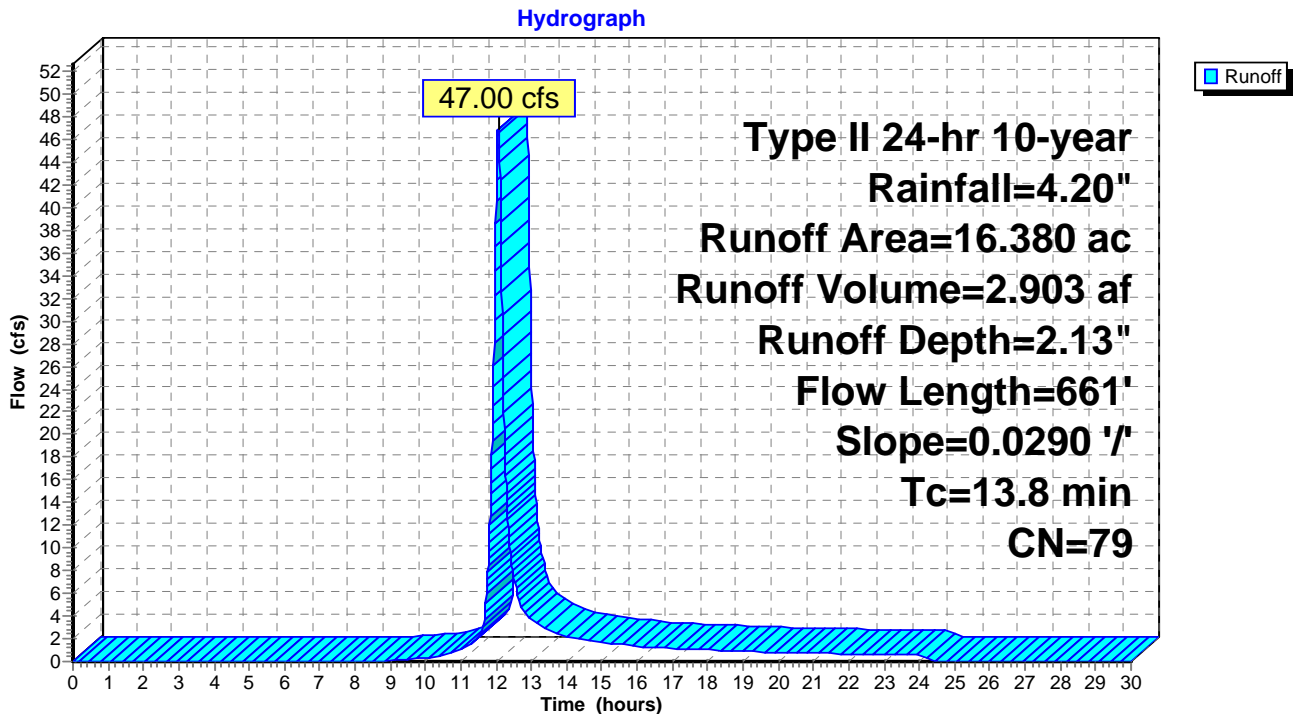
Runoff = 47.00 cfs @ 12.06 hrs, Volume= 2.903 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
9.430	81	1/3 acre lots, 30% imp, HSG C
6.950	76	Woods/grass comb., Fair, HSG C
16.380	79	Weighted Average
13.551		Pervious Area
2.829		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	661	0.0290	0.80		Lag/CN Method,

Subcatchment ED F: Existing DA F



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment ED G: Existing DA G

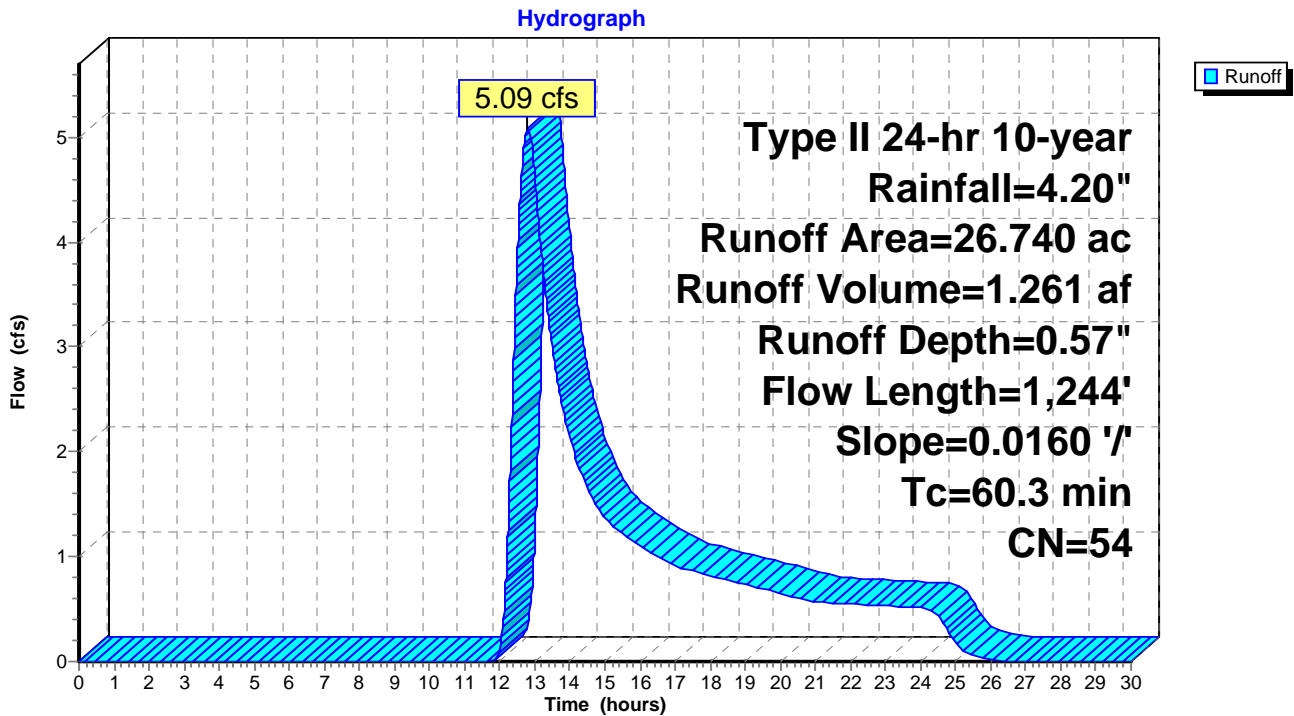
Runoff = 5.09 cfs @ 12.80 hrs, Volume= 1.261 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
20.440	57	1/3 acre lots, 30% imp, HSG A
6.300	43	Woods/grass comb., Fair, HSG A
26.740	54	Weighted Average
20.608		Pervious Area
6.132		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.3	1,244	0.0160	0.34		Lag/CN Method,

Subcatchment ED G: Existing DA G



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment PD I: PD I

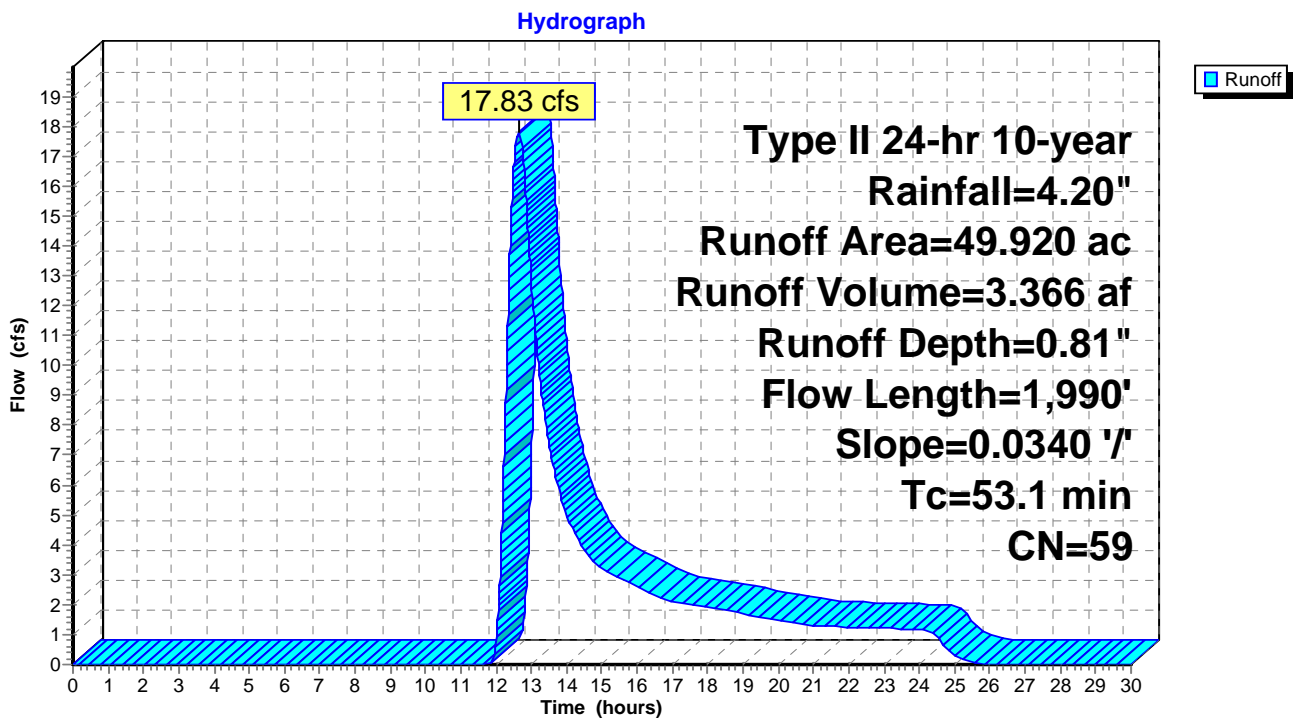
Runoff = 17.83 cfs @ 12.63 hrs, Volume= 3.366 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
37.220	61	1/4 acre lots, 38% imp, HSG A
12.700	55	Woods, Good, HSG B
49.920	59	Weighted Average
35.776		Pervious Area
14.144		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.1	1,990	0.0340	0.63		Lag/CN Method,

Subcatchment PD I: PD I



Proposed Drainage McKownville Rt 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Subcatchment PD I-A: PD I-A

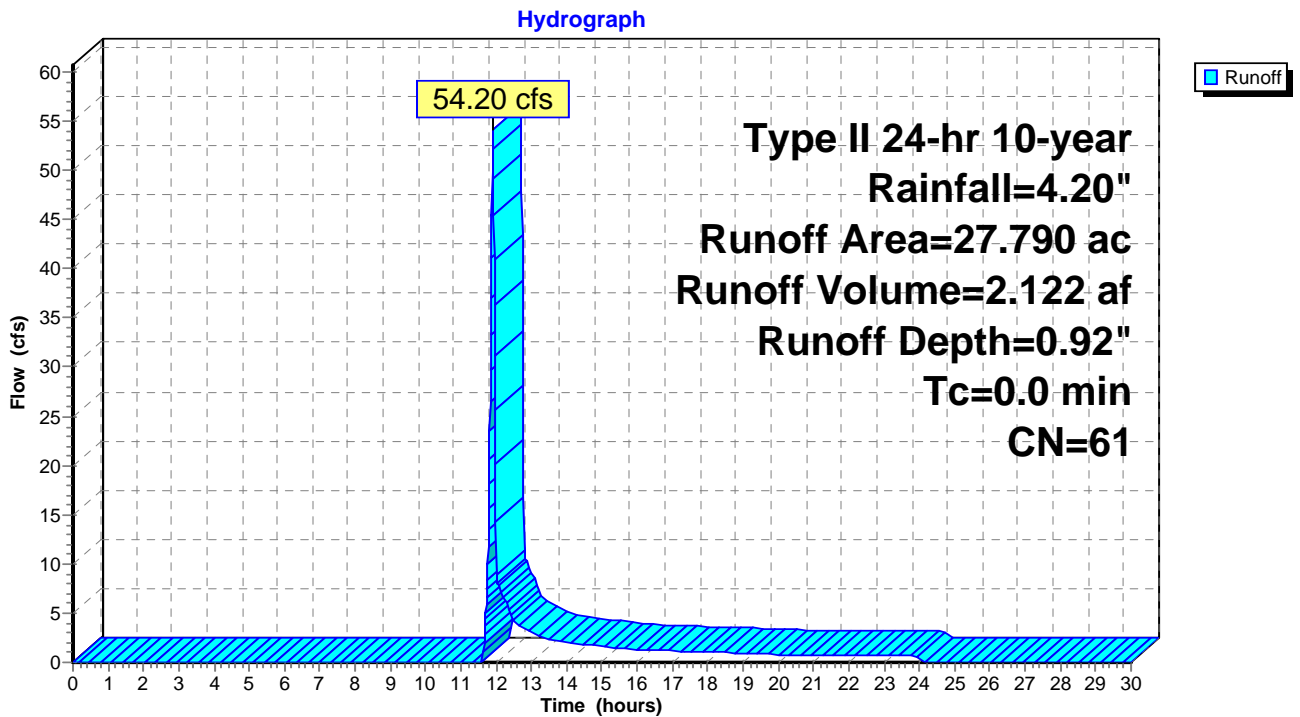
Runoff = 54.20 cfs @ 11.90 hrs, Volume= 2.122 af, Depth= 0.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Type II 24-hr 10-year Rainfall=4.20"

Area (ac)	CN	Description
27.790	61	1/4 acre lots, 38% imp, HSG A
17.230		Pervious Area
10.560		Impervious Area

Subcatchment PD I-A: PD I-A



Proposed Drainage McKownville Rt 20 Area

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Summary for Reach 9R: EB Krumkill

Inflow Area = 49.920 ac, 28.33% Impervious, Inflow Depth > 0.81" for 10-year event
Inflow = 16.43 cfs @ 12.80 hrs, Volume= 3.363 af
Outflow = 14.98 cfs @ 13.01 hrs, Volume= 3.359 af, Atten= 9%, Lag= 12.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.92 fps, Min. Travel Time= 15.2 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 35.1 min

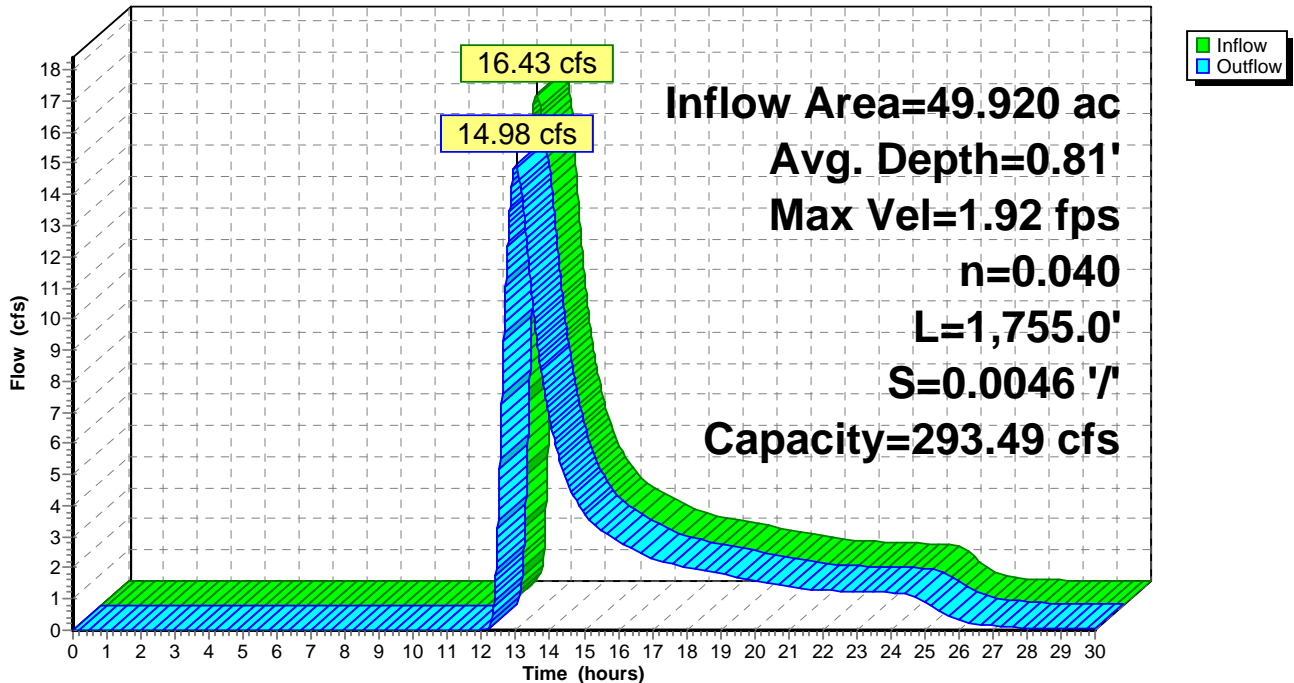
Peak Storage= 13,676 cf @ 13.01 hrs, Average Depth at Peak Storage= 0.81'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 293.49 cfs

8.00' x 4.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 1,755.0' Slope= 0.0046 '/'
Inlet Invert= 186.00', Outlet Invert= 178.00'



Reach 9R: EB Krumkill

Hydrograph



Summary for Reach KK P: Krumkill

Inflow Area = 1,100.500 ac, 34.10% Impervious, Inflow Depth > 2.32" for 10-year event

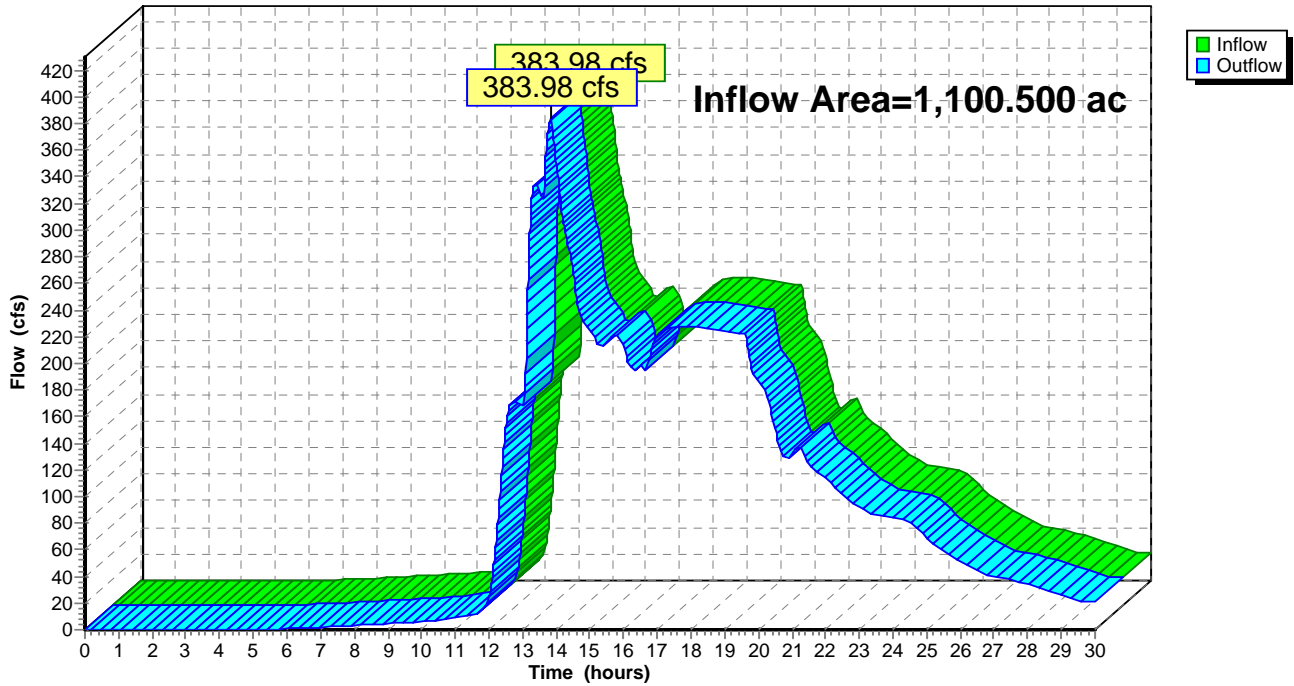
Inflow = 383.98 cfs @ 13.84 hrs, Volume= 212.835 af

Outflow = 383.98 cfs @ 13.84 hrs, Volume= 212.835 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Reach KK P: Krumkill

Hydrograph



Proposed Drainage McKownville Rt 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Reach WB R-3: WBR3

Inflow Area = 1,007.460 ac, 34.96% Impervious, Inflow Depth > 2.47" for 10-year event
Inflow = 388.71 cfs @ 13.70 hrs, Volume= 207.229 af
Outflow = 387.59 cfs @ 13.70 hrs, Volume= 207.160 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 7.37 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.87 fps, Avg. Travel Time= 1.0 min

Peak Storage= 12,094 cf @ 13.70 hrs, Average Depth at Peak Storage= 2.84'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 1,258.70 cfs

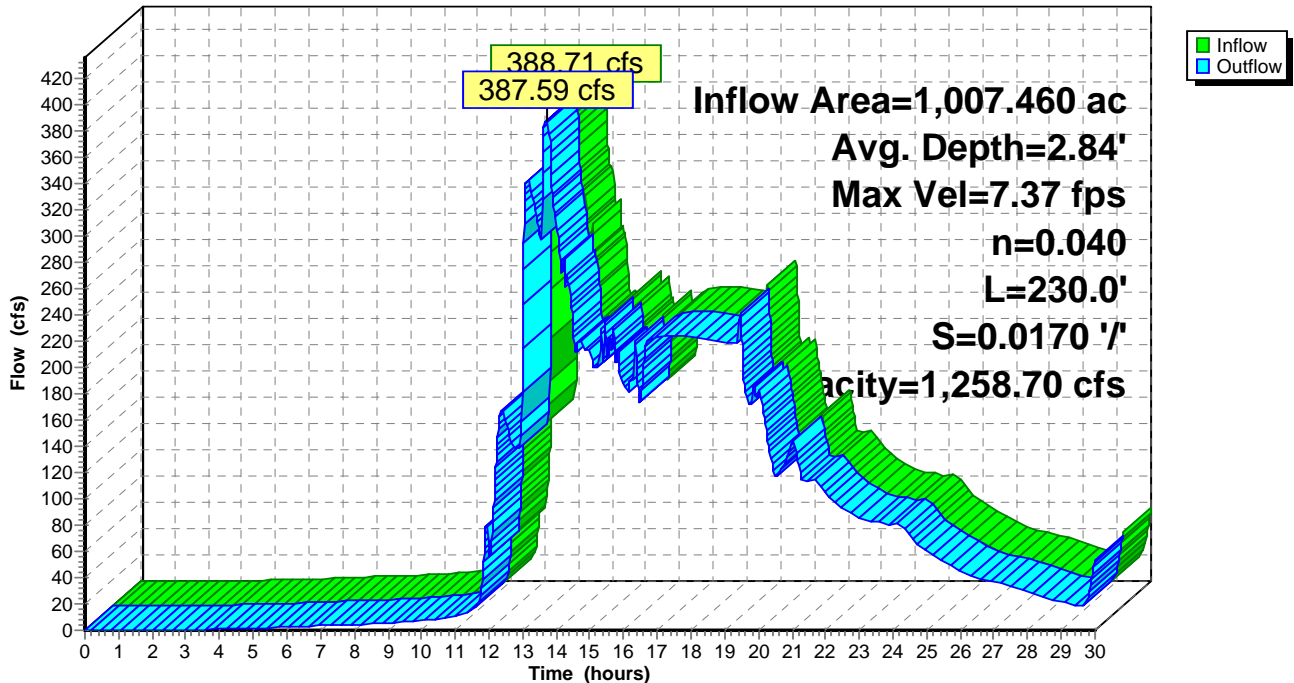
10.00' x 5.00' deep channel, n= 0.040 Mountain streams
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 230.0' Slope= 0.0170 '/
Inlet Invert= 177.90', Outlet Invert= 174.00'



‡

Reach WB R-3: WBR3

Hydrograph



Proposed Drainage McKownville Rt 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Reach WBR1: WB R-1

Inflow Area = 937.570 ac, 35.27% Impervious, Inflow Depth > 2.58" for 10-year event
Inflow = 569.77 cfs @ 13.57 hrs, Volume= 201.320 af
Outflow = 409.04 cfs @ 13.60 hrs, Volume= 201.166 af, Atten= 28%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 6.17 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 3.16 fps, Avg. Travel Time= 1.6 min

Peak Storage= 19,897 cf @ 13.60 hrs, Average Depth at Peak Storage= 3.32'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 966.62 cfs

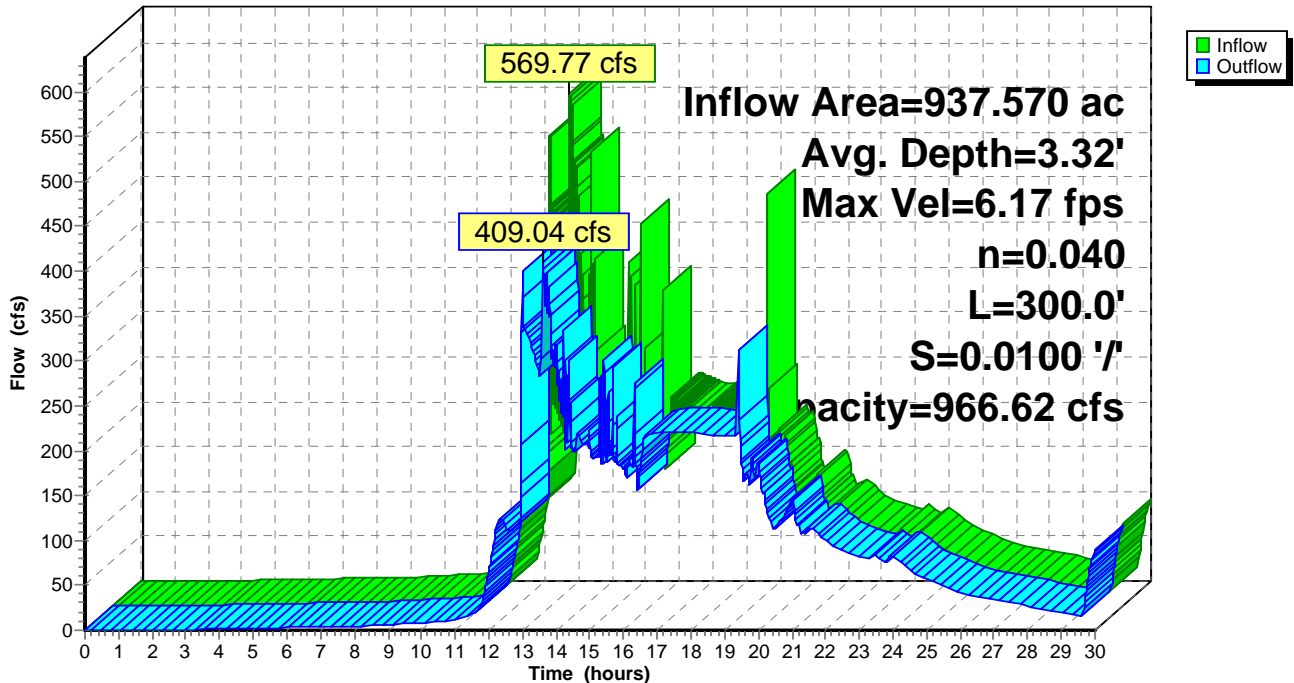
10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 300.0' Slope= 0.0100 '/
Inlet Invert= 189.00', Outlet Invert= 186.00'



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Reach WBR1: WB R-1

Hydrograph



Proposed Drainage McKownville Rt 20 Area

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Summary for Reach WBR2: WB R-2

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 2.53" for 10-year event
Inflow = 383.72 cfs @ 13.74 hrs, Volume= 203.115 af
Outflow = 383.81 cfs @ 13.70 hrs, Volume= 203.082 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 10.61 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 5.46 fps, Avg. Travel Time= 0.5 min

Peak Storage= 5,428 cf @ 13.70 hrs, Average Depth at Peak Storage= 2.19'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 2,088.13 cfs

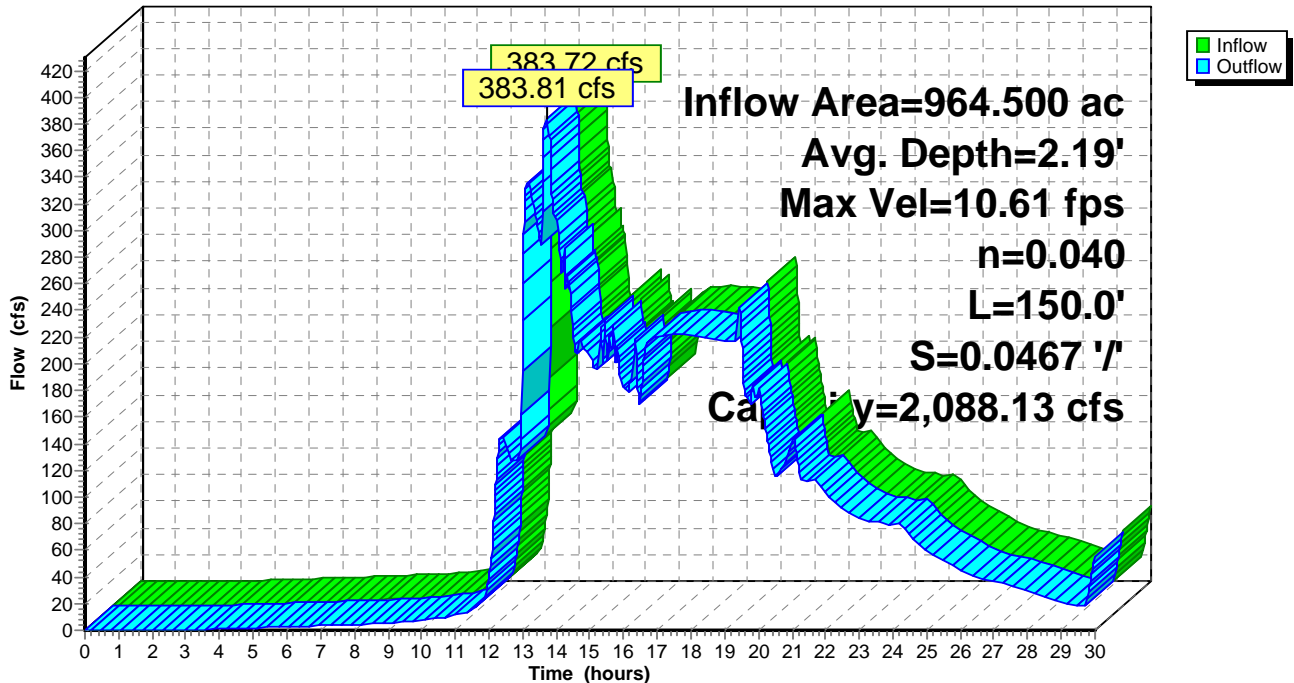
10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/' Top Width= 40.00'
Length= 150.0' Slope= 0.0467 '/'
Inlet Invert= 185.00', Outlet Invert= 178.00'



‡

Reach WBR2: WB R-2

Hydrograph



Proposed Drainage McKownville Rt 20 Area

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Summary for Reach WBR4: WB R-4

Inflow Area = 1,050.580 ac, 34.38% Impervious, Inflow Depth > 2.41" for 10-year event
Inflow = 392.94 cfs @ 13.75 hrs, Volume= 211.324 af
Outflow = 391.24 cfs @ 13.71 hrs, Volume= 211.125 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.52 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 2.43 fps, Avg. Travel Time= 3.1 min

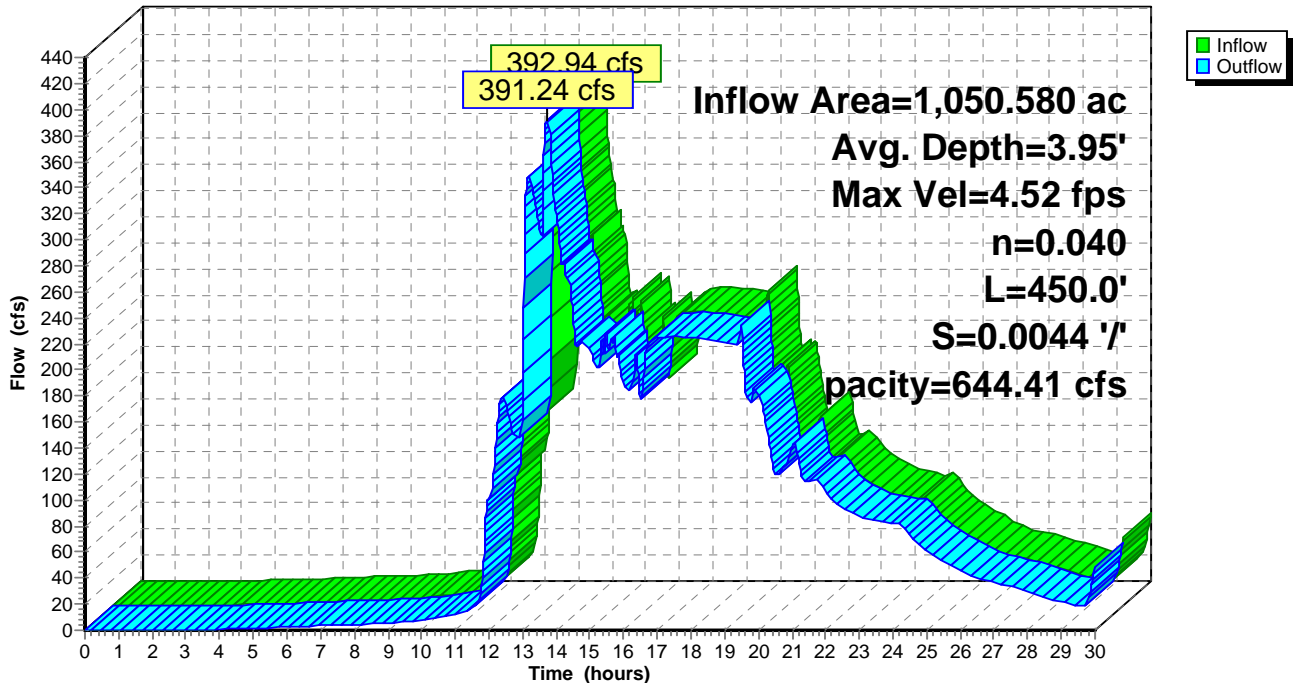
Peak Storage= 38,908 cf @ 13.71 hrs, Average Depth at Peak Storage= 3.95'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 644.41 cfs

10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/' Top Width= 40.00'
Length= 450.0' Slope= 0.0044 '/'
Inlet Invert= 186.00', Outlet Invert= 184.00'



Reach WBR4: WB R-4

Hydrograph



Proposed Drainage McKownville Rt 20 Area

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Type II 24-hr 10-year Rainfall=4.20"

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Summary for Reach WBR5: WB R-5

Inflow Area = 1,050.580 ac, 34.38% Impervious, Inflow Depth > 2.40" for 10-year event
Inflow = 406.47 cfs @ 13.71 hrs, Volume= 210.071 af
Outflow = 376.34 cfs @ 13.84 hrs, Volume= 209.477 af, Atten= 7%, Lag= 7.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.84 fps, Min. Travel Time= 8.9 min
Avg. Velocity = 2.14 fps, Avg. Travel Time= 16.0 min

Peak Storage= 200,918 cf @ 13.84 hrs, Average Depth at Peak Storage= 4.29'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 522.94 cfs

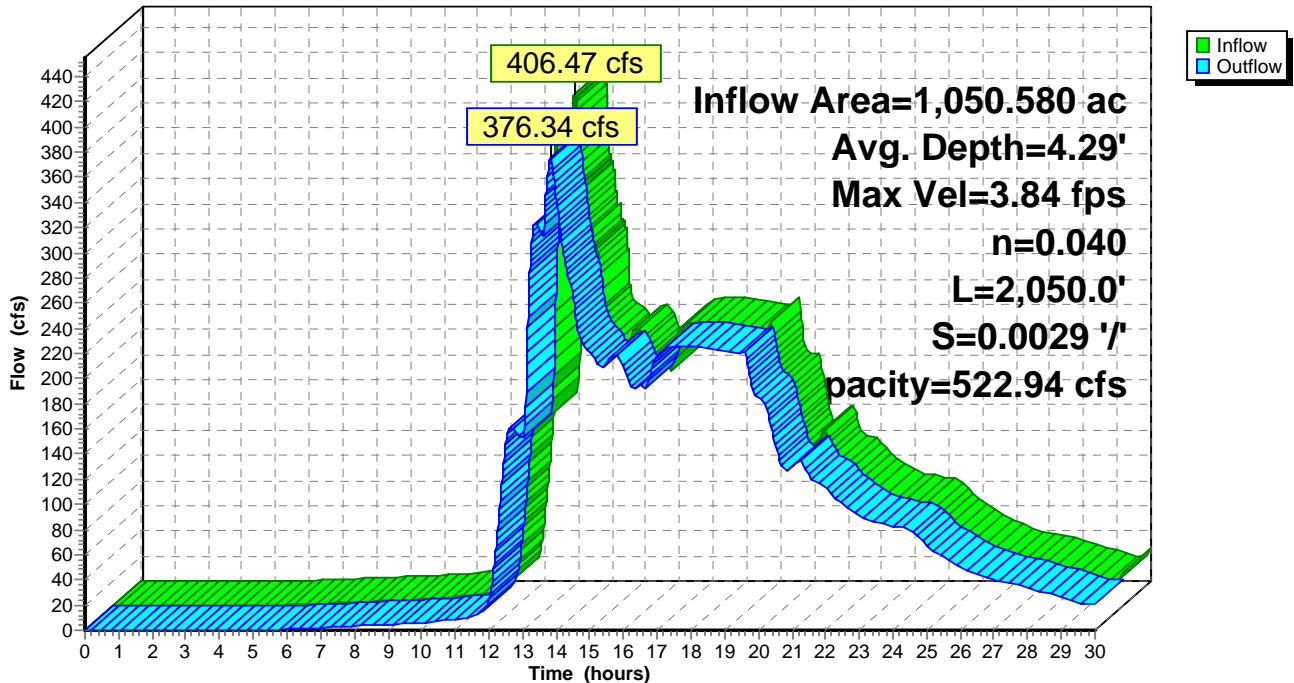
10.00' x 5.00' deep channel, n= 0.040 Mountain streams
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 2,050.0' Slope= 0.0029 '/
Inlet Invert= 182.00', Outlet Invert= 176.00'



‡

Reach WBR5: WB R-5

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Pond 19P: 48" 85'

Inflow Area = 885.660 ac, 34.84% Impervious, Inflow Depth > 2.63" for 10-year event
 Inflow = 694.79 cfs @ 12.94 hrs, Volume= 194.320 af
 Outflow = 694.79 cfs @ 12.94 hrs, Volume= 194.320 af, Atten= 0%, Lag= 0.0 min
 Primary = 694.79 cfs @ 12.94 hrs, Volume= 194.320 af

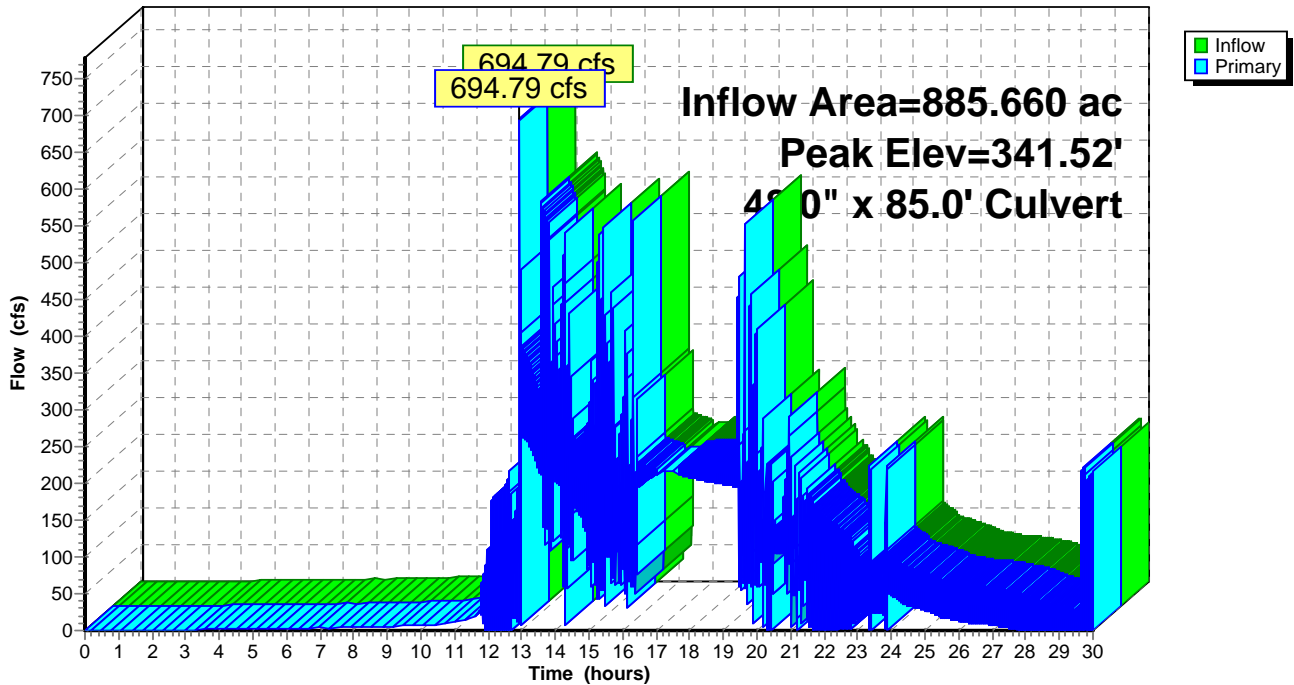
Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 341.52' @ 12.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	194.00'	48.0" x 85.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 193.00' S= 0.0118 '/ Cc= 0.900 n= 0.025 Corrugated metal

Primary OutFlow Max=678.49 cfs @ 12.94 hrs HW=335.30' TW=195.28' (Dynamic Tailwater)
 ↳=Culvert (Barrel Controls 678.49 cfs @ 53.99 fps)

Pond 19P: 48" 85'

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Pond ARd C: Acre Rd Culvert

Inflow Area = 1,007.460 ac, 34.96% Impervious, Inflow Depth > 2.47" for 10-year event
 Inflow = 387.59 cfs @ 13.70 hrs, Volume= 207.160 af
 Outflow = 387.97 cfs @ 13.75 hrs, Volume= 207.159 af, Atten= 0%, Lag= 2.7 min
 Primary = 387.97 cfs @ 13.75 hrs, Volume= 207.159 af

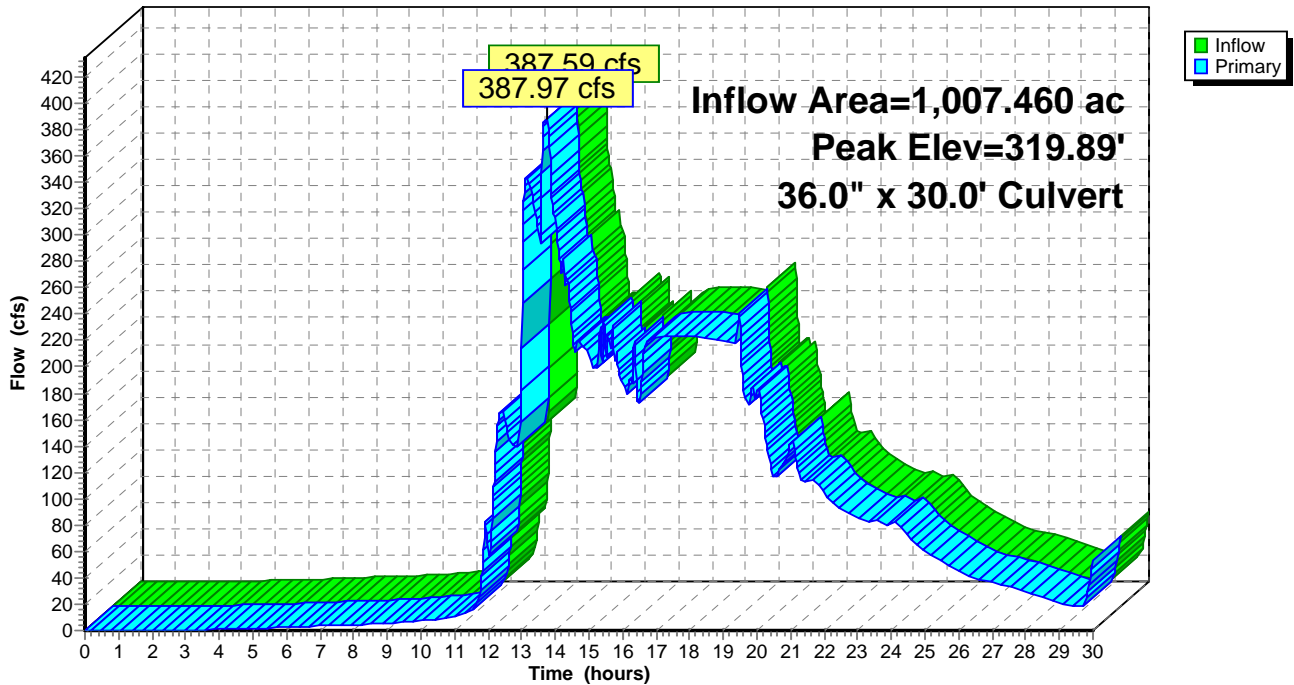
Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 319.89' @ 13.75 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	174.00'	36.0" x 30.0' long Culvert CPP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 173.90' S= 0.0033 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=387.70 cfs @ 13.75 hrs HW=319.71' TW=189.95' (Dynamic Tailwater)
 ←1=Culvert (Inlet Controls 387.70 cfs @ 54.85 fps)

Pond ARd C: Acre Rd Culvert

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Pond MRd C: McKown Rd Culv

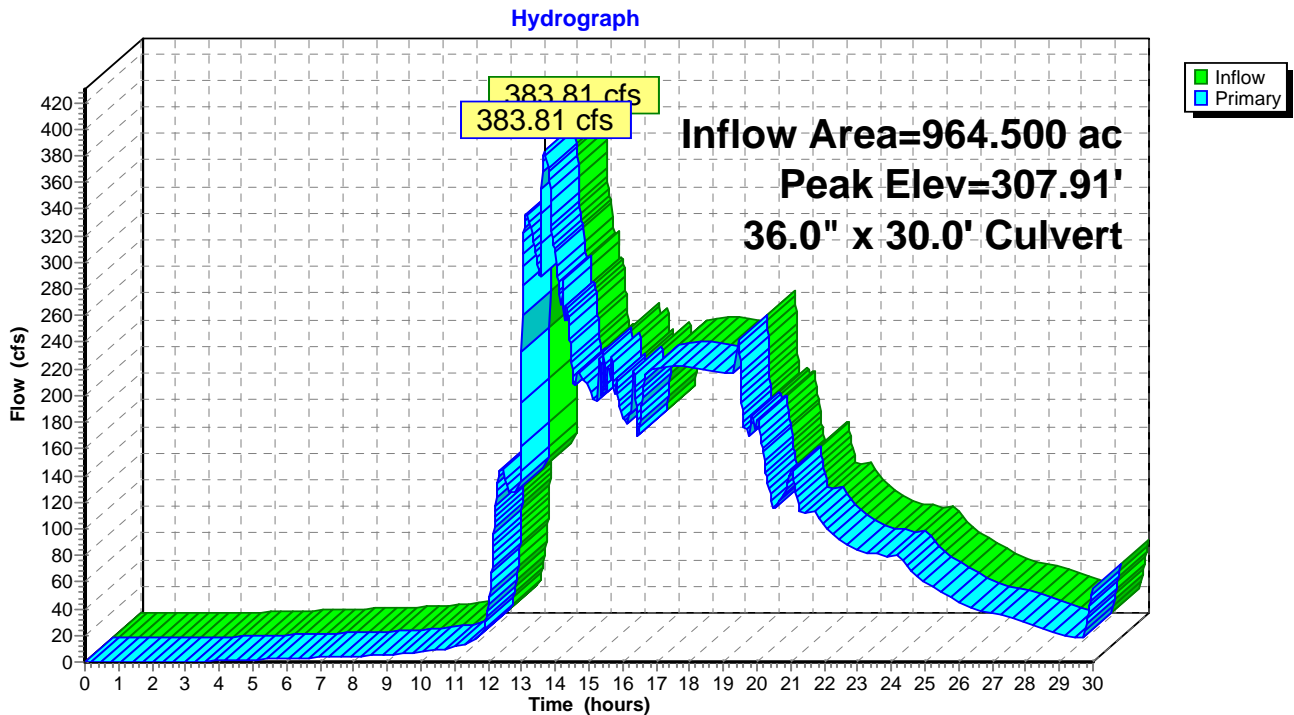
Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 2.53" for 10-year event
 Inflow = 383.81 cfs @ 13.70 hrs, Volume= 203.082 af
 Outflow = 383.81 cfs @ 13.70 hrs, Volume= 203.082 af, Atten= 0%, Lag= 0.0 min
 Primary = 383.81 cfs @ 13.70 hrs, Volume= 203.082 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 307.91' @ 13.70 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	36.0" x 30.0' long Culvert RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 177.00' S= 0.0333 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=383.52 cfs @ 13.70 hrs HW=307.72' TW=180.74' (Dynamic Tailwater)
 ←1=Culvert (Inlet Controls 383.52 cfs @ 54.26 fps)

Pond MRd C: McKown Rd Culv



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Pond PS A: Proposed Storage A

Inflow Area = 937.570 ac, 35.27% Impervious, Inflow Depth > 2.60" for 10-year event
 Inflow = 709.58 cfs @ 12.94 hrs, Volume= 203.284 af
 Outflow = 569.77 cfs @ 13.57 hrs, Volume= 201.315 af, Atten= 20%, Lag= 37.8 min
 Primary = 156.24 cfs @ 13.57 hrs, Volume= 134.116 af
 Secondary = 413.54 cfs @ 13.57 hrs, Volume= 67.205 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 199.37' @ 13.57 hrs Surf.Area= 27,376 sf Storage= 128,832 cf

Plug-Flow detention time= 11.5 min calculated for 201.248 af (99% of inflow)
 Center-of-Mass det. time= 4.4 min (1,071.5 - 1,067.0)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	128,832 cf	80.00'W x 200.00'L x 6.00'H Prismatic Z=3.0

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	4.00' W x 3.00' H x 10.0' long Culvert RCP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 189.90' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean
#2	Secondary	194.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=152.96 cfs @ 13.57 hrs HW=199.37' TW=192.28' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 152.96 cfs @ 12.75 fps)

Secondary OutFlow Max=413.54 cfs @ 13.57 hrs HW=199.37' TW=192.28' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 413.54 cfs @ 7.70 fps)

Proposed Drainage McKownville Rt 20 Area

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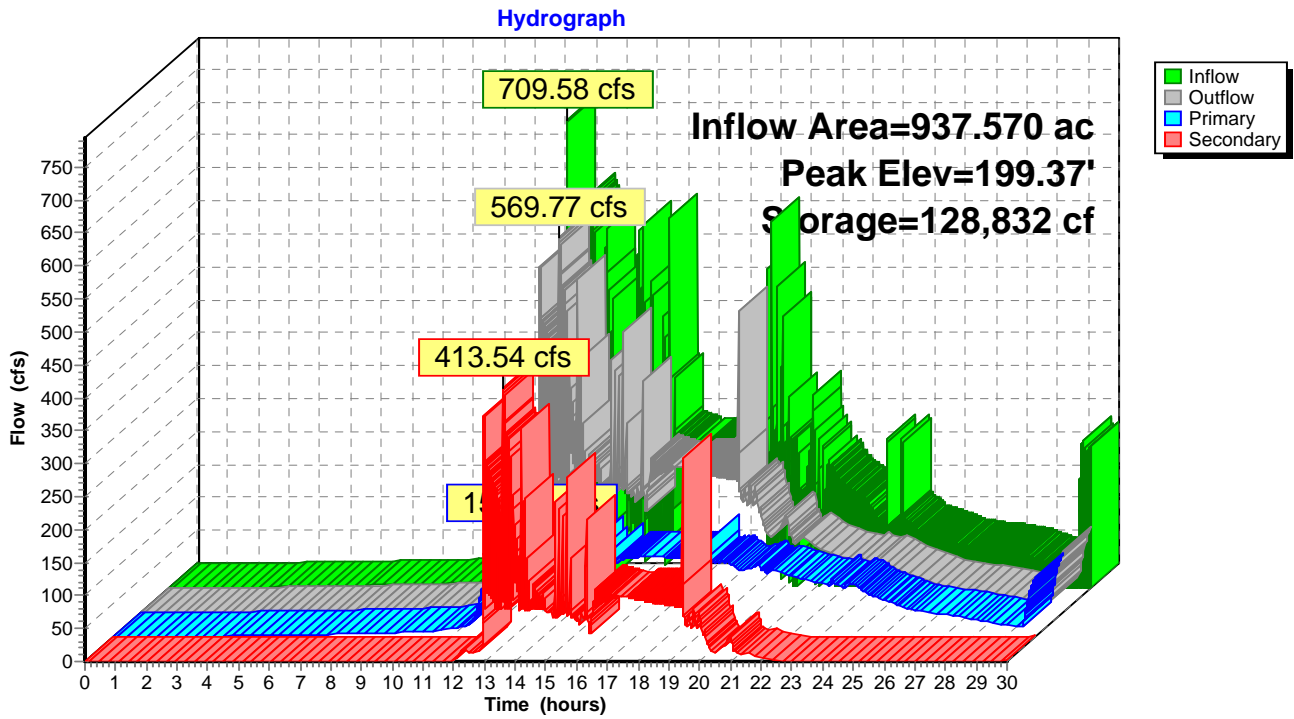
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Type II 24-hr 10-year Rainfall=4.20"

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Pond PS A: Proposed Storage A



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Pond PS B: Proposed Storage B

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 2.54" for 10-year event
 Inflow = 412.96 cfs @ 13.60 hrs, Volume= 204.548 af
 Outflow = 383.72 cfs @ 13.74 hrs, Volume= 203.115 af, Atten= 7%, Lag= 8.5 min
 Primary = 114.20 cfs @ 13.69 hrs, Volume= 112.502 af
 Secondary = 269.61 cfs @ 13.74 hrs, Volume= 90.612 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 191.66' @ 13.74 hrs Surf.Area= 25,577 sf Storage= 123,570 cf

Plug-Flow detention time= 9.8 min calculated for 203.047 af (99% of inflow)
 Center-of-Mass det. time= 4.7 min (1,073.1 - 1,068.4)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	132,402 cf	85.00'W x 215.00'L x 6.00'H Prismatic Z=2.0

Device	Routing	Invert	Outlet Devices
#1	Primary	186.00'	4.00' W x 3.00' H x 10.0' long Culvert RCP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 185.90' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean
#2	Secondary	189.00'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=114.07 cfs @ 13.69 hrs HW=191.66' TW=187.18' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 114.07 cfs @ 9.51 fps)

Secondary OutFlow Max=269.29 cfs @ 13.74 hrs HW=191.66' TW=187.18' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 269.29 cfs @ 5.07 fps)

Proposed Drainage McKownville Rt 20 Area

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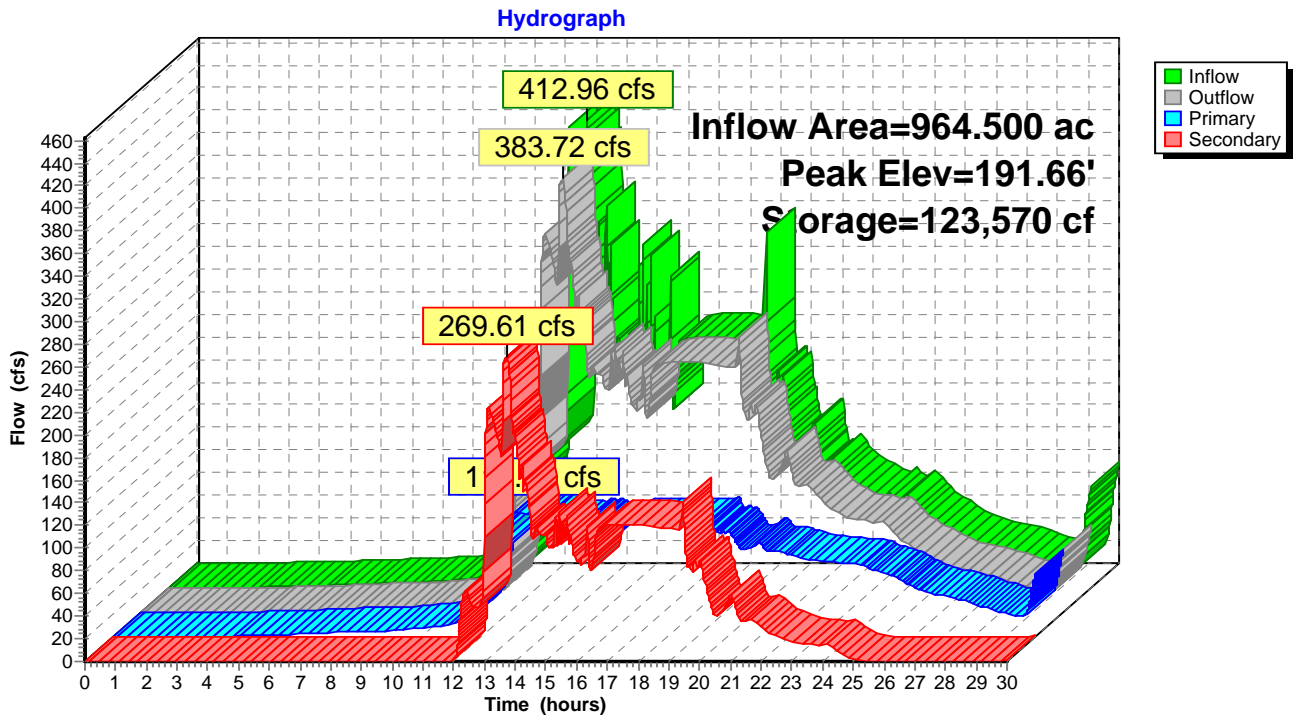
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Type II 24-hr 10-year Rainfall=4.20"

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Pond PS B: Proposed Storage B



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Pond PS C: Proposed Storage C

Inflow Area = 1,050.580 ac, 34.38% Impervious, Inflow Depth > 2.41" for 10-year event
 Inflow = 391.24 cfs @ 13.71 hrs, Volume= 211.125 af
 Outflow = 406.47 cfs @ 13.71 hrs, Volume= 210.071 af, Atten= 0%, Lag= 0.0 min
 Primary = 81.16 cfs @ 13.15 hrs, Volume= 87.890 af
 Secondary = 327.32 cfs @ 13.75 hrs, Volume= 122.181 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 191.60' @ 13.75 hrs Surf.Area= 26,596 sf Storage= 135,312 cf

Plug-Flow detention time= 12.3 min calculated for 210.001 af (99% of inflow)
 Center-of-Mass det. time= 8.7 min (1,076.3 - 1,067.5)

Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	135,312 cf	85.00'W x 220.00'L x 6.00'H Prismatic Z=2.0

Device	Routing	Invert	Outlet Devices
#1	Primary	184.00'	36.0" x 30.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 183.50' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Secondary	187.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=81.15 cfs @ 13.15 hrs HW=191.18' TW=185.46' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 81.15 cfs @ 11.48 fps)

Secondary OutFlow Max=327.09 cfs @ 13.75 hrs HW=191.60' TW=186.22' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 327.09 cfs @ 7.12 fps)

Proposed Drainage McKownville Rt 20 Area

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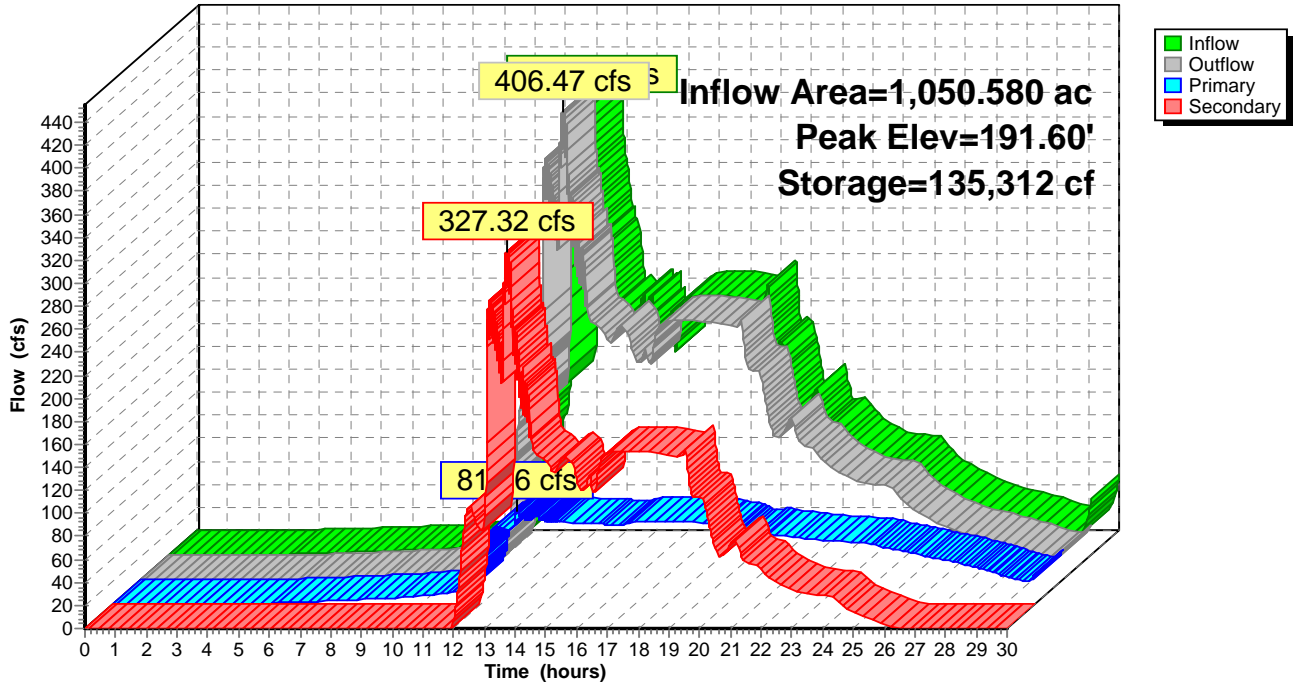
Type II 24-hr 10-year Rainfall=4.20"

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Pond PS C: Proposed Storage C

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr 10-year Rainfall=4.20"

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Summary for Pond PS D: Proposed Storage D

Inflow Area = 49.920 ac, 28.33% Impervious, Inflow Depth = 0.81" for 10-year event
 Inflow = 17.83 cfs @ 12.63 hrs, Volume= 3.366 af
 Outflow = 16.43 cfs @ 12.80 hrs, Volume= 3.363 af, Atten= 8%, Lag= 10.3 min
 Primary = 16.43 cfs @ 12.80 hrs, Volume= 3.363 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 192.18' @ 12.80 hrs Surf.Area= 0.122 ac Storage= 0.233 af

Plug-Flow detention time= 16.4 min calculated for 3.363 af (100% of inflow)
 Center-of-Mass det. time= 15.9 min (950.8 - 934.9)

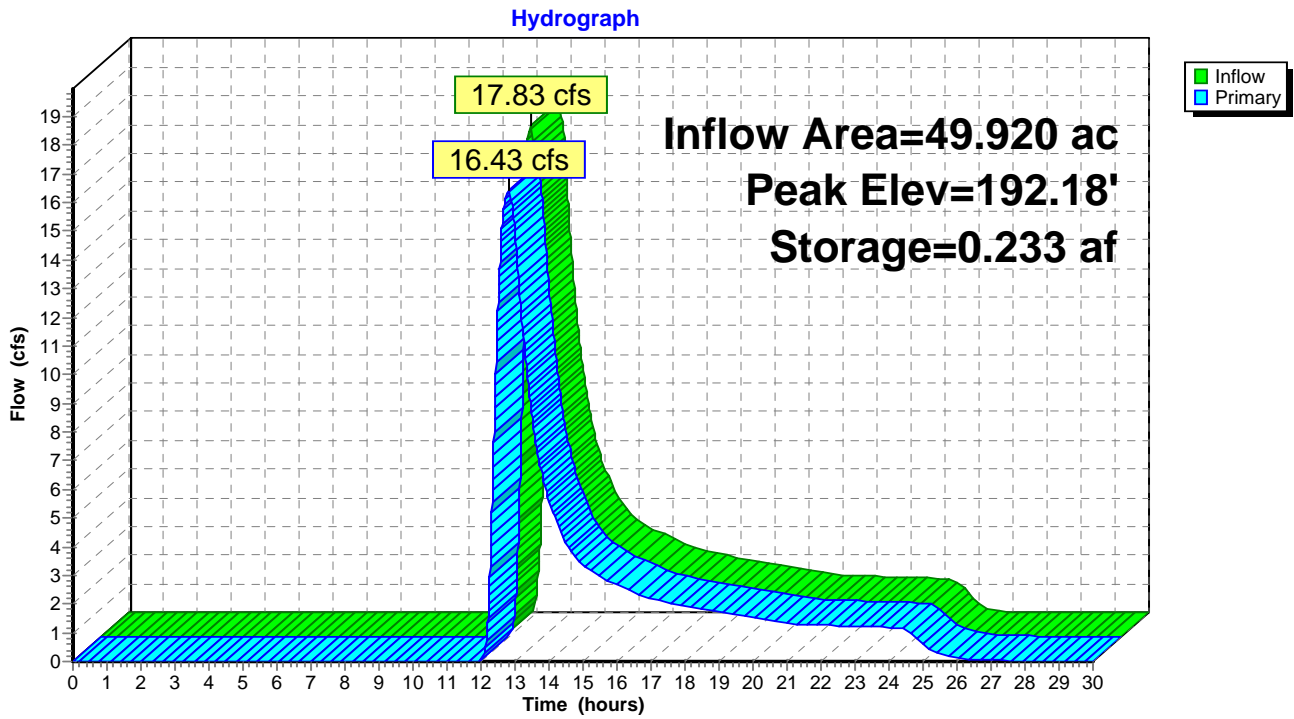
Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	0.807 af	45.00'W x 90.00'L x 6.00'H Prismatic Z=2.0

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	24.0" x 30.0' long Culvert CPP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 189.50' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	195.00'	5.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=16.43 cfs @ 12.80 hrs HW=192.18' TW=186.75' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 16.43 cfs @ 5.23 fps)
- 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond PS D: Proposed Storage D



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points x 2
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ED A: Existing DA A Runoff Area=8.170 ac 70.75% Impervious Runoff Depth=2.21"
Flow Length=1,334' Slope=0.0100 '/' Tc=28.1 min CN=90 Runoff=16.35 cfs 1.508 af

Subcatchment ED A1: Existing DA A1 Runoff Area=8.170 ac 70.75% Impervious Runoff Depth=2.21"
Flow Length=1,334' Slope=0.0100 '/' Tc=28.1 min CN=90 Runoff=16.35 cfs 1.508 af

Subcatchment ED B: Existing DA B Runoff Area=7.240 ac 100.00% Impervious Runoff Depth=3.02"
Flow Length=363' Slope=0.0275 '/' Tc=4.0 min CN=98 Runoff=35.43 cfs 1.820 af

Subcatchment ED C: Existing DA C Runoff Area=36.500 ac 25.00% Impervious Runoff Depth=0.86"
Flow Length=1,133' Slope=0.0335 '/' Tc=25.6 min CN=70 Runoff=26.63 cfs 2.608 af

Subcatchment ED D: Existing DA D Runoff Area=18.760 ac 3.20% Impervious Runoff Depth=0.39"
Flow Length=1,139' Slope=0.0237 '/' Tc=40.7 min CN=59 Runoff=2.99 cfs 0.614 af

Subcatchment ED E: Existing DA E Runoff Area=15.170 ac 30.00% Impervious Runoff Depth=0.96"
Flow Length=1,334' Slope=0.0150 '/' Tc=41.3 min CN=72 Runoff=9.16 cfs 1.215 af

Subcatchment ED F: Existing DA F Runoff Area=16.380 ac 17.27% Impervious Runoff Depth=1.37"
Flow Length=661' Slope=0.0290 '/' Tc=13.8 min CN=79 Runoff=30.18 cfs 1.876 af

Subcatchment ED G: Existing DA G Runoff Area=26.740 ac 22.93% Impervious Runoff Depth=0.24"
Flow Length=1,244' Slope=0.0160 '/' Tc=60.3 min CN=54 Runoff=1.40 cfs 0.529 af

Subcatchment PD I: PD I Runoff Area=49.920 ac 28.33% Impervious Runoff Depth=0.39"
Flow Length=1,990' Slope=0.0340 '/' Tc=53.1 min CN=59 Runoff=6.71 cfs 1.634 af

Subcatchment PD I-A: PD I-A Runoff Area=27.790 ac 38.00% Impervious Runoff Depth=0.46"
Tc=0.0 min CN=61 Runoff=24.23 cfs 1.076 af

Reach 9R: EB Krumkill Avg. Depth=0.44' Max Vel=1.34 fps Inflow=6.24 cfs 1.631 af
n=0.040 L=1,755.0' S=0.0046 '/' Capacity=293.49 cfs Outflow=5.21 cfs 1.627 af

Reach KK P: Krumkill Inflow=154.44 cfs 109.540 af
Outflow=154.44 cfs 109.540 af

Reach WB R-3: WBR3 Avg. Depth=1.84' Max Vel=5.82 fps Inflow=166.19 cfs 108.226 af
n=0.040 L=230.0' S=0.0170 '/' Capacity=1,258.70 cfs Outflow=165.90 cfs 108.177 af

Reach WBR1: WB R-1 Avg. Depth=2.13' Max Vel=4.84 fps Inflow=172.84 cfs 104.858 af
n=0.040 L=300.0' S=0.0100 '/' Capacity=966.62 cfs Outflow=168.87 cfs 104.792 af

Reach WBR2: WB R-2 Avg. Depth=1.39' Max Vel=8.30 fps Inflow=164.20 cfs 105.959 af
n=0.040 L=150.0' S=0.0467 '/' Capacity=2,088.13 cfs Outflow=164.11 cfs 105.936 af

Reach WBR4: WB R-4 Avg. Depth=2.60' Max Vel=3.60 fps Inflow=167.92 cfs 110.582 af
n=0.040 L=450.0' S=0.0044 '/' Capacity=644.41 cfs Outflow=166.56 cfs 110.427 af

Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Reach WBR5: WB R-5 Avg. Depth=2.76' Max Vel=3.02 fps Inflow=160.05 cfs 108.970 af
n=0.040 L=2,050.0' S=0.0029 1' Capacity=522.94 cfs Outflow=152.20 cfs 107.913 af

Pond 19P: 48" 85' Peak Elev=242.63' Inflow=398.21 cfs 99.669 af
48.0" x 85.0' Culvert Outflow=398.21 cfs 99.669 af

Pond ARd C: Acre Rd Culvert Peak Elev=212.35' Inflow=165.90 cfs 108.177 af
36.0" x 30.0' Culvert Outflow=165.89 cfs 108.177 af

Pond MRd C: McKown Rd Culv Peak Elev=202.99' Inflow=164.11 cfs 105.936 af
36.0" x 30.0' Culvert Outflow=164.11 cfs 105.936 af

Pond PS A: Proposed Storage A Peak Elev=195.61' Storage=118,307 cf Inflow=401.75 cfs 105.605 af
Primary=113.80 cfs 101.102 af Secondary=59.04 cfs 3.756 af Outflow=172.84 cfs 104.857 af

Pond PS B: Proposed Storage B Peak Elev=190.24' Storage=88,594 cf Inflow=170.45 cfs 106.914 af
Primary=89.61 cfs 88.313 af Secondary=74.59 cfs 17.646 af Outflow=164.20 cfs 105.959 af

Pond PS C: Proposed Storage C Peak Elev=189.19' Storage=114,112 cf Inflow=166.56 cfs 110.427 af
Primary=65.34 cfs 75.805 af Secondary=94.71 cfs 33.165 af Outflow=160.05 cfs 108.970 af

Pond PS D: Proposed Storage D Peak Elev=191.11' Storage=0.110 af Inflow=6.71 cfs 1.634 af
Outflow=6.24 cfs 1.631 af

Total Runoff Area = 214.840 ac Runoff Volume = 14.388 af Average Runoff Depth = 0.80"
68.93% Pervious = 148.099 ac 31.07% Impervious = 66.741 ac

Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED A: Existing DA A

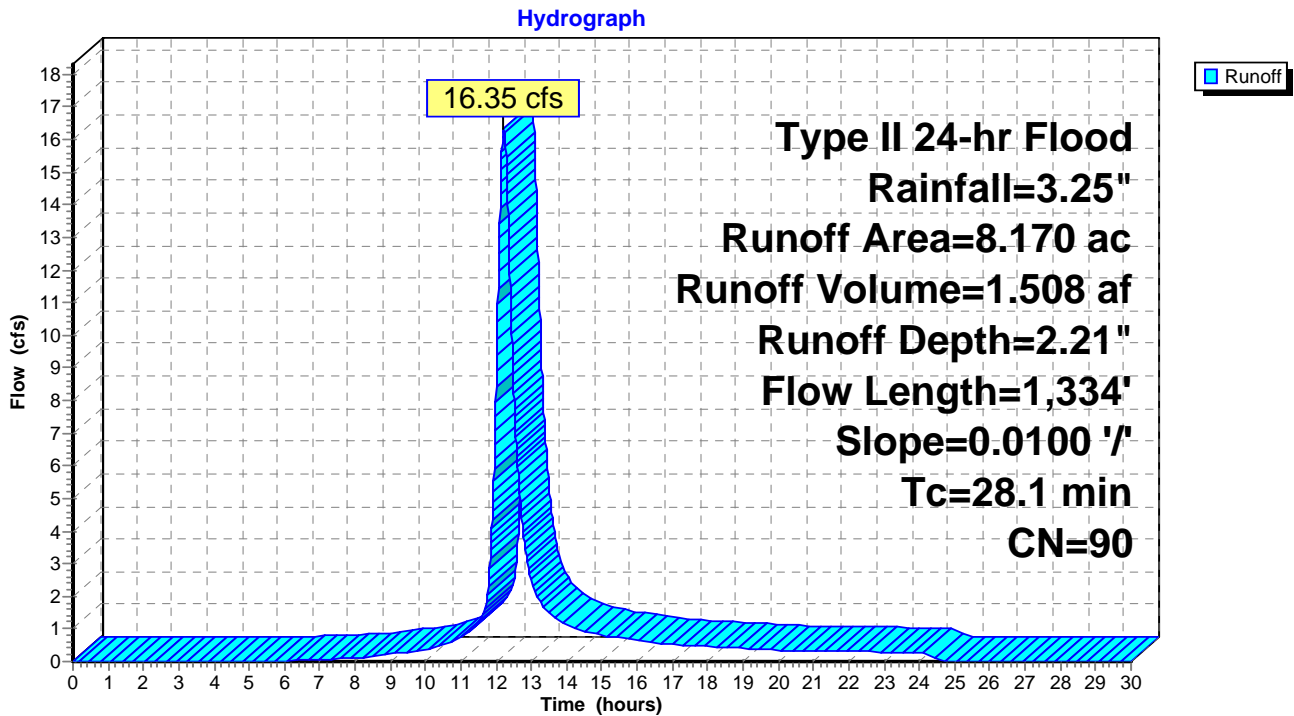
Runoff = 16.35 cfs @ 12.21 hrs, Volume= 1.508 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
5.780	98	Paved parking & roofs
2.390	69	50-75% Grass cover, Fair, HSG B
8.170	90	Weighted Average
2.390		Pervious Area
5.780		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	1,334	0.0100	0.79		Lag/CN Method,

Subcatchment ED A: Existing DA A



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED A1: Existing DA A1

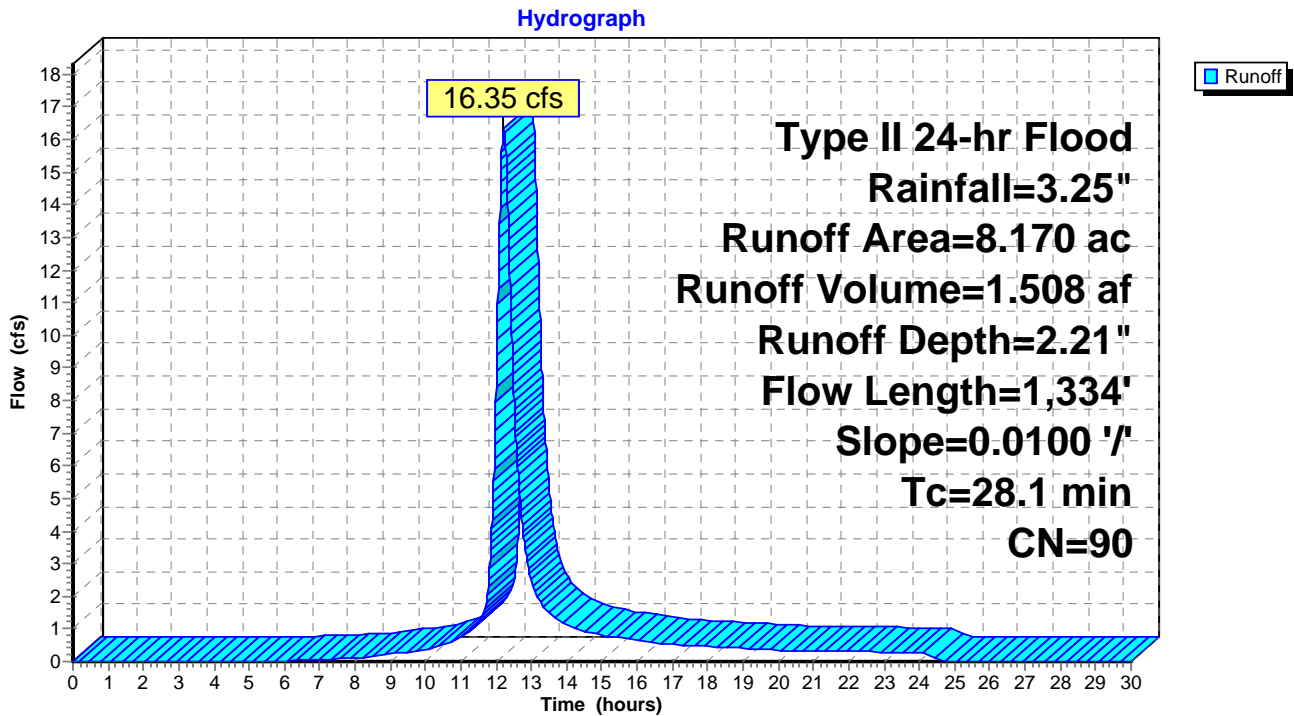
Runoff = 16.35 cfs @ 12.21 hrs, Volume= 1.508 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
5.780	98	Paved parking & roofs
2.390	69	50-75% Grass cover, Fair, HSG B
8.170	90	Weighted Average
2.390		Pervious Area
5.780		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	1,334	0.0100	0.79		Lag/CN Method,

Subcatchment ED A1: Existing DA A1



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED B: Existing DA B

Runoff = 35.43 cfs @ 11.94 hrs, Volume= 1.820 af, Depth= 3.02"

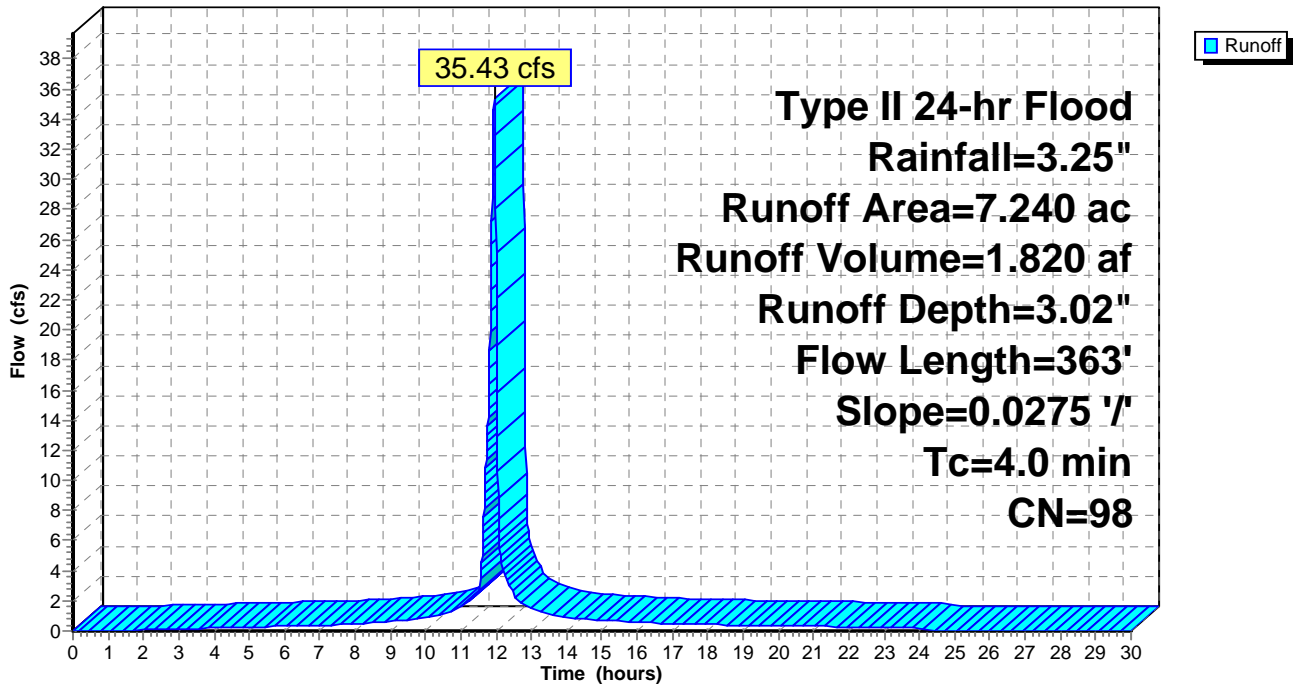
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
7.240	98	Paved parking & roofs
7.240		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	363	0.0275	1.50		Lag/CN Method,

Subcatchment ED B: Existing DA B

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED C: Existing DA C

Runoff = 26.63 cfs @ 12.21 hrs, Volume= 2.608 af, Depth= 0.86"

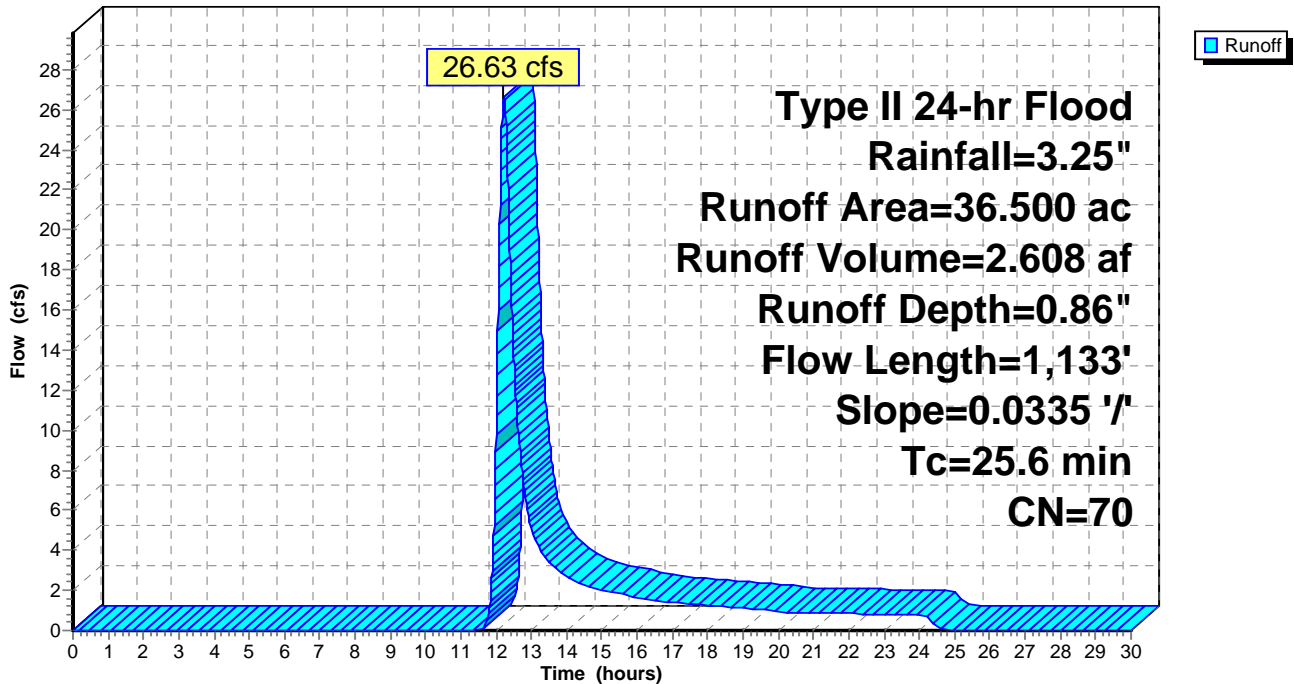
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
36.500	70	1/2 acre lots, 25% imp, HSG B
27.375		Pervious Area
9.125		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	1,133	0.0335	0.74		Lag/CN Method,

Subcatchment ED C: Existing DA C

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED D: Existing DA D

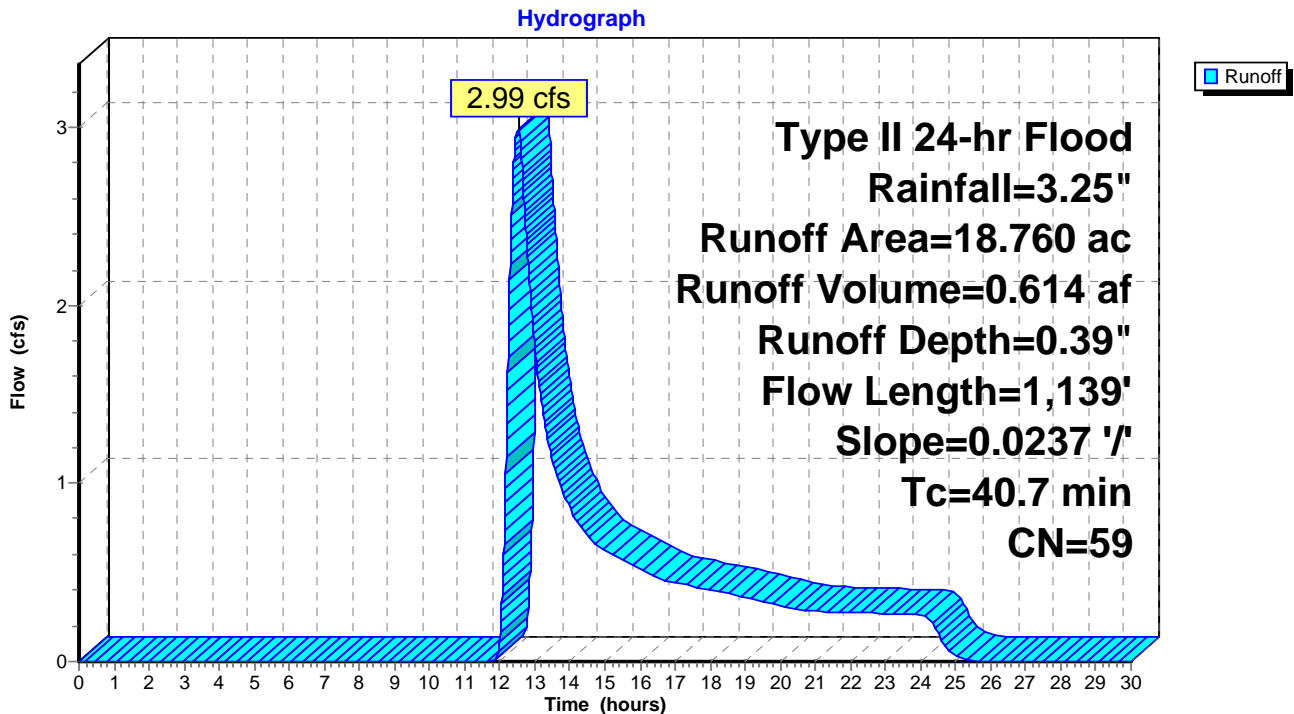
Runoff = 2.99 cfs @ 12.52 hrs, Volume= 0.614 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
18.160	58	Woods/grass comb., Good, HSG B
0.600	98	Paved parking & roofs
18.760	59	Weighted Average
18.160		Pervious Area
0.600		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.7	1,139	0.0237	0.47		Lag/CN Method,

Subcatchment ED D: Existing DA D



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED E: Existing DA E

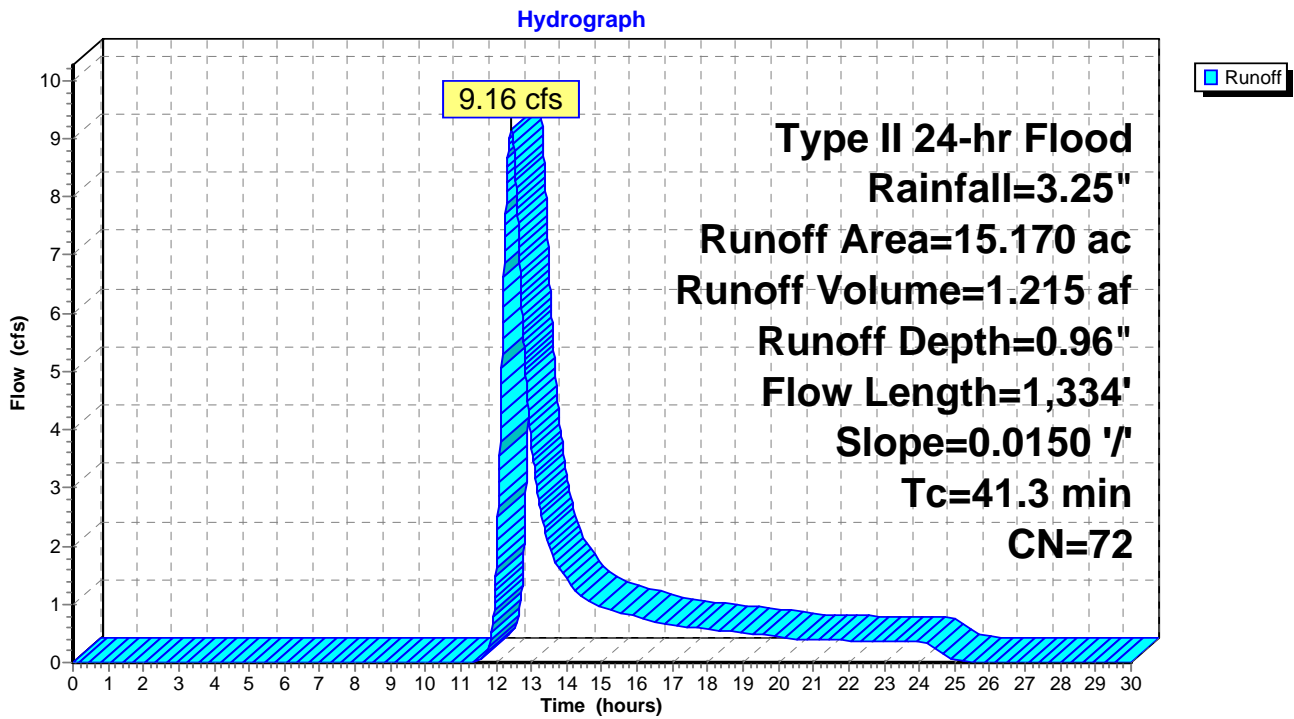
Runoff = 9.16 cfs @ 12.43 hrs, Volume= 1.215 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
15.170	72	1/3 acre lots, 30% imp, HSG B
10.619		Pervious Area
4.551		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.3	1,334	0.0150	0.54		Lag/CN Method,

Subcatchment ED E: Existing DA E



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED F: Existing DA F

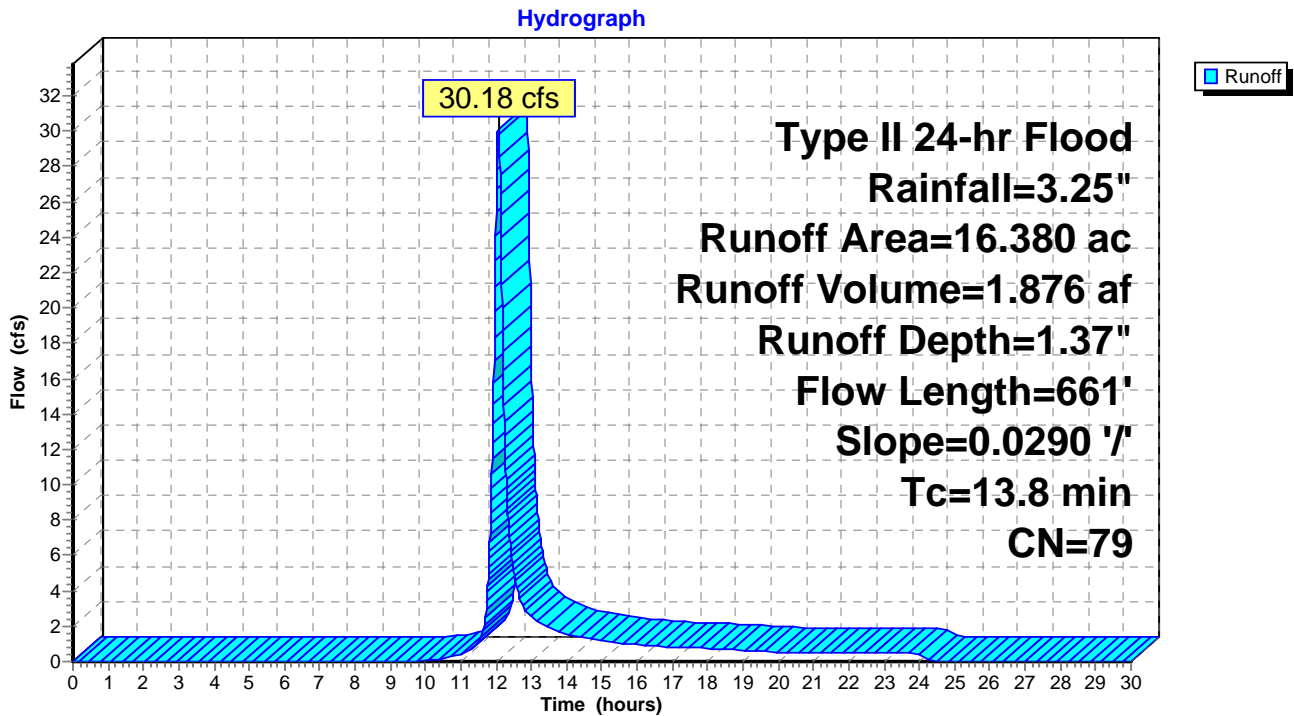
Runoff = 30.18 cfs @ 12.06 hrs, Volume= 1.876 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
9.430	81	1/3 acre lots, 30% imp, HSG C
6.950	76	Woods/grass comb., Fair, HSG C
16.380	79	Weighted Average
13.551		Pervious Area
2.829		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	661	0.0290	0.80		Lag/CN Method,

Subcatchment ED F: Existing DA F



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment ED G: Existing DA G

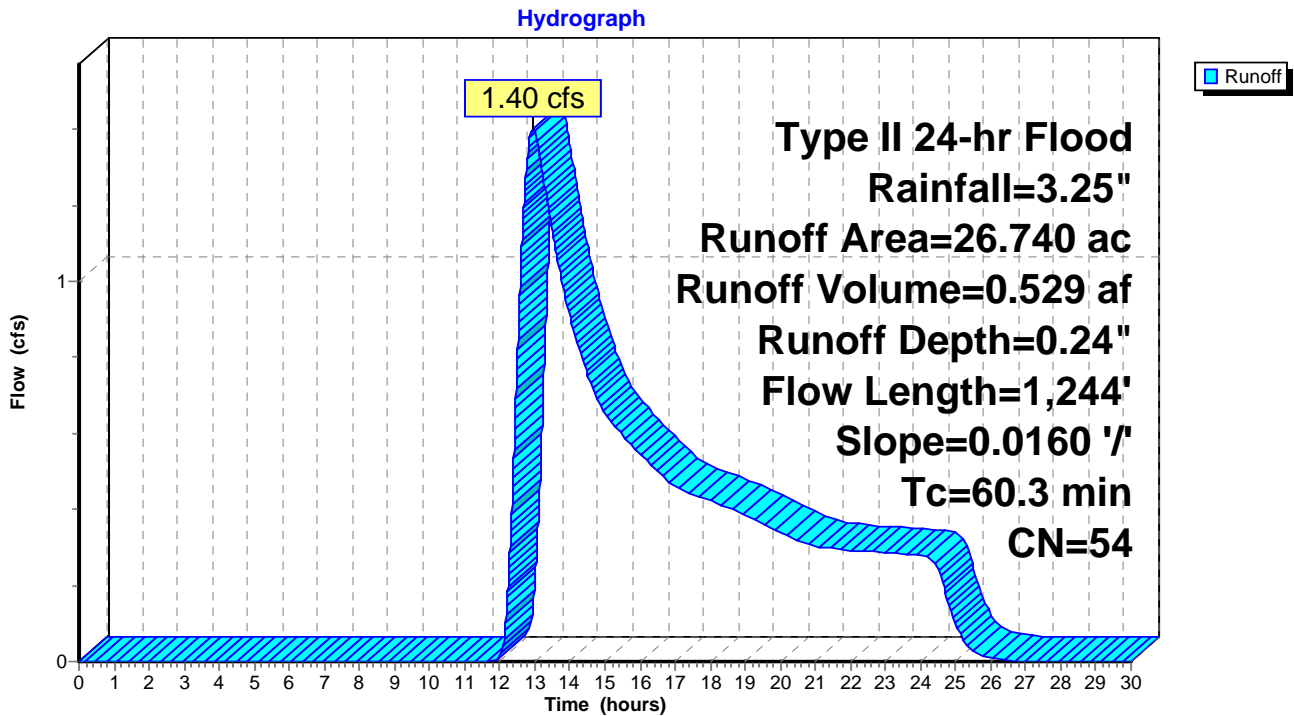
Runoff = 1.40 cfs @ 12.94 hrs, Volume= 0.529 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
20.440	57	1/3 acre lots, 30% imp, HSG A
6.300	43	Woods/grass comb., Fair, HSG A
26.740	54	Weighted Average
20.608		Pervious Area
6.132		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.3	1,244	0.0160	0.34		Lag/CN Method,

Subcatchment ED G: Existing DA G



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment PD I: PD I

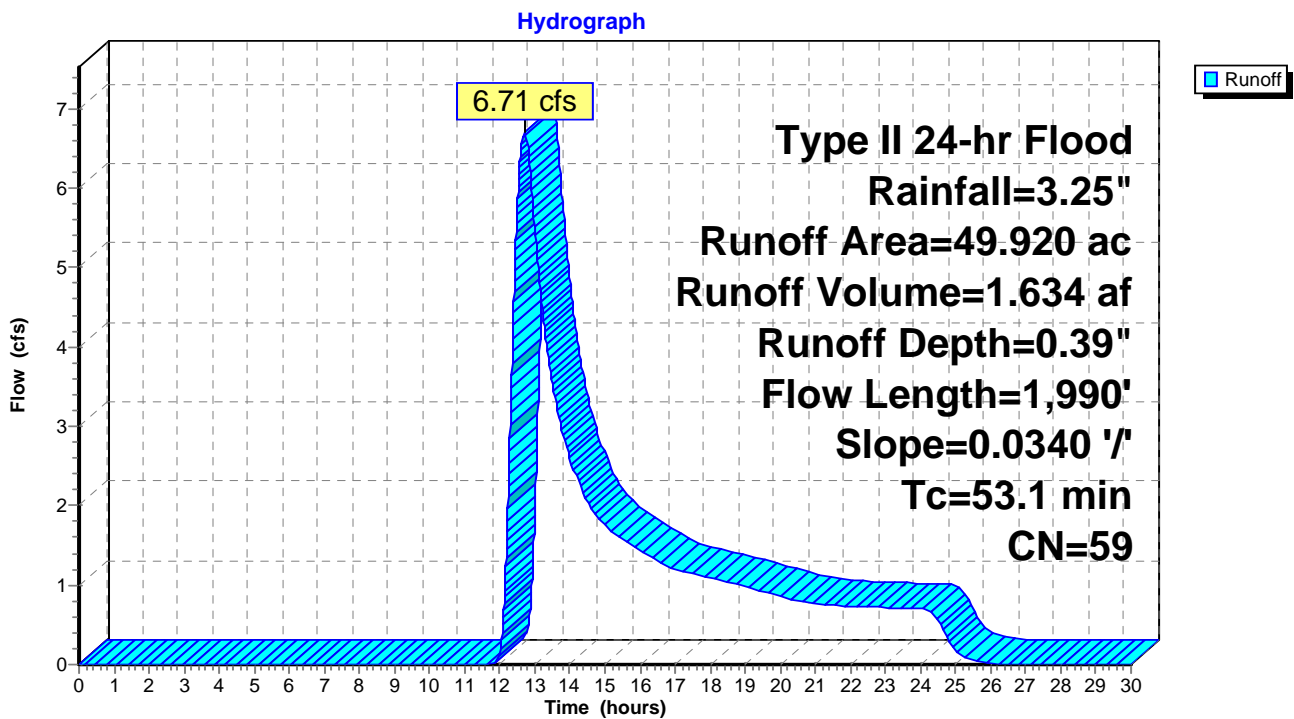
Runoff = 6.71 cfs @ 12.69 hrs, Volume= 1.634 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
37.220	61	1/4 acre lots, 38% imp, HSG A
12.700	55	Woods, Good, HSG B
49.920	59	Weighted Average
35.776		Pervious Area
14.144		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.1	1,990	0.0340	0.63		Lag/CN Method,

Subcatchment PD I: PD I



Proposed Drainage McKownville Rt 20 Area

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Type II 24-hr Flood Rainfall=3.25"

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Summary for Subcatchment PD I-A: PD I-A

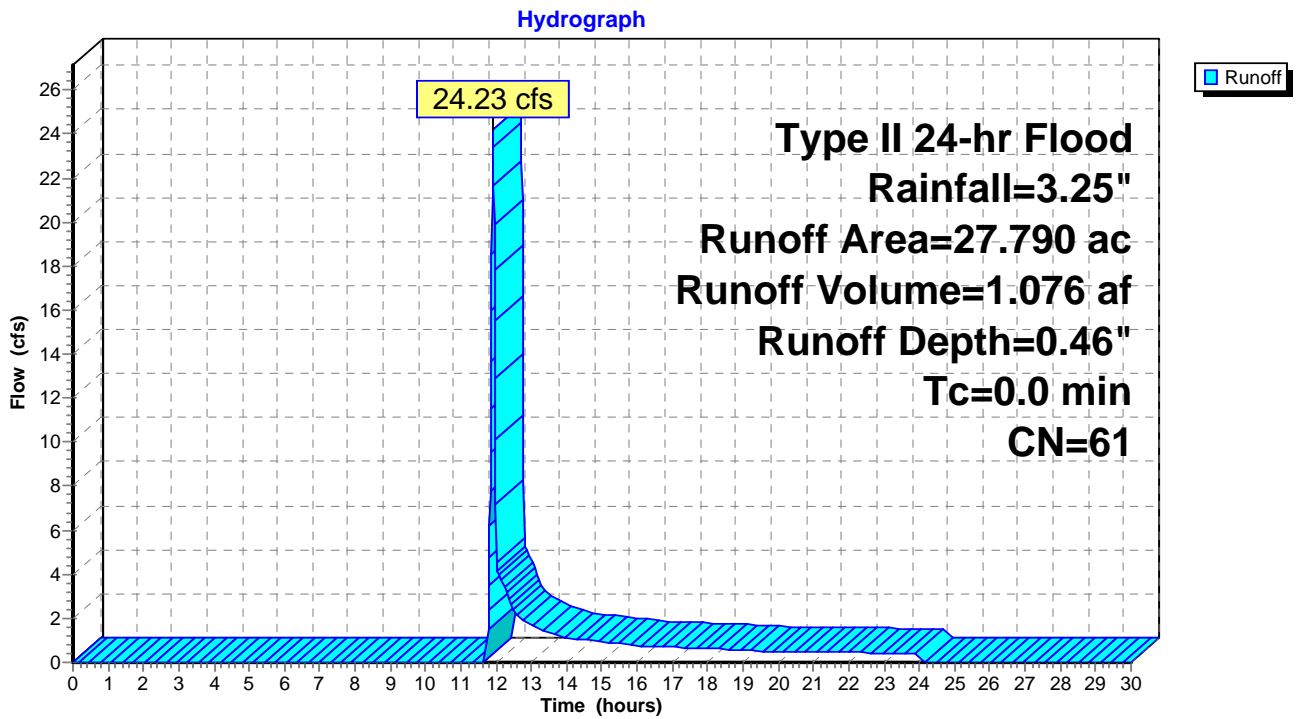
Runoff = 24.23 cfs @ 11.90 hrs, Volume= 1.076 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Type II 24-hr Flood Rainfall=3.25"

Area (ac)	CN	Description
27.790	61	1/4 acre lots, 38% imp, HSG A
17.230		Pervious Area
10.560		Impervious Area

Subcatchment PD I-A: PD I-A



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Type II 24-hr Flood Rainfall=3.25"

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Summary for Reach 9R: EB Krumkill

Inflow Area = 49.920 ac, 28.33% Impervious, Inflow Depth > 0.39" for Flood event
Inflow = 6.24 cfs @ 12.87 hrs, Volume= 1.631 af
Outflow = 5.21 cfs @ 13.19 hrs, Volume= 1.627 af, Atten= 17%, Lag= 19.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.34 fps, Min. Travel Time= 21.8 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 43.5 min

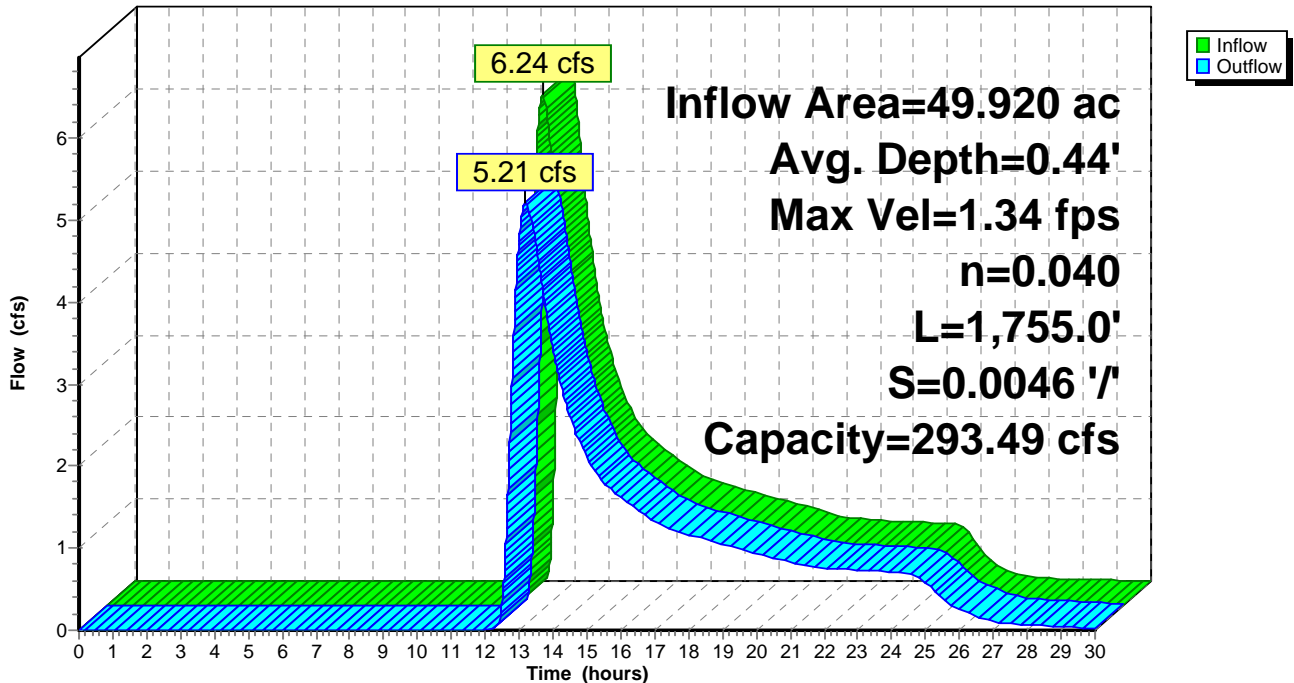
Peak Storage= 6,822 cf @ 13.19 hrs, Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 293.49 cfs

8.00' x 4.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/ Top Width= 24.00'
Length= 1,755.0' Slope= 0.0046 '/
Inlet Invert= 186.00', Outlet Invert= 178.00'



Reach 9R: EB Krumkill

Hydrograph



Proposed Drainage McKownville Rt 20 Area

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Type II 24-hr Flood Rainfall=3.25"

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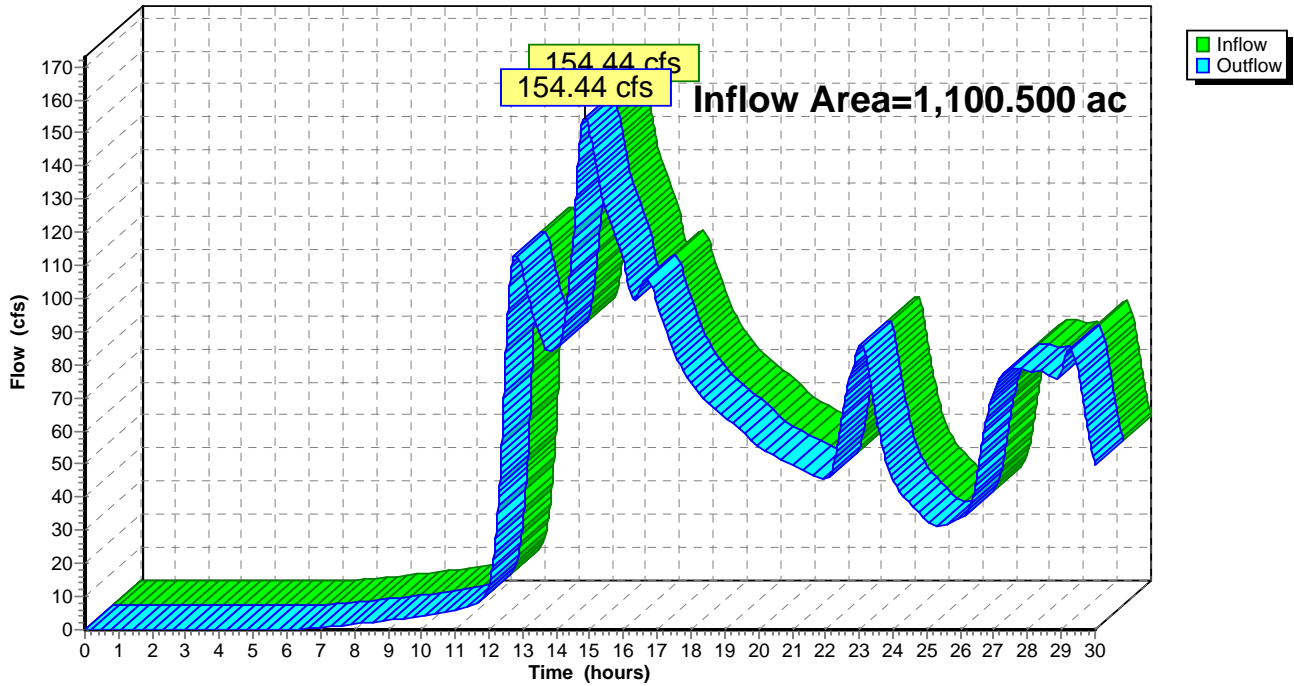
Summary for Reach KK P: Krumkill

Inflow Area = 1,100.500 ac, 34.10% Impervious, Inflow Depth > 1.19" for Flood event
Inflow = 154.44 cfs @ 14.84 hrs, Volume= 109.540 af
Outflow = 154.44 cfs @ 14.84 hrs, Volume= 109.540 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Reach KK P: Krumkill

Hydrograph



Proposed Drainage McKownville Rt 20 Area

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Type II 24-hr Flood Rainfall=3.25"

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Summary for Reach WB R-3: WBR3

Inflow Area = 1,007.460 ac, 34.96% Impervious, Inflow Depth > 1.29" for Flood event
Inflow = 166.19 cfs @ 14.56 hrs, Volume= 108.226 af
Outflow = 165.90 cfs @ 14.57 hrs, Volume= 108.177 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.82 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 3.36 fps, Avg. Travel Time= 1.1 min

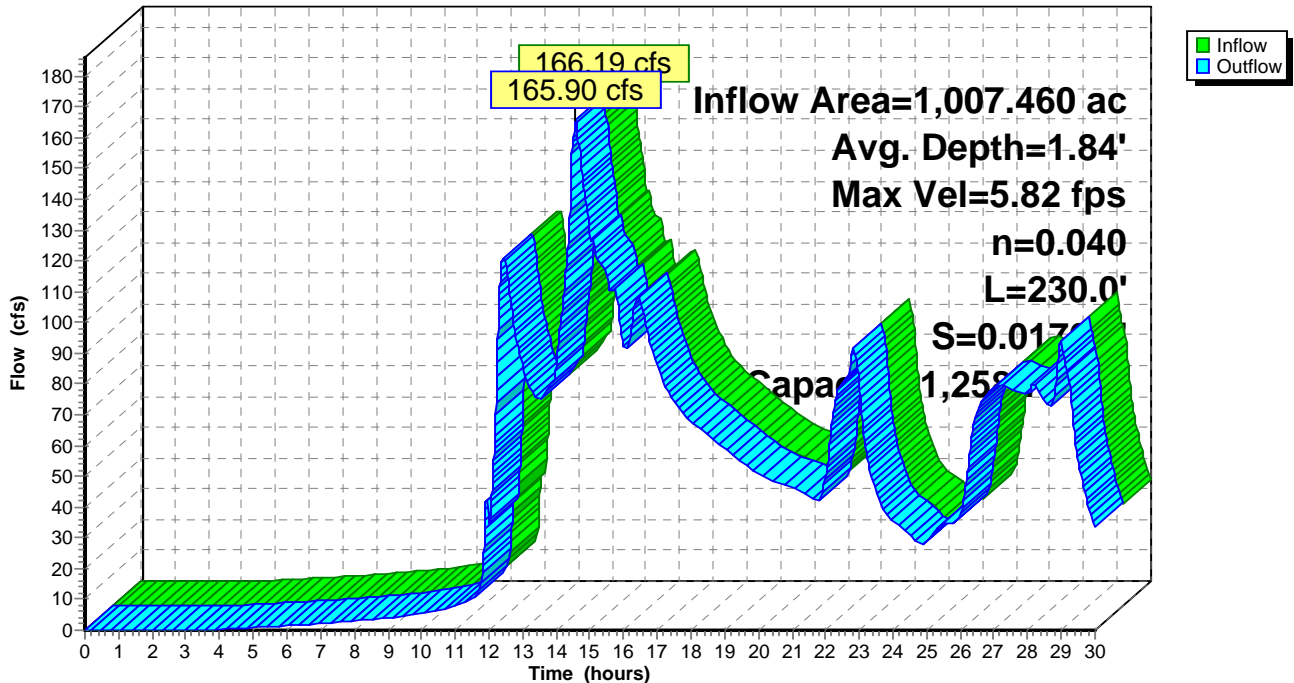
Peak Storage= 6,559 cf @ 14.57 hrs, Average Depth at Peak Storage= 1.84'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 1,258.70 cfs

10.00' x 5.00' deep channel, n= 0.040 Mountain streams
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 230.0' Slope= 0.0170 '/
Inlet Invert= 177.90', Outlet Invert= 174.00'



Reach WB R-3: WBR3

Hydrograph



Proposed Drainage McKownville Rt 20 Area

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Summary for Reach WBR1: WB R-1

Inflow Area = 937.570 ac, 35.27% Impervious, Inflow Depth > 1.34" for Flood event
Inflow = 172.84 cfs @ 14.53 hrs, Volume= 104.858 af
Outflow = 168.87 cfs @ 14.54 hrs, Volume= 104.792 af, Atten= 2%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.84 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 2.75 fps, Avg. Travel Time= 1.8 min

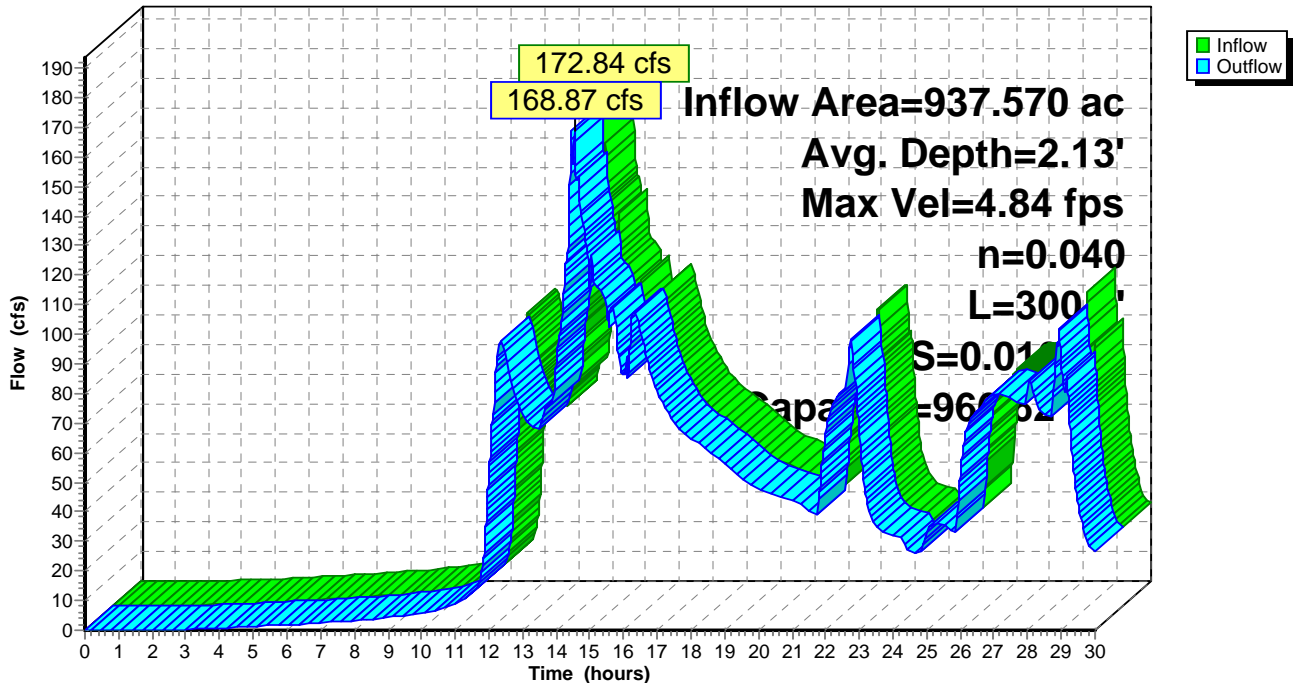
Peak Storage= 10,467 cf @ 14.54 hrs, Average Depth at Peak Storage= 2.13'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 966.62 cfs

10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 300.0' Slope= 0.0100 '/
Inlet Invert= 189.00', Outlet Invert= 186.00'



Reach WBR1: WB R-1

Hydrograph



Proposed Drainage McKownville Rt 20 Area

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Type II 24-hr Flood Rainfall=3.25"

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Summary for Reach WBR2: WB R-2

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 1.32" for Flood event
Inflow = 164.20 cfs @ 14.56 hrs, Volume= 105.959 af
Outflow = 164.11 cfs @ 14.56 hrs, Volume= 105.936 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 8.30 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 4.71 fps, Avg. Travel Time= 0.5 min

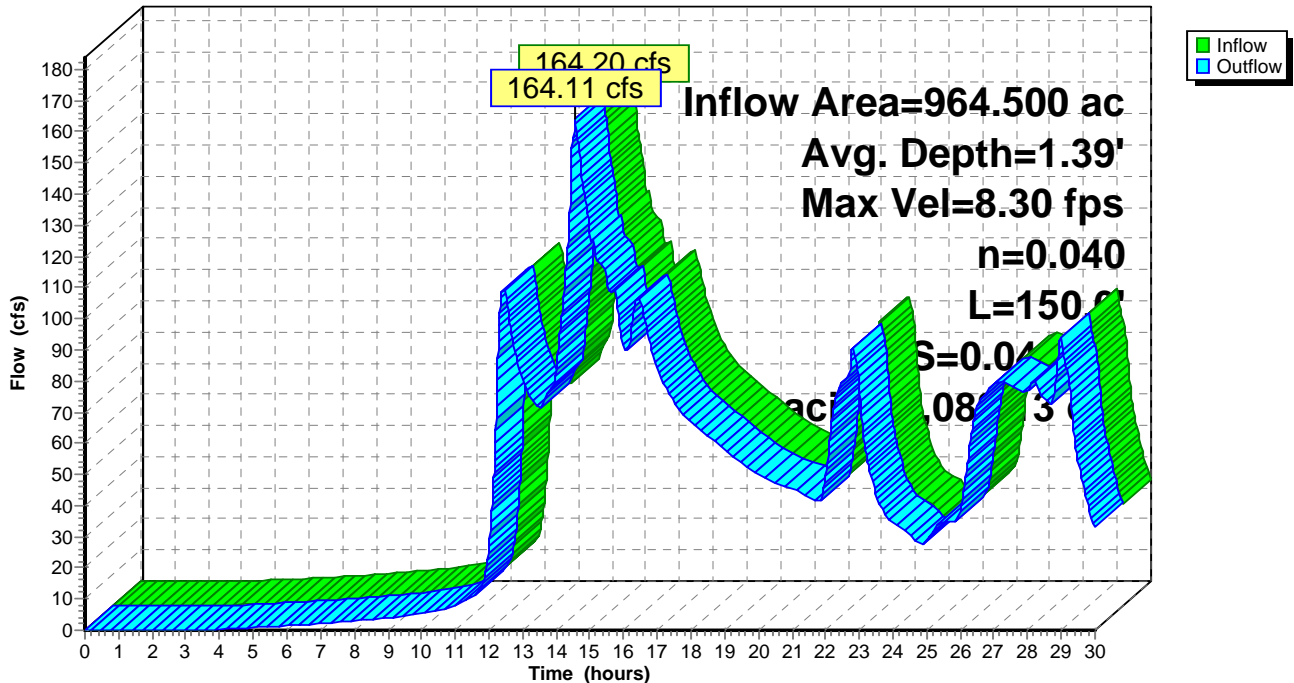
Peak Storage= 2,967 cf @ 14.56 hrs, Average Depth at Peak Storage= 1.39'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 2,088.13 cfs

10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 150.0' Slope= 0.0467 '/
Inlet Invert= 185.00', Outlet Invert= 178.00'



Reach WBR2: WB R-2

Hydrograph



Proposed Drainage McKownville Rt 20 Area

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Summary for Reach WBR4: WB R-4

Inflow Area = 1,050.580 ac, 34.38% Impervious, Inflow Depth > 1.26" for Flood event
Inflow = 167.92 cfs @ 14.57 hrs, Volume= 110.582 af
Outflow = 166.56 cfs @ 14.59 hrs, Volume= 110.427 af, Atten= 1%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.60 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 2.12 fps, Avg. Travel Time= 3.5 min

Peak Storage= 20,835 cf @ 14.59 hrs, Average Depth at Peak Storage= 2.60'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 644.41 cfs

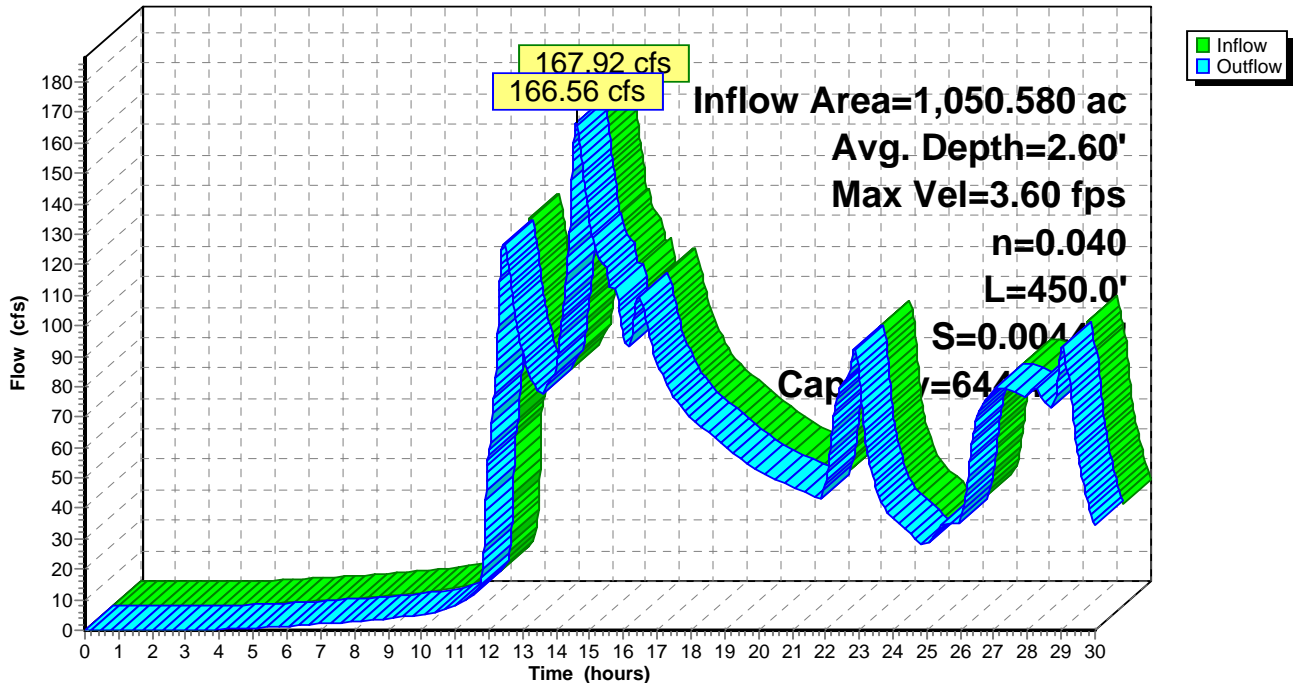
10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 450.0' Slope= 0.0044 '/
Inlet Invert= 186.00', Outlet Invert= 184.00'



‡

Reach WBR4: WB R-4

Hydrograph



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Summary for Reach WBR5: WB R-5

Inflow Area = 1,050.580 ac, 34.38% Impervious, Inflow Depth > 1.24" for Flood event
Inflow = 160.05 cfs @ 14.70 hrs, Volume= 108.970 af
Outflow = 152.20 cfs @ 14.84 hrs, Volume= 107.913 af, Atten= 5%, Lag= 8.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.02 fps, Min. Travel Time= 11.3 min
Avg. Velocity = 1.86 fps, Avg. Travel Time= 18.4 min

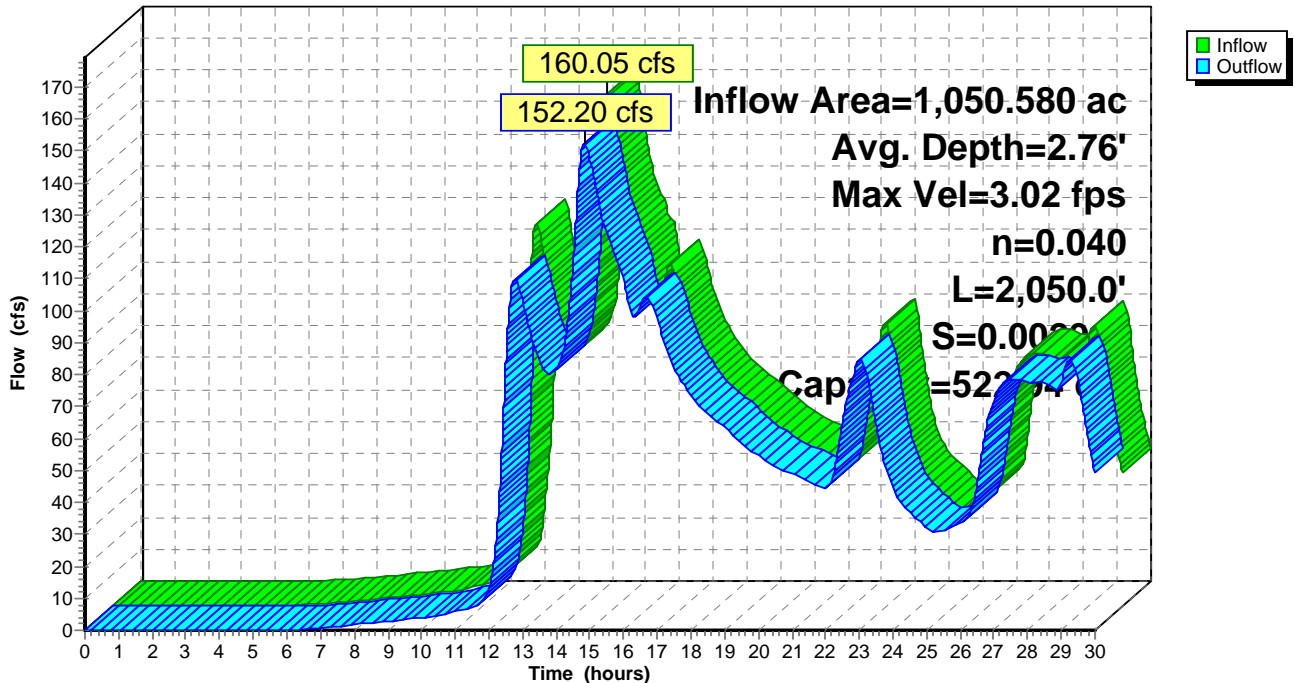
Peak Storage= 103,461 cf @ 14.84 hrs, Average Depth at Peak Storage= 2.76'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 522.94 cfs

10.00' x 5.00' deep channel, n= 0.040 Mountain streams
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 2,050.0' Slope= 0.0029 '/
Inlet Invert= 182.00', Outlet Invert= 176.00'



Reach WBR5: WB R-5

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Pond 19P: 48" 85'

Inflow Area = 885.660 ac, 34.84% Impervious, Inflow Depth > 1.35" for Flood event
Inflow = 398.21 cfs @ 15.00 hrs, Volume= 99.669 af
Outflow = 398.21 cfs @ 15.00 hrs, Volume= 99.669 af, Atten= 0%, Lag= 0.0 min
Primary = 398.21 cfs @ 15.00 hrs, Volume= 99.669 af

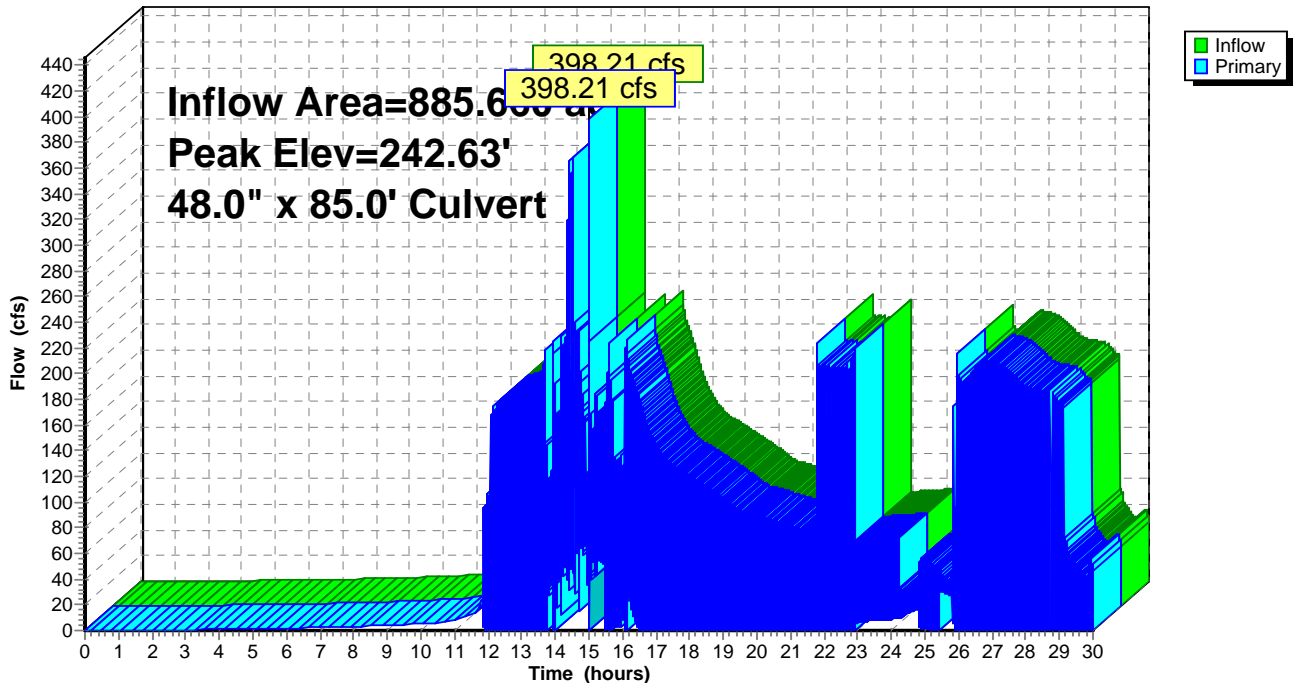
Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 242.63' @ 15.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	194.00'	48.0" x 85.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 193.00' S= 0.0118 '/' Cc= 0.900 n= 0.025 Corrugated metal

Primary OutFlow Max=361.58 cfs @ 15.00 hrs HW=236.28' TW=194.79' (Dynamic Tailwater)
↑=Culvert (Barrel Controls 361.58 cfs @ 28.77 fps)

Pond 19P: 48" 85'

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Pond ARd C: Acre Rd Culvert

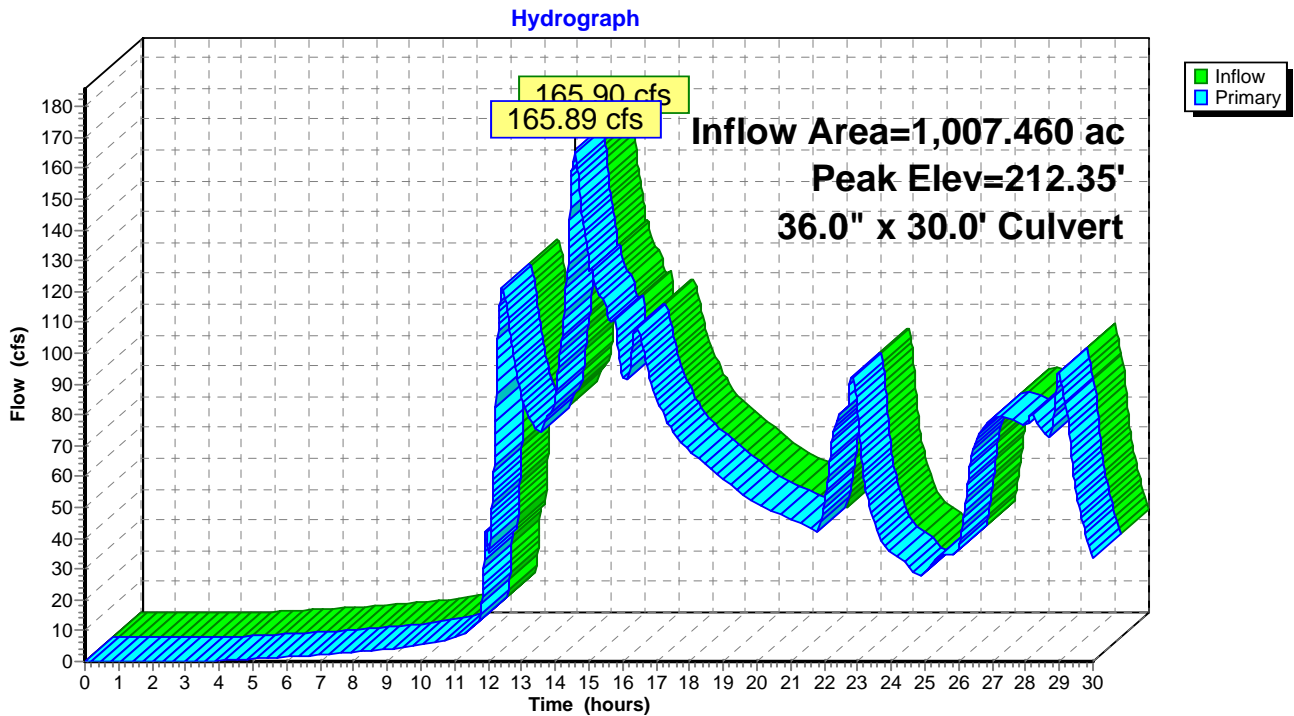
Inflow Area = 1,007.460 ac, 34.96% Impervious, Inflow Depth > 1.29" for Flood event
 Inflow = 165.90 cfs @ 14.57 hrs, Volume= 108.177 af
 Outflow = 165.89 cfs @ 14.57 hrs, Volume= 108.177 af, Atten= 0%, Lag= 0.0 min
 Primary = 165.89 cfs @ 14.57 hrs, Volume= 108.177 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 212.35' @ 14.57 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	174.00'	36.0" x 30.0' long Culvert CPP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 173.90' S= 0.0033 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=165.84 cfs @ 14.57 hrs HW=212.34' TW=188.59' (Dynamic Tailwater)
 ←**1=Culvert** (Inlet Controls 165.84 cfs @ 23.46 fps)

Pond ARd C: Acre Rd Culvert



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Pond MRd C: McKown Rd Culv

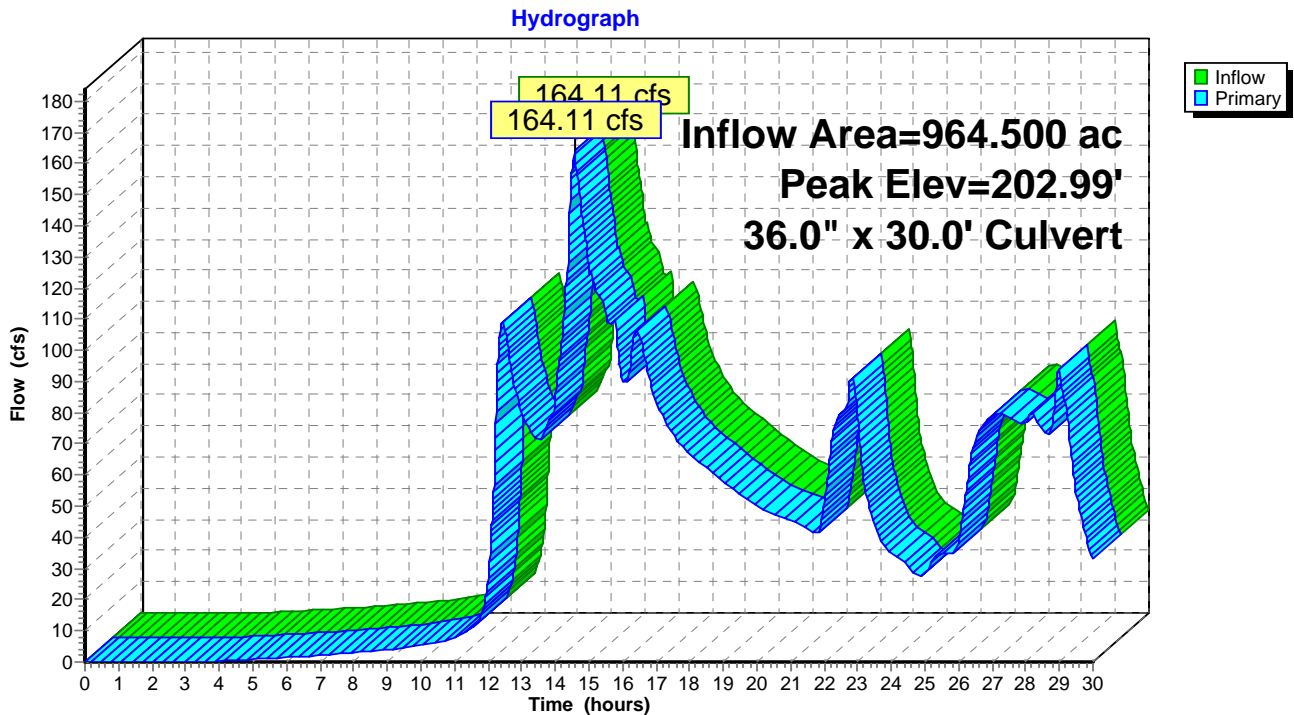
Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 1.32" for Flood event
 Inflow = 164.11 cfs @ 14.56 hrs, Volume= 105.936 af
 Outflow = 164.11 cfs @ 14.56 hrs, Volume= 105.936 af, Atten= 0%, Lag= 0.0 min
 Primary = 164.11 cfs @ 14.56 hrs, Volume= 105.936 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 202.99' @ 14.56 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	36.0" x 30.0' long Culvert RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 177.00' S= 0.0333 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=163.98 cfs @ 14.56 hrs HW=202.95' TW=179.74' (Dynamic Tailwater)
 ←**1=Culvert** (Inlet Controls 163.98 cfs @ 23.20 fps)

Pond MRd C: McKown Rd Culv



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Pond PS A: Proposed Storage A

Inflow Area = 937.570 ac, 35.27% Impervious, Inflow Depth > 1.35" for Flood event
 Inflow = 401.75 cfs @ 15.00 hrs, Volume= 105.605 af
 Outflow = 172.84 cfs @ 14.53 hrs, Volume= 104.857 af, Atten= 57%, Lag= 0.0 min
 Primary = 113.80 cfs @ 14.53 hrs, Volume= 101.102 af
 Secondary = 59.04 cfs @ 14.53 hrs, Volume= 3.756 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 195.61' @ 14.53 hrs Surf.Area= 26,557 sf Storage= 118,307 cf

Plug-Flow detention time= 16.3 min calculated for 104.857 af (99% of inflow)
 Center-of-Mass det. time= 11.9 min (1,180.7 - 1,168.8)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	128,832 cf	80.00'W x 200.00'L x 6.00'H Prismatic Z=3.0

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	4.00' W x 3.00' H x 10.0' long Culvert RCP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 189.90' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean
#2	Secondary	194.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=113.64 cfs @ 14.53 hrs HW=195.60' TW=191.11' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 113.64 cfs @ 9.47 fps)

Secondary OutFlow Max=58.40 cfs @ 14.53 hrs HW=195.60' TW=191.11' (Dynamic Tailwater)
 ↑**2=Broad-Crested Rectangular Weir** (Weir Controls 58.40 cfs @ 3.65 fps)

Proposed Drainage McKownville Rt 20 Area

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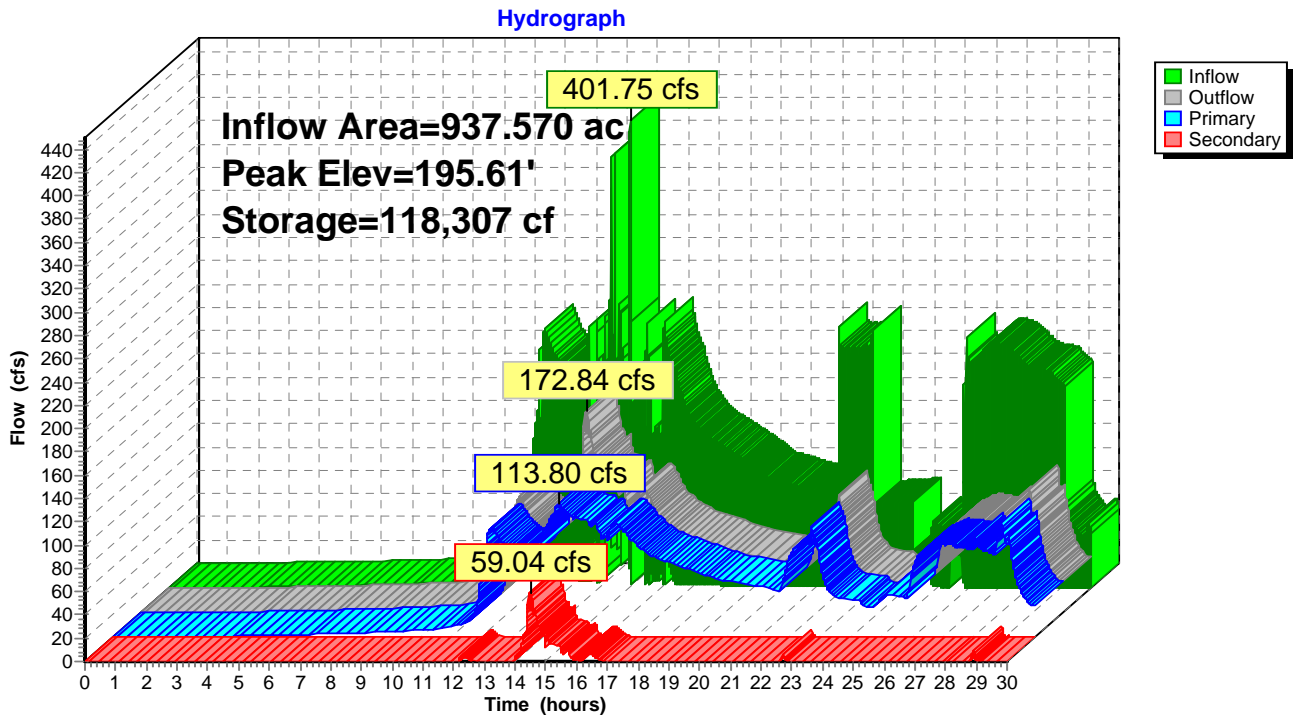
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Pond PS A: Proposed Storage A



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Pond PS B: Proposed Storage B

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 1.33" for Flood event
 Inflow = 170.45 cfs @ 14.54 hrs, Volume= 106.914 af
 Outflow = 164.20 cfs @ 14.56 hrs, Volume= 105.959 af, Atten= 4%, Lag= 1.1 min
 Primary = 89.61 cfs @ 14.56 hrs, Volume= 88.313 af
 Secondary = 74.59 cfs @ 14.56 hrs, Volume= 17.646 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 190.24' @ 14.56 hrs Surf.Area= 23,646 sf Storage= 88,594 cf

Plug-Flow detention time= 15.6 min calculated for 105.959 af (99% of inflow)
 Center-of-Mass det. time= 10.0 min (1,185.4 - 1,175.3)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	132,402 cf	85.00'W x 215.00'L x 6.00'H Prismatic Z=2.0

Device	Routing	Invert	Outlet Devices
#1	Primary	186.00'	4.00' W x 3.00' H x 10.0' long Culvert RCP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 185.90' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean
#2	Secondary	189.00'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=89.60 cfs @ 14.56 hrs HW=190.24' TW=186.39' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 89.60 cfs @ 7.47 fps)

Secondary OutFlow Max=74.58 cfs @ 14.56 hrs HW=190.24' TW=186.39' (Dynamic Tailwater)
 ↑**2=Broad-Crested Rectangular Weir** (Weir Controls 74.58 cfs @ 3.02 fps)

Proposed Drainage McKownville Rt 20 Area

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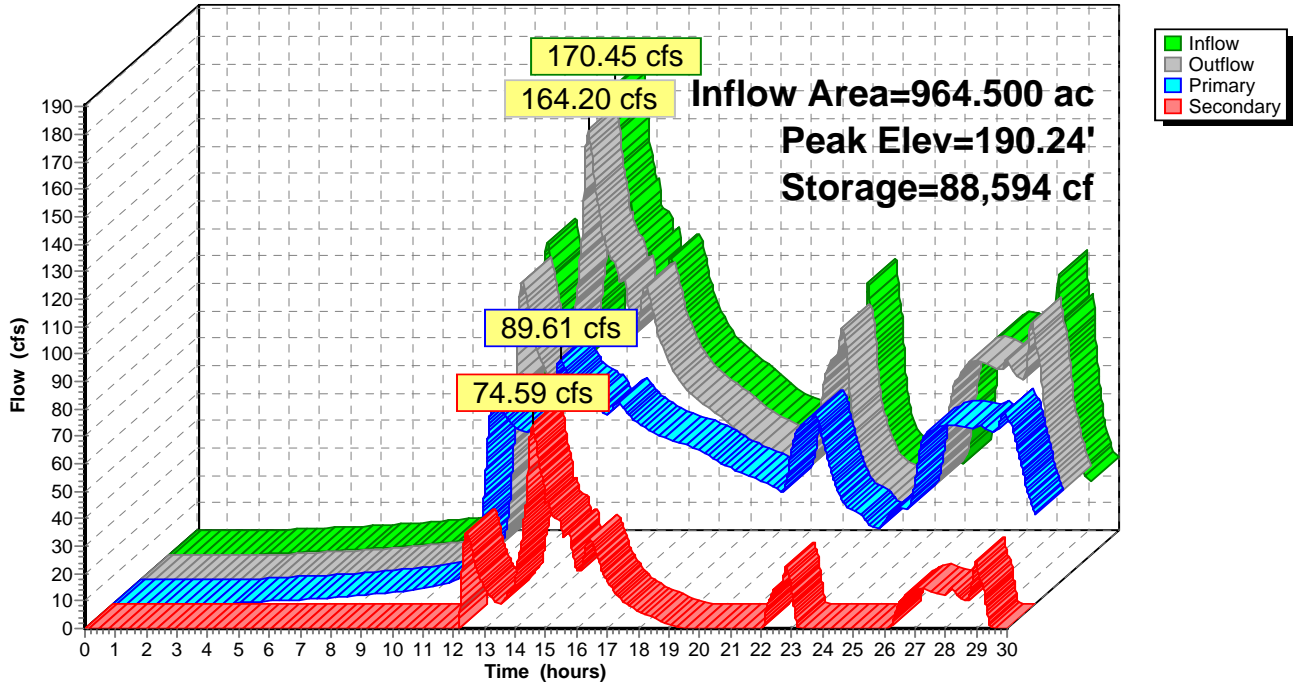
Type II 24-hr Flood Rainfall=3.25"

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Pond PS B: Proposed Storage B

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Pond PS C: Proposed Storage C

Inflow Area = 1,050.580 ac, 34.38% Impervious, Inflow Depth > 1.26" for Flood event
 Inflow = 166.56 cfs @ 14.59 hrs, Volume= 110.427 af
 Outflow = 160.05 cfs @ 14.70 hrs, Volume= 108.970 af, Atten= 4%, Lag= 6.3 min
 Primary = 65.34 cfs @ 14.70 hrs, Volume= 75.805 af
 Secondary = 94.71 cfs @ 14.70 hrs, Volume= 33.165 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 189.19' @ 14.70 hrs Surf.Area= 25,456 sf Storage= 114,112 cf

Plug-Flow detention time= 18.8 min calculated for 108.970 af (99% of inflow)
 Center-of-Mass det. time= 10.7 min (1,186.3 - 1,175.6)

Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	135,312 cf	85.00'W x 220.00'L x 6.00'H Prismatic Z=2.0

Device	Routing	Invert	Outlet Devices
#1	Primary	184.00'	36.0" x 30.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 183.50' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Secondary	187.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=65.34 cfs @ 14.70 hrs HW=189.19' TW=184.69' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 65.34 cfs @ 9.24 fps)

Secondary OutFlow Max=94.70 cfs @ 14.70 hrs HW=189.19' TW=184.69' (Dynamic Tailwater)
 ↑**2=Broad-Crested Rectangular Weir** (Weir Controls 94.70 cfs @ 4.33 fps)

Proposed Drainage McKownville Rt 20 Area

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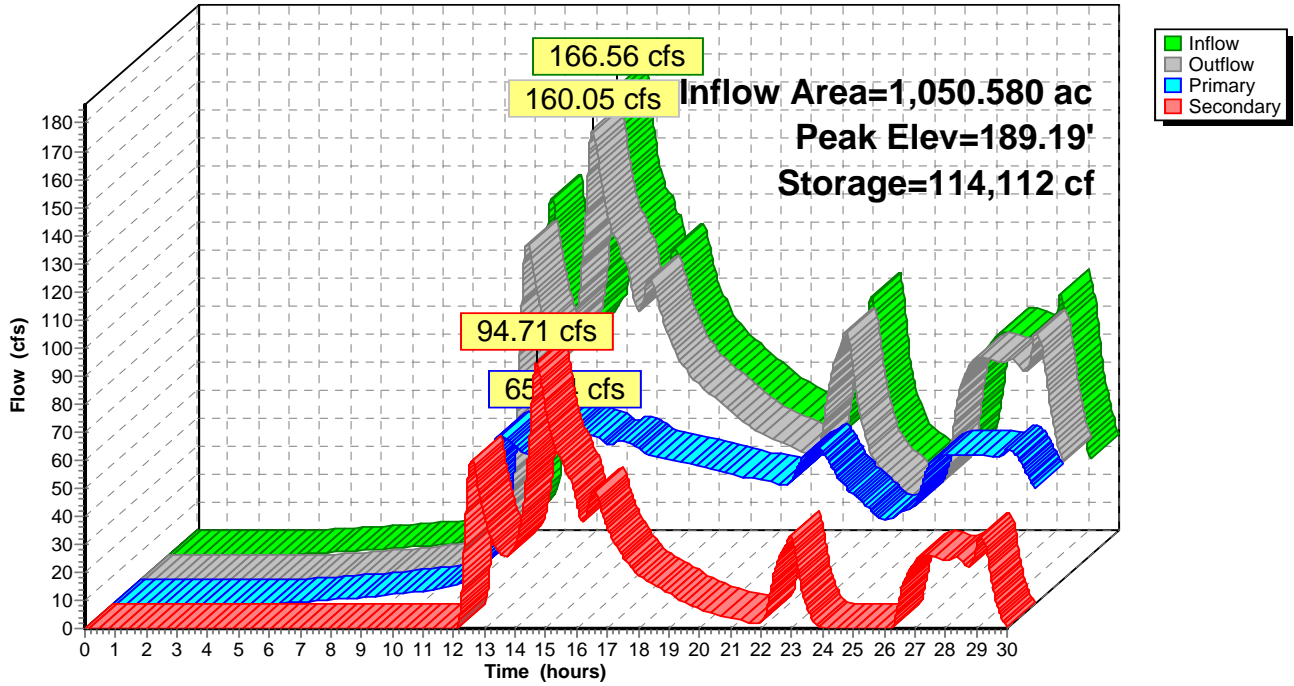
Type II 24-hr Flood Rainfall=3.25"

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Pond PS C: Proposed Storage C

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood Rainfall=3.25"

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Summary for Pond PS D: Proposed Storage D

Inflow Area = 49.920 ac, 28.33% Impervious, Inflow Depth = 0.39" for Flood event
 Inflow = 6.71 cfs @ 12.69 hrs, Volume= 1.634 af
 Outflow = 6.24 cfs @ 12.87 hrs, Volume= 1.631 af, Atten= 7%, Lag= 10.5 min
 Primary = 6.24 cfs @ 12.87 hrs, Volume= 1.631 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 191.11' @ 12.87 hrs Surf.Area= 0.107 ac Storage= 0.110 af

Plug-Flow detention time= 22.6 min calculated for 1.630 af (100% of inflow)
 Center-of-Mass det. time= 21.7 min (988.5 - 966.9)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	0.807 af	45.00'W x 90.00'L x 6.00'H Prismatic Z=2.0

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	24.0" x 30.0' long Culvert CPP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 189.50' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	195.00'	5.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=6.24 cfs @ 12.87 hrs HW=191.11' TW=186.37' (Dynamic Tailwater)

- 1=Culvert (Barrel Controls 6.24 cfs @ 5.07 fps)
- 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Proposed Drainage McKownville Rt 20 Area

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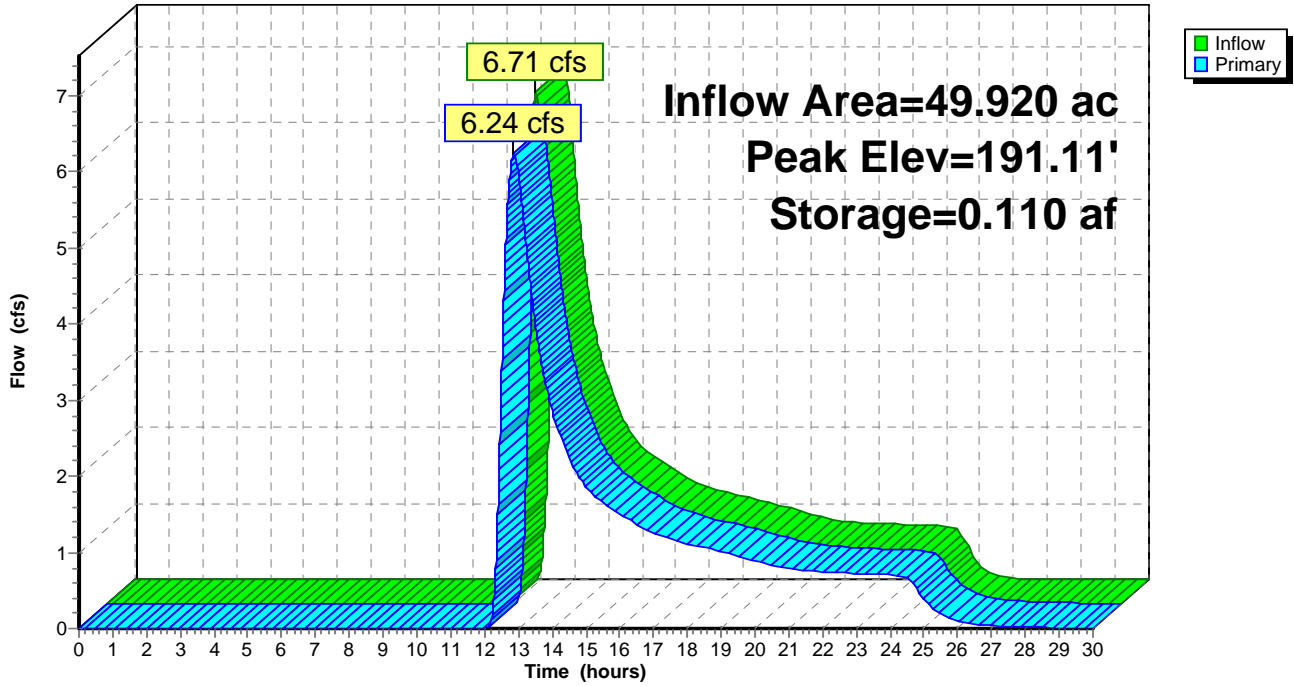
Type II 24-hr Flood Rainfall=3.25"

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Pond PS D: Proposed Storage D

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points x 2
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ED A: Existing DA A Runoff Area=8.170 ac 70.75% Impervious Runoff Depth=2.55"
Flow Length=1,334' Slope=0.0100 '/' Tc=28.1 min CN=90 Runoff=18.76 cfs 1.737 af

Subcatchment ED A1: Existing DA A1 Runoff Area=8.170 ac 70.75% Impervious Runoff Depth=2.55"
Flow Length=1,334' Slope=0.0100 '/' Tc=28.1 min CN=90 Runoff=18.76 cfs 1.737 af

Subcatchment ED B: Existing DA B Runoff Area=7.240 ac 100.00% Impervious Runoff Depth=3.38"
Flow Length=363' Slope=0.0275 '/' Tc=4.0 min CN=98 Runoff=39.44 cfs 2.037 af

Subcatchment ED C: Existing DA C Runoff Area=36.500 ac 25.00% Impervious Runoff Depth=1.08"
Flow Length=1,133' Slope=0.0335 '/' Tc=25.6 min CN=70 Runoff=34.69 cfs 3.275 af

Subcatchment ED D: Existing DA D Runoff Area=18.760 ac 3.20% Impervious Runoff Depth=0.54"
Flow Length=1,139' Slope=0.0237 '/' Tc=40.7 min CN=59 Runoff=4.69 cfs 0.840 af

Subcatchment ED E: Existing DA E Runoff Area=15.170 ac 30.00% Impervious Runoff Depth=1.19"
Flow Length=1,334' Slope=0.0150 '/' Tc=41.3 min CN=72 Runoff=11.71 cfs 1.509 af

Subcatchment ED F: Existing DA F Runoff Area=16.380 ac 17.27% Impervious Runoff Depth=1.65"
Flow Length=661' Slope=0.0290 '/' Tc=13.8 min CN=79 Runoff=36.42 cfs 2.255 af

Subcatchment ED G: Existing DA G Runoff Area=26.740 ac 22.93% Impervious Runoff Depth=0.35"
Flow Length=1,244' Slope=0.0160 '/' Tc=60.3 min CN=54 Runoff=2.53 cfs 0.777 af

Subcatchment PD I: PD I Runoff Area=49.920 ac 28.33% Impervious Runoff Depth=0.54"
Flow Length=1,990' Slope=0.0340 '/' Tc=53.1 min CN=59 Runoff=10.41 cfs 2.236 af

Subcatchment PD I-A: PD I-A Runoff Area=27.790 ac 38.00% Impervious Runoff Depth=0.62"
Tc=0.0 min CN=61 Runoff=34.86 cfs 1.443 af

Reach 9R: EB Krumkill Avg. Depth=0.58' Max Vel=1.58 fps Inflow=9.75 cfs 2.233 af
n=0.040 L=1,755.0' S=0.0046 '/' Capacity=293.49 cfs Outflow=8.40 cfs 2.229 af

Reach KK P: Krumkill Inflow=217.91 cfs 125.470 af
Outflow=217.91 cfs 125.470 af

Reach WB R-3: WBR3 Avg. Depth=2.20' Max Vel=6.42 fps Inflow=236.62 cfs 124.419 af
n=0.040 L=230.0' S=0.0170 '/' Capacity=1,258.70 cfs Outflow=234.89 cfs 124.316 af

Reach WBR1: WB R-1 Avg. Depth=2.79' Max Vel=5.59 fps Inflow=391.00 cfs 120.819 af
n=0.040 L=300.0' S=0.0100 '/' Capacity=966.62 cfs Outflow=286.99 cfs 120.654 af

Reach WBR2: WB R-2 Avg. Depth=1.69' Max Vel=9.20 fps Inflow=234.02 cfs 121.516 af
n=0.040 L=150.0' S=0.0467 '/' Capacity=2,088.13 cfs Outflow=233.56 cfs 121.468 af

Reach WBR4: WB R-4 Avg. Depth=3.06' Max Vel=3.93 fps Inflow=237.97 cfs 127.348 af
n=0.040 L=450.0' S=0.0044 '/' Capacity=644.41 cfs Outflow=231.07 cfs 127.022 af

Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Reach WBR5: WB R-5 Avg. Depth=3.27' Max Vel=3.31 fps Inflow=220.86 cfs 124.909 af
n=0.040 L=2,050.0' S=0.0029 '/ Capacity=522.94 cfs Outflow=213.74 cfs 123.241 af

Pond 19P: 48" 85' Peak Elev=262.16' Inflow=466.02 cfs 115.733 af
48.0" x 85.0' Culvert Outflow=466.02 cfs 115.733 af

Pond ARd C: Acre Rd Culvert Peak Elev=236.67' Inflow=234.89 cfs 124.316 af
36.0" x 30.0' Culvert Outflow=234.92 cfs 124.316 af

Pond MRd C: McKown Rd Culv Peak Elev=227.18' Inflow=233.56 cfs 121.468 af
36.0" x 30.0' Culvert Outflow=233.56 cfs 121.468 af

Pond PS A: Proposed Storage A Peak Elev=197.84' Storage=128,832 cf Inflow=470.84 cfs 122.782 af
Primary=141.61 cfs 106.901 af Secondary=249.40 cfs 13.918 af Outflow=391.00 cfs 120.816 af

Pond PS B: Proposed Storage B Peak Elev=190.74' Storage=100,621 cf Inflow=289.36 cfs 123.231 af
Primary=101.91 cfs 91.069 af Secondary=132.11 cfs 30.446 af Outflow=234.02 cfs 121.516 af

Pond PS C: Proposed Storage C Peak Elev=189.83' Storage=130,756 cf Inflow=231.07 cfs 127.022 af
Primary=70.81 cfs 76.266 af Secondary=150.05 cfs 48.643 af Outflow=220.86 cfs 124.909 af

Pond PS D: Proposed Storage D Peak Elev=191.47' Storage=0.150 af Inflow=10.41 cfs 2.236 af
Outflow=9.75 cfs 2.233 af

Total Runoff Area = 214.840 ac Runoff Volume = 17.845 af Average Runoff Depth = 1.00"
68.93% Pervious = 148.099 ac 31.07% Impervious = 66.741 ac

Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED A: Existing DA A

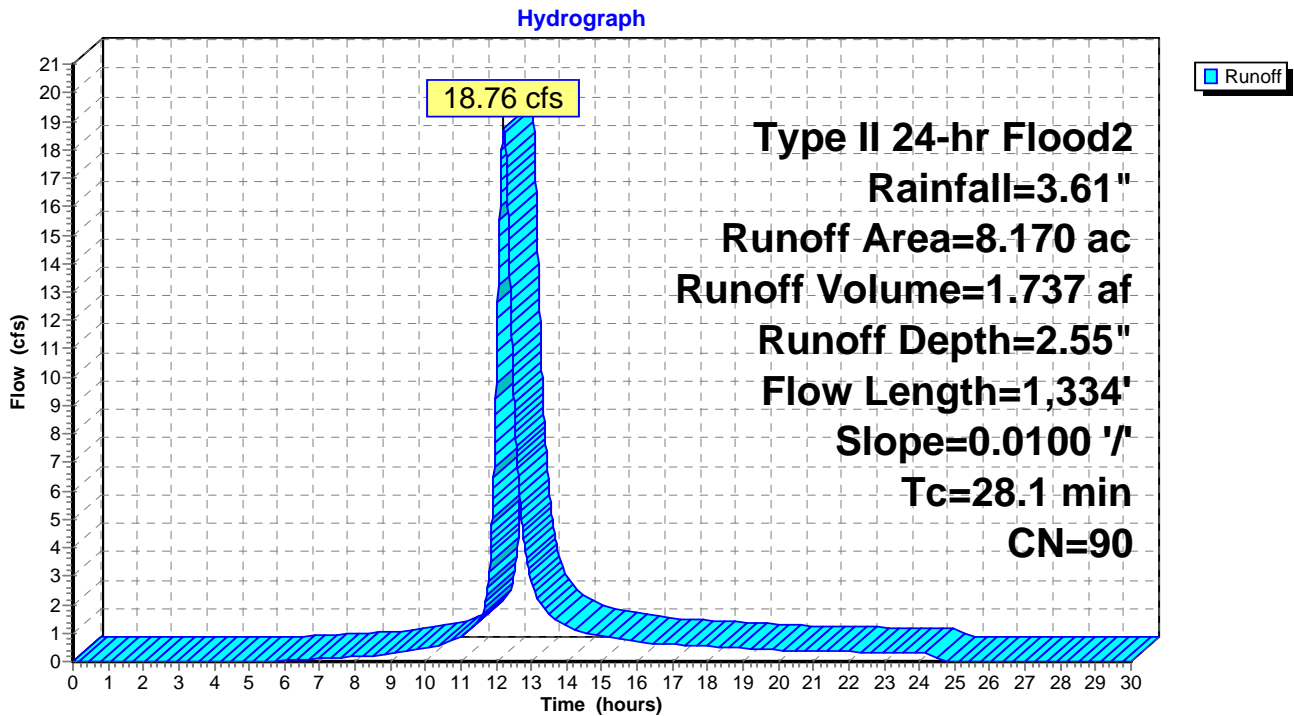
Runoff = 18.76 cfs @ 12.21 hrs, Volume= 1.737 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
5.780	98	Paved parking & roofs
2.390	69	50-75% Grass cover, Fair, HSG B
8.170	90	Weighted Average
2.390		Pervious Area
5.780		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	1,334	0.0100	0.79		Lag/CN Method,

Subcatchment ED A: Existing DA A



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED A1: Existing DA A1

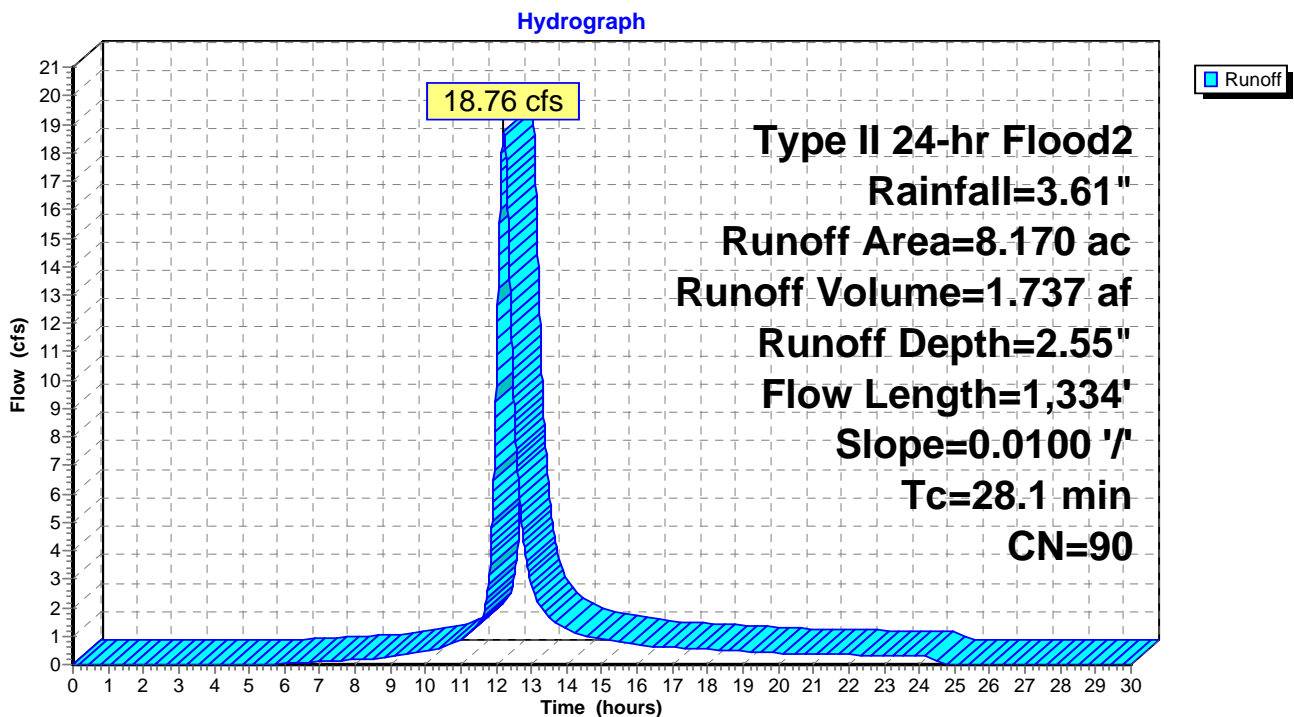
Runoff = 18.76 cfs @ 12.21 hrs, Volume= 1.737 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
5.780	98	Paved parking & roofs
2.390	69	50-75% Grass cover, Fair, HSG B
8.170	90	Weighted Average
2.390		Pervious Area
5.780		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	1,334	0.0100	0.79		Lag/CN Method,

Subcatchment ED A1: Existing DA A1



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED B: Existing DA B

Runoff = 39.44 cfs @ 11.94 hrs, Volume= 2.037 af, Depth= 3.38"

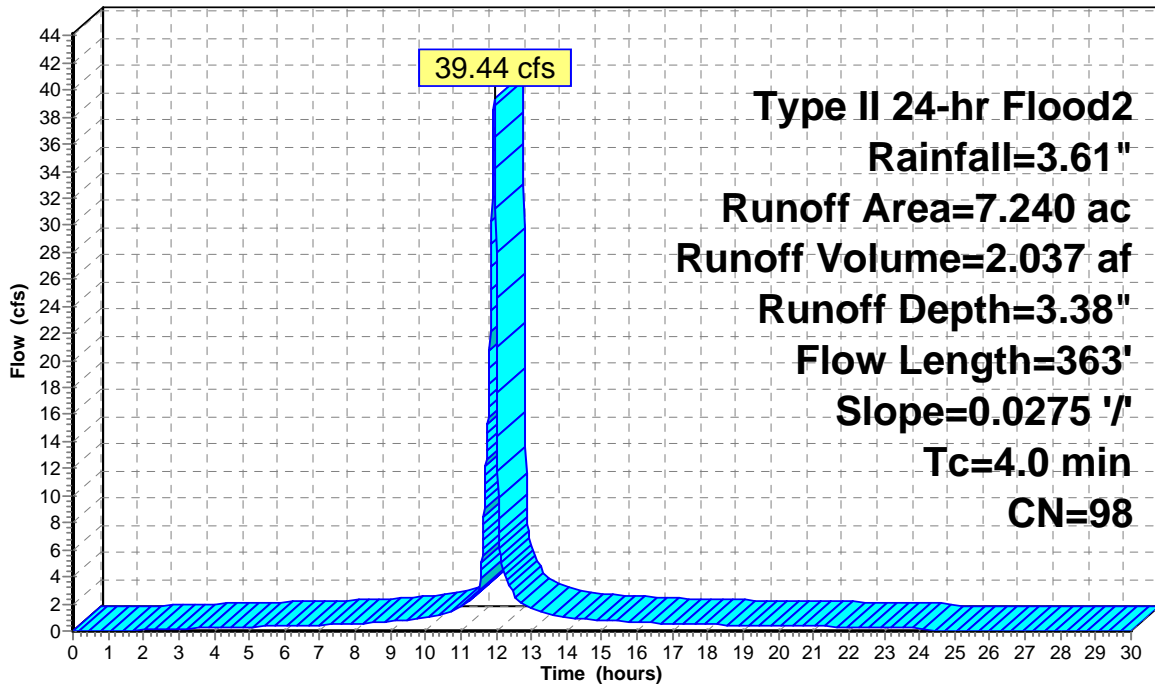
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
7.240	98	Paved parking & roofs
7.240		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	363	0.0275	1.50		Lag/CN Method,

Subcatchment ED B: Existing DA B

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED C: Existing DA C

Runoff = 34.69 cfs @ 12.21 hrs, Volume= 3.275 af, Depth= 1.08"

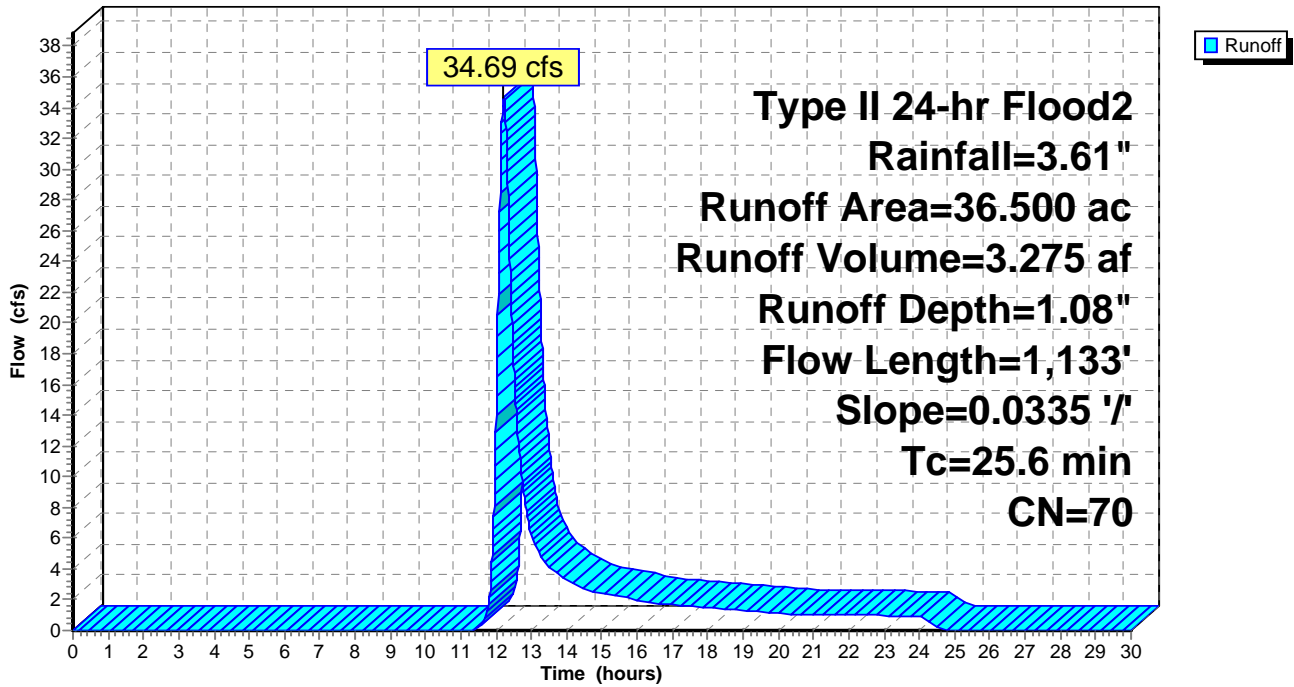
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
36.500	70	1/2 acre lots, 25% imp, HSG B
27.375		Pervious Area
9.125		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	1,133	0.0335	0.74		Lag/CN Method,

Subcatchment ED C: Existing DA C

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED D: Existing DA D

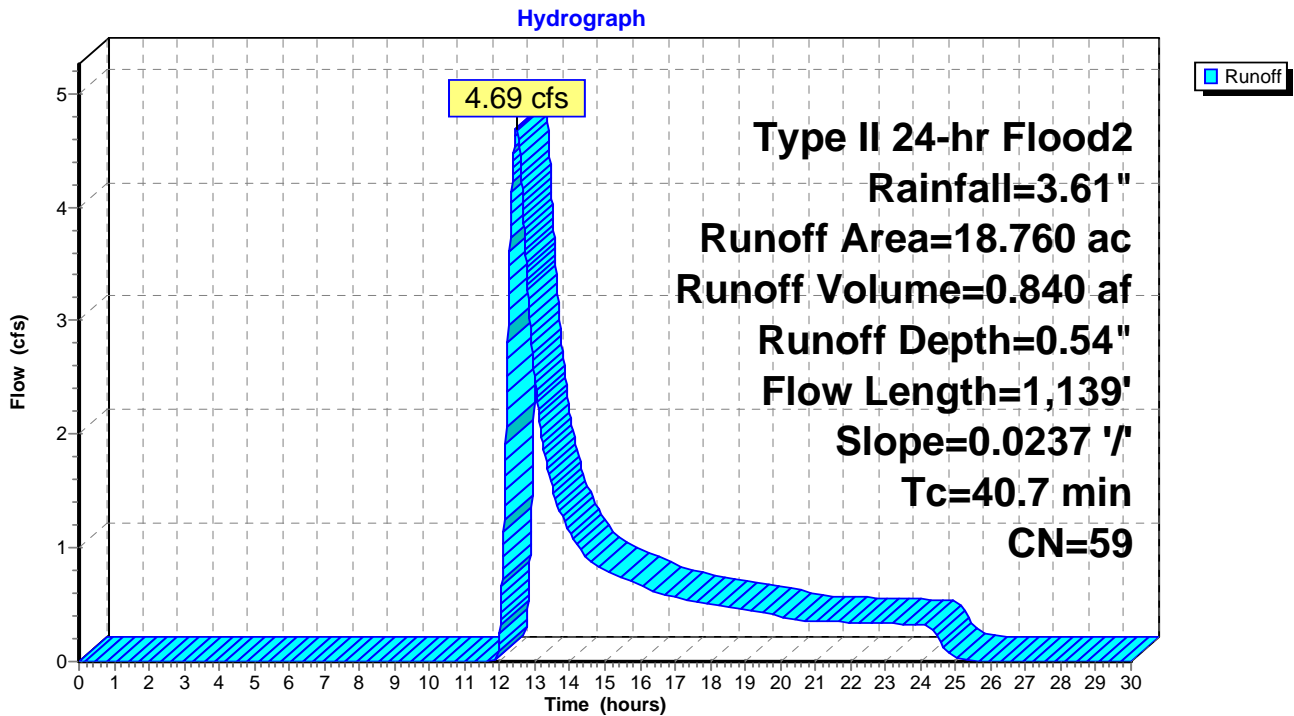
Runoff = 4.69 cfs @ 12.48 hrs, Volume= 0.840 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
18.160	58	Woods/grass comb., Good, HSG B
0.600	98	Paved parking & roofs
18.760	59	Weighted Average
18.160		Pervious Area
0.600		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.7	1,139	0.0237	0.47		Lag/CN Method,

Subcatchment ED D: Existing DA D



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED E: Existing DA E

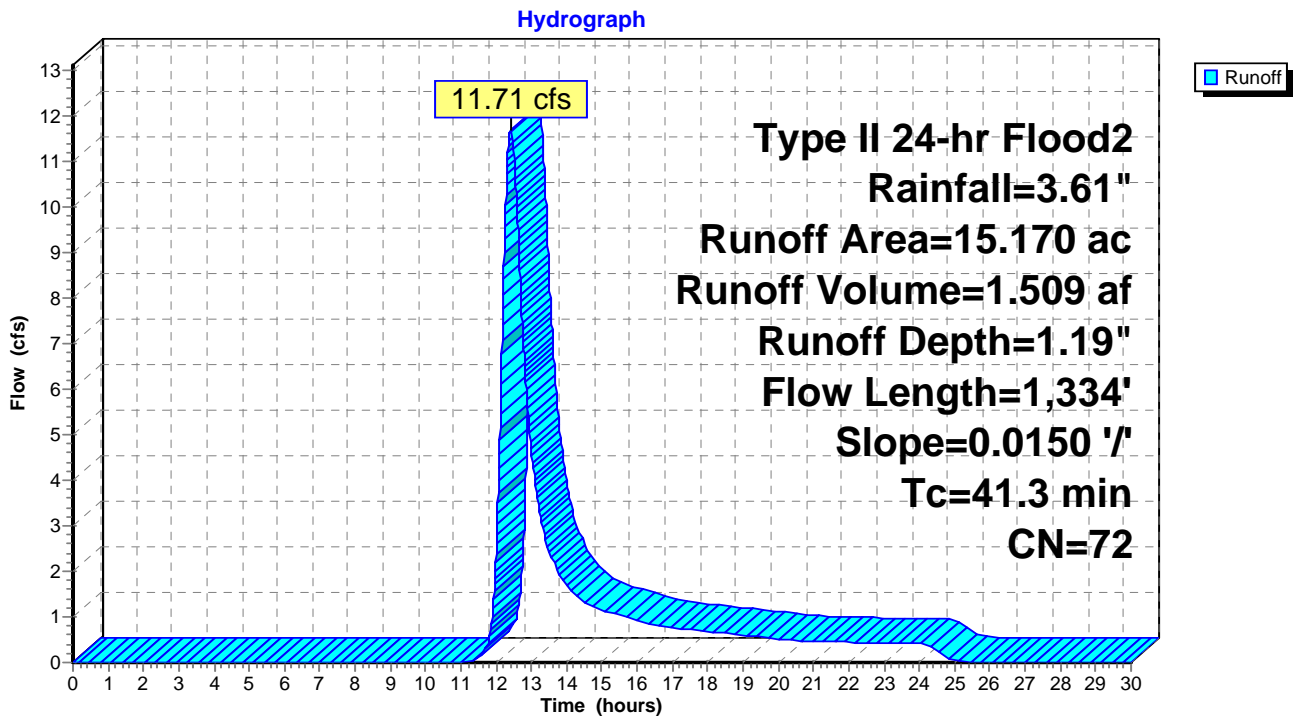
Runoff = 11.71 cfs @ 12.43 hrs, Volume= 1.509 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
15.170	72	1/3 acre lots, 30% imp, HSG B
10.619		Pervious Area
4.551		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.3	1,334	0.0150	0.54		Lag/CN Method,

Subcatchment ED E: Existing DA E



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED F: Existing DA F

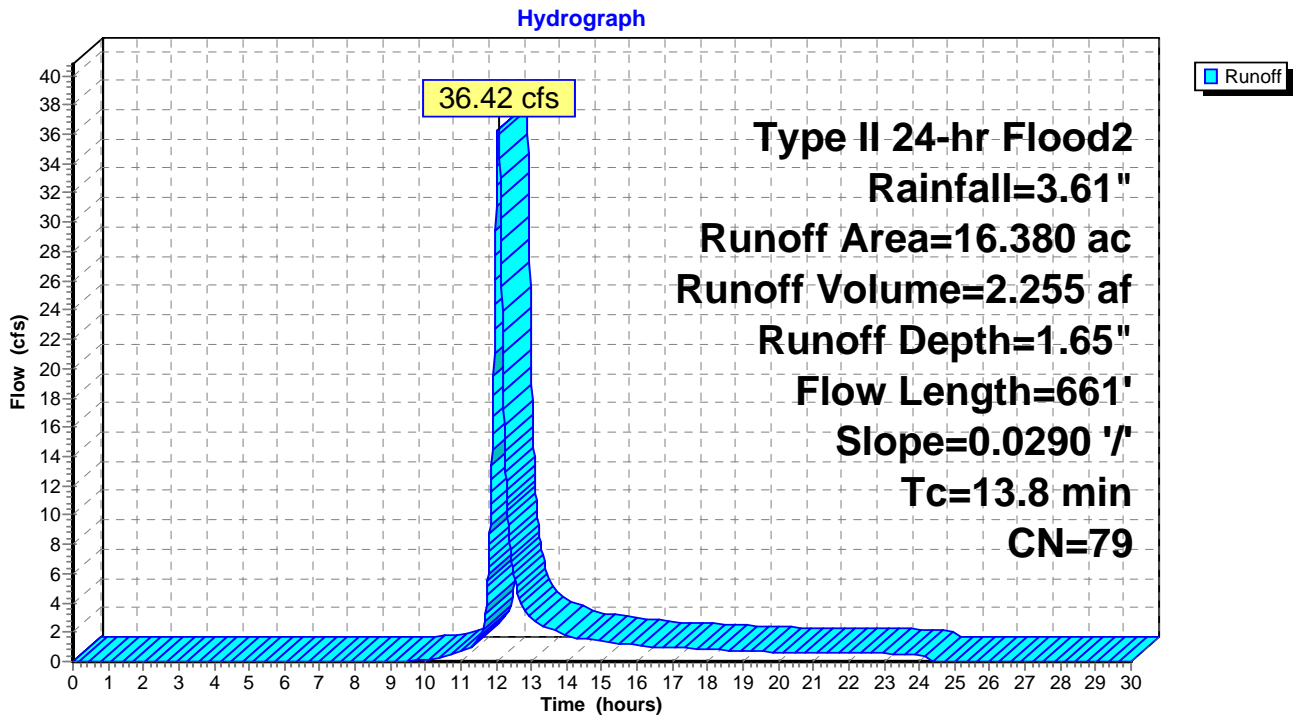
Runoff = 36.42 cfs @ 12.06 hrs, Volume= 2.255 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
9.430	81	1/3 acre lots, 30% imp, HSG C
6.950	76	Woods/grass comb., Fair, HSG C
16.380	79	Weighted Average
13.551		Pervious Area
2.829		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	661	0.0290	0.80		Lag/CN Method,

Subcatchment ED F: Existing DA F



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment ED G: Existing DA G

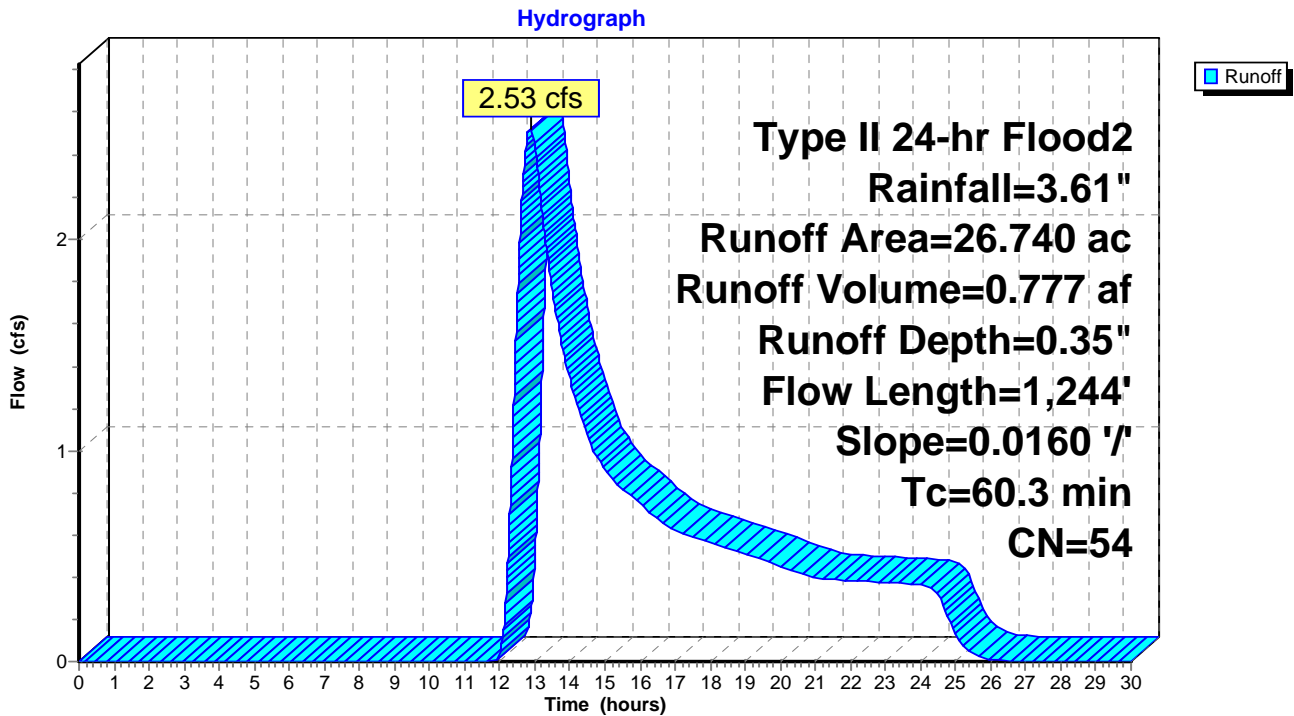
Runoff = 2.53 cfs @ 12.87 hrs, Volume= 0.777 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
20.440	57	1/3 acre lots, 30% imp, HSG A
6.300	43	Woods/grass comb., Fair, HSG A
26.740	54	Weighted Average
20.608		Pervious Area
6.132		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.3	1,244	0.0160	0.34		Lag/CN Method,

Subcatchment ED G: Existing DA G



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment PD I: PD I

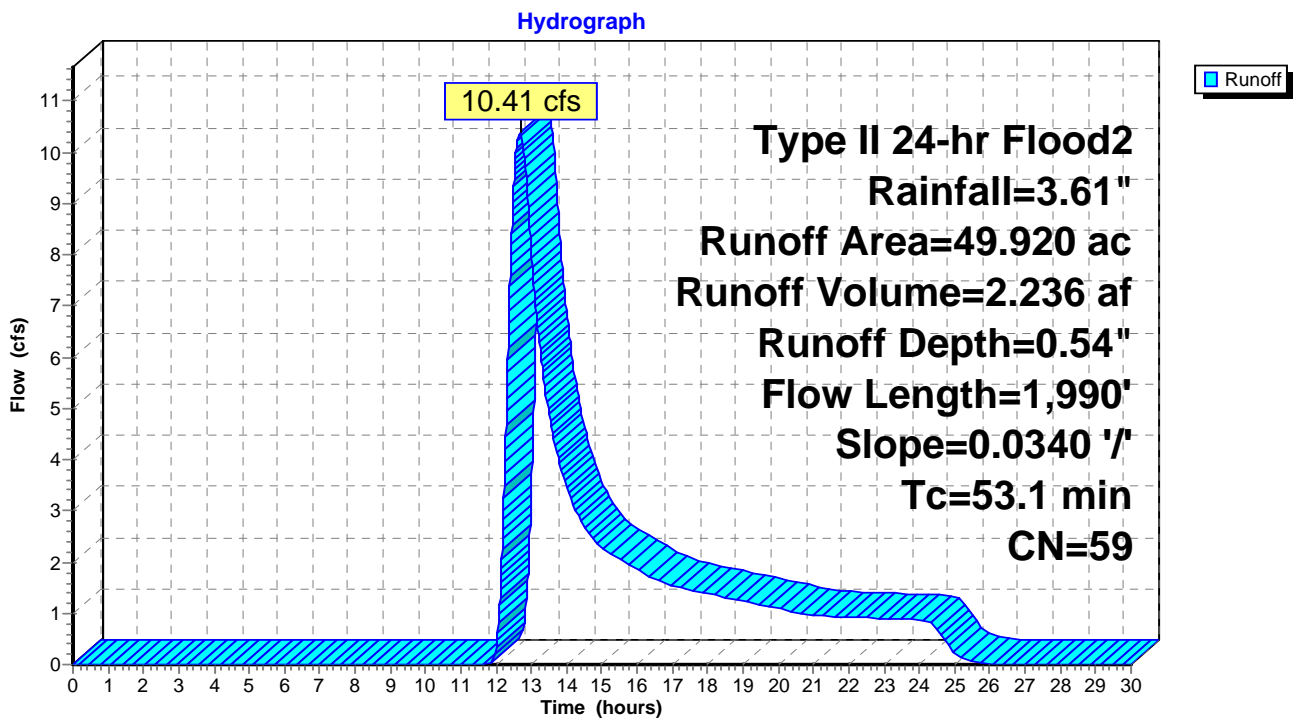
Runoff = 10.41 cfs @ 12.68 hrs, Volume= 2.236 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
37.220	61	1/4 acre lots, 38% imp, HSG A
12.700	55	Woods, Good, HSG B
49.920	59	Weighted Average
35.776		Pervious Area
14.144		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.1	1,990	0.0340	0.63		Lag/CN Method,

Subcatchment PD I: PD I



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Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Subcatchment PD I-A: PD I-A

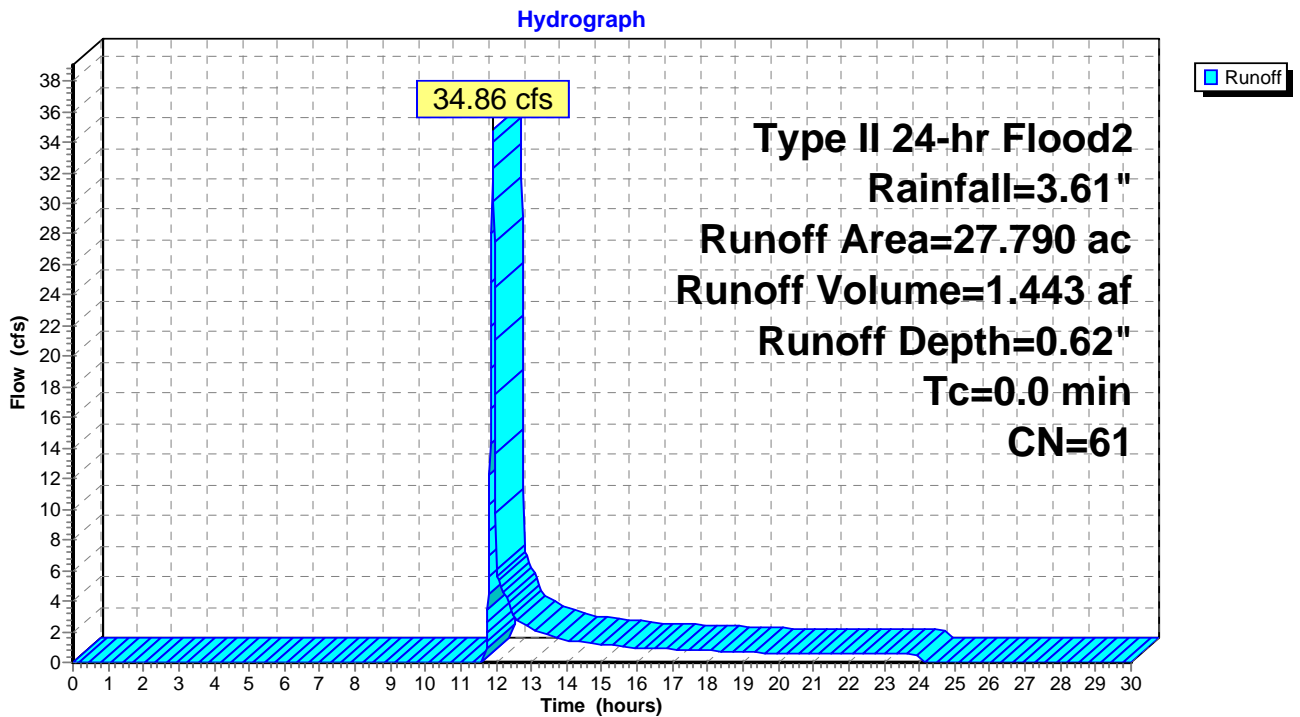
Runoff = 34.86 cfs @ 11.90 hrs, Volume= 1.443 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Type II 24-hr Flood2 Rainfall=3.61"

Area (ac)	CN	Description
27.790	61	1/4 acre lots, 38% imp, HSG A
17.230		Pervious Area
10.560		Impervious Area

Subcatchment PD I-A: PD I-A



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Reach 9R: EB Krumkill

Inflow Area = 49.920 ac, 28.33% Impervious, Inflow Depth > 0.54" for Flood2 event
Inflow = 9.75 cfs @ 12.82 hrs, Volume= 2.233 af
Outflow = 8.40 cfs @ 13.08 hrs, Volume= 2.229 af, Atten= 14%, Lag= 15.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.58 fps, Min. Travel Time= 18.5 min
Avg. Velocity = 0.74 fps, Avg. Travel Time= 39.6 min

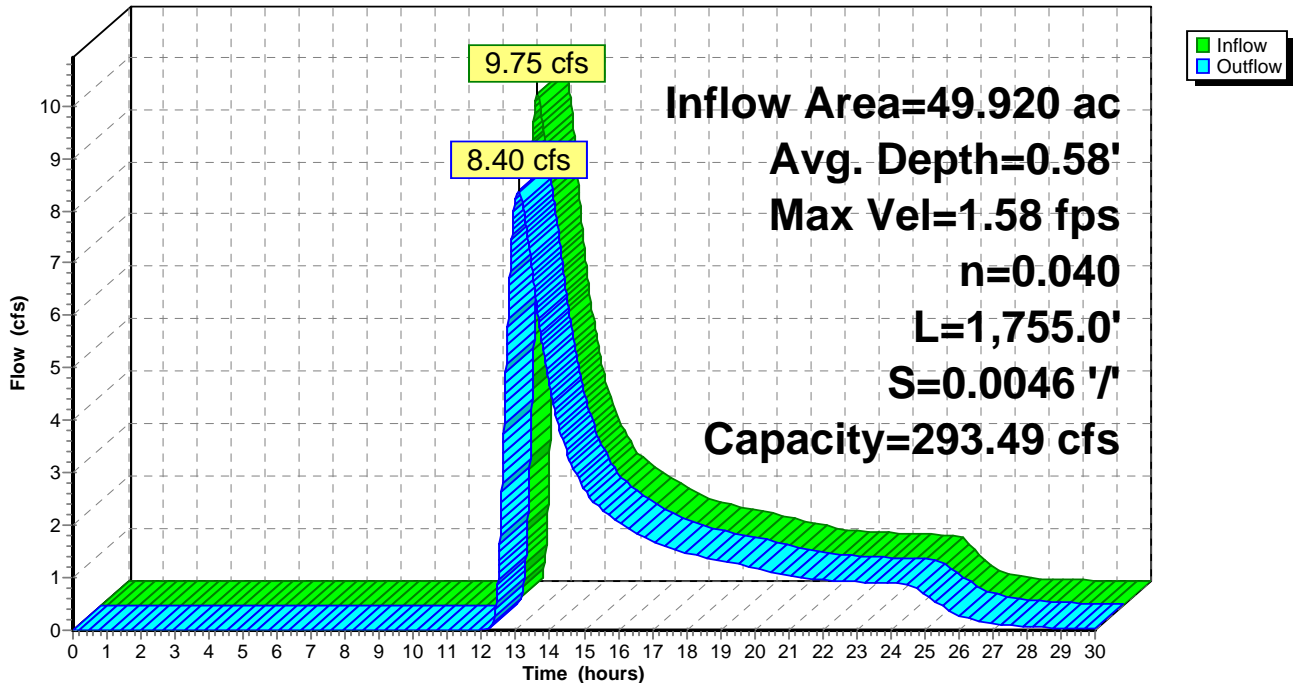
Peak Storage= 9,309 cf @ 13.08 hrs, Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 293.49 cfs

8.00' x 4.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/ Top Width= 24.00'
Length= 1,755.0' Slope= 0.0046 '/
Inlet Invert= 186.00', Outlet Invert= 178.00'



Reach 9R: EB Krumkill

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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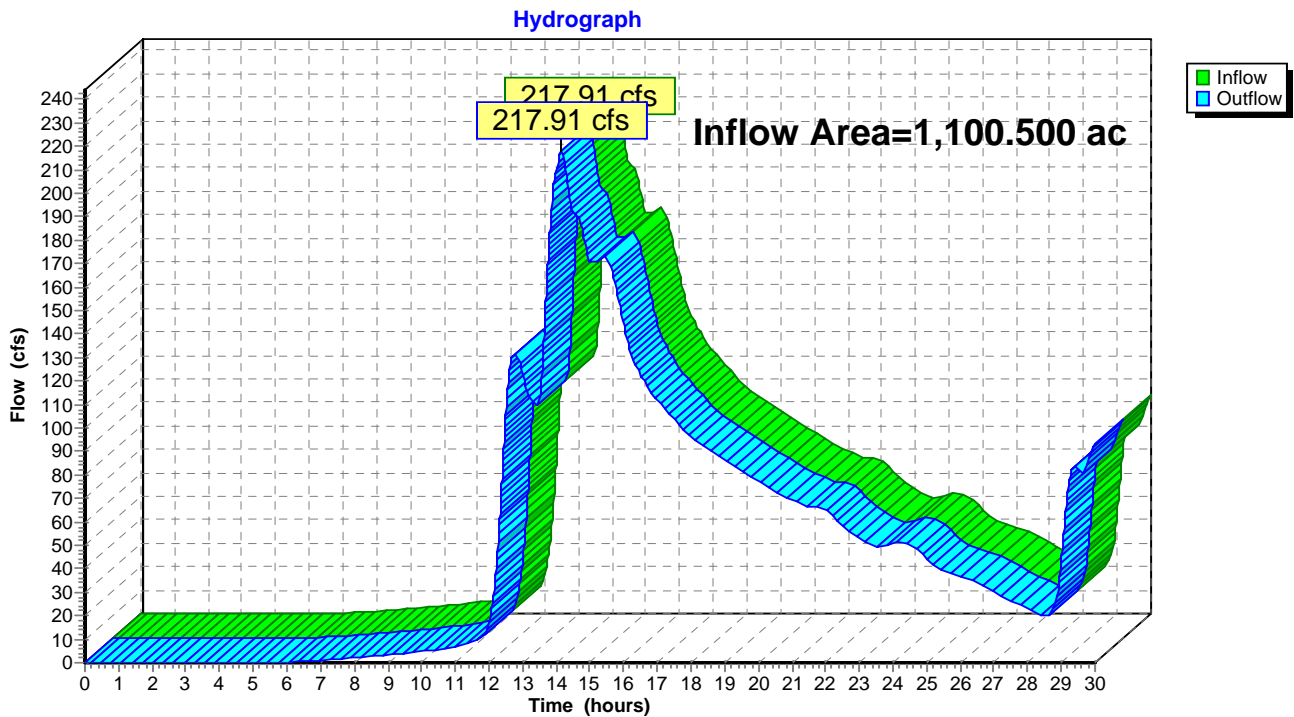
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Summary for Reach KK P: Krumkill

Inflow Area = 1,100.500 ac, 34.10% Impervious, Inflow Depth > 1.37" for Flood2 event
Inflow = 217.91 cfs @ 14.15 hrs, Volume= 125.470 af
Outflow = 217.91 cfs @ 14.15 hrs, Volume= 125.470 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Reach KK P: Krumkill



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Reach WB R-3: WBR3

Inflow Area = 1,007.460 ac, 34.96% Impervious, Inflow Depth > 1.48" for Flood2 event
Inflow = 236.62 cfs @ 14.03 hrs, Volume= 124.419 af
Outflow = 234.89 cfs @ 14.04 hrs, Volume= 124.316 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 6.42 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 3.43 fps, Avg. Travel Time= 1.1 min

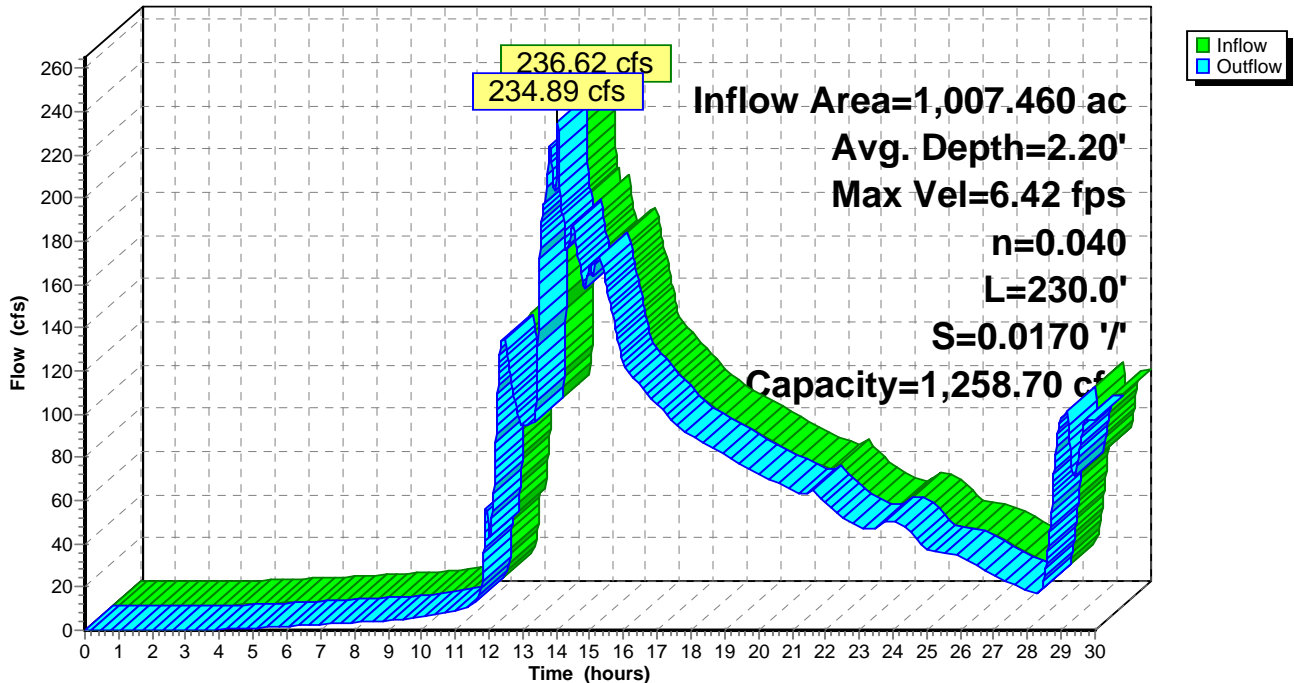
Peak Storage= 8,415 cf @ 14.04 hrs, Average Depth at Peak Storage= 2.20'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 1,258.70 cfs

10.00' x 5.00' deep channel, n= 0.040 Mountain streams
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 230.0' Slope= 0.0170 '/
Inlet Invert= 177.90', Outlet Invert= 174.00'



Reach WB R-3: WBR3

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Reach WBR1: WB R-1

Inflow Area = 937.570 ac, 35.27% Impervious, Inflow Depth > 1.55" for Flood2 event
Inflow = 391.00 cfs @ 14.01 hrs, Volume= 120.819 af
Outflow = 286.99 cfs @ 14.02 hrs, Volume= 120.654 af, Atten= 27%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.59 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.81 fps, Avg. Travel Time= 1.8 min

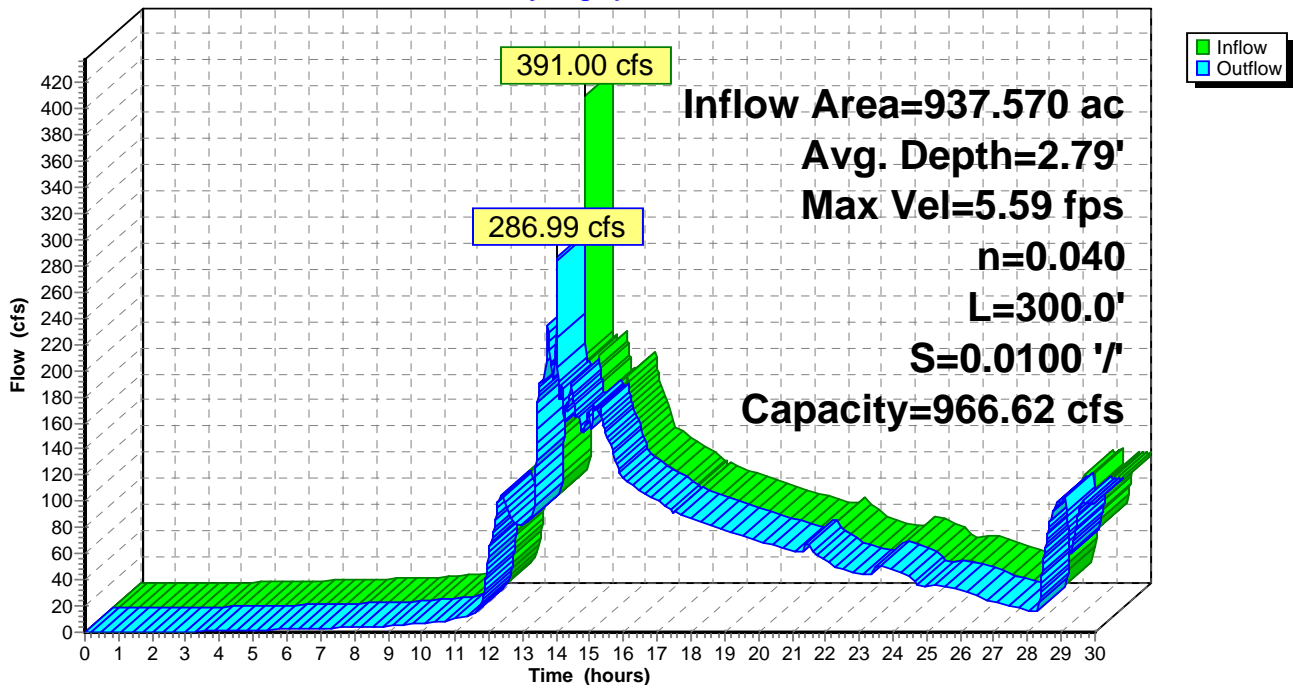
Peak Storage= 15,368 cf @ 14.02 hrs, Average Depth at Peak Storage= 2.79'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 966.62 cfs

10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 300.0' Slope= 0.0100 '/
Inlet Invert= 189.00', Outlet Invert= 186.00'



Reach WBR1: WB R-1

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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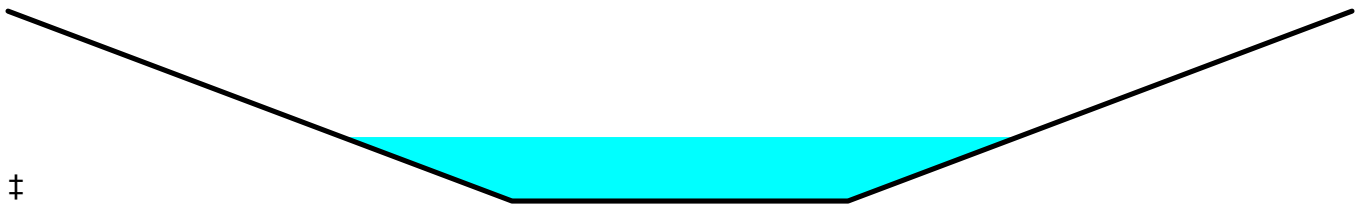
Summary for Reach WBR2: WB R-2

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 1.51" for Flood2 event
Inflow = 234.02 cfs @ 14.03 hrs, Volume= 121.516 af
Outflow = 233.56 cfs @ 14.03 hrs, Volume= 121.468 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 9.20 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 4.82 fps, Avg. Travel Time= 0.5 min

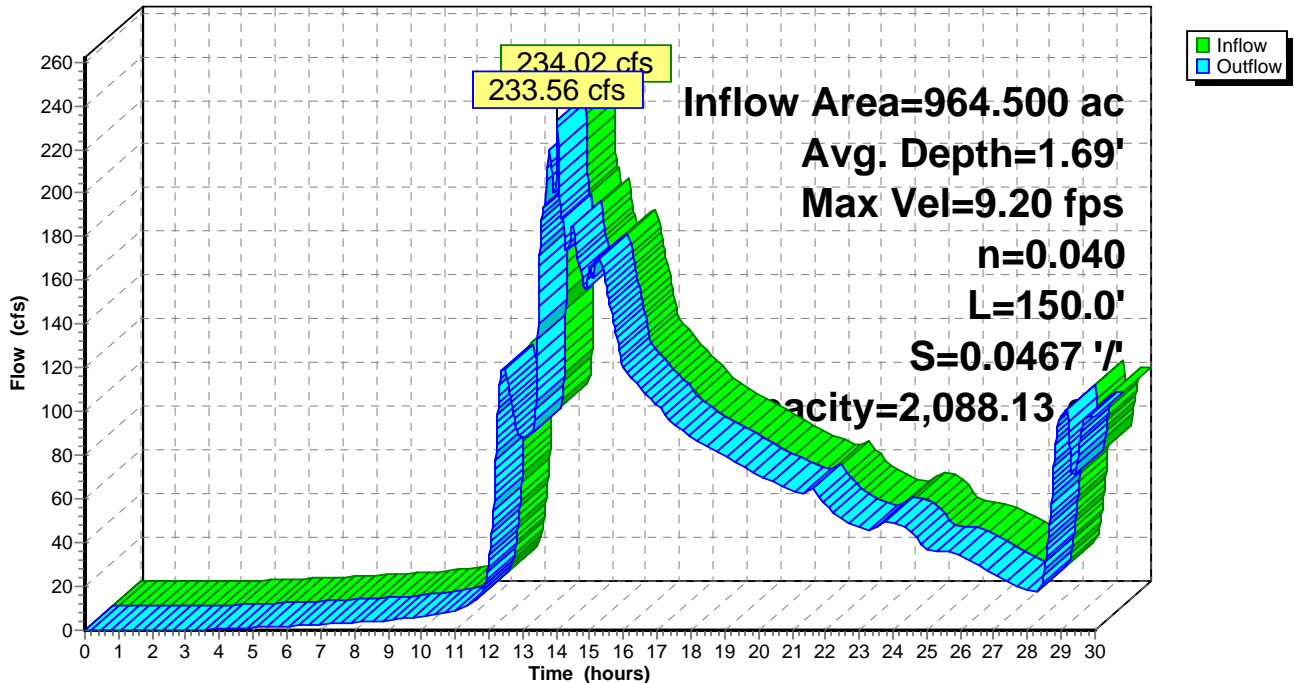
Peak Storage= 3,806 cf @ 14.03 hrs, Average Depth at Peak Storage= 1.69'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 2,088.13 cfs

10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 150.0' Slope= 0.0467 '/
Inlet Invert= 185.00', Outlet Invert= 178.00'



Reach WBR2: WB R-2

Hydrograph



Proposed Drainage McKownville Rt 20 Area

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Summary for Reach WBR4: WB R-4

Inflow Area = 1,050.580 ac, 34.38% Impervious, Inflow Depth > 1.45" for Flood2 event
Inflow = 237.97 cfs @ 14.04 hrs, Volume= 127.348 af
Outflow = 231.07 cfs @ 14.06 hrs, Volume= 127.022 af, Atten= 3%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.93 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 3.5 min

Peak Storage= 26,441 cf @ 14.06 hrs, Average Depth at Peak Storage= 3.06'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 644.41 cfs

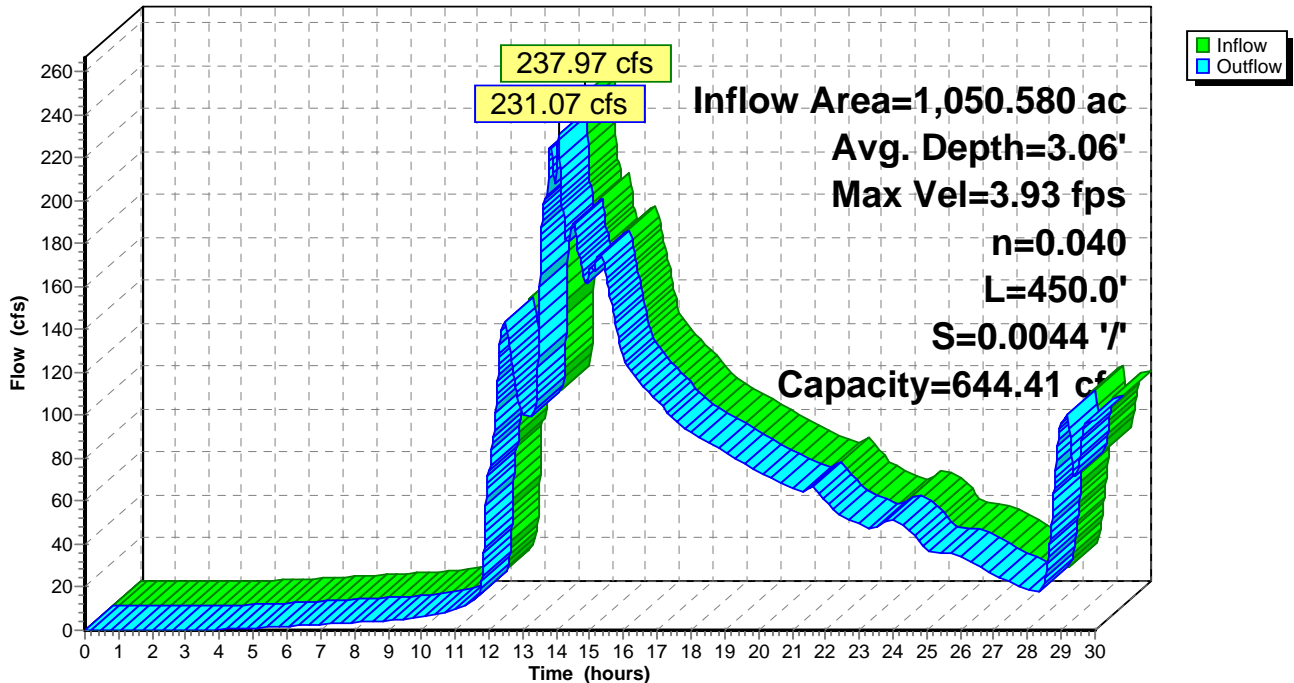
10.00' x 5.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 450.0' Slope= 0.0044 '/
Inlet Invert= 186.00', Outlet Invert= 184.00'



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Reach WBR4: WB R-4

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Reach WBR5: WB R-5

Inflow Area = 1,050.580 ac, 34.38% Impervious, Inflow Depth > 1.43" for Flood2 event
Inflow = 220.86 cfs @ 14.10 hrs, Volume= 124.909 af
Outflow = 213.74 cfs @ 14.15 hrs, Volume= 123.241 af, Atten= 3%, Lag= 3.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.31 fps, Min. Travel Time= 10.3 min
Avg. Velocity = 1.89 fps, Avg. Travel Time= 18.0 min

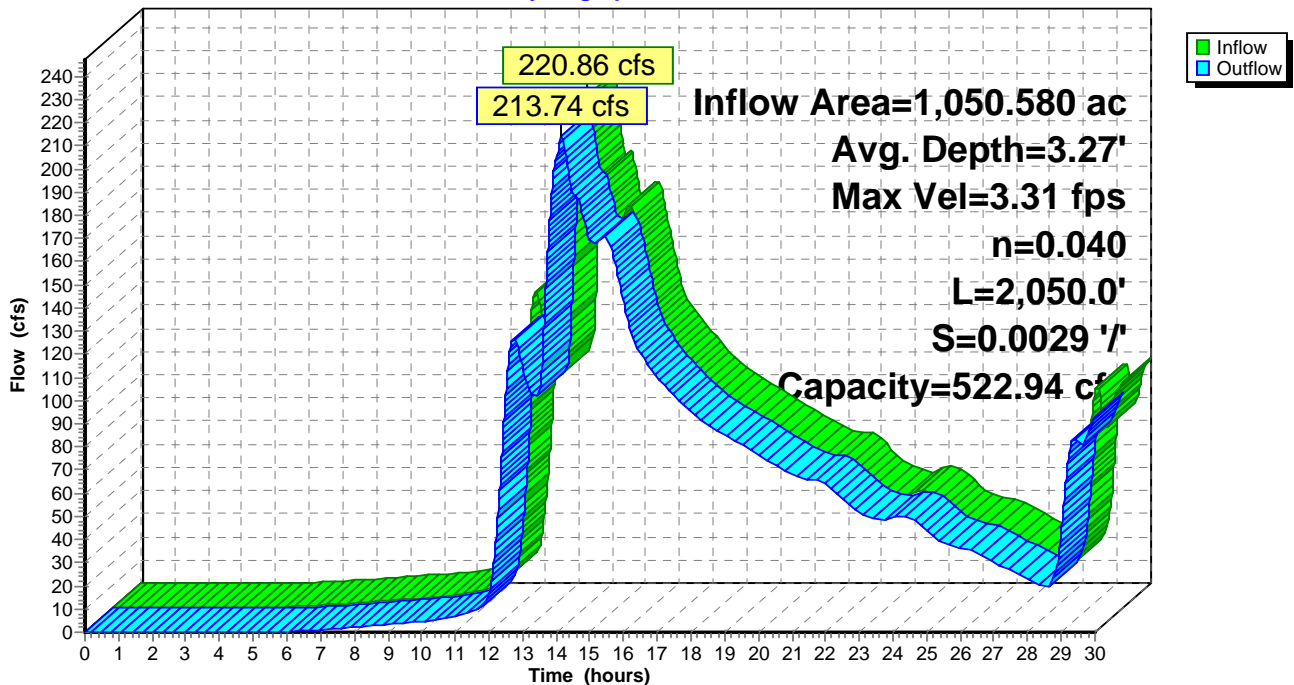
Peak Storage= 132,555 cf @ 14.15 hrs, Average Depth at Peak Storage= 3.27'
Bank-Full Depth= 5.00', Capacity at Bank-Full= 522.94 cfs

10.00' x 5.00' deep channel, n= 0.040 Mountain streams
Side Slope Z-value= 3.0 '/ Top Width= 40.00'
Length= 2,050.0' Slope= 0.0029 '/
Inlet Invert= 182.00', Outlet Invert= 176.00'



Reach WBR5: WB R-5

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Pond 19P: 48" 85'

Inflow Area = 885.660 ac, 34.84% Impervious, Inflow Depth > 1.57" for Flood2 event
 Inflow = 466.02 cfs @ 14.34 hrs, Volume= 115.733 af
 Outflow = 466.02 cfs @ 14.34 hrs, Volume= 115.733 af, Atten= 0%, Lag= 0.0 min
 Primary = 466.02 cfs @ 14.34 hrs, Volume= 115.733 af

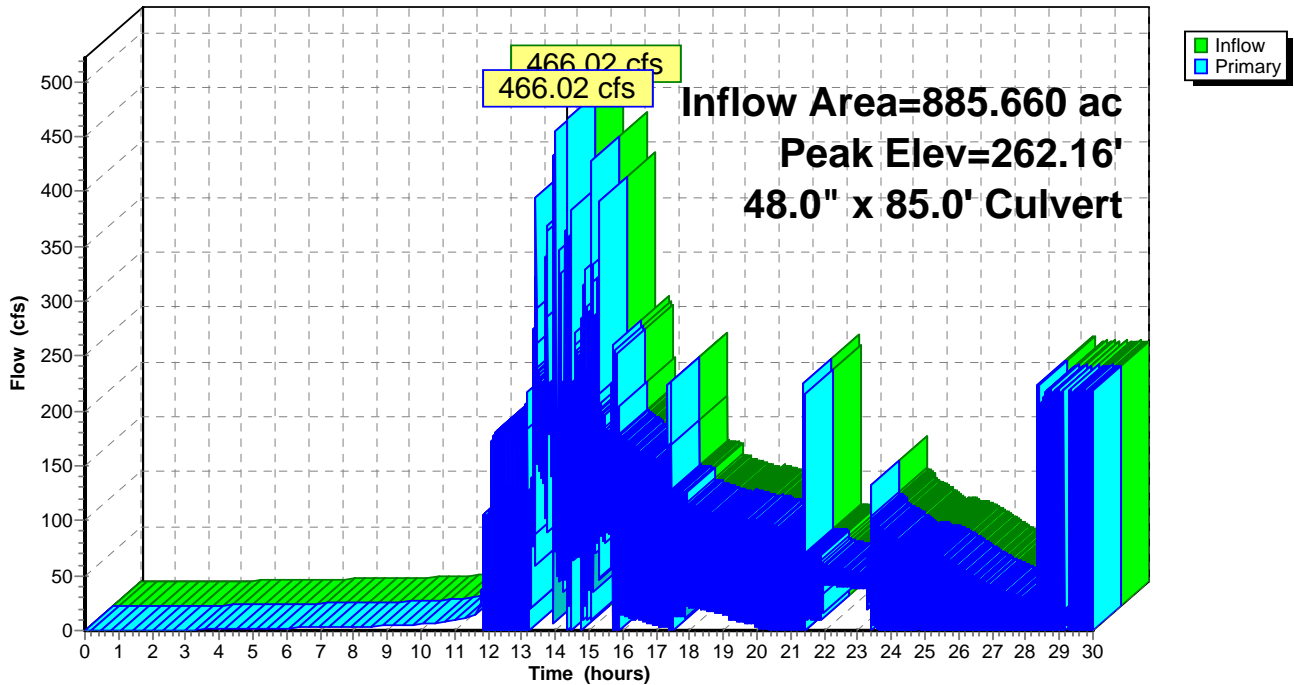
Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 262.16' @ 14.34 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	194.00'	48.0" x 85.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 193.00' S= 0.0118 '/ Cc= 0.900 n= 0.025 Corrugated metal

Primary OutFlow Max=459.39 cfs @ 14.34 hrs HW=260.40' TW=195.62' (Dynamic Tailwater)
 ↳ **1=Culvert** (Barrel Controls 459.39 cfs @ 36.56 fps)

Pond 19P: 48" 85'

Hydrograph



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Pond ARd C: Acre Rd Culvert

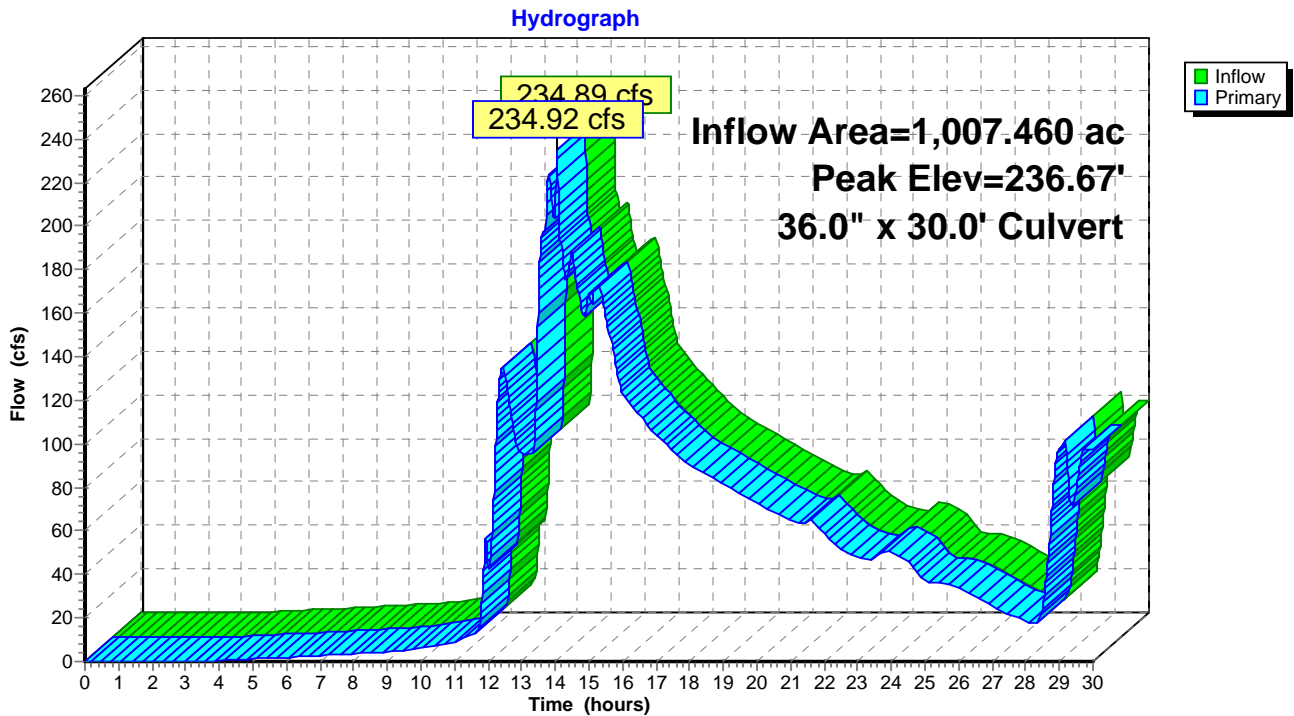
Inflow Area = 1,007.460 ac, 34.96% Impervious, Inflow Depth > 1.48" for Flood2 event
Inflow = 234.89 cfs @ 14.04 hrs, Volume= 124.316 af
Outflow = 234.92 cfs @ 14.04 hrs, Volume= 124.316 af, Atten= 0%, Lag= 0.0 min
Primary = 234.92 cfs @ 14.04 hrs, Volume= 124.316 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 236.67' @ 14.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	174.00'	36.0" x 30.0' long Culvert CPP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 173.90' S= 0.0033 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=234.42 cfs @ 14.04 hrs HW=236.47' TW=189.03' (Dynamic Tailwater)
←1=Culvert (Inlet Controls 234.42 cfs @ 33.16 fps)

Pond ARd C: Acre Rd Culvert



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Pond MRd C: McKown Rd Culv

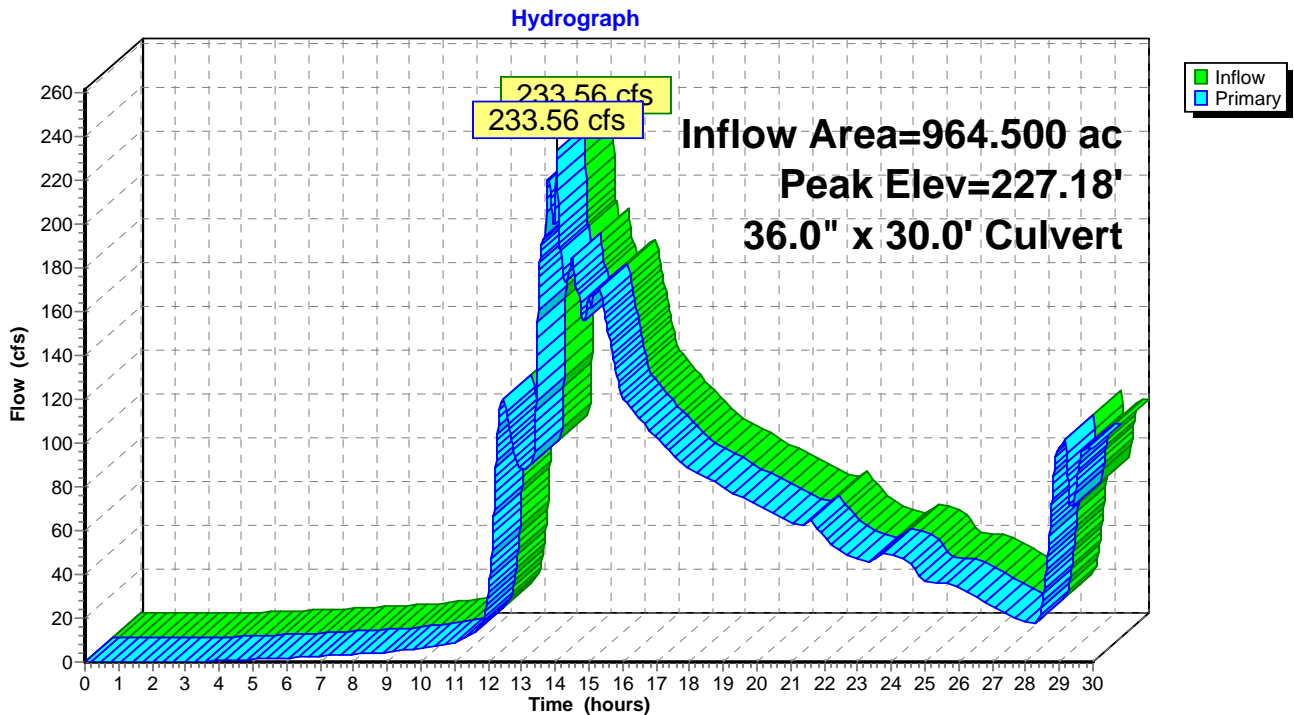
Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 1.51" for Flood2 event
 Inflow = 233.56 cfs @ 14.03 hrs, Volume= 121.468 af
 Outflow = 233.56 cfs @ 14.03 hrs, Volume= 121.468 af, Atten= 0%, Lag= 0.0 min
 Primary = 233.56 cfs @ 14.03 hrs, Volume= 121.468 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 227.18' @ 14.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	36.0" x 30.0' long Culvert RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 177.00' S= 0.0333 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=232.64 cfs @ 14.03 hrs HW=226.81' TW=180.09' (Dynamic Tailwater)
 ←1=Culvert (Inlet Controls 232.64 cfs @ 32.91 fps)

Pond MRd C: McKown Rd Culv



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Pond PS A: Proposed Storage A

Inflow Area = 937.570 ac, 35.27% Impervious, Inflow Depth > 1.57" for Flood2 event
 Inflow = 470.84 cfs @ 14.34 hrs, Volume= 122.782 af
 Outflow = 391.00 cfs @ 14.01 hrs, Volume= 120.816 af, Atten= 17%, Lag= 0.0 min
 Primary = 141.61 cfs @ 14.01 hrs, Volume= 106.901 af
 Secondary = 249.40 cfs @ 14.01 hrs, Volume= 13.918 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 197.84' @ 14.01 hrs Surf.Area= 27,376 sf Storage= 128,832 cf

Plug-Flow detention time= 15.1 min calculated for 120.776 af (98% of inflow)
 Center-of-Mass det. time= 4.0 min (1,114.6 - 1,110.7)

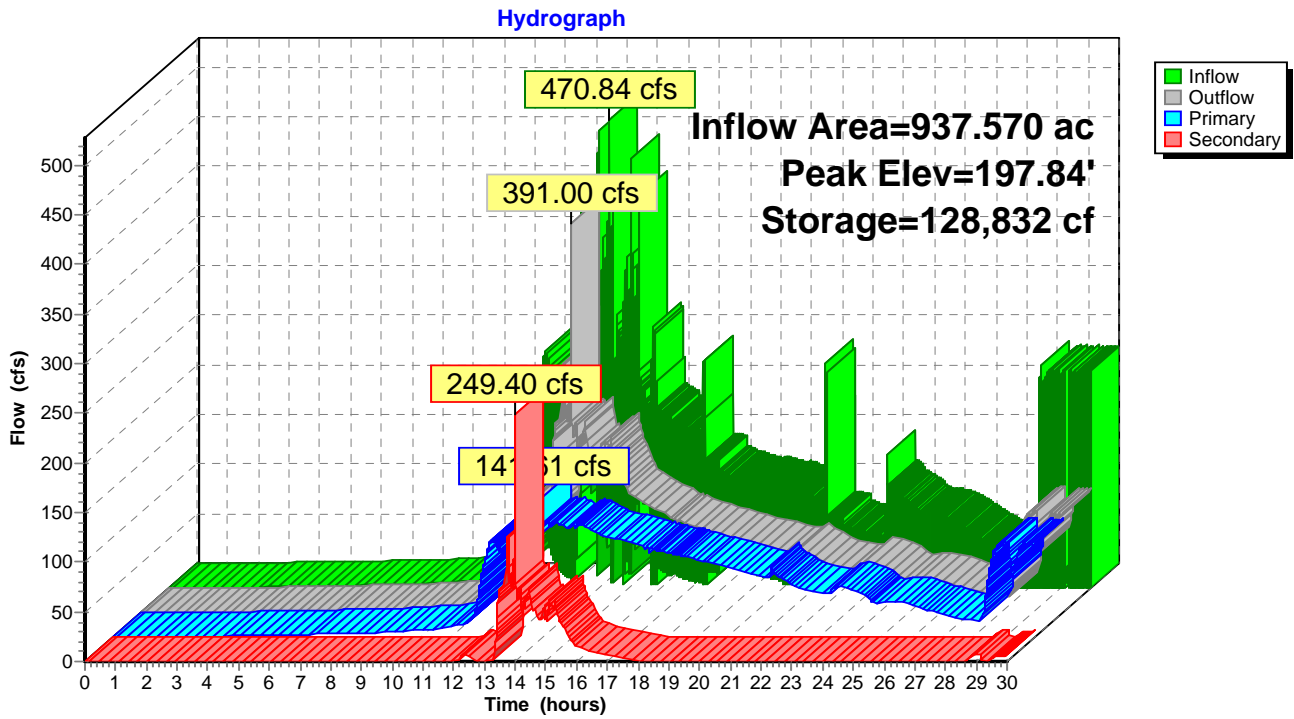
Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	128,832 cf	80.00'W x 200.00'L x 6.00'H Prismatic Z=3.0

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	4.00' W x 3.00' H x 10.0' long Culvert RCP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 189.90' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean
#2	Secondary	194.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=139.33 cfs @ 14.01 hrs HW=197.80' TW=191.70' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 139.33 cfs @ 11.61 fps)

Secondary OutFlow Max=249.19 cfs @ 14.01 hrs HW=197.83' TW=191.70' (Dynamic Tailwater)
 ↑**2=Broad-Crested Rectangular Weir** (Weir Controls 249.19 cfs @ 6.50 fps)

Pond PS A: Proposed Storage A



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Pond PS B: Proposed Storage B

Inflow Area = 964.500 ac, 34.95% Impervious, Inflow Depth > 1.53" for Flood2 event
 Inflow = 289.36 cfs @ 14.02 hrs, Volume= 123.231 af
 Outflow = 234.02 cfs @ 14.03 hrs, Volume= 121.516 af, Atten= 19%, Lag= 0.8 min
 Primary = 101.91 cfs @ 14.03 hrs, Volume= 91.069 af
 Secondary = 132.11 cfs @ 14.03 hrs, Volume= 30.446 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 190.74' @ 14.03 hrs Surf.Area= 24,320 sf Storage= 100,621 cf

Plug-Flow detention time= 13.8 min calculated for 121.475 af (99% of inflow)
 Center-of-Mass det. time= 4.2 min (1,113.8 - 1,109.6)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	132,402 cf	85.00'W x 215.00'L x 6.00'H Prismatic Z=2.0

Device	Routing	Invert	Outlet Devices
#1	Primary	186.00'	4.00' W x 3.00' H x 10.0' long Culvert RCP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 185.90' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean
#2	Secondary	189.00'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=101.88 cfs @ 14.03 hrs HW=190.74' TW=186.68' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 101.88 cfs @ 8.49 fps)

Secondary OutFlow Max=131.78 cfs @ 14.03 hrs HW=190.74' TW=186.68' (Dynamic Tailwater)
 ↑**2=Broad-Crested Rectangular Weir** (Weir Controls 131.78 cfs @ 3.80 fps)

Proposed Drainage McKownville Rt 20 Area

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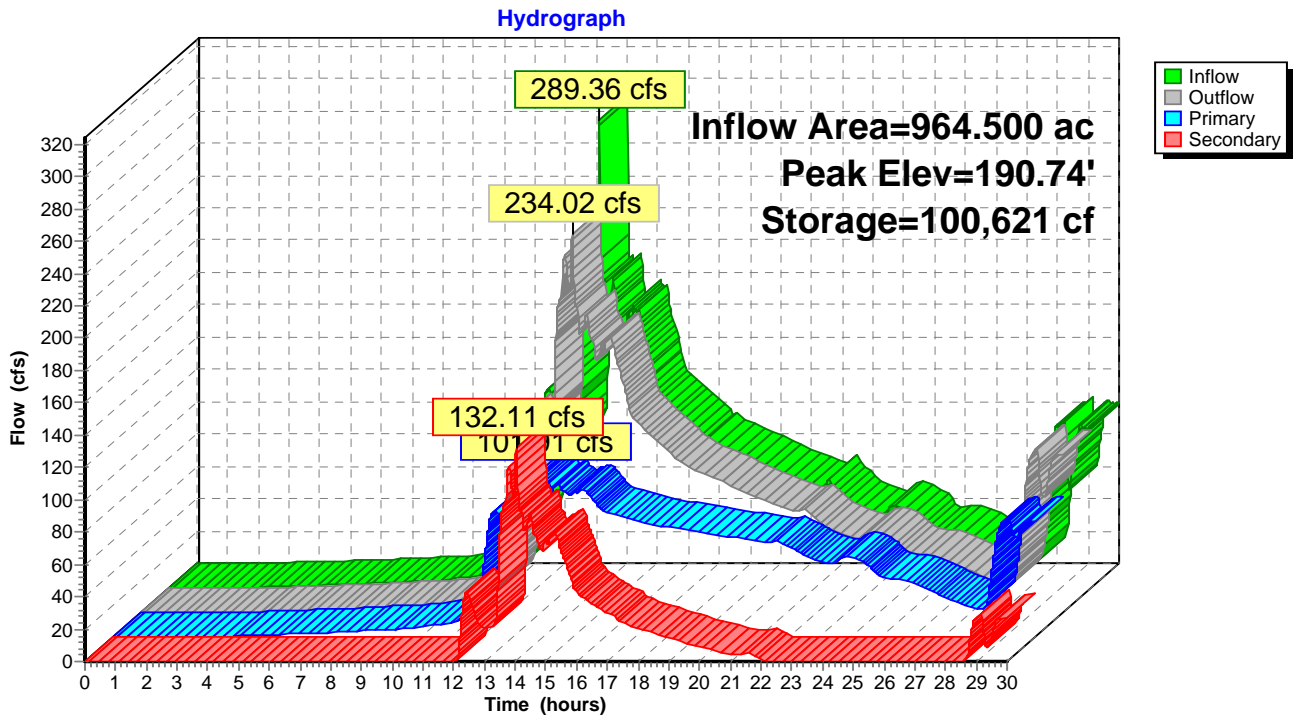
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Type II 24-hr Flood2 Rainfall=3.61"

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Pond PS B: Proposed Storage B



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Pond PS C: Proposed Storage C

Inflow Area = 1,050.580 ac, 34.38% Impervious, Inflow Depth > 1.45" for Flood2 event
 Inflow = 231.07 cfs @ 14.06 hrs, Volume= 127.022 af
 Outflow = 220.86 cfs @ 14.10 hrs, Volume= 124.909 af, Atten= 4%, Lag= 2.1 min
 Primary = 70.81 cfs @ 14.10 hrs, Volume= 76.266 af
 Secondary = 150.05 cfs @ 14.10 hrs, Volume= 48.643 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 189.83' @ 14.10 hrs Surf.Area= 26,354 sf Storage= 130,756 cf

Plug-Flow detention time= 17.0 min calculated for 124.868 af (98% of inflow)
 Center-of-Mass det. time= 5.4 min (1,109.6 - 1,104.2)

Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	135,312 cf	85.00'W x 220.00'L x 6.00'H Prismatic Z=2.0

Device	Routing	Invert	Outlet Devices
#1	Primary	184.00'	36.0" x 30.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 183.50' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Secondary	187.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=70.80 cfs @ 14.10 hrs HW=189.83' TW=185.25' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 70.80 cfs @ 10.02 fps)

Secondary OutFlow Max=149.98 cfs @ 14.10 hrs HW=189.83' TW=185.25' (Dynamic Tailwater)
 ↑**2=Broad-Crested Rectangular Weir** (Weir Controls 149.98 cfs @ 5.31 fps)

Proposed Drainage McKownville Rt 20 Area

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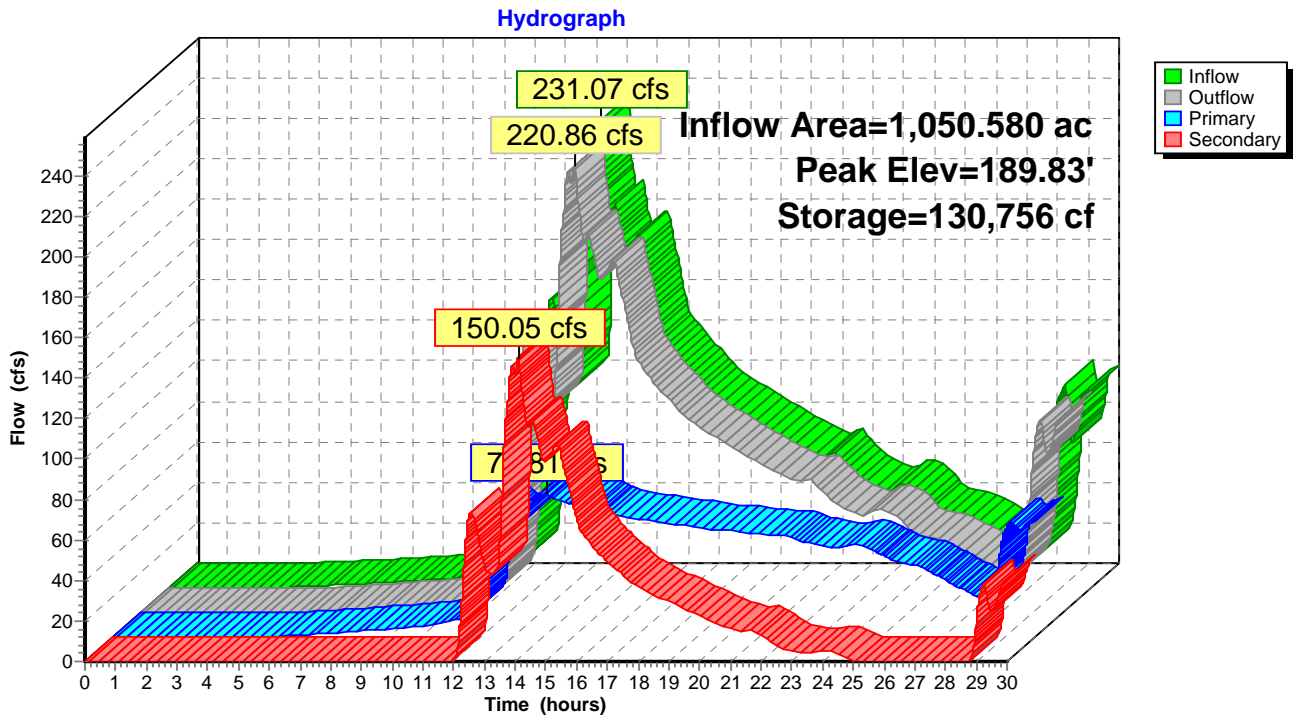
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Type II 24-hr Flood2 Rainfall=3.61"

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Pond PS C: Proposed Storage C



Proposed Drainage McKownville Rt 20 Area

Type II 24-hr Flood2 Rainfall=3.61"

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Summary for Pond PS D: Proposed Storage D

Inflow Area = 49.920 ac, 28.33% Impervious, Inflow Depth = 0.54" for Flood2 event
 Inflow = 10.41 cfs @ 12.68 hrs, Volume= 2.236 af
 Outflow = 9.75 cfs @ 12.82 hrs, Volume= 2.233 af, Atten= 6%, Lag= 8.3 min
 Primary = 9.75 cfs @ 12.82 hrs, Volume= 2.233 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 191.47' @ 12.82 hrs Surf.Area= 0.112 ac Storage= 0.150 af

Plug-Flow detention time= 19.6 min calculated for 2.233 af (100% of inflow)
 Center-of-Mass det. time= 18.8 min (970.9 - 952.1)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	0.807 af	45.00'W x 90.00'L x 6.00'H Prismatic Z=2.0

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	24.0" x 30.0' long Culvert CPP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 189.50' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	195.00'	5.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=9.75 cfs @ 12.82 hrs HW=191.47' TW=186.51' (Dynamic Tailwater)

- 1=Culvert (Barrel Controls 9.75 cfs @ 5.50 fps)
- 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond PS D: Proposed Storage D

Hydrograph

