HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

MEMORANDUM

12 October 2016
File No. 40373-342

SUBJECT: Run-on and Run-off Control Plan
Landfill 11
Dayton Power & Light Company
J.M. Stuart Electric Generating Station
Aberdeen, Ohio

Haley & Aldrich, Inc. has assisted Dayton Power & Light Company (DP&L) with creating the Run-on and Run-off Control Plan for Landfill 11 at the J.M. Stuart Station (JMSS) to satisfy requirements of the Environmental Protection Agency (EPA) 40 CFR Parts 257 and 261 "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities" (CCR Rule) section §257.81. Landfill 11 run-on and run-off control system existing conditions documentation has been reviewed and associated stormwater modeling and analysis performed as part of the evaluation to satisfy the Run-on and Run-off Control System Plan requirement of CCR Rule Section §257.81 as described below.

§257.81(a): The owner or operator of an existing or new CCR landfill or any lateral expansion of a CCR landfill must design, construct, operate, and maintain:

§257.81(a)(1): A run-on control system to prevent flow onto the active portion of the CCR unit during the peak discharge from a 24-hour, 25-year storm

Landfill 11 is being filled in two phases (west and east) and the entire 129 acre+/- landfill is currently deemed active. A significant volume of waste has been placed, temporarily covered and become well vegetated in the west half of the unit while. active disposal is ongoing within the eastern portion where significant additional capacity remains. Once the east portion has been filled to match the west elevations, both sides will be filled to final design elevations.

The existing run-on control system includes raised perimeter dikes/berms and raised access roads around the entire perimeter of the unit to prevent flow onto the active portion of the landfill. In addition, drainage swales north of the landfill, direct runoff to the east and west away from the unit along US Route 52.

§257.81(a)(2): A run-off control system from the active portion of the CCR unit to collect and control at least the water volume resulting from a 24-hour, 25-year storm.

The primary elements providing run-off control for the landfill include a perimeter channel that follows the perimeter of the unit and a series of let-down structures located on terraced benches that operate together to capture and convey stormwater runoff from the landfill. The western portion is currently not receiving CCRs and has a temporary soil cover with established vegetation. The eastern portion is currently receiving CCRs which are being placed to promote positive drainage towards the perimeter channel.

Terraced benches have been constructed on the western portion of the landfill. The benches are graded to convey stormwater to grated inlets at designated low points along each bench. The inlets are interconnected with pipes at adjoining benches to convey water down the sides of the landfill at specified locations and discharge into the perimeter channel. Four let down pipe systems are located on the western portion of the landfill. The perimeter channel is graded around the west half of the landfill in a counter-clockwise direction to convey runoff from the north, west and east sides to a set of three pipes which finally convey the water into Pond 6.

Benches and stormwater let down systems have not been constructed on the eastern portion of the landfill. As the eastern portion of the landfill continues to receive CCRs, benches, inlets, and pipes will be installed to provide additional control of stormwater runoff from the landfill. The perimeter channel of the eastern portion of the landfill collects and conveys water around the east half of the landfill in a clock-wise direction to a set of three pipes which finally convey the water into Pond 6.

Haley & Aldrich analyzed the existing stormwater run-on and run-off controls for Landfill 11 for the 24-hour, 25-year storm event using HydroCAD Stormwater Modeling System, version 10.00-12 (HydroCAD). The rainfall data for the analysis was obtained from NOAA Atlas 14 for Manchester, Ohio. Modeling was performed using a Soil Conservation Service Type-II rainfall distribution for the 24-hour 25-year storm event (4.99 inches). **Appendix 1** includes rainfall data used in the hydrologic model. The existing conditions and drainage area delineation map used to generate the run-on/runoff control model for the landfill was prepared using the most recent topographic field survey (prepared in 2013) and is included as **Figure 1**.

The HydroCAD model results included as **Appendix 2**, demonstrates that the east and west perimeter channels and discharge pipes are sufficient to collect, control and convey landfill runoff resulting from the 24 hour, 25-year storm event to Pond 6 without overtopping the channel.

§257.81(b): Run-off from the active portion of the CCR unit must be handled in accordance with the surface water requirement under §257.3-3.

> *§257.3-3(a): For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of pollutants into waters of the United States that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES) under section 402 of the Clean Water Act, as amended.*

<u>§257.3-3(b)</u>: For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of dredged material or fill material to waters of the United States that is in violation of the requirements under section 404 of the Clean Water Act, as amended.

<u>§257.3-3(c)</u>: A facility or practice shall not cause non-point source pollution of waters of the United States that violates applicable legal requirements implementing an areawide or Statewide water quality management plan that has been approved by the Administrator under section 208 of the Clean Water Act, as amended.

Discharge from Landfill11 is conveyed to Pond 6. Pond 6 discharges into Pond 7A and ultimately the Ohio River via NPDES Outfall 013. Discharge from the site is subject to the Authorization to Discharge under the National Pollution Discharge Elimination System dated 1 February 2013 and prepared by the Ohio Environmental Protection Agency.

<u>§257.81(c)(1)</u>: Contents of plan. The owner or operator must prepare initial and periodic run-on and run-off control system plans for the CCR unit according to the timeframes specified in paragraphs (c)(3) and (4) of this section. These plans must document how the run-on and run-off control systems have been designed and constructed to meet the applicable requirements of this section. Each plan must be supported by appropriate engineering calculations. The owner or operator has completed the initial run-on and run-off control system plan when the plan has been placed in the facility's operating record as required by §257.105(g)(3).

This document and all attachments serve as the initial Run-on Run-off control plan. Periodic Run-on and Run-off control plans will be prepared at 5-year increments or whenever there is a change in conditions that would affect the plan.

<u>§257.81(c)(2)</u>: Amendment of the plan. The owner or operator may amend the written run-on and run-off control system plan at any time provided the revised plan is placed in the facility's operating record as required by §257.105 (g) (3). The owner or operator must amend the written run-on and run-off control system plan whenever there is a change in conditions that would substantially affect the written plan in effect.

The written run-on and run-off control plan will be amended at least 60 days prior to a planned change in the operation of the facility or the CCR impoundment, or no later than 60 days after an unanticipated event requires the need to revise the plan. If the written run-on and run-off control plan needs to be revised after closure activities have commenced, the plan will be revised no later than 30 days following the triggering event.

Any amendments to the plan will include written certification from a qualified professional engineer that the initial and any amendments to the run-on and run-off control plan meet the requirements of the CCR Rule.

A record of amendments to the plan will be tracked below. The latest version of the run-on and run-off control plan will be noted on the front cover of the plan.

Version	Date	Description of Changes Made
1	12 October 2016	Initial Issue

<u>§257.81(c)(3)</u>: Timeframes for preparing the initial plan

(i) Existing CCR landfills. The owner or operator of the CCR unit must prepare an initial run-on and run-off control system plan no later than October 17, 2016

The Run-on and Run-off Control Plan has been prepared within the specified time.

(ii) New CCR landfills and any lateral expansion of a CCR landfill. The owner or operator must prepare the initial run-on and run-off control system plan no later than the date of initial receipt of CCR in the CCR unit.

N/A- Landfill 11 is an existing landfill.

<u>§257.81(c)(4)</u>: Frequency of revising the plan. The owner or operator of the CCR unit must prepare periodic run-on and run-off control system plans required by paragraph (c)(1) of this section every five years. The date of completing the initial plan is the basis for establishing the deadline to complete the first subsequent plan. The owner or operator may complete any required plan prior to the required deadline provided the owner or operator places the completed plan into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing a subsequent plan is based on the date of completing the previous plan. For purposes of this paragraph (c)(4), the owner or operator has completed a periodic run-on and run-off control system plan when the plan has been placed in the facility's operating record as required by §257.105(g)(3).

The Run-on and Run-off control system plan or any subsequent Run-on and Run-off control system plan will be assessed and amended whenever there is a change in operation of the CCR landfill that would substantially affect the Run-on and Run-off Control System Plan or when unanticipated events necessitate a revision of the plan either before or after closure activities have commenced.

Professional Engineer Certification

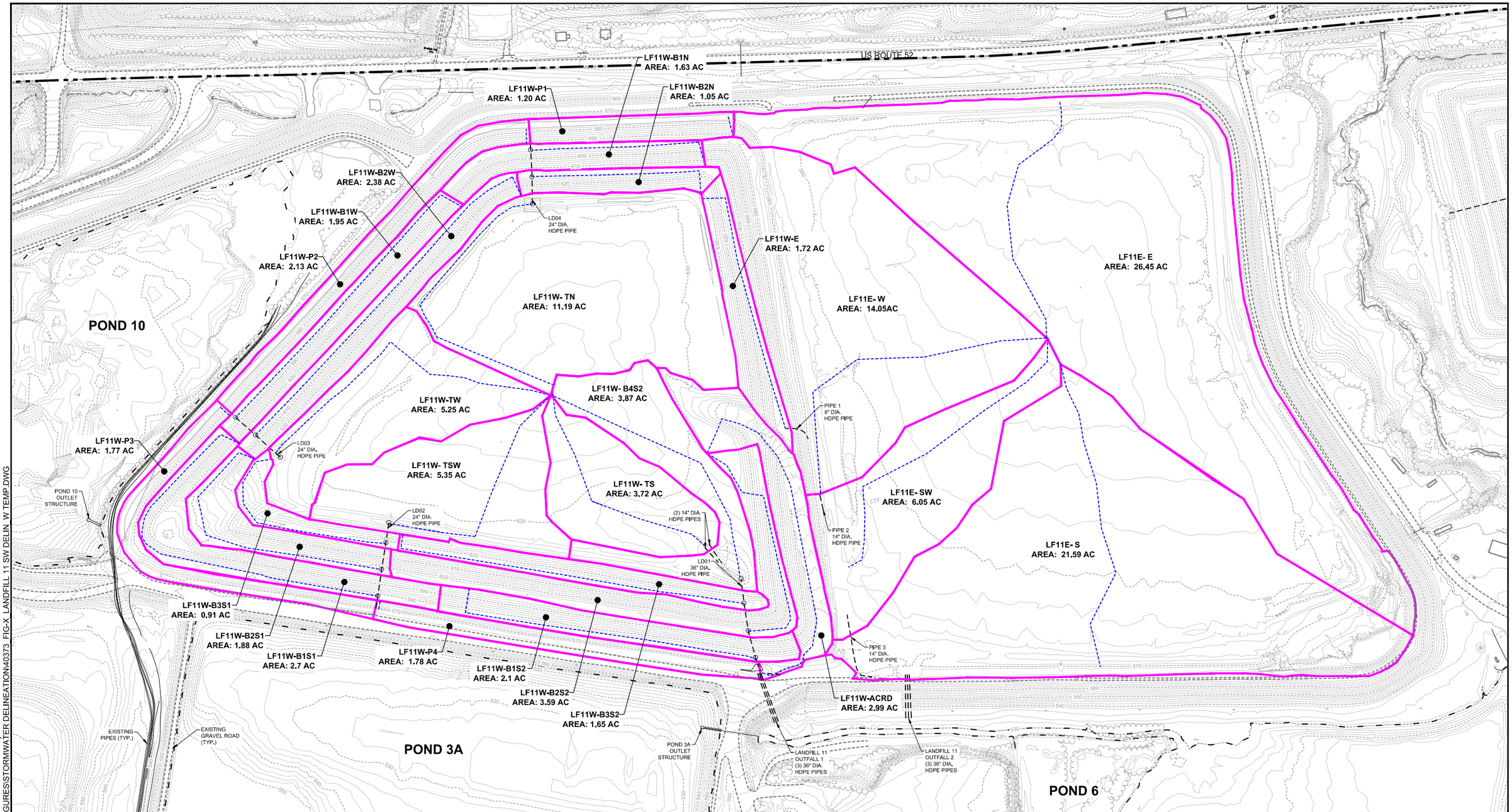
§257.81(c)(5): The owner or operator must obtain a certification from a qualified professional engineer stating that the initial and periodic run-on and run-off control system plans meet the requirements of this section.

I certify that the above-referenced run-on and run-on control system for DP&L's Landfill 11 at J.M. Stuart Electric Generating Station meet the USEPA's Final CCR Rule requirements of §257.81.

Signed: _____
Consulting Engineer

Print Name: Steven F. Putrich
Ohio License No.: 67329
Title: Vice President
Company: Haley & Aldrich, Inc.

Professional Engineer's Seal and date:



LEGEND

- EXISTING PROPERTY LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING PROCESS PIPES
- EXISTING STORMWATER PIPES
- EXISTING LETDOWN
- EXISTING GRAVEL ROAD
- STORMWATER DELINEATION
- TC

NOTES

1. TOPOGRAPHY FROM GROUND CONTROL SURVEYS DATED APRIL 2013 BY L.R. KIMBALL, AND FROM AERIAL PHOTOGRAPHY DATED APRIL 18, 2013.
   - HORIZONTAL CONTROL IS BASED ON NAD83 OH STATE PLANE DATUM.
   - VERTICAL CONTROL IS BASED ON NAVD88 DATUM, ADJUSTED IN VERTICAL TO PLANT VERTICAL.
2. TOPOGRAPHY FROM 2013 SURVEY WAS COMBINED WITH POND ATHYMETRY (POND 7 FROM 2012, POND 10 FROM 2013, PONDS 3A, 5, 6 FROM 2014).

0 300
SCALE IN FEET

HALEY ALDRICH

DAYTON POWER & LIGHT COMPANY
J.M. STUART STATION
ABERDEEN, OHIO

LANDFILL 11
STORMWATER DELINEATION PLAN

SCALE: AS SHOWN
MARCH 2016

FIGURE 1

VARI, KATALIN Printed: 3/30/2016 2:07 PM Layout: LF 11
G:\40373_DP&L\CAD-JMSS\GLOBAL\FIGURES\STORMWATER DELINEATION\40373_FIG-X_LANDFILL 11 SW DELIN_W TEMP.DWG

Appendix 1

NOAA Atlas 14, Volume 2, Version 3
Location name: Manchester, Ohio, US*
Latitude: 38.6375°, Longitude: -83.6749°
Elevation: 567 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	100
5-min	0.378 (0.344–0.415)	0.449 (0.409–0.495)	0.536 (0.488–0.590)	0.605 (0.549–0.665)	0.692 (0.626–0.759)	0.760 (0.686–0.833)	0.827 (0.741–0.905)	0.895 (0.799–0.980)	0.987 (0.875–1.08)	1.0 (0.930–
10-min	0.587 (0.534–0.645)	0.702 (0.639–0.773)	0.834 (0.759–0.917)	0.934 (0.848–1.03)	1.06 (0.958–1.16)	1.15 (1.04–1.26)	1.24 (1.12–1.36)	1.34 (1.19–1.46)	1.45 (1.29–1.59)	1.5 (1.35–
15-min	0.719 (0.654–0.791)	0.858 (0.781–0.945)	1.02 (0.932–1.13)	1.15 (1.04–1.26)	1.31 (1.18–1.43)	1.43 (1.29–1.56)	1.55 (1.39–1.69)	1.66 (1.48–1.82)	1.81 (1.61–1.98)	1.9 (1.69–
30-min	0.952 (0.866–1.05)	1.15 (1.05–1.27)	1.40 (1.28–1.54)	1.60 (1.45–1.75)	1.85 (1.67–2.03)	2.04 (1.84–2.24)	2.23 (2.00–2.44)	2.43 (2.16–2.66)	2.68 (2.38–2.94)	2.8 (2.54–
60-min	1.16 (1.06–1.28)	1.41 (1.28–1.55)	1.76 (1.60–1.93)	2.03 (1.84–2.23)	2.39 (2.17–2.63)	2.69 (2.42–2.95)	2.98 (2.68–3.27)	3.29 (2.94–3.60)	3.71 (3.29–4.06)	4.0 (3.56–
2-hr	1.36 (1.23–1.52)	1.65 (1.49–1.84)	2.06 (1.86–2.29)	2.39 (2.16–2.66)	2.85 (2.56–3.16)	3.23 (2.89–3.58)	3.63 (3.23–4.01)	4.05 (3.58–4.47)	4.64 (4.07–5.12)	5.1 (4.47–
3-hr	1.46 (1.32–1.63)	1.76 (1.59–1.96)	2.20 (1.99–2.46)	2.56 (2.31–2.85)	3.08 (2.76–3.42)	3.50 (3.12–3.88)	3.95 (3.51–4.37)	4.42 (3.91–4.88)	5.10 (4.47–5.63)	5.6 (4.93–
6-hr	1.76 (1.60–1.94)	2.11 (1.93–2.34)	2.63 (2.39–2.91)	3.06 (2.77–3.37)	3.67 (3.31–4.03)	4.18 (3.75–4.58)	4.72 (4.21–5.17)	5.30 (4.71–5.80)	6.14 (5.39–6.70)	6.8 (5.96–
12-hr	2.08 (1.90–2.28)	2.50 (2.28–2.75)	3.08 (2.82–3.39)	3.57 (3.26–3.92)	4.27 (3.88–4.67)	4.85 (4.38–5.29)	5.47 (4.91–5.95)	6.13 (5.48–6.66)	7.08 (6.27–7.68)	7.8 (6.91–
24-hr	2.44 (2.27–2.64)	2.92 (2.71–3.15)	3.60 (3.35–3.89)	4.17 (3.87–4.49)	4.99 (4.60–5.37)	5.67 (5.20–6.10)	6.39 (5.83–6.88)	7.17 (6.50–7.72)	8.29 (7.44–8.93)	9.2 (8.20–
2-day	2.90 (2.69–3.14)	3.46 (3.22–3.76)	4.25 (3.94–4.60)	4.89 (4.52–5.29)	5.79 (5.34–6.26)	6.53 (6.00–7.06)	7.30 (6.68–7.90)	8.12 (7.38–8.79)	9.28 (8.35–10.1)	10. (9.13–
3-day	3.10 (2.90–3.35)	3.70 (3.46–4.00)	4.52 (4.21–4.88)	5.18 (4.82–5.58)	6.10 (5.66–6.57)	6.85 (6.33–7.37)	7.63 (7.01–8.21)	8.44 (7.71–9.10)	9.58 (8.67–10.3)	10. (9.43–
4-day	3.31 (3.10–3.55)	3.95 (3.70–4.24)	4.80 (4.49–5.15)	5.48 (5.12–5.88)	6.42 (5.98–6.88)	7.17 (6.66–7.69)	7.95 (7.35–8.53)	8.76 (8.05–9.40)	9.88 (8.99–10.6)	10. (9.73–
7-day	3.93 (3.68–4.21)	4.67 (4.37–5.01)	5.64 (5.27–6.04)	6.42 (5.99–6.89)	7.53 (7.00–8.07)	8.42 (7.80–9.03)	9.36 (8.62–10.0)	10.3 (9.46–11.1)	11.7 (10.6–12.6)	12. (11.5–
10-day	4.47 (4.20–4.78)	5.31 (4.98–5.67)	6.37 (5.98–6.81)	7.24 (6.78–7.73)	8.44 (7.87–9.01)	9.41 (8.74–10.0)	10.4 (9.63–11.1)	11.4 (10.5–12.2)	12.9 (11.8–13.9)	14. (12.7–
20-day	6.14 (5.80–6.50)	7.26 (6.86–7.69)	8.56 (8.08–9.06)	9.59 (9.04–10.1)	11.0 (10.3–11.6)	12.0 (11.3–12.7)	13.1 (12.2–13.8)	14.1 (13.2–15.0)	15.5 (14.4–16.5)	16. (15.3–
30-day	7.74 (7.36–8.14)	9.11 (8.66–9.58)	10.6 (10.1–11.1)	11.7 (11.1–12.3)	13.3 (12.5–13.9)	14.4 (13.6–15.1)	15.5 (14.6–16.3)	16.6 (15.6–17.5)	18.0 (16.8–19.0)	19. (17.7–
45-day	9.85 (9.41–10.3)	11.6 (11.0–12.1)	13.2 (12.6–13.9)	14.5 (13.8–15.2)	16.0 (15.3–16.8)	17.2 (16.3–18.0)	18.2 (17.3–19.1)	19.2 (18.2–20.2)	20.5 (19.3–21.5)	21. (20.1–
60-day	11.8 (11.3–12.3)	13.8 (13.2–14.4)	15.7 (15.0–16.4)	17.1 (16.3–17.8)	18.8 (17.9–19.6)	20.0 (19.1–20.9)	21.2 (20.2–22.2)	22.2 (21.2–23.3)	23.5 (22.3–24.7)	24. (23.1–

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

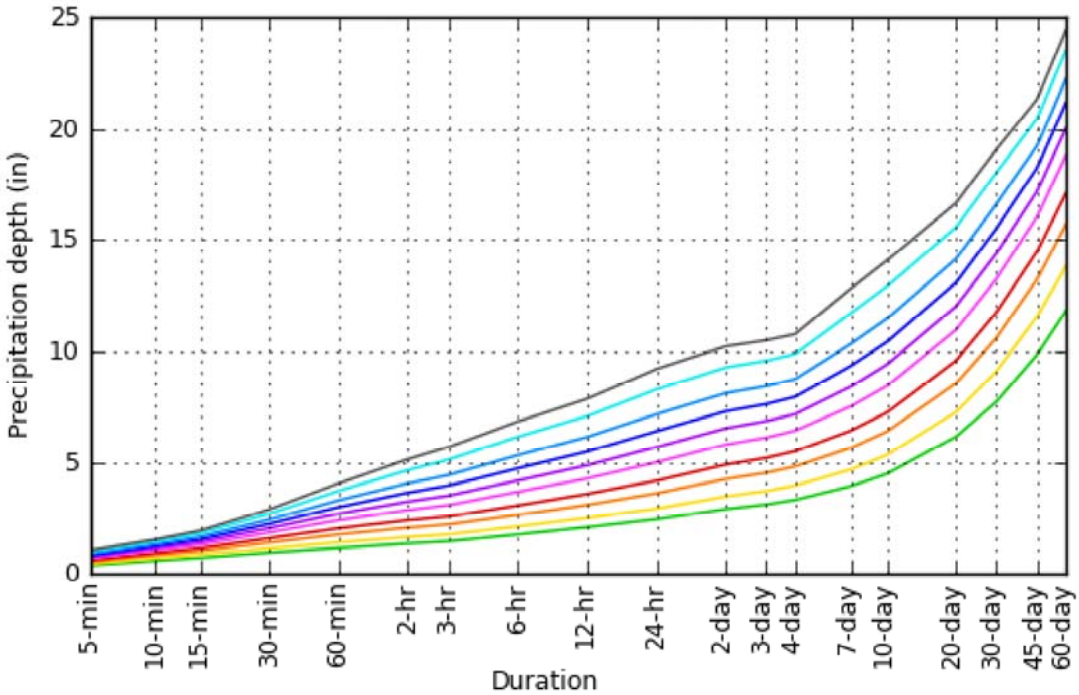
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (
given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are n
checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

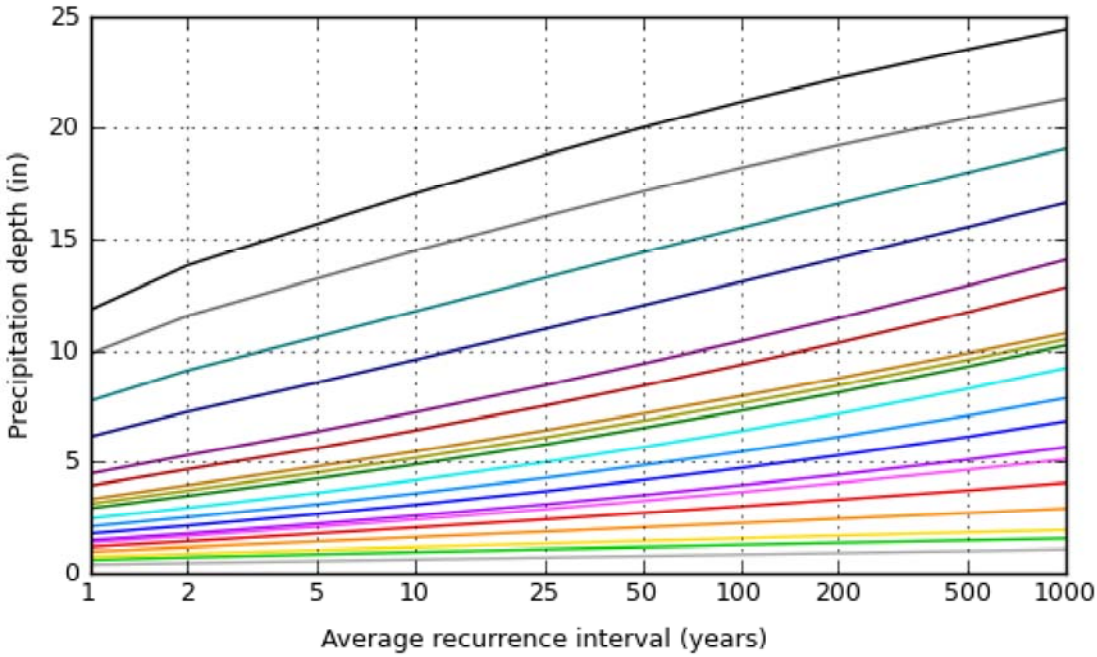
Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 38.6375°, Longitude: -83.6749°





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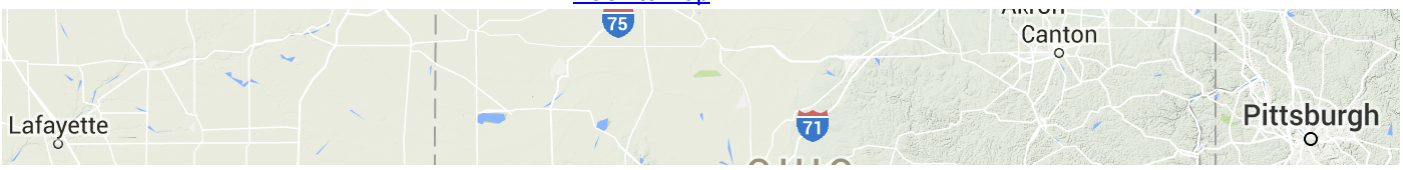
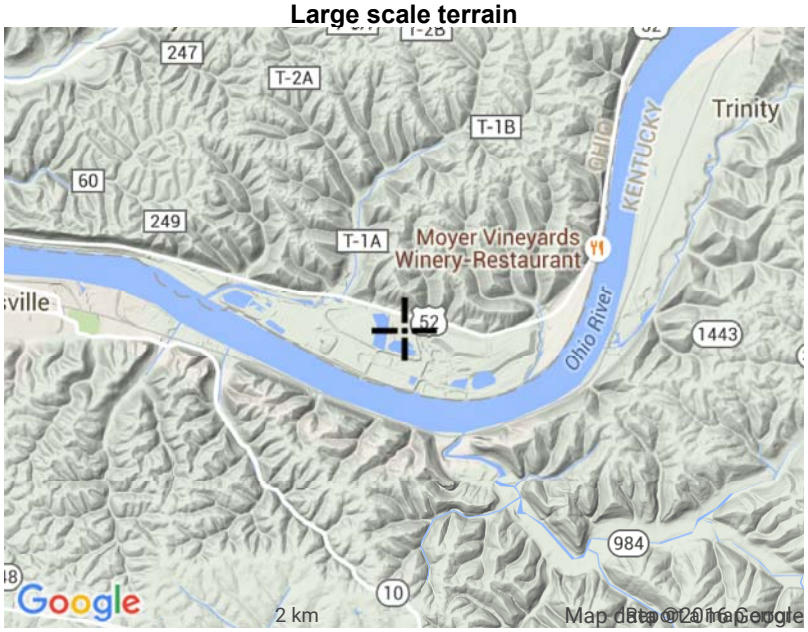
Back to Top



Large scale terrain



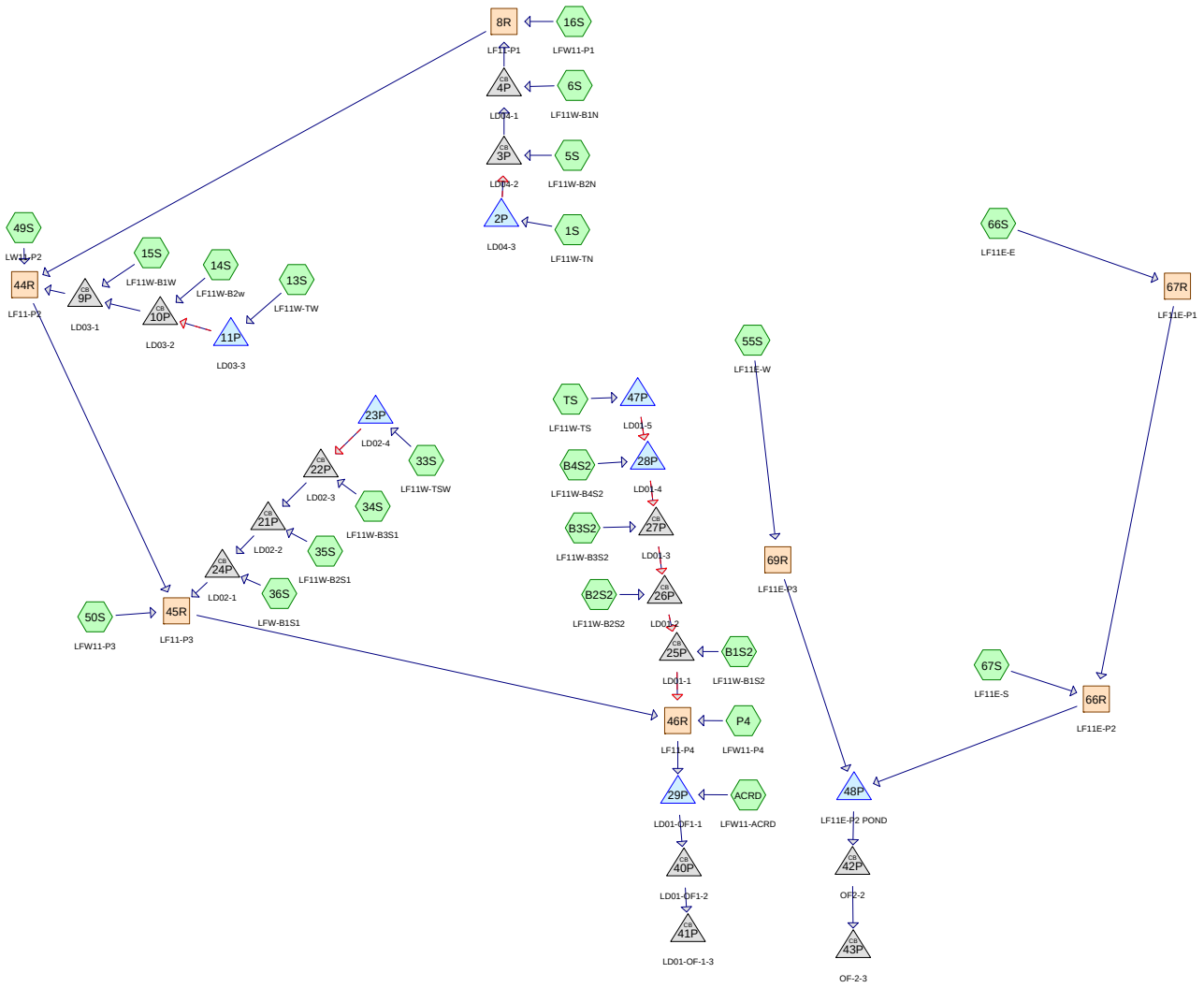
Large scale map

Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix 2



Subcat Reach Pond Link

Routing Diagram for LF 11 HydroCAD No temp pipes_rev5
Prepared by {enter your company name here}, Printed 10/12/2016
HydroCAD® 10.00 s/n 08262 © 2013 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
65.090	85	(55S, 66S, 67S)
64.030	74	>75% Grass cover, Good, HSG C (1S, 5S, 6S, 13S, 14S, 15S, 16S, 33S, 34S, 35S, 36S, 49S, 50S, 55S, ACRD, B1S2, B2S2, B3S2, B4S2, P4, TS)
129.120	**80**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
64.030	HSG C	1S, 5S, 6S, 13S, 14S, 15S, 16S, 33S, 34S, 35S, 36S, 49S, 50S, 55S, ACRD, B1S2, B2S2, B3S2, B4S2, P4, TS
0.000	HSG D	
65.090	Other	55S, 66S, 67S
129.120		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	65.090	65.090		55S, 66S, 67S
0.000	0.000	64.030	0.000	0.000	64.030	>75% Grass cover, Good	1S, 5S, 6S, 13S, 14S, 15S, 16S, 33S, 34S, 35S, 36S, 49S, 50S, 55S, ACRD, B1S2, B2S2, B3S2, B4S2, P4, TS
0.000	**0.000**	**64.030**	**0.000**	**65.090**	**129.120**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	2P	611.50	596.00	86.0	0.1802	0.013	24.0	0.0	0.0
2	3P	592.00	577.50	85.0	0.1706	0.013	24.0	0.0	0.0
3	4P	575.78	575.02	76.0	0.0100	0.013	24.0	0.0	0.0
4	9P	572.45	571.59	65.0	0.0132	0.013	24.0	0.0	0.0
5	10P	589.00	574.50	85.0	0.1706	0.013	24.0	0.0	0.0
6	11P	616.50	612.00	44.0	0.1023	0.013	24.0	0.0	0.0
7	21P	582.75	568.00	85.0	0.1735	0.013	24.0	0.0	0.0
8	22P	601.20	586.75	85.0	0.1700	0.013	24.0	0.0	0.0
9	23P	616.50	605.20	64.0	0.1766	0.013	24.0	0.0	0.0
10	24P	571.04	570.04	54.0	0.0185	0.013	24.0	0.0	0.0
11	25P	567.32	566.87	45.0	0.0100	0.013	36.0	0.0	0.0
12	26P	582.00	565.00	94.0	0.1809	0.013	36.0	0.0	0.0
13	27P	600.00	584.00	88.0	0.1818	0.013	36.0	0.0	0.0
14	28P	612.54	604.00	96.0	0.0890	0.013	36.0	0.0	0.0
15	29P	560.43	558.08	48.0	0.0490	0.013	36.0	0.0	0.0
16	40P	558.08	539.88	76.0	0.2395	0.013	36.0	0.0	0.0
17	41P	539.88	537.63	45.0	0.0500	0.013	36.0	0.0	0.0
18	42P	557.58	541.89	60.0	0.2615	0.013	36.0	0.0	0.0
19	43P	541.89	535.56	50.0	0.1266	0.013	36.0	0.0	0.0
20	47P	619.30	616.30	65.0	0.0462	0.013	14.0	0.0	0.0
21	48P	559.38	557.58	45.0	0.0400	0.013	36.0	0.0	0.0

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: LF11W-TN Runoff Area=11.190 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=1,003' Tc=19.7 min CN=74 Runoff=29.54 cfs 2.205 af

Subcatchment5S: LF11W-B2N Runoff Area=1.050 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=600' Tc=5.6 min CN=74 Runoff=4.51 cfs 0.207 af

Subcatchment6S: LF11W-B1N Runoff Area=1.630 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=610' Tc=5.1 min CN=74 Runoff=7.13 cfs 0.321 af

Subcatchment13S: LF11W-TW Runoff Area=5.250 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=1,154' Slope=0.0200 '/' Tc=21.7 min CN=74 Runoff=13.08 cfs 1.034 af

Subcatchment14S: LF11W-B2w Runoff Area=2.380 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=1,284' Tc=9.7 min CN=74 Runoff=8.78 cfs 0.469 af

Subcatchment15S: LF11W-B1W Runoff Area=1.950 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=1,180' Tc=9.5 min CN=74 Runoff=7.24 cfs 0.384 af

Subcatchment16S: LFW11-P1 Runoff Area=1.200 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=66' Slope=0.3300 '/' Tc=3.7 min CN=74 Runoff=5.53 cfs 0.236 af

Subcatchment33S: LF11W-TSW Runoff Area=5.350 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=922' Tc=20.3 min CN=74 Runoff=13.87 cfs 1.054 af

Subcatchment34S: LF11W-B3S1 Runoff Area=0.910 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=763' Tc=13.2 min CN=74 Runoff=2.96 cfs 0.179 af

Subcatchment35S: LF11W-B2S1 Runoff Area=1.880 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=930' Tc=7.3 min CN=74 Runoff=7.58 cfs 0.370 af

Subcatchment36S: LFW-B1S1 Runoff Area=2.700 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=1,256' Tc=9.5 min CN=74 Runoff=10.03 cfs 0.532 af

Subcatchment49S: LW11-P2 Runoff Area=2.130 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=46' Slope=0.3300 '/' Tc=2.8 min CN=74 Runoff=10.15 cfs 0.420 af

Subcatchment50S: LFW11-P3 Runoff Area=1.770 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=40' Slope=0.3300 '/' Tc=2.5 min CN=74 Runoff=8.52 cfs 0.349 af

Subcatchment55S: LF11E-W Runoff Area=23.640 ac 0.00% Impervious Runoff Depth=3.17"
Flow Length=1,055' Slope=0.0140 '/' Tc=10.0 min CN=83 Runoff=113.98 cfs 6.253 af

Subcatchment66S: LF11E-E Runoff Area=26.450 ac 0.00% Impervious Runoff Depth=3.37"
Flow Length=838' Slope=0.0097 '/' Tc=9.6 min CN=85 Runoff=135.90 cfs 7.424 af

Subcatchment67S: LF11E-S Runoff Area=19.940 ac 0.00% Impervious Runoff Depth=3.37"
Flow Length=1,001' Slope=0.0130 '/' Tc=9.8 min CN=85 Runoff=101.86 cfs 5.597 af

Subcatchment ACRD: LFW11-ACRD Runoff Area=2.990 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=1,151' Tc=21.8 min CN=74 Runoff=7.43 cfs 0.589 af

Subcatchment B1S2: LF11W-B1S2 Runoff Area=2.100 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=1,006' Tc=8.7 min CN=74 Runoff=8.04 cfs 0.414 af

Subcatchment B2S2: LF11W-B2S2 Runoff Area=3.590 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=787' Tc=30.0 min CN=74 Runoff=7.29 cfs 0.707 af

Subcatchment B3S2: LF11W-B3S2 Runoff Area=1.650 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=1,139' Slope=0.0050 '/' Tc=17.9 min CN=74 Runoff=4.61 cfs 0.325 af

Subcatchment B4S2: LF11W-B4S2 Runoff Area=3.870 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=902' Tc=21.6 min CN=74 Runoff=9.67 cfs 0.762 af

Subcatchment P4: LFW11-P4 Runoff Area=1.780 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=28' Slope=0.3300 '/' Tc=1.9 min CN=74 Runoff=8.75 cfs 0.351 af

Subcatchment TS: LF11W-TS Runoff Area=3.720 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=761' Tc=16.4 min CN=74 Runoff=10.87 cfs 0.733 af

Reach 8R: LF11-P1 Avg. Flow Depth=1.58' Max Vel=2.28 fps Inflow=33.81 cfs 3.326 af
n=0.030 L=642.0' S=0.0020 '/' Capacity=298.03 cfs Outflow=32.32 cfs 3.321 af

Reach 44R: LF11-P2 Avg. Flow Depth=1.99' Max Vel=2.59 fps Inflow=58.69 cfs 6.521 af
n=0.030 L=1,342.0' S=0.0020 '/' Capacity=298.27 cfs Outflow=51.36 cfs 6.499 af

Reach 45R: LF11-P3 Avg. Flow Depth=1.79' Max Vel=4.26 fps Inflow=75.92 cfs 9.816 af
n=0.017 L=1,398.0' S=0.0019 '/' Capacity=519.55 cfs Outflow=72.40 cfs 9.793 af

Reach 46R: LF11-P4 Avg. Flow Depth=2.11' Max Vel=4.72 fps Inflow=105.32 cfs 13.800 af
n=0.017 L=1,224.0' S=0.0020 '/' Capacity=526.97 cfs Outflow=102.70 cfs 13.775 af

Reach 66R: LF11E-P2 Avg. Flow Depth=2.08' Max Vel=7.52 fps Inflow=170.34 cfs 15.815 af
n=0.017 L=1,613.0' S=0.0052 '/' Capacity=845.94 cfs Outflow=159.86 cfs 15.791 af

Reach 67R: LF11E-P1 Avg. Flow Depth=2.28' Max Vel=3.35 fps Inflow=136.52 cfs 9.269 af
n=0.025 L=3,248.0' S=0.0020 '/' Capacity=358.30 cfs Outflow=81.92 cfs 9.206 af

Reach 69R: LF11E-P3 Avg. Flow Depth=1.63' Max Vel=6.96 fps Inflow=113.98 cfs 6.253 af
n=0.022 L=1,820.0' S=0.0097 '/' Capacity=895.55 cfs Outflow=102.59 cfs 6.253 af

Pond 2P: LD04-3 Peak Elev=616.31' Storage=120 cf Inflow=29.54 cfs 2.205 af
Primary=29.53 cfs 2.205 af Secondary=0.00 cfs 0.000 af Outflow=29.53 cfs 2.205 af

Pond 3P: LD04-2 Peak Elev=597.06' Inflow=30.46 cfs 2.412 af
24.0" Round Culvert n=0.013 L=85.0' S=0.1706 '/' Outflow=30.46 cfs 2.412 af

Pond 4P: LD04-1 Peak Elev=581.23' Inflow=31.89 cfs 2.733 af
24.0" Round Culvert n=0.013 L=76.0' S=0.0100 '/' Outflow=31.89 cfs 2.733 af

Pond 9P: LD03-1 Peak Elev=577.03' Inflow=25.29 cfs 1.887 af
24.0" Round Culvert n=0.013 L=65.0' S=0.0132 '/' Outflow=25.29 cfs 1.887 af

Pond 10P: LD03-2 Peak Elev=591.52' Inflow=18.63 cfs 1.503 af
24.0" Round Culvert n=0.013 L=85.0' S=0.1706 '/' Outflow=18.63 cfs 1.503 af

Pond 11P: LD03-3 Peak Elev=618.24' Storage=44 cf Inflow=13.08 cfs 1.034 af
Primary=13.08 cfs 1.034 af Secondary=0.00 cfs 0.000 af Outflow=13.08 cfs 1.034 af

Pond 21P: LD02-2 Peak Elev=585.53' Inflow=20.20 cfs 1.604 af
24.0" Round Culvert n=0.013 L=85.0' S=0.1735 '/' Outflow=20.20 cfs 1.604 af

Pond 22P: LD02-3 Peak Elev=603.36' Inflow=16.30 cfs 1.233 af
24.0" Round Culvert n=0.013 L=85.0' S=0.1700 '/' Outflow=16.30 cfs 1.233 af

Pond 23P: LD02-4 Peak Elev=618.33' Storage=46 cf Inflow=13.87 cfs 1.054 af
Primary=13.87 cfs 1.054 af Secondary=0.00 cfs 0.000 af Outflow=13.87 cfs 1.054 af

Pond 24P: LD02-1 Peak Elev=577.07' Inflow=29.94 cfs 2.136 af
24.0" Round Culvert n=0.013 L=54.0' S=0.0185 '/' Outflow=29.94 cfs 2.136 af

Pond 25P: LD01-1 Peak Elev=570.25' Inflow=31.70 cfs 2.942 af
Primary=31.70 cfs 2.942 af Secondary=0.00 cfs 0.000 af Outflow=31.70 cfs 2.942 af

Pond 26P: LD01-2 Peak Elev=584.27' Inflow=29.41 cfs 2.528 af
Primary=29.41 cfs 2.528 af Secondary=0.00 cfs 0.000 af Outflow=29.41 cfs 2.528 af

Pond 27P: LD01-3 Peak Elev=601.92' Inflow=22.63 cfs 1.820 af
Primary=22.63 cfs 1.820 af Secondary=0.00 cfs 0.000 af Outflow=22.63 cfs 1.820 af

Pond 28P: LD01-4 Peak Elev=614.25' Storage=2,095 cf Inflow=18.96 cfs 1.495 af
Primary=18.59 cfs 1.495 af Secondary=0.00 cfs 0.000 af Outflow=18.59 cfs 1.495 af

Pond 29P: LD01-OF1-1 Peak Elev=563.07' Storage=132 cf Inflow=109.43 cfs 14.365 af
Primary=109.43 cfs 14.364 af Secondary=0.00 cfs 0.000 af Outflow=109.43 cfs 14.364 af

Pond 40P: LD01-OF1-2 Peak Elev=560.72' Inflow=109.43 cfs 14.364 af
36.0" Round Culvert x 3.00 n=0.013 L=76.0' S=0.2395 '/' Outflow=109.43 cfs 14.364 af

Pond 41P: LD01-OF-1-3 Peak Elev=542.84' Inflow=109.43 cfs 14.364 af
36.0" Round Culvert x 3.00 n=0.013 L=45.0' S=0.0500 '/' Outflow=109.43 cfs 14.364 af

Pond 42P: OF2-2 Peak Elev=561.55' Inflow=160.43 cfs 22.040 af
36.0" Round Culvert x 3.00 n=0.013 L=60.0' S=0.2615 '/' Outflow=160.43 cfs 22.040 af

Pond 43P: OF-2-3 Peak Elev=546.56' Inflow=160.43 cfs 22.040 af
36.0" Round Culvert x 3.00 n=0.013 L=50.0' S=0.1266 '/' Outflow=160.43 cfs 22.040 af

Pond 47P: LD01-5 Peak Elev=621.19' Storage=1,460 cf Inflow=10.87 cfs 0.733 af
Primary=9.29 cfs 0.733 af Secondary=0.00 cfs 0.000 af Outflow=9.29 cfs 0.733 af

Pond 48P: LF11E-P2 POND Peak Elev=568.62' Storage=87,698 cf Inflow=261.41 cfs 22.044 af
Primary=160.43 cfs 22.040 af Secondary=0.00 cfs 0.000 af Outflow=160.43 cfs 22.040 af

Total Runoff Area = 129.120 ac Runoff Volume = 30.915 af Average Runoff Depth = 2.87"
100.00% Pervious = 129.120 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: LF11W-TN

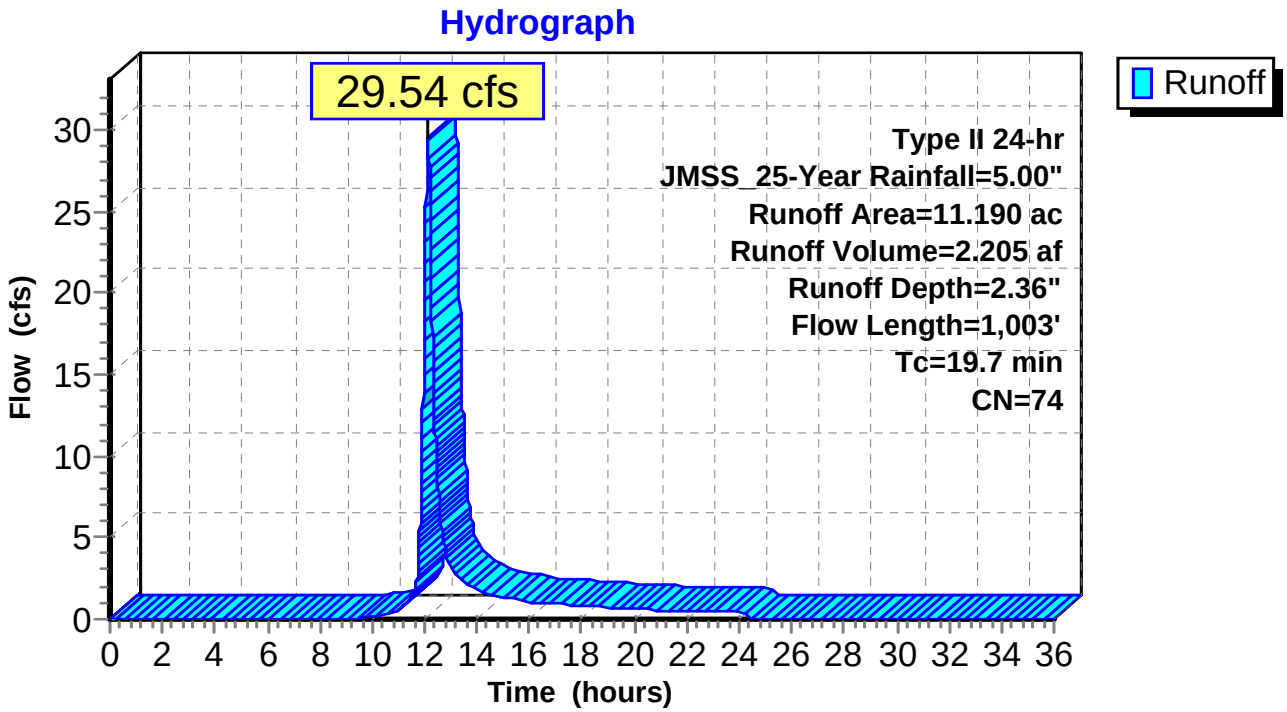
Runoff = 29.54 cfs @ 12.13 hrs, Volume= 2.205 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
11.190	74	>75% Grass cover, Good, HSG C
11.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.5	603	0.0050	6.54	559.59	**Channel Flow,** Area= 85.5 sf Perim= 44.0' r= 1.94' n= 0.025 Earth, clean & winding
19.7	1,003	Total			

Subcatchment 1S: LF11W-TN



Summary for Subcatchment 5S: LF11W-B2N

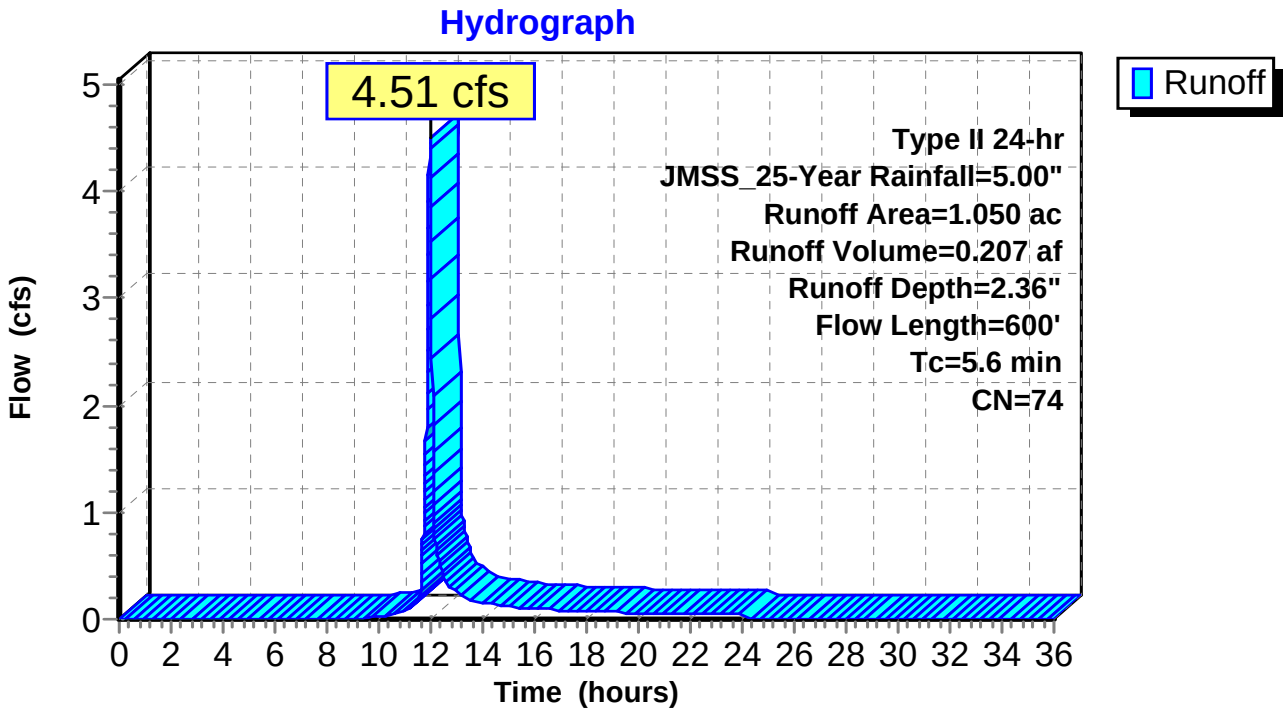
Runoff = 4.51 cfs @ 11.97 hrs, Volume= 0.207 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
1.050	74	>75% Grass cover, Good, HSG C
1.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0660	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
2.1	52	0.3300	0.41		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.56"
0.8	528	0.0500	10.89	200.43	**Channel Flow,** Area= 18.4 sf Perim= 24.8' r= 0.74' n= 0.025 Earth, clean & straight
5.6	600	Total			

Subcatchment 5S: LF11W-B2N



Summary for Subcatchment 6S: LF11W-B1N

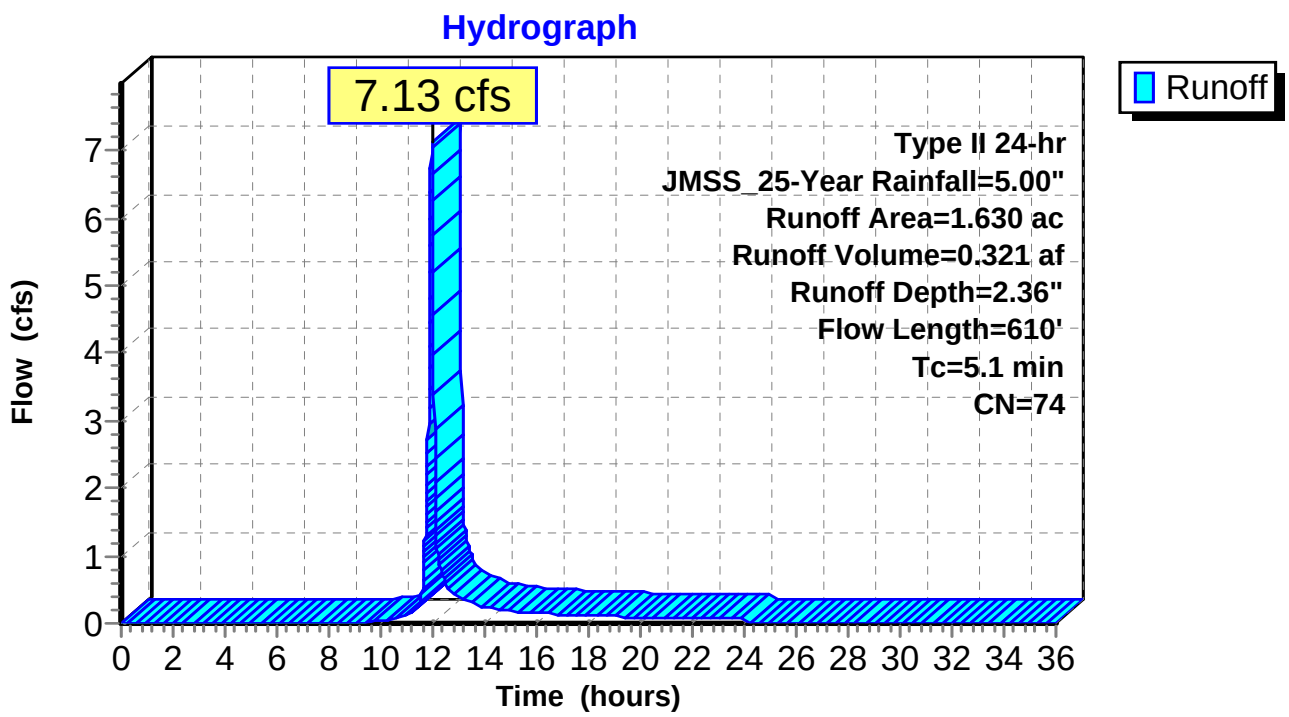
Runoff = 7.13 cfs @ 11.96 hrs, Volume= 0.321 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
1.630	74	>75% Grass cover, Good, HSG C
1.630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	80	0.3300	0.31		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
0.8	530	0.0500	10.89	200.43	**Channel Flow,** Area= 18.4 sf Perim= 24.8' r= 0.74' n= 0.025 Earth, clean & straight
5.1	610	Total			

Subcatchment 6S: LF11W-B1N



Summary for Subcatchment 13S: LF11W-TW

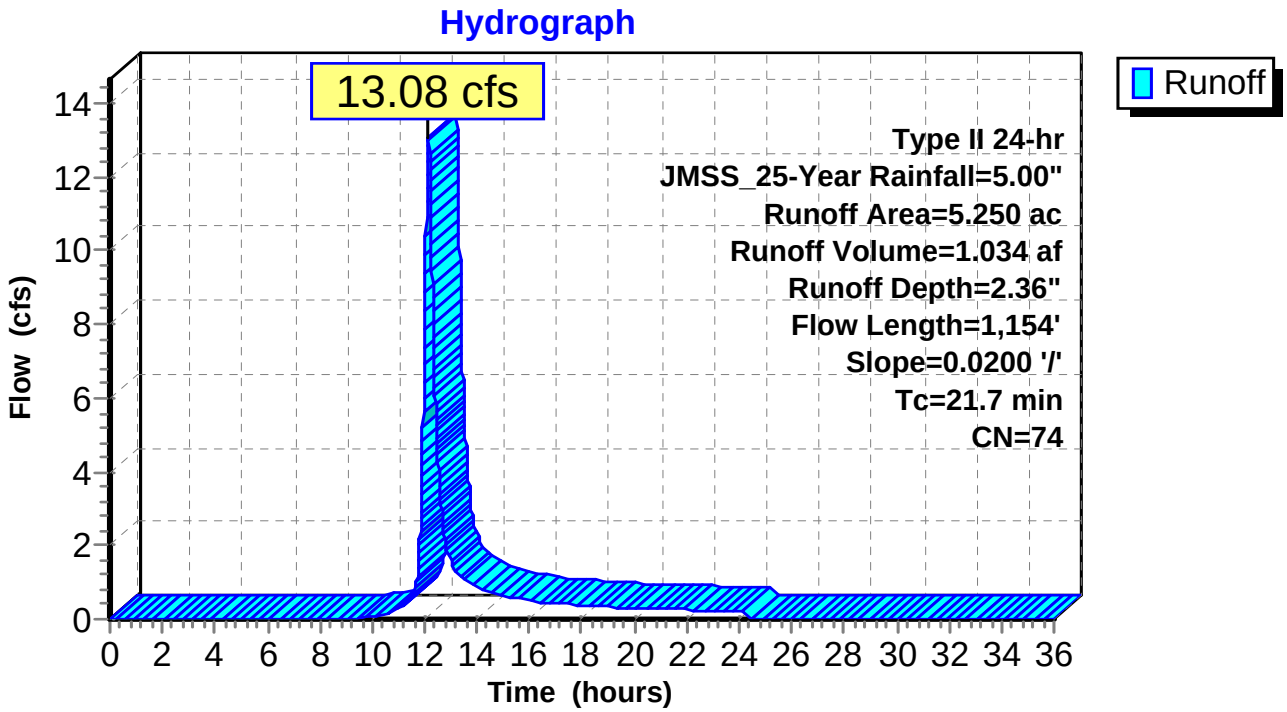
Runoff = 13.08 cfs @ 12.15 hrs, Volume= 1.034 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
5.250	74	>75% Grass cover, Good, HSG C
5.250		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
3.3	450	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.4	604	0.0200	4.28	5.14	**Channel Flow,** Area= 1.2 sf Perim= 3.3' r= 0.36' n= 0.025 Earth, grassed & winding
21.7	1,154	Total			

Subcatchment 13S: LF11W-TW



Summary for Subcatchment 14S: LF11W-B2w

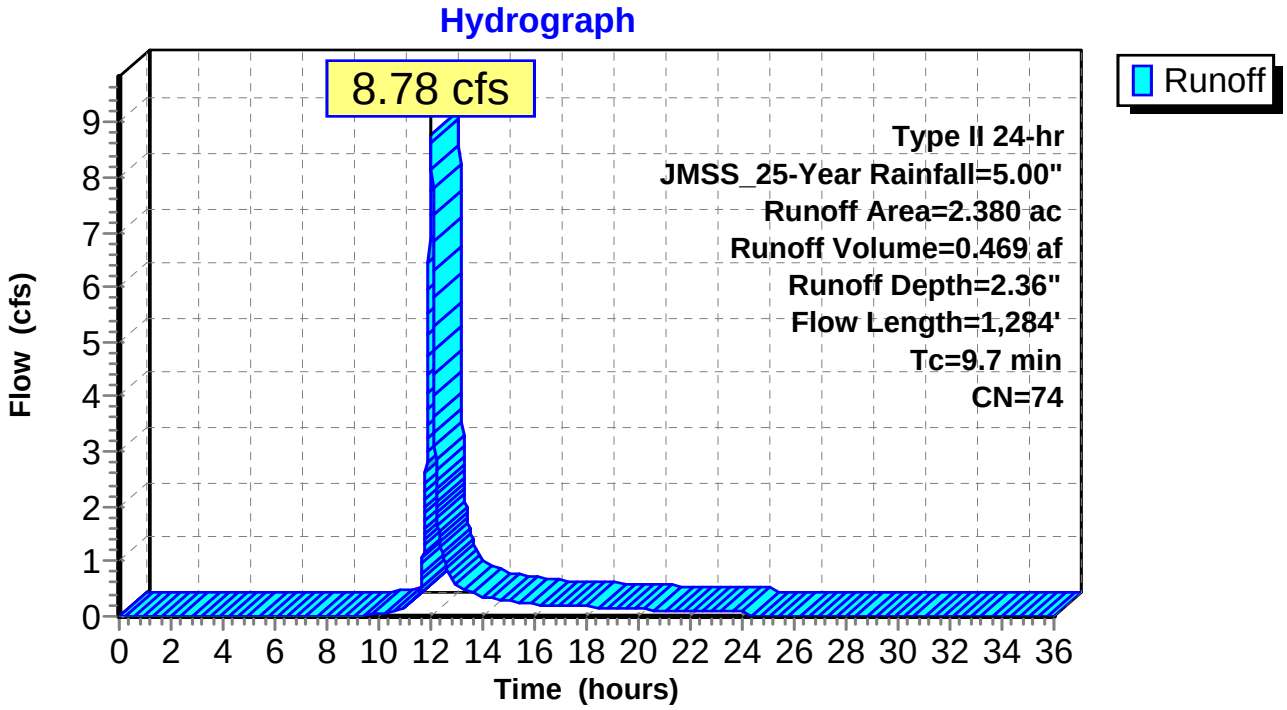
Runoff = 8.78 cfs @ 12.02 hrs, Volume= 0.469 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
2.380	74	>75% Grass cover, Good, HSG C
2.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	67	0.3300	0.30		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
5.9	1,217	0.0050	3.44	63.38	**Channel Flow,** Area= 18.4 sf Perim= 24.8' r= 0.74' n= 0.025 Earth, clean & straight
9.7	1,284	Total			

Subcatchment 14S: LF11W-B2w



Summary for Subcatchment 15S: LF11W-B1W

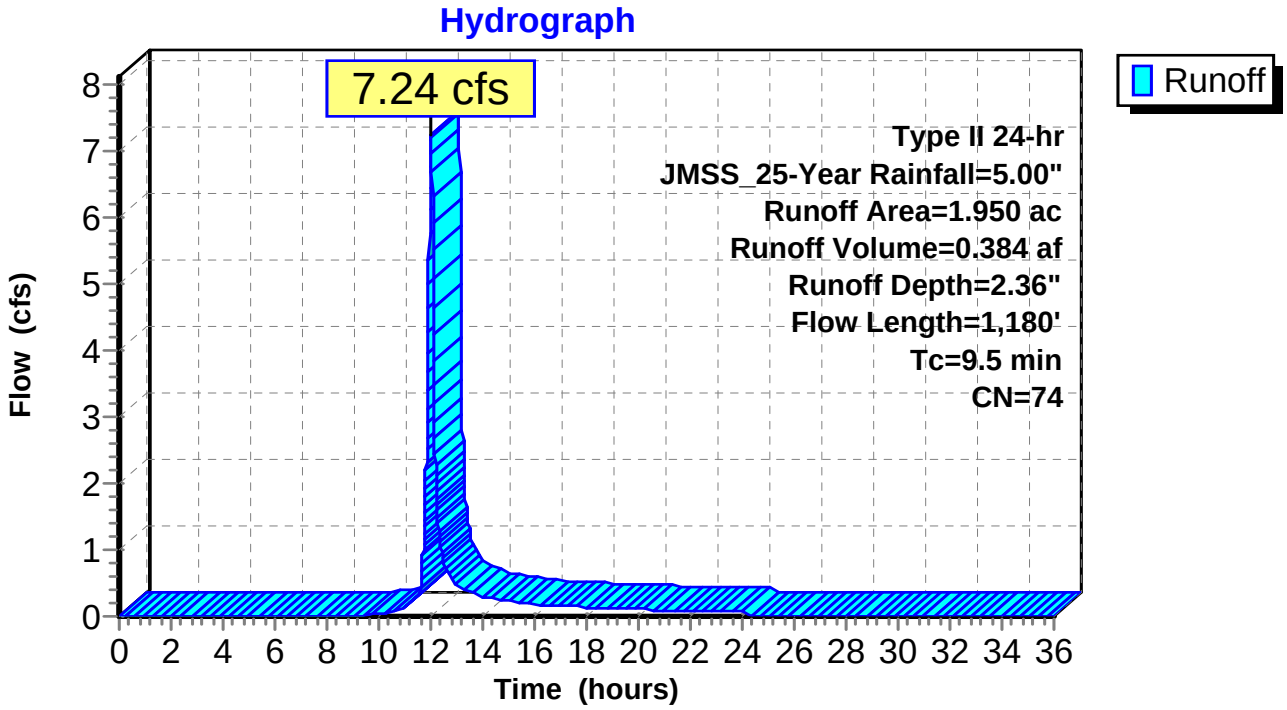
Runoff = 7.24 cfs @ 12.01 hrs, Volume= 0.384 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
1.950	74	>75% Grass cover, Good, HSG C
1.950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	76	0.3300	0.30		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
5.3	1,104	0.0050	3.44	63.38	**Channel Flow,** Area= 18.4 sf Perim= 24.8' r= 0.74' n= 0.025 Earth, clean & straight
9.5	1,180	Total			

Subcatchment 15S: LF11W-B1W



Summary for Subcatchment 16S: LFW11-P1

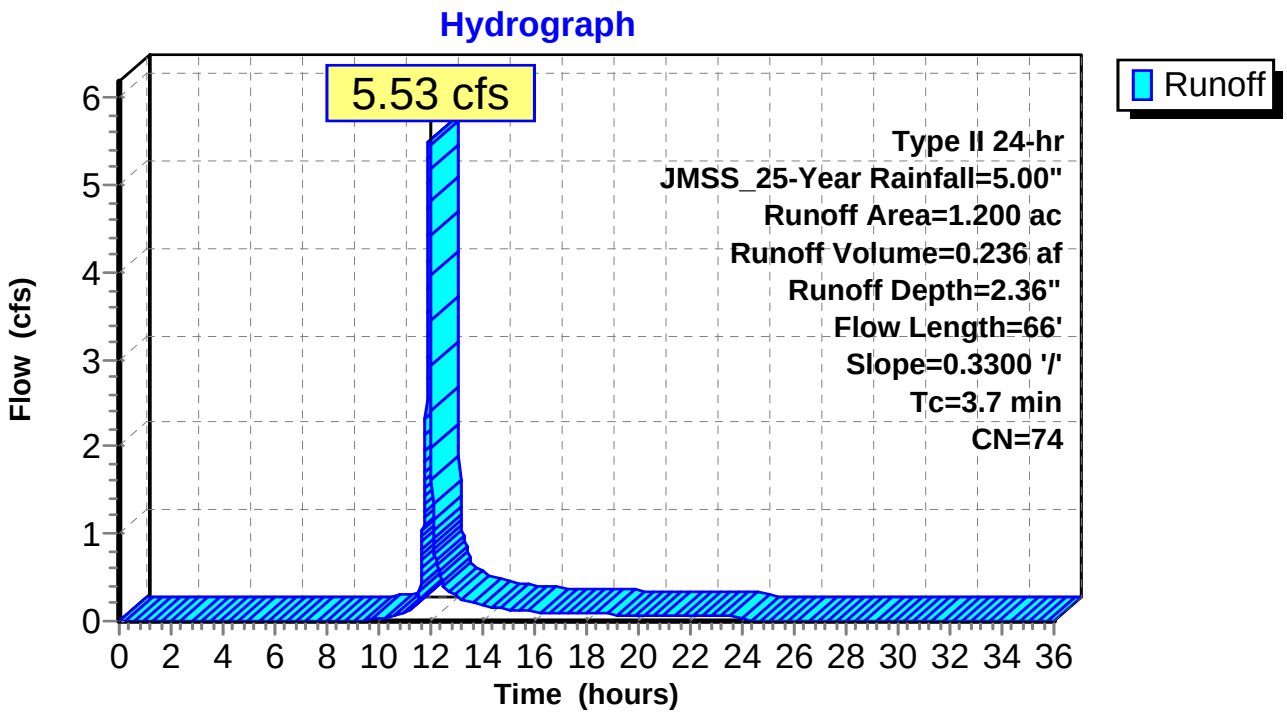
Runoff = 5.53 cfs @ 11.95 hrs, Volume= 0.236 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
1.200	74	>75% Grass cover, Good, HSG C
1.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	66	0.3300	0.30		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"

Subcatchment 16S: LFW11-P1



Summary for Subcatchment 33S: LF11W-TSW

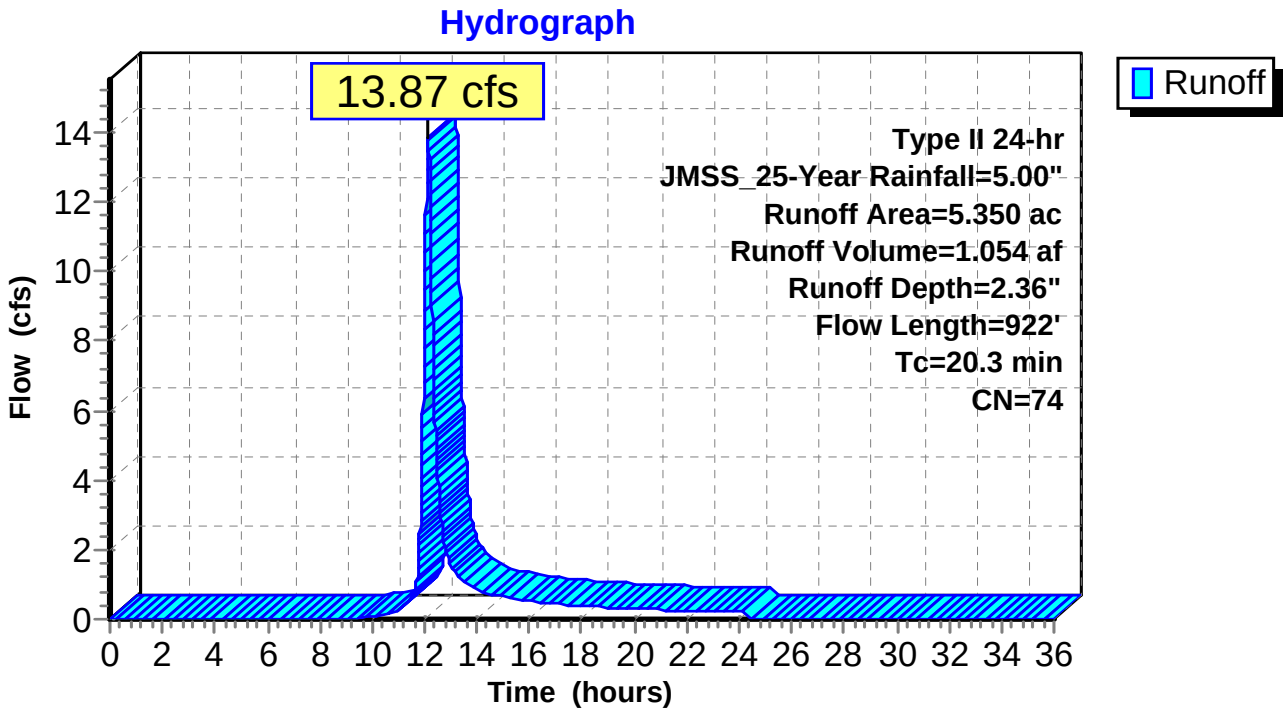
Runoff = 13.87 cfs @ 12.13 hrs, Volume= 1.054 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
5.350	74	>75% Grass cover, Good, HSG C
5.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	100	0.0191	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
3.1	411	0.0191	2.23		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.9	411	0.0050	7.49	793.71	**Channel Flow,** Area= 106.0 sf Perim= 54.0' r= 1.96' n= 0.022 Earth, clean & straight
20.3	922	Total			

Subcatchment 33S: LF11W-TSW



Summary for Subcatchment 34S: LF11W-B3S1

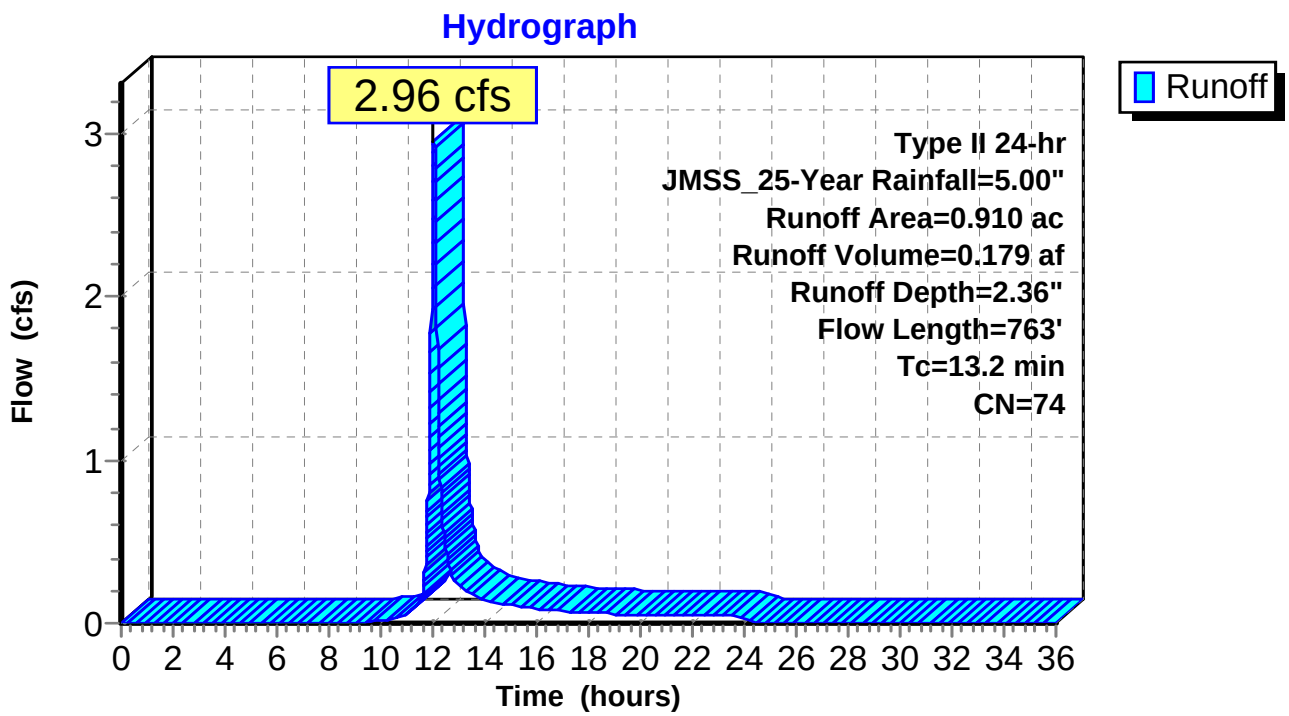
Runoff = 2.96 cfs @ 12.05 hrs, Volume= 0.179 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
0.910	74	>75% Grass cover, Good, HSG C
0.910		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0750	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
0.6	163	0.0750	4.41		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.2	500	0.0050	2.62	29.39	**Channel Flow,** Area= 11.2 sf Perim= 22.7' r= 0.49' n= 0.025 Earth, clean & straight
13.2	763	Total			

Subcatchment 34S: LF11W-B3S1



Summary for Subcatchment 35S: LF11W-B2S1

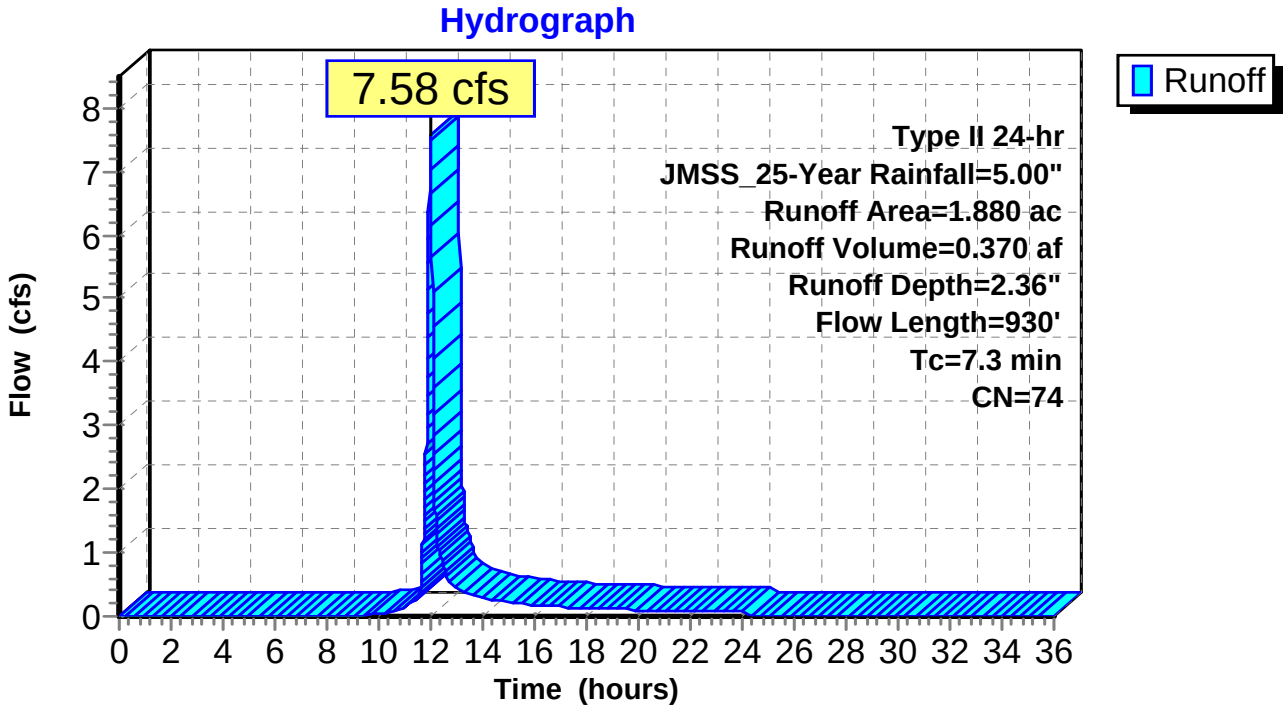
Runoff = 7.58 cfs @ 11.99 hrs, Volume= 0.370 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
1.880	74	>75% Grass cover, Good, HSG C
1.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	52	0.3300	0.28		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
4.2	878	0.0050	3.44	63.38	**Channel Flow,** Area= 18.4 sf Perim= 24.8' r= 0.74' n= 0.025 Earth, clean & straight
7.3	930	Total			

Subcatchment 35S: LF11W-B2S1



Summary for Subcatchment 36S: LFW-B1S1

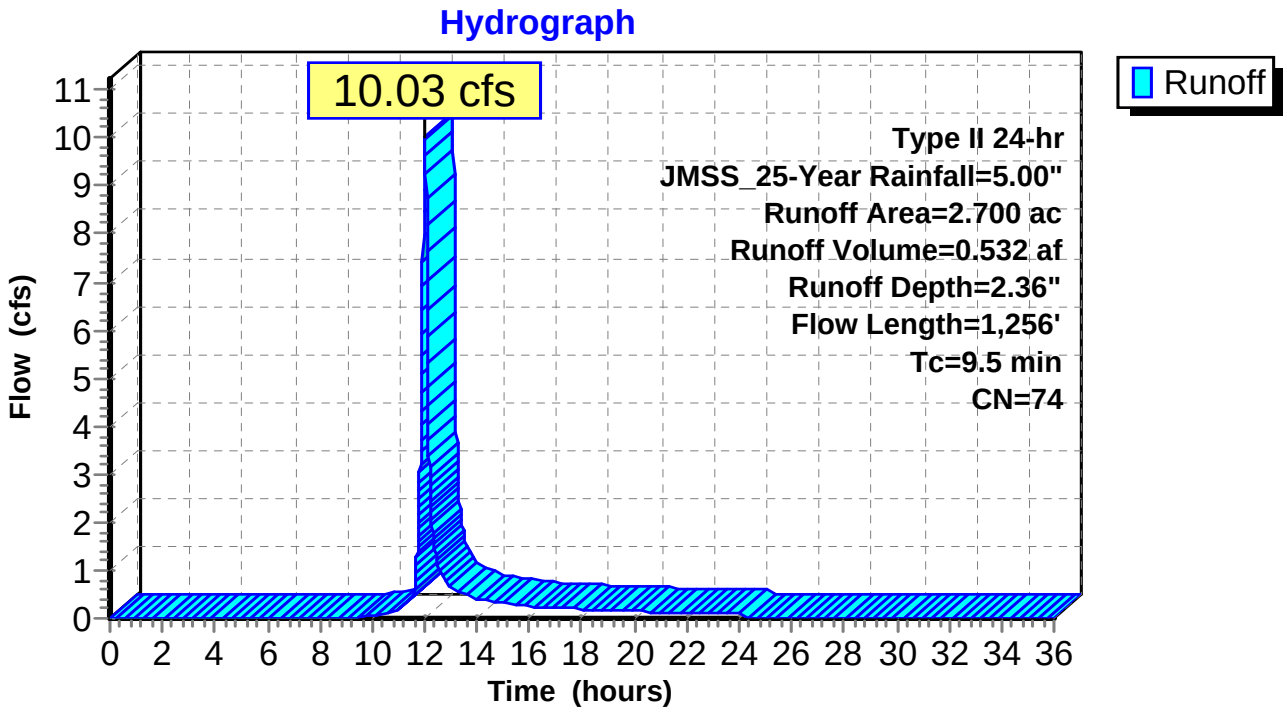
Runoff = 10.03 cfs @ 12.01 hrs, Volume= 0.532 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
2.700	74	>75% Grass cover, Good, HSG C
2.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	65	0.3300	0.29		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
5.8	1,191	0.0050	3.44	63.38	**Channel Flow,** Area= 18.4 sf Perim= 24.8' r= 0.74' n= 0.025 Earth, clean & straight
9.5	1,256	Total			

Subcatchment 36S: LFW-B1S1



Summary for Subcatchment 49S: LW11-P2

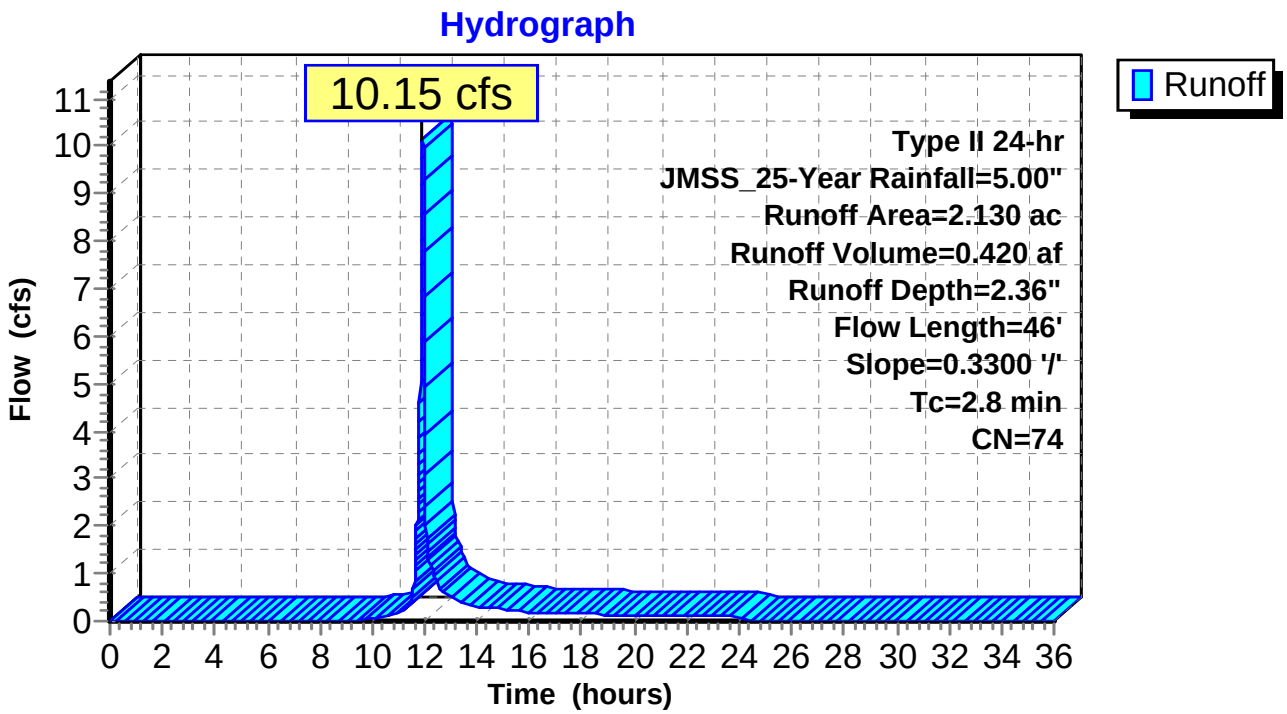
Runoff = 10.15 cfs @ 11.94 hrs, Volume= 0.420 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
2.130	74	>75% Grass cover, Good, HSG C
2.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	46	0.3300	0.27		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"

Subcatchment 49S: LW11-P2



Summary for Subcatchment 50S: LFW11-P3

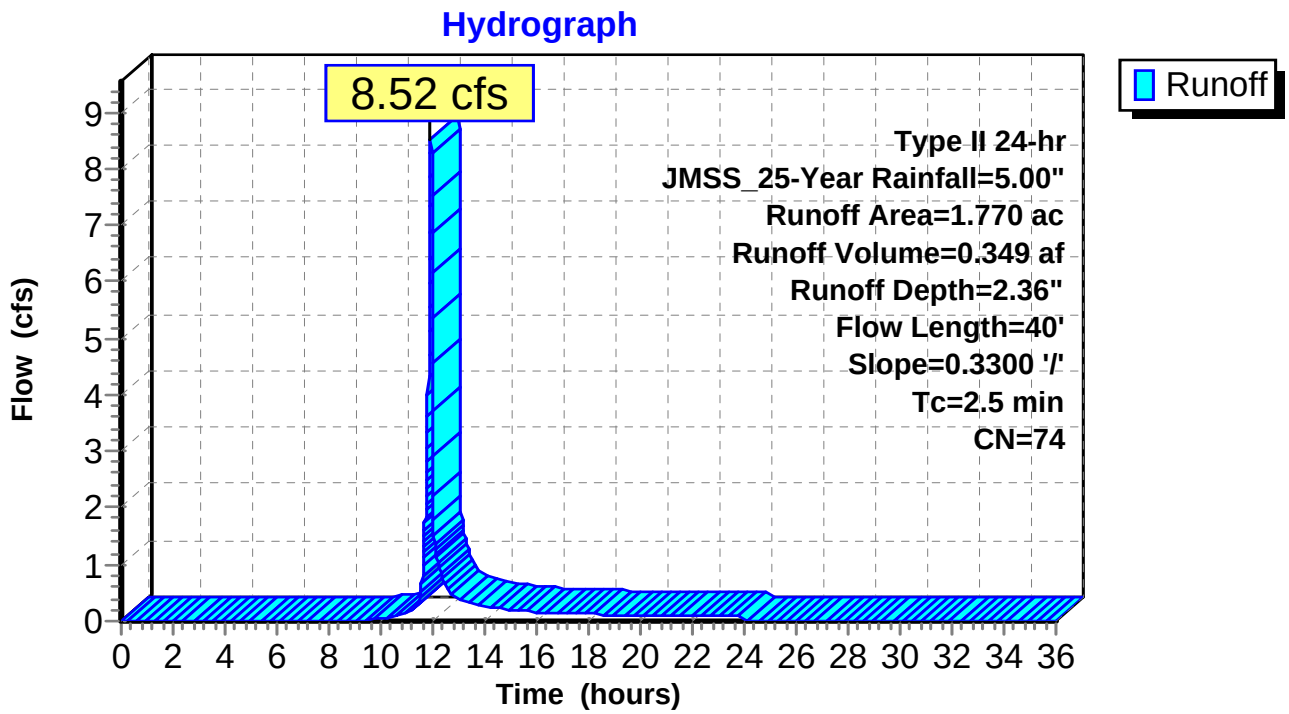
Runoff = 8.52 cfs @ 11.93 hrs, Volume= 0.349 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
1.770	74	>75% Grass cover, Good, HSG C
1.770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	40	0.3300	0.27		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"

Subcatchment 50S: LFW11-P3



Summary for Subcatchment 55S: LF11E-W

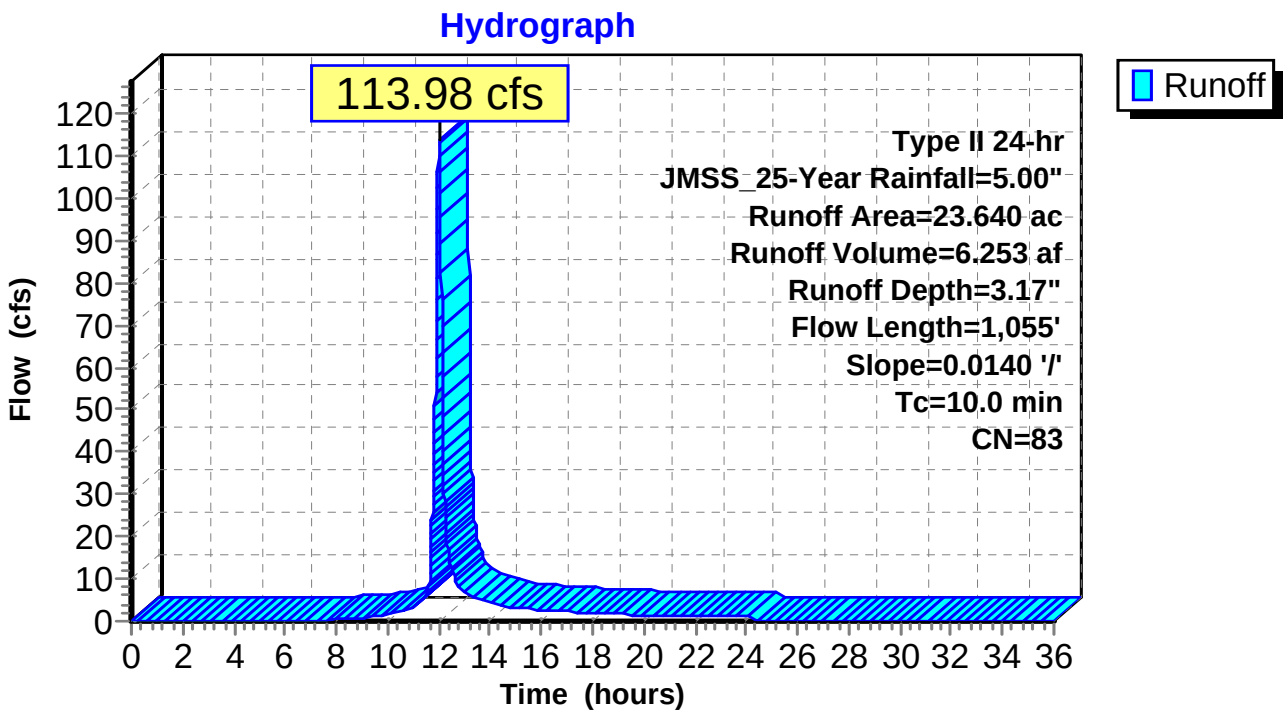
Runoff = 113.98 cfs @ 12.01 hrs, Volume= 6.253 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

	Area (ac)	CN	Description
*	18.700	85	
	4.940	74	>75% Grass cover, Good, HSG C
	23.640	83	Weighted Average
	23.640		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0140	1.07		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.56"
8.4	955	0.0140	1.90		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.0	1,055	Total			

Subcatchment 55S: LF11E-W



Summary for Subcatchment 66S: LF11E-E

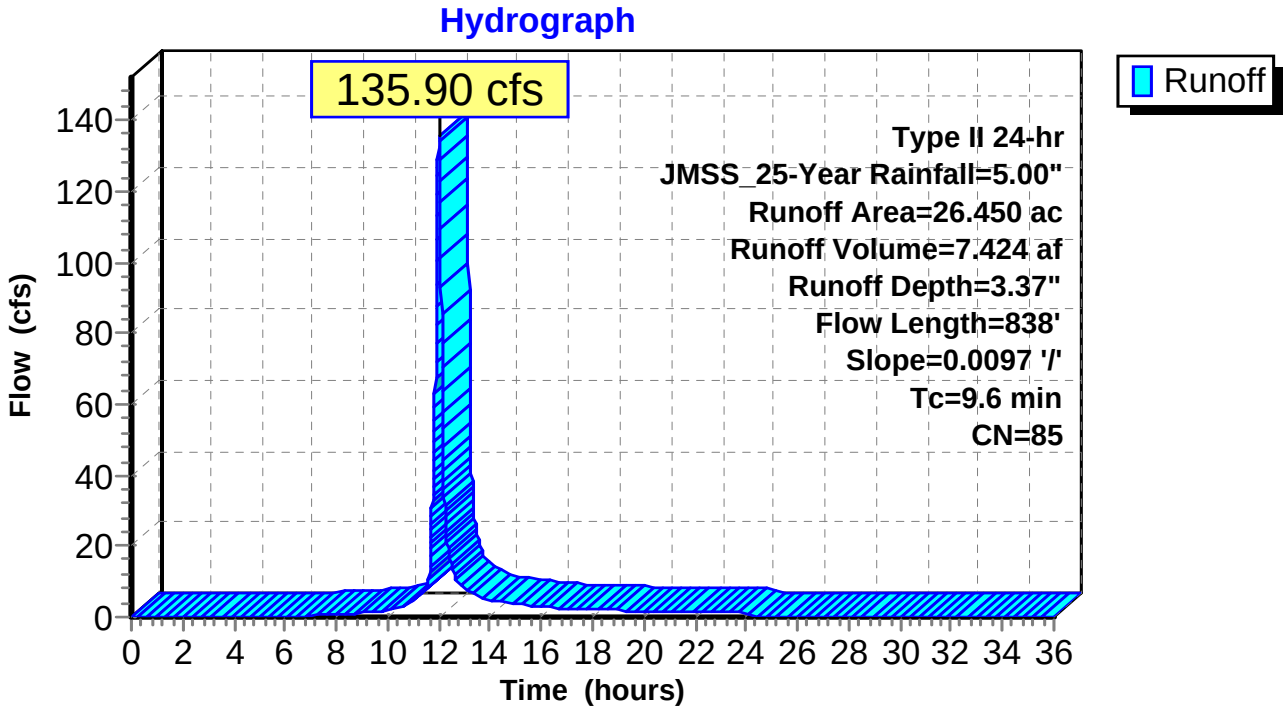
Runoff = 135.90 cfs @ 12.01 hrs, Volume= 7.424 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

	Area (ac)	CN	Description
*	26.450	85	
	26.450		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0097	0.92		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.56"
7.8	738	0.0097	1.59		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
9.6	838	Total			

Subcatchment 66S: LF11E-E



Summary for Subcatchment 67S: LF11E-S

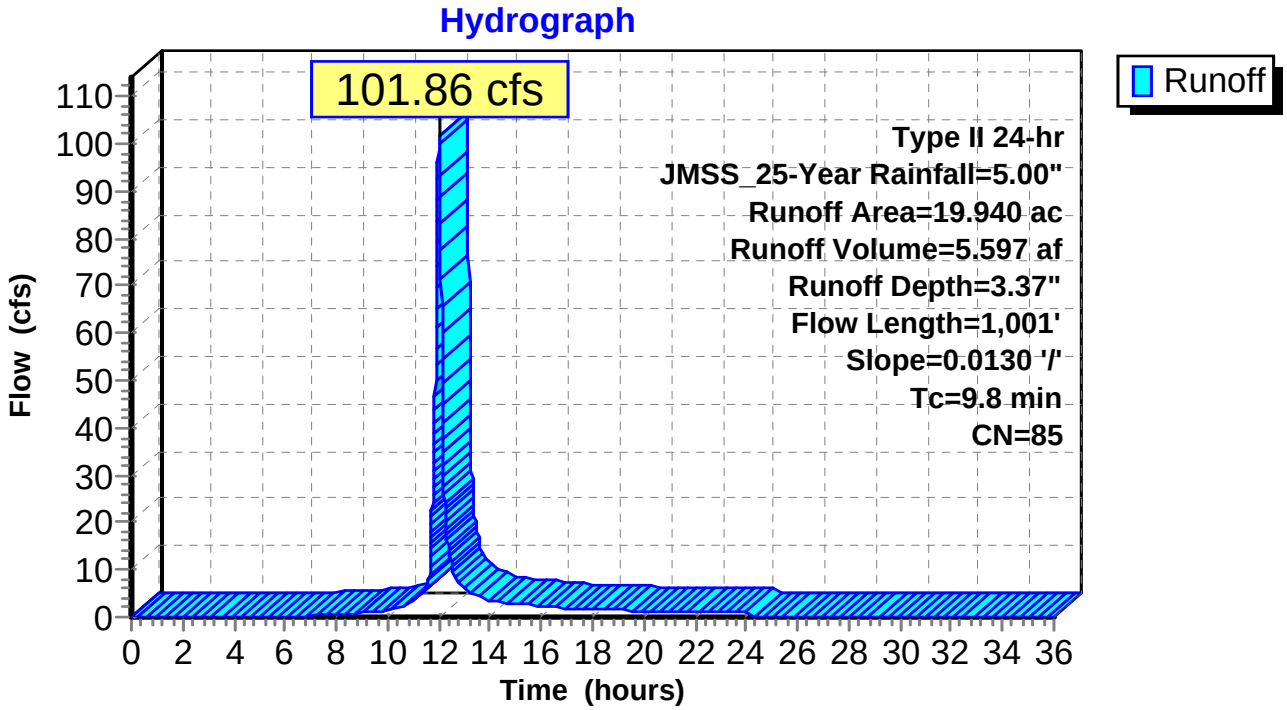
Runoff = 101.86 cfs @ 12.01 hrs, Volume= 5.597 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

	Area (ac)	CN	Description
*	19.940	85	
	19.940		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0130	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.56"
8.2	901	0.0130	1.84		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
9.8	1,001	Total			

Subcatchment 67S: LF11E-S



Summary for Subcatchment ACRD: LFW11-ACRD

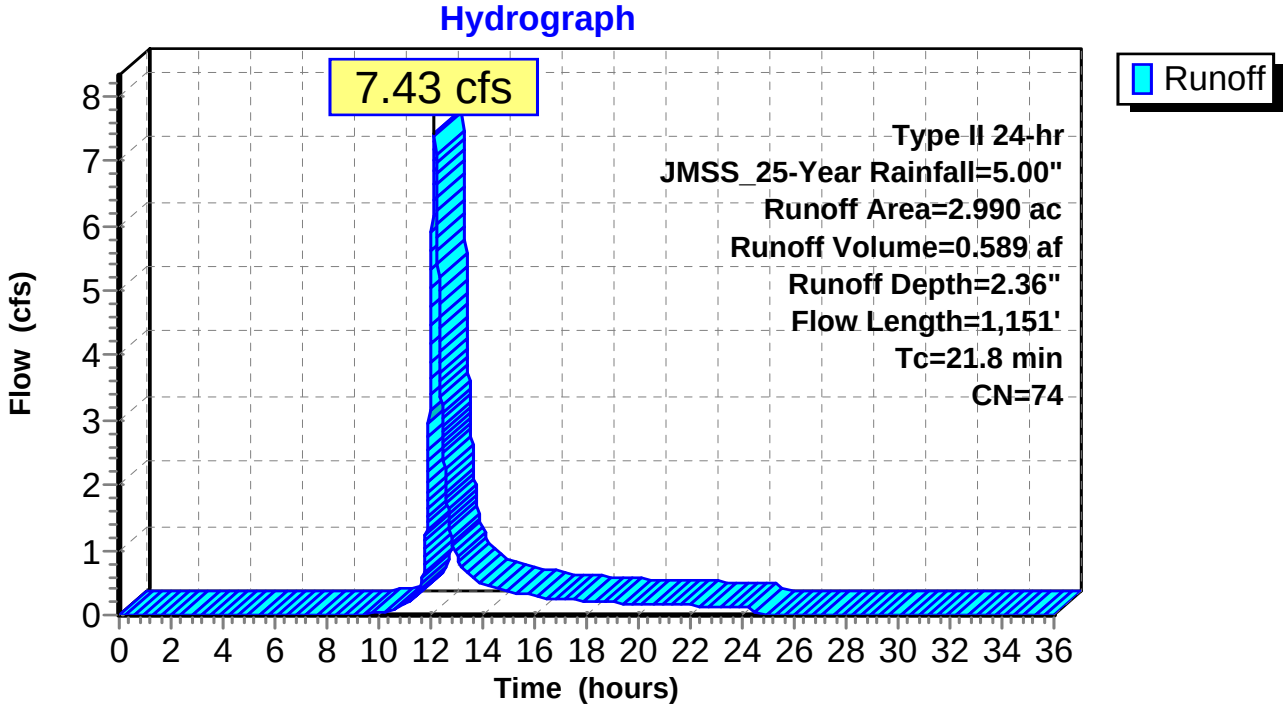
Runoff = 7.43 cfs @ 12.15 hrs, Volume= 0.589 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
2.990	74	>75% Grass cover, Good, HSG C
2.990		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	80	0.0120	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
0.1	38	0.3000	8.82		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
5.2	873	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	160	0.2100	23.81	159.50	**Channel Flow,** Area= 6.7 sf Perim= 8.2' r= 0.82' n= 0.025 Earth, clean & winding
21.8	1,151	Total			

Subcatchment ACRD: LFW11-ACRD



Summary for Subcatchment B1S2: LF11W-B1S2

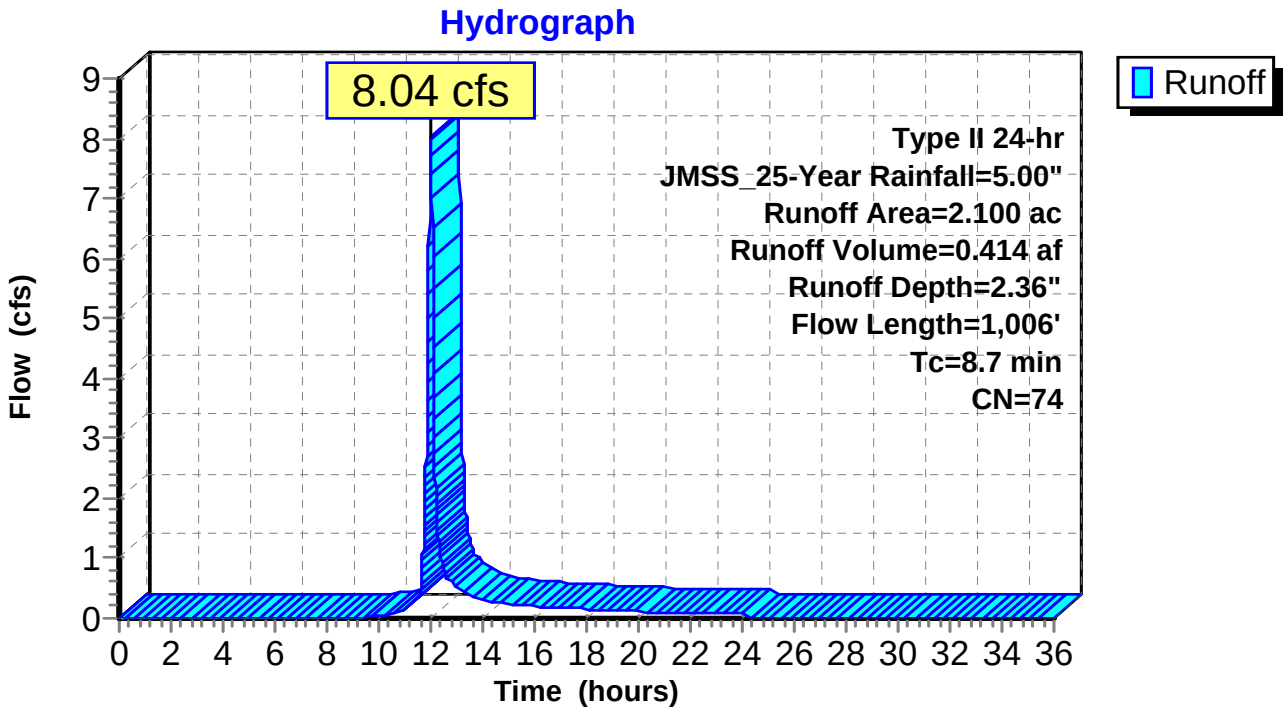
Runoff = 8.04 cfs @ 12.01 hrs, Volume= 0.414 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
2.100	74	>75% Grass cover, Good, HSG C
2.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	77	0.3300	0.30		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
4.5	929	0.0050	3.44	63.38	**Channel Flow,** Area= 18.4 sf Perim= 24.8' r= 0.74' n= 0.025 Earth, clean & winding
8.7	1,006	Total			

Subcatchment B1S2: LF11W-B1S2



Summary for Subcatchment B2S2: LF11W-B2S2

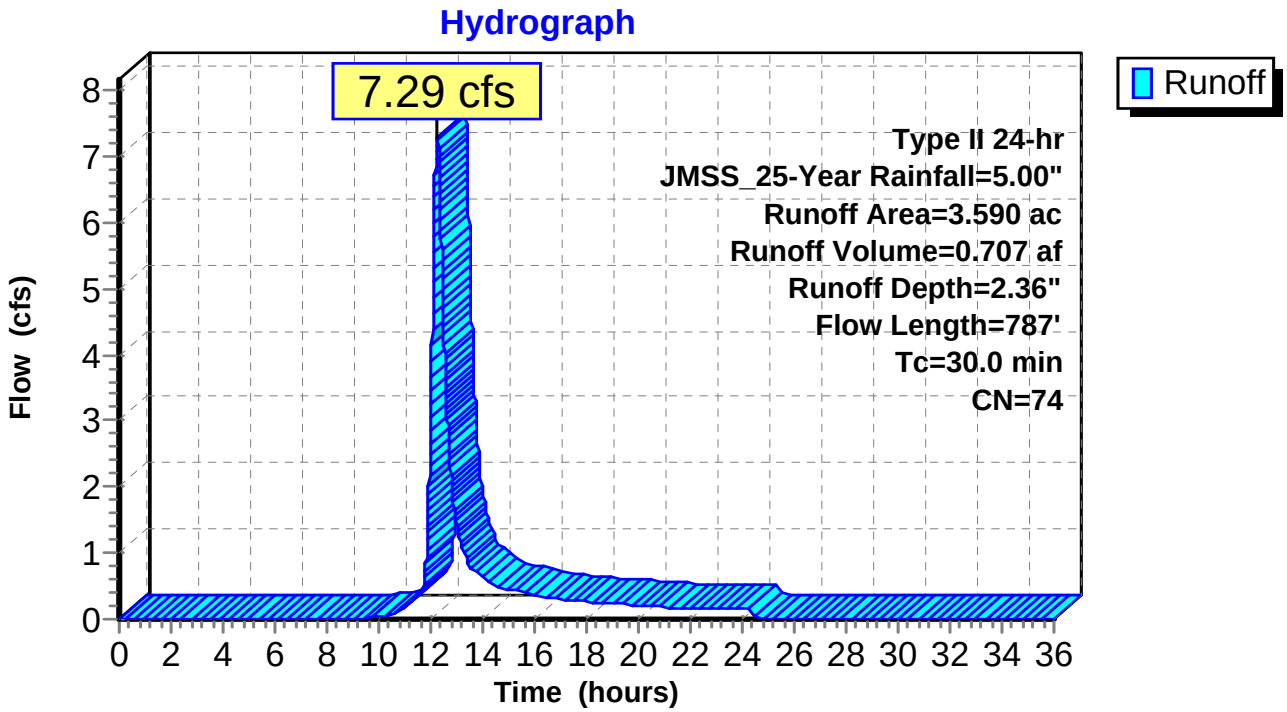
Runoff = 7.29 cfs @ 12.24 hrs, Volume= 0.707 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
3.590	74	>75% Grass cover, Good, HSG C
3.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.4	180	0.0140	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
0.1	59	0.3300	9.25		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.5	548	0.0400	18.77	688.82	**Channel Flow,** Area= 36.7 sf Perim= 18.5' r= 1.98' n= 0.025 Earth, clean & straight
30.0	787	Total			

Subcatchment B2S2: LF11W-B2S2



Summary for Subcatchment B3S2: LF11W-B3S2

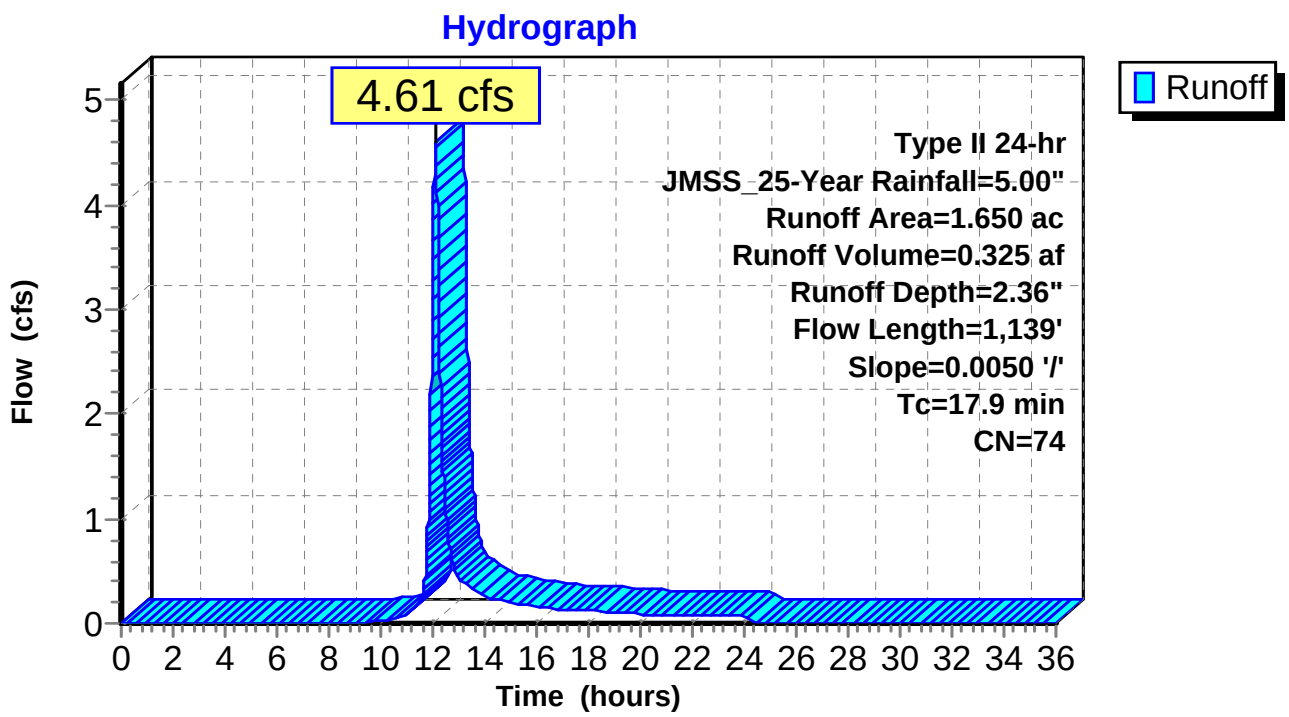
Runoff = 4.61 cfs @ 12.11 hrs, Volume= 0.325 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
1.650	74	>75% Grass cover, Good, HSG C
1.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	31	0.0050	0.05		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
7.0	1,108	0.0050	2.63	30.27	**Channel Flow,** Area= 11.5 sf Perim= 23.2' r= 0.50' n= 0.025 Earth, clean & straight
17.9	1,139	Total			

Subcatchment B3S2: LF11W-B3S2



Summary for Subcatchment B4S2: LF11W-B4S2

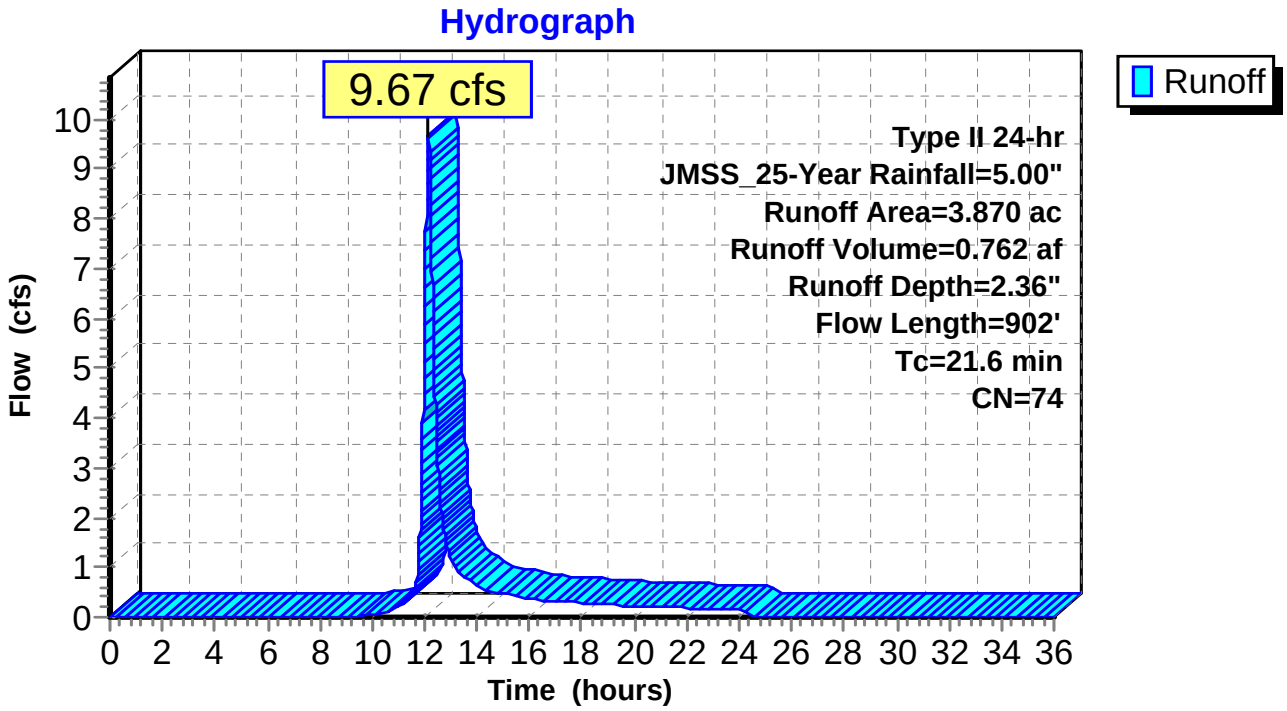
Runoff = 9.67 cfs @ 12.15 hrs, Volume= 0.762 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
3.870	74	>75% Grass cover, Good, HSG C
3.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0180	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
3.2	418	0.0180	2.16		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	384	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
21.6	902	Total			

Subcatchment B4S2: LF11W-B4S2



Summary for Subcatchment P4: LFW11-P4

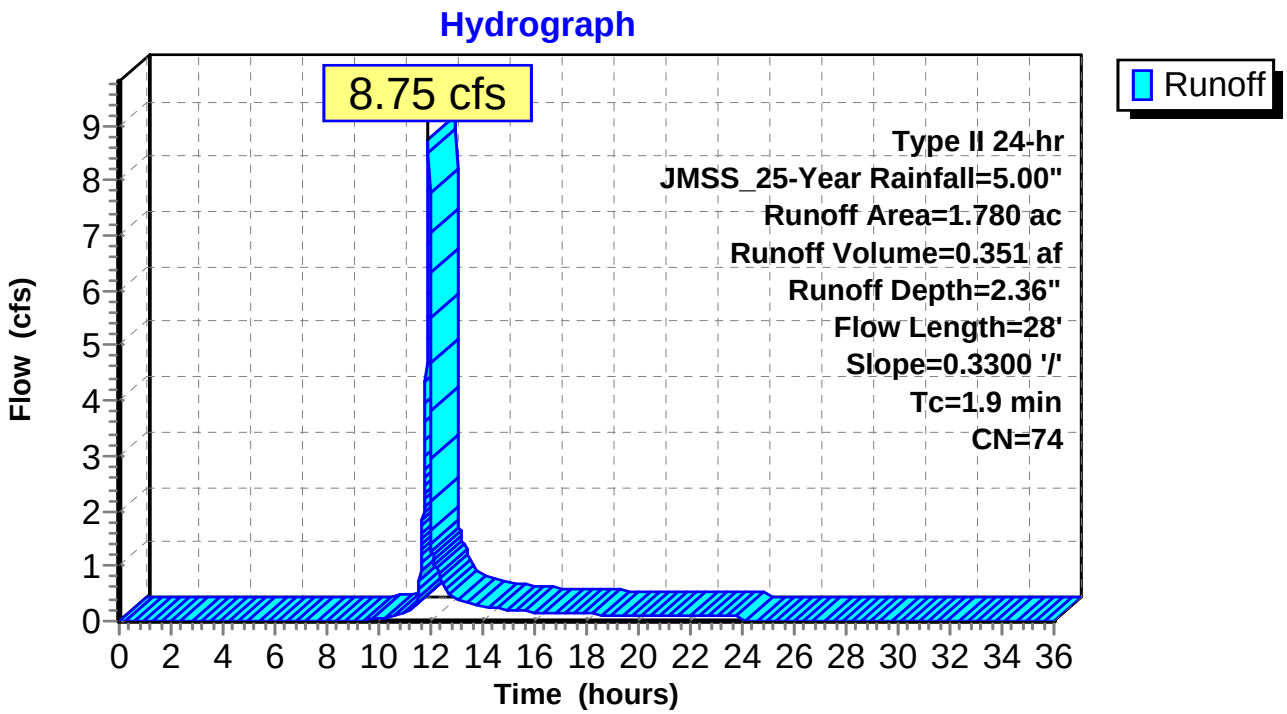
Runoff = 8.75 cfs @ 11.93 hrs, Volume= 0.351 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
1.780	74	>75% Grass cover, Good, HSG C
1.780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	28	0.3300	0.25		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"

Subcatchment P4: LFW11-P4



Summary for Subcatchment TS: LF11W-TS

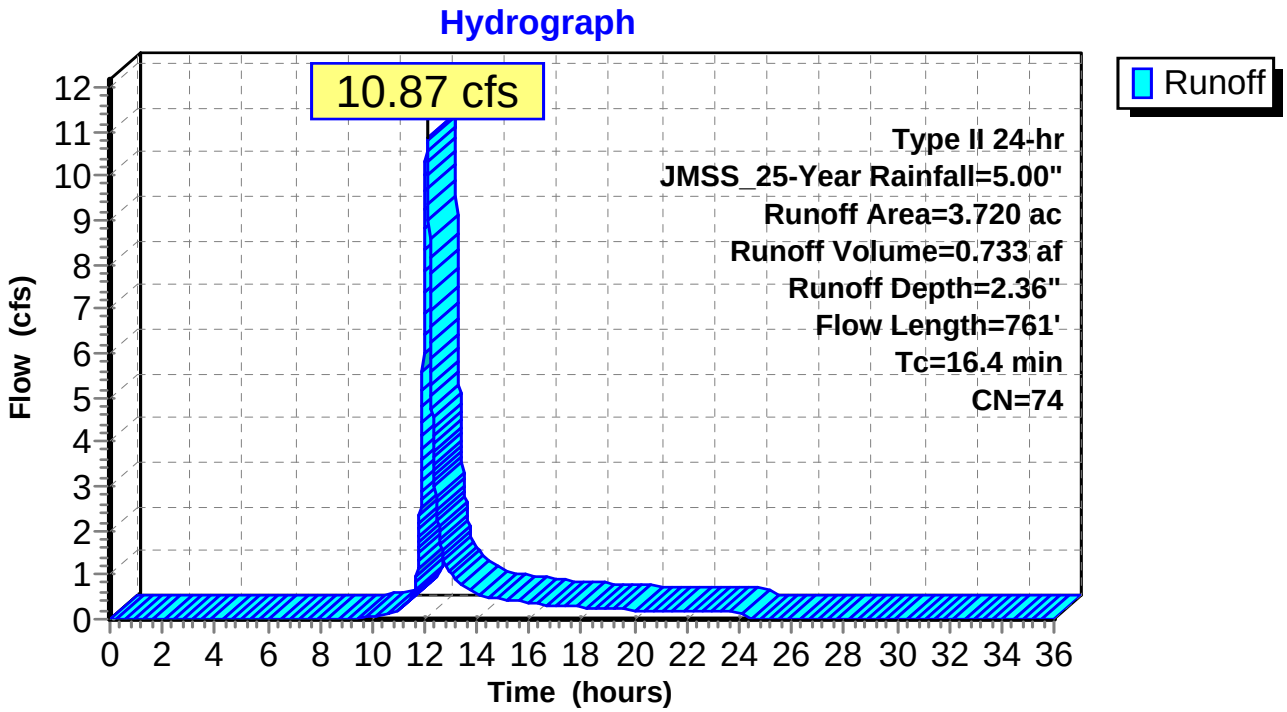
Runoff = 10.87 cfs @ 12.09 hrs, Volume= 0.733 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_25-Year Rainfall=5.00"

Area (ac)	CN	Description
3.720	74	>75% Grass cover, Good, HSG C
3.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.4	100	0.0260	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.56"
1.6	311	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	350	0.0400	14.74	2,320.14	**Channel Flow,** Area= 157.4 sf Perim= 114.0' r= 1.38' n= 0.025 Earth, clean & straight
16.4	761	Total			

Subcatchment TS: LF11W-TS



Summary for Reach 8R: LF11-P1

LEACHATE BASEFLOW=0.12CFS

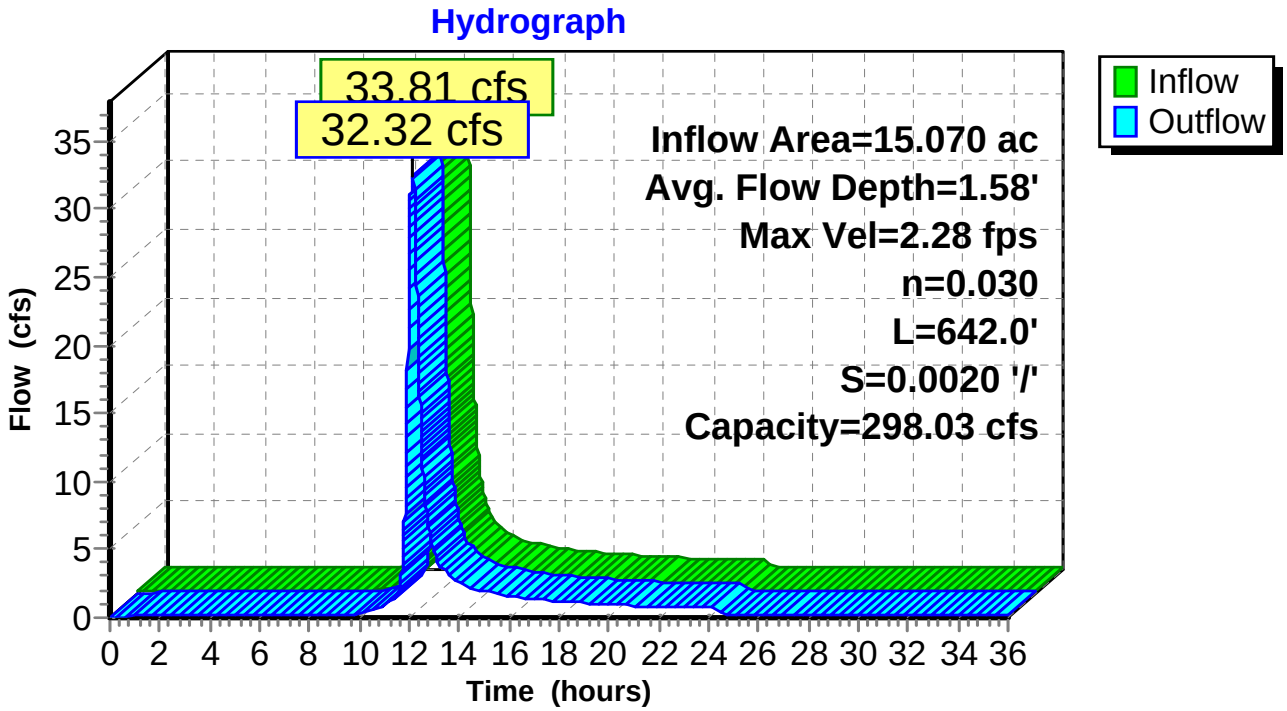
Inflow Area = 15.070 ac, 0.00% Impervious, Inflow Depth > 2.65" for JMSS_25-Year event
Inflow = 33.81 cfs @ 12.00 hrs, Volume= 3.326 af, Incl. 0.12 cfs Base Flow
Outflow = 32.32 cfs @ 12.14 hrs, Volume= 3.321 af, Atten= 4%, Lag= 8.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.28 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 0.59 fps, Avg. Travel Time= 18.2 min

Peak Storage= 9,094 cf @ 12.14 hrs
Average Depth at Peak Storage= 1.58'
Bank-Full Depth= 4.50' Flow Area= 73.1 sf, Capacity= 298.03 cfs

5.00' x 4.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.5 '/' Top Width= 27.50'
Length= 642.0' Slope= 0.0020 '/'
Inlet Invert= 573.73', Outlet Invert= 572.45'

Reach 8R: LF11-P1



Summary for Reach 44R: LF11-P2

LEACHATE BASEFLOW=0.30CFS

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[62] Hint: Exceeded Reach 8R OUTLET depth by 0.55' @ 12.40 hrs
[80] Warning: Exceeded Pond 9P by 0.16' @ 25.21 hrs (0.08 cfs 0.046 af)

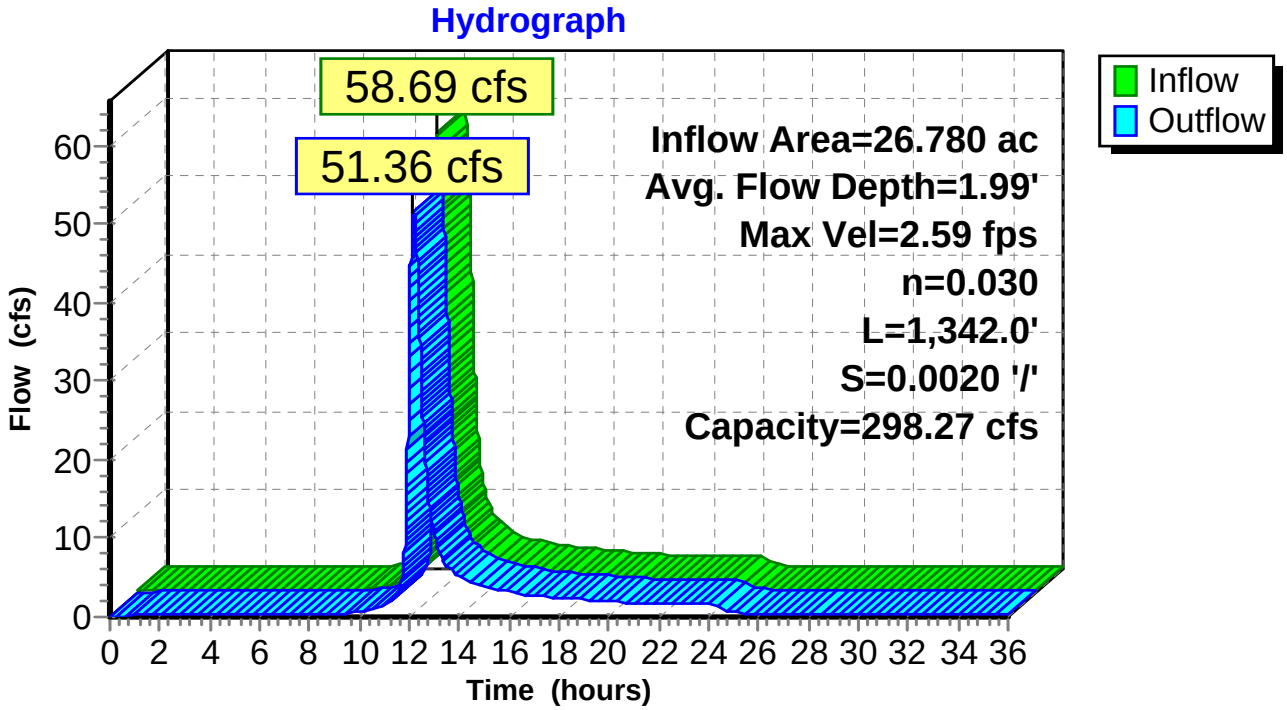
Inflow Area =	26.780 ac,	0.00% Impervious,	Inflow Depth >	2.92"	for JMSS_25-Year event
Inflow =	58.69 cfs @	12.03 hrs,	Volume=	6.521 af,	Incl. 0.30 cfs Base Flow
Outflow =	51.36 cfs @	12.18 hrs,	Volume=	6.499 af,	Atten= 12%, Lag= 9.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.59 fps, Min. Travel Time= 8.6 min
Avg. Velocity = 0.80 fps, Avg. Travel Time= 28.1 min

Peak Storage= 26,644 cf @ 12.18 hrs
Average Depth at Peak Storage= 1.99'
Bank-Full Depth= 4.50' Flow Area= 73.1 sf, Capacity= 298.27 cfs

5.00' x 4.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.5 '/' Top Width= 27.50'
Length= 1,342.0' Slope= 0.0020 '/'
Inlet Invert= 572.45', Outlet Invert= 569.77'

Reach 44R: LF11-P2



Summary for Reach 45R: LF11-P3

LEACHATE BASEFLOW=0.28CFS

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[61] Hint: Exceeded Reach 44R outlet invert by 1.79' @ 12.18 hrs

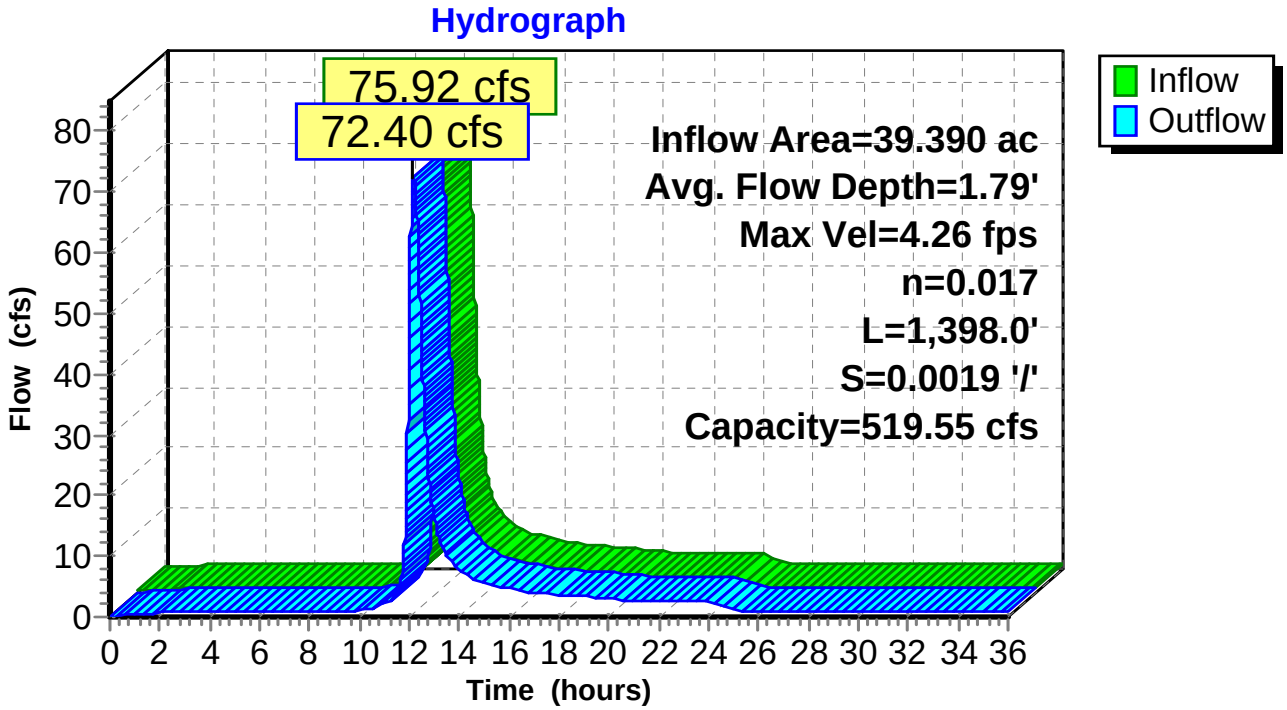
Inflow Area = 39.390 ac, 0.00% Impervious, Inflow Depth > 2.99" for JMSS_25-Year event
Inflow = 75.92 cfs @ 12.09 hrs, Volume= 9.816 af, Incl. 0.28 cfs Base Flow
Outflow = 72.40 cfs @ 12.18 hrs, Volume= 9.793 af, Atten= 5%, Lag= 5.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.26 fps, Min. Travel Time= 5.5 min
Avg. Velocity = 1.34 fps, Avg. Travel Time= 17.4 min

Peak Storage= 23,773 cf @ 12.18 hrs
Average Depth at Peak Storage= 1.79'
Bank-Full Depth= 4.50' Flow Area= 73.1 sf, Capacity= 519.55 cfs

5.00' x 4.50' deep channel, n= 0.017 Concrete, unfinished
Side Slope Z-value= 2.5 '/' Top Width= 27.50'
Length= 1,398.0' Slope= 0.0019 '/'
Inlet Invert= 569.77', Outlet Invert= 567.05'

Reach 45R: LF11-P3



Summary for Reach 46R: LF11-P4

LEACHATE BASEFLOW = 0.24 CFS

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[62] Hint: Exceeded Reach 45R OUTLET depth by 0.36' @ 12.33 hrs

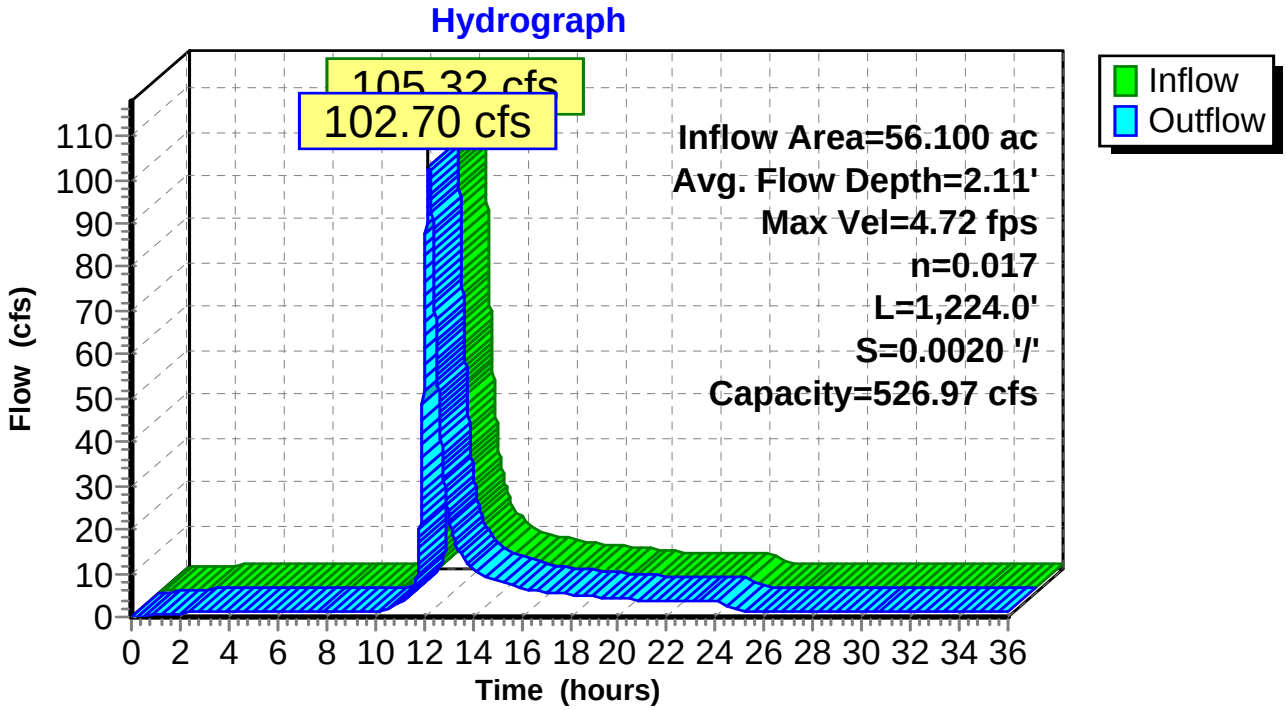
Inflow Area = 56.100 ac, 0.00% Impervious, Inflow Depth > 2.95" for JMSS_25-Year event
Inflow = 105.32 cfs @ 12.17 hrs, Volume= 13.800 af, Incl. 0.24 cfs Base Flow
Outflow = 102.70 cfs @ 12.23 hrs, Volume= 13.775 af, Atten= 2%, Lag= 3.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.72 fps, Min. Travel Time= 4.3 min
Avg. Velocity = 1.51 fps, Avg. Travel Time= 13.5 min

Peak Storage= 26,616 cf @ 12.23 hrs
Average Depth at Peak Storage= 2.11'
Bank-Full Depth= 4.50' Flow Area= 73.1 sf, Capacity= 526.97 cfs

5.00' x 4.50' deep channel, n= 0.017 Concrete, unfinished
Side Slope Z-value= 2.5 '/' Top Width= 27.50'
Length= 1,224.0' Slope= 0.0020 '/'
Inlet Invert= 567.05', Outlet Invert= 564.60'

Reach 46R: LF11-P4



Summary for Reach 66R: LF11E-P2

LEACHATE BASEFLOW = 0.34CFS

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[61] Hint: Exceeded Reach 67R outlet invert by 2.08' @ 12.08 hrs

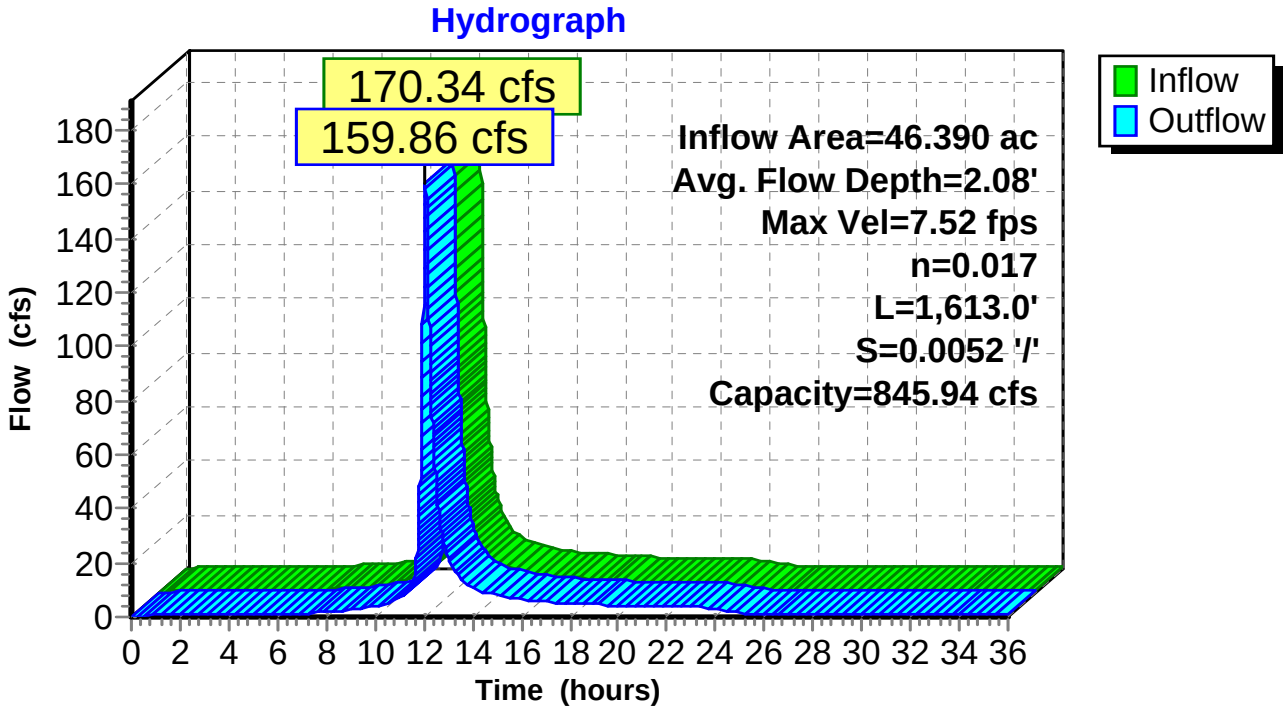
Inflow Area = 46.390 ac, 0.00% Impervious, Inflow Depth > 4.09" for JMSS_25-Year event
Inflow = 170.34 cfs @ 12.04 hrs, Volume= 15.815 af, Incl. 0.34 cfs Base Flow
Outflow = 159.86 cfs @ 12.08 hrs, Volume= 15.791 af, Atten= 6%, Lag= 2.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.52 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 2.15 fps, Avg. Travel Time= 12.5 min

Peak Storage= 34,289 cf @ 12.08 hrs
Average Depth at Peak Storage= 2.08'
Bank-Full Depth= 4.50' Flow Area= 73.1 sf, Capacity= 845.94 cfs

5.00' x 4.50' deep channel, n= 0.017 Concrete, unfinished
Side Slope Z-value= 2.5 '/' Top Width= 27.50'
Length= 1,613.0' Slope= 0.0052 '/'
Inlet Invert= 567.70', Outlet Invert= 559.38'

Reach 66R: LF11E-P2



Summary for Reach 67R: LF11E-P1

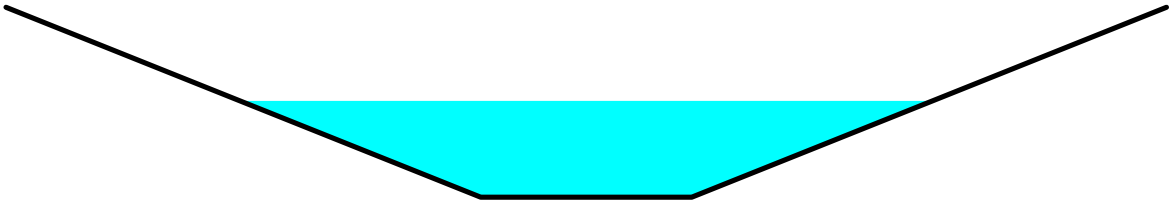
LEACHATE BASEFLOW=0.62CFS

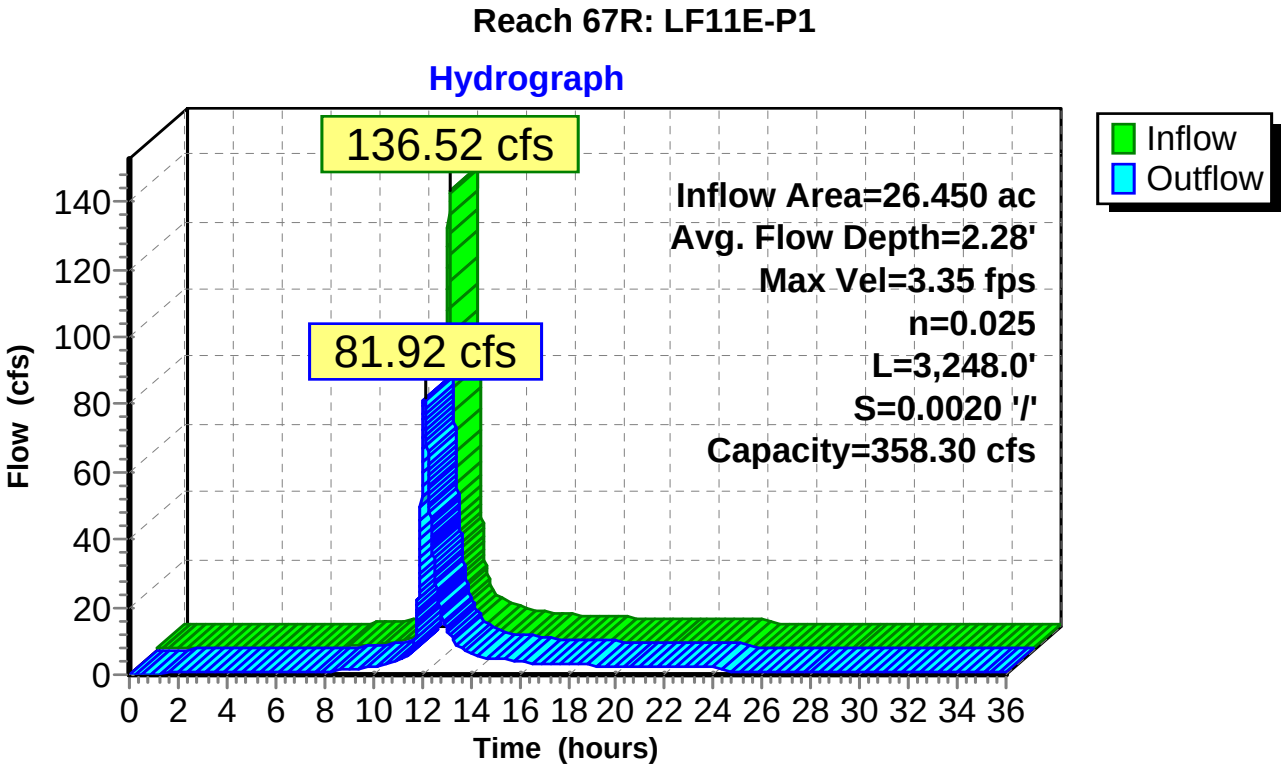
Inflow Area = 26.450 ac, 0.00% Impervious, Inflow Depth > 4.21" for JMSS_25-Year event
Inflow = 136.52 cfs @ 12.01 hrs, Volume= 9.269 af, Incl. 0.62 cfs Base Flow
Outflow = 81.92 cfs @ 12.11 hrs, Volume= 9.206 af, Atten= 40%, Lag= 5.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.35 fps, Min. Travel Time= 16.2 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 52.7 min

Peak Storage= 79,431 cf @ 12.11 hrs
Average Depth at Peak Storage= 2.28'
Bank-Full Depth= 4.50' Flow Area= 73.1 sf, Capacity= 358.30 cfs

5.00' x 4.50' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 2.5 '/' Top Width= 27.50'
Length= 3,248.0' Slope= 0.0020 '/'
Inlet Invert= 574.20', Outlet Invert= 567.70'





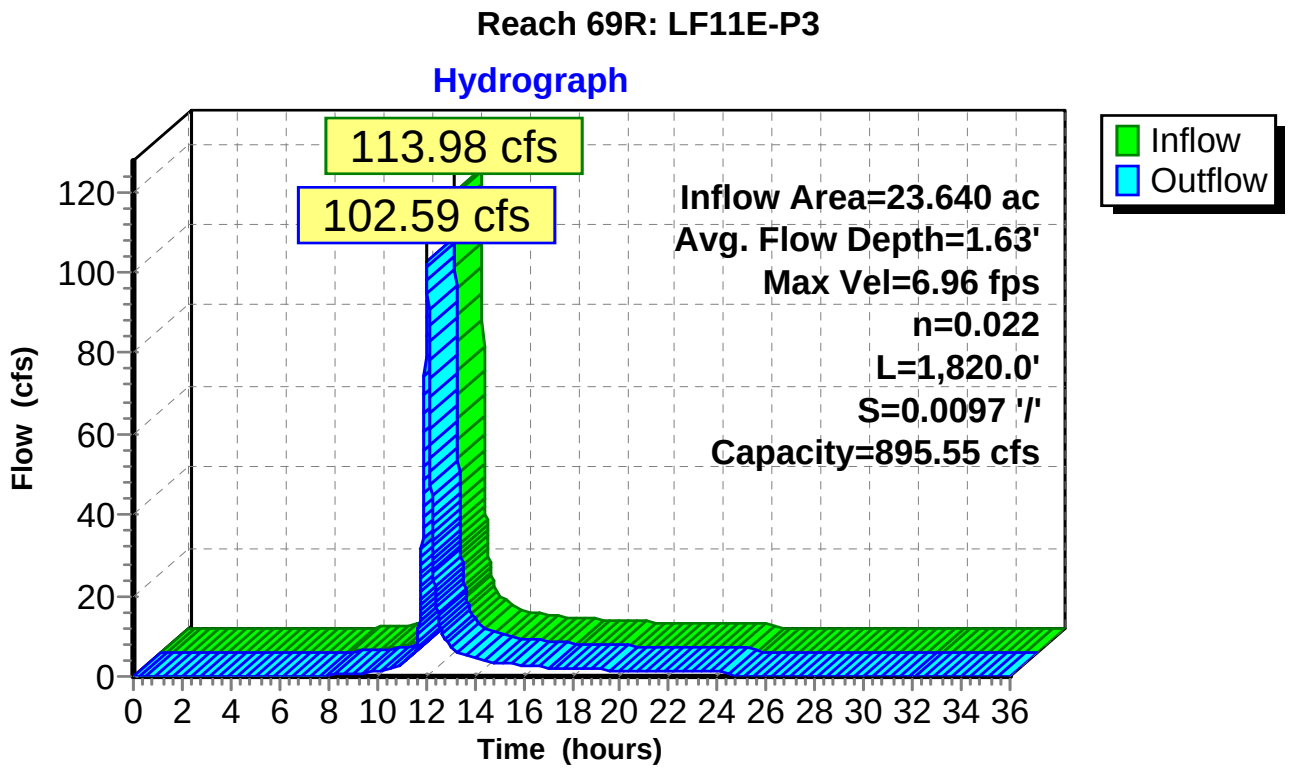
Summary for Reach 69R: LF11E-P3

Inflow Area = 23.640 ac, 0.00% Impervious, Inflow Depth = 3.17" for JMSS_25-Year event
Inflow = 113.98 cfs @ 12.01 hrs, Volume= 6.253 af
Outflow = 102.59 cfs @ 12.06 hrs, Volume= 6.253 af, Atten= 10%, Lag= 2.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.96 fps, Min. Travel Time= 4.4 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 16.8 min

Peak Storage= 26,827 cf @ 12.06 hrs
Average Depth at Peak Storage= 1.63'
Bank-Full Depth= 4.50' Flow Area= 73.1 sf, Capacity= 895.55 cfs

5.00' x 4.50' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 2.5 '/' Top Width= 27.50'
Length= 1,820.0' Slope= 0.0097 '/'
Inlet Invert= 577.00', Outlet Invert= 559.38'



Summary for Pond 2P: LD04-3

Inflow Area = 11.190 ac, 0.00% Impervious, Inflow Depth = 2.36" for JMSS_25-Year event
Inflow = 29.54 cfs @ 12.13 hrs, Volume= 2.205 af
Outflow = 29.53 cfs @ 12.13 hrs, Volume= 2.205 af, Atten= 0%, Lag= 0.1 min
Primary = 29.53 cfs @ 12.13 hrs, Volume= 2.205 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 616.31' @ 12.13 hrs Surf.Area= 25 sf Storage= 120 cf

Plug-Flow detention time= 0.1 min calculated for 2.204 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (847.0 - 846.9)

Volume	Invert	Avail.Storage	Storage Description
#1	611.50'	74,031 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

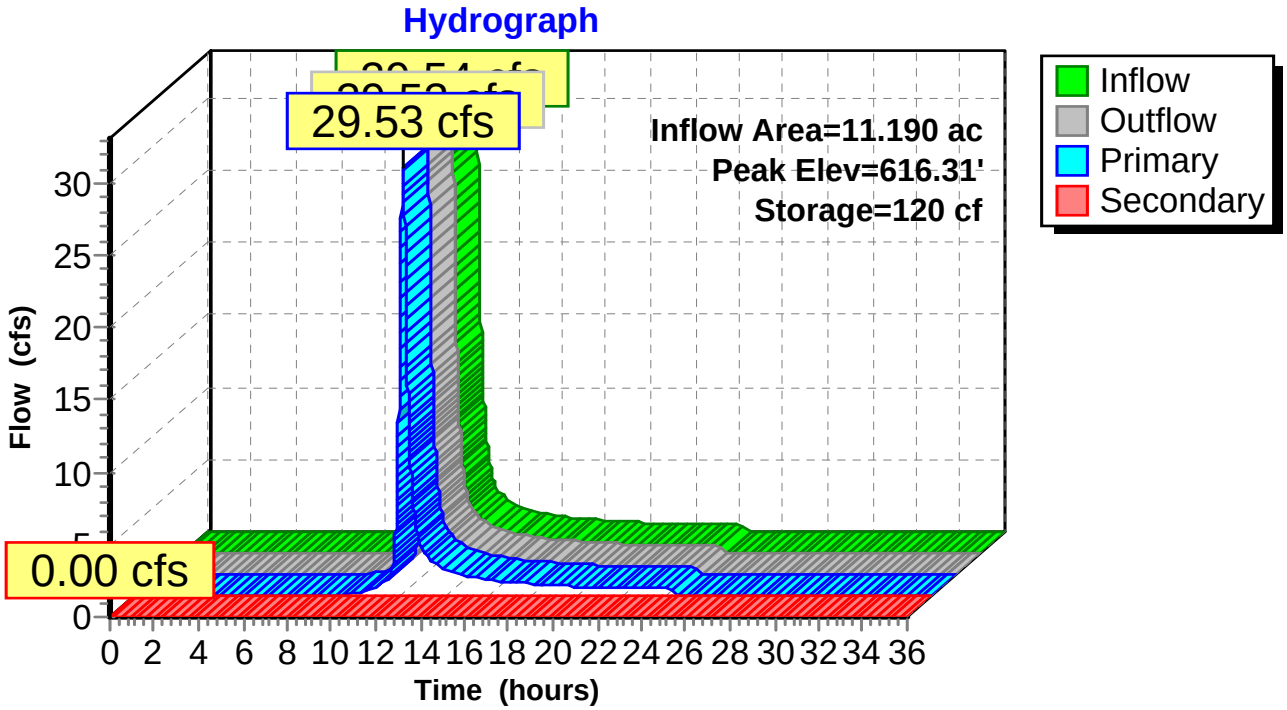
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
611.50	25	0	0
621.50	25	250	250
624.00	1,000	1,281	1,531
629.00	20,000	52,500	54,031
630.00	20,000	20,000	74,031

Device	Routing	Invert	Outlet Devices
#1	Primary	611.50'	**24.0" Round Culvert** L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 611.50' / 596.00' S= 0.1802 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	629.00'	**30.0' long x 5.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=29.53 cfs @ 12.13 hrs HW=616.31' TW=597.05' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 29.53 cfs @ 9.40 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=611.50' TW=592.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: LD04-3



Summary for Pond 3P: LD04-2

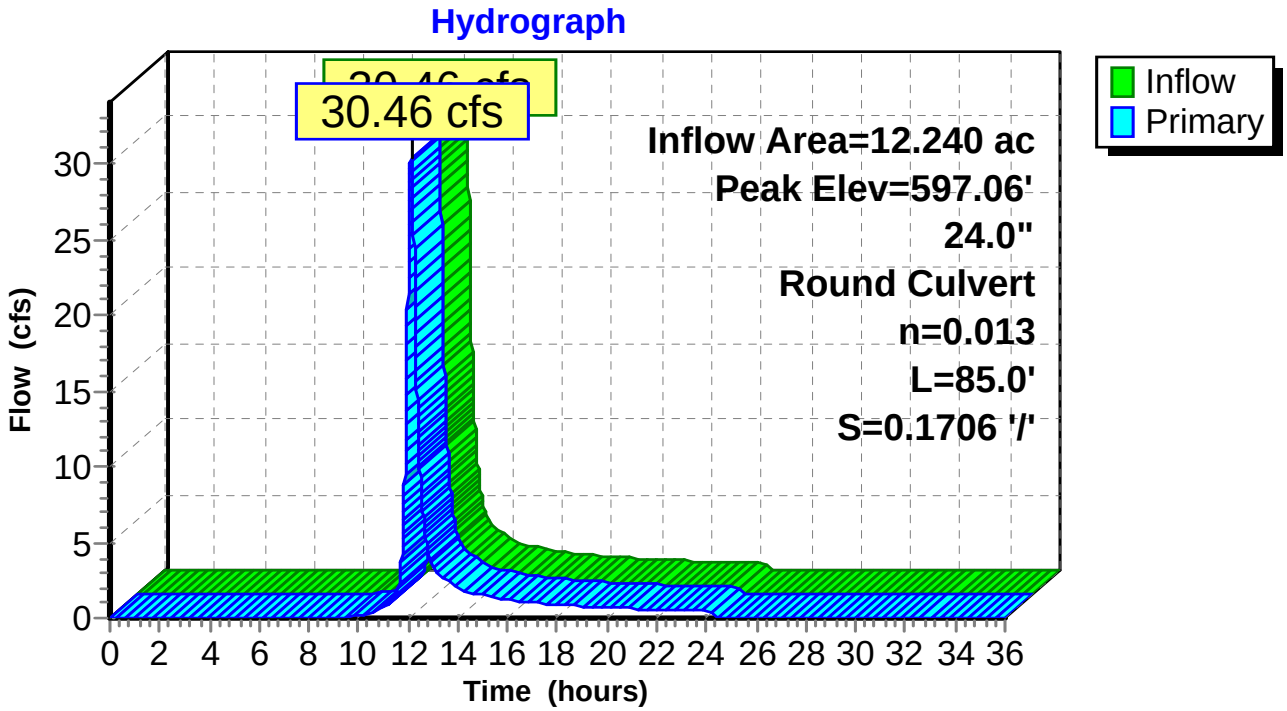
Inflow Area = 12.240 ac, 0.00% Impervious, Inflow Depth = 2.36" for JMSS_25-Year event
Inflow = 30.46 cfs @ 12.12 hrs, Volume= 2.412 af
Outflow = 30.46 cfs @ 12.12 hrs, Volume= 2.412 af, Atten= 0%, Lag= 0.0 min
Primary = 30.46 cfs @ 12.12 hrs, Volume= 2.412 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 597.06' @ 12.12 hrs
Flood Elev= 609.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	592.00'	**24.0" Round Culvert** L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 592.00' / 577.50' S= 0.1706 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=30.45 cfs @ 12.12 hrs HW=597.05' TW=581.20' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 30.45 cfs @ 9.69 fps)

Pond 3P: LD04-2



Summary for Pond 4P: LD04-1

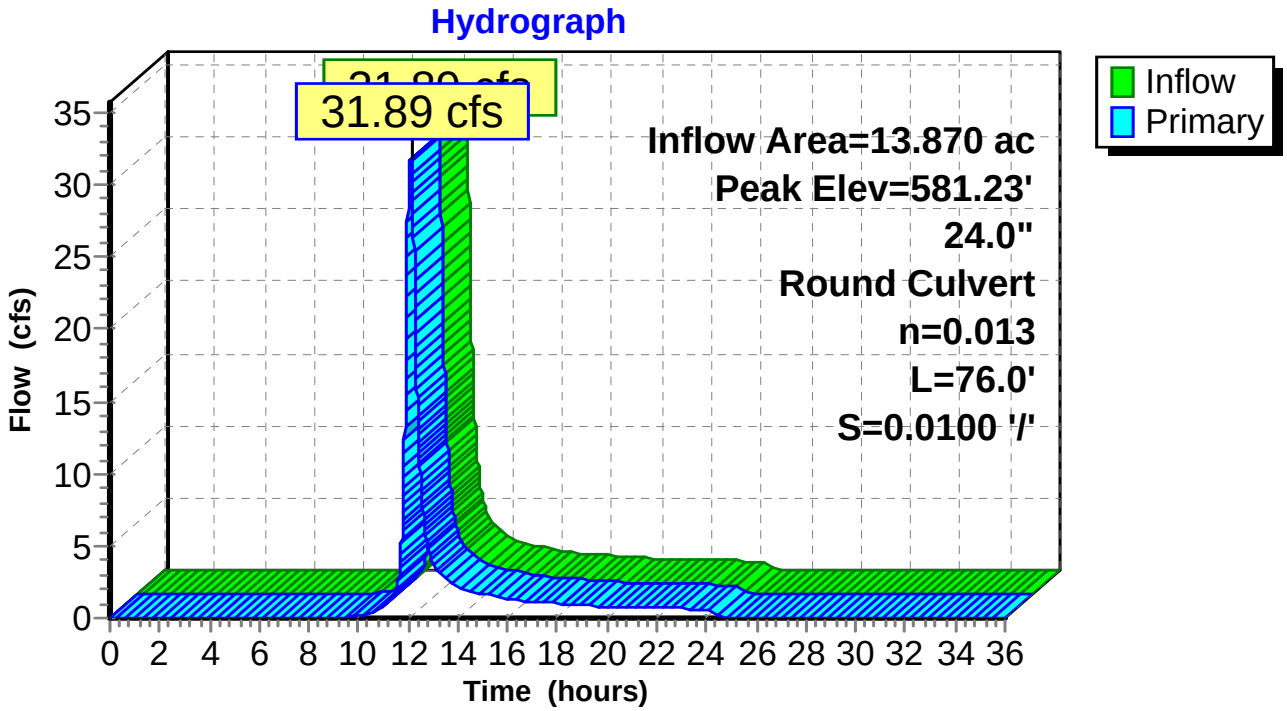
Inflow Area = 13.870 ac, 0.00% Impervious, Inflow Depth = 2.36" for JMSS_25-Year event
Inflow = 31.89 cfs @ 12.11 hrs, Volume= 2.733 af
Outflow = 31.89 cfs @ 12.11 hrs, Volume= 2.733 af, Atten= 0%, Lag= 0.0 min
Primary = 31.89 cfs @ 12.11 hrs, Volume= 2.733 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 581.23' @ 12.11 hrs
Flood Elev= 590.77'

Device	Routing	Invert	Outlet Devices
#1	Primary	575.78'	**24.0" Round Culvert** L= 76.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 575.78' / 575.02' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=31.89 cfs @ 12.11 hrs HW=581.22' TW=575.31' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 31.89 cfs @ 10.15 fps)

Pond 4P: LD04-1



Summary for Pond 9P: LD03-1

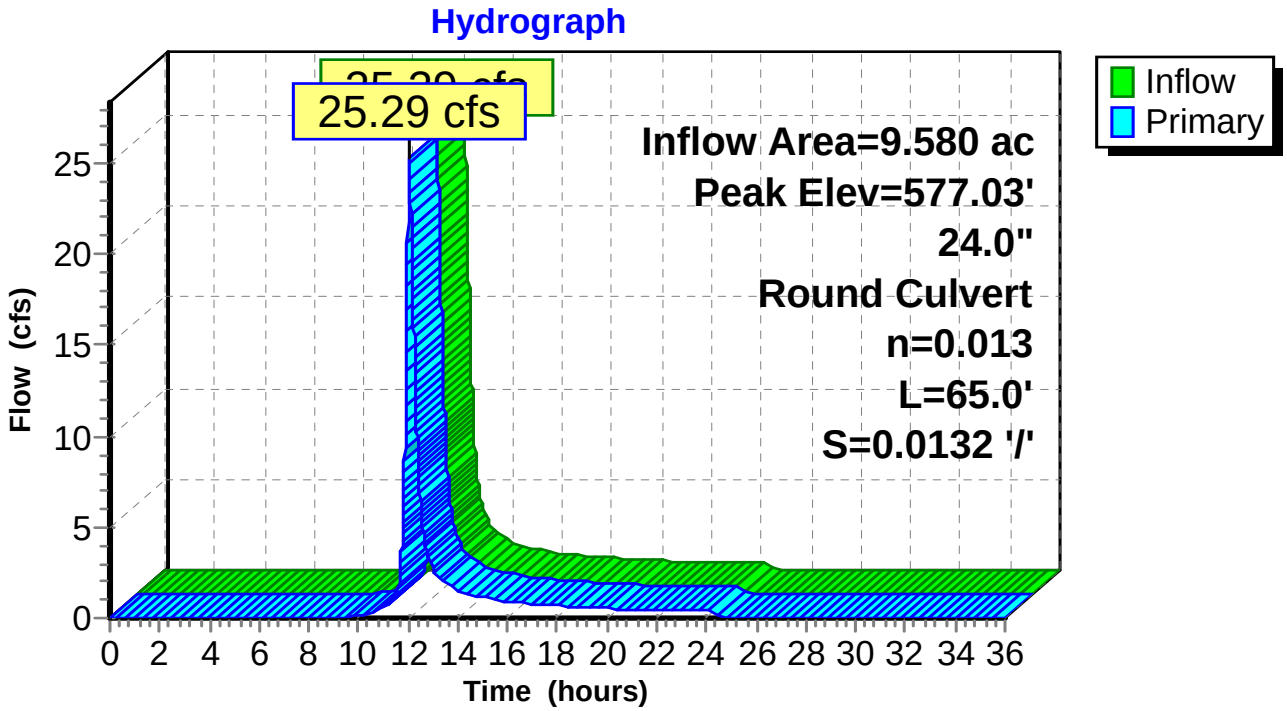
Inflow Area = 9.580 ac, 0.00% Impervious, Inflow Depth = 2.36" for JMSS_25-Year event
Inflow = 25.29 cfs @ 12.04 hrs, Volume= 1.887 af
Outflow = 25.29 cfs @ 12.04 hrs, Volume= 1.887 af, Atten= 0%, Lag= 0.0 min
Primary = 25.29 cfs @ 12.04 hrs, Volume= 1.887 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 577.03' @ 12.05 hrs
Flood Elev= 584.28'

Device	Routing	Invert	Outlet Devices
#1	Primary	572.45'	**24.0" Round Culvert** L= 65.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 572.45' / 571.59' S= 0.0132 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=25.14 cfs @ 12.04 hrs HW=577.02' TW=574.25' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 25.14 cfs @ 8.00 fps)

Pond 9P: LD03-1



Summary for Pond 10P: LD03-2

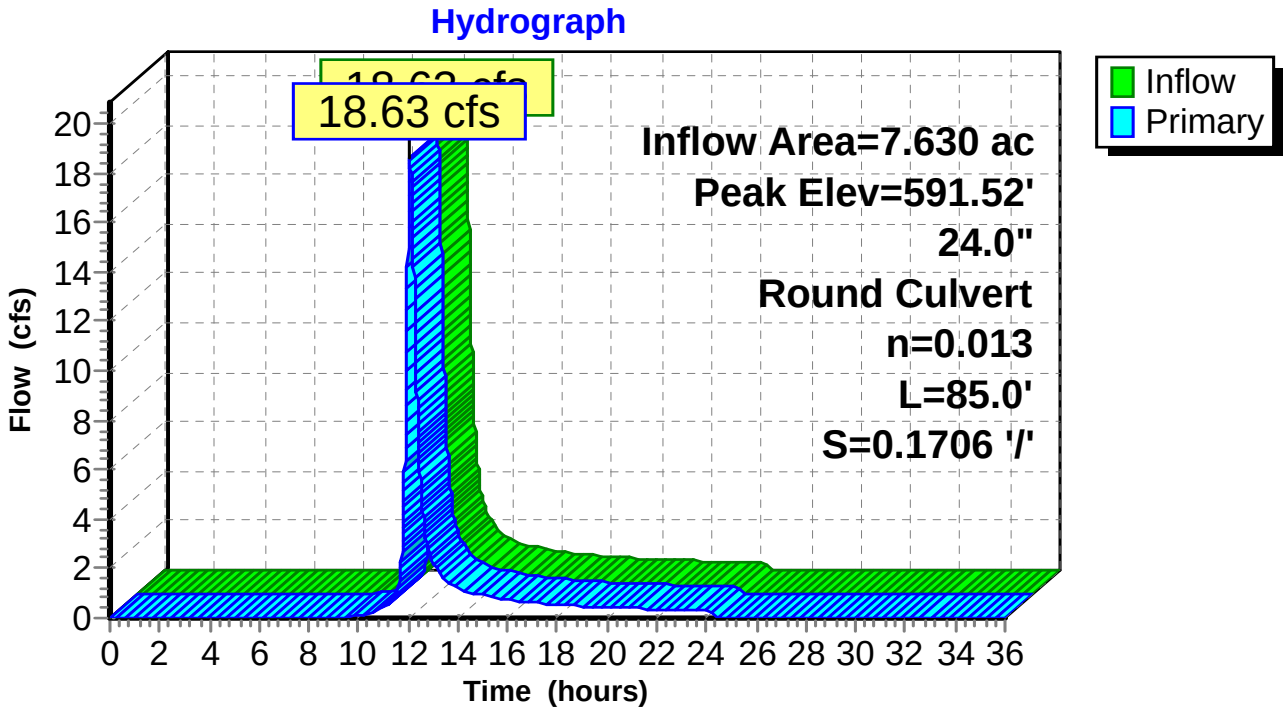
Inflow Area = 7.630 ac, 0.00% Impervious, Inflow Depth = 2.36" for JMSS_25-Year event
Inflow = 18.63 cfs @ 12.06 hrs, Volume= 1.503 af
Outflow = 18.63 cfs @ 12.06 hrs, Volume= 1.503 af, Atten= 0%, Lag= 0.0 min
Primary = 18.63 cfs @ 12.06 hrs, Volume= 1.503 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 591.52' @ 12.06 hrs
Flood Elev= 604.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	589.00'	**24.0" Round Culvert** L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 589.00' / 574.50' S= 0.1706 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=18.62 cfs @ 12.06 hrs HW=591.52' TW=576.99' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 18.62 cfs @ 5.93 fps)

Pond 10P: LD03-2



Summary for Pond 11P: LD03-3

Inflow Area = 5.250 ac, 0.00% Impervious, Inflow Depth = 2.36" for JMSS_25-Year event
Inflow = 13.08 cfs @ 12.15 hrs, Volume= 1.034 af
Outflow = 13.08 cfs @ 12.15 hrs, Volume= 1.034 af, Atten= 0%, Lag= 0.0 min
Primary = 13.08 cfs @ 12.15 hrs, Volume= 1.034 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 618.24' @ 12.15 hrs Surf.Area= 25 sf Storage= 44 cf

Plug-Flow detention time= 0.2 min calculated for 1.034 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (848.9 - 848.8)

Volume	Invert	Avail.Storage	Storage Description
#1	616.50'	4,125 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

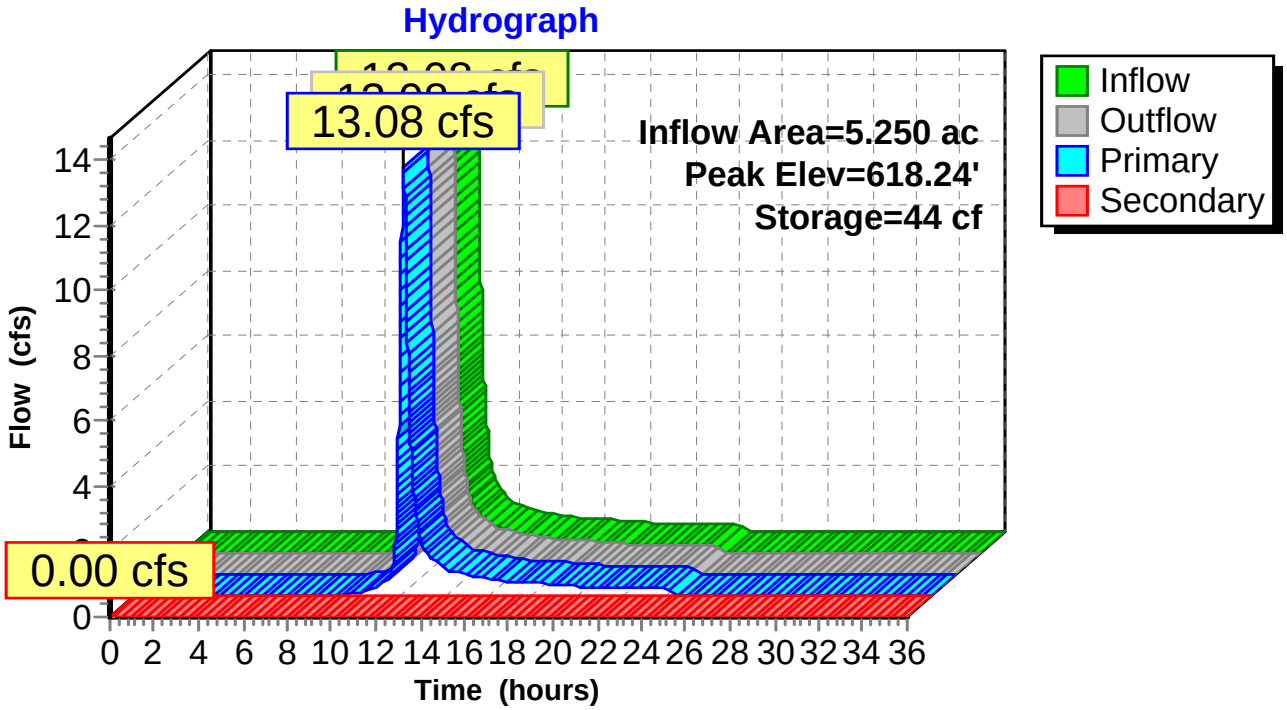
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
616.50	25	0	0
623.00	25	163	163
624.00	150	88	250
629.00	1,000	2,875	3,125
630.00	1,000	1,000	4,125

Device	Routing	Invert	Outlet Devices
#1	Primary	616.50'	**24.0" Round Culvert** L= 44.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 616.50' / 612.00' S= 0.1023 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	629.00'	**30.0' long x 5.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=13.08 cfs @ 12.15 hrs HW=618.24' TW=591.22' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 13.08 cfs @ 4.50 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=616.50' TW=589.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11P: LD03-3



Summary for Pond 21P: LD02-2

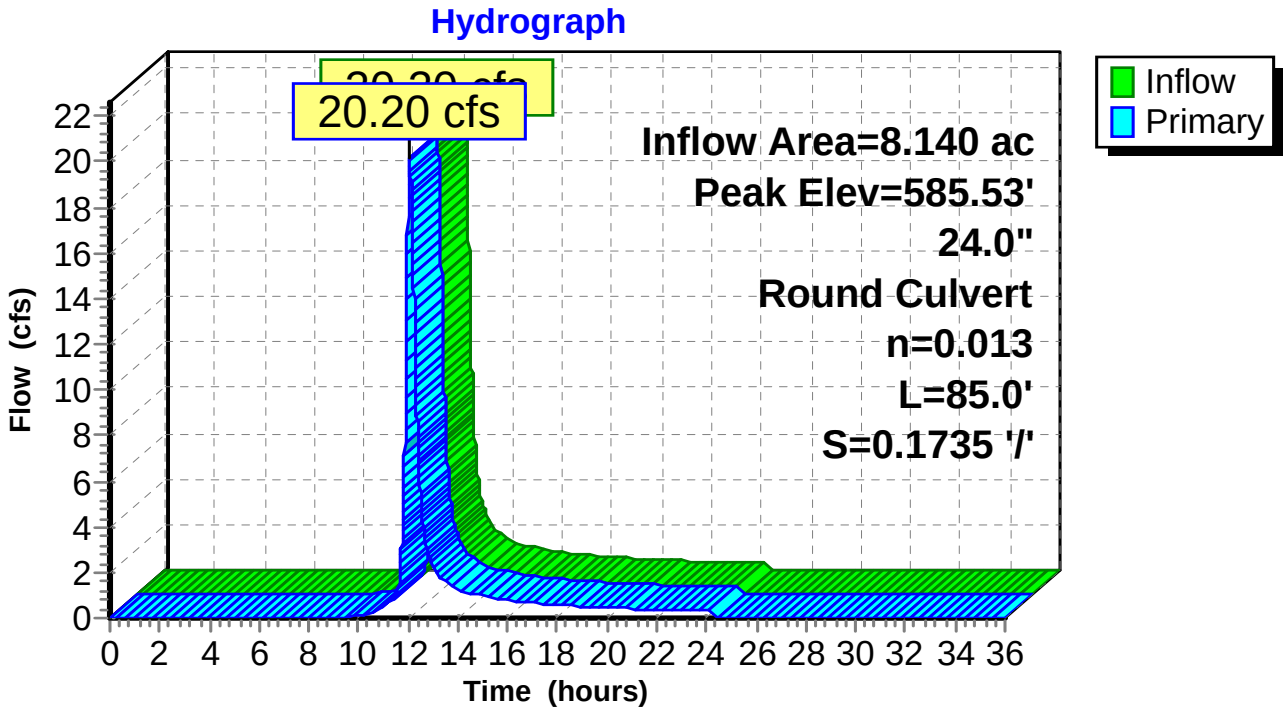
Inflow Area = 8.140 ac, 0.00% Impervious, Inflow Depth = 2.36" for JMSS_25-Year event
Inflow = 20.20 cfs @ 12.05 hrs, Volume= 1.604 af
Outflow = 20.20 cfs @ 12.05 hrs, Volume= 1.604 af, Atten= 0%, Lag= 0.0 min
Primary = 20.20 cfs @ 12.05 hrs, Volume= 1.604 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 585.53' @ 12.05 hrs
Flood Elev= 597.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	582.75'	**24.0" Round Culvert** L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 582.75' / 568.00' S= 0.1735 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=20.19 cfs @ 12.05 hrs HW=585.53' TW=576.95' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 20.19 cfs @ 6.43 fps)

Pond 21P: LD02-2



Summary for Pond 22P: LD02-3

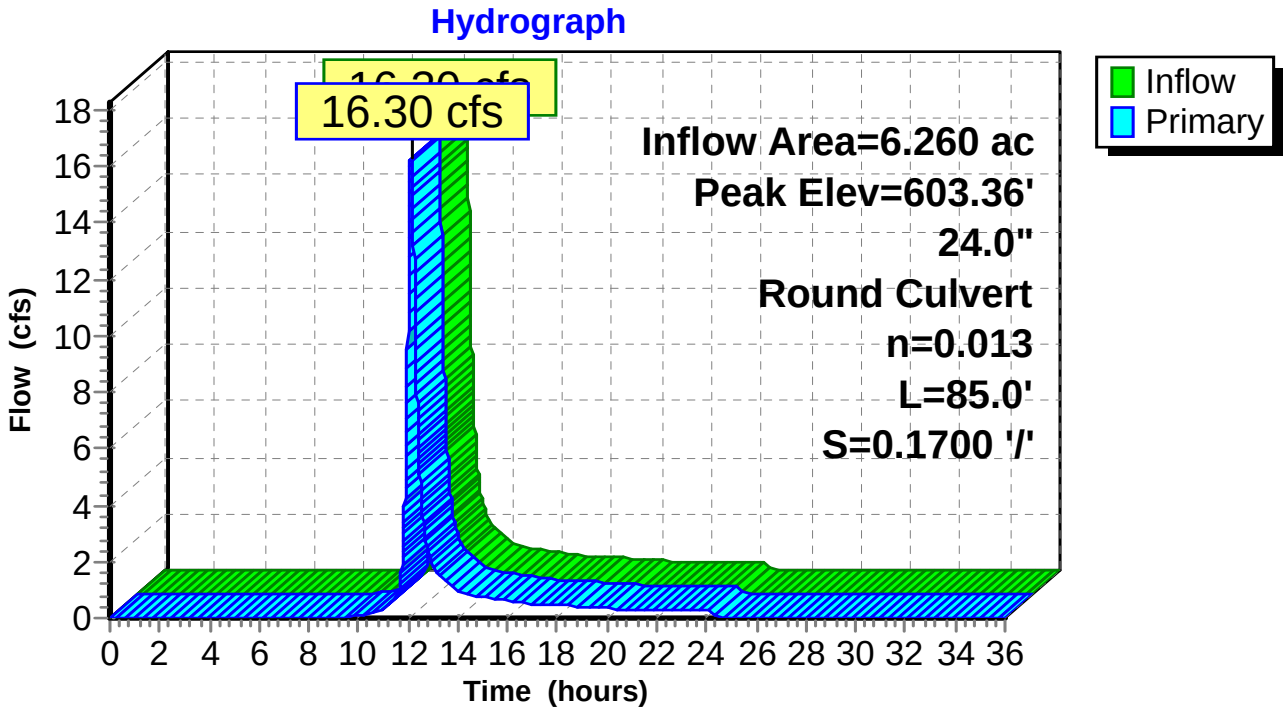
Inflow Area = 6.260 ac, 0.00% Impervious, Inflow Depth = 2.36" for JMSS_25-Year event
Inflow = 16.30 cfs @ 12.11 hrs, Volume= 1.233 af
Outflow = 16.30 cfs @ 12.11 hrs, Volume= 1.233 af, Atten= 0%, Lag= 0.0 min
Primary = 16.30 cfs @ 12.11 hrs, Volume= 1.233 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 603.36' @ 12.11 hrs
Flood Elev= 617.17'

Device	Routing	Invert	Outlet Devices
#1	Primary	601.20'	**24.0" Round Culvert** L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 601.20' / 586.75' S= 0.1700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=16.29 cfs @ 12.11 hrs HW=603.36' TW=585.32' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 16.29 cfs @ 5.19 fps)

Pond 22P: LD02-3



Summary for Pond 23P: LD02-4

Inflow Area = 5.350 ac, 0.00% Impervious, Inflow Depth = 2.36" for JMSS_25-Year event
Inflow = 13.87 cfs @ 12.13 hrs, Volume= 1.054 af
Outflow = 13.87 cfs @ 12.14 hrs, Volume= 1.054 af, Atten= 0%, Lag= 0.1 min
Primary = 13.87 cfs @ 12.14 hrs, Volume= 1.054 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 618.33' @ 12.14 hrs Surf.Area= 25 sf Storage= 46 cf

Plug-Flow detention time= 0.2 min calculated for 1.054 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (847.6 - 847.5)

Volume	Invert	Avail.Storage	Storage Description
#1	616.50'	4,125 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

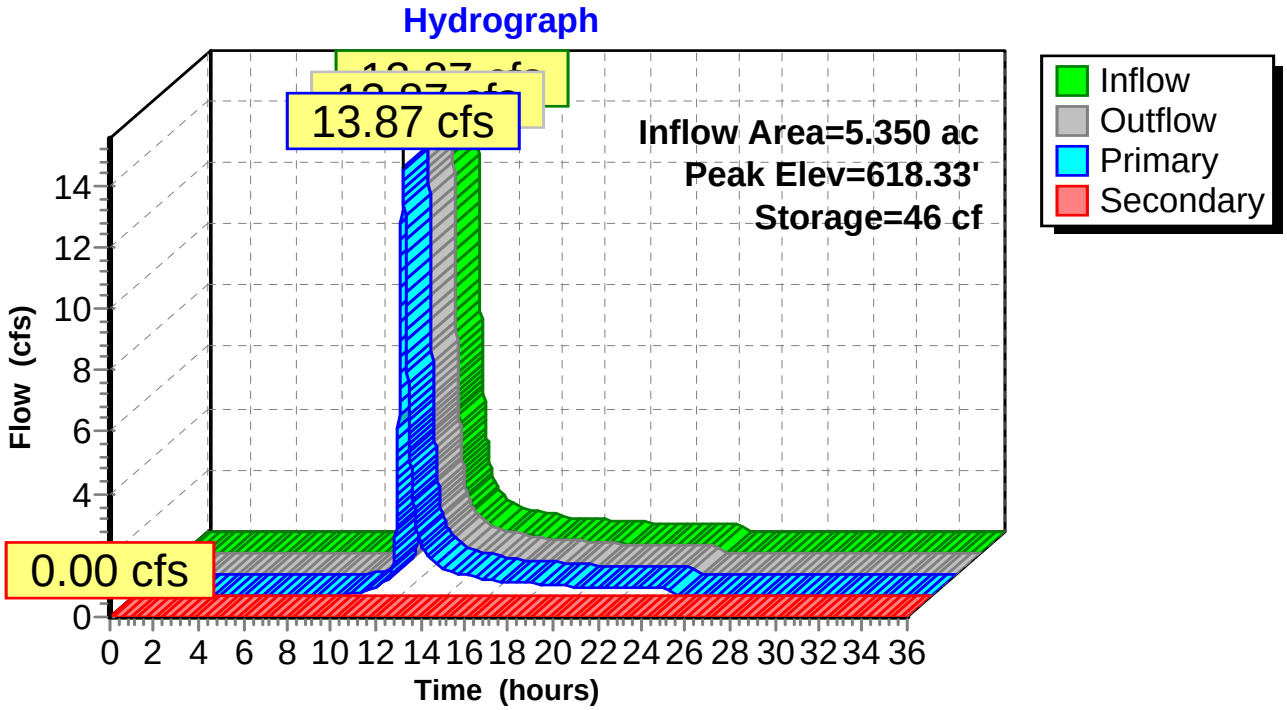
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
616.50	25	0	0
623.00	25	163	163
624.00	150	88	250
629.00	1,000	2,875	3,125
630.00	1,000	1,000	4,125

Device	Routing	Invert	Outlet Devices
#1	Primary	616.50'	**24.0" Round Culvert** L= 64.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 616.50' / 605.20' S= 0.1766 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	629.00'	**30.0' long x 5.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=13.87 cfs @ 12.14 hrs HW=618.33' TW=603.34' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 13.87 cfs @ 4.60 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=616.50' TW=601.20' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 23P: LD02-4



Summary for Pond 24P: LD02-1

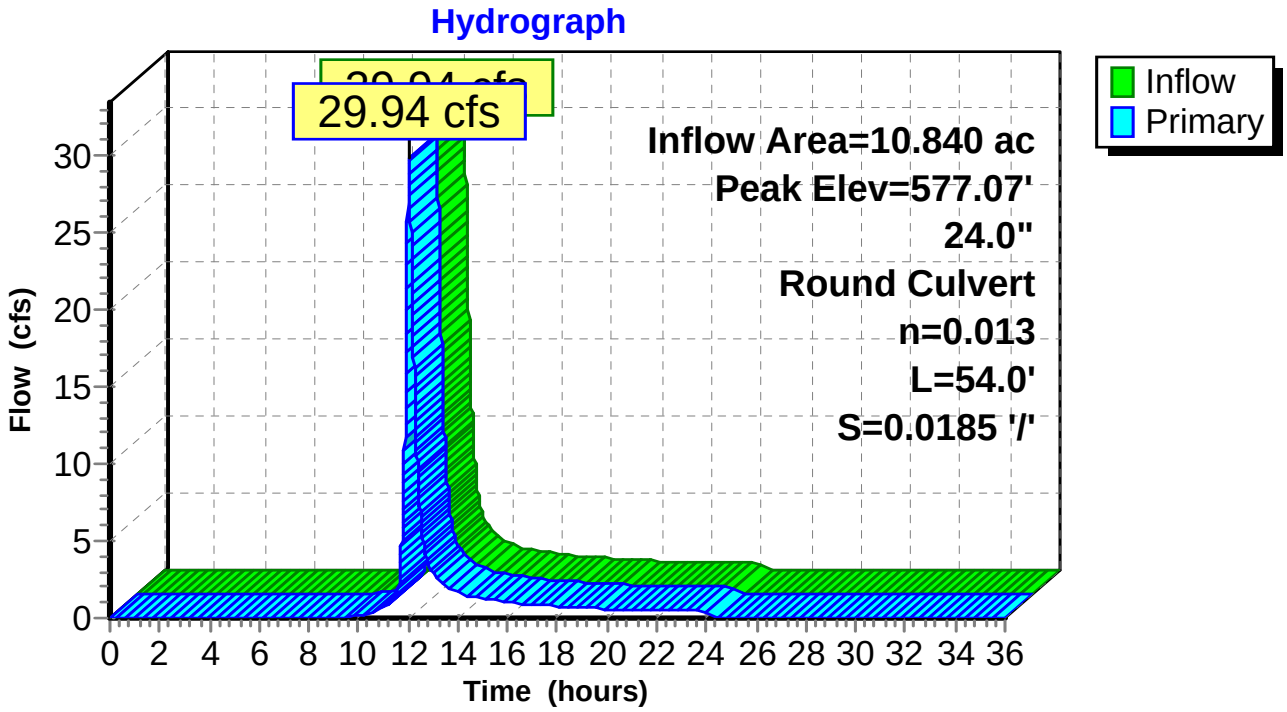
Inflow Area = 10.840 ac, 0.00% Impervious, Inflow Depth = 2.36" for JMSS_25-Year event
Inflow = 29.94 cfs @ 12.03 hrs, Volume= 2.136 af
Outflow = 29.94 cfs @ 12.03 hrs, Volume= 2.136 af, Atten= 0%, Lag= 0.0 min
Primary = 29.94 cfs @ 12.03 hrs, Volume= 2.136 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 577.07' @ 12.03 hrs
Flood Elev= 577.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	571.04'	**24.0" Round Culvert** L= 54.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 571.04' / 570.04' S= 0.0185 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=29.92 cfs @ 12.03 hrs HW=577.07' TW=571.35' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 29.92 cfs @ 9.52 fps)

Pond 24P: LD02-1



Summary for Pond 25P: LD01-1

Inflow Area =	14.930 ac,	0.00% Impervious,	Inflow Depth =	2.36"	for JMSS_25-Year event
Inflow =	31.70 cfs @	12.16 hrs,	Volume=	2.942 af	
Outflow =	31.70 cfs @	12.16 hrs,	Volume=	2.942 af,	Atten= 0%, Lag= 0.0 min
Primary =	31.70 cfs @	12.16 hrs,	Volume=	2.942 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

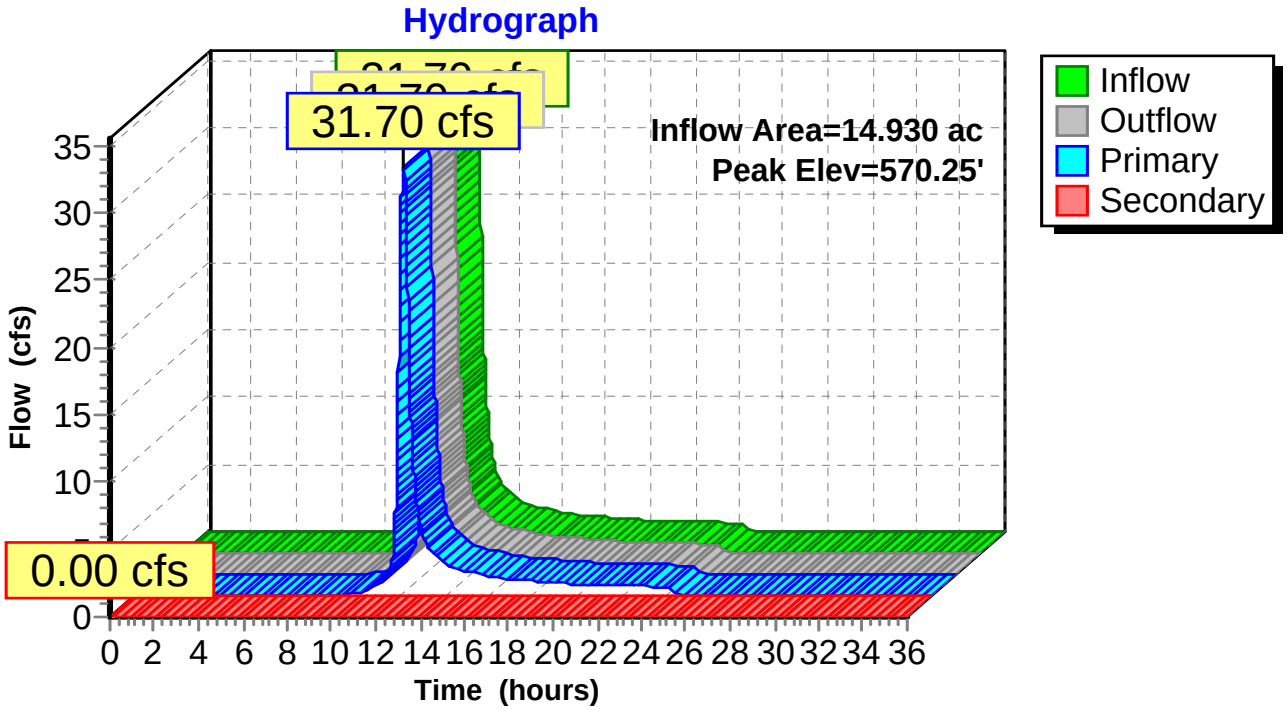
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 570.25' @ 12.18 hrs
Flood Elev= 573.46'

Device	Routing	Invert	Outlet Devices
#1	Primary	567.32'	**36.0" Round Culvert** L= 45.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 567.32' / 566.87' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	573.00'	**10.0' long x 3.0' 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 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=31.50 cfs @ 12.16 hrs HW=570.24' TW=569.12' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 31.50 cfs @ 4.49 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=567.32' TW=567.05' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 25P: LD01-1



Summary for Pond 26P: LD01-2

Inflow Area = 12.830 ac, 0.00% Impervious, Inflow Depth = 2.36" for JMSS_25-Year event
Inflow = 29.41 cfs @ 12.18 hrs, Volume= 2.528 af
Outflow = 29.41 cfs @ 12.18 hrs, Volume= 2.528 af, Atten= 0%, Lag= 0.0 min
Primary = 29.41 cfs @ 12.18 hrs, Volume= 2.528 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

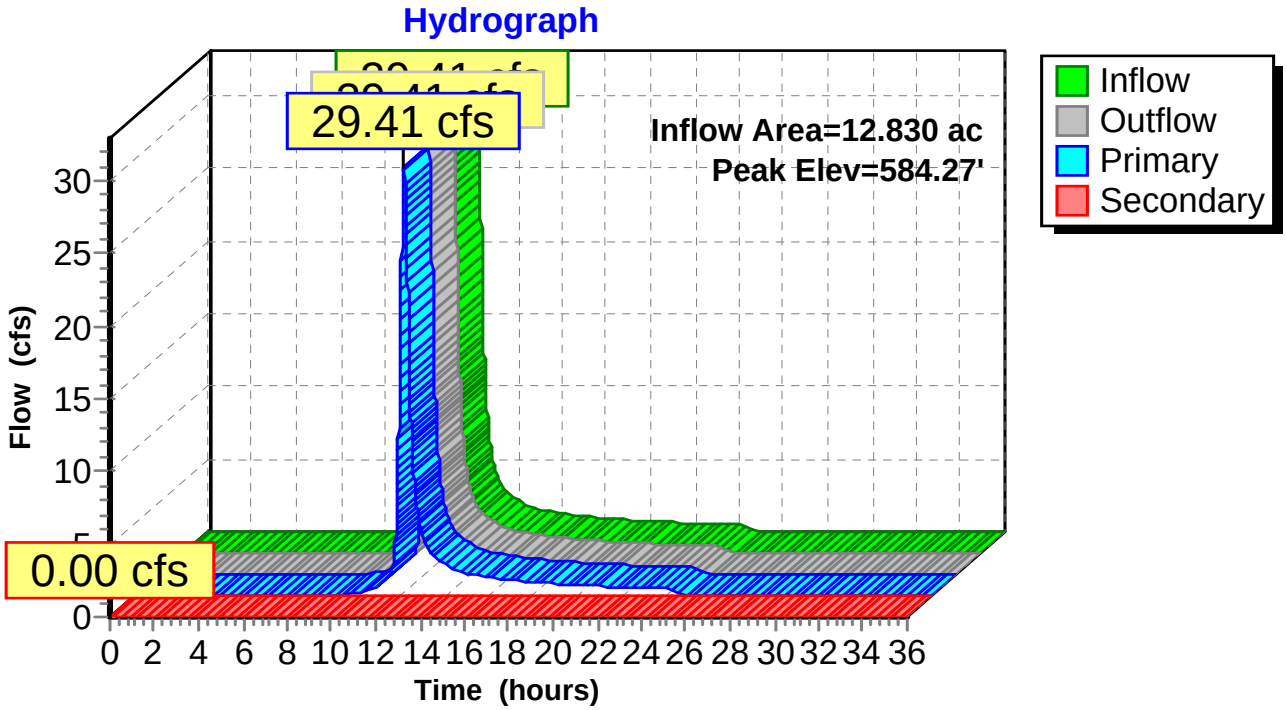
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 584.27' @ 12.18 hrs
Flood Elev= 590.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	582.00'	**36.0" Round Culvert** L= 94.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 582.00' / 565.00' S= 0.1809 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	593.00'	**10.0' long x 3.0' 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 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=29.40 cfs @ 12.18 hrs HW=584.27' TW=570.25' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 29.40 cfs @ 5.13 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=582.00' TW=567.32' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 26P: LD01-2



Summary for Pond 27P: LD01-3

Inflow Area =	9.240 ac,	0.00% Impervious,	Inflow Depth =	2.36"	for JMSS_25-Year event
Inflow =	22.63 cfs @	12.17 hrs,	Volume=	1.820 af	
Outflow =	22.63 cfs @	12.17 hrs,	Volume=	1.820 af,	Atten= 0%, Lag= 0.0 min
Primary =	22.63 cfs @	12.17 hrs,	Volume=	1.820 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

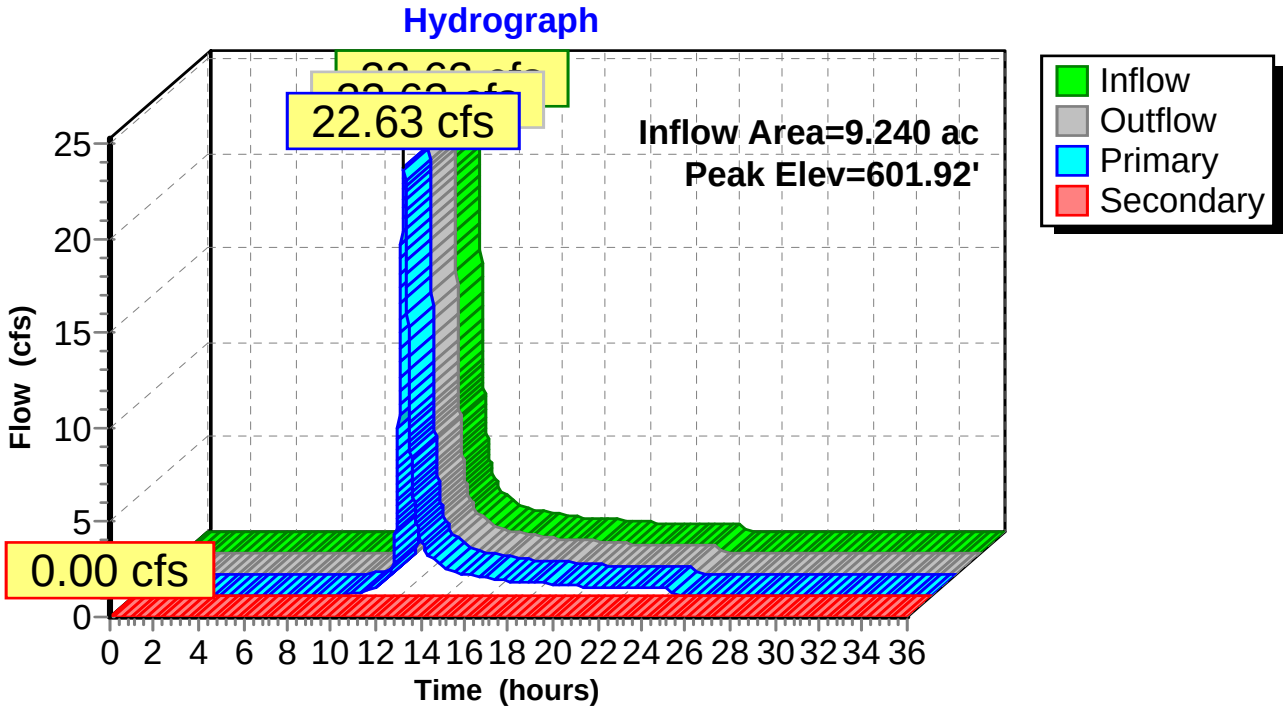
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 601.92' @ 12.17 hrs
Flood Elev= 612.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	600.00'	**36.0" Round Culvert** L= 88.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 600.00' / 584.00' S= 0.1818 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	604.00'	**10.0' long x 3.0' 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 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=22.62 cfs @ 12.17 hrs HW=601.92' TW=584.26' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 22.62 cfs @ 4.72 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=600.00' TW=582.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 27P: LD01-3



Summary for Pond 28P: LD01-4

Inflow Area = 7.590 ac, 0.00% Impervious, Inflow Depth = 2.36" for JMSS_25-Year event
Inflow = 18.96 cfs @ 12.15 hrs, Volume= 1.495 af
Outflow = 18.59 cfs @ 12.19 hrs, Volume= 1.495 af, Atten= 2%, Lag= 2.0 min
Primary = 18.59 cfs @ 12.19 hrs, Volume= 1.495 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 614.25' @ 12.19 hrs Surf.Area= 2,436 sf Storage= 2,095 cf

Plug-Flow detention time= 2.1 min calculated for 1.495 af (100% of inflow)
Center-of-Mass det. time= 2.0 min (848.8 - 846.9)

Volume	Invert	Avail.Storage	Storage Description
#1	612.54'	106,783 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

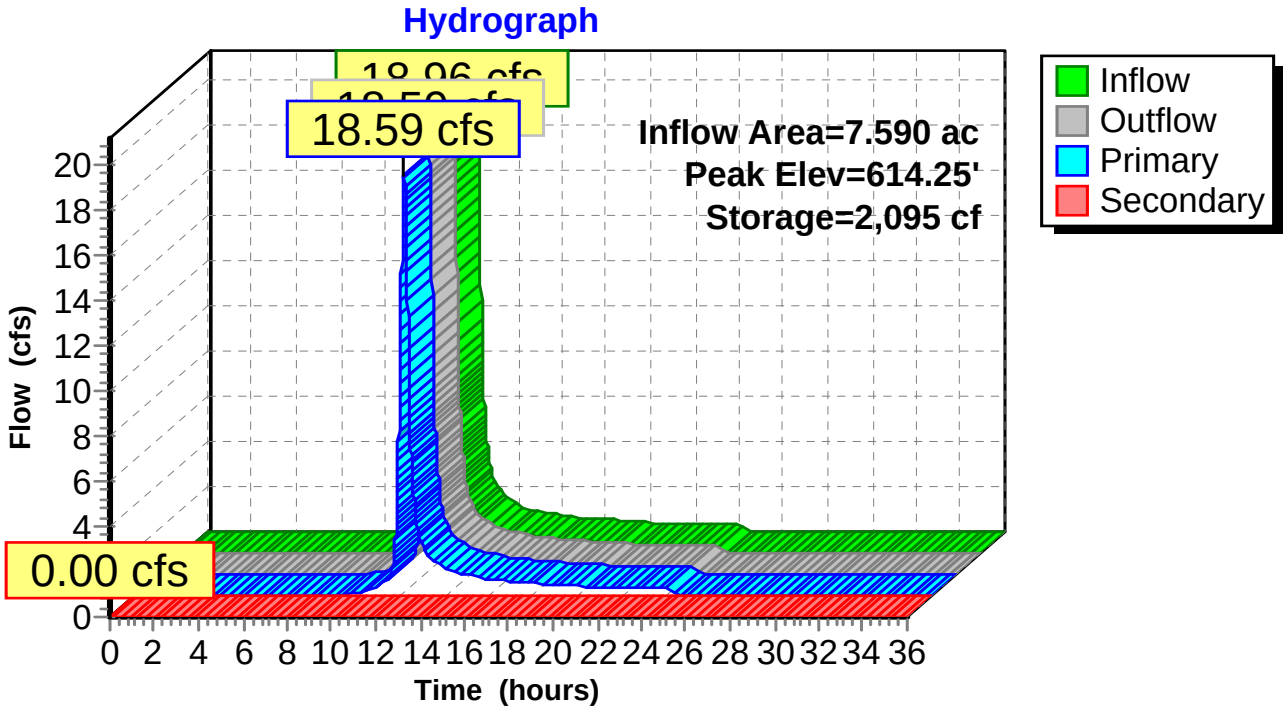
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
612.54	100	0	0
614.00	2,000	1,533	1,533
623.00	17,500	87,750	89,283
624.00	17,500	17,500	106,783

Device	Routing	Invert	Outlet Devices
#1	Primary	612.54'	**36.0" Round Culvert** L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 612.54' / 604.00' S= 0.0890 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf
#2	Secondary	623.00'	**30.0' long x 5.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=18.59 cfs @ 12.19 hrs HW=614.25' TW=601.92' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 18.59 cfs @ 4.46 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=612.54' TW=600.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 28P: LD01-4



Summary for Pond 29P: LD01-OF1-1

Inflow Area = 59.090 ac, 0.00% Impervious, Inflow Depth > 2.92" for JMSS_25-Year event
Inflow = 109.43 cfs @ 12.22 hrs, Volume= 14.365 af
Outflow = 109.43 cfs @ 12.22 hrs, Volume= 14.364 af, Atten= 0%, Lag= 0.0 min
Primary = 109.43 cfs @ 12.22 hrs, Volume= 14.364 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 563.07' @ 12.22 hrs Surf.Area= 50 sf Storage= 132 cf
Flood Elev= 569.00' Surf.Area= 40,240 sf Storage= 60,576 cf

Plug-Flow detention time= 0.1 min calculated for 14.360 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (909.4 - 909.3)

Volume	Invert	Avail.Storage	Storage Description
#1	560.43'	100,816 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

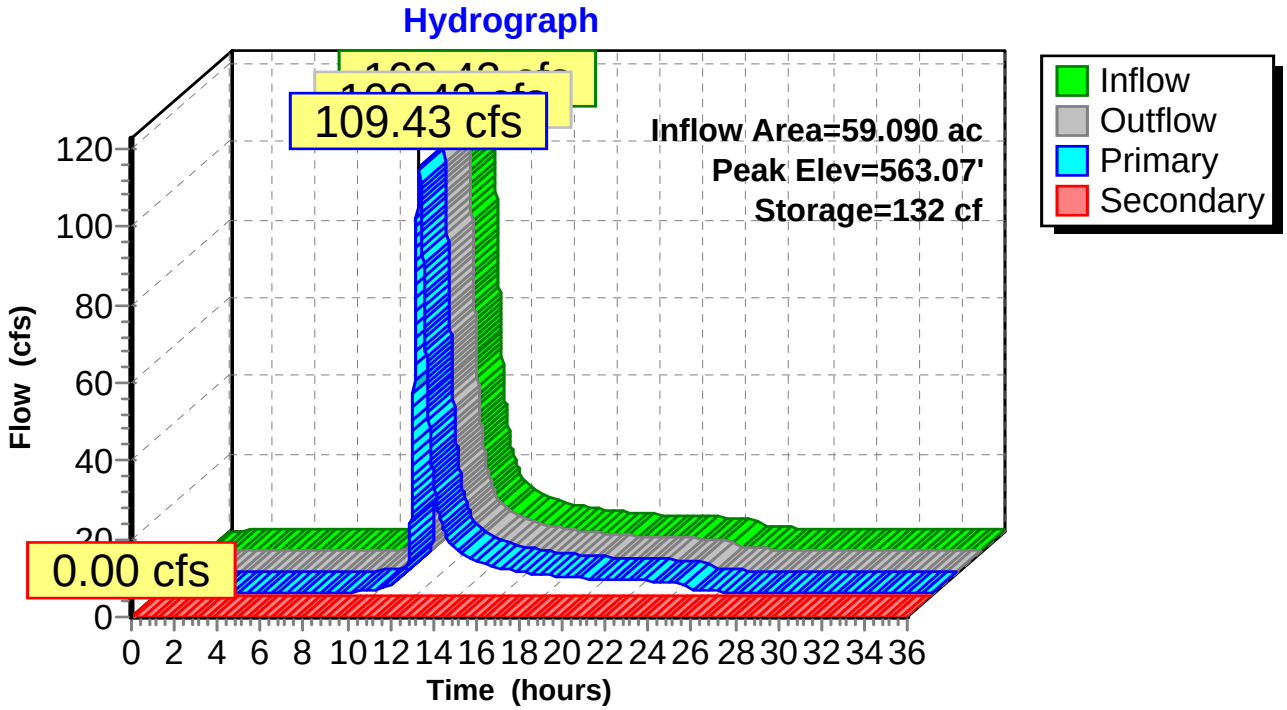
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
560.43	50	0	0
563.93	50	175	175
566.00	649	723	898
567.00	12,701	6,675	7,573
568.00	26,532	19,617	27,190
569.00	40,240	33,386	60,576
570.00	40,240	40,240	100,816

Device	Routing	Invert	Outlet Devices
#1	Primary	560.43'	**36.0" Round Culvert X 3.00** L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 560.43' / 558.08' S= 0.0490 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	569.00'	**30.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=109.42 cfs @ 12.22 hrs HW=563.07' TW=560.72' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 109.42 cfs @ 5.53 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=560.43' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 29P: LD01-OF1-1



Summary for Pond 40P: LD01-OF1-2

[57] Hint: Peaked at 560.72' (Flood elevation advised)

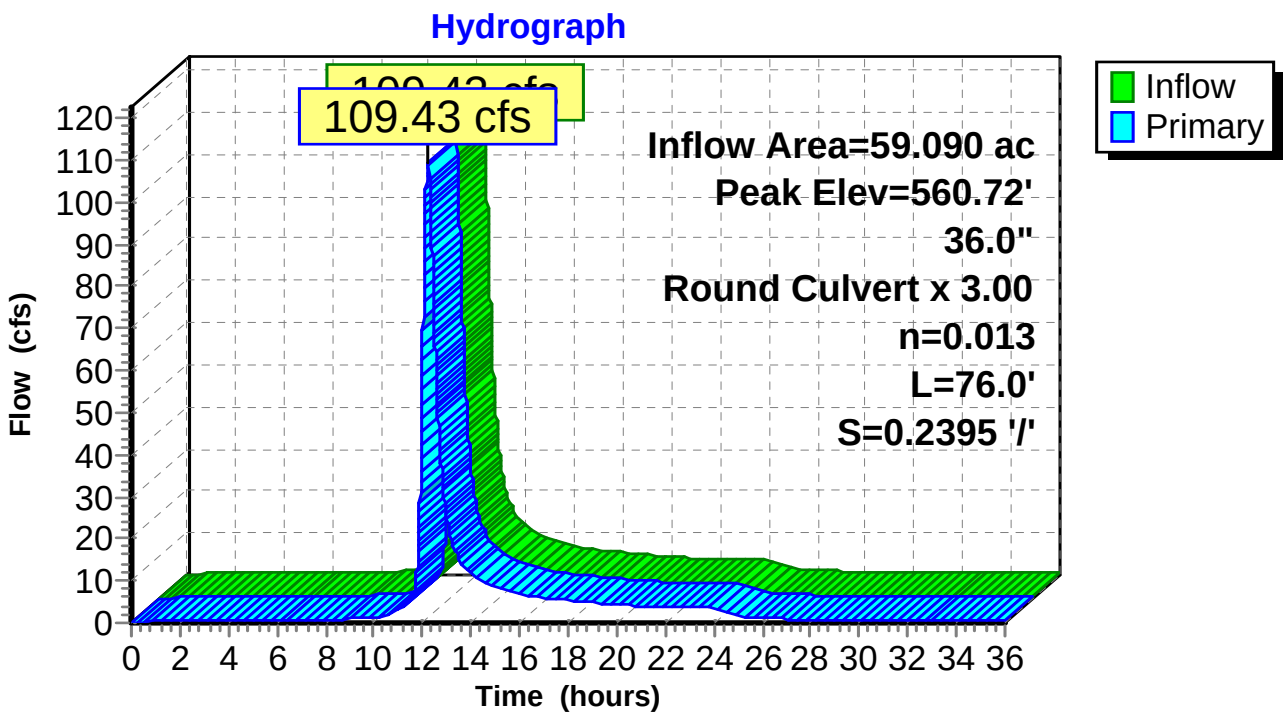
Inflow Area =	59.090 ac,	0.00% Impervious,	Inflow Depth >	2.92"	for JMSS_25-Year event
Inflow =	109.43 cfs @	12.22 hrs,	Volume=	14.364 af	
Outflow =	109.43 cfs @	12.22 hrs,	Volume=	14.364 af,	Atten= 0%, Lag= 0.0 min
Primary =	109.43 cfs @	12.22 hrs,	Volume=	14.364 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 560.72' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	558.08'	**36.0" Round Culvert X 3.00** L= 76.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 558.08' / 539.88' S= 0.2395 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=109.42 cfs @ 12.22 hrs HW=560.72' TW=542.84' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 109.42 cfs @ 5.53 fps)

Pond 40P: LD01-OF1-2



Summary for Pond 41P: LD01-OF-1-3

[57] Hint: Peaked at 542.84' (Flood elevation advised)

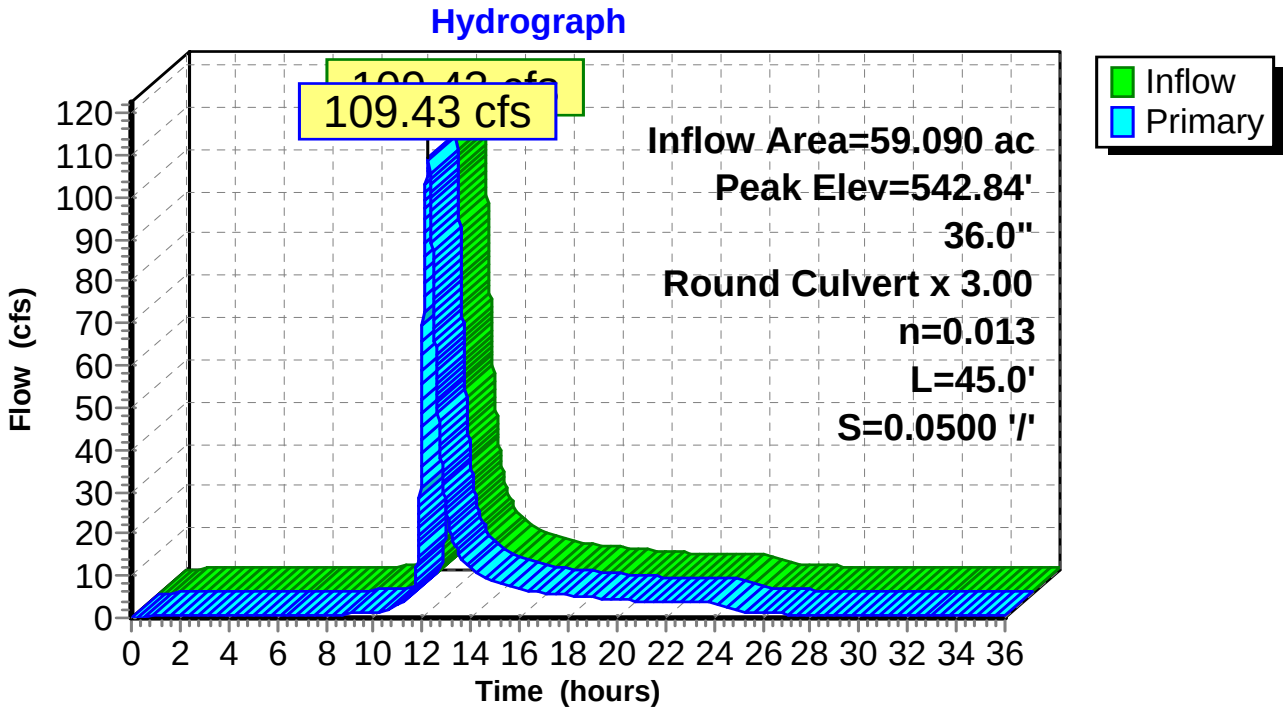
Inflow Area =	59.090 ac,	0.00% Impervious,	Inflow Depth >	2.92"	for JMSS_25-Year event
Inflow =	109.43 cfs @	12.22 hrs,	Volume=	14.364 af	
Outflow =	109.43 cfs @	12.22 hrs,	Volume=	14.364 af,	Atten= 0%, Lag= 0.0 min
Primary =	109.43 cfs @	12.22 hrs,	Volume=	14.364 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 542.84' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	539.88'	**36.0" Round Culvert X 3.00** L= 45.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 539.88' / 537.63' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=109.42 cfs @ 12.22 hrs HW=542.84' (Free Discharge)
└**1=Culvert** (Inlet Controls 109.42 cfs @ 5.17 fps)

Pond 41P: LD01-OF-1-3



Summary for Pond 42P: OF2-2

[57] Hint: Peaked at 561.55' (Flood elevation advised)

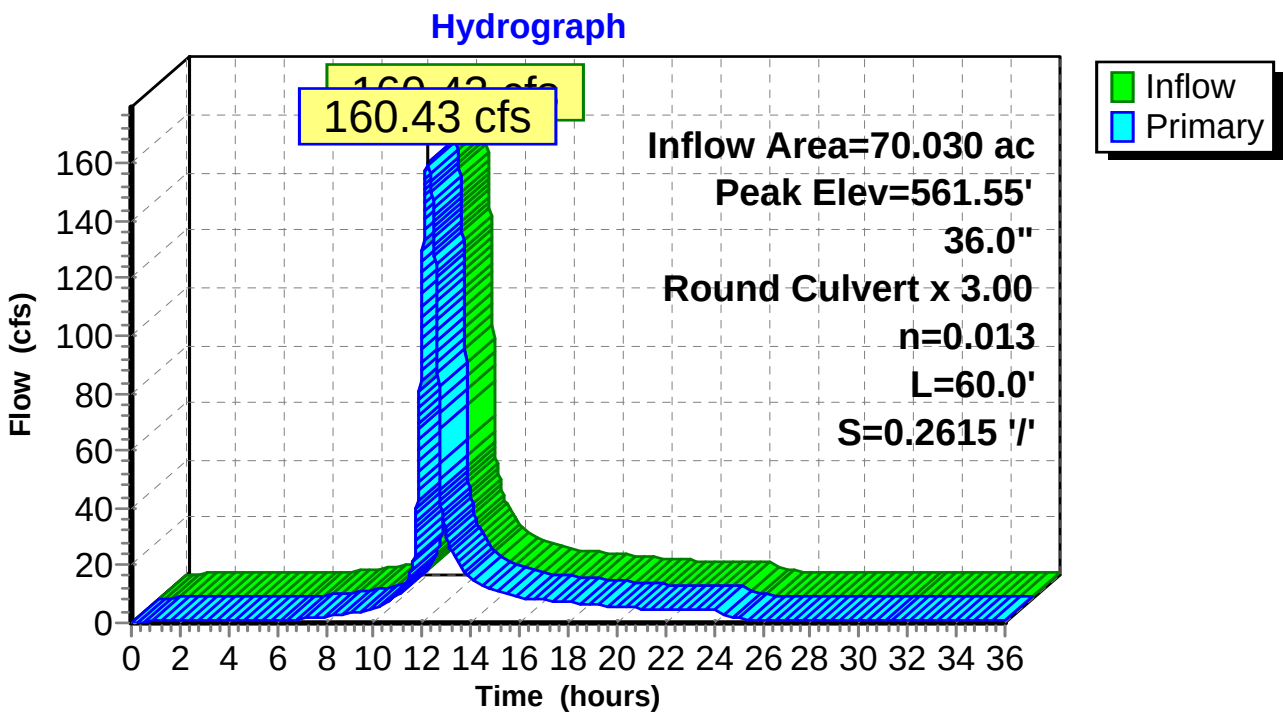
Inflow Area =	70.030 ac,	0.00% Impervious,	Inflow Depth >	3.78"	for JMSS_25-Year event
Inflow =	160.43 cfs @	12.22 hrs,	Volume=	22.040 af	
Outflow =	160.43 cfs @	12.22 hrs,	Volume=	22.040 af,	Atten= 0%, Lag= 0.0 min
Primary =	160.43 cfs @	12.22 hrs,	Volume=	22.040 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 561.55' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	557.58'	**36.0" Round Culvert X 3.00** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 557.58' / 541.89' S= 0.2615 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=160.42 cfs @ 12.22 hrs HW=561.55' TW=546.56' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 160.42 cfs @ 7.57 fps)

Pond 42P: OF2-2



Summary for Pond 43P: OF-2-3

[57] Hint: Peaked at 546.56' (Flood elevation advised)

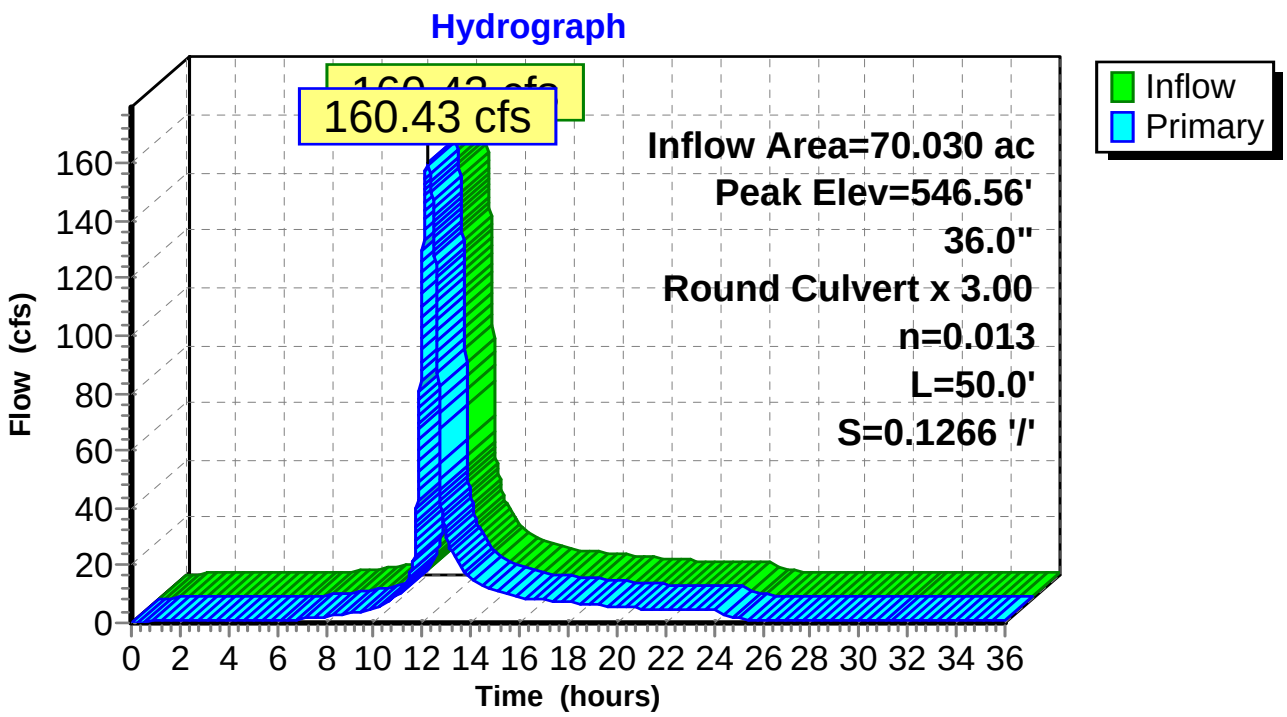
Inflow Area =	70.030 ac,	0.00% Impervious,	Inflow Depth >	3.78"	for JMSS_25-Year event
Inflow =	160.43 cfs @	12.22 hrs,	Volume=	22.040 af	
Outflow =	160.43 cfs @	12.22 hrs,	Volume=	22.040 af,	Atten= 0%, Lag= 0.0 min
Primary =	160.43 cfs @	12.22 hrs,	Volume=	22.040 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 546.56' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	541.89'	**36.0" Round Culvert X 3.00** L= 50.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 541.89' / 535.56' S= 0.1266 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=160.42 cfs @ 12.22 hrs HW=546.56' (Free Discharge)
└**1=Culvert** (Inlet Controls 160.42 cfs @ 7.57 fps)

Pond 43P: OF-2-3



Summary for Pond 47P: LD01-5

Inflow Area = 3.720 ac, 0.00% Impervious, Inflow Depth = 2.36" for JMSS_25-Year event
Inflow = 10.87 cfs @ 12.09 hrs, Volume= 0.733 af
Outflow = 9.29 cfs @ 12.16 hrs, Volume= 0.733 af, Atten= 15%, Lag= 4.5 min
Primary = 9.29 cfs @ 12.16 hrs, Volume= 0.733 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 621.19' @ 12.16 hrs Surf.Area= 2,106 sf Storage= 1,460 cf

Plug-Flow detention time= 1.2 min calculated for 0.733 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (845.0 - 843.8)

Volume	Invert	Avail.Storage	Storage Description
#1	619.30'	12,888 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

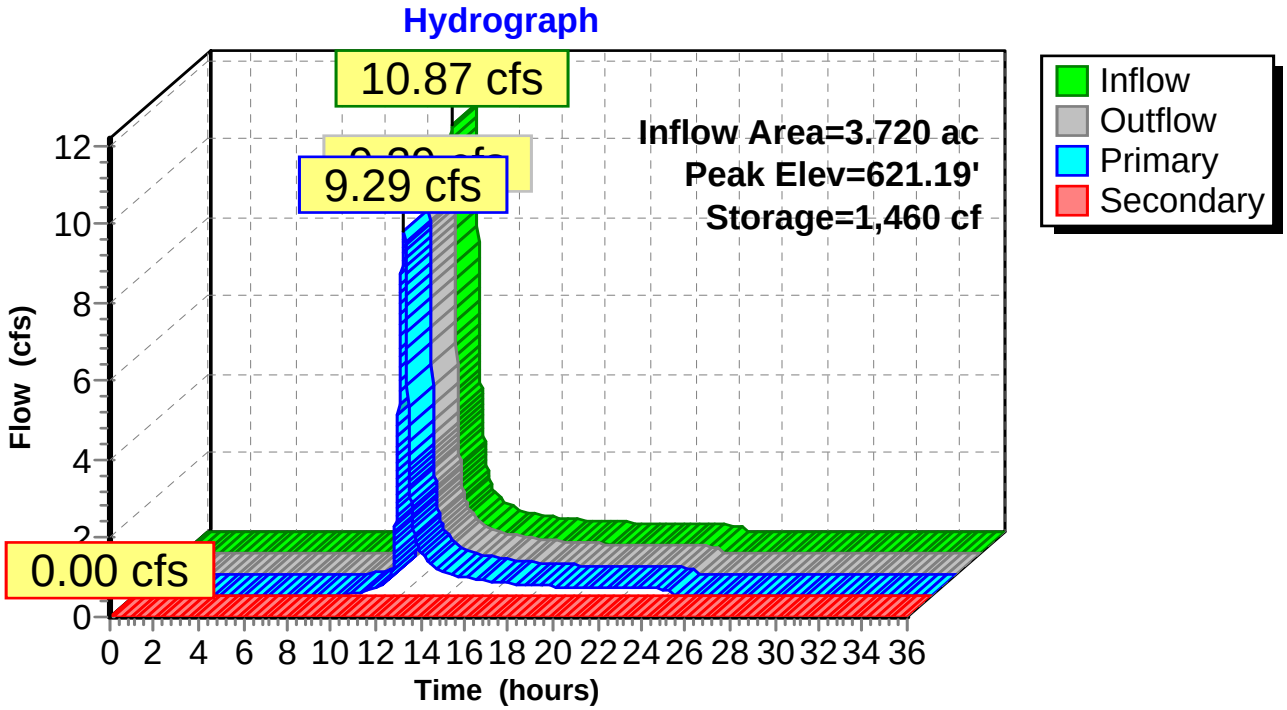
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
619.30	50	0	0
620.00	200	88	88
623.00	5,000	7,800	7,888
624.00	5,000	5,000	12,888

Device	Routing	Invert	Outlet Devices
#1	Primary	619.30'	**14.0" Round Culvert X 2.00** L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 619.30' / 616.30' S= 0.0462 '/' Cc= 0.900 n= 0.013, Flow Area= 1.07 sf
#2	Secondary	623.00'	**30.0' long x 5.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=9.29 cfs @ 12.16 hrs HW=621.19' TW=614.24' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 9.29 cfs @ 4.35 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=619.30' TW=612.54' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 47P: LD01-5



Summary for Pond 48P: LF11E-P2 POND

[62] Hint: Exceeded Reach 66R OUTLET depth by 7.57' @ 12.27 hrs
[62] Hint: Exceeded Reach 69R OUTLET depth by 8.24' @ 12.28 hrs

Inflow Area =	70.030 ac,	0.00% Impervious,	Inflow Depth >	3.78"	for JMSS_25-Year event
Inflow =	261.41 cfs @	12.07 hrs,	Volume=	22.044 af	
Outflow =	160.43 cfs @	12.22 hrs,	Volume=	22.040 af,	Atten= 39%, Lag= 8.9 min
Primary =	160.43 cfs @	12.22 hrs,	Volume=	22.040 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 568.62' @ 12.22 hrs Surf.Area= 48,191 sf Storage= 87,698 cf
Flood Elev= 569.00' Surf.Area= 57,732 sf Storage= 107,860 cf

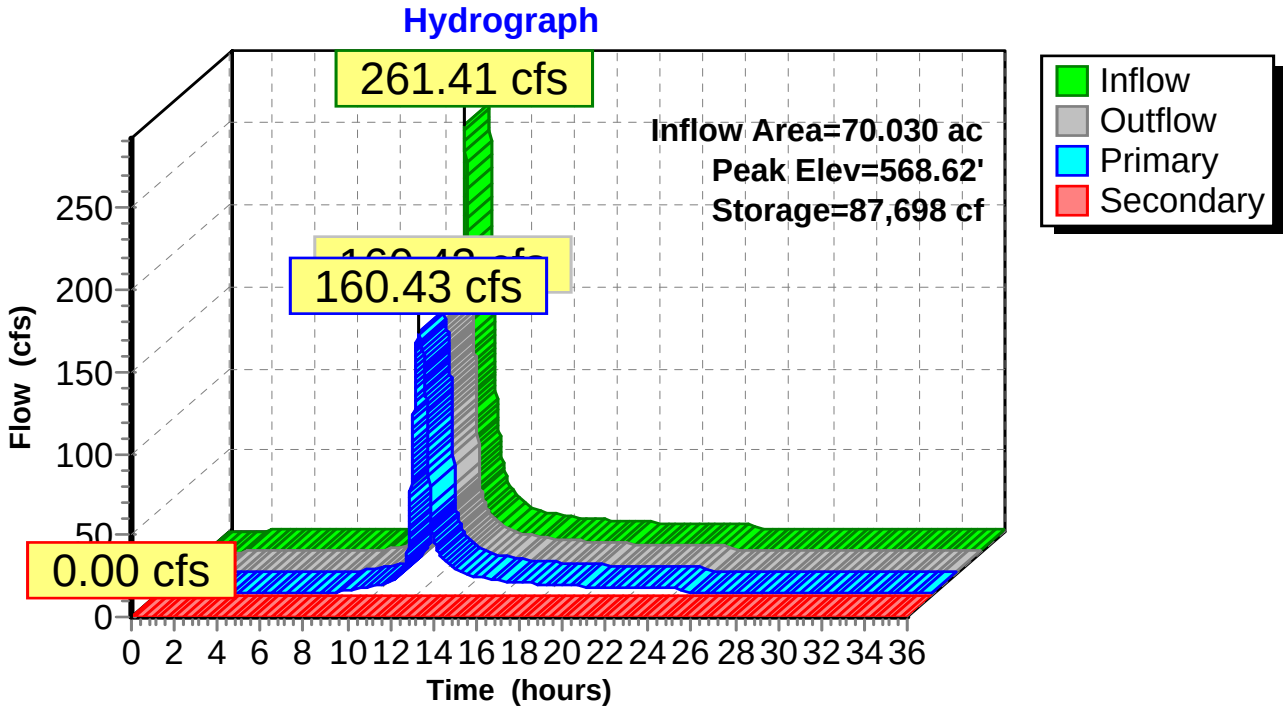
Plug-Flow detention time= 3.0 min calculated for 22.040 af (100% of inflow)
Center-of-Mass det. time= 2.8 min (865.2 - 862.4)

Volume	Invert	Avail.Storage	Storage Description
#1	559.38'	165,592 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
559.38	27	0	0
563.49	27	111	111
563.50	500	3	114
567.70	25,153	53,871	53,985
569.00	57,732	53,875	107,860
570.00	57,732	57,732	165,592

Device	Routing	Invert	Outlet Devices
#1	Primary	559.38'	**36.0" Round Culvert X 3.00** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 559.38' / 557.58' S= 0.0400 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf
#2	Device 1	563.50'	**30.0" Horiz. Orifice/Grate X 3.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	569.00'	**30.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=160.42 cfs @ 12.22 hrs HW=568.62' TW=561.55' (Dynamic Tailwater)
└─**1=Culvert** (Passes 160.42 cfs of 271.50 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 160.42 cfs @ 10.89 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=559.38' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 48P: LF11E-P2 POND