STORMWATER MANAGEMENT REPORT

Kansas Sky Solar Project

Douglas County, Kansas

NOVEMBER 2024

PREPARED FOR:

SAVION
A RENEWABLE ENERGY COMPANY

PREPARED BY:

Westwood

Stormwater Management Report

Kansas Sky Solar Project

Douglas County, Kansas

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Westwood Project Number: R0042114.00
Date: November 27, 2024

Westwood

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Introduction

The purpose of this report is to summarize the proposed stormwater management for the Kansas Sky Solar Project ("the project"). This report was prepared to meet stormwater management requirements per Douglas County and is intended for submittal to these agencies for permitting review and approval.

The project site is proposed within a 1,113 acre property boundary and is located approximately one mile north of the city of Lawrence in Douglas County, Kansas. The site's current use is agricultural row crops.

The area below the proposed solar panels is assumed to be pervious due to the area between and beneath the panels being vegetated. The proposed use of the site will be a solar facility consisting of native or naturalized vegetation below and around the solar array and about 24 acres of new impervious surface including gravel access roads, inverters, substation, O&M, and other associated solar infrastructure.

Minimal grading will be proposed on site and existing drainage patterns will be maintained. Stormwater management practices including retention and detention basins are proposed on site to meet the requirements of the county. Other stormwater measures are proposed to route water through the site including drainage crossings and swales.

Data Sources

TABLE 1: DATA SOURCES

Task	Format	Source	Use
Elevation	XML	SAM LLC	Onsite Model Elevations
Elevation	1-meter TIF	USGS TNM	Offsite Model Elevations
Elevation	TIF	Westwood Professional Services	Onsite Proposed Model Elevations
Landcover	Shapefile	USDA 2021 Crop Data Layer	Existing Landcover
Soil Types	Shapefile	Douglas County	Soil Types
Precipitation	PDF File	NOAA Atlas 14	Design Storms
Site Boundary	KMZ	Savion	Define Model Extents
2014 Aerial Photography	ArcGIS Map Service	USDA FSA	Reference

Site Conditions

Site Location

The project site is proposed within a 1,113 acre property boundary and is located approximately one mile north of the city of Lawrence in Douglas County, Kansas. See Exhibit 1 for a map of the project location.

Topography Description

The existing topographic information used in this analysis was obtained from a combination of the survey prepared by SAM dated 10/19/2022 and USGS National Elevation Set 1-meter elevation data obtained from the USGS The National Map. Survey elevations were used for onsite elevations whereas the 1-meter data was used to determine offsite contributing watersheds. The site is generally flat with slopes around 1%-5%.

Drainage Patterns

Onsite runoff is split into 12 drainage areas based on discharge locations and flowpaths. The drainage areas drain to 7 ultimate discharge locations. This study assumes that the Kansas River levee gates are closed, which would occur during times of high river flow. Drainage areas that normally drain toward the river are assumed to be ponded and diverted if necessary to Maple Grove Tributary. Discharge location 1 is a sump condition, locations 2-5 discharge to Maple Grove West, and discharge locations 6 & 7 discharge to Maple Grove East. Drainage areas and discharge locations are shown in Exhibits 6 & 7.

Soils

Soils data was obtained from the curve number shapefile provided by Douglas County. The site consists of Hydrologic Soil Group (HSG) B, C, and D soils. Type B soils have moderate runoff potential and infiltration rates. Type C soils have moderate runoff potential and low infiltration rates. Type D soils have high runoff potential and low infiltration rates. Low infiltration rates can cause localized flooding in low areas for extended periods on site. See Exhibit 3 for the soils distribution throughout the site.

Landcover

A review of aerial photographs and the USDA 2021 Crop Data Layer shows that the site is currently used and has historically been used for agricultural row crops. See Exhibit 4 for a map of the landcover throughout the site.

Requirements

State and County requirements have been reviewed for the project. All requirements determined to be relevant to the project are summarized below.

Kansas Department of Health and Environment Construction Stormwater Requirements

A Kansas Department of Health and Environment (KDHE) Construction Stormwater permit will be required for this project and will be obtained prior to construction.

Douglas County Stormwater Management Requirements

Douglas County has established the following stormwater management requirements for this project. Per County Code 12-306-49.06-d-7 and recommendations from the County Engineer,

storage and controlled release at points of discharge from the site may be required. The County Engineer has specified that runoff volumes and peak rates of discharge from the proposed project must be limited to existing conditions.

Drainage Improvements

Proposed ditches and culverts within the project will be sized as the project progresses. Based on the runoff calculations, improvements to public drainage systems will not be required.

Methodology

Existing and proposed conditions are modeled in HEC-HMS software. HEC-HMS is a hydrologic modeling software which involves determining rainfall-runoff relationships based on watershed characteristics and inputs, such as precipitation data and computational parameters. It models stormwater runoff discharge rates and velocities from ponds, culverts, outlet control structures, and stream reaches.

Hydrology

Curve Number Methodology, based on the NRCS TR-55 method, was used in the modeling for predicting direct runoff. Curve numbers were assigned by reviewing the soil and landcover for each drainage area. The County Engineer specified the curve numbers to be assigned to proposed land uses within the project.

Times of concentration were calculated for each drainage area using the lag method. The lag method uses the hydraulic length (distance traveled by a drop of water from the most distant part of the subcatchment to the outlet point) and the average land slope (average slope of entire watershed). The overall curve number for the site along with the lag information is used to get the time of concentration for the site.

Appendix A provides NOAA Atlas 14 rainfall data used in runoff calculations for the project. Rainfall values are listed in Table 2 below.

TABLE 2: RAINFALL TABLE

Storm Event	2-year 24-hour	10-year 24-hour	100-year 24-hour
Rainfall (in)	3.54	5.21	8.12

Stormwater Management Approach

A solar project differs greatly from other commercial or residential developments. When constructed, a solar project will include solar panels, at-grade gravel access roads, and other electrical equipment. The panels will be mounted above the ground with native or naturalized vegetation growing below. Due to the area between and beneath the panels being vegetated, panels are not considered an impervious surface. While solar projects may require grading, the existing terrain is smoothed to accommodate array installation, rather than significant changes to grades or slopes, and the grading is designed to maintain existing drainage patterns. Douglas County Code 12-306-49-05-b-3 limits grading to 5% of the project area. Access roads are installed at grade and allow for runoff to sheet flow through the proposed vegetation which provides a reduction in runoff.

In areas where proposed runoff exceeds that of existing conditions, basins are required to limit discharge from the site. To meet this requirement, a retention basin is provided in drainage area

1, and a detention basin is provided in drainage area 10. The proposed basins will hold water during storm events and reduce the runoff volume leaving the site.

Modeling

The site is modeled in existing and proposed conditions in order to complete the water quantity analysis required.

Existing Conditions

Existing curve numbers were assigned based on existing landcover and soil types (Appendix B). See Table 3 for a summary of existing conditions. Exhibit 4 shows the existing landcover across the site.

TABLE 3: EXISTING CONDITIONS CURVE NUMBERS

Cover	CN	Area (ac)
Water	100	7.9
Row Crop, HSG B	75	250.3
Row Crop, HSG C	82	329.5
Row Crop, HSG D	85	477.8
Pasture, HSG B	61	2.4
Pasture, HSG C	74	5.3
Pasture, HSG D	80	21.7
Woods, HSG B	55	0.4
Woods, HSG D	77	3.0
Row Crop, HSG C (OFFSITE)	82	0.1
Row Crop, HSG D (OFFSITE)	85	1.6
Total		1,100.0

Proposed Conditions

The County Engineer specified the curve numbers to be assigned to proposed land uses within the project. These curve numbers were assigned based on soil types provided by the county and the proposed landcover (Appendix B). See Table 4 below for a summary of proposed conditions and Exhibit 5 for a map of the proposed landcover. The specific species to be used for the proposed landcover can be found in the Revised Vegetation & Agrivoltaics Management Plan, Exhibit L, Appendix B.

TABLE 4: PROPOSED CONDITIONS CURVE NUMBERS

Cover	CN	Area (ac)
Roads/Inverters/Substation/O&M	98	24.2
Water	100	7.9
Woods, HSG B	55	0.4
Woods, HSG D	77	3.0
Racking, HSG B	67	41.8
Racking, HSG C	80	72.7
Racking, HSG D	86	103.2

Cover	CN	Area (ac)
Area between Racks, HSG B	76	90.0
Area between Racks, HSG C	86	149.1
Area between Racks, HSG D	91	211.9
Pasture, HSG B	61	116.0
Pasture, HSG C	74	105.6
Pasture, HSG D	80	172.5
Row Crop, HSG C (OFFSITE)	82	0.1
Row Crop, HSG D (OFFSITE)	85	1.6
Total		1,100.0

Results

The results of the analysis are described below.

Water Quantity Analysis

Stormwater quantity calculations for the site were prepared using HEC-HMS. Table 5 shows a summary of the runoff volumes for the recommended storm events at each site discharge location. Calculations are included in Appendices C & D.

TABLE 5: RUNOFF VOLUME SUMMARY

Location	2-year Runoff Volume (ac-ft)			10-year Runoff Volume (ac-ft)			100-year Runoff Volume (ac-ft)		
	Existing	Proposed – Unattenuated	Proposed – Attenuated	Existing	Proposed – Unattenuated	Proposed – Attenuated	Existing	Proposed – Unattenuated	Proposed – Attenuated
1[1]	56.2	58.5	51.9	99.2	101.9	95.4	178.6	181.9	175.3
2[1]	8.2	7.8	-	14.7	14.2	-	26.9	26.2	-
3[2]	2.9	2.2	-	5.7	4.7	-	11.2	9.8	-
4[2]	4.0	2.4	-	7.9	5.5	-	15.5	12.2	-
5[2]	55.0	49.6	-	101.4	94.2	-	189.2	180.0	-
6[3]	21.7	21.5	-	38.1	37.9	-	68.6	68.2	-
7[3]	16.8	17.0	16.4	30.2	30.5	29.8	55.1	55.5	54.8

[1] Sump Condition; [2] Maple Grove West; [3] Maple Grove East

As seen in Table 5 above, discharge locations 2-6 reduce runoff volumes without the need for additional storage. This is due to the conversion from row crop landcover to native and naturalized vegetation. The proposed vegetation will slow the runoff and allow for increased infiltration, and therefore a smaller runoff volume will leave the site compared to existing conditions. Discharge locations 1 & 7 will require additional storage as described below.

Stormwater Management Practices

Basin Calculations

Two basins are provided downstream of the proposed facilities and in areas where the proposed unattenuated water quantity analysis shows an increase in runoff. The first location is in drainage area 1 (sump condition and no outflow). A retention basin (Basin 1) is proposed in this location to provide additional storage to prevent increased flooding on adjacent properties. Basin 1 can be seen in Exhibits 7, 7A, 7C, and 8. The second location is in drainage area 10. A

detention basin (Basin 10) is proposed here to provide additional storage to match or reduce the existing discharge conditions. Basin 10 can be seen in Exhibits 7, 7E, and 8. Basin details can be found in the civil plans. The basins were sized to provide storage for the difference in runoff volume between the existing and proposed conditions for the 100-year, 24-hour storm event. See Table 6 below for the required sizing, and Table 7 for a summary of the basin geometry. Calculations can be found in Appendices C & D.

TABLE 6: BASIN STORAGE SUMMARY

Basin ID	Existing Runoff Volume (ac-ft)	Proposed Unattenuated Runoff Volume (ac-ft)	Required Storage Volume (ac-ft)	Provided Storage Volume (ac-ft)
1	178.6	181.9	3.30	13.17
10	55.1	55.5	0.40	1.85

TABLE 7: BASIN GEOMETRY

Basin ID	Basin Type	Bottom Elevation (ft)	Primary Outlet Elevation (ft)	Emergency Overflow Elevation (ft)	100-year, 24-hour High Water Level	Top Elevation (ft)
1	Retention	829.0	-	829.50*	829.6	830.0
10	Detention	827.0	827.0	827.75	828.5	829.0

*Modeled at existing outflow points from the basin

Based on conversations with the county engineer, the basins must be designed to drain down in 72 hours. Due to Basin 1 being located in a sump condition, it is not required to meet this standard, as it will only drain via minimal infiltration and evaporation. Basin 10 is designed with a 4" culvert at the bottom to drawdown the standing volume in the basin. See Table 8 below for a drawdown summary, and calculations can be found in Appendix D.

TABLE 8: DRAWDOWN SUMMARY

Basin ID	Provided Storage Volume (cf)	Discharge Device	Discharge Rate (cfs)	Drawdown Time (hr)
10	80,586	4" Culvert	0.31	72.2

Conclusion

The proposed site was designed to meet the requirements of Douglas County. The proposed site consists of a retention basin and a detention basin designed in optimal locations to reduce the runoff volume from the site. In addition, the proposed vegetative cover below the array will also help to reduce runoff volumes for the final conditions. Drainage crossings and swales within the site boundary will be sized as the project progresses.

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National Engineering Handbook, Part 630 Hydrology. Chapter 9 Hydrologic Soil-Cover Complexes. USDA. NRCS. 210-VI-NEH, July 2004

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Exhibits

Data Source(s): Westwood (2024); Esri WMS Basemap Imagery (Accessed 2024); USGS (2024); FEMA (2024); USDA (2024)

Legend

- Project Area
- County Boundary

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Kansas Sky Solar Project

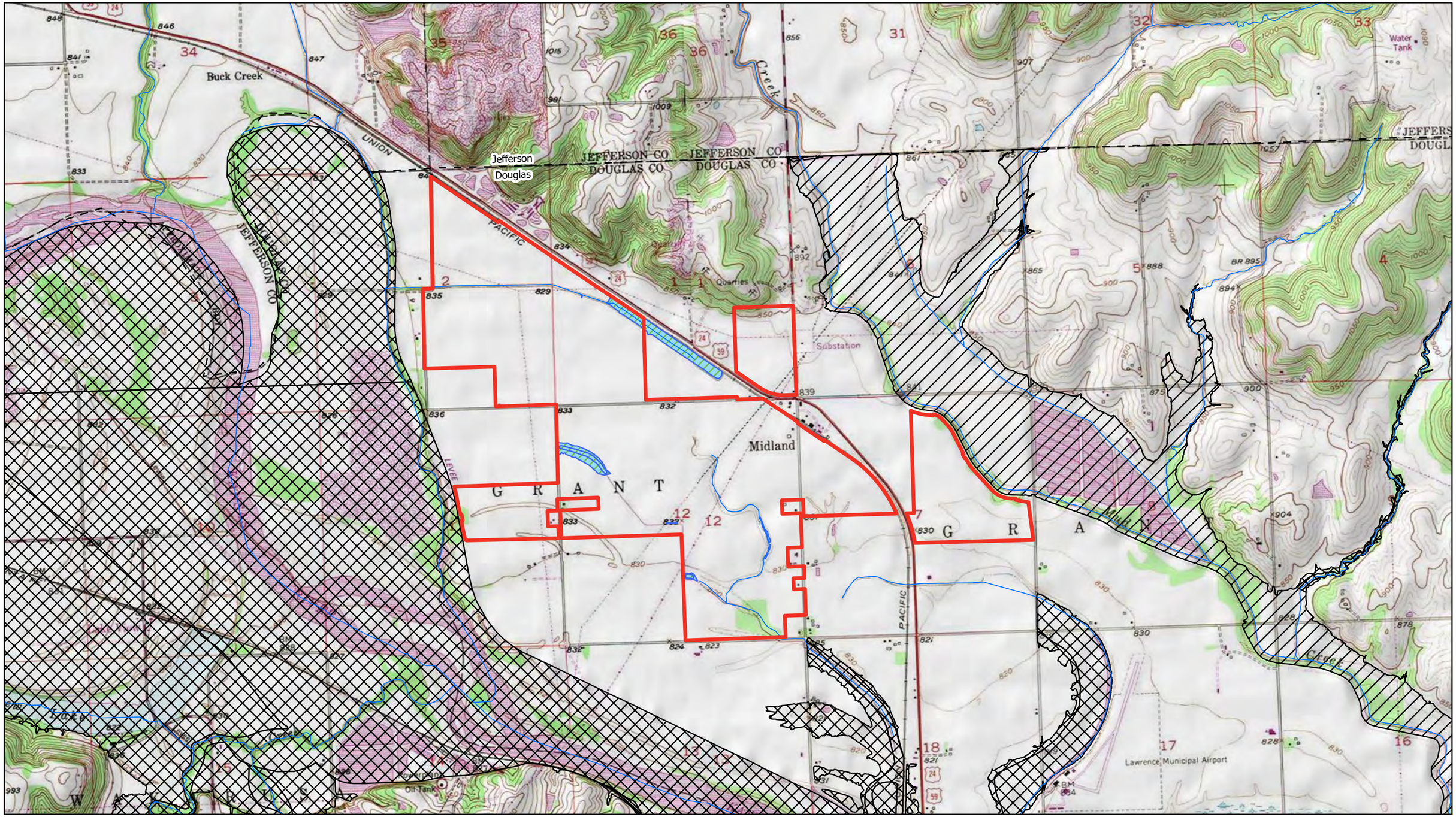
Douglas County, Kansas

N

0 Miles 1

Exhibit 1: Location Map

September 20, 2024



Data Source(s): Westwood (2024); Esri WMS Basemap Imagery (Accessed 2024); USGS (2024); FEMA (2024); USDA (2024)

Legend

- Project Area
- HUC-12 Boundary
- County Boundary
- FEMA Zone A
- FEMA Zone AE
- Delineated Wetlands
- NHD Flowlines

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N

0 Feet 2,000

Exhibit 2: Base Hydrologic Map

September 20, 2024

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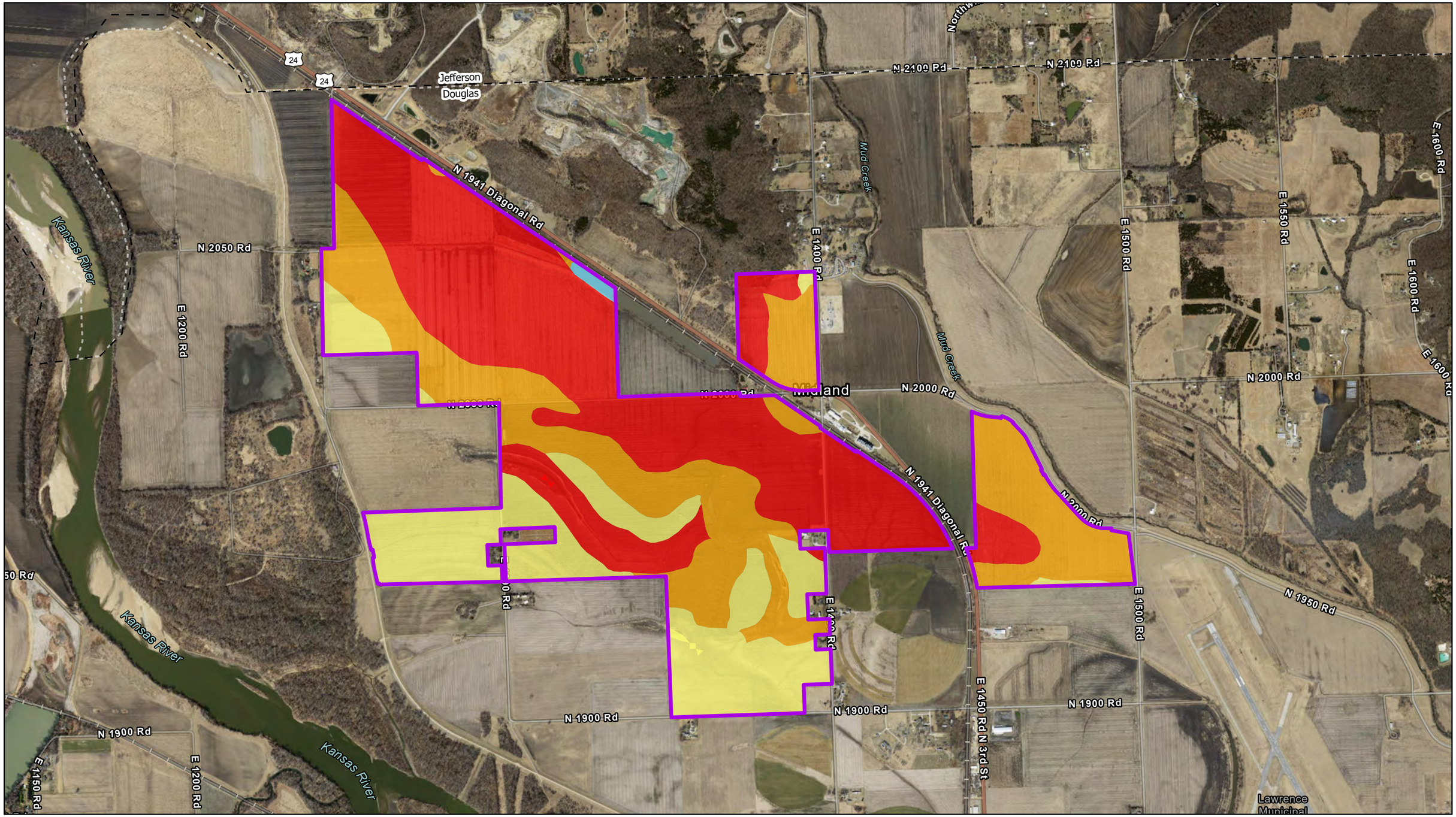
02-Base Hydrologic Map - USGS, FEMA, and NWI Wetlands Map | 9/26/2024 11:11 AM | sfalls



Data Source(s): Westwood (2024); Esri WMS Basemap Imagery (Accessed 2024); USGS (2024); FEMA (2024); USDA (2024)

Legend

- Project Area
- County Boundary

Hydrologic Soil Group

- B
- C
- D
- W

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N

0 Feet 1,500

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Exhibit 3: Soils Map

September 20, 2024

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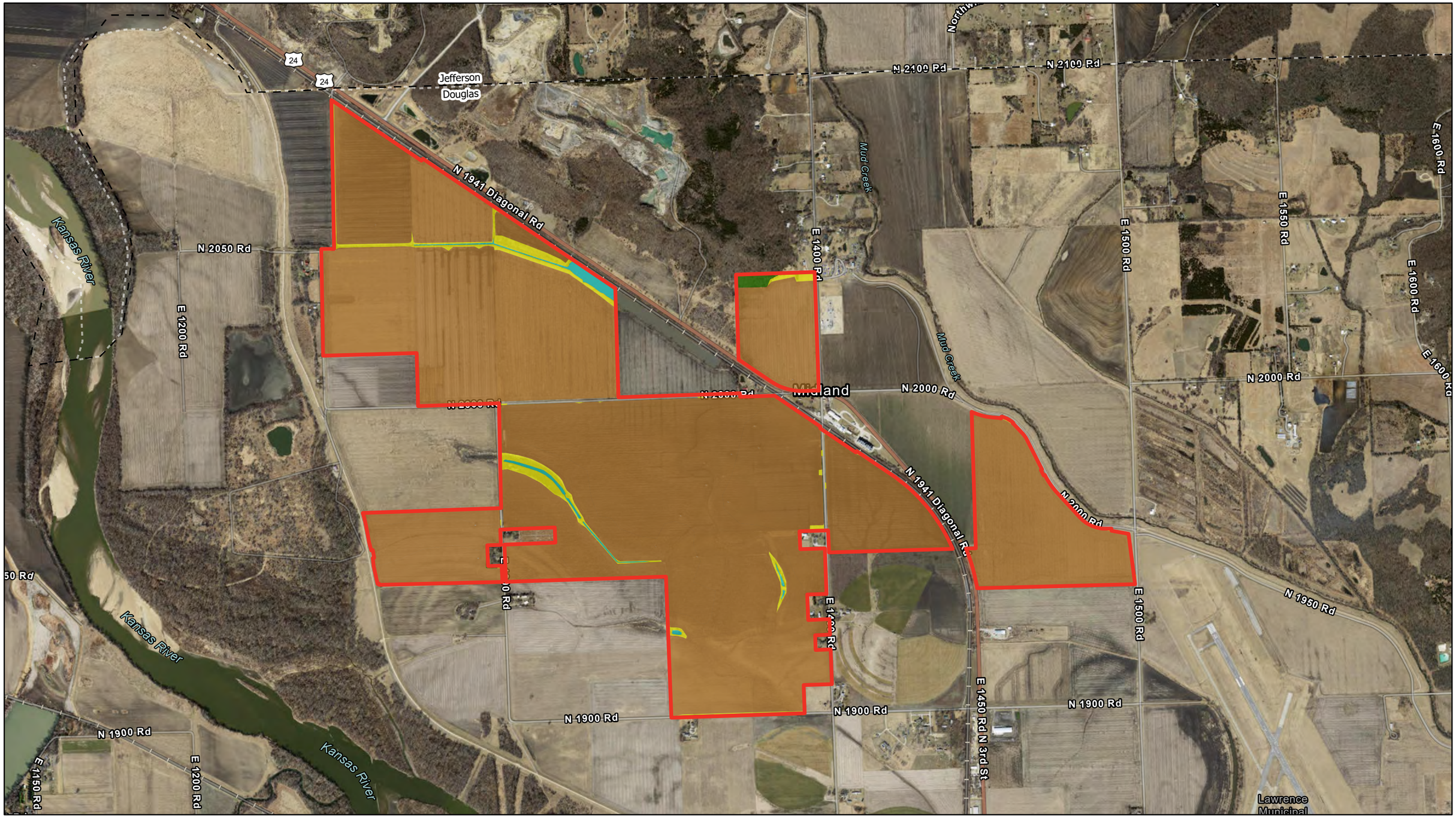

Data Source(s): Westwood (2024); Esri WMS Basemap Imagery (Accessed 2024); USGS (2024); FEMA (2024); USDA (2024)

Legend

- Project Area
- County Boundary
- Row Crop
- Pasture
- Woods
- Impervious
- Water

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N

0 Feet 1,500

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Douglas County, Kansas

Exhibit 4: Existing Landcover Map

September 20, 2024

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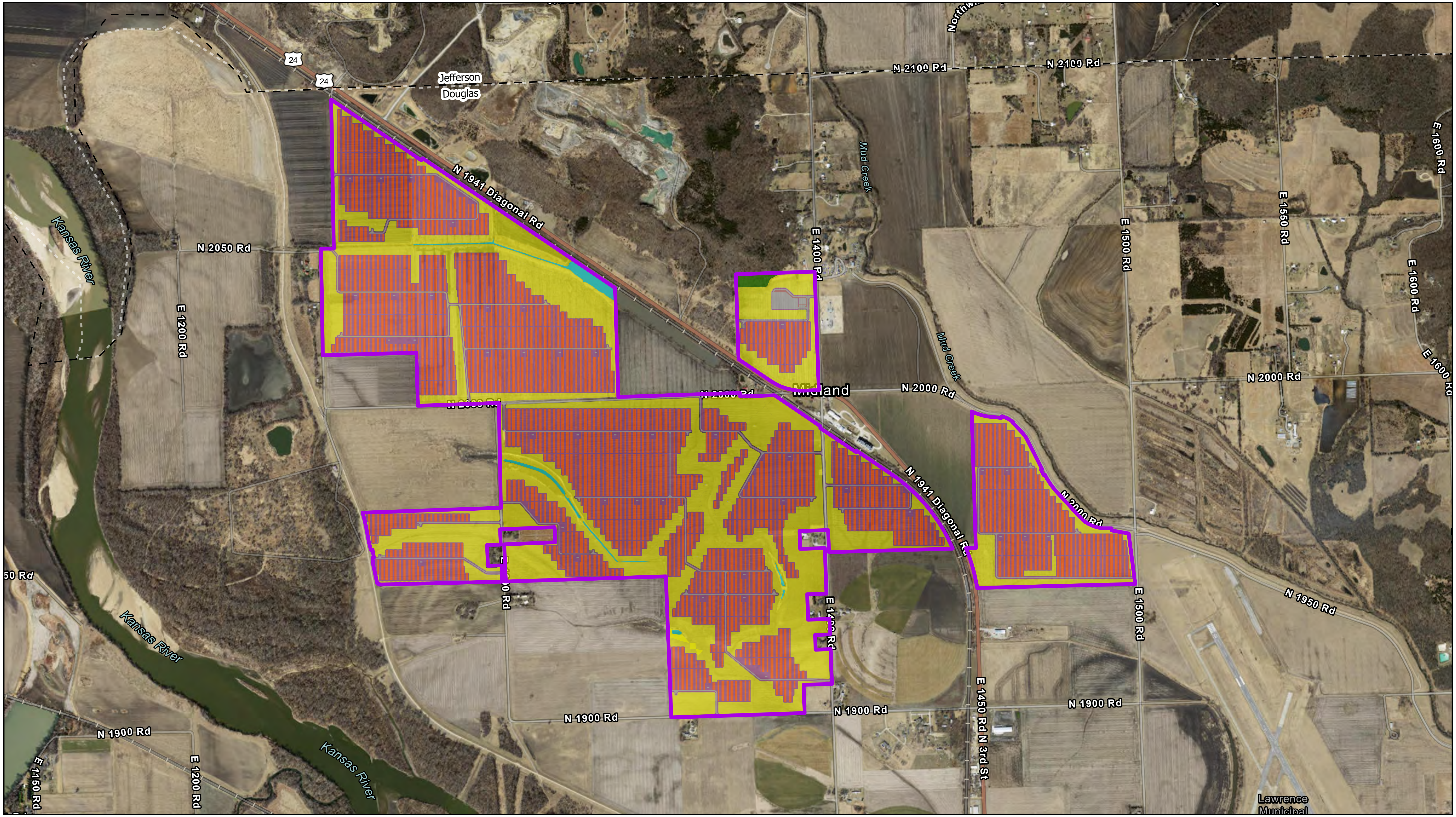

Data Source(s): Westwood (2024); Esri WMS Basemap Imagery (Accessed 2024); USGS (2024); FEMA (2024); USDA (2024)

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Legend

- Project Area
- County Boundary
- Racks
- Area Between Racks
- Woods
- Pasture
- Impervious
- Water

N

0 1,500 Feet

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Exhibit 5: Proposed Landcover Map

September 20, 2024

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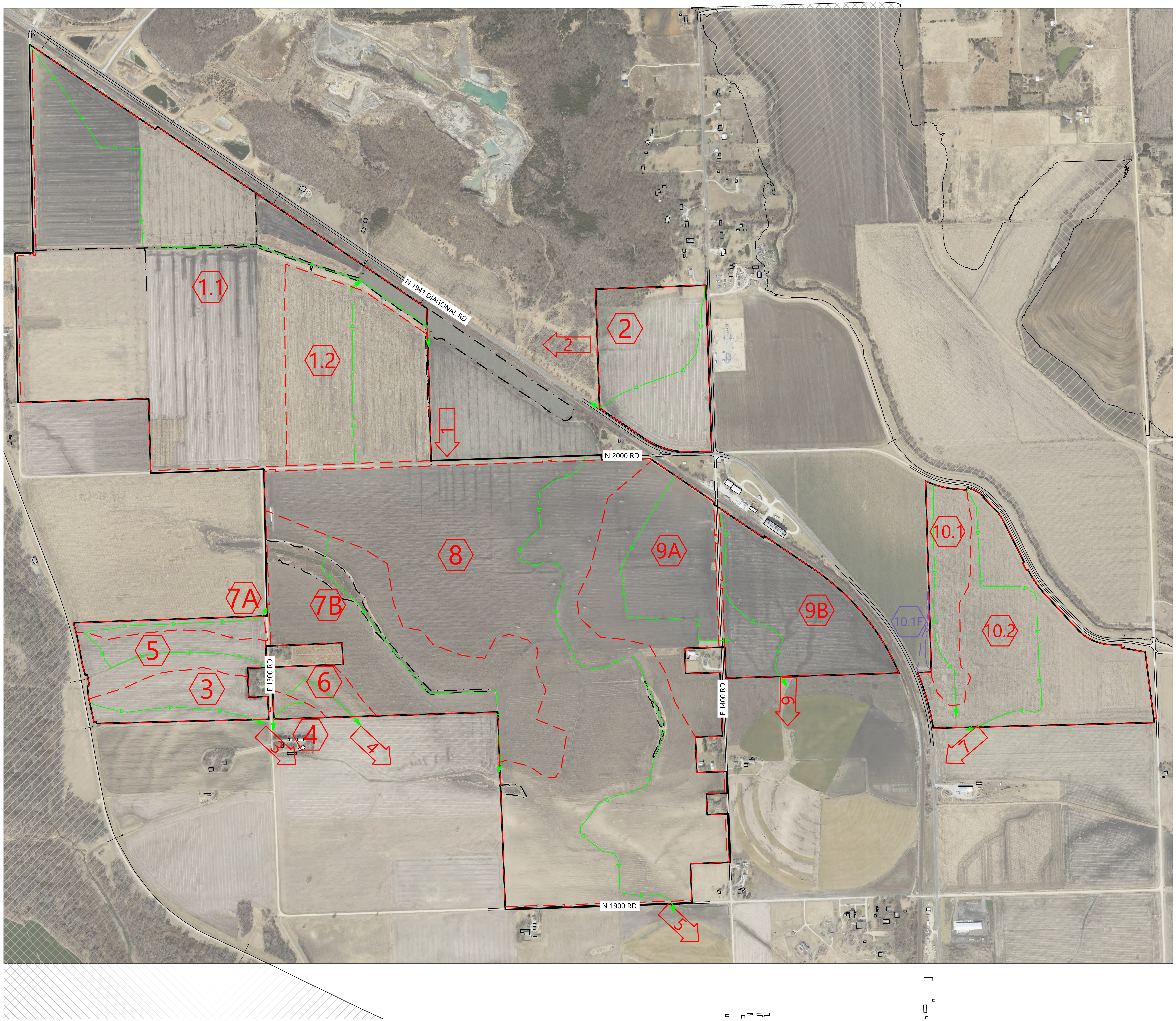

LEGEND:

- PROJECT BOUNDARY
- EX. PAVED ROAD
- EX. BUILDING
- EX. WETLAND
- FEMA FLOOD HAZARD ZONE
- EX. ONSITE DRAINAGE AREA BOUNDARY
- OFFSITE DRAINAGE AREA BOUNDARY
- EX. TIME OF CONCENTRATION LINE
- OFFSITE TIME OF CONCENTRATION LINE
- DISCHARGE LOCATION
- 1 ONSITE DRAINAGE AREA LABEL
- 1 OFFSITE DRAINAGE AREA LABEL
- 1 DISCHARGE AREA LABEL

0' 600' 1200' 1800'

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Overall Existing Drainage Map

DATE: 11/12/2024

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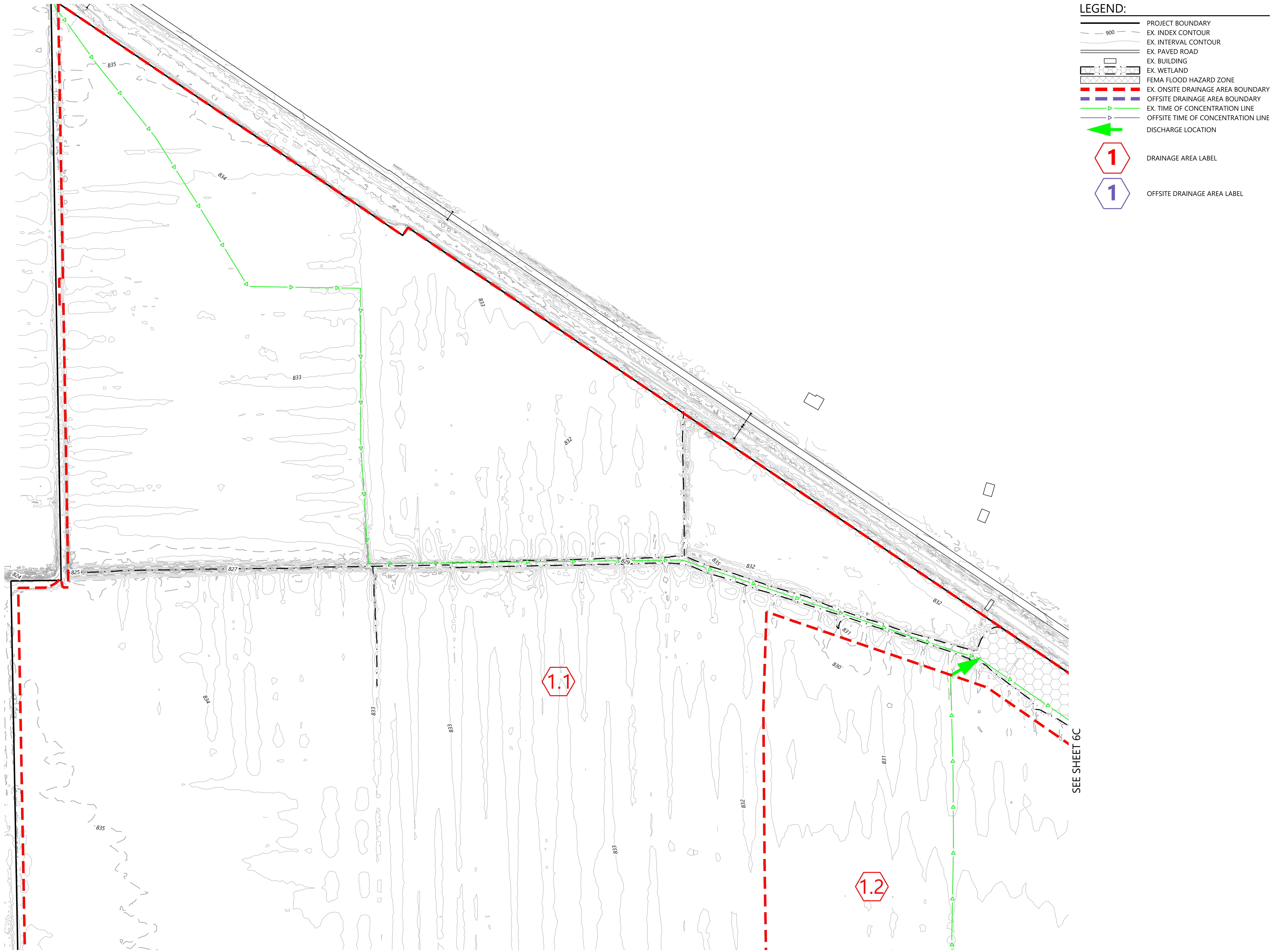

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Existing Drainage Map

DATE: 11/12/2024

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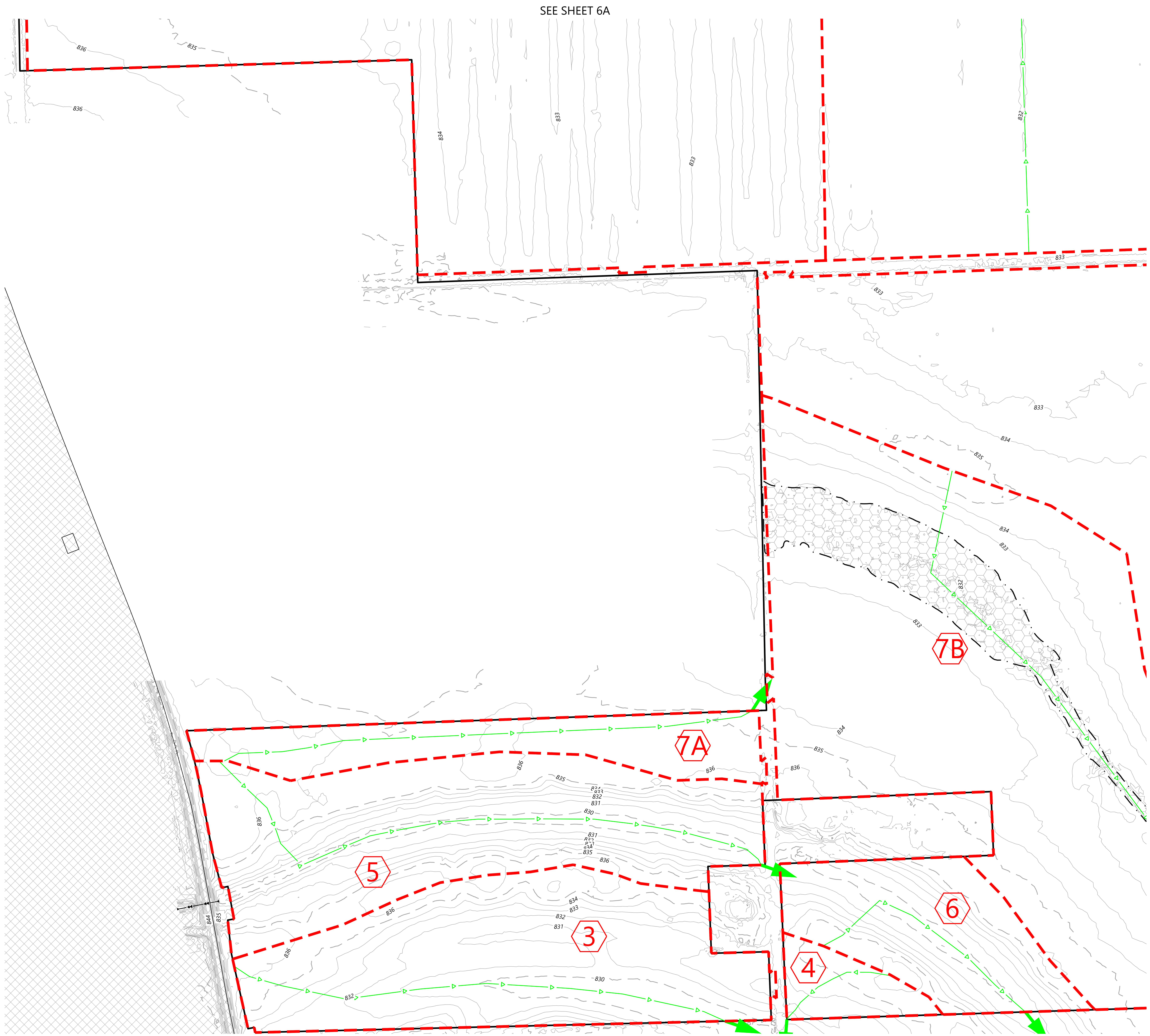

LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR
- EX. INTERVAL CONTOUR
- EX. PAVED ROAD
- EX. BUILDING
- EX. WETLAND
- FEMA FLOOD HAZARD ZONE
- EX. ONSITE DRAINAGE AREA BOUNDARY
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- OFFSITE TIME OF CONCENTRATION LINE
- DISCHARGE LOCATION
- 1 DRAINAGE AREA LABEL
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0' 200' 400' 600'

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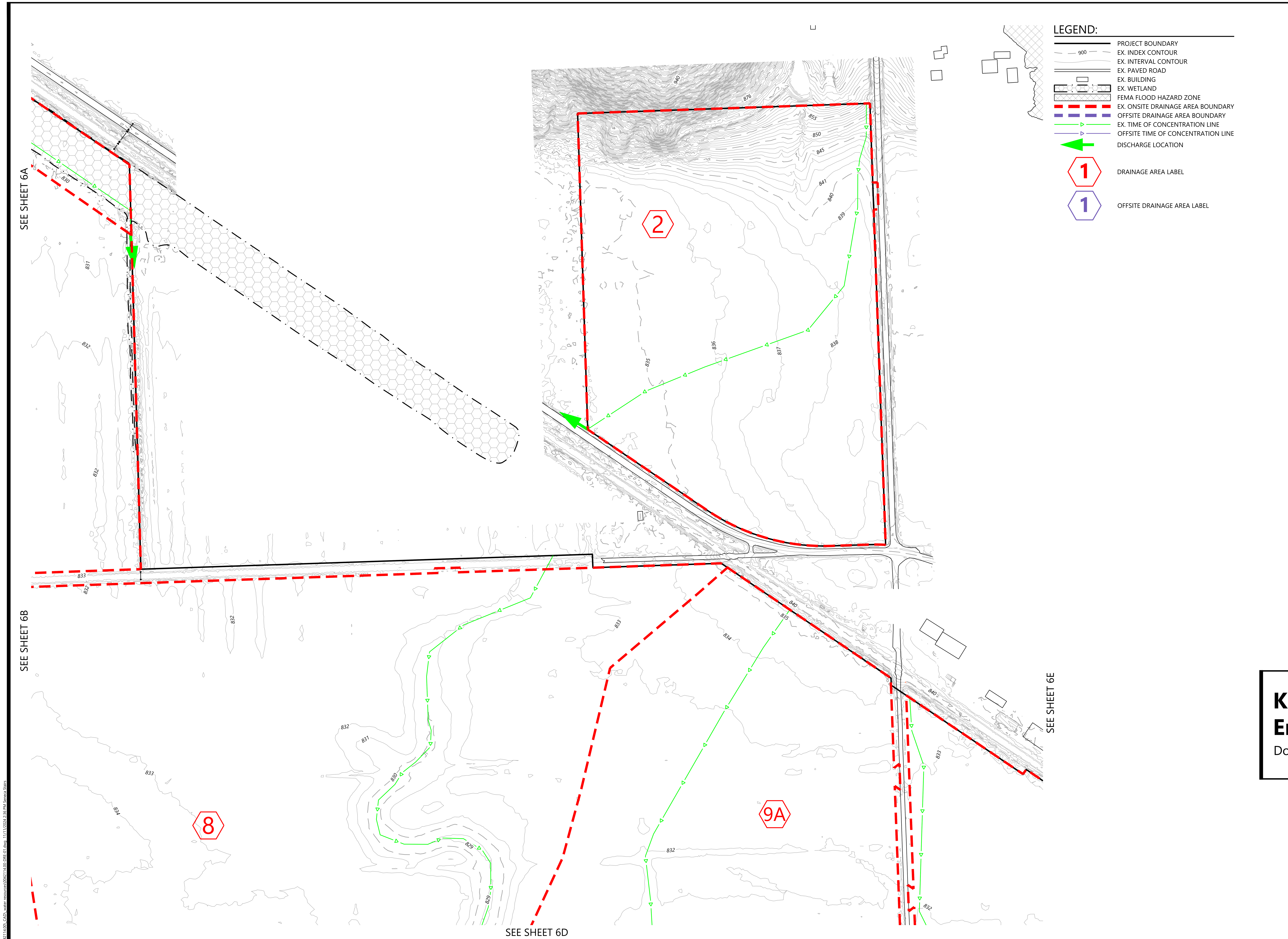
Douglas County, Kansas

Existing Drainage Map

DATE: 11/12/2024

REV:

SHEET: 6B



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Existing Drainage Map

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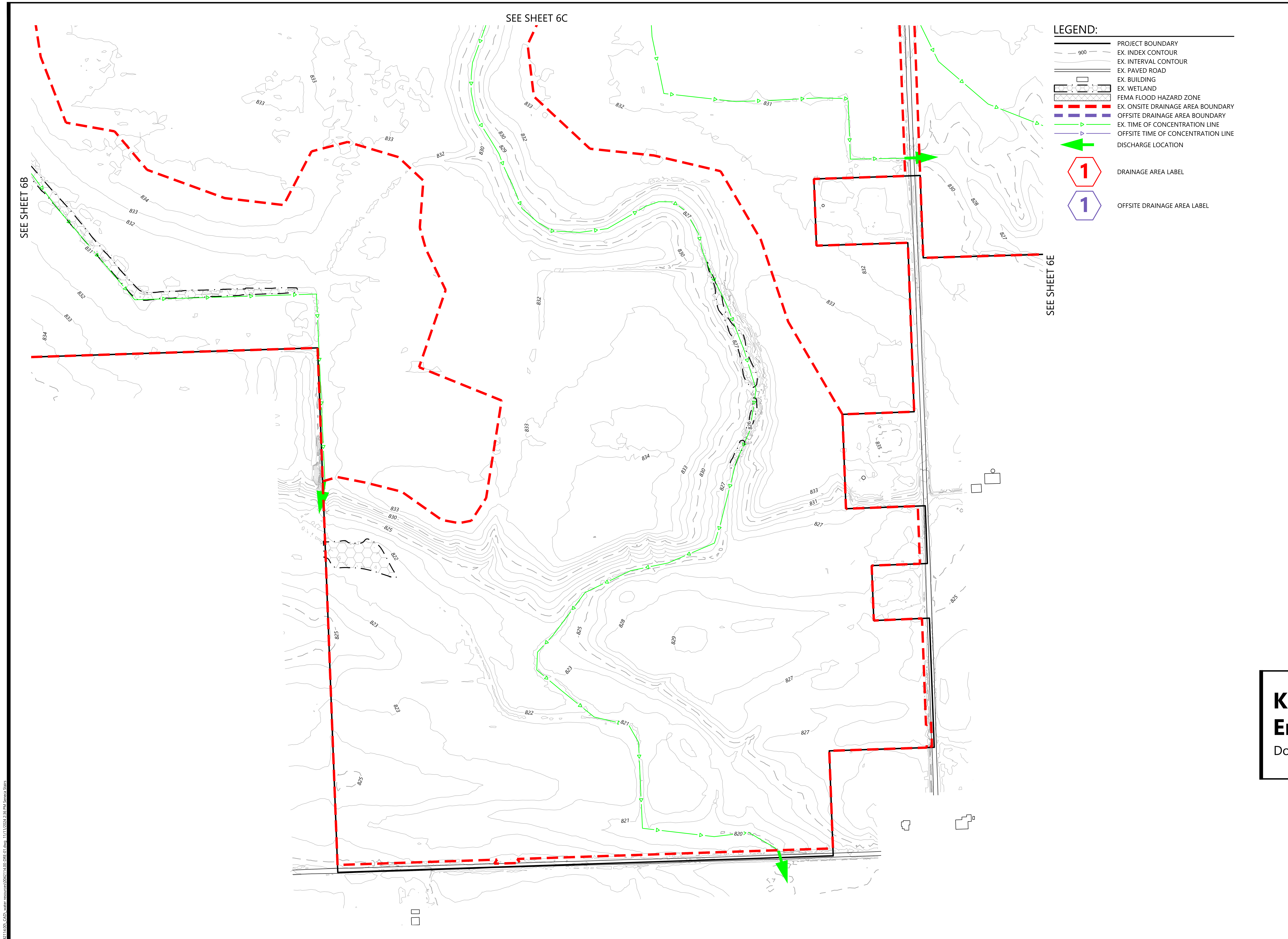

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0' 200' 400' 600'

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Douglas County, Kansas

Existing Drainage Map

DATE: 11/12/2024

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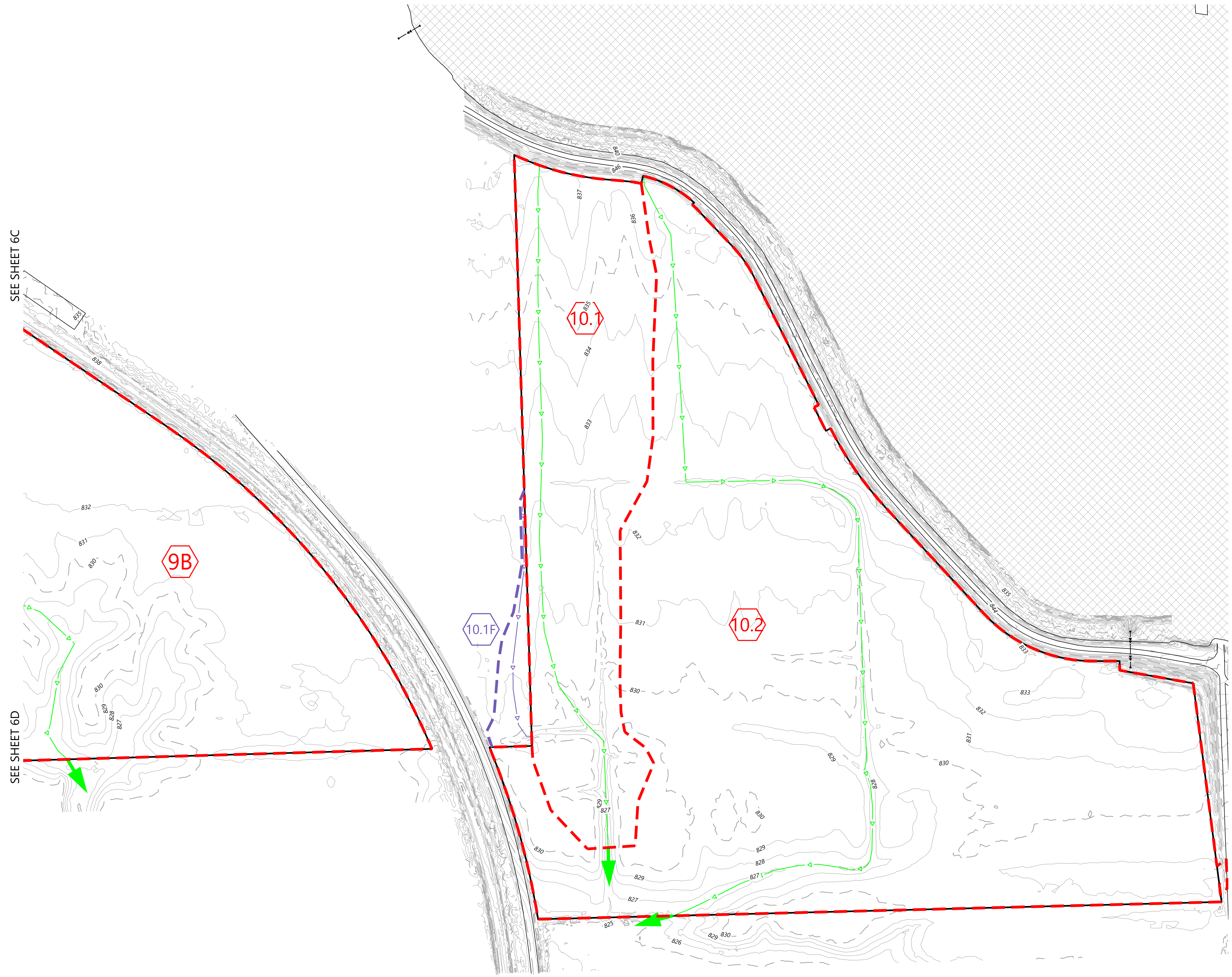

LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR
- EX. INTERVAL CONTOUR
- EX. PAVED ROAD
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0' 200' 400' 600'

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Existing Drainage Map

DATE: 11/12/2024

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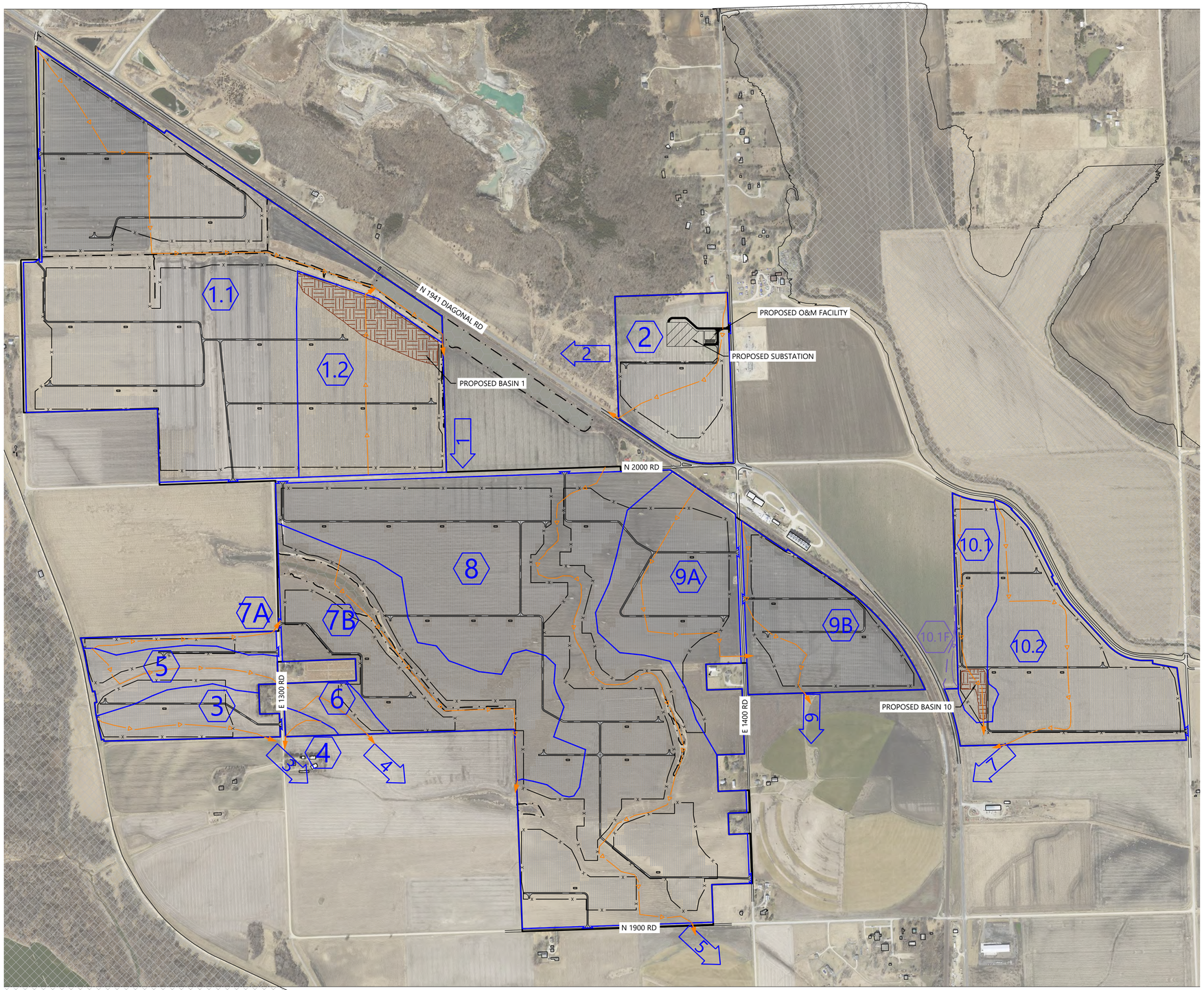

LEGEND:

- PROJECT BOUNDARY
- EX. PAVED ROAD
- EX. BUILDING
- EX. WETLAND
- FEMA FLOOD HAZARD ZONE
- PROPOSED SOLAR ARRAY
- PROPOSED ACCESS ROAD
- PROPOSED SECURITY FENCE
- PROPOSED ELECTRICAL EQUIPMENT
- PROPOSED FACILITIES
- PROPOSED BASIN
- PROPOSED ONSITE DRAINAGE AREA BOUNDARY
- OFFSITE DRAINAGE AREA BOUNDARY
- PROPOSED TIME OF CONCENTRATION LINE
- OFFSITE TIME OF CONCENTRATION LINE
- DISCHARGE LOCATION
- 1 DRAINAGE AREA LABEL
- 1 OFFSITE DRAINAGE AREA LABEL
- 1 DISCHARGE AREA LABEL

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#	DATE	COMMENT	BY	CHK	APR

0' 600' 1200' 1800'

Kansas Sky Energy Center

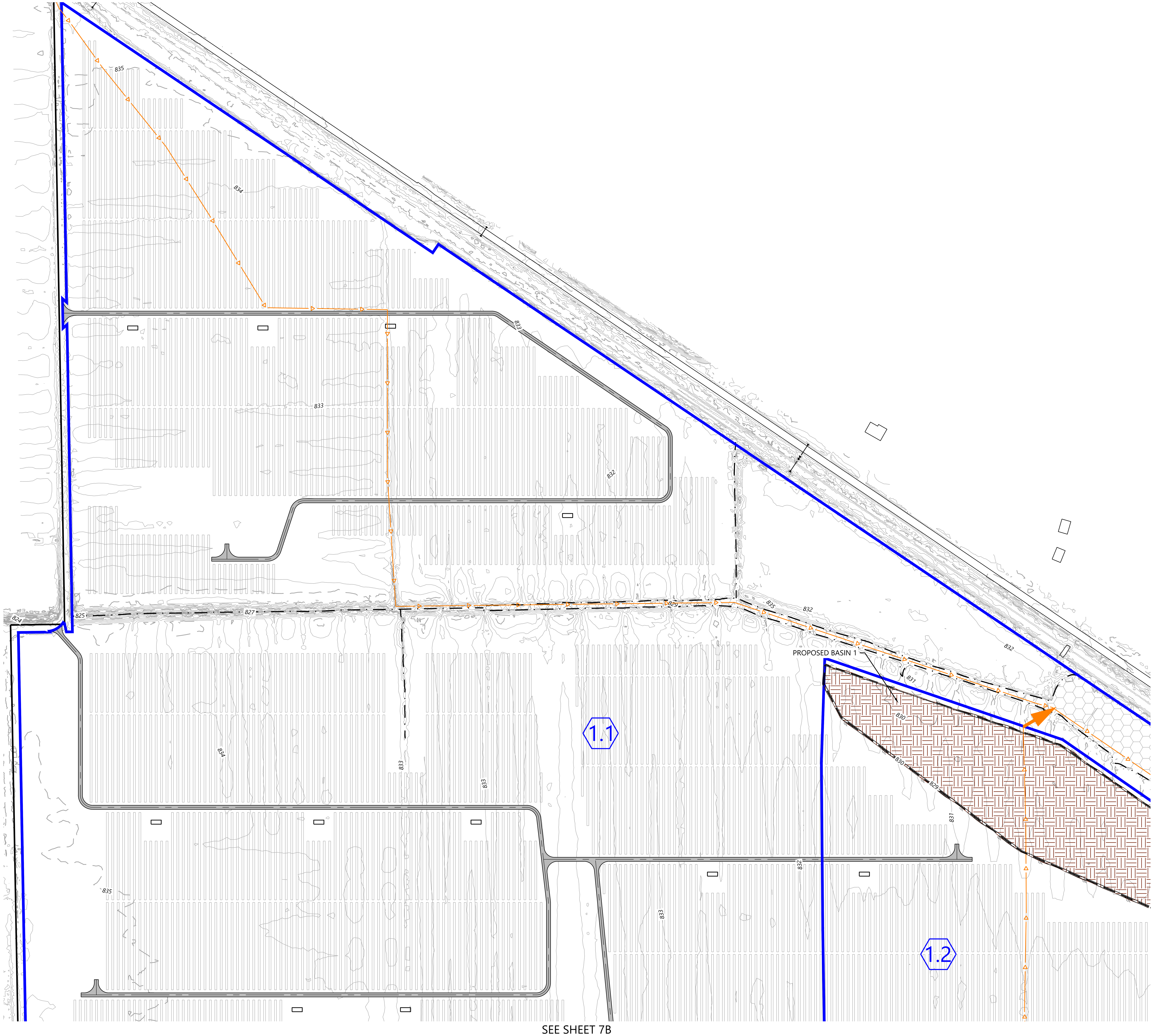
Douglas County, Kansas

Overall Proposed Drainage Map

DATE: 11/12/2024

REV:

SHEET: 7



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- EX. INTERVAL CONTOUR
- EX. PAVED ROAD
- EX. BUILDING
- EX. WETLAND
- FEMA FLOOD HAZARD ZONE
- PROPOSED INDEX CONTOUR
- PROPOSED INTERVAL CONTOUR
- PROPOSED SOLAR ARRAY
- PROPOSED ACCESS ROAD
- PROPOSED SECURITY FENCE
- PROPOSED ELECTRICAL EQUIPMENT
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- PROPOSED BASIN
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0' 200' 400' 600'

Kansas Sky Energy Center

Douglas County, Kansas

Proposed Drainage Map

DATE: 11/12/2024

REV:

SHEET: 7A

SEE SHEET 7A

SEE SHEET 7C

SEE SHEET 7D

LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR
- EX. INTERVAL CONTOUR
- EX. PAVED ROAD
- EX. BUILDING
- EX. WETLAND
- FEMA FLOOD HAZARD ZONE
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- DRAINAGE AREA LABEL
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0' 200' 400' 600'

Kansas Sky Energy Center

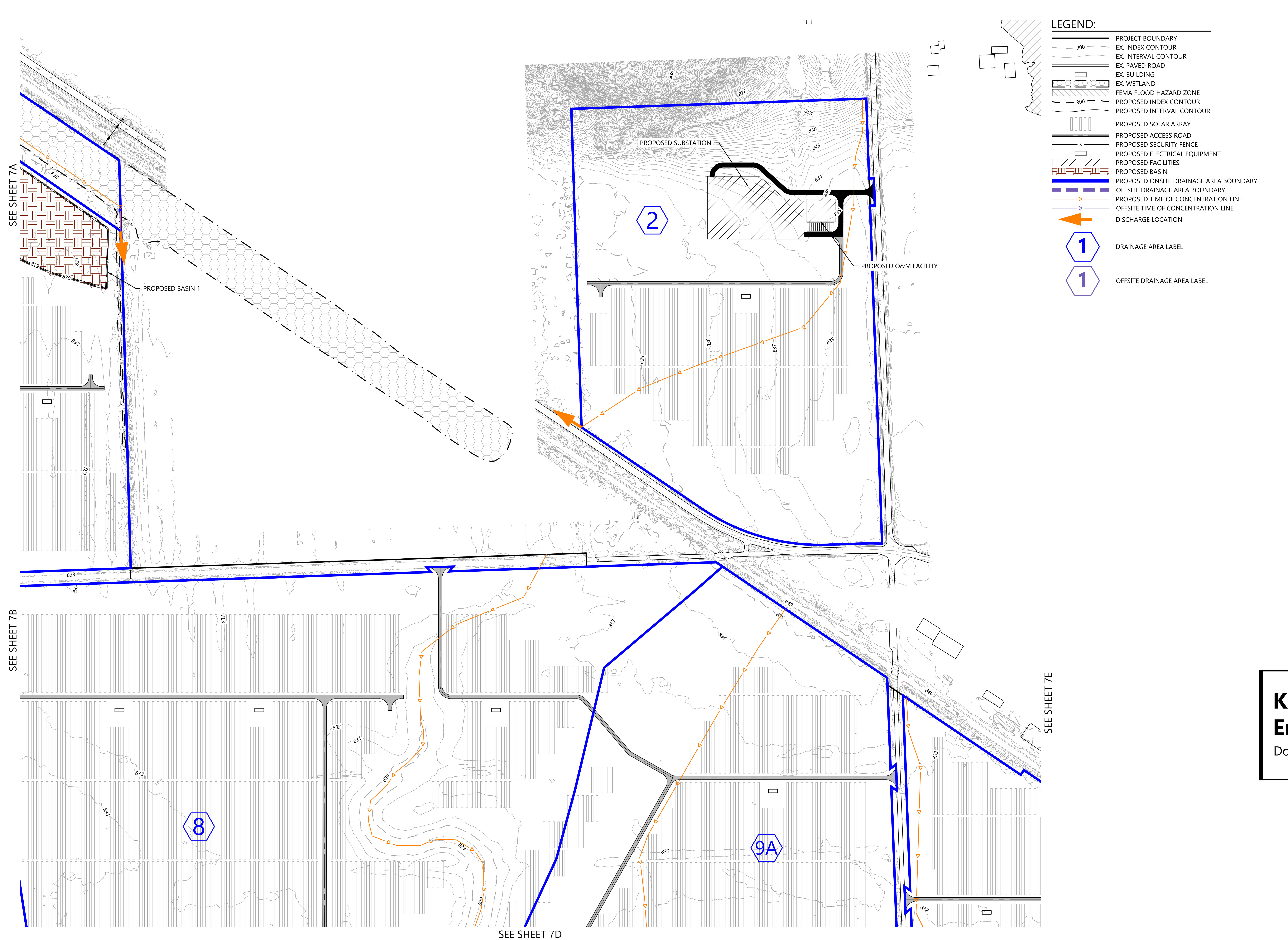
Douglas County, Kansas

Proposed Drainage Map

DATE: 11/12/2024

REV:

SHEET: 7B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PROPOSED INTERVAL CONTOUR
PROPOSED SOLAR ARRAY
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DISCHARGE LOCATION
DRAINAGE AREA LABEL
OFFSITE DRAINAGE AREA LABEL
SEE SHEET 7A
SEE SHEET 7B
SEE SHEET 7D
SEE SHEET 7E
PROPOSED BASIN 1
PROPOSED SUBSTATION
PROPOSED O&M FACILITY
2
8
9A
0'
200'
400'
600'

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Kansas Sky Energy Center

Douglas County, Kansas

Proposed Drainage Map

DATE: 11/12/2024

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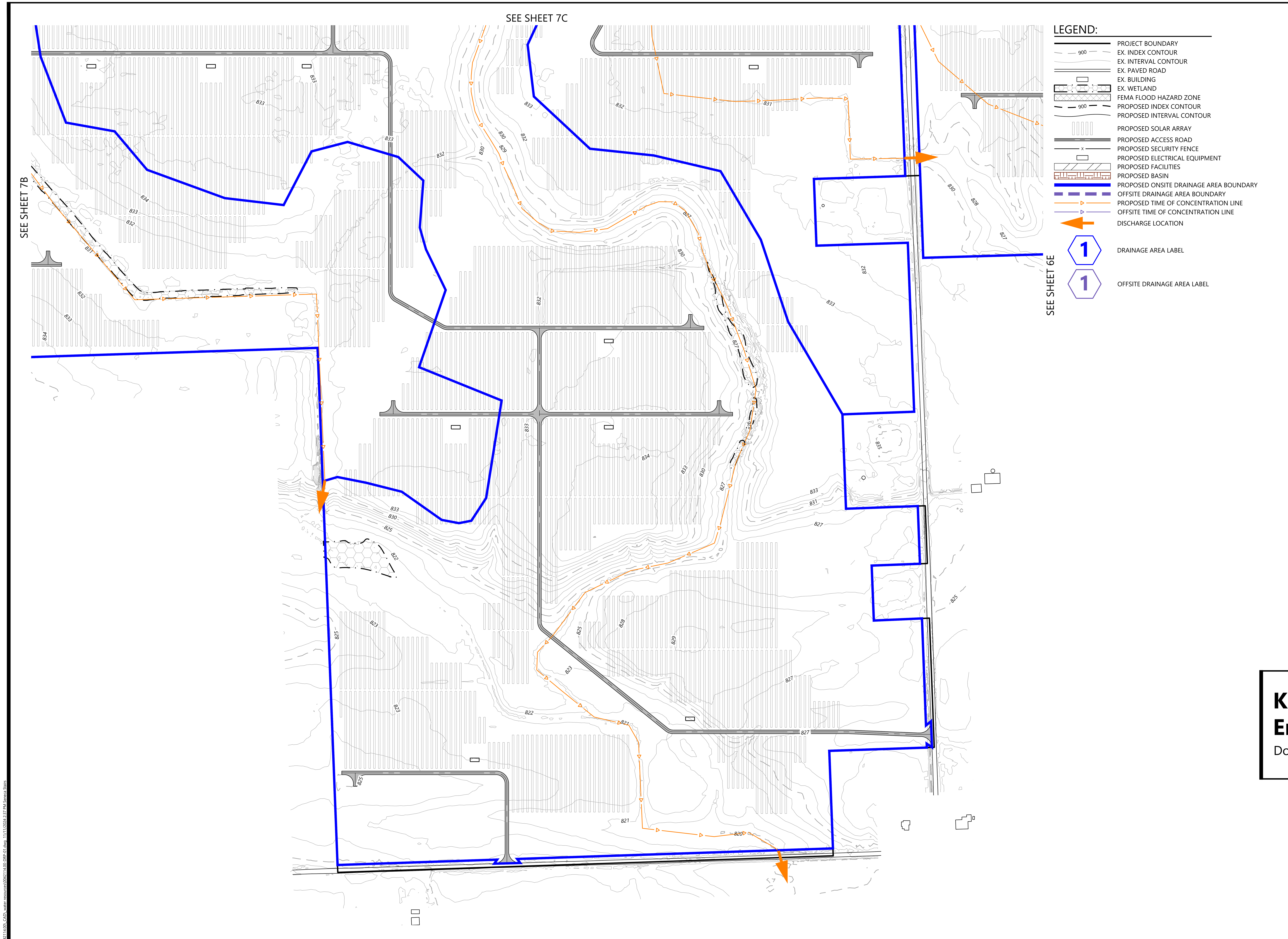

SEE SHEET 7C
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EX. PAVED ROAD
EX. BUILDING
EX. WETLAND
FEMA FLOOD HAZARD ZONE
PROPOSED INDEX CONTOUR
PROPOSED INTERVAL CONTOUR
PROPOSED SOLAR ARRAY
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PROPOSED TIME OF CONCENTRATION LINE
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DISCHARGE LOCATION
DRAINAGE AREA LABEL
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0' 200' 400' 600'

Kansas Sky Energy Center

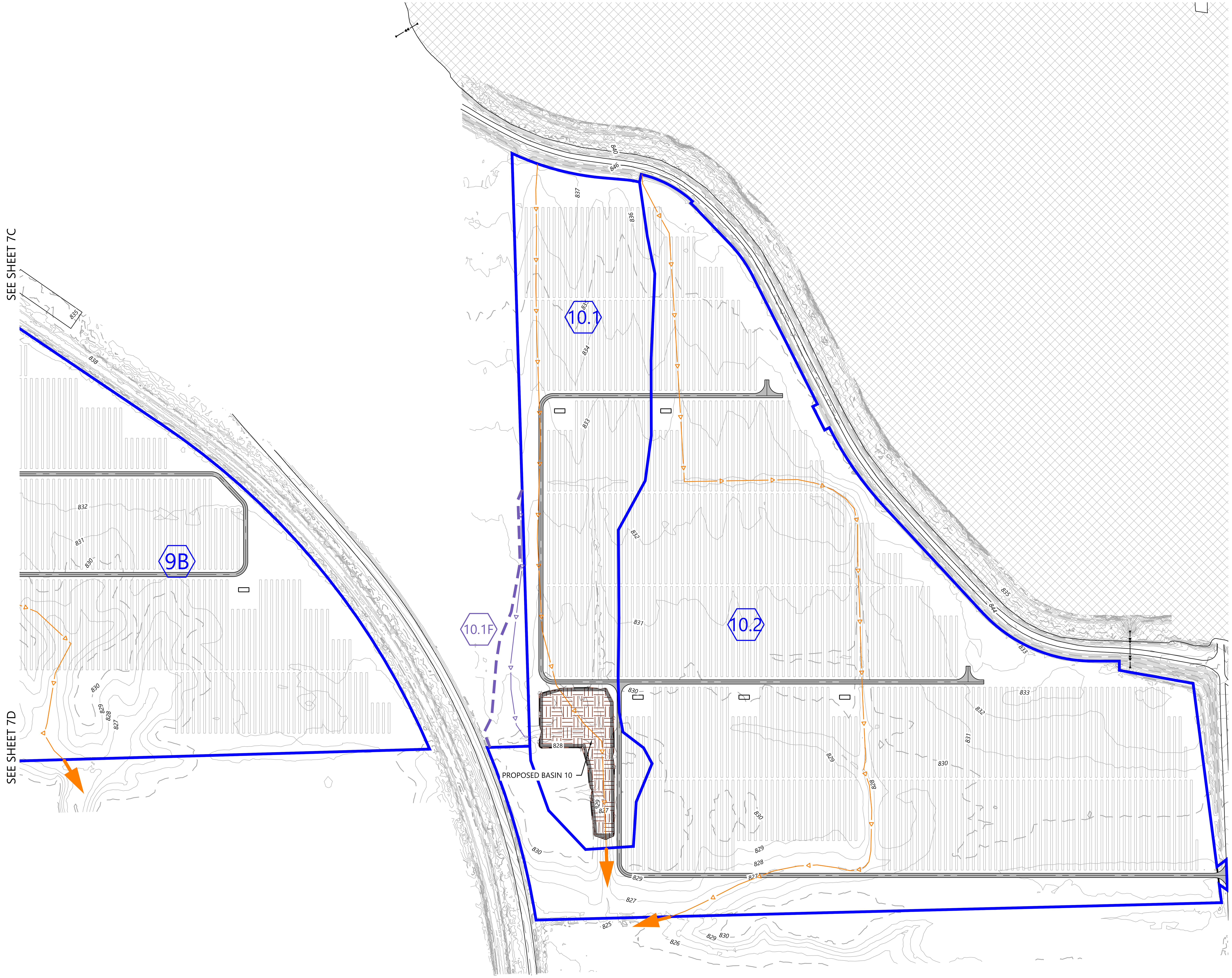
Douglas County, Kansas

Proposed Drainage Map

DATE: 11/12/2024

REV:

SHEET: 7D



LEGEND:

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- EX. INTERVAL CONTOUR
- EX. PAVED ROAD
- EX. BUILDING
- EX. WETLAND
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- PROPOSED ONSITE DRAINAGE AREA BOUNDARY
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0' 200' 400' 600'

Kansas Sky Energy Center

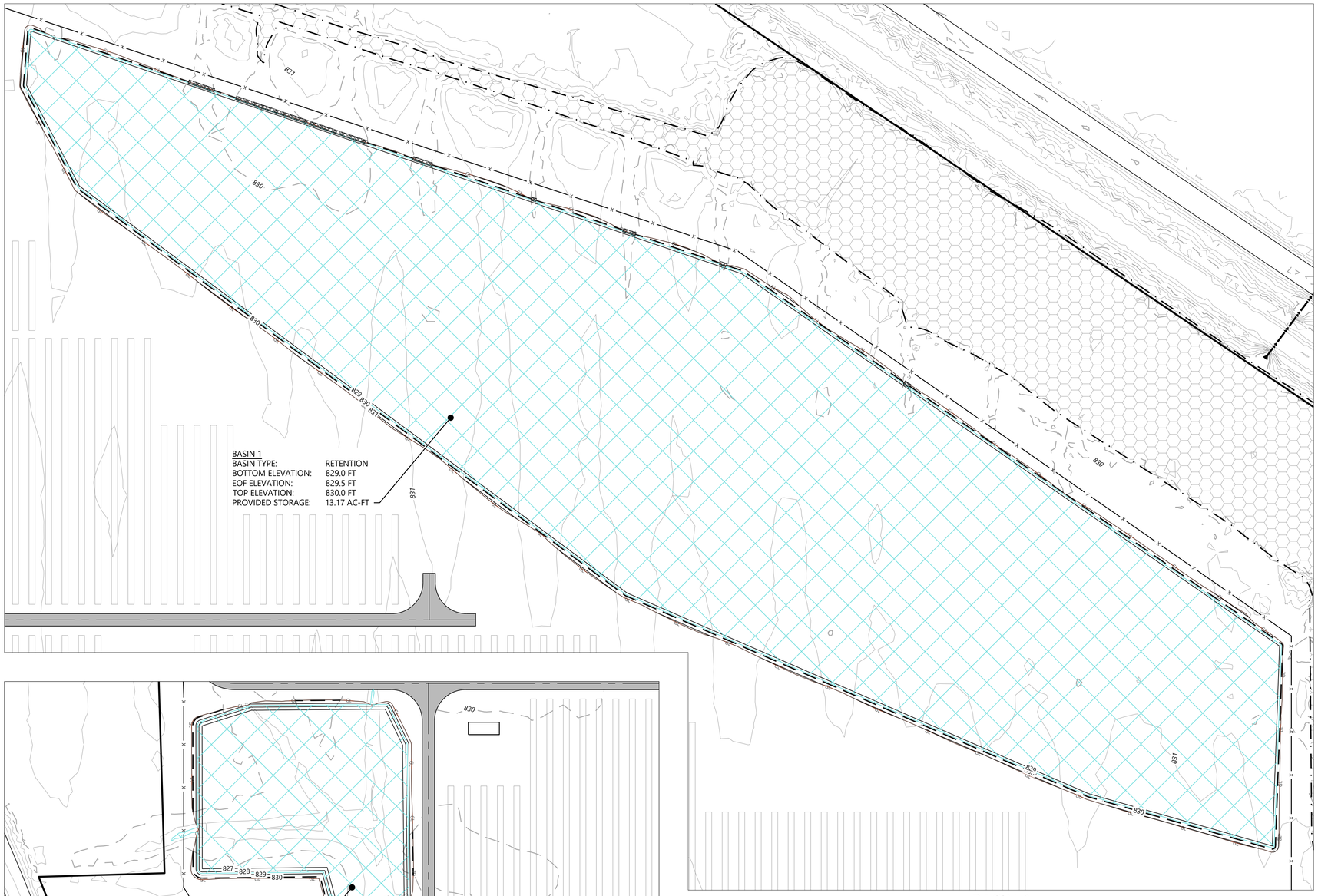
Douglas County, Kansas

Proposed Drainage Map

DATE: 11/12/2024

SHEET: 7E

REV:



BASIN 10

LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR
- EX. INTERVAL CONTOUR
- EX. PAVED ROAD
- EX. BUILDING
- EX. WETLAND
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- PROPOSED INTERVAL CONTOUR
- PROPOSED SOLAR ARRAY
- PROPOSED ACCESS ROAD
- PROPOSED SECURITY FENCE
- PROPOSED ELECTRICAL EQUIPMENT
- PROPOSED FACILITIES
- PROPOSED 100YR HIGH WATER LEVEL
- PROPOSED EMERGENCY OVERFLOW OUTLET
- PROPOSED CULVERT

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REVISIONS:

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0' 75' 150' 225'

Kansas Sky Energy Center

Douglas County, Kansas

Detailed Basin Maps

DATE: 11/12/2024
REV:
SHEET: 8

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Appendix A

NOAA Atlas 14 Precipitation Data

NOAA Atlas 14, Volume 8, Version 2
Location name: Lawrence, Kansas, USA*
Latitude: 39.0205°, Longitude: -95.2524°
Elevation: m/ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.395** (0.311-0.499)	**0.470** (0.369-0.594)	**0.592** (0.464-0.750)	**0.694** (0.542-0.881)	**0.835** (0.634-1.07)	**0.943** (0.704-1.22)	**1.05** (0.765-1.38)	**1.16** (0.819-1.54)	**1.31** (0.895-1.75)	**1.42** (0.952-1.91)
10-min	**0.579** (0.455-0.731)	**0.688** (0.540-0.870)	**0.868** (0.680-1.10)	**1.02** (0.793-1.29)	**1.22** (0.928-1.57)	**1.38** (1.03-1.79)	**1.54** (1.12-2.01)	**1.70** (1.20-2.25)	**1.92** (1.31-2.57)	**2.08** (1.39-2.80)
15-min	**0.705** (0.555-0.892)	**0.839** (0.659-1.06)	**1.06** (0.829-1.34)	**1.24** (0.967-1.57)	**1.49** (1.13-1.92)	**1.68** (1.26-2.18)	**1.88** (1.37-2.46)	**2.08** (1.46-2.74)	**2.34** (1.60-3.13)	**2.54** (1.70-3.42)
30-min	**1.01** (0.798-1.28)	**1.21** (0.952-1.53)	**1.53** (1.20-1.94)	**1.80** (1.40-2.28)	**2.17** (1.64-2.78)	**2.45** (1.82-3.16)	**2.73** (1.98-3.56)	**3.01** (2.12-3.97)	**3.38** (2.31-4.52)	**3.66** (2.46-4.93)
60-min	**1.33** (1.05-1.69)	**1.59** (1.25-2.02)	**2.02** (1.59-2.56)	**2.38** (1.86-3.02)	**2.89** (2.19-3.71)	**3.27** (2.44-4.24)	**3.67** (2.67-4.80)	**4.07** (2.87-5.38)	**4.60** (3.15-6.16)	**5.01** (3.36-6.76)
2-hr	**1.65** (1.31-2.06)	**1.98** (1.57-2.47)	**2.51** (1.99-3.15)	**2.97** (2.34-3.72)	**3.60** (2.77-4.60)	**4.10** (3.10-5.26)	**4.61** (3.39-5.98)	**5.13** (3.65-6.73)	**5.83** (4.03-7.75)	**6.36** (4.31-8.52)
3-hr	**1.85** (1.48-2.30)	**2.21** (1.77-2.75)	**2.82** (2.25-3.51)	**3.33** (2.65-4.16)	**4.07** (3.15-5.17)	**4.64** (3.53-5.93)	**5.23** (3.88-6.76)	**5.85** (4.20-7.65)	**6.68** (4.65-8.86)	**7.33** (4.99-9.77)
6-hr	**2.21** (1.79-2.71)	**2.63** (2.13-3.23)	**3.35** (2.71-4.13)	**3.97** (3.19-4.90)	**4.86** (3.82-6.12)	**5.57** (4.29-7.05)	**6.30** (4.72-8.07)	**7.06** (5.12-9.17)	**8.11** (5.70-10.7)	**8.92** (6.14-11.8)
12-hr	**2.59** (2.12-3.14)	**3.07** (2.52-3.74)	**3.90** (3.19-4.75)	**4.61** (3.75-5.62)	**5.63** (4.47-7.02)	**6.44** (5.02-8.08)	**7.29** (5.52-9.26)	**8.17** (5.99-10.5)	**9.38** (6.66-12.3)	**10.3** (7.17-13.6)
24-hr	**3.01** (2.50-3.61)	**3.54** (2.93-4.25)	**4.43** (3.67-5.33)	**5.21** (4.29-6.28)	**6.32** (5.08-7.80)	**7.21** (5.68-8.95)	**8.12** (6.23-10.2)	**9.09** (6.73-11.6)	**10.4** (7.47-13.5)	**11.4** (8.02-14.9)
2-day	**3.47** (2.92-4.12)	**4.02** (3.38-4.78)	**4.95** (4.15-5.89)	**5.76** (4.80-6.87)	**6.92** (5.63-8.45)	**7.85** (6.26-9.65)	**8.81** (6.83-11.0)	**9.82** (7.36-12.4)	**11.2** (8.13-14.4)	**12.3** (8.71-15.9)
3-day	**3.78** (3.20-4.46)	**4.35** (3.68-5.13)	**5.32** (4.49-6.28)	**6.15** (5.16-7.28)	**7.34** (6.02-8.91)	**8.30** (6.66-10.1)	**9.29** (7.25-11.5)	**10.3** (7.78-13.0)	**11.7** (8.57-15.0)	**12.9** (9.16-16.6)
4-day	**4.06** (3.45-4.76)	**4.65** (3.95-5.45)	**5.64** (4.79-6.63)	**6.50** (5.49-7.66)	**7.73** (6.36-9.33)	**8.71** (7.03-10.6)	**9.72** (7.62-12.0)	**10.8** (8.17-13.5)	**12.2** (8.97-15.6)	**13.4** (9.57-17.2)
7-day	**4.82** (4.15-5.60)	**5.47** (4.70-6.36)	**6.57** (5.63-7.65)	**7.51** (6.40-8.76)	**8.84** (7.35-10.6)	**9.91** (8.07-11.9)	**11.0** (8.71-13.5)	**12.1** (9.28-15.1)	**13.7** (10.1-17.4)	**14.9** (10.8-19.1)
10-day	**5.49** (4.75-6.33)	**6.22** (5.38-7.18)	**7.44** (6.41-8.61)	**8.48** (7.28-9.84)	**9.95** (8.32-11.8)	**11.1** (9.11-13.3)	**12.3** (9.80-15.0)	**13.6** (10.4-16.8)	**15.2** (11.3-19.2)	**16.6** (12.0-21.1)
20-day	**7.30** (6.40-8.33)	**8.32** (7.29-9.50)	**9.99** (8.72-11.4)	**11.4** (9.89-13.1)	**13.3** (11.2-15.6)	**14.8** (12.2-17.5)	**16.3** (13.1-19.6)	**17.8** (13.8-21.8)	**19.8** (14.9-24.8)	**21.4** (15.7-27.0)
30-day	**8.86** (7.83-10.0)	**10.1** (8.91-11.4)	**12.1** (10.7-13.7)	**13.7** (12.0-15.6)	**16.0** (13.5-18.5)	**17.6** (14.7-20.7)	**19.3** (15.6-23.0)	**20.9** (16.3-25.5)	**23.1** (17.4-28.6)	**24.7** (18.2-31.0)
45-day	**10.9** (9.72-12.3)	**12.4** (11.0-14.0)	**14.7** (13.1-16.6)	**16.6** (14.7-18.8)	**19.1** (16.3-21.9)	**20.9** (17.5-24.2)	**22.6** (18.4-26.7)	**24.3** (19.0-29.3)	**26.4** (19.9-32.5)	**27.8** (20.7-34.9)
60-day	**12.8** (11.4-14.3)	**14.4** (12.9-16.1)	**17.0** (15.1-19.0)	**19.0** (16.8-21.4)	**21.5** (18.4-24.5)	**23.4** (19.6-27.0)	**25.1** (20.4-29.4)	**26.6** (20.9-31.9)	**28.5** (21.7-34.9)	**29.8** (22.2-37.2)

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

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

Please refer to NOAA Atlas 14 document for more information.

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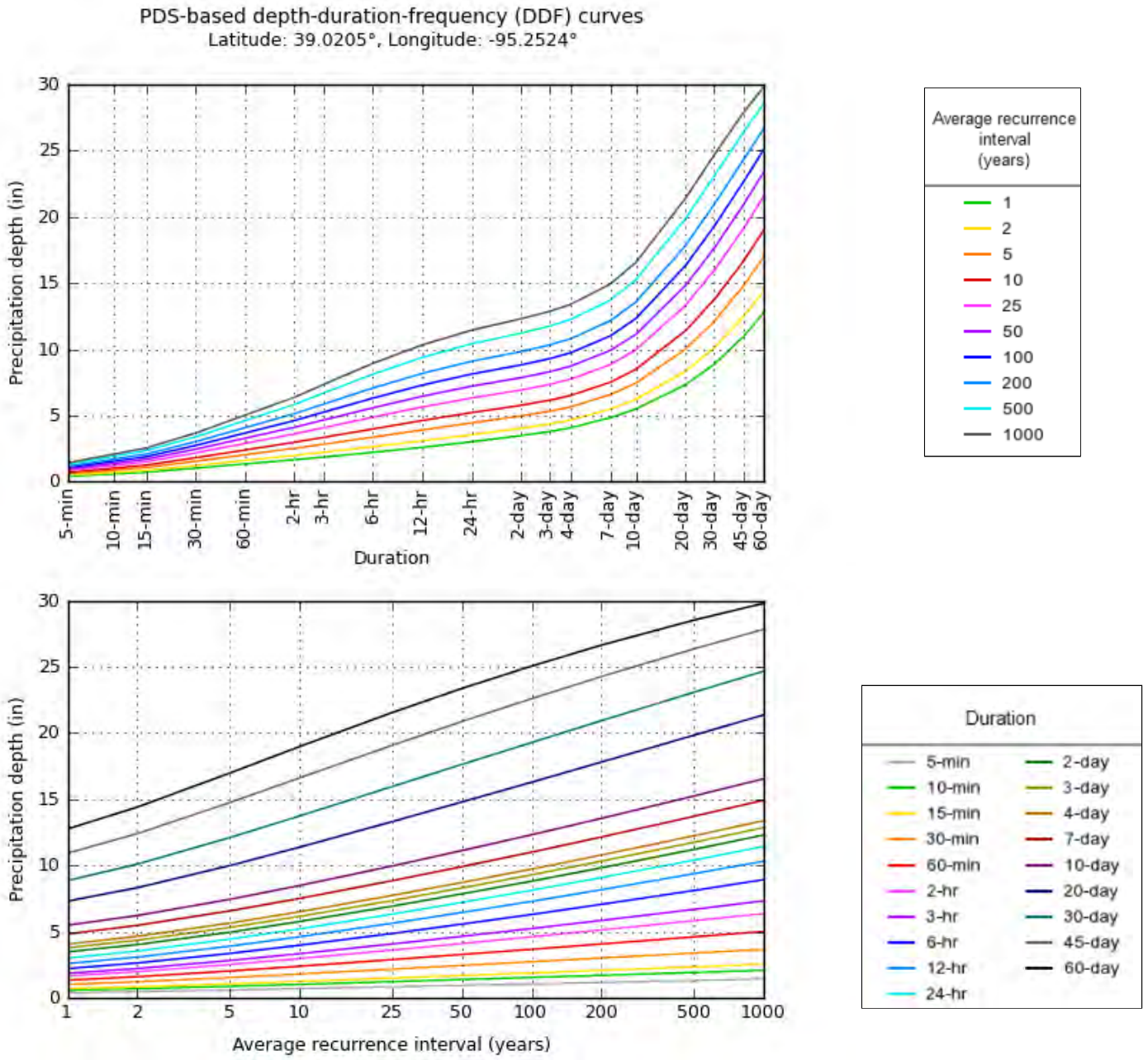
PF graphical



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Created (GMT): Mon Apr 17 13:59:13 2023

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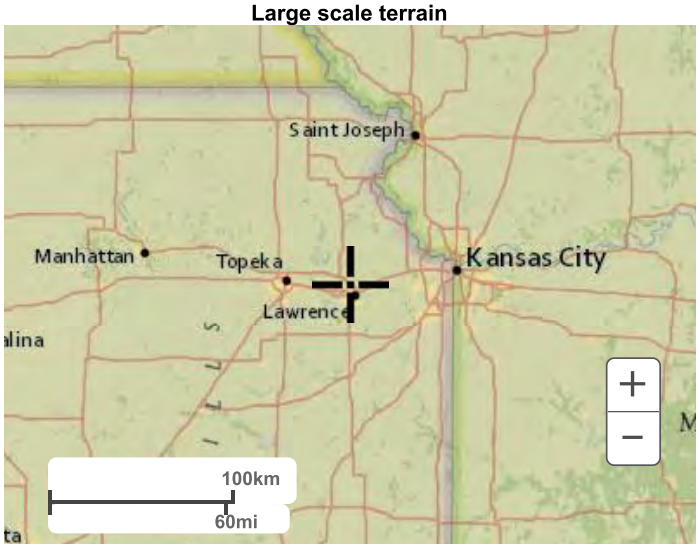
Maps & aerials

Small scale terrain

Large scale terrain



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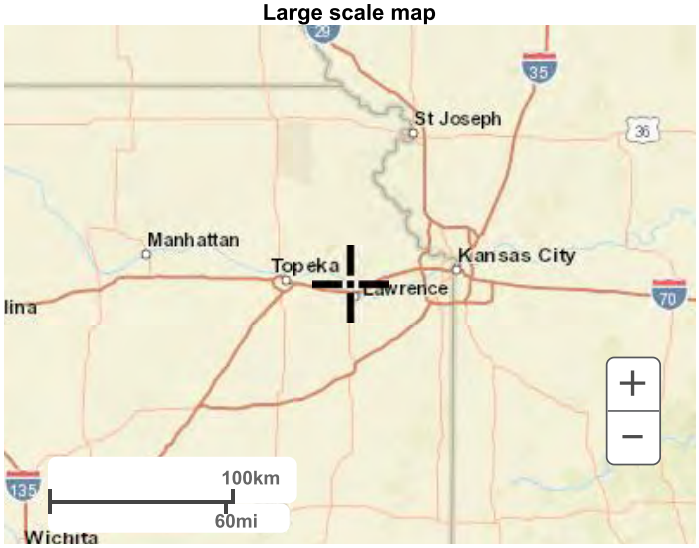

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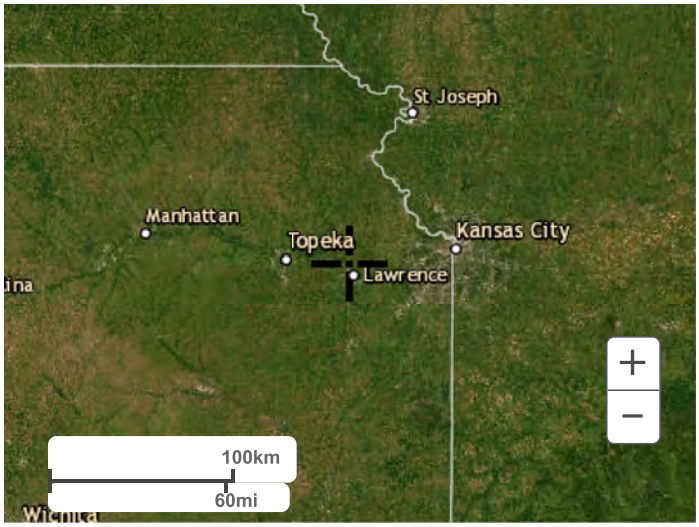

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National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix B

Curve Numbers

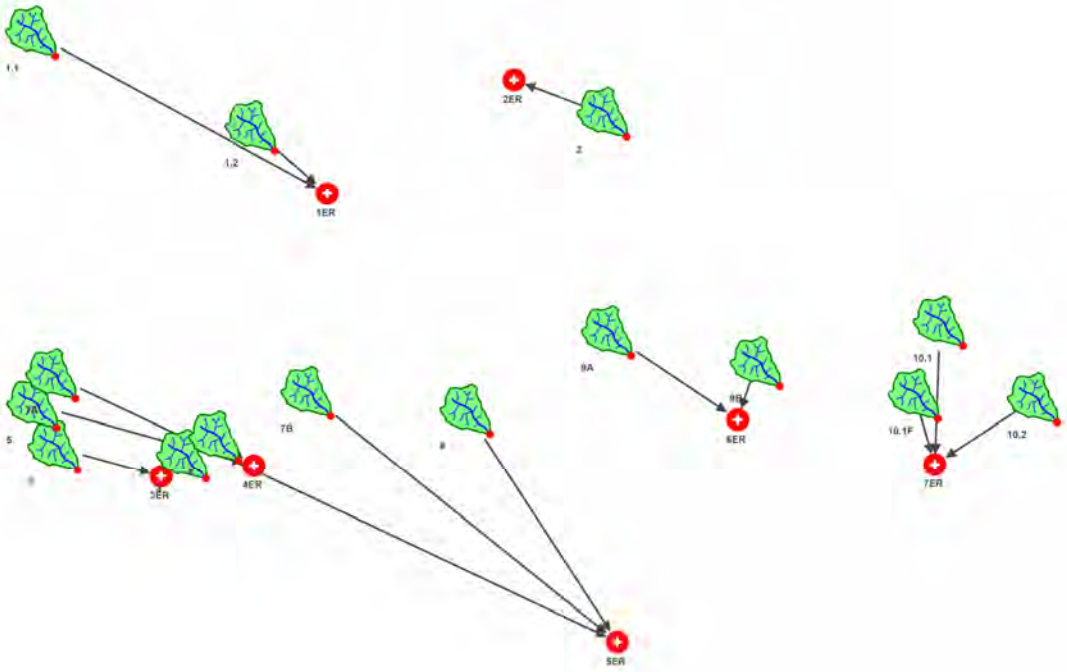
		Existing Landcover (ac)											
Drainage Area ID	Area (ac)	Row Crop			Impervious	Pasture			Water	Woods			Weighted CN
		HSG B	HSG C	HSG D		HSG B	HSG C	HSG D		HSG B	HSG C	HSG D	
		75	82	85	98	61	74	80	100	55	70	77	
1.1	268.7	20.8	72.9	157.1			1.6	11.2	5.1				83.42
1.2	77.9		7.0	70.9									84.73
2	53.7	0.9	29.0	18.9		0.9		1.0				3.0	82.27
3	23.4	23.0				0.1				0.3			74.68
4	2.9	2.9											75.00
5	25.3	25.2								0.1			74.92
6	10.9	10.9											75.00
7A	9.3	9.3											75.00
7B	96.5	32.7	14.2	39.2				8.2	2.2				81.09
8	288.8	113.3	102.9	68.9		1.4	1.6	0.1	0.6				79.86
9A	75.3	8.5	18.4	47.2			0.5	0.7					83.02
9B	57.3			56.8				0.5					84.96
10.1	25.2		17.4	7.8									82.93
10.2	83.1	2.8	67.7	11.0			1.6						82.01
10F	1.7		0.1	1.6									84.82

		Proposed Landcover (ac)														
Drainage Area ID	Area (ac)	Racks			Area between Racks			Impervious	Pasture			Water	Woods			Weighted CN
		HSG B	HSG C	HSG D	HSG B	HSG C	HSG D		HSG B	HSG C	HSG D		HSG B	HSG C	HSG D	
		67	80	86	76	86	91	98	61	74	80	100	55	70	77	
1.1	268.7	4.0	17.9	38.8	8.2	36.8	79.1	5.3	8.4	18.4	46.7	5.1				84.34
1.2	77.9		1.7	15.4		3.3	30.4	0.9		2.8	23.4					85.73
2	53.7		4.0	1.7		8.7	4.0	3.9	1.9	13.6	12.9				3.0	80.93
3	23.4	5.1			10.7			0.7	6.6				0.3			70.20
4	2.9								2.9							61.00
5	25.3	2.7			6.3			0.6	15.6				0.1			66.23
6	10.9	0.6			1.4				8.9							63.26
7A	9.3	1.4			3.2			0.2	4.5							67.86
7B	96.5	7.3	2.6	6.4	15.7	5.5	14.2	1.6	8.6	5.7	26.7	2.2				79.43
8	288.8	20.6	21.6	15.1	44.2	44.5	30.8	5.8	47.8	36.2	21.6	0.6				77.38
9A	75.3	0.1	2.8	9.4	0.3	6.1	19.5	1.4	8.2	9.9	17.6					81.53
9B	57.3			12.0			24.8	1.2			19.3					86.39
10.1	25.2		4.6	1.1		9.2	2.5	0.8		3.6	3.4					83.26
10.2	83.1		17.5	3.3		35.0	6.6	1.8	2.6	15.4	0.9					82.32

Appendix C

Existing HEC-HMS Results

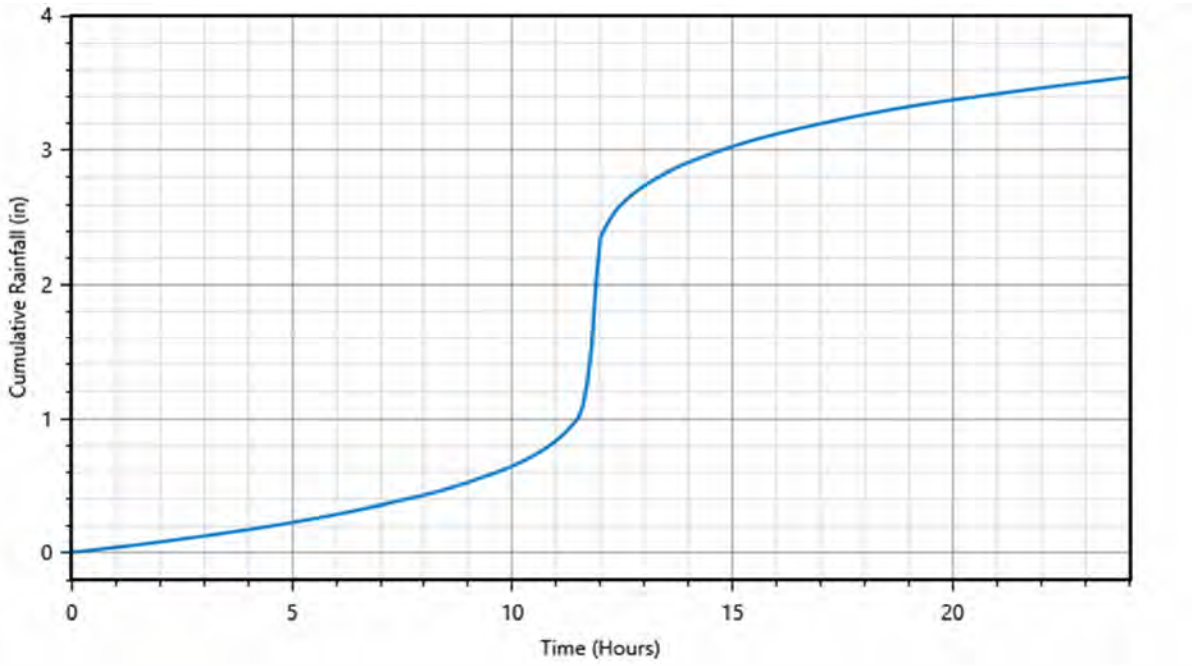
Watershed Routing Diagram



2yr Existing

Design Storm

Precipitation type: SCS Storm
SCS storm distribution: Type II
Rainfall depth: 3.54 in

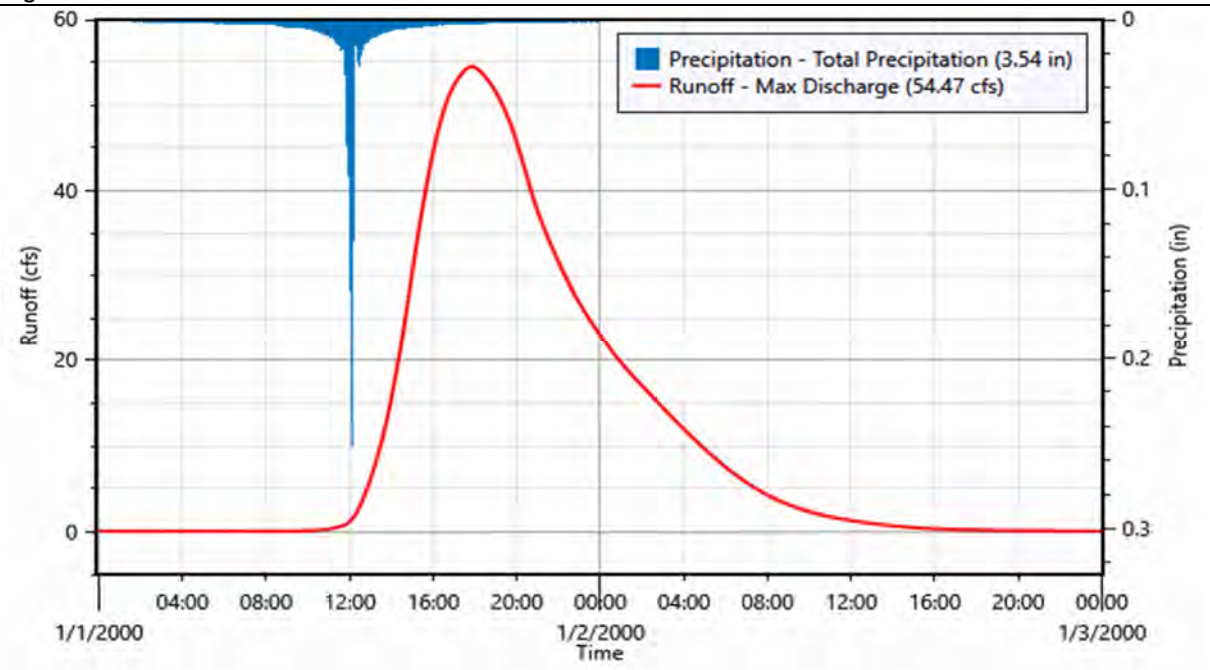


Watershed Summary

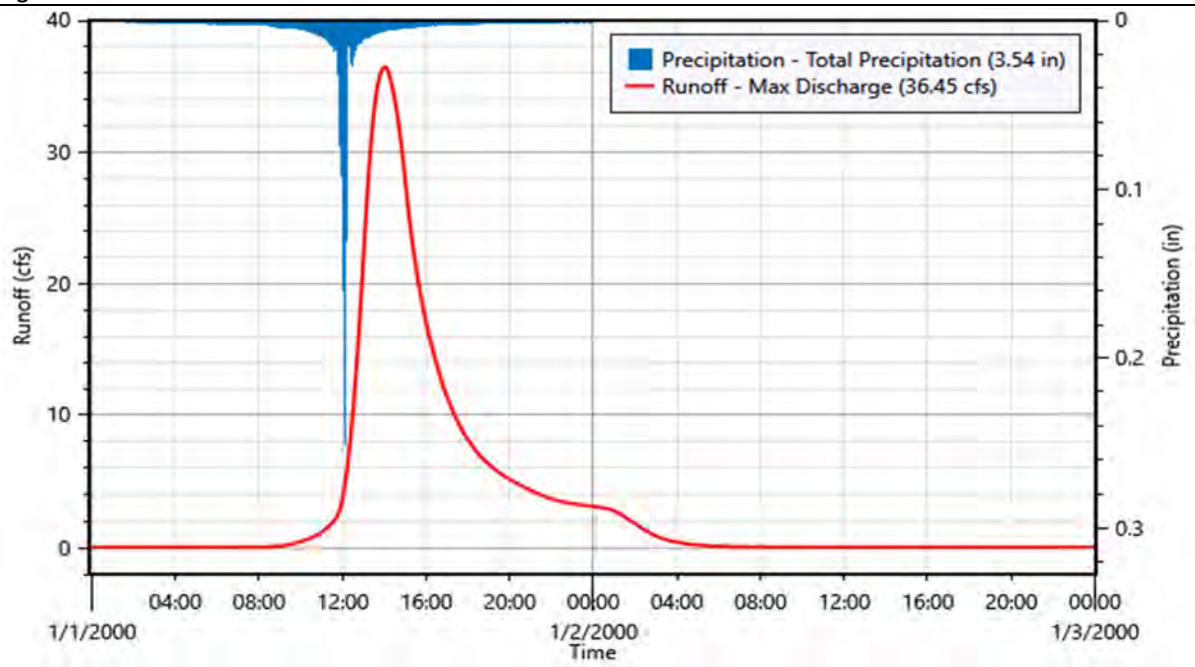
Subbasin ID	Drainage Area (acres)	Initial Abstraction (in)	Curve Number	Impervious Surface (%)	Lag Time (minutes)	Peak Discharge (cfs)
1.1	268.700	0.40	83.43	0.00	323.50	54.47
1.2	77.900	0.36	84.73	0.00	119.80	36.45
2	53.700	0.43	82.27	0.00	23.20	74.18
3	23.400	0.68	74.68	0.00	27.30	19.77
4	2.900	0.67	75.00	0.00	10.10	4.43
5	25.300	0.67	74.92	0.00	24.00	23.66
6	10.900	0.67	75.00	0.00	12.90	14.87
7A	9.300	0.67	75.00	0.00	94.60	3.22
7B	96.500	0.47	81.09	0.00	186.50	27.12
8	288.800	0.50	79.86	0.00	104.40	120.45
9A	75.300	0.41	83.02	0.00	79.60	44.64
9B	57.300	0.35	84.96	0.00	32.50	70.93
10.1	25.200	0.41	82.86	0.00	49.30	21.22
10.1F	1.700	0.36	84.82	0.00	29.10	2.25
10.2	83.100	0.44	81.98	0.00	77.30	48.07

Subbasins

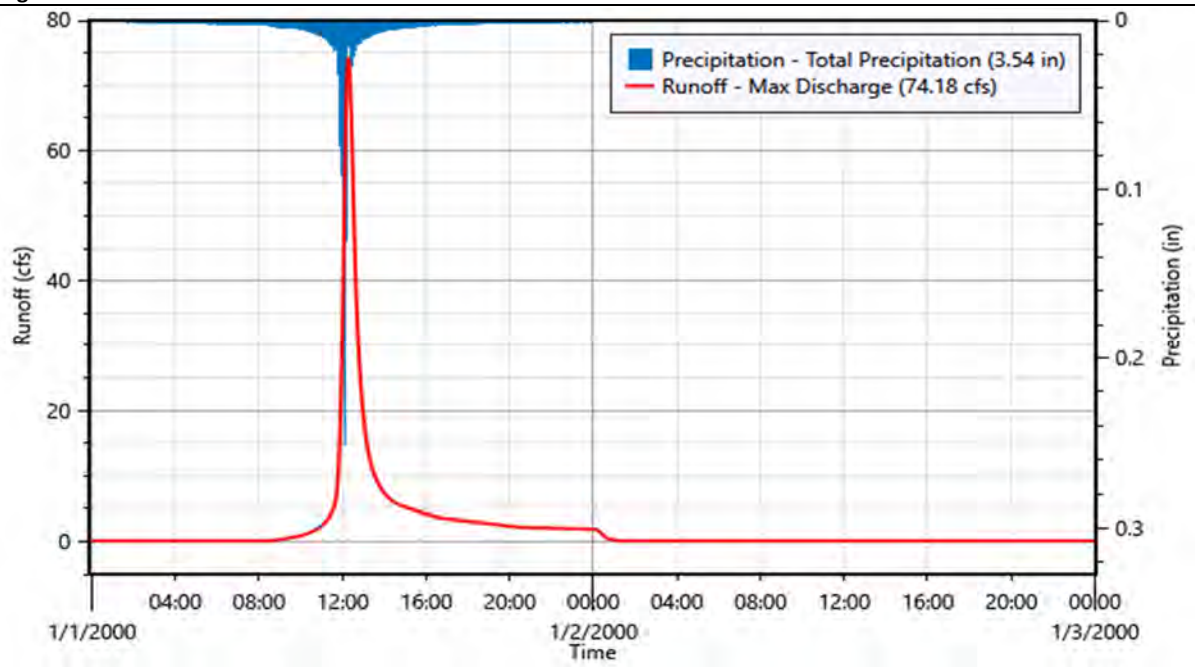
Subbasin ID:	**1.1**			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	54.47 cfs	**Time of peak:**	01 Jan 2000, 05:51	
Drainage area:	268.700 acres	**Total rainfall:**	3.54 in	79.267 ac-ft
Initial abstraction:	0.40 in	**Losses:**	1.62 in	36.198 ac-ft
Curve Number:	83.43	**Precip excess:**	1.92 in	43.068 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.92 in	43.068 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	323.50 minutes	**Total runoff:**	1.92 in	43.068 ac-ft



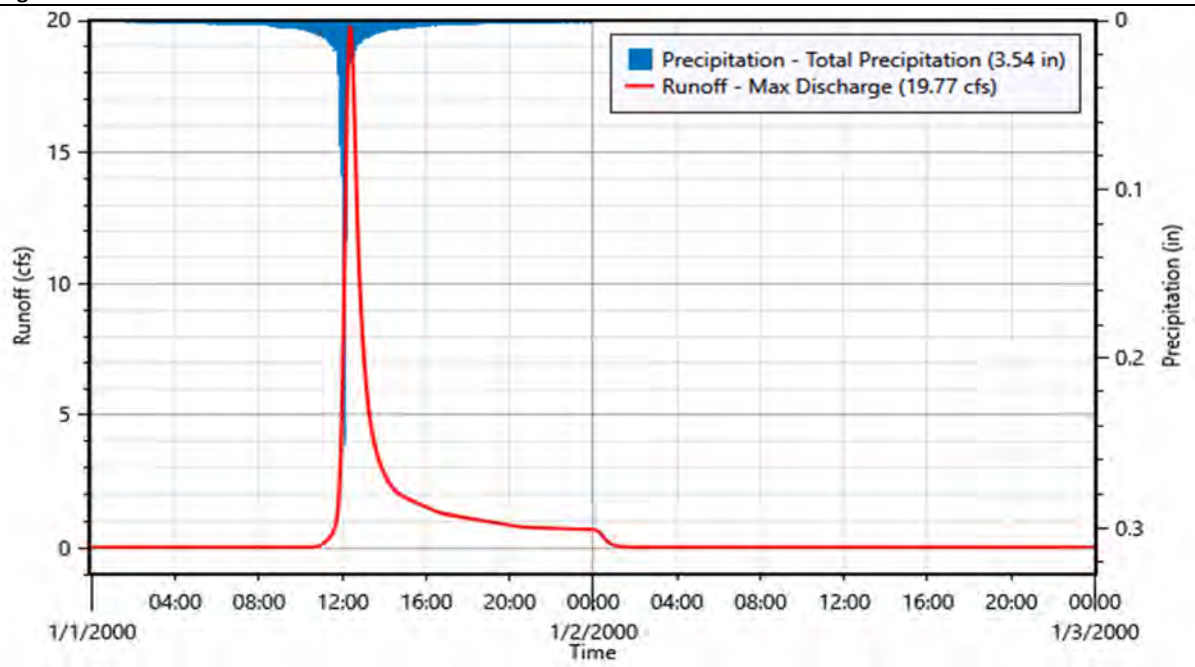
Subbasin ID:	1.2			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	36.45 cfs	**Time of peak:**	01 Jan 2000, 02:00	
Drainage area:	77.900 acres	**Total rainfall:**	3.54 in	22.981 ac-ft
Initial abstraction:	0.36 in	**Losses:**	1.51 in	9.804 ac-ft
Curve Number:	84.73	**Precip excess:**	2.03 in	13.176 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.03 in	13.176 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	119.80 minutes	**Total runoff:**	2.03 in	13.176 ac-ft



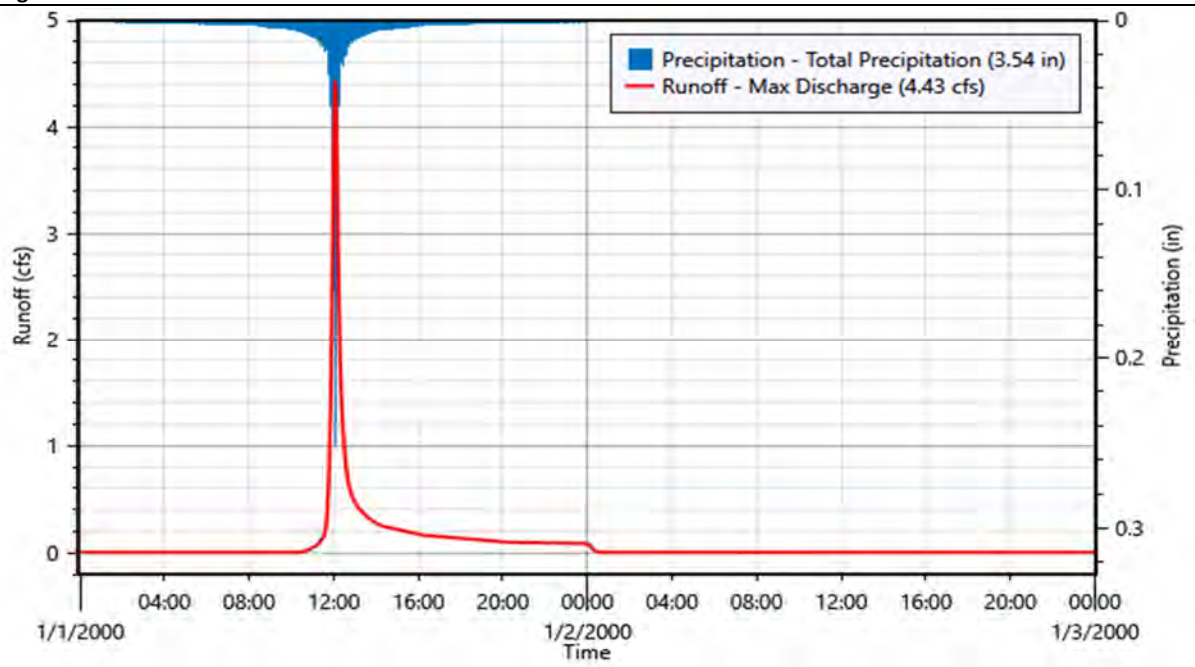
Subbasin ID:	2			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	74.18 cfs	**Time of peak:**	01 Jan 2000, 12:15	
Drainage area:	53.700 acres	**Total rainfall:**	3.54 in	15.841 ac-ft
Initial abstraction:	0.43 in	**Losses:**	1.70 in	7.621 ac-ft
Curve Number:	82.27	**Precip excess:**	1.84 in	8.221 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.84 in	8.221 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	23.20 minutes	**Total runoff:**	1.84 in	8.221 ac-ft



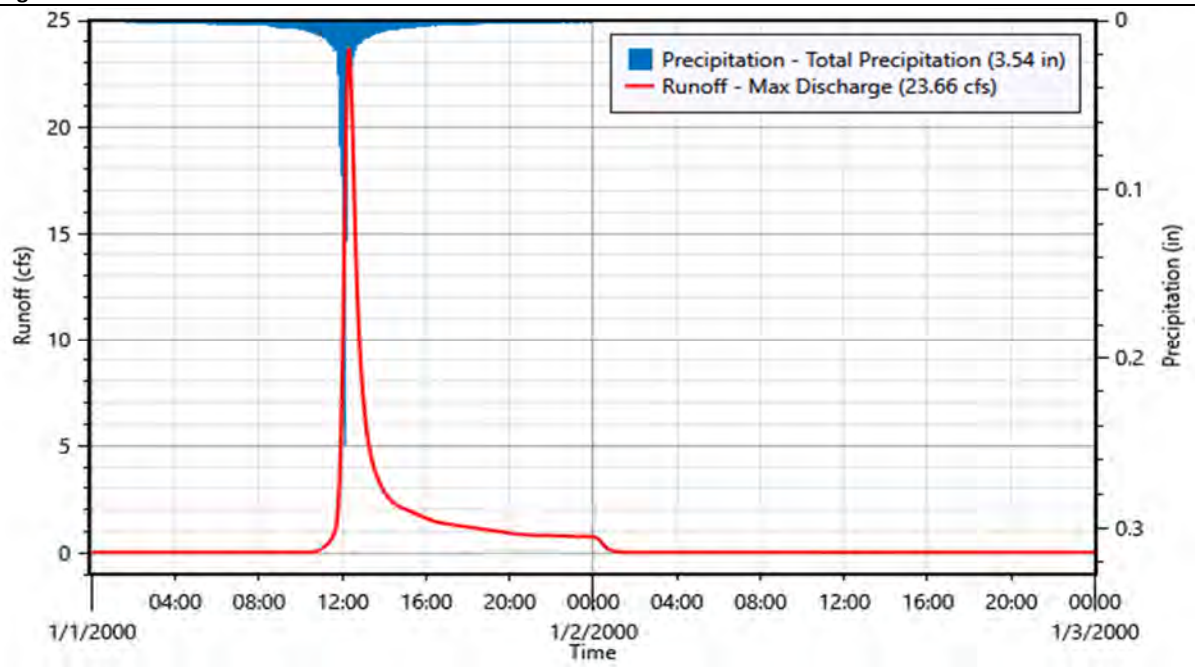
Subbasin ID:	3			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	19.77 cfs	**Time of peak:**	01 Jan 2000, 12:21	
Drainage area:	23.400 acres	**Total rainfall:**	3.54 in	6.903 ac-ft
Initial abstraction:	0.68 in	**Losses:**	2.23 in	4.351 ac-ft
Curve Number:	74.68	**Precip excess:**	1.31 in	2.552 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.31 in	2.552 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	27.30 minutes	**Total runoff:**	1.31 in	2.552 ac-ft



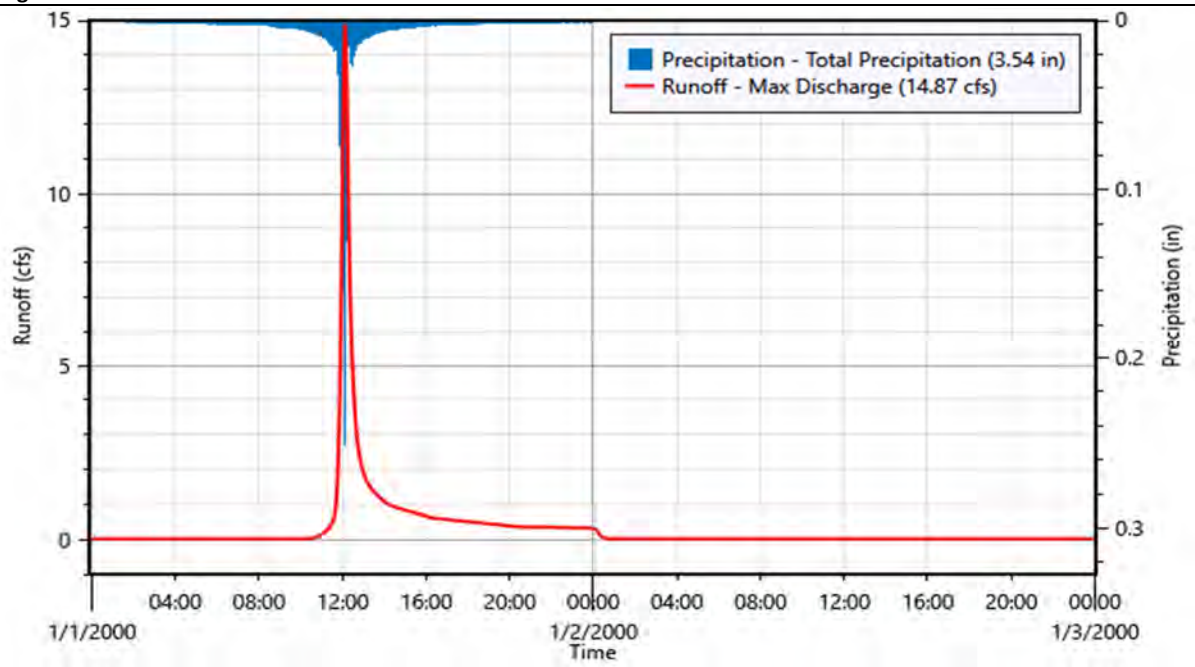
Subbasin ID:	4			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	4.43 cfs	**Time of peak:**	01 Jan 2000, 12:03	
Drainage area:	2.900 acres	**Total rainfall:**	3.54 in	0.855 ac-ft
Initial abstraction:	0.67 in	**Losses:**	2.21 in	0.535 ac-ft
Curve Number:	75.00	**Precip excess:**	1.33 in	0.321 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.33 in	0.321 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	10.10 minutes	**Total runoff:**	1.33 in	0.321 ac-ft



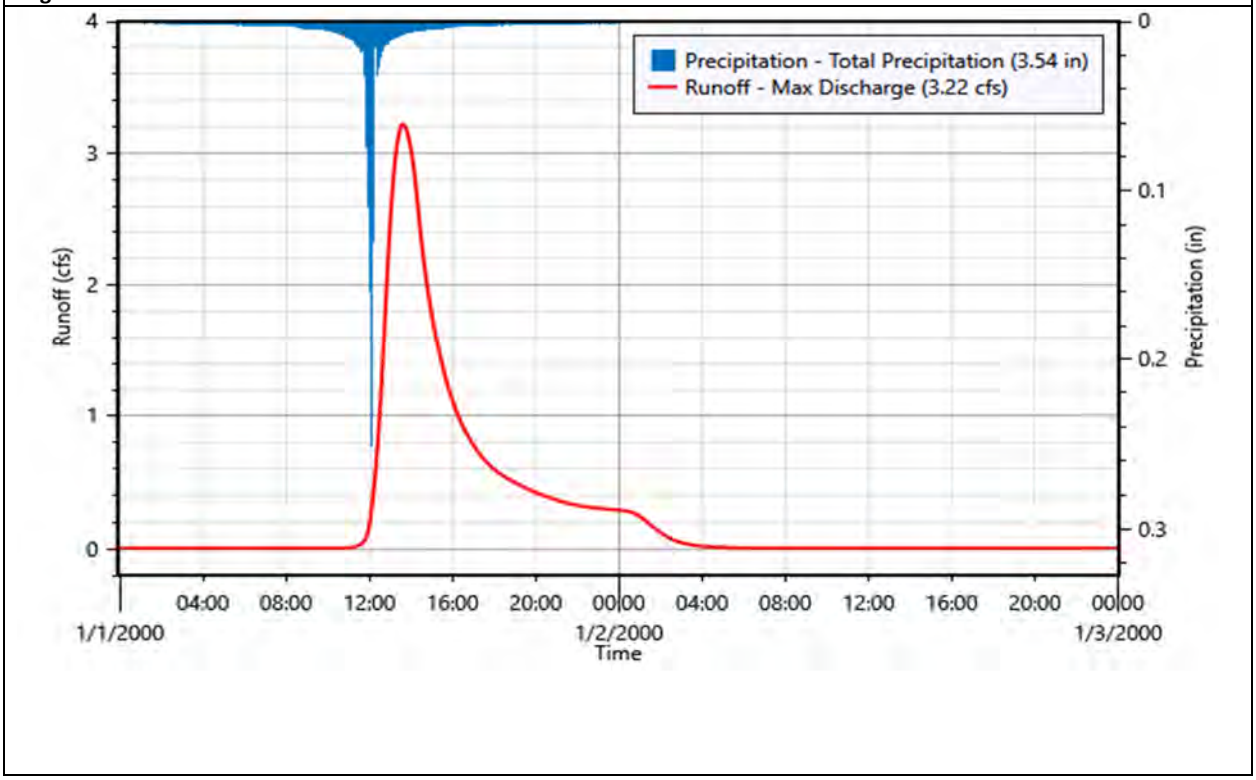
Subbasin ID:	5			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	23.66 cfs	**Time of peak:**	01 Jan 2000, 12:18	
Drainage area:	25.300 acres	**Total rainfall:**	3.54 in	7.463 ac-ft
Initial abstraction:	0.67 in	**Losses:**	2.22 in	4.670 ac-ft
Curve Number:	74.92	**Precip excess:**	1.32 in	2.793 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.32 in	2.793 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	24.00 minutes	**Total runoff:**	1.32 in	2.793 ac-ft



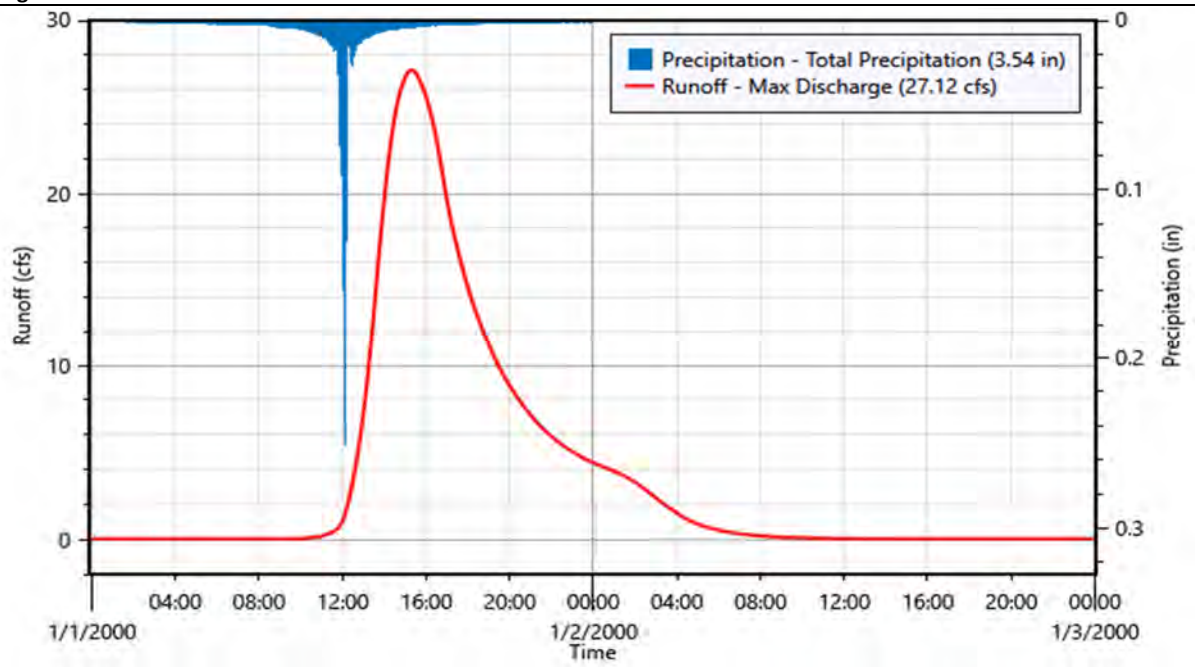
Subbasin ID:	6			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	14.87 cfs	**Time of peak:**	01 Jan 2000, 12:06	
Drainage area:	10.900 acres	**Total rainfall:**	3.54 in	3.215 ac-ft
Initial abstraction:	0.67 in	**Losses:**	2.21 in	2.009 ac-ft
Curve Number:	75.00	**Precip excess:**	1.33 in	1.206 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.33 in	1.206 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	12.90 minutes	**Total runoff:**	1.33 in	1.206 ac-ft



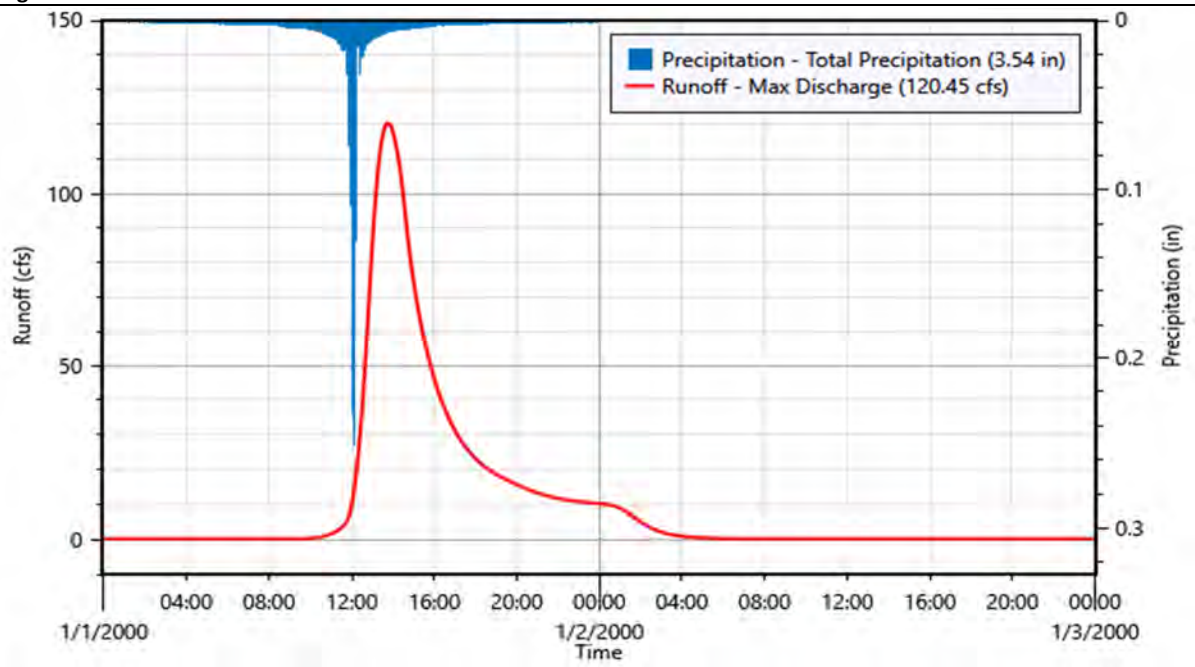
Subbasin ID:	7A			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	3.22 cfs	**Time of peak:**	01 Jan 2000, 01:39	
Drainage area:	9.300 acres	**Total rainfall:**	3.54 in	2.743 ac-ft
Initial abstraction:	0.67 in	**Losses:**	2.21 in	1.714 ac-ft
Curve Number:	75.00	**Precip excess:**	1.33 in	1.029 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.33 in	1.029 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	94.60 minutes	**Total runoff:**	1.33 in	1.029 ac-ft



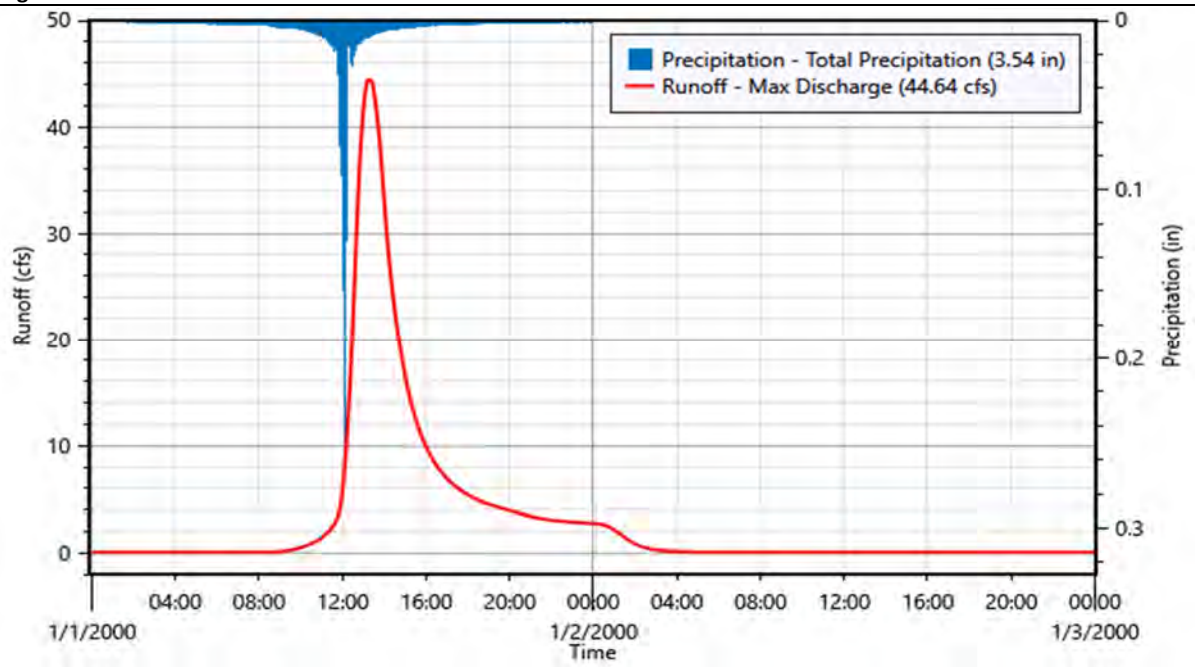
Subbasin ID:	7B			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	27.12 cfs	**Time of peak:**	01 Jan 2000, 03:18	
Drainage area:	96.500 acres	**Total rainfall:**	3.54 in	28.467 ac-ft
Initial abstraction:	0.47 in	**Losses:**	1.80 in	14.437 ac-ft
Curve Number:	81.09	**Precip excess:**	1.74 in	14.030 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.74 in	14.030 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	186.50 minutes	**Total runoff:**	1.74 in	14.030 ac-ft



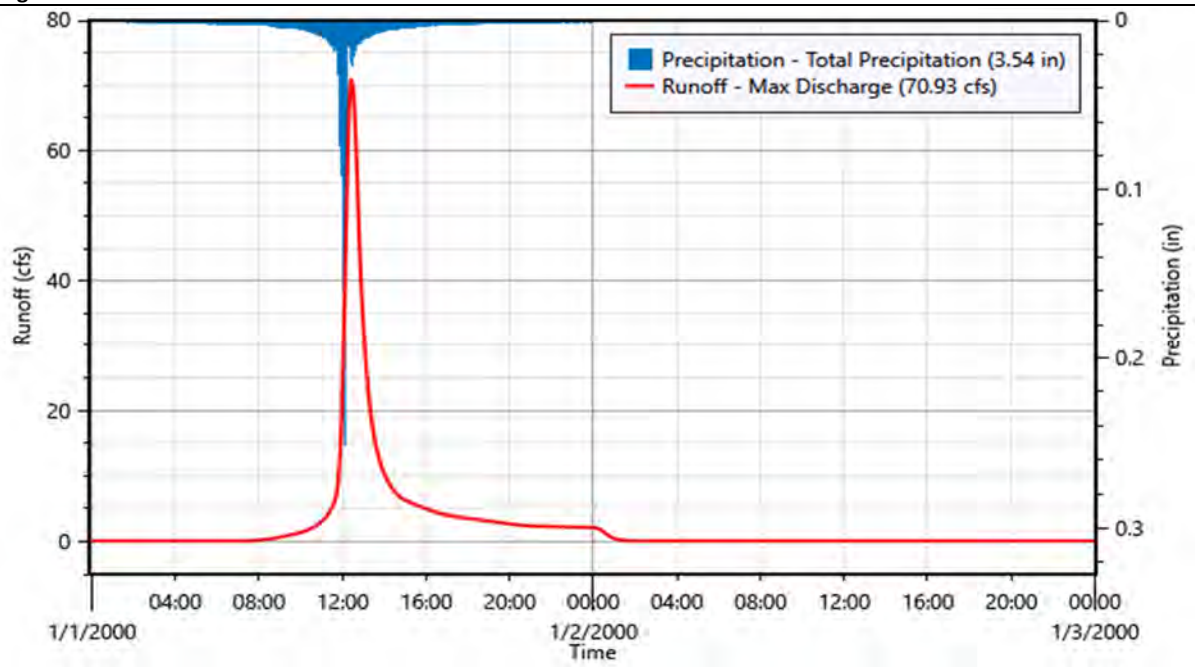
Subbasin ID:	8			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	120.45 cfs	**Time of peak:**	01 Jan 2000, 01:45	
Drainage area:	288.800 acres	**Total rainfall:**	3.54 in	85.196 ac-ft
Initial abstraction:	0.50 in	**Losses:**	1.88 in	45.207 ac-ft
Curve Number:	79.86	**Precip excess:**	1.66 in	39.989 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.66 in	39.989 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	104.40 minutes	**Total runoff:**	1.66 in	39.989 ac-ft



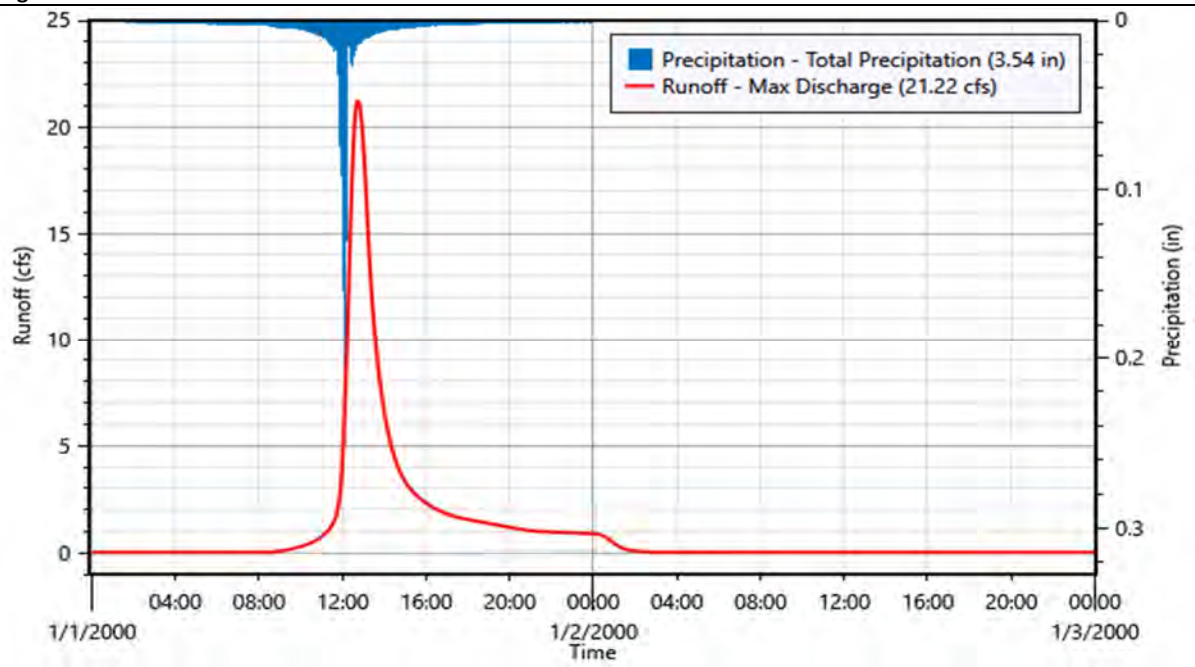
Subbasin ID:	9A			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	44.64 cfs	**Time of peak:**	01 Jan 2000, 01:18	
Drainage area:	75.300 acres	**Total rainfall:**	3.54 in	22.213 ac-ft
Initial abstraction:	0.41 in	**Losses:**	1.65 in	10.335 ac-ft
Curve Number:	83.02	**Precip excess:**	1.89 in	11.879 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.89 in	11.879 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	79.60 minutes	**Total runoff:**	1.89 in	11.879 ac-ft



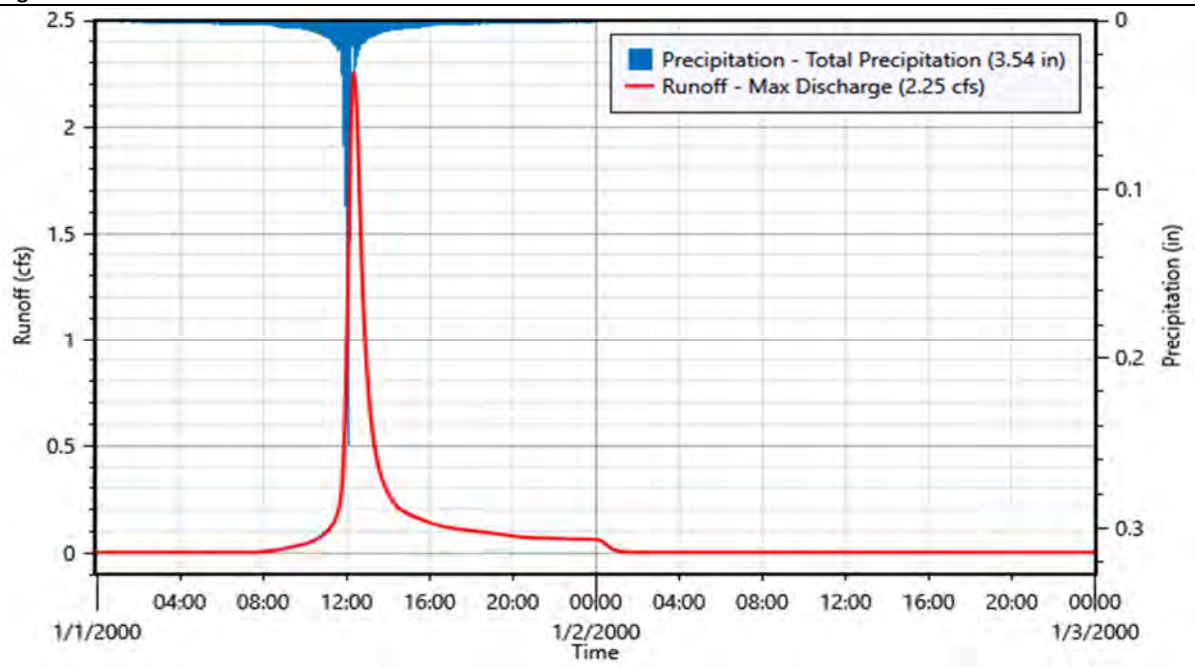
Subbasin ID:	9B			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	70.93 cfs	**Time of peak:**	01 Jan 2000, 12:24	
Drainage area:	57.300 acres	**Total rainfall:**	3.54 in	16.903 ac-ft
Initial abstraction:	0.35 in	**Losses:**	1.49 in	7.107 ac-ft
Curve Number:	84.96	**Precip excess:**	2.05 in	9.796 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.05 in	9.796 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	32.50 minutes	**Total runoff:**	2.05 in	9.796 ac-ft



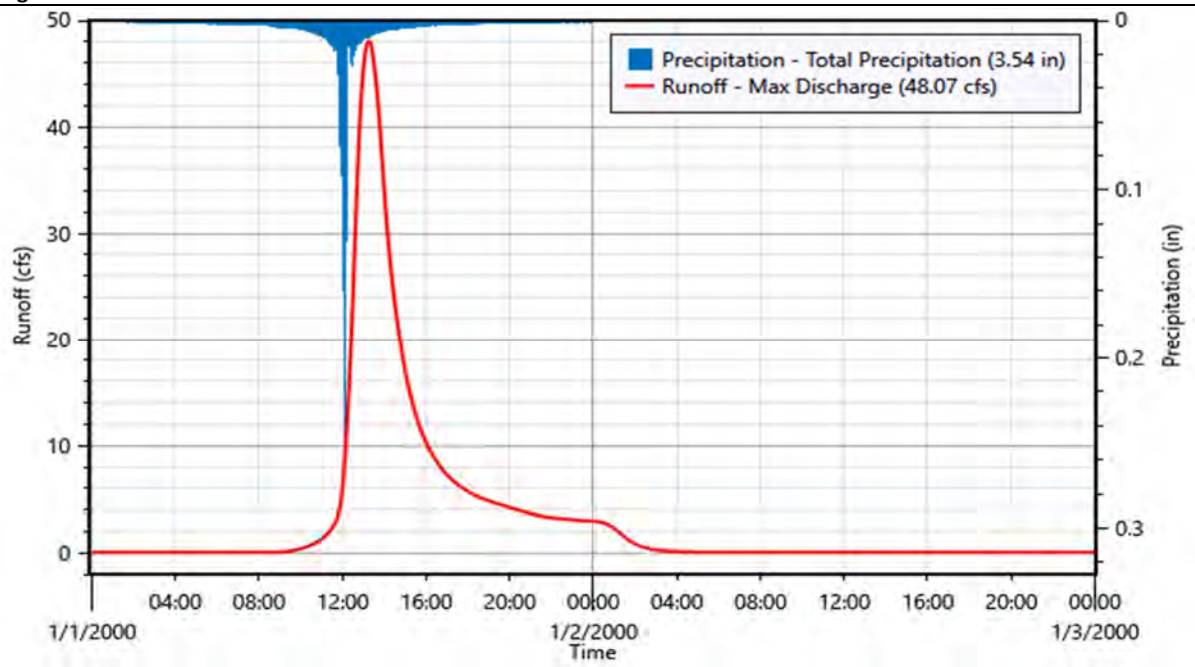
Subbasin ID:	10.1			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	21.22 cfs	**Time of peak:**	01 Jan 2000, 12:45	
Drainage area:	25.200 acres	**Total rainfall:**	3.54 in	7.434 ac-ft
Initial abstraction:	0.41 in	**Losses:**	1.66 in	3.476 ac-ft
Curve Number:	82.86	**Precip excess:**	1.88 in	3.958 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.88 in	3.958 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	49.30 minutes	**Total runoff:**	1.88 in	3.958 ac-ft



Subbasin ID:	10.1F			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	2.25 cfs	**Time of peak:**	01 Jan 2000, 12:21	
Drainage area:	1.700 acres	**Total rainfall:**	3.54 in	0.501 ac-ft
Initial abstraction:	0.36 in	**Losses:**	1.51 in	0.213 ac-ft
Curve Number:	84.82	**Precip excess:**	2.03 in	0.288 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.03 in	0.288 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	29.10 minutes	**Total runoff:**	2.03 in	0.288 ac-ft



Subbasin ID:	10.2			
Scenario:	**2yr Existing**		**Depth**	**Volume**
Peak discharge:	48.07 cfs	**Time of peak:**	01 Jan 2000, 01:15	
Drainage area:	83.100 acres	**Total rainfall:**	3.54 in	24.515 ac-ft
Initial abstraction:	0.44 in	**Losses:**	1.73 in	11.954 ac-ft
Curve Number:	81.98	**Precip excess:**	1.81 in	12.561 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.81 in	12.561 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	77.30 minutes	**Total runoff:**	1.81 in	12.561 ac-ft



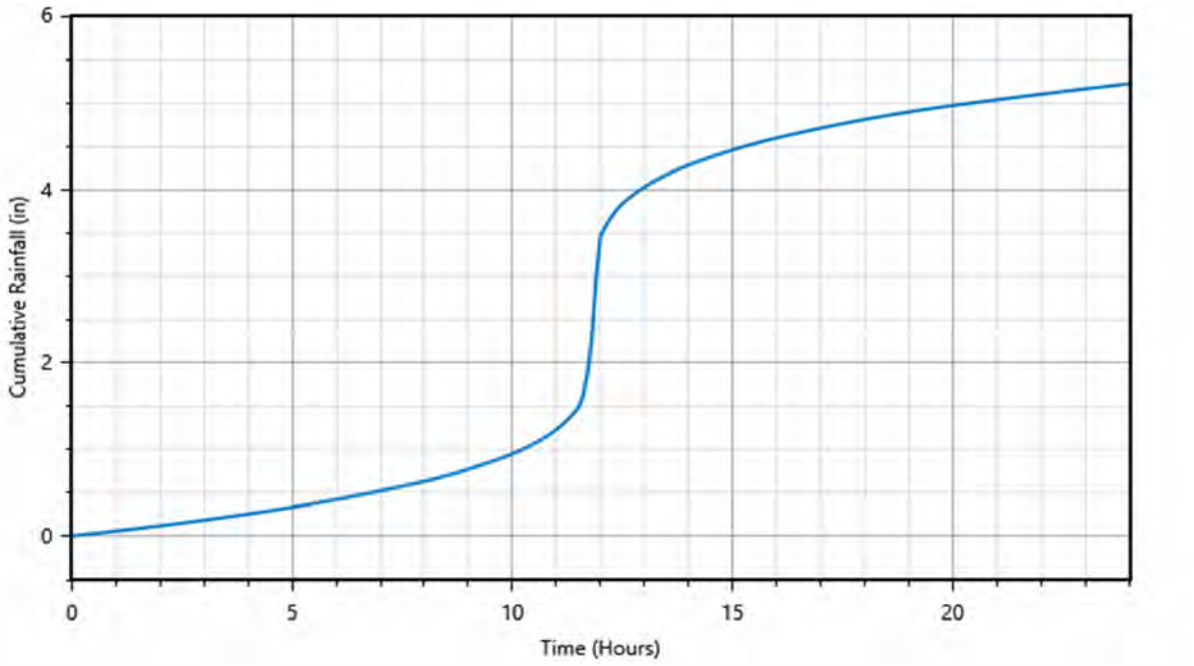
Nodes

Element ID	Element Type	Outflow Volume (ac-ft)
1ER	Junction	56.2
2ER	Junction	8.2
3ER	Junction	2.9
4ER	Junction	4.0
5ER	Junction	55.0
6ER	Junction	21.7
7ER	Junction	16.8

10yr Existing

Design Storm

Precipitation type: SCS Storm
SCS storm distribution: Type II
Rainfall depth: 5.21 in

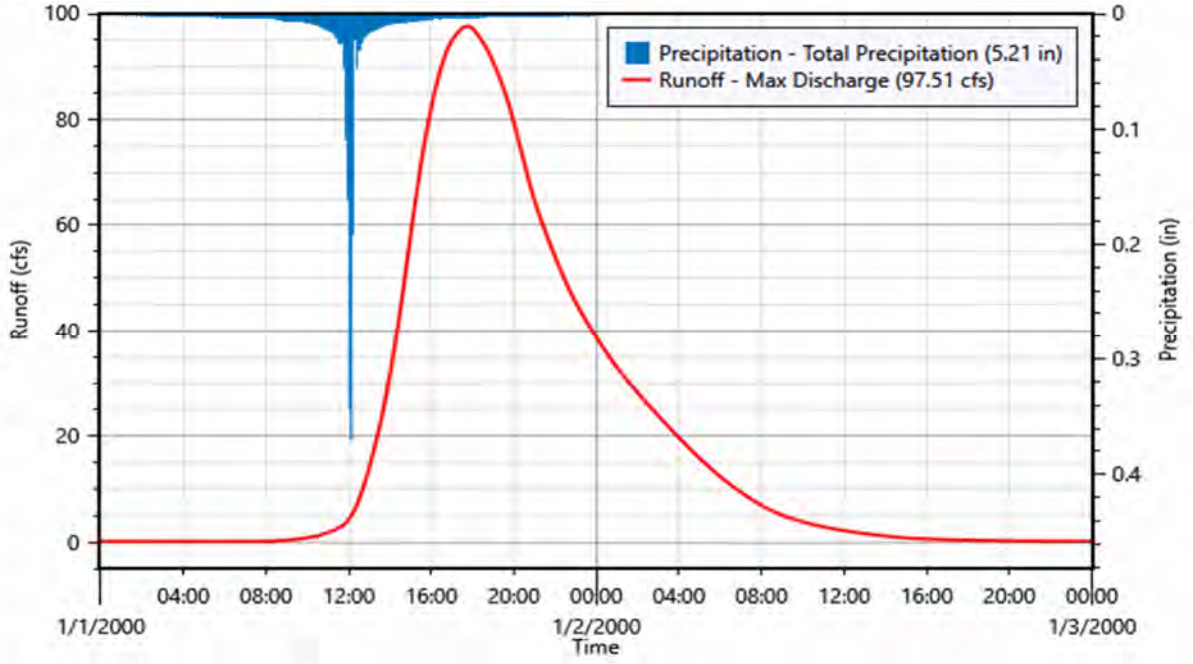


Watershed Summary

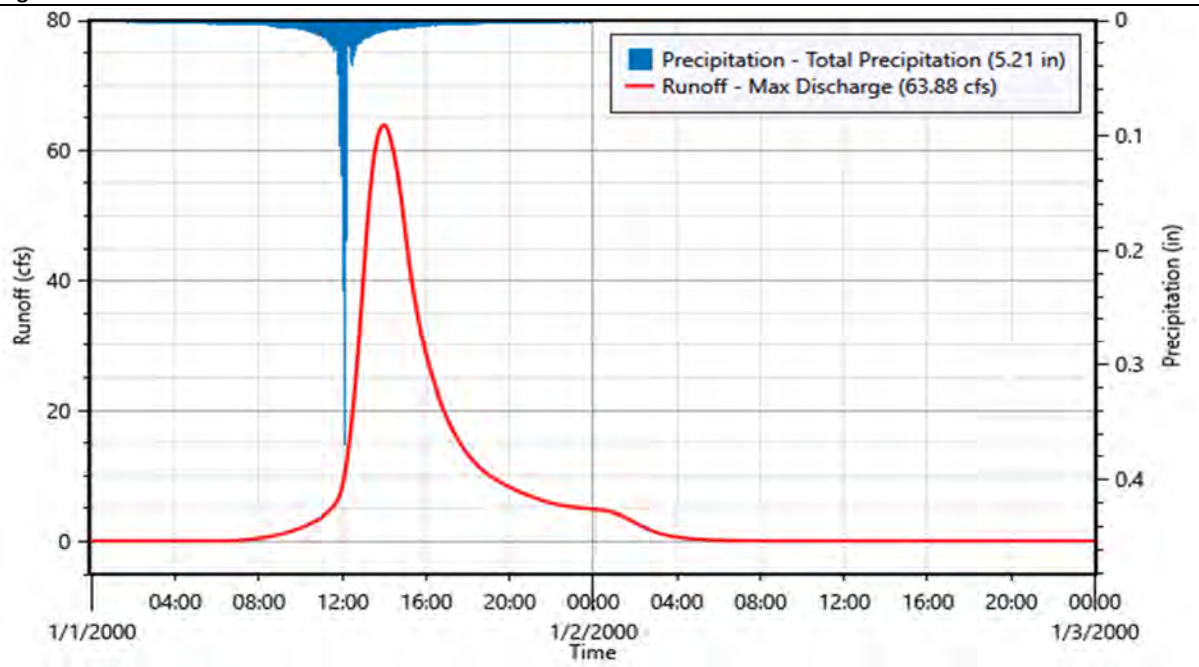
Subbasin ID	Drainage Area (acres)	Initial Abstraction (in)	Curve Number	Impervious Surface (%)	Lag Time (minutes)	Peak Discharge (cfs)
1.1	268.700	0.40	83.43	0.00	323.50	97.51
1.2	77.900	0.36	84.73	0.00	119.80	63.88
2	53.700	0.43	82.27	0.00	23.20	133.99
3	23.400	0.68	74.68	0.00	27.30	40.84
4	2.900	0.67	75.00	0.00	10.10	8.97
5	25.300	0.67	74.92	0.00	24.00	48.46
6	10.900	0.67	75.00	0.00	12.90	30.19
7A	9.300	0.67	75.00	0.00	94.60	6.65
7B	96.500	0.47	81.09	0.00	186.50	50.33
8	288.800	0.50	79.86	0.00	104.40	227.29
9A	75.300	0.41	83.02	0.00	79.60	80.16
9B	57.300	0.35	84.96	0.00	32.50	123.25
10.1	25.200	0.41	82.86	0.00	49.30	38.10
10.1F	1.700	0.36	84.82	0.00	29.10	3.92
10.2	83.100	0.44	81.98	0.00	77.30	87.67

Subbasins

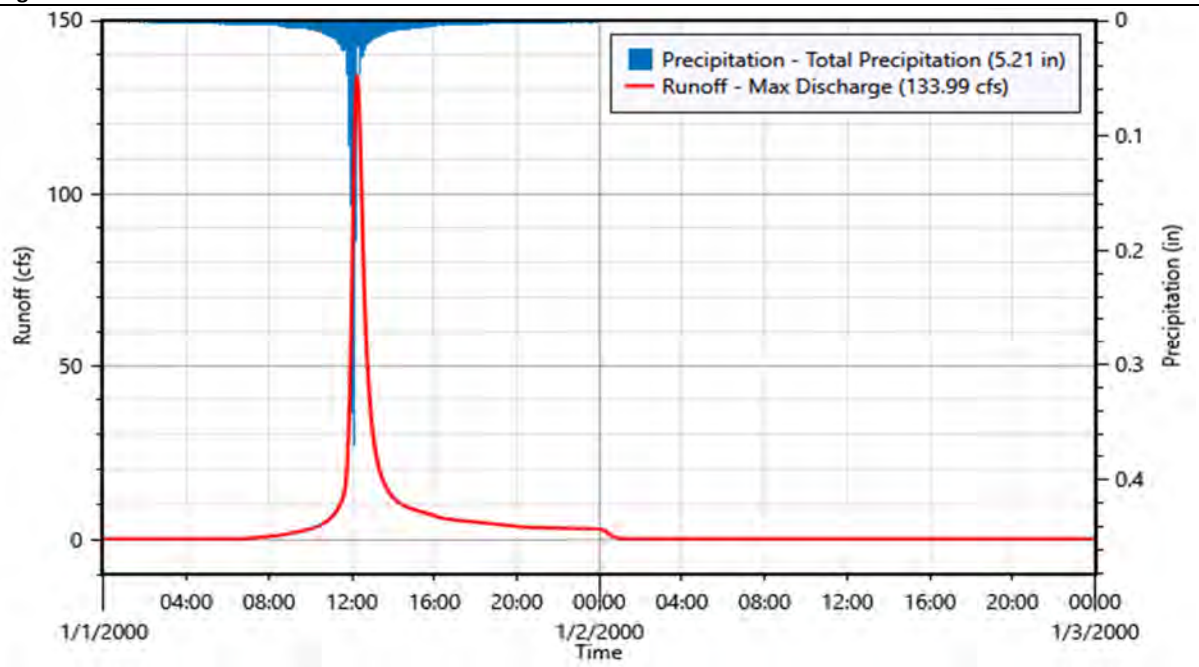
Subbasin ID:	1.1			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	97.51 cfs	**Time of peak:**	01 Jan 2000, 05:45	
Drainage area:	268.700 acres	**Total rainfall:**	5.21 in	116.661 ac-ft
Initial abstraction:	0.40 in	**Losses:**	1.81 in	40.432 ac-ft
Curve Number:	83.43	**Precip excess:**	3.40 in	76.228 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.40 in	76.227 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	323.50 minutes	**Total runoff:**	3.40 in	76.227 ac-ft



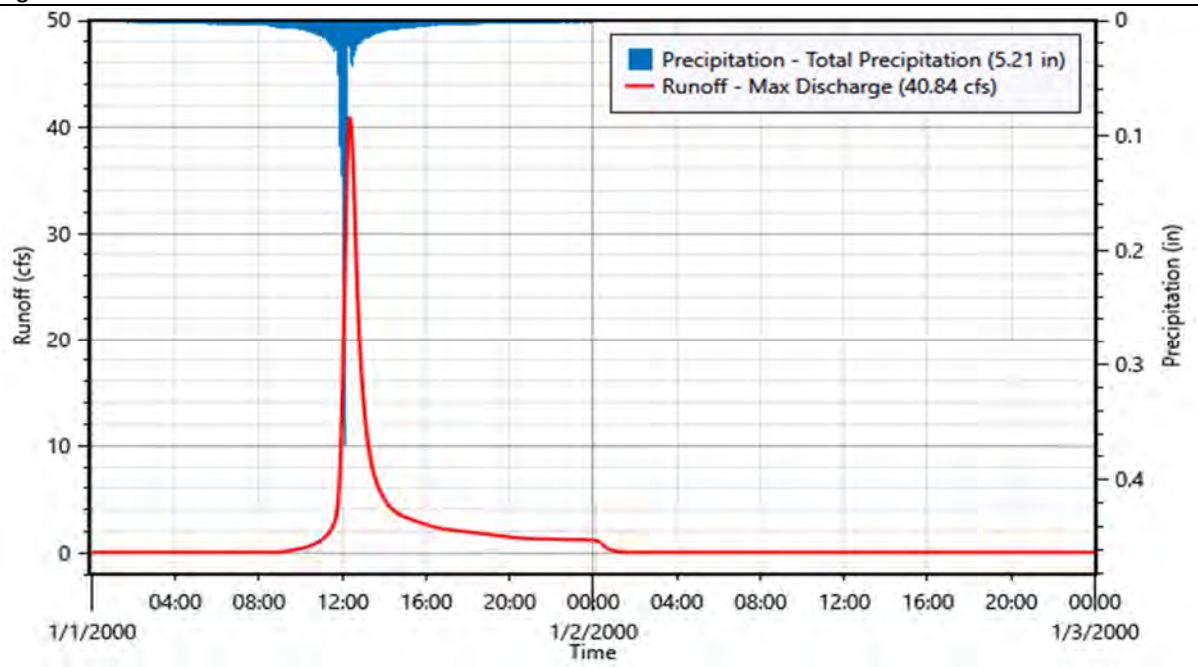
Subbasin ID:	1.2			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	63.88 cfs	**Time of peak:**	01 Jan 2000, 02:00	
Drainage area:	77.900 acres	**Total rainfall:**	5.21 in	33.822 ac-ft
Initial abstraction:	0.36 in	**Losses:**	1.67 in	10.867 ac-ft
Curve Number:	84.73	**Precip excess:**	3.54 in	22.955 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.54 in	22.955 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	119.80 minutes	**Total runoff:**	3.54 in	22.955 ac-ft



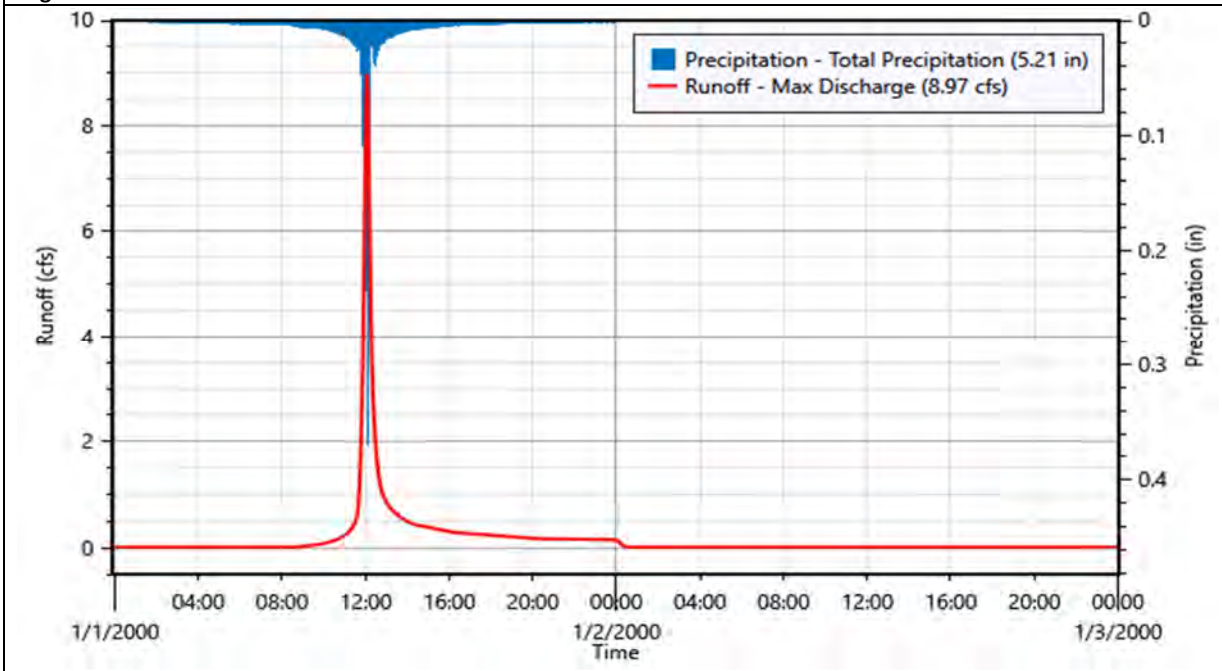
Subbasin ID:	2			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	133.99 cfs	**Time of peak:**	01 Jan 2000, 12:15	
Drainage area:	53.700 acres	**Total rainfall:**	5.21 in	23.315 ac-ft
Initial abstraction:	0.43 in	**Losses:**	1.92 in	8.571 ac-ft
Curve Number:	82.27	**Precip excess:**	3.29 in	14.743 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.29 in	14.743 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	23.20 minutes	**Total runoff:**	3.29 in	14.743 ac-ft



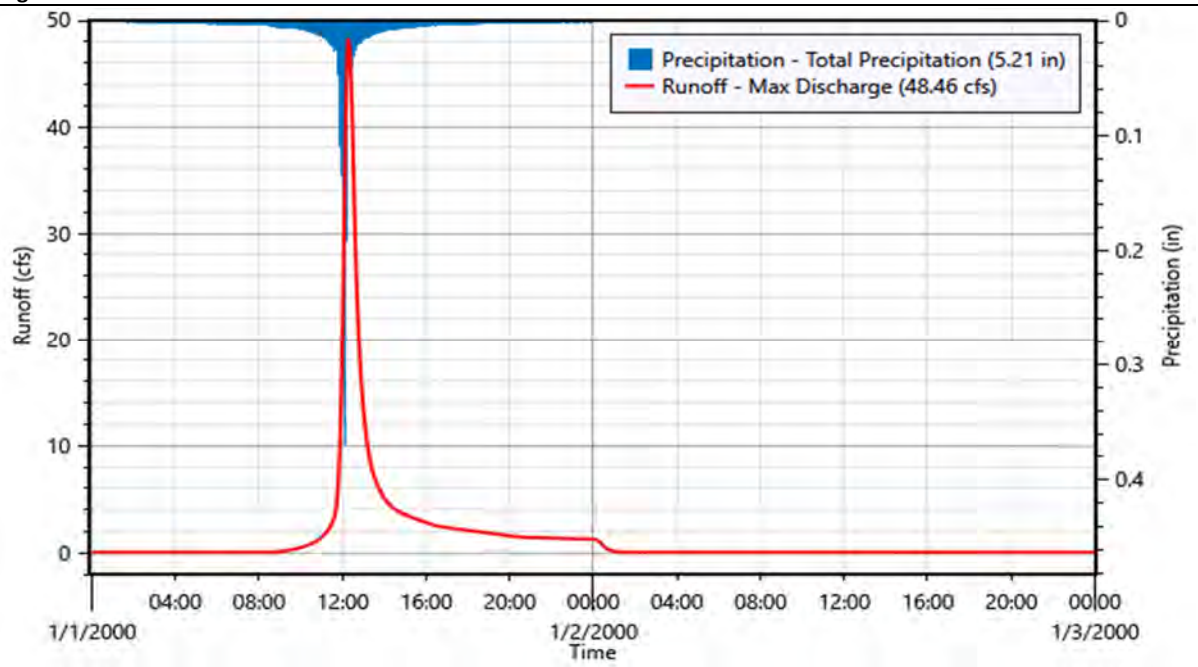
Subbasin ID:	3			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	40.84 cfs	**Time of peak:**	01 Jan 2000, 12:21	
Drainage area:	23.400 acres	**Total rainfall:**	5.21 in	10.160 ac-ft
Initial abstraction:	0.68 in	**Losses:**	2.62 in	5.107 ac-ft
Curve Number:	74.68	**Precip excess:**	2.59 in	5.052 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.59 in	5.052 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	27.30 minutes	**Total runoff:**	2.59 in	5.052 ac-ft



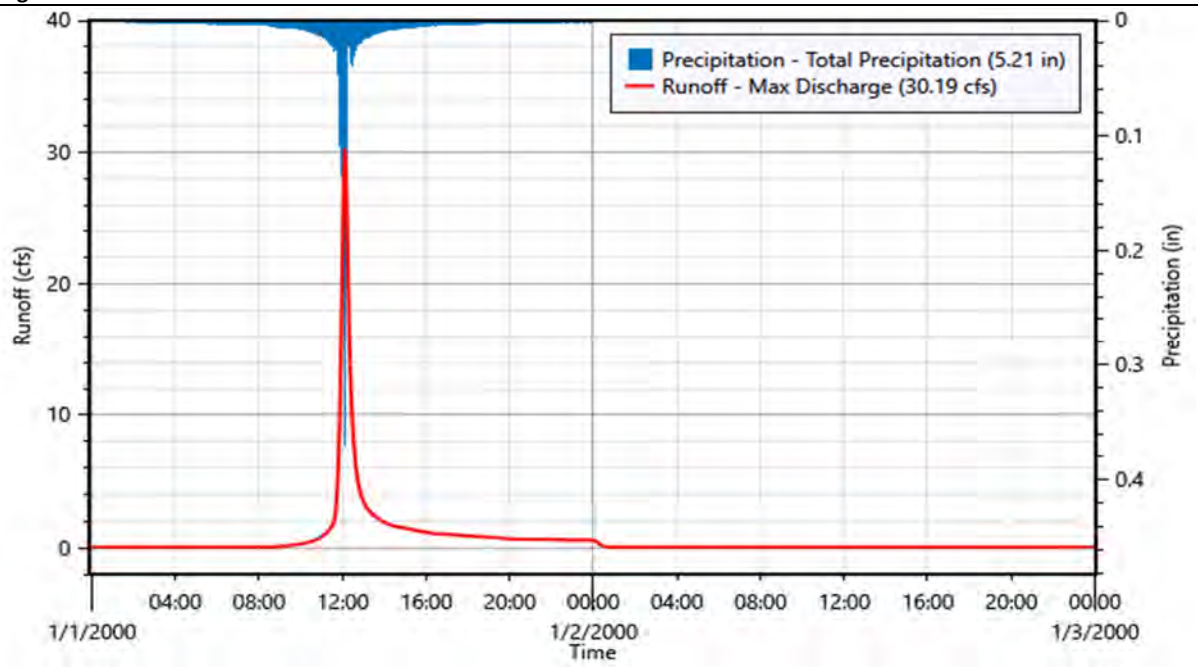
Subbasin ID:	4			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	8.97 cfs	**Time of peak:**	01 Jan 2000, 12:03	
Drainage area:	2.900 acres	**Total rainfall:**	5.21 in	1.259 ac-ft
Initial abstraction:	0.67 in	**Losses:**	2.59 in	0.626 ac-ft
Curve Number:	75.00	**Precip excess:**	2.62 in	0.633 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.62 in	0.633 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	10.10 minutes	**Total runoff:**	2.62 in	0.633 ac-ft



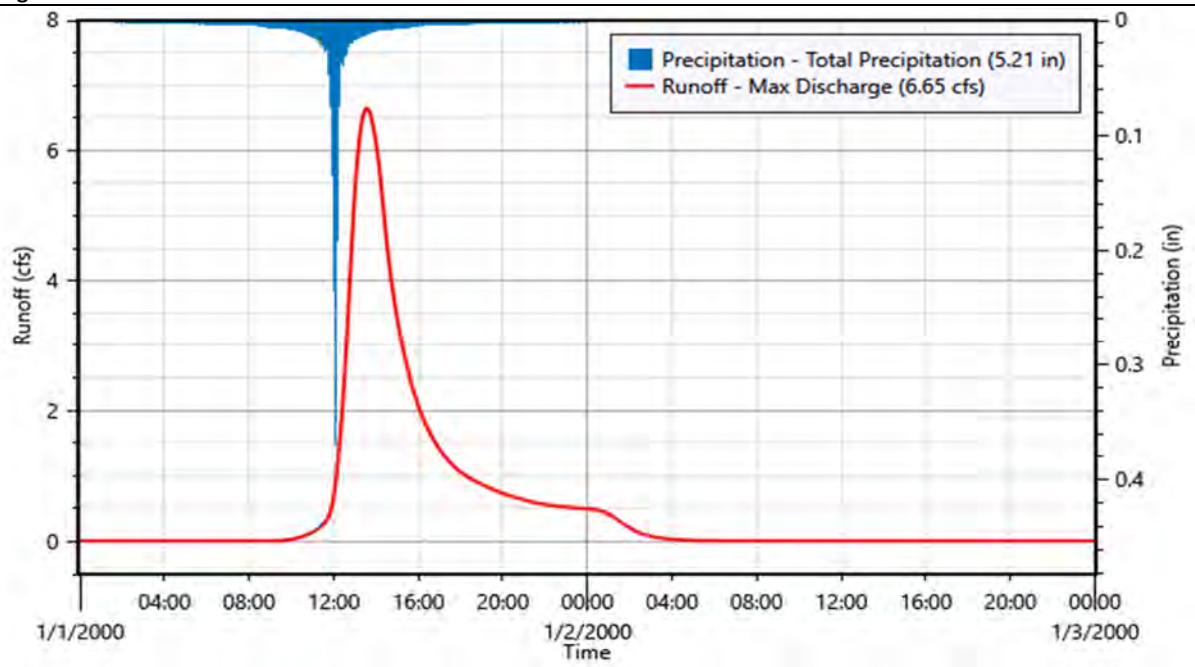
Subbasin ID:	5			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	48.46 cfs	**Time of peak:**	01 Jan 2000, 12:18	
Drainage area:	25.300 acres	**Total rainfall:**	5.21 in	10.984 ac-ft
Initial abstraction:	0.67 in	**Losses:**	2.60 in	5.475 ac-ft
Curve Number:	74.92	**Precip excess:**	2.61 in	5.509 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.61 in	5.509 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	24.00 minutes	**Total runoff:**	2.61 in	5.509 ac-ft



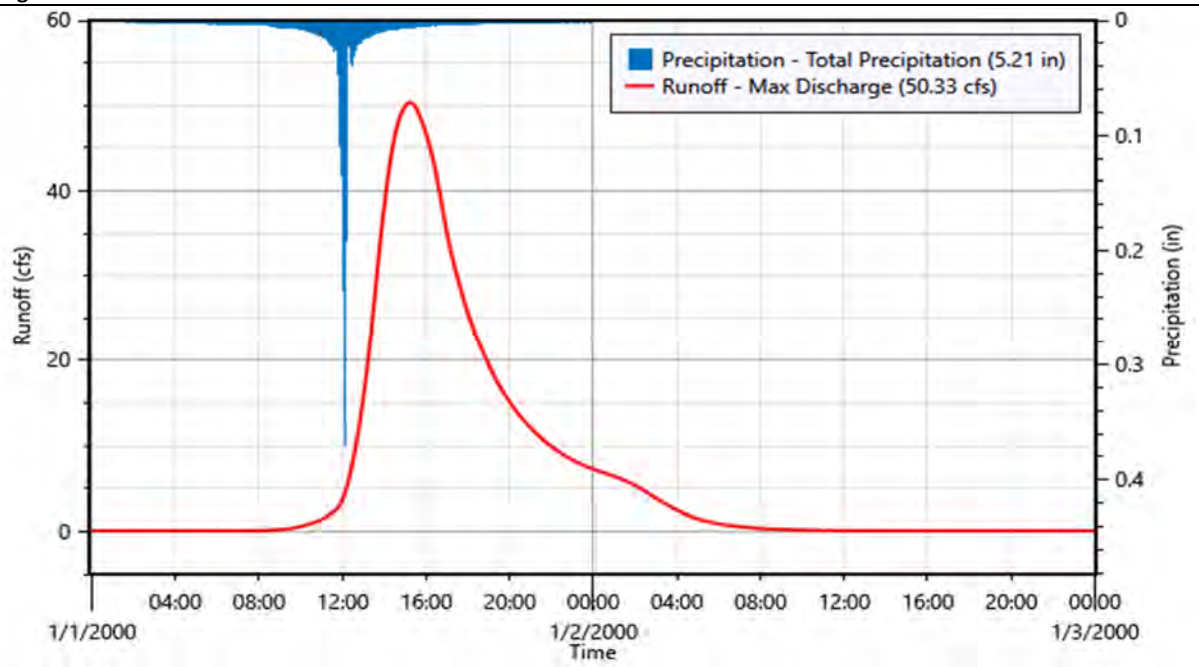
Subbasin ID:	6			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	30.19 cfs	**Time of peak:**	01 Jan 2000, 12:06	
Drainage area:	10.900 acres	**Total rainfall:**	5.21 in	4.732 ac-ft
Initial abstraction:	0.67 in	**Losses:**	2.59 in	2.354 ac-ft
Curve Number:	75.00	**Precip excess:**	2.62 in	2.378 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.62 in	2.378 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	12.90 minutes	**Total runoff:**	2.62 in	2.378 ac-ft



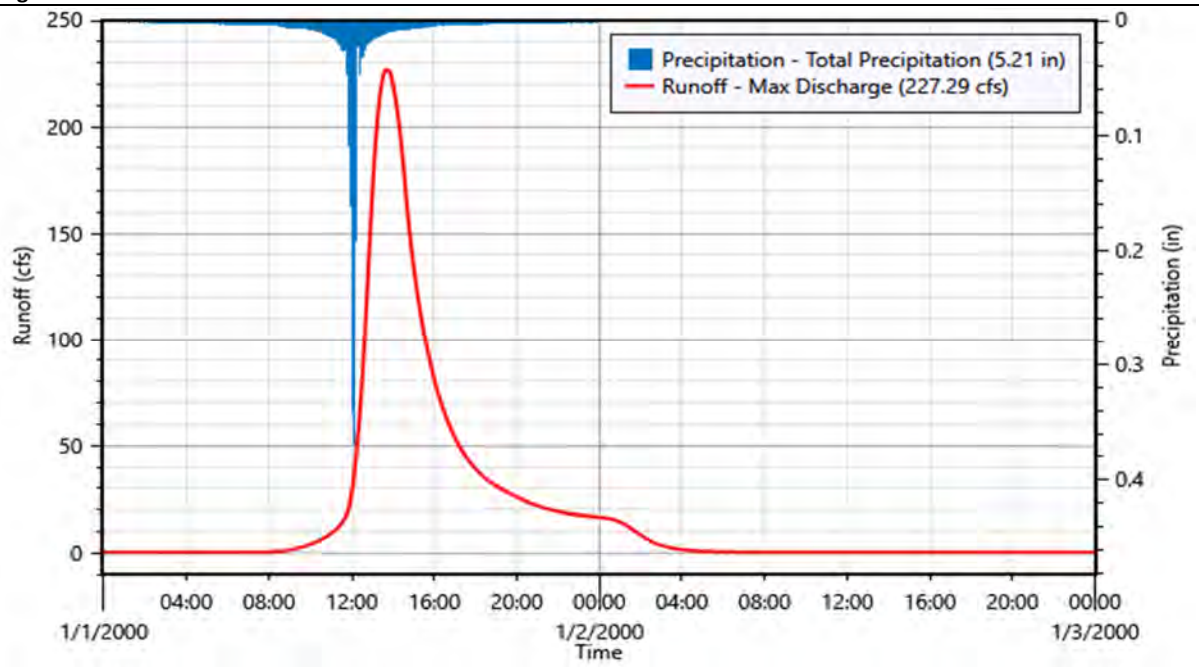
Subbasin ID:	7A			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	6.65 cfs	**Time of peak:**	01 Jan 2000, 01:36	
Drainage area:	9.300 acres	**Total rainfall:**	5.21 in	4.038 ac-ft
Initial abstraction:	0.67 in	**Losses:**	2.59 in	2.009 ac-ft
Curve Number:	75.00	**Precip excess:**	2.62 in	2.029 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.62 in	2.029 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	94.60 minutes	**Total runoff:**	2.62 in	2.029 ac-ft



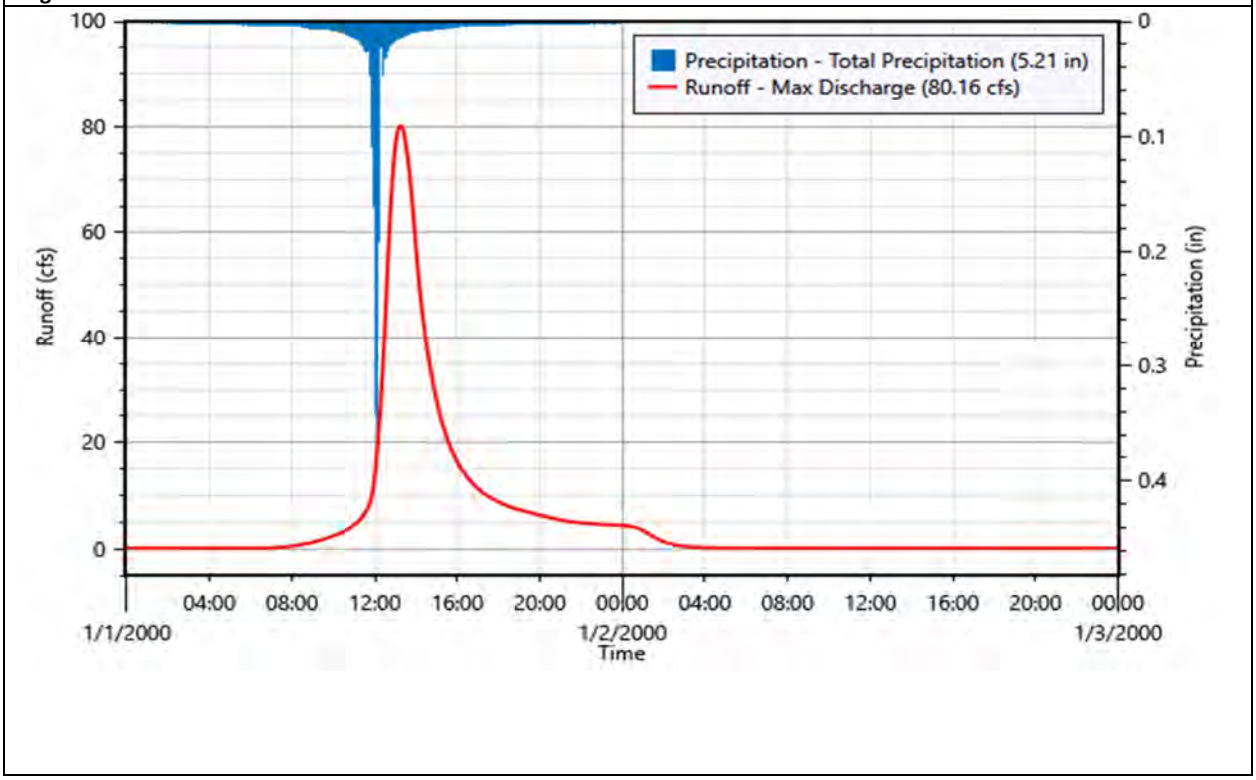
Subbasin ID:	7B			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	50.33 cfs	**Time of peak:**	01 Jan 2000, 03:15	
Drainage area:	96.500 acres	**Total rainfall:**	5.21 in	41.897 ac-ft
Initial abstraction:	0.47 in	**Losses:**	2.03 in	16.349 ac-ft
Curve Number:	81.09	**Precip excess:**	3.18 in	25.548 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.18 in	25.548 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	186.50 minutes	**Total runoff:**	3.18 in	25.548 ac-ft



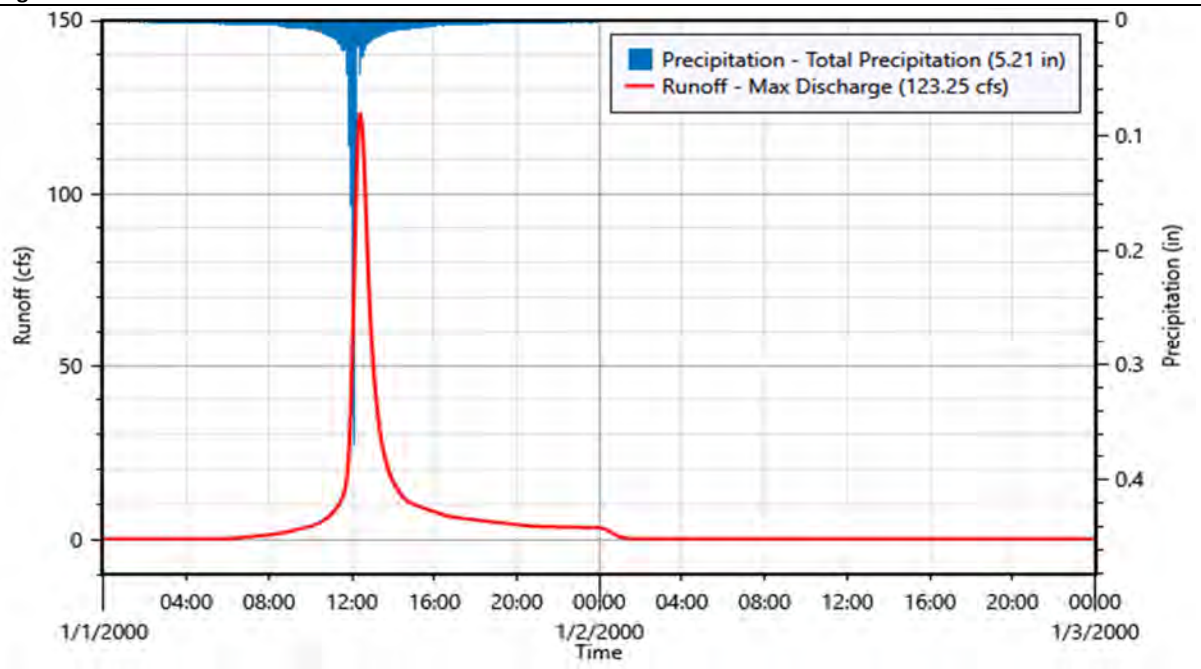
Subbasin ID:	8			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	227.29 cfs	**Time of peak:**	01 Jan 2000, 01:45	
Drainage area:	288.800 acres	**Total rainfall:**	5.21 in	125.387 ac-ft
Initial abstraction:	0.50 in	**Losses:**	2.14 in	51.562 ac-ft
Curve Number:	79.86	**Precip excess:**	3.07 in	73.825 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.07 in	73.825 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	104.40 minutes	**Total runoff:**	3.07 in	73.825 ac-ft



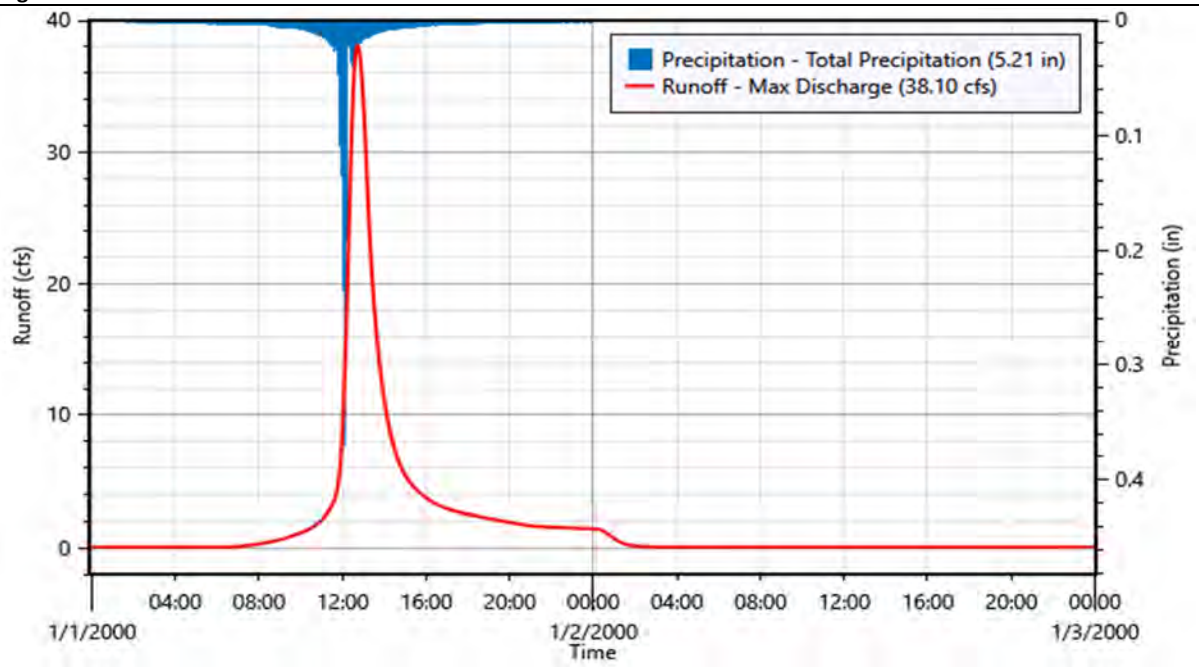
Subbasin ID:	9A			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	80.16 cfs	**Time of peak:**	01 Jan 2000, 01:15	
Drainage area:	75.300 acres	**Total rainfall:**	5.21 in	32.693 ac-ft
Initial abstraction:	0.41 in	**Losses:**	1.84 in	11.572 ac-ft
Curve Number:	83.02	**Precip excess:**	3.37 in	21.120 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.37 in	21.120 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	79.60 minutes	**Total runoff:**	3.37 in	21.120 ac-ft



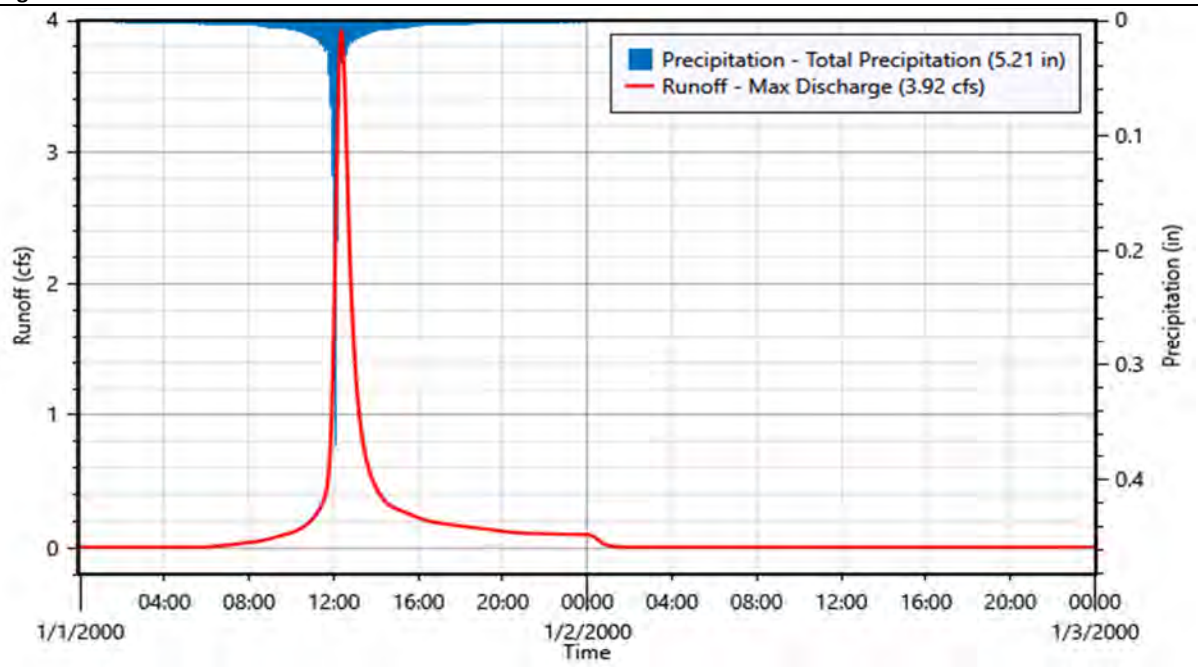
Subbasin ID:	9B			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	123.25 cfs	**Time of peak:**	01 Jan 2000, 12:24	
Drainage area:	57.300 acres	**Total rainfall:**	5.21 in	24.878 ac-ft
Initial abstraction:	0.35 in	**Losses:**	1.65 in	7.867 ac-ft
Curve Number:	84.96	**Precip excess:**	3.56 in	17.010 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.56 in	17.010 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	32.50 minutes	**Total runoff:**	3.56 in	17.010 ac-ft



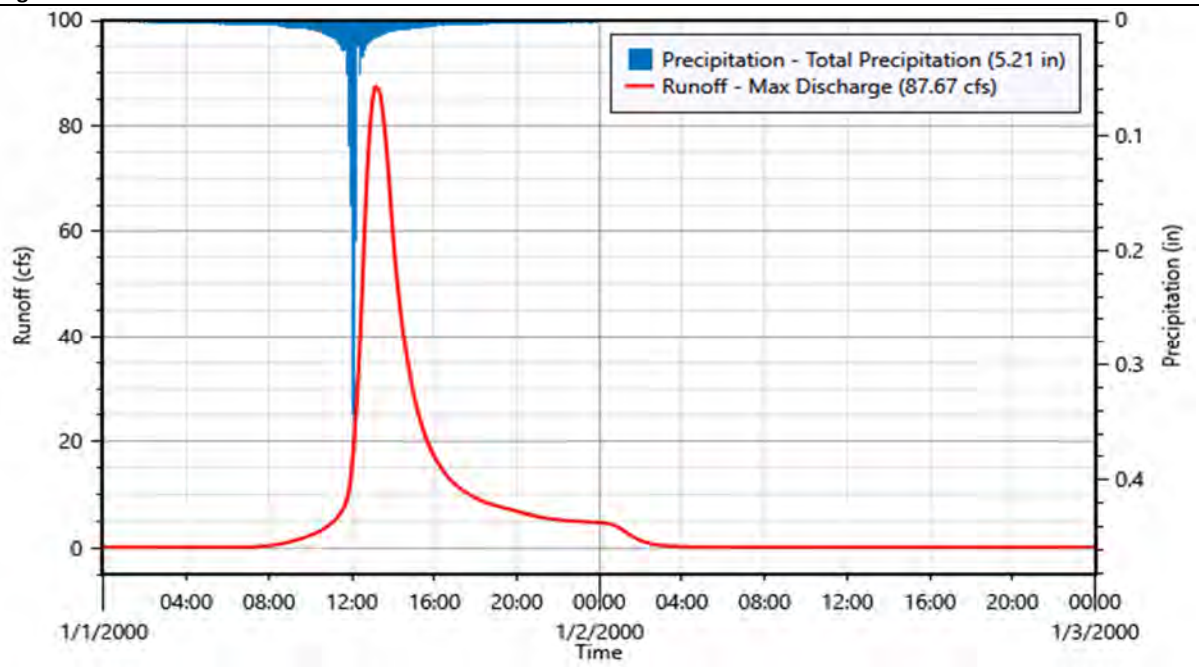
Subbasin ID:	10.1			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	38.10 cfs	**Time of peak:**	01 Jan 2000, 12:42	
Drainage area:	25.200 acres	**Total rainfall:**	5.21 in	10.941 ac-ft
Initial abstraction:	0.41 in	**Losses:**	1.86 in	3.897 ac-ft
Curve Number:	82.86	**Precip excess:**	3.35 in	7.044 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.35 in	7.044 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	49.30 minutes	**Total runoff:**	3.35 in	7.044 ac-ft



Subbasin ID:	10.1F			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	3.92 cfs	**Time of peak:**	01 Jan 2000, 12:21	
Drainage area:	1.700 acres	**Total rainfall:**	5.21 in	0.738 ac-ft
Initial abstraction:	0.36 in	**Losses:**	1.67 in	0.236 ac-ft
Curve Number:	84.82	**Precip excess:**	3.54 in	0.502 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.54 in	0.502 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	29.10 minutes	**Total runoff:**	3.54 in	0.502 ac-ft



Subbasin ID:	10.2			
Scenario:	**10yr Existing**		**Depth**	**Volume**
Peak discharge:	87.67 cfs	**Time of peak:**	01 Jan 2000, 01:12	
Drainage area:	83.100 acres	**Total rainfall:**	5.21 in	36.079 ac-ft
Initial abstraction:	0.44 in	**Losses:**	1.94 in	13.467 ac-ft
Curve Number:	81.98	**Precip excess:**	3.27 in	22.612 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.27 in	22.612 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	77.30 minutes	**Total runoff:**	3.27 in	22.612 ac-ft



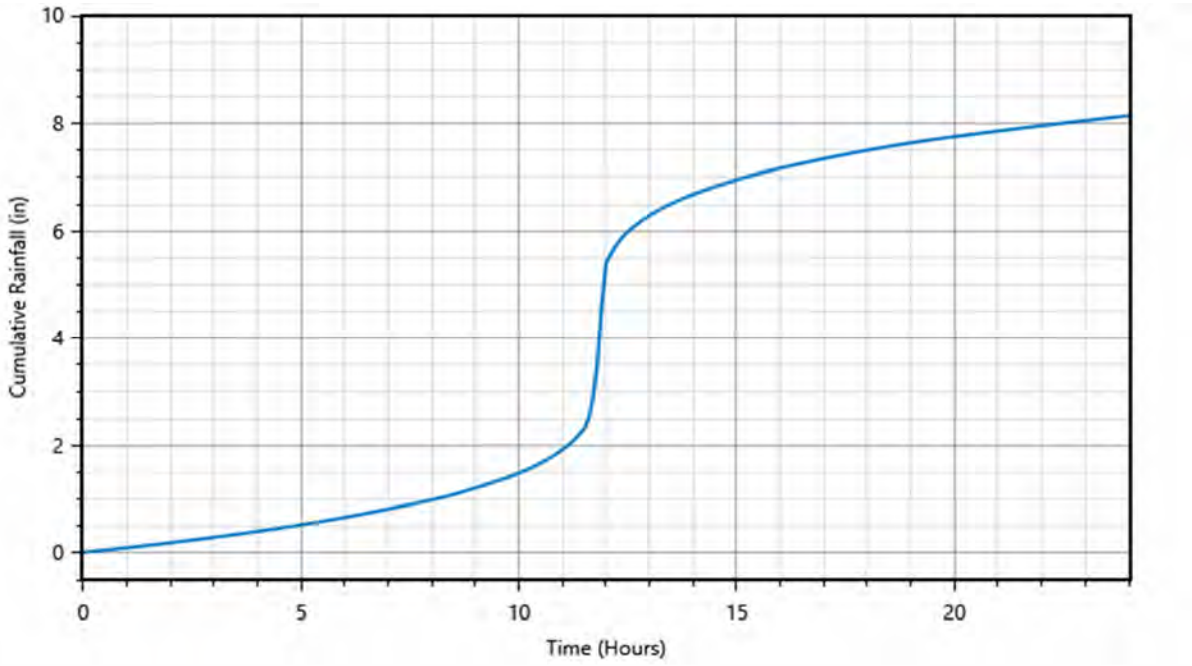
Nodes

Element ID	Element Type	Outflow Volume (ac-ft)
1ER	Junction	99.2
2ER	Junction	14.7
3ER	Junction	5.7
4ER	Junction	7.9
5ER	Junction	101.4
6ER	Junction	38.1
7ER	Junction	30.2

100yr Existing

Design Storm

Precipitation type: SCS Storm
SCS storm distribution: Type II
Rainfall depth: 8.13 in

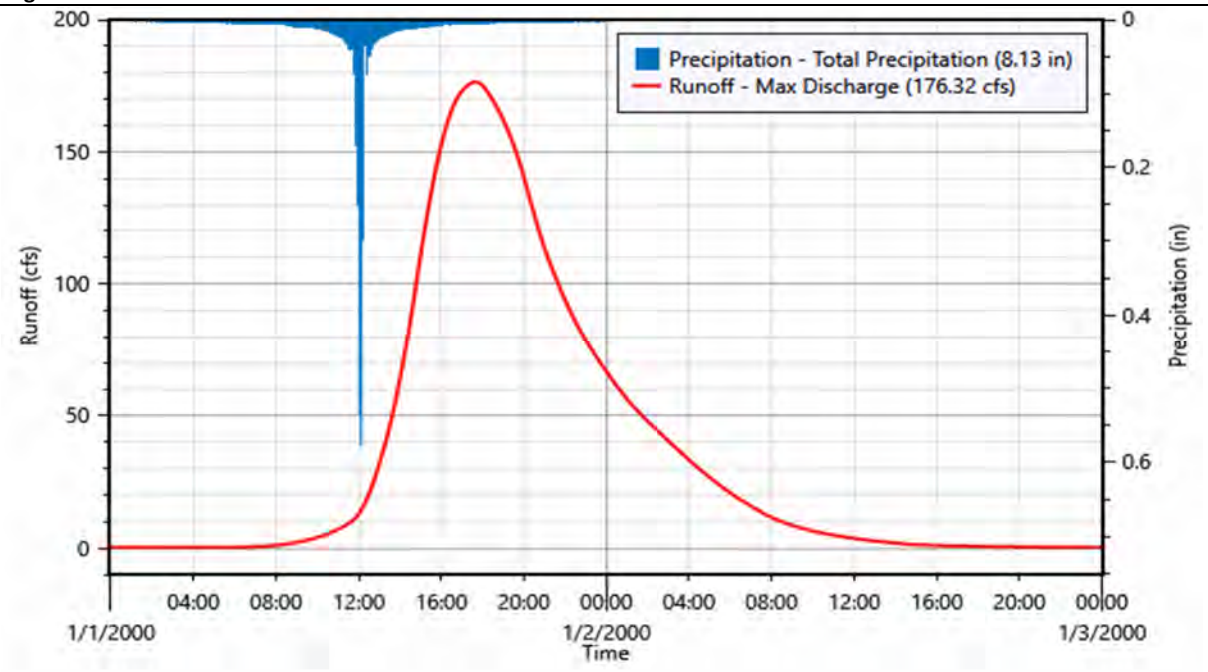


Watershed Summary

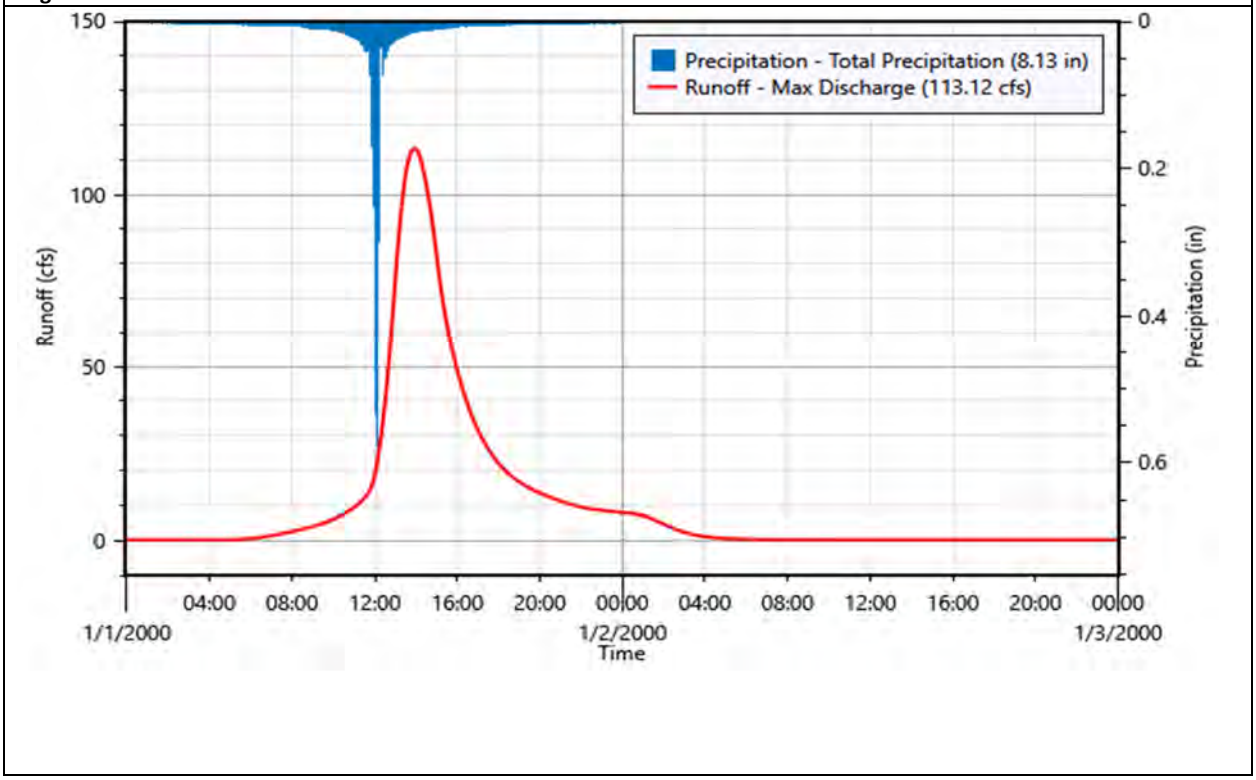
Subbasin ID	Drainage Area (acres)	Initial Abstraction (in)	Curve Number	Impervious Surface (%)	Lag Time (minutes)	Peak Discharge (cfs)
1.1	268.700	0.40	83.43	0.00	323.50	176.32
1.2	77.900	0.36	84.73	0.00	119.80	113.12
2	53.700	0.43	82.27	0.00	23.20	241.93
3	23.400	0.68	74.68	0.00	27.30	81.39
4	2.900	0.67	75.00	0.00	10.10	17.62
5	25.300	0.67	74.92	0.00	24.00	96.28
6	10.900	0.67	75.00	0.00	12.90	59.39
7A	9.300	0.67	75.00	0.00	94.60	13.31
7B	96.500	0.47	81.09	0.00	186.50	93.32
8	288.800	0.50	79.86	0.00	104.40	426.12
9A	75.300	0.41	83.02	0.00	79.60	144.43
9B	57.300	0.35	84.96	0.00	32.50	216.16
10.1	25.200	0.41	82.86	0.00	49.30	68.59
10.1F	1.700	0.36	84.82	0.00	29.10	6.89
10.2	83.100	0.44	81.98	0.00	77.30	159.97

Subbasins

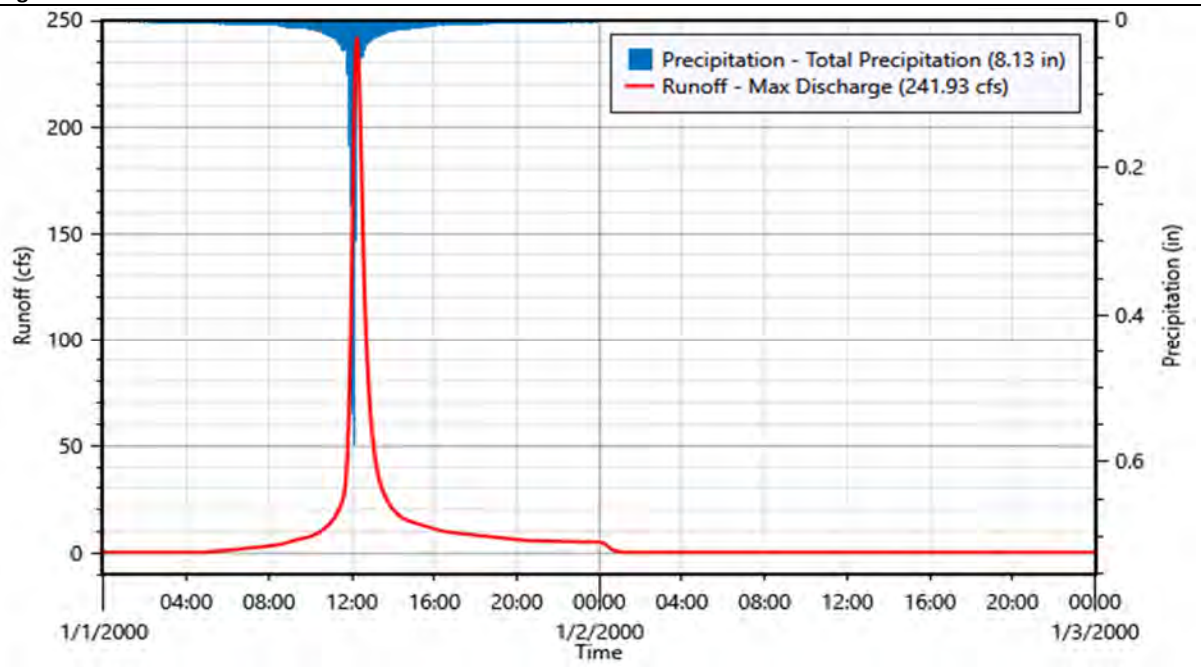
Subbasin ID:	1.1			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	176.32 cfs	**Time of peak:**	01 Jan 2000, 05:39	
Drainage area:	268.700 acres	**Total rainfall:**	8.13 in	182.044 ac-ft
Initial abstraction:	0.40 in	**Losses:**	1.98 in	44.338 ac-ft
Curve Number:	83.43	**Precip excess:**	6.15 in	137.706 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	6.15 in	137.704 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	323.50 minutes	**Total runoff:**	6.15 in	137.704 ac-ft



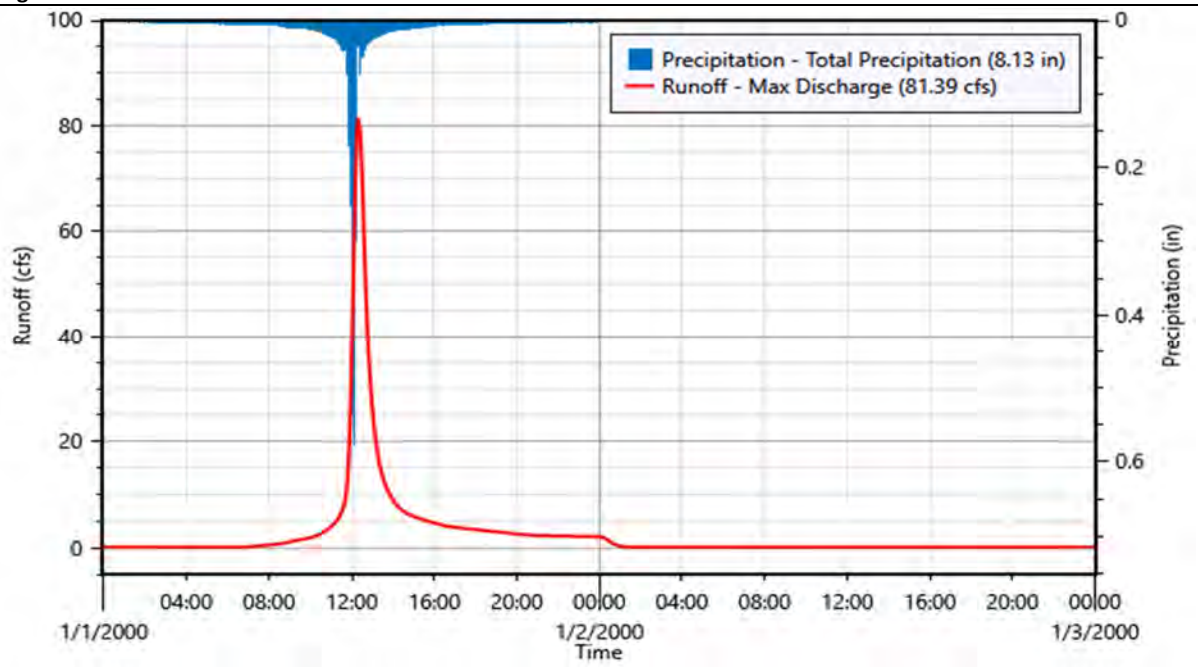
Subbasin ID:	1.2			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	113.12 cfs	**Time of peak:**	01 Jan 2000, 01:57	
Drainage area:	77.900 acres	**Total rainfall:**	8.13 in	52.777 ac-ft
Initial abstraction:	0.36 in	**Losses:**	1.82 in	11.834 ac-ft
Curve Number:	84.73	**Precip excess:**	6.31 in	40.944 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	6.31 in	40.944 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	119.80 minutes	**Total runoff:**	6.31 in	40.944 ac-ft



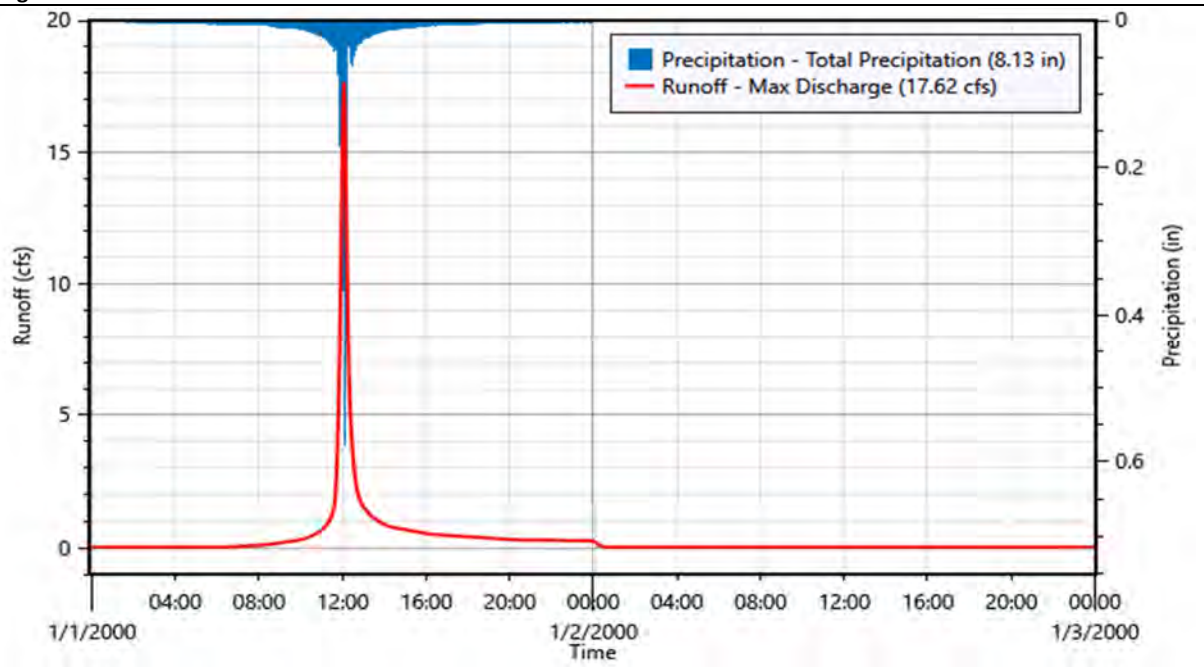
Subbasin ID:	2			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	241.93 cfs	**Time of peak:**	01 Jan 2000, 12:15	
Drainage area:	53.700 acres	**Total rainfall:**	8.13 in	36.382 ac-ft
Initial abstraction:	0.43 in	**Losses:**	2.11 in	9.459 ac-ft
Curve Number:	82.27	**Precip excess:**	6.02 in	26.922 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	6.02 in	26.922 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	23.20 minutes	**Total runoff:**	6.02 in	26.922 ac-ft



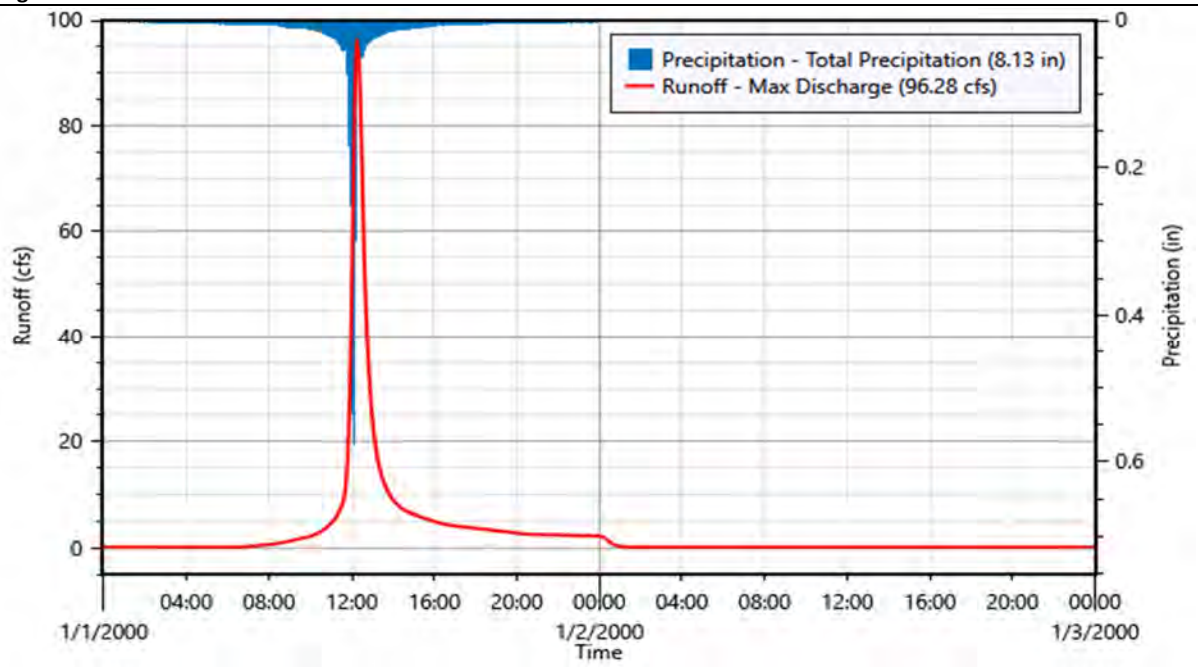
Subbasin ID:	3			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	81.39 cfs	**Time of peak:**	01 Jan 2000, 12:21	
Drainage area:	23.400 acres	**Total rainfall:**	8.13 in	15.854 ac-ft
Initial abstraction:	0.68 in	**Losses:**	3.01 in	5.870 ac-ft
Curve Number:	74.68	**Precip excess:**	5.12 in	9.984 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	5.12 in	9.984 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	27.30 minutes	**Total runoff:**	5.12 in	9.984 ac-ft



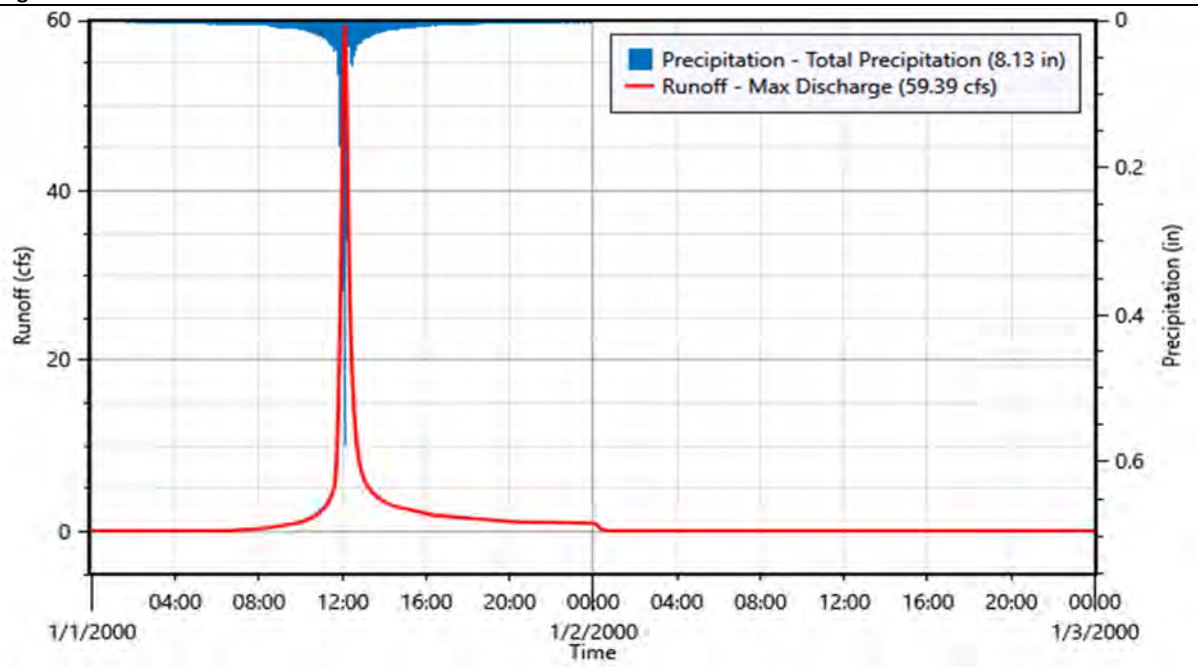
Subbasin ID:	4			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	17.62 cfs	**Time of peak:**	01 Jan 2000, 12:03	
Drainage area:	2.900 acres	**Total rainfall:**	8.13 in	1.965 ac-ft
Initial abstraction:	0.67 in	**Losses:**	2.97 in	0.719 ac-ft
Curve Number:	75.00	**Precip excess:**	5.16 in	1.246 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	5.16 in	1.246 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	10.10 minutes	**Total runoff:**	5.16 in	1.246 ac-ft



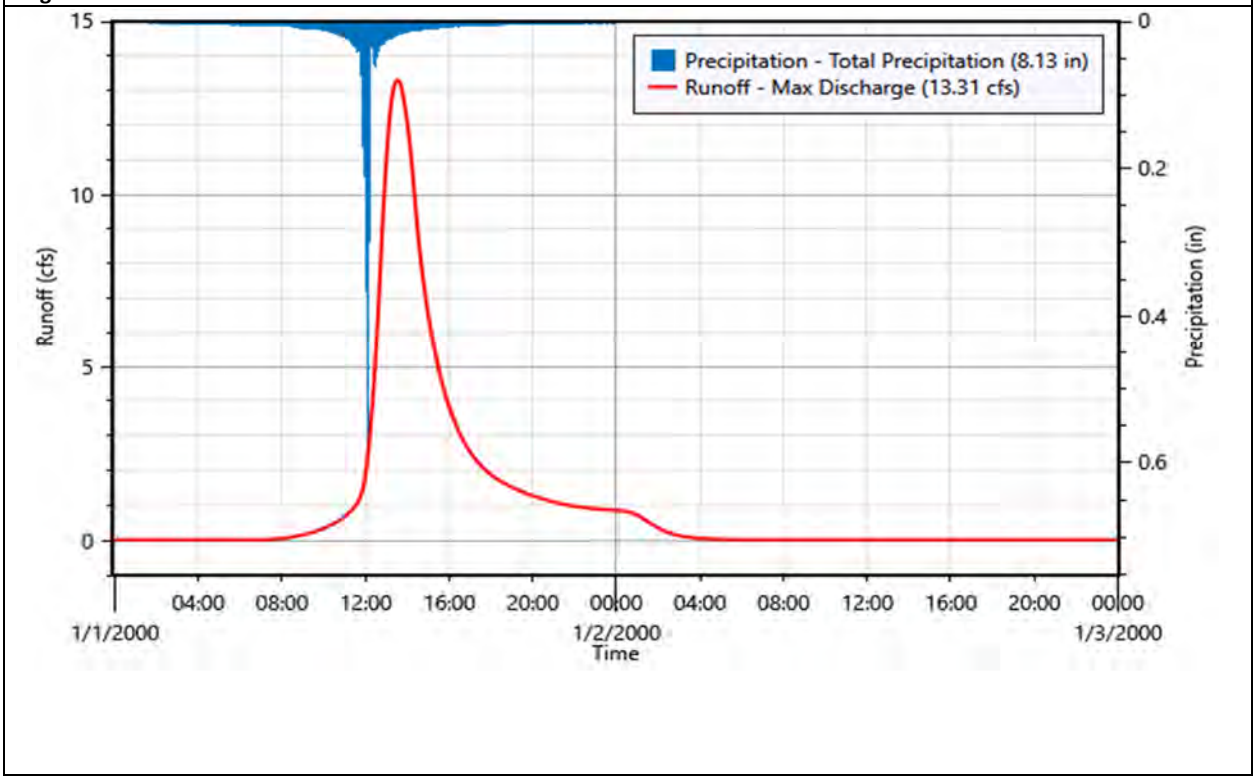
Subbasin ID:	5			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	96.28 cfs	**Time of peak:**	01 Jan 2000, 12:15	
Drainage area:	25.300 acres	**Total rainfall:**	8.13 in	17.141 ac-ft
Initial abstraction:	0.67 in	**Losses:**	2.98 in	6.284 ac-ft
Curve Number:	74.92	**Precip excess:**	5.15 in	10.856 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	5.15 in	10.856 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	24.00 minutes	**Total runoff:**	5.15 in	10.856 ac-ft



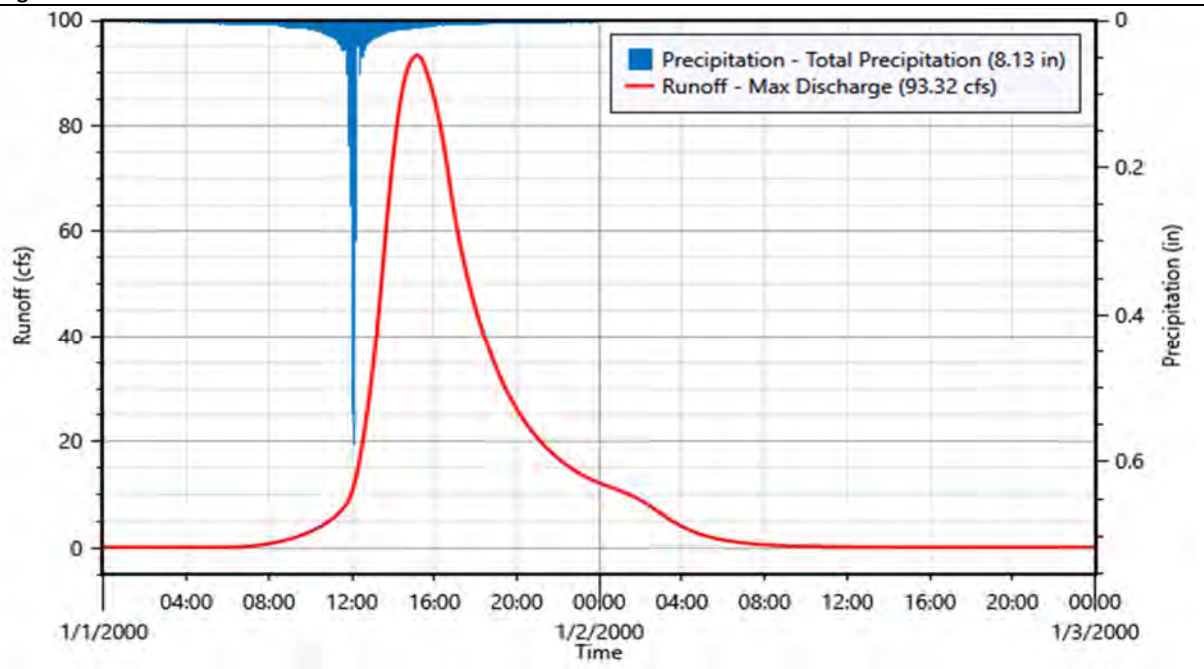
Subbasin ID:	6			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	59.39 cfs	**Time of peak:**	01 Jan 2000, 12:06	
Drainage area:	10.900 acres	**Total rainfall:**	8.13 in	7.385 ac-ft
Initial abstraction:	0.67 in	**Losses:**	2.97 in	2.701 ac-ft
Curve Number:	75.00	**Precip excess:**	5.16 in	4.683 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	5.16 in	4.683 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	12.90 minutes	**Total runoff:**	5.16 in	4.683 ac-ft



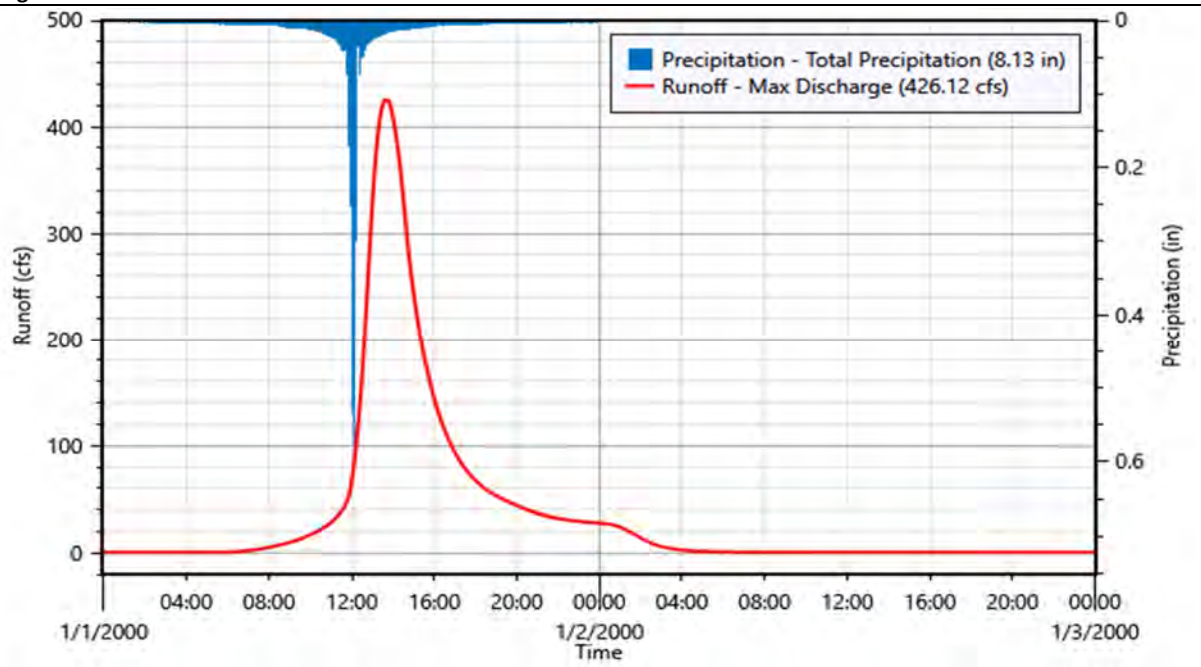
Subbasin ID:	7A			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	13.31 cfs	**Time of peak:**	01 Jan 2000, 01:33	
Drainage area:	9.300 acres	**Total rainfall:**	8.13 in	6.301 ac-ft
Initial abstraction:	0.67 in	**Losses:**	2.97 in	2.305 ac-ft
Curve Number:	75.00	**Precip excess:**	5.16 in	3.996 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	5.16 in	3.996 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	94.60 minutes	**Total runoff:**	5.16 in	3.996 ac-ft



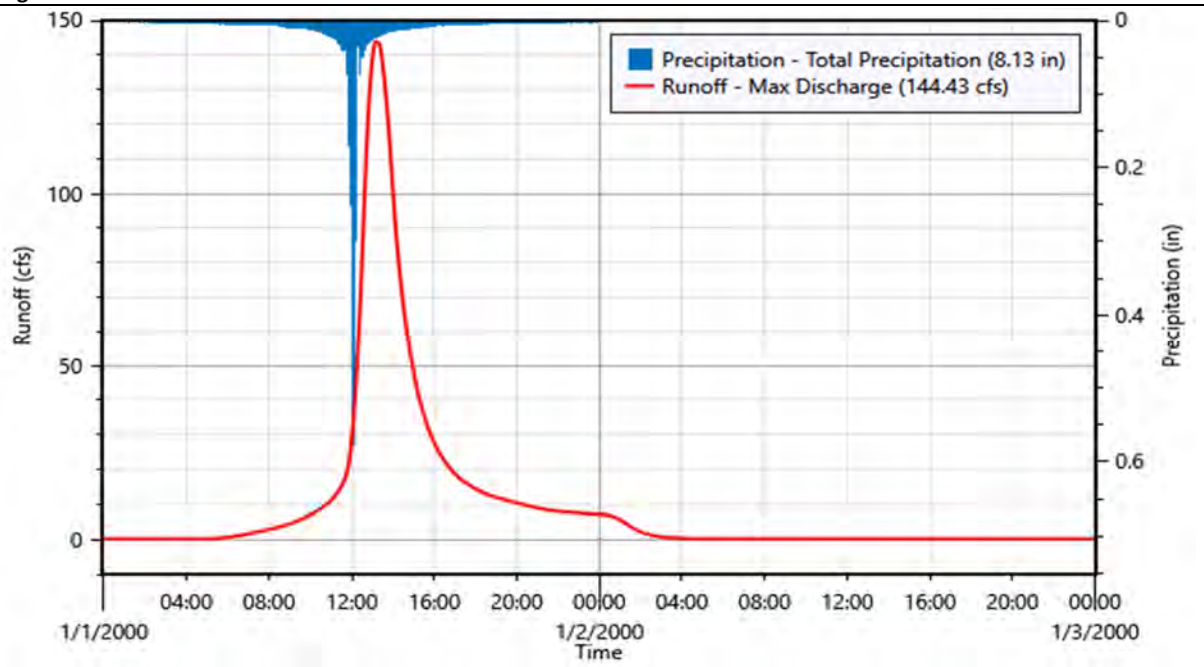
Subbasin ID:	7B			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	93.32 cfs	**Time of peak:**	01 Jan 2000, 03:12	
Drainage area:	96.500 acres	**Total rainfall:**	8.13 in	65.379 ac-ft
Initial abstraction:	0.47 in	**Losses:**	2.26 in	18.156 ac-ft
Curve Number:	81.09	**Precip excess:**	5.87 in	47.223 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	5.87 in	47.223 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	186.50 minutes	**Total runoff:**	5.87 in	47.223 ac-ft



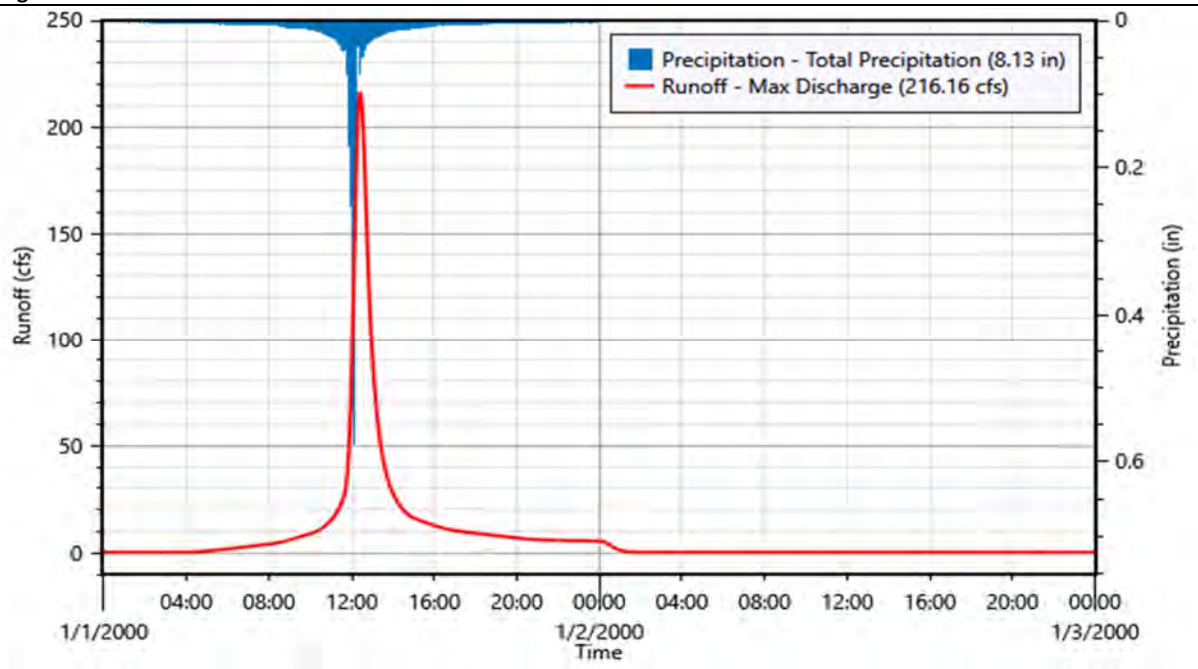
Subbasin ID:	8			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	426.12 cfs	**Time of peak:**	01 Jan 2000, 01:42	
Drainage area:	288.800 acres	**Total rainfall:**	8.13 in	195.662 ac-ft
Initial abstraction:	0.50 in	**Losses:**	2.40 in	57.650 ac-ft
Curve Number:	79.86	**Precip excess:**	5.73 in	138.012 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	5.73 in	138.012 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	104.40 minutes	**Total runoff:**	5.73 in	138.012 ac-ft



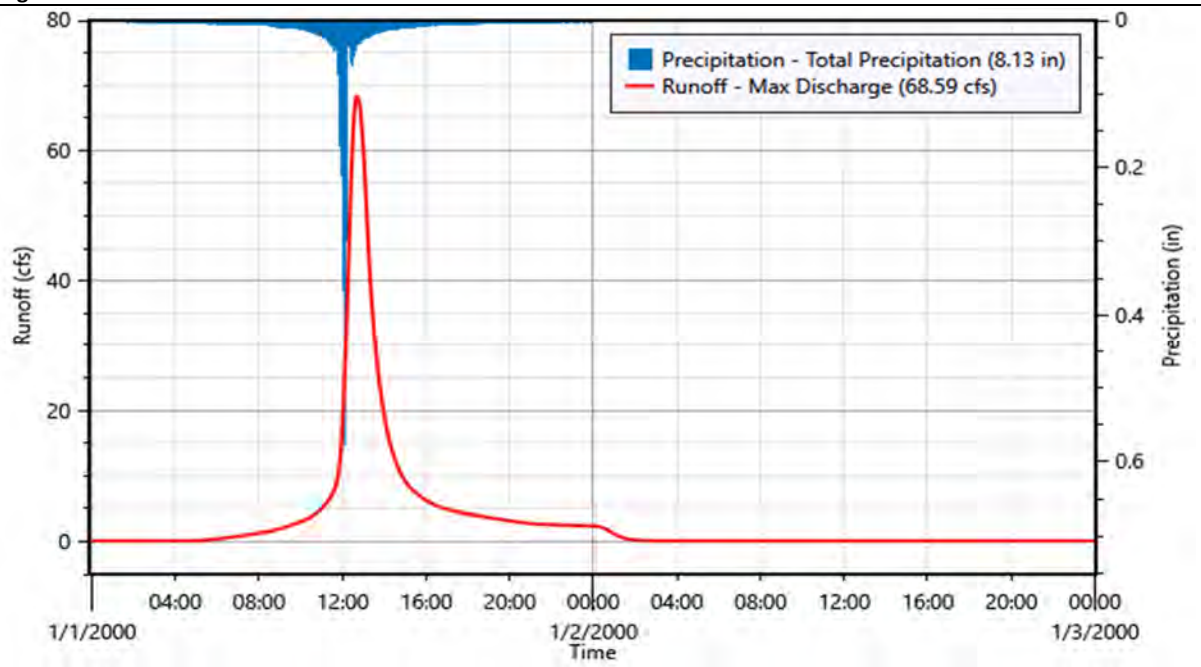
Subbasin ID:	9A			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	144.43 cfs	**Time of peak:**	01 Jan 2000, 01:15	
Drainage area:	75.300 acres	**Total rainfall:**	8.13 in	51.016 ac-ft
Initial abstraction:	0.41 in	**Losses:**	2.03 in	12.719 ac-ft
Curve Number:	83.02	**Precip excess:**	6.10 in	38.297 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	6.10 in	38.297 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	79.60 minutes	**Total runoff:**	6.10 in	38.297 ac-ft



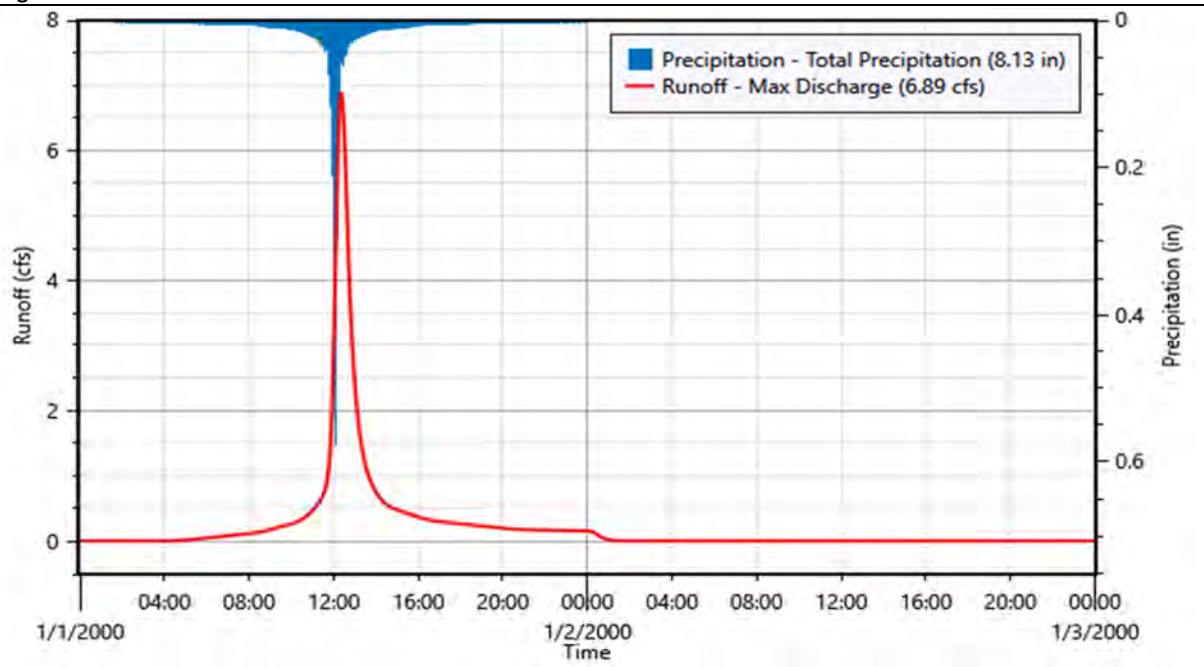
Subbasin ID:	9B			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	216.16 cfs	**Time of peak:**	01 Jan 2000, 12:24	
Drainage area:	57.300 acres	**Total rainfall:**	8.13 in	38.821 ac-ft
Initial abstraction:	0.35 in	**Losses:**	1.79 in	8.557 ac-ft
Curve Number:	84.96	**Precip excess:**	6.34 in	30.263 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	6.34 in	30.263 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	32.50 minutes	**Total runoff:**	6.34 in	30.263 ac-ft



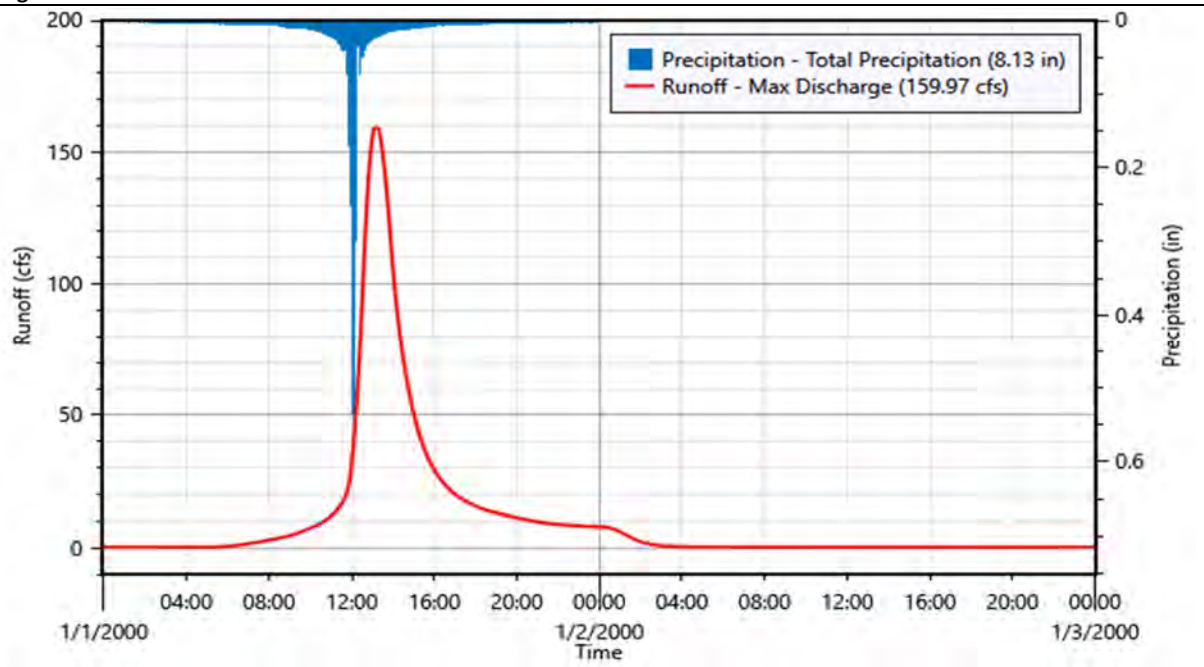
Subbasin ID:	10.1			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	68.59 cfs	**Time of peak:**	01 Jan 2000, 12:42	
Drainage area:	25.200 acres	**Total rainfall:**	8.13 in	17.073 ac-ft
Initial abstraction:	0.41 in	**Losses:**	2.04 in	4.287 ac-ft
Curve Number:	82.86	**Precip excess:**	6.09 in	12.786 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	6.09 in	12.786 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	49.30 minutes	**Total runoff:**	6.09 in	12.786 ac-ft



Subbasin ID:	10.1F			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	6.89 cfs	**Time of peak:**	01 Jan 2000, 12:21	
Drainage area:	1.700 acres	**Total rainfall:**	8.13 in	1.152 ac-ft
Initial abstraction:	0.36 in	**Losses:**	1.81 in	0.257 ac-ft
Curve Number:	84.82	**Precip excess:**	6.32 in	0.895 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	6.32 in	0.895 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	29.10 minutes	**Total runoff:**	6.32 in	0.895 ac-ft



Subbasin ID:	10.2			
Scenario:	**100yr Existing**		**Depth**	**Volume**
Peak discharge:	159.97 cfs	**Time of peak:**	01 Jan 2000, 01:12	
Drainage area:	83.100 acres	**Total rainfall:**	8.13 in	56.300 ac-ft
Initial abstraction:	0.44 in	**Losses:**	2.15 in	14.885 ac-ft
Curve Number:	81.98	**Precip excess:**	5.98 in	41.415 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	5.98 in	41.415 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	77.30 minutes	**Total runoff:**	5.98 in	41.415 ac-ft



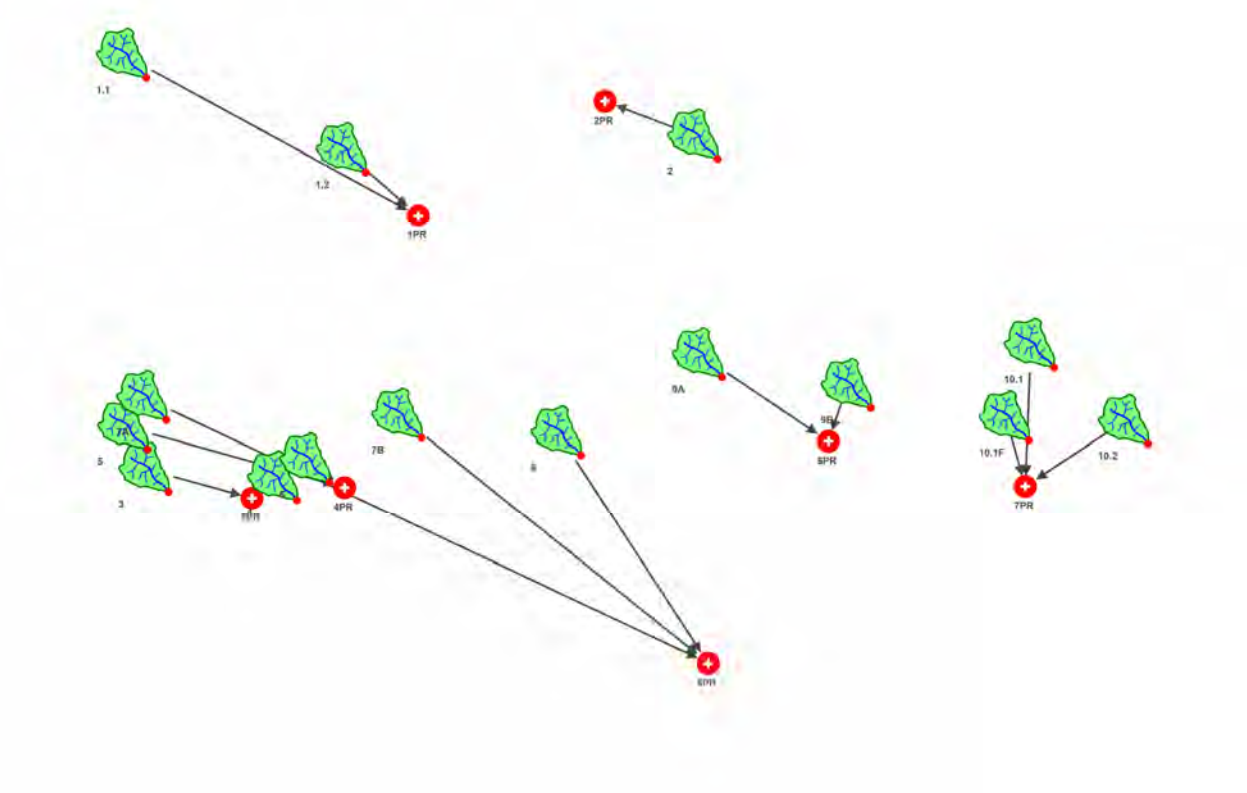
Nodes

Element ID	Element Type	Outflow Volume (ac-ft)
1ER	Junction	178.6
2ER	Junction	26.9
3ER	Junction	11.2
4ER	Junction	15.5
5ER	Junction	189.2
6ER	Junction	68.6
7ER	Junction	55.1

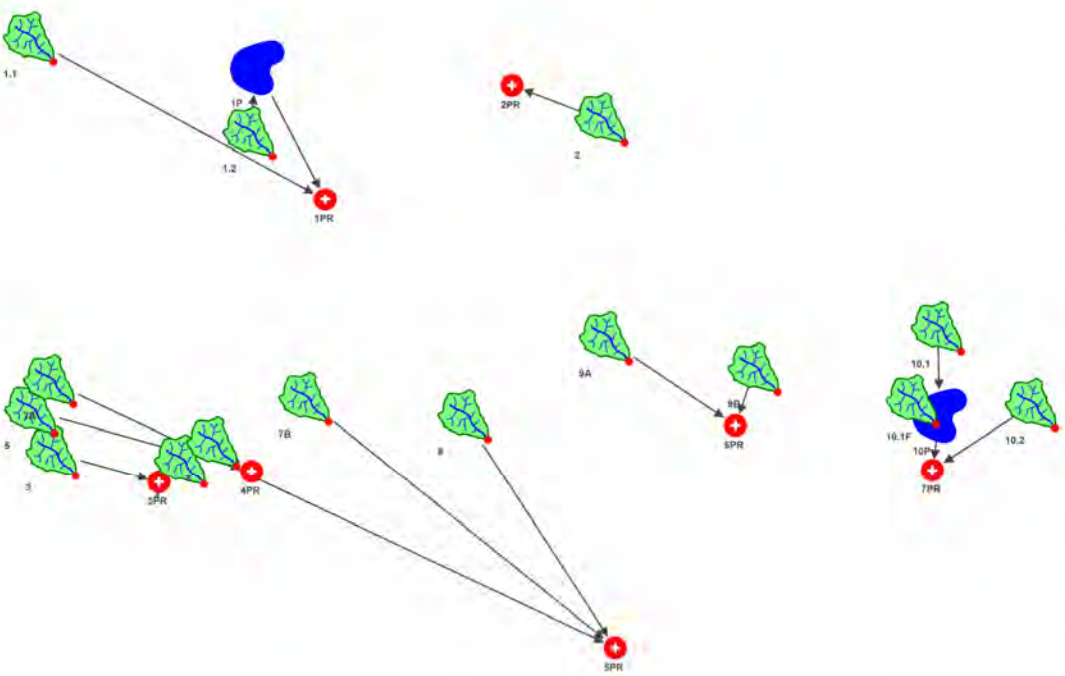
Appendix D

Proposed HEC-HMS Results

Watershed Routing Diagram - Unattenuated



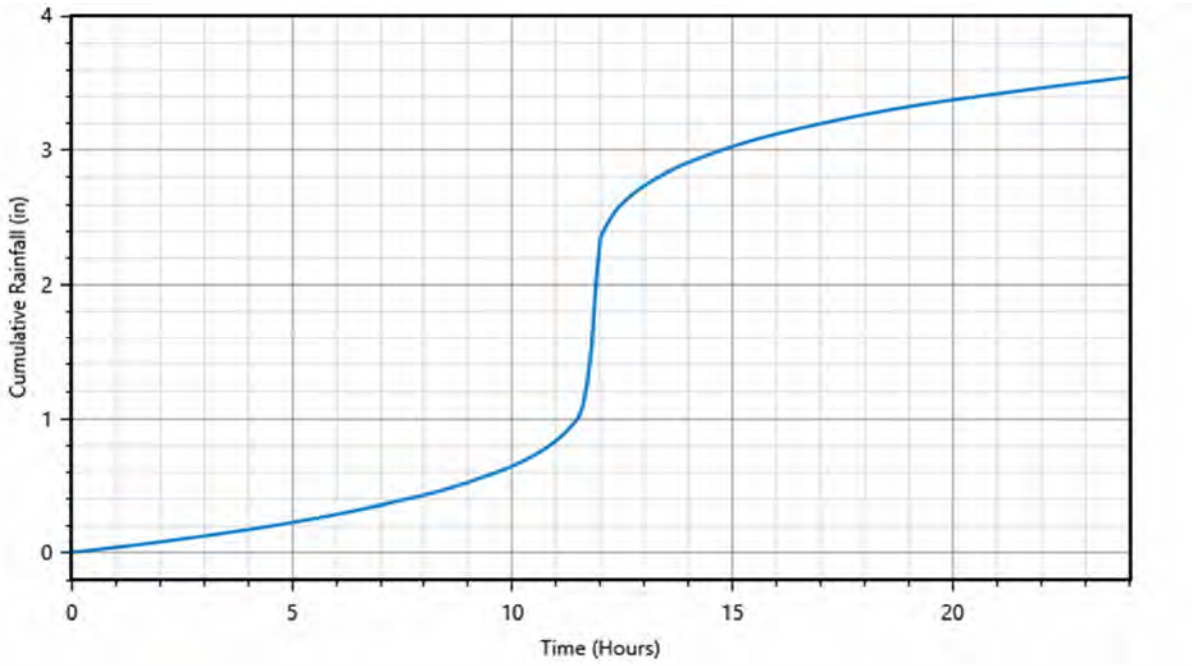
Watershed Routing Diagram - Attenuated



2yr Proposed

Design Storm

Precipitation type: SCS Storm
SCS storm distribution: Type II
Rainfall depth: 3.54 in

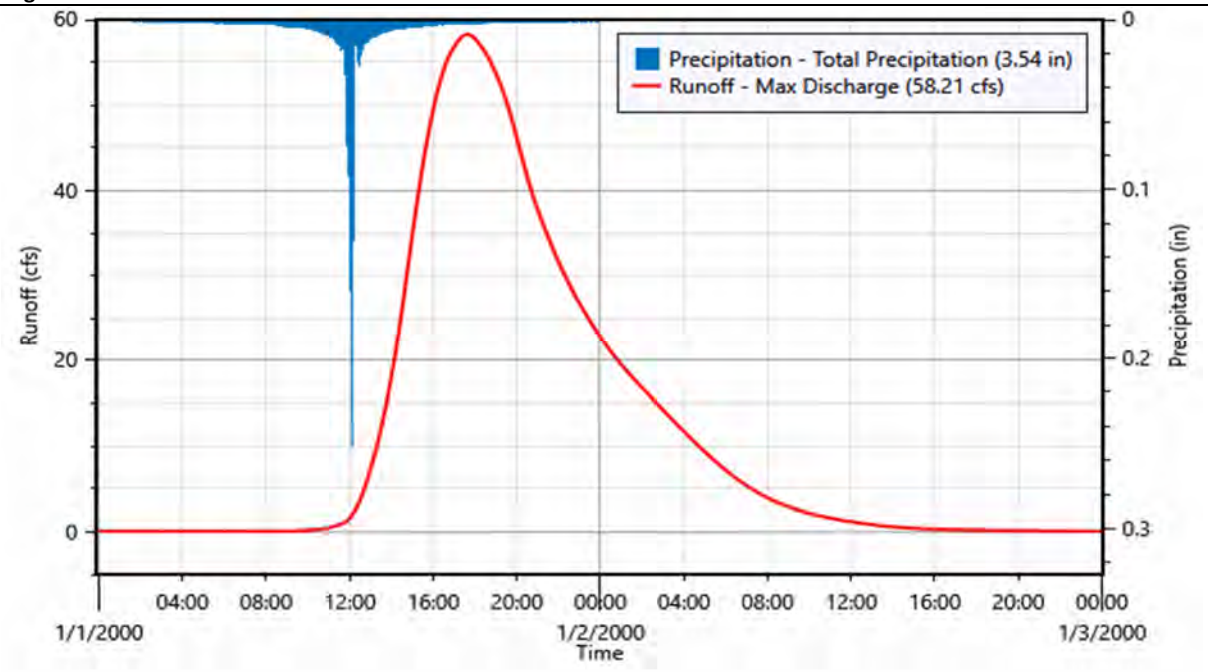


Watershed Summary

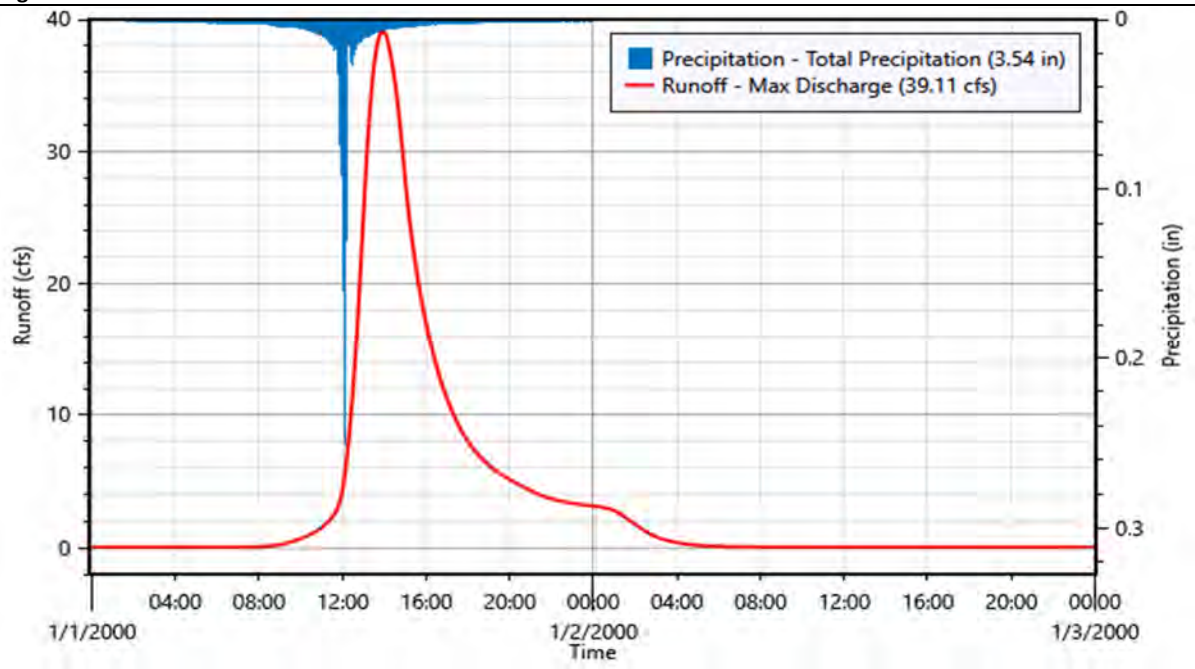
Subbasin ID	Drainage Area (acres)	Initial Abstraction (in)	Curve Number	Impervious Surface (%)	Lag Time (minutes)	Peak Discharge (cfs)
1.1	268.700	0.37	84.34	0.00	313.50	58.21
1.2	77.900	0.33	85.73	0.00	115.60	39.11
2	53.700	0.47	80.93	0.00	24.20	67.93
3	23.400	0.85	70.20	0.00	30.90	13.66
4	2.900	1.28	61.00	0.00	14.70	1.23
5	25.300	1.02	66.23	0.00	30.50	11.01
6	10.900	1.16	63.26	0.00	17.80	5.21
7A	9.300	0.95	67.86	0.00	69.00	2.55
7B	96.500	0.52	79.43	0.00	108.90	38.02
8	288.800	0.58	77.38	0.00	112.60	100.25
9A	75.300	0.45	81.53	0.00	83.60	40.26
9B	57.300	0.32	86.39	0.00	30.90	77.68
10.1	25.200	0.40	83.26	0.00	48.70	21.78
10.1F	1.700	0.36	84.82	0.00	29.10	2.25
10.2	83.100	0.43	82.32	0.00	76.50	49.20

Subbasins

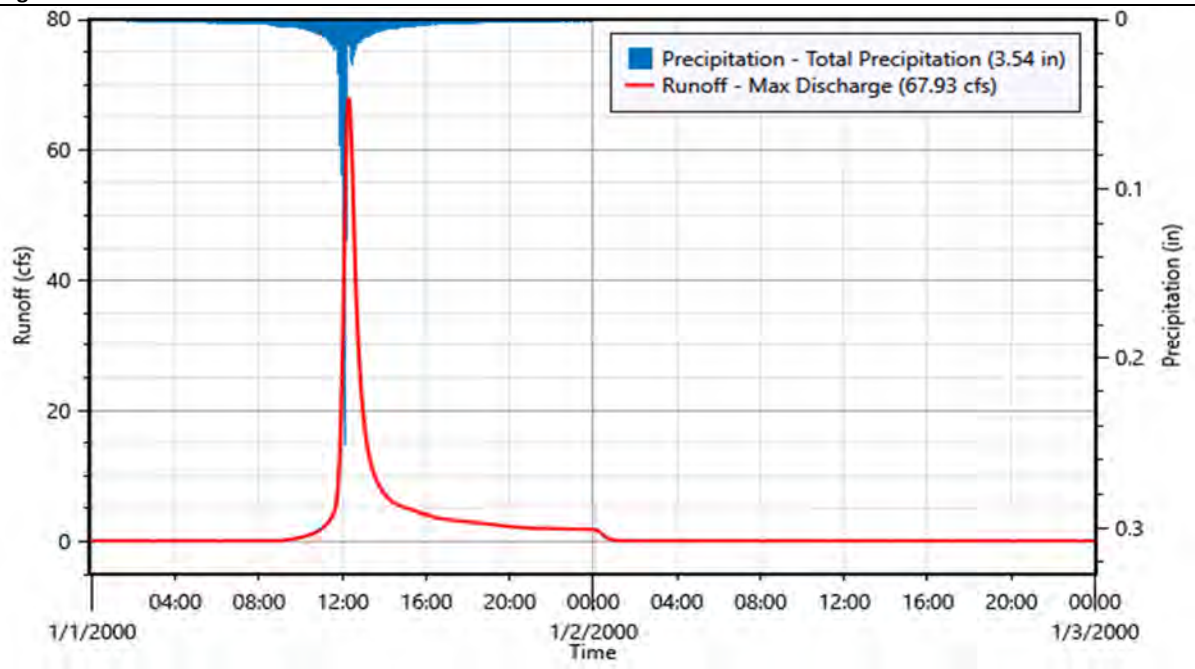
Subbasin ID:	1.1			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	58.21 cfs	**Time of peak:**	01 Jan 2000, 05:39	
Drainage area:	268.700 acres	**Total rainfall:**	3.54 in	79.267 ac-ft
Initial abstraction:	0.37 in	**Losses:**	1.54 in	34.504 ac-ft
Curve Number:	84.34	**Precip excess:**	2.00 in	44.763 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.00 in	44.762 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	313.50 minutes	**Total runoff:**	2.00 in	44.762 ac-ft



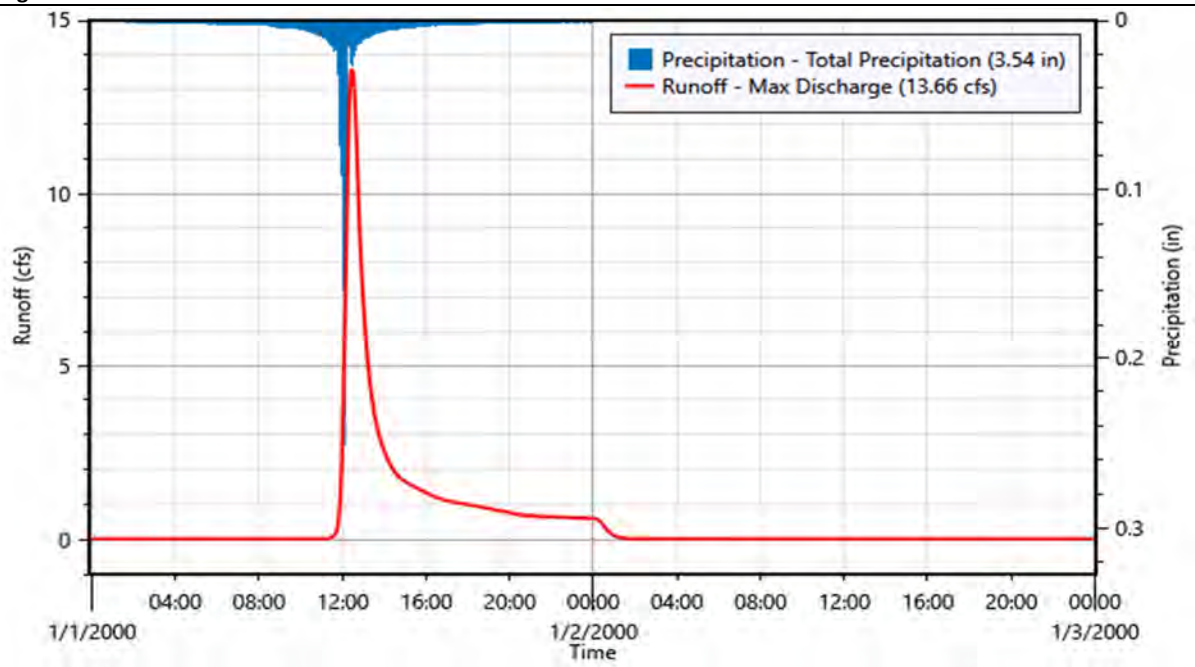
Subbasin ID:	1.2			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	39.11 cfs	**Time of peak:**	01 Jan 2000, 01:57	
Drainage area:	77.900 acres	**Total rainfall:**	3.54 in	22.981 ac-ft
Initial abstraction:	0.33 in	**Losses:**	1.43 in	9.258 ac-ft
Curve Number:	85.73	**Precip excess:**	2.11 in	13.723 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.11 in	13.723 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	115.60 minutes	**Total runoff:**	2.11 in	13.723 ac-ft



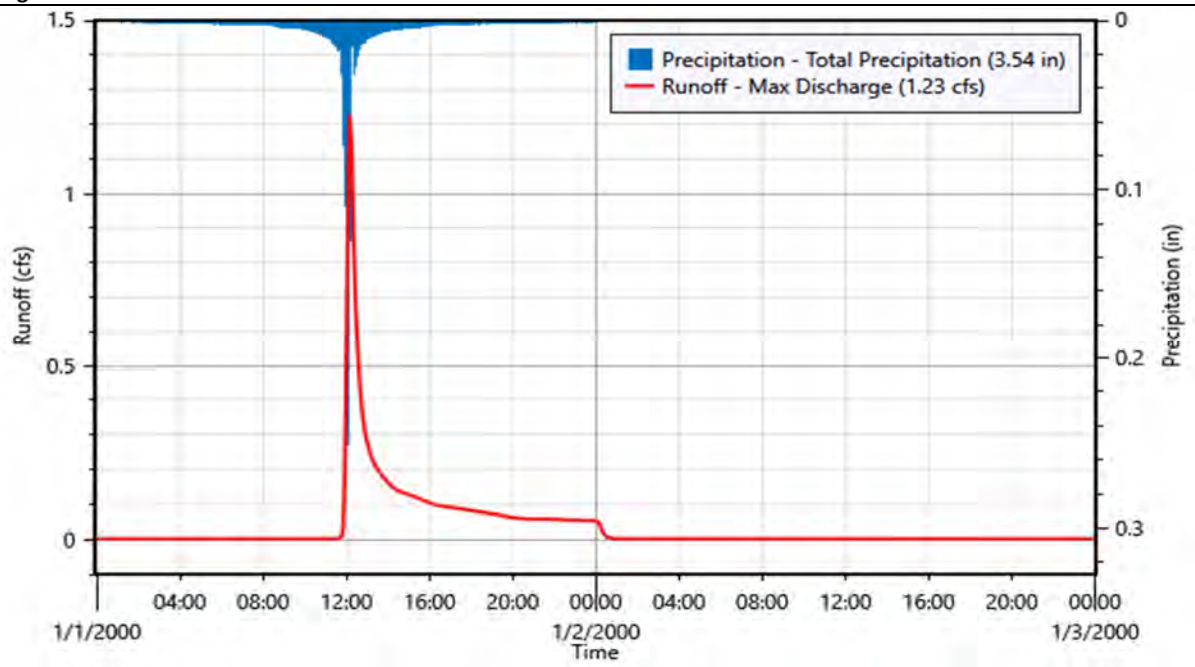
Subbasin ID:	2			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	67.93 cfs	**Time of peak:**	01 Jan 2000, 12:18	
Drainage area:	53.700 acres	**Total rainfall:**	3.54 in	15.841 ac-ft
Initial abstraction:	0.47 in	**Losses:**	1.80 in	8.069 ac-ft
Curve Number:	80.93	**Precip excess:**	1.74 in	7.772 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.74 in	7.772 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	24.20 minutes	**Total runoff:**	1.74 in	7.772 ac-ft



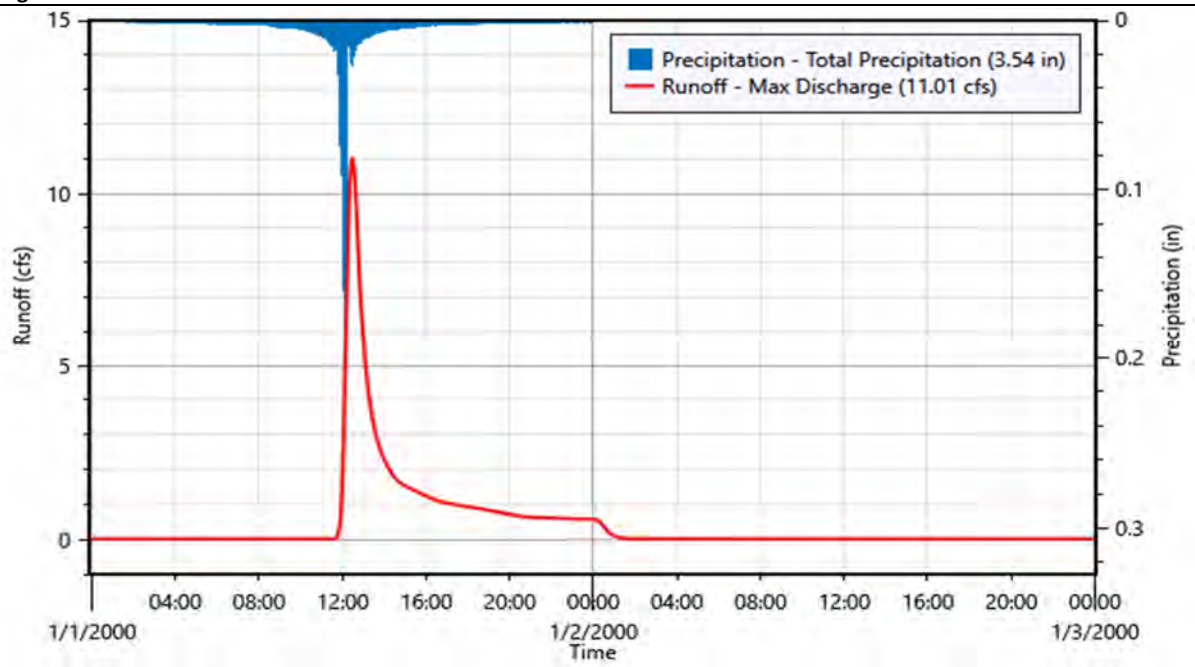
Subbasin ID:	3			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	13.66 cfs	**Time of peak:**	01 Jan 2000, 12:27	
Drainage area:	23.400 acres	**Total rainfall:**	3.54 in	6.903 ac-ft
Initial abstraction:	0.85 in	**Losses:**	2.50 in	4.868 ac-ft
Curve Number:	70.20	**Precip excess:**	1.04 in	2.035 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.04 in	2.035 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	30.90 minutes	**Total runoff:**	1.04 in	2.035 ac-ft



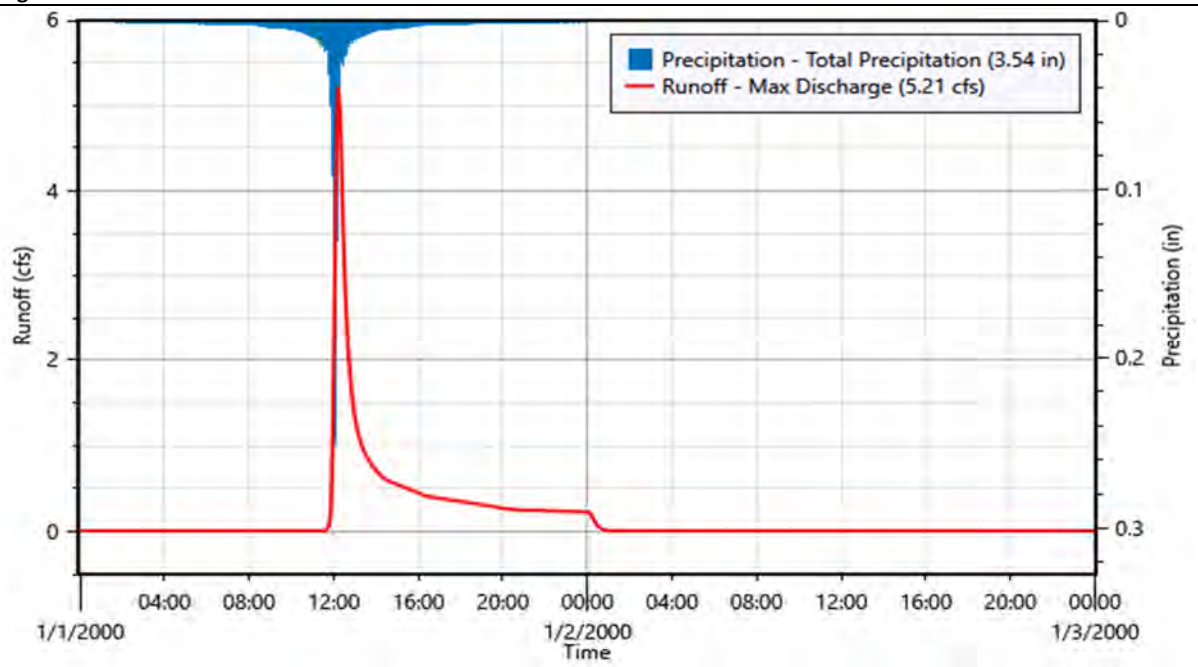
Subbasin ID:	4			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	1.23 cfs	**Time of peak:**	01 Jan 2000, 12:12	
Drainage area:	2.900 acres	**Total rainfall:**	3.54 in	0.855 ac-ft
Initial abstraction:	1.28 in	**Losses:**	2.95 in	0.713 ac-ft
Curve Number:	61.00	**Precip excess:**	0.59 in	0.143 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	0.59 in	0.143 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	14.70 minutes	**Total runoff:**	0.59 in	0.143 ac-ft



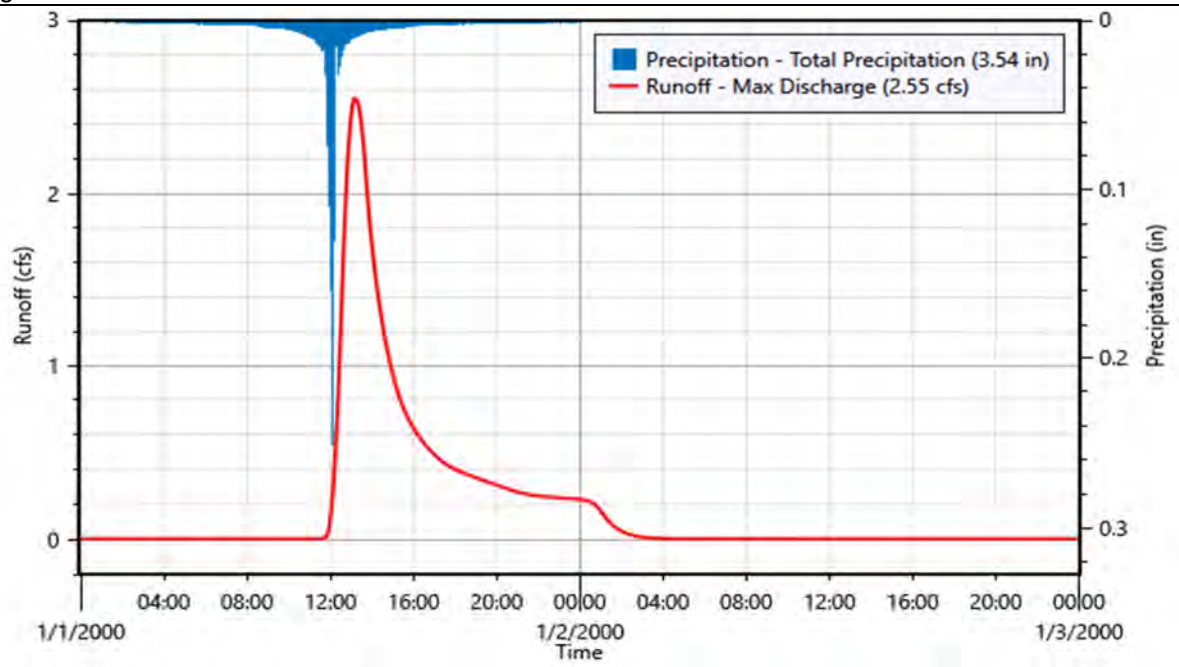
Subbasin ID:	5			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	11.01 cfs	**Time of peak:**	01 Jan 2000, 12:27	
Drainage area:	25.300 acres	**Total rainfall:**	3.54 in	7.463 ac-ft
Initial abstraction:	1.02 in	**Losses:**	2.71 in	5.706 ac-ft
Curve Number:	66.23	**Precip excess:**	0.83 in	1.757 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	0.83 in	1.757 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	30.50 minutes	**Total runoff:**	0.83 in	1.757 ac-ft



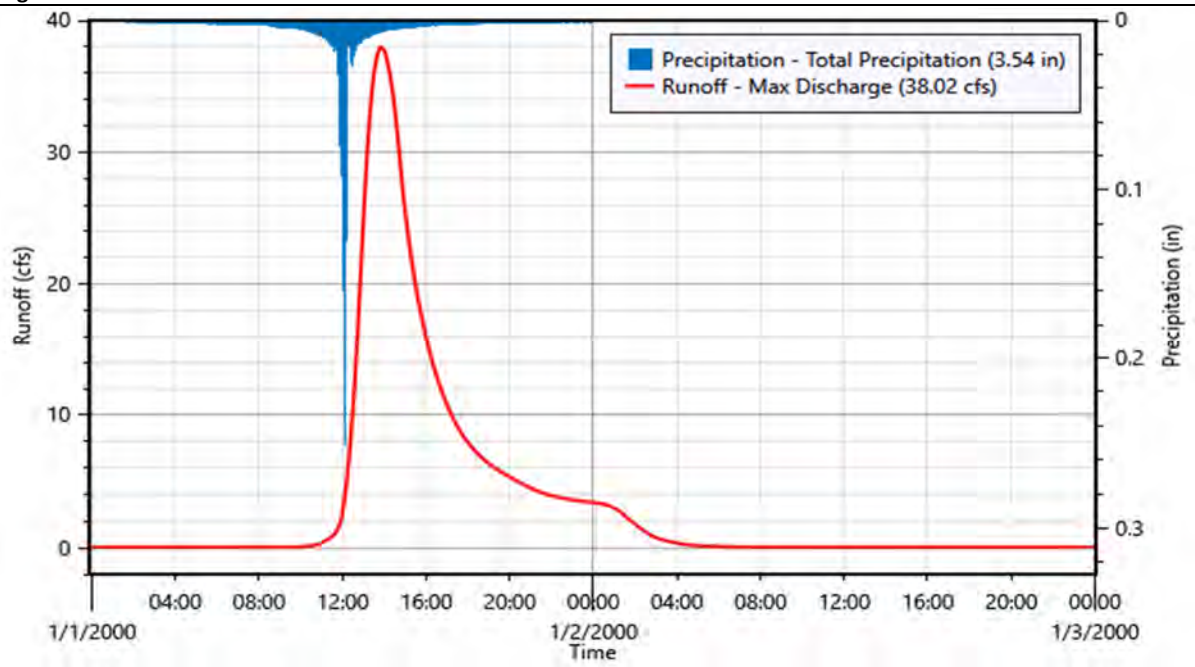
Subbasin ID:	6			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	5.21 cfs	**Time of peak:**	01 Jan 2000, 12:12	
Drainage area:	10.900 acres	**Total rainfall:**	3.54 in	3.215 ac-ft
Initial abstraction:	1.16 in	**Losses:**	2.85 in	2.587 ac-ft
Curve Number:	63.26	**Precip excess:**	0.69 in	0.628 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	0.69 in	0.628 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	17.80 minutes	**Total runoff:**	0.69 in	0.628 ac-ft



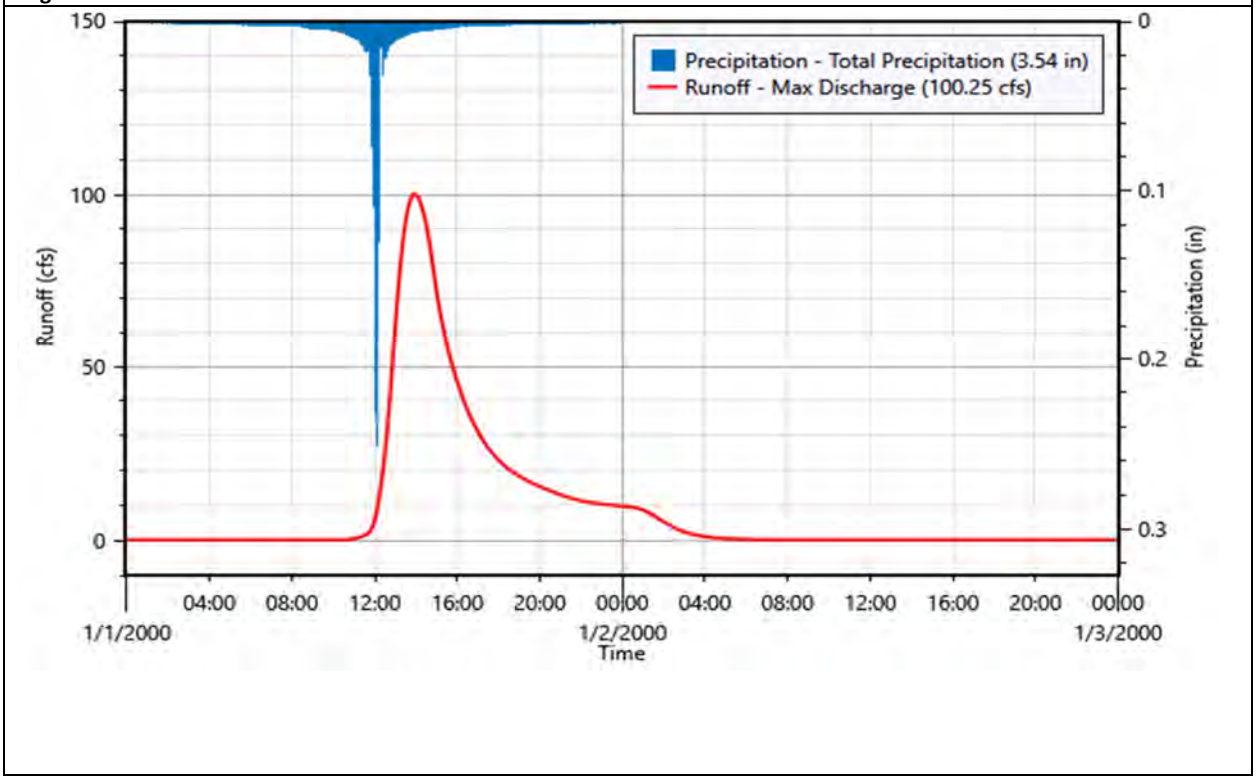
Subbasin ID:	7A			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	2.55 cfs	**Time of peak:**	01 Jan 2000, 01:12	
Drainage area:	9.300 acres	**Total rainfall:**	3.54 in	2.743 ac-ft
Initial abstraction:	0.95 in	**Losses:**	2.62 in	2.034 ac-ft
Curve Number:	67.86	**Precip excess:**	0.92 in	0.710 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	0.92 in	0.710 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	69.00 minutes	**Total runoff:**	0.92 in	0.710 ac-ft



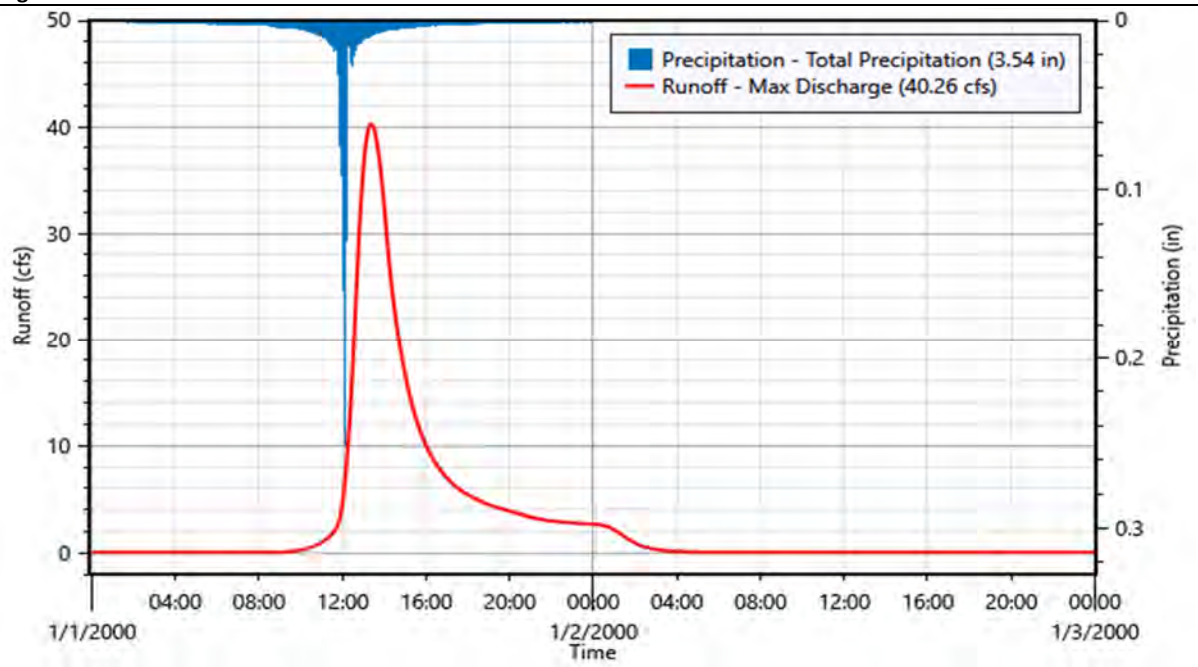
Subbasin ID:	7B			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	38.02 cfs	**Time of peak:**	01 Jan 2000, 01:51	
Drainage area:	96.500 acres	**Total rainfall:**	3.54 in	28.467 ac-ft
Initial abstraction:	0.52 in	**Losses:**	1.91 in	15.393 ac-ft
Curve Number:	79.43	**Precip excess:**	1.63 in	13.074 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.63 in	13.074 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	108.90 minutes	**Total runoff:**	1.63 in	13.074 ac-ft



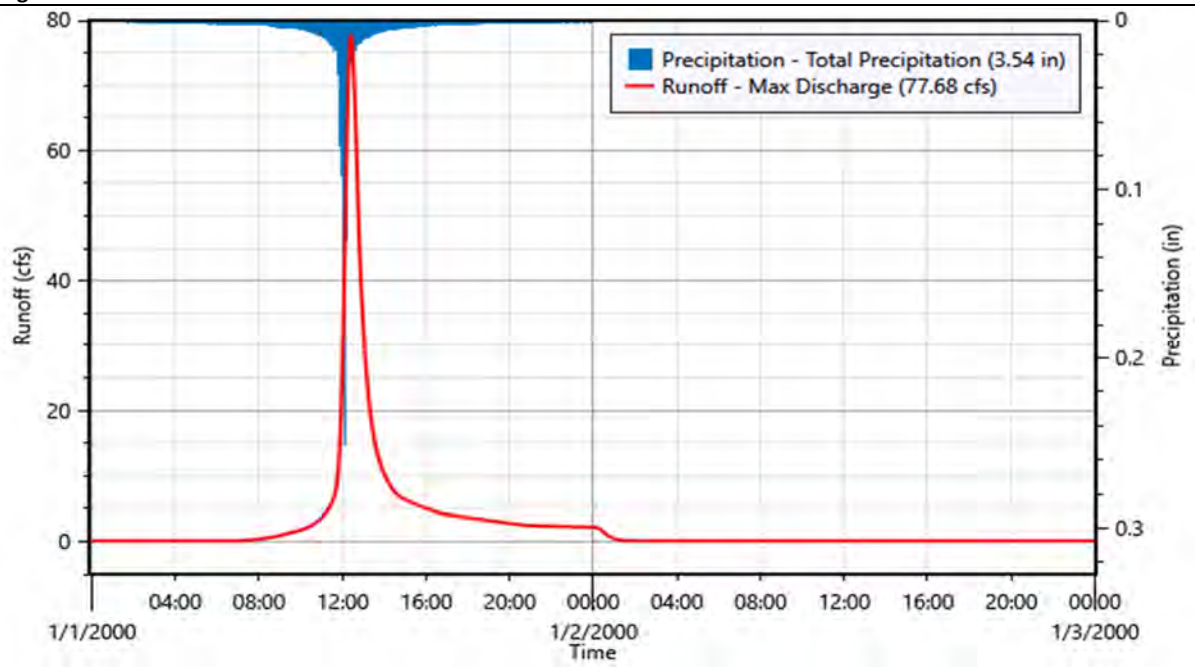
Subbasin ID:	8			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	100.25 cfs	**Time of peak:**	01 Jan 2000, 01:57	
Drainage area:	288.800 acres	**Total rainfall:**	3.54 in	85.196 ac-ft
Initial abstraction:	0.58 in	**Losses:**	2.05 in	49.355 ac-ft
Curve Number:	77.38	**Precip excess:**	1.49 in	35.841 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.49 in	35.841 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	112.60 minutes	**Total runoff:**	1.49 in	35.841 ac-ft



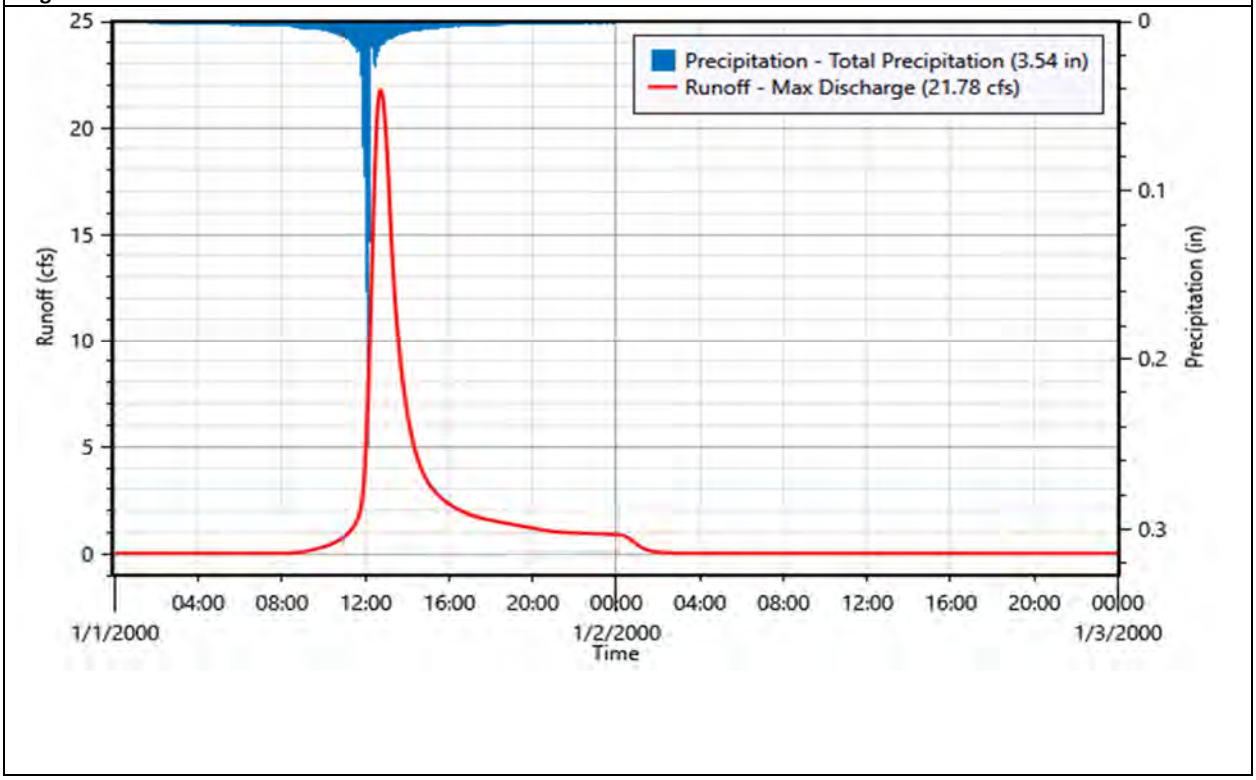
Subbasin ID:	9A			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	40.26 cfs	**Time of peak:**	01 Jan 2000, 01:21	
Drainage area:	75.300 acres	**Total rainfall:**	3.54 in	22.213 ac-ft
Initial abstraction:	0.45 in	**Losses:**	1.76 in	11.026 ac-ft
Curve Number:	81.53	**Precip excess:**	1.78 in	11.188 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.78 in	11.188 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	83.60 minutes	**Total runoff:**	1.78 in	11.188 ac-ft



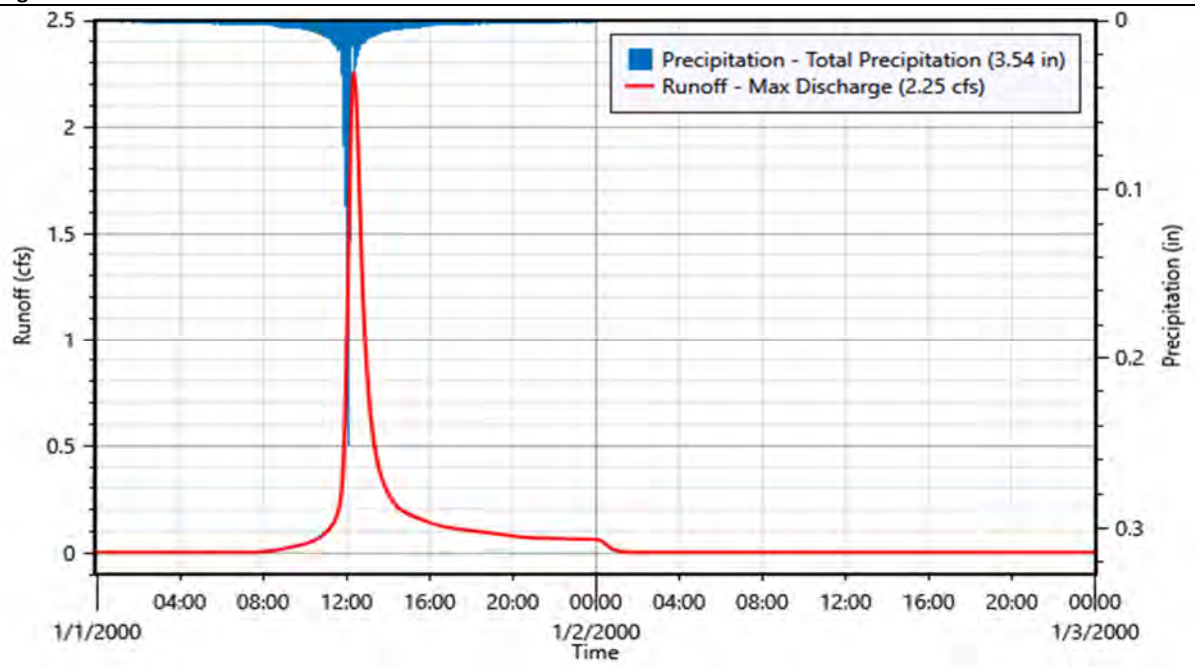
Subbasin ID:	9B			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	77.68 cfs	**Time of peak:**	01 Jan 2000, 12:24	
Drainage area:	57.300 acres	**Total rainfall:**	3.54 in	16.903 ac-ft
Initial abstraction:	0.32 in	**Losses:**	1.38 in	6.579 ac-ft
Curve Number:	86.39	**Precip excess:**	2.16 in	10.324 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.16 in	10.324 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	30.90 minutes	**Total runoff:**	2.16 in	10.324 ac-ft



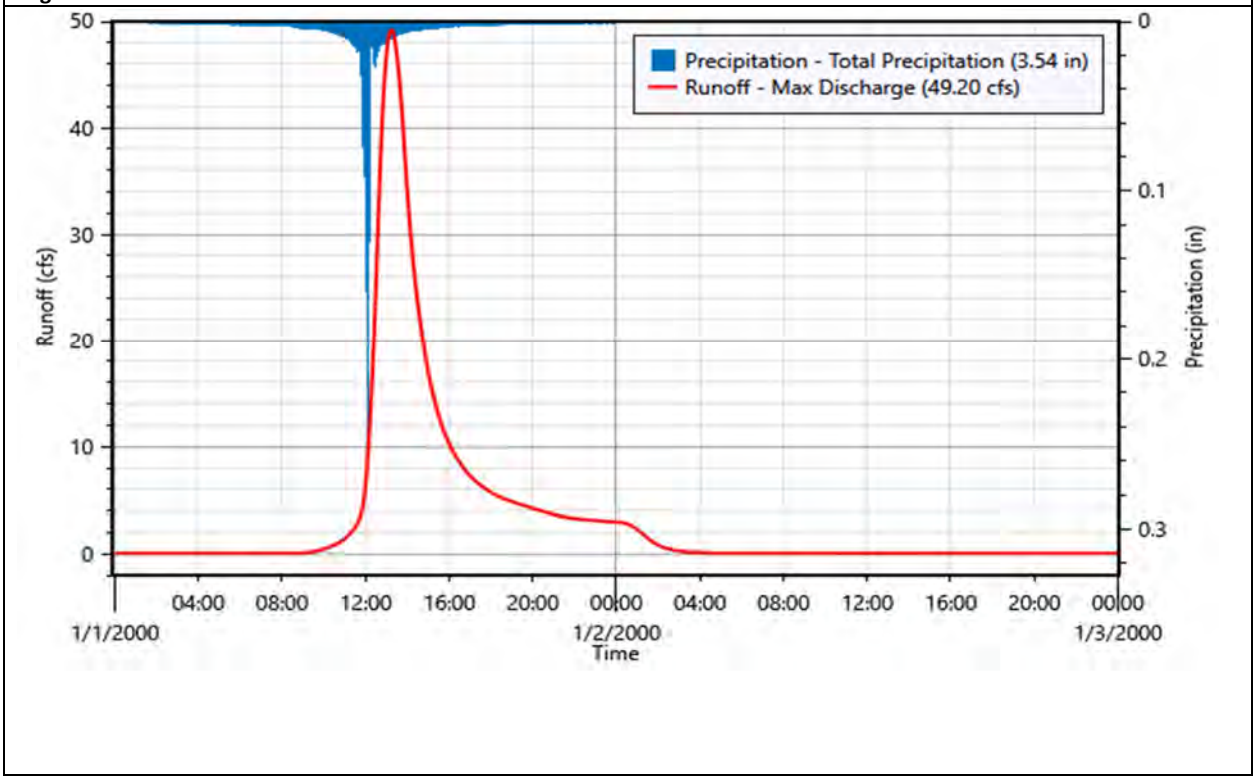
Subbasin ID:	10.1			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	21.78 cfs	**Time of peak:**	01 Jan 2000, 12:42	
Drainage area:	25.200 acres	**Total rainfall:**	3.54 in	7.434 ac-ft
Initial abstraction:	0.40 in	**Losses:**	1.63 in	3.414 ac-ft
Curve Number:	83.26	**Precip excess:**	1.91 in	4.020 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.91 in	4.020 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	48.70 minutes	**Total runoff:**	1.91 in	4.020 ac-ft



Subbasin ID:	10.1F			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	2.25 cfs	**Time of peak:**	01 Jan 2000, 12:21	
Drainage area:	1.700 acres	**Total rainfall:**	3.54 in	0.501 ac-ft
Initial abstraction:	0.36 in	**Losses:**	1.51 in	0.213 ac-ft
Curve Number:	84.82	**Precip excess:**	2.03 in	0.288 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.03 in	0.288 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	29.10 minutes	**Total runoff:**	2.03 in	0.288 ac-ft



Subbasin ID:	10.2			
Scenario:	**2yr Proposed**		**Depth**	**Volume**
Peak discharge:	49.20 cfs	**Time of peak:**	01 Jan 2000, 01:15	
Drainage area:	83.100 acres	**Total rainfall:**	3.54 in	24.515 ac-ft
Initial abstraction:	0.43 in	**Losses:**	1.70 in	11.775 ac-ft
Curve Number:	82.32	**Precip excess:**	1.84 in	12.739 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.84 in	12.739 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	76.50 minutes	**Total runoff:**	1.84 in	12.739 ac-ft



Nodes - Unattenuated

Element ID	Element Type	Outflow Volume (ac-ft)
1PR	Junction	58.5
2PR	Junction	7.8
3PR	Junction	2.2
4PR	Junction	2.4
5PR	Junction	49.6
6PR	Junction	21.5
7PR	Junction	17.0

Nodes - Attenuated

Element ID	Element Type	Outflow Volume (ac-ft)
1PR	Junction	51.9
7PR	Junction	16.1

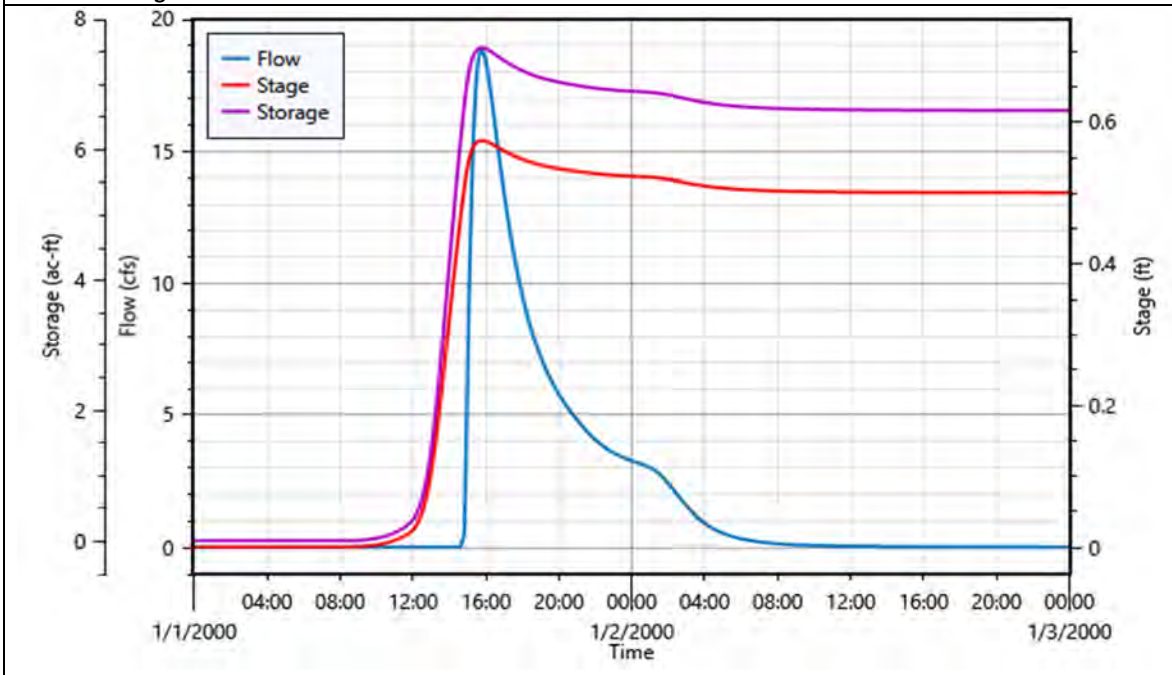
Storage Area Summary

Storage Area ID	Maximum Inflow (cfs)	Maximum Outflow (cfs)	Maximum Pool Elevation (ft)	Minimum Pool Elevation (ft)	Maximum Stage (ft)
1P	39.11	18.82	829.57	829.00	0.57
10P	23.25	12.78	828.00	827.00	1.00

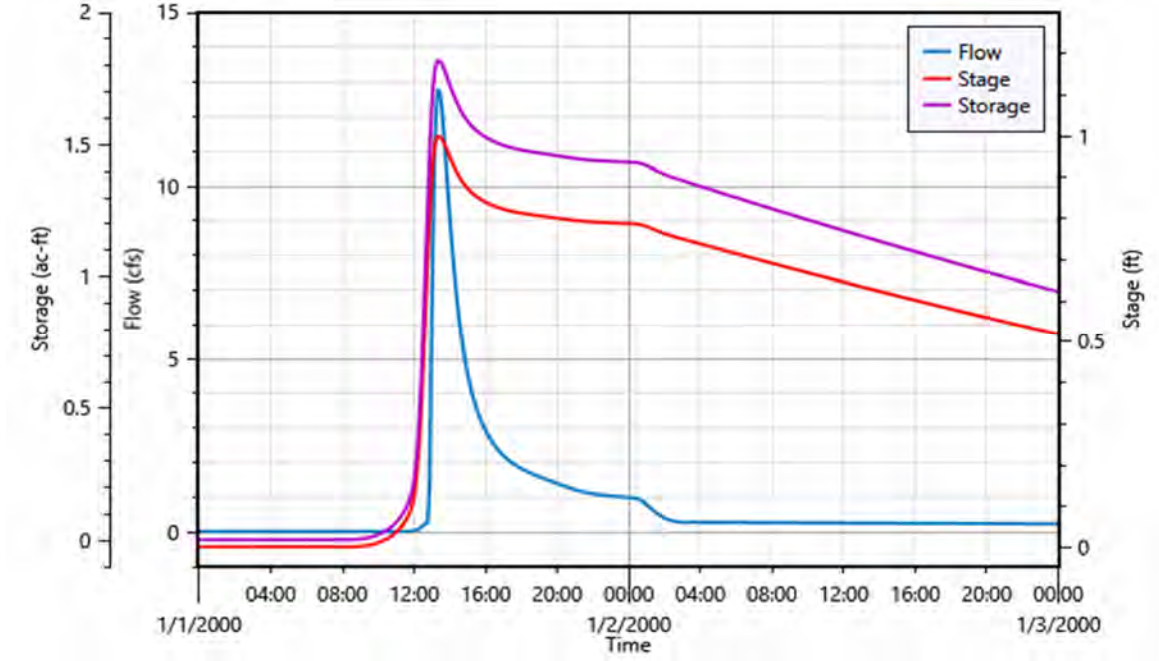
Storage Areas

These are the storage areas that are defined:

Storage Area ID:	**1P**		
Scenario:	**2yr Proposed**		
Maximum storage:	7.552 ac-ft		
Maximum pool elevation:	829.57 ft	**Maximum Volume**	**Time of Peak**
Maximum inflow:	39.11 cfs	13.723 ac-ft	01Jan2000, 13:57
Maximum outflow:	18.82 cfs	7.132 ac-ft	01Jan2000, 15:45
Minimum pool elevation:	829.00 ft		
Maximum stage:	0.57 ft		



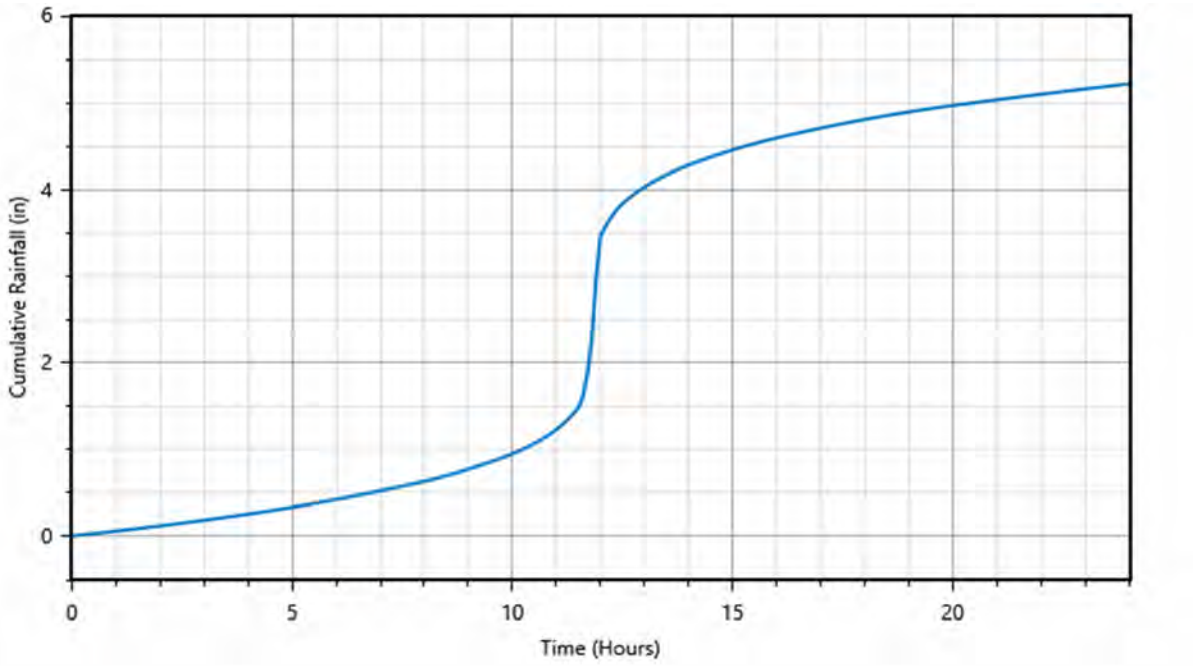
Storage Area ID:	**10P**		
Scenario:	**2yr Proposed**		
Maximum storage:	1.819 ac-ft		
Maximum pool elevation:	828.00 ft	**Maximum Volume**	**Time of Peak**
Maximum inflow:	23.25 cfs	4.308 ac-ft	01Jan2000, 12:42
Maximum outflow:	12.78 cfs	3.367 ac-ft	01Jan2000, 13:21
Minimum pool elevation:	827.00 ft		
Maximum stage:	1.00 ft		



10yr Proposed

Design Storm

Precipitation type: SCS Storm
SCS storm distribution: Type II
Rainfall depth: 5.21 in

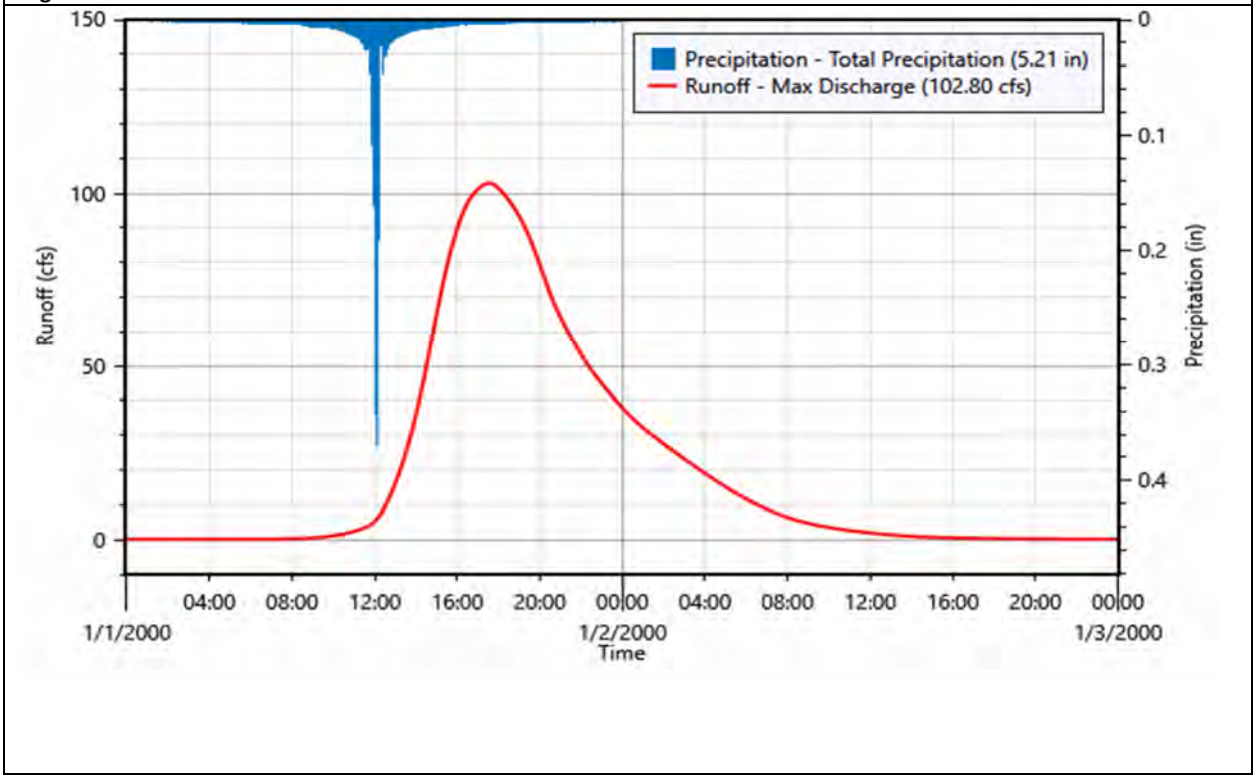


Watershed Summary

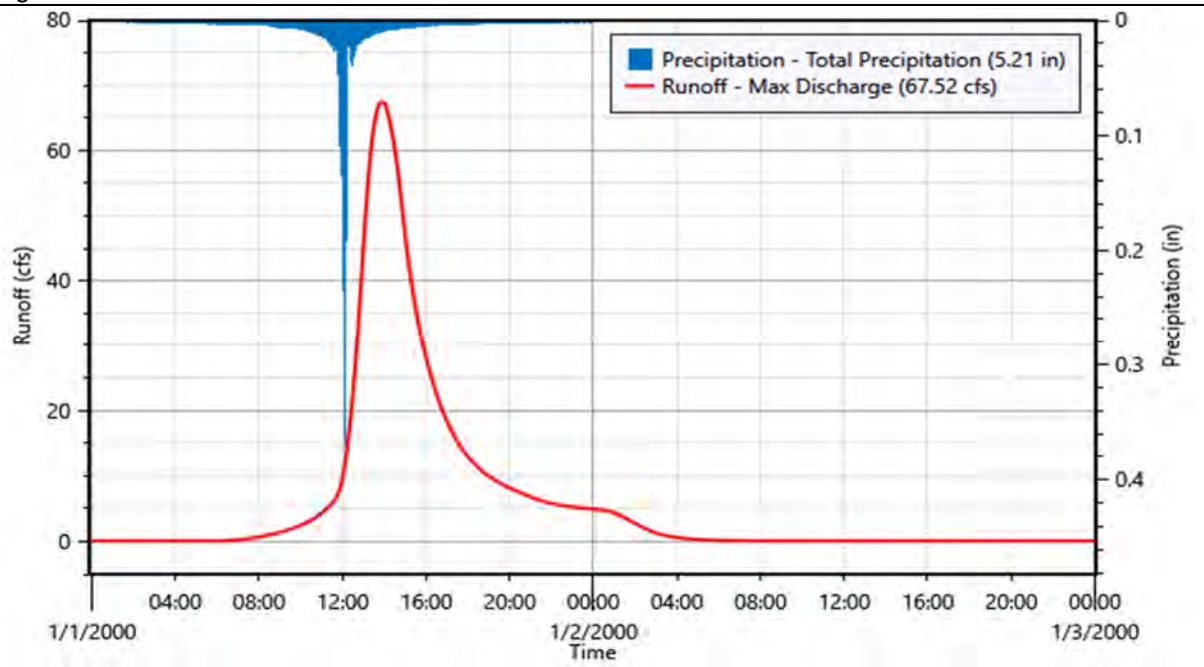
Subbasin ID	Drainage Area (acres)	Initial Abstraction (in)	Curve Number	Impervious Surface (%)	Lag Time (minutes)	Peak Discharge (cfs)
1.1	268.700	0.37	84.34	0.00	313.50	102.80
1.2	77.900	0.33	85.73	0.00	115.60	67.52
2	53.700	0.47	80.93	0.00	24.20	124.84
3	23.400	0.85	70.20	0.00	30.90	31.38
4	2.900	1.28	61.00	0.00	14.70	3.94
5	25.300	1.02	66.23	0.00	30.50	28.46
6	10.900	1.16	63.26	0.00	17.80	15.03
7A	9.300	0.95	67.86	0.00	69.00	6.25
7B	96.500	0.52	79.43	0.00	108.90	72.40
8	288.800	0.58	77.38	0.00	112.60	197.39
9A	75.300	0.45	81.53	0.00	83.60	73.93
9B	57.300	0.32	86.39	0.00	30.90	132.06
10.1	25.200	0.40	83.26	0.00	48.70	38.88
10.1F	1.700	0.36	84.82	0.00	29.10	3.92
10.2	83.100	0.43	82.32	0.00	76.50	89.29

Subbasins

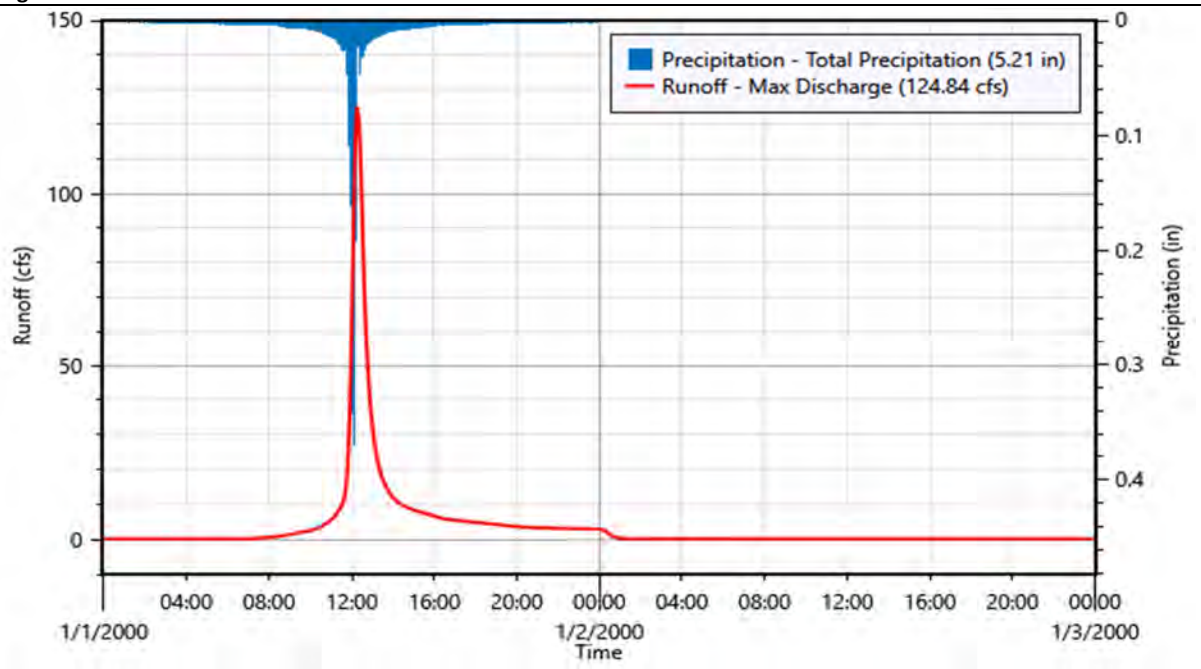
Subbasin ID:	1.1			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	102.80 cfs	**Time of peak:**	01 Jan 2000, 05:33	
Drainage area:	268.700 acres	**Total rainfall:**	5.21 in	116.661 ac-ft
Initial abstraction:	0.37 in	**Losses:**	1.71 in	38.334 ac-ft
Curve Number:	84.34	**Precip excess:**	3.50 in	78.327 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.50 in	78.326 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	313.50 minutes	**Total runoff:**	3.50 in	78.326 ac-ft



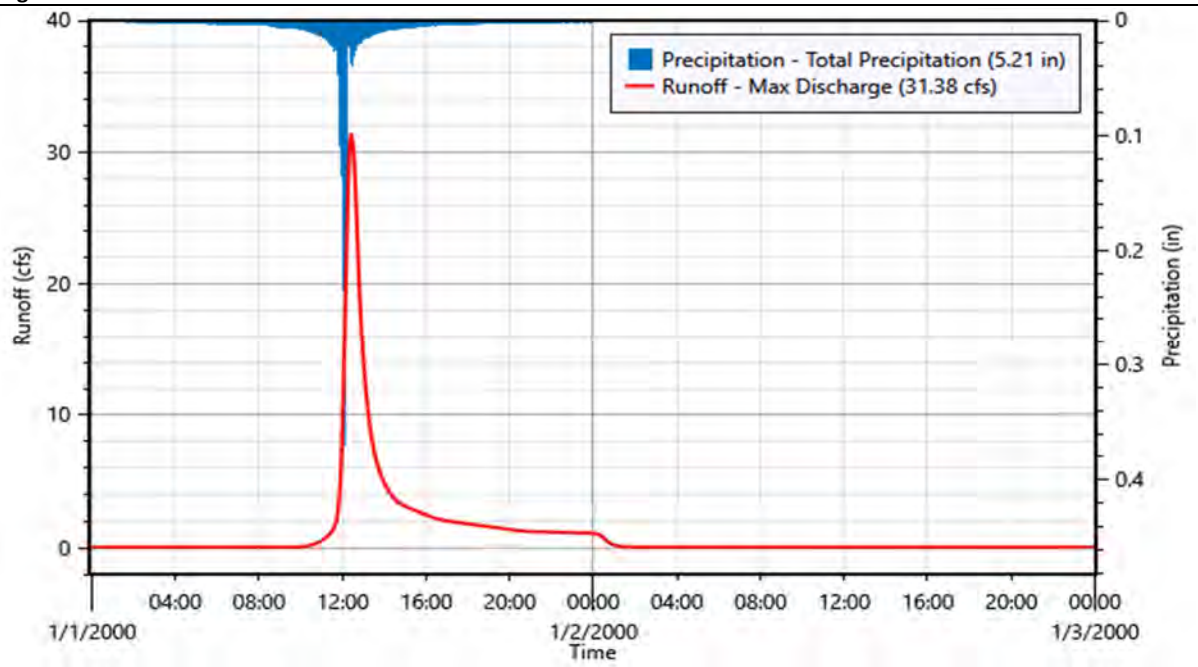
Subbasin ID:	1.2			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	67.52 cfs	**Time of peak:**	01 Jan 2000, 01:54	
Drainage area:	77.900 acres	**Total rainfall:**	5.21 in	33.822 ac-ft
Initial abstraction:	0.33 in	**Losses:**	1.57 in	10.200 ac-ft
Curve Number:	85.73	**Precip excess:**	3.64 in	23.622 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.64 in	23.622 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	115.60 minutes	**Total runoff:**	3.64 in	23.622 ac-ft



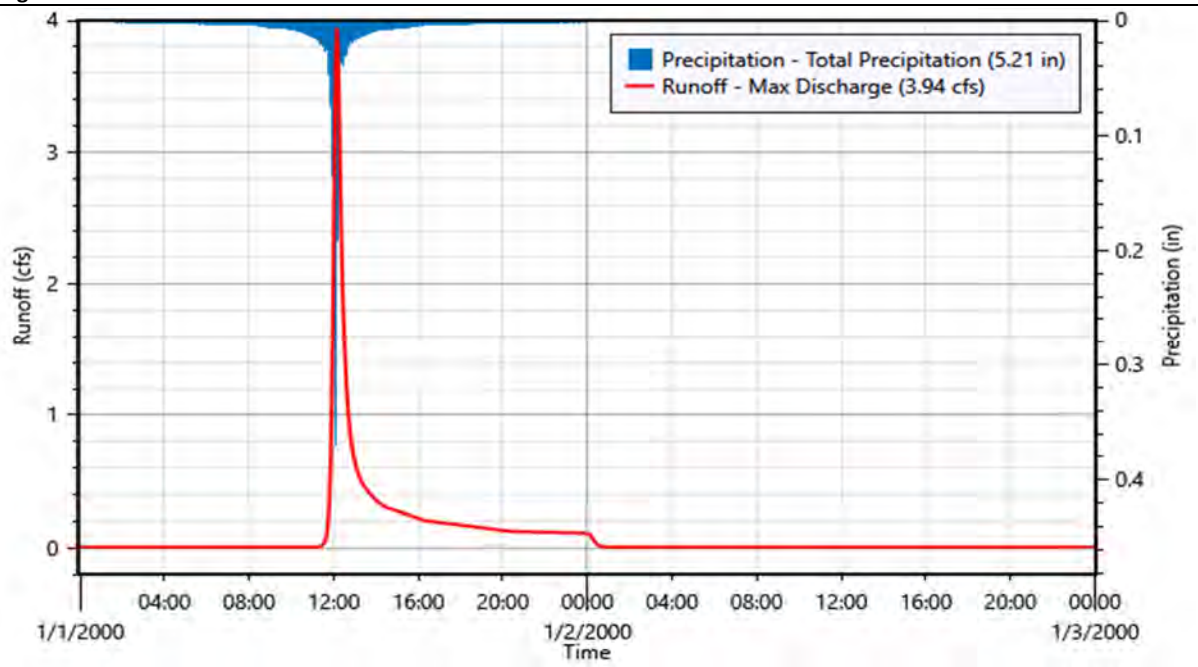
Subbasin ID:	2			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	124.84 cfs	**Time of peak:**	01 Jan 2000, 12:18	
Drainage area:	53.700 acres	**Total rainfall:**	5.21 in	23.315 ac-ft
Initial abstraction:	0.47 in	**Losses:**	2.04 in	9.147 ac-ft
Curve Number:	80.93	**Precip excess:**	3.17 in	14.168 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.17 in	14.168 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	24.20 minutes	**Total runoff:**	3.17 in	14.168 ac-ft



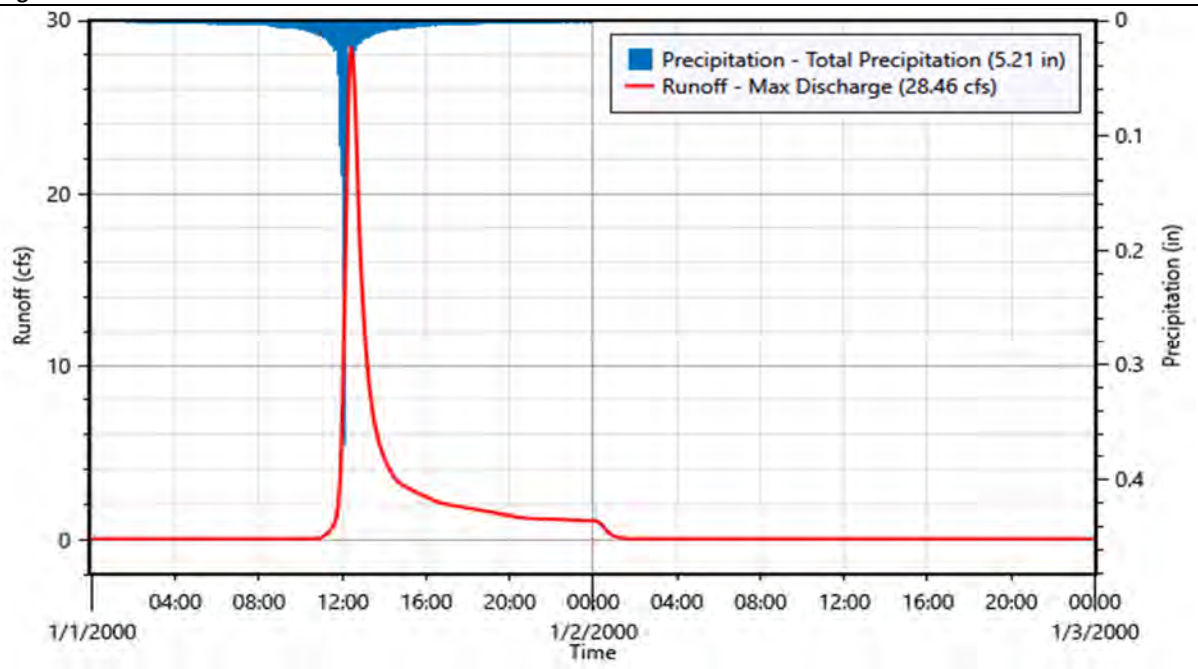
Subbasin ID:	3			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	31.38 cfs	**Time of peak:**	01 Jan 2000, 12:24	
Drainage area:	23.400 acres	**Total rainfall:**	5.21 in	10.160 ac-ft
Initial abstraction:	0.85 in	**Losses:**	3.00 in	5.852 ac-ft
Curve Number:	70.20	**Precip excess:**	2.21 in	4.308 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.21 in	4.308 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	30.90 minutes	**Total runoff:**	2.21 in	4.308 ac-ft



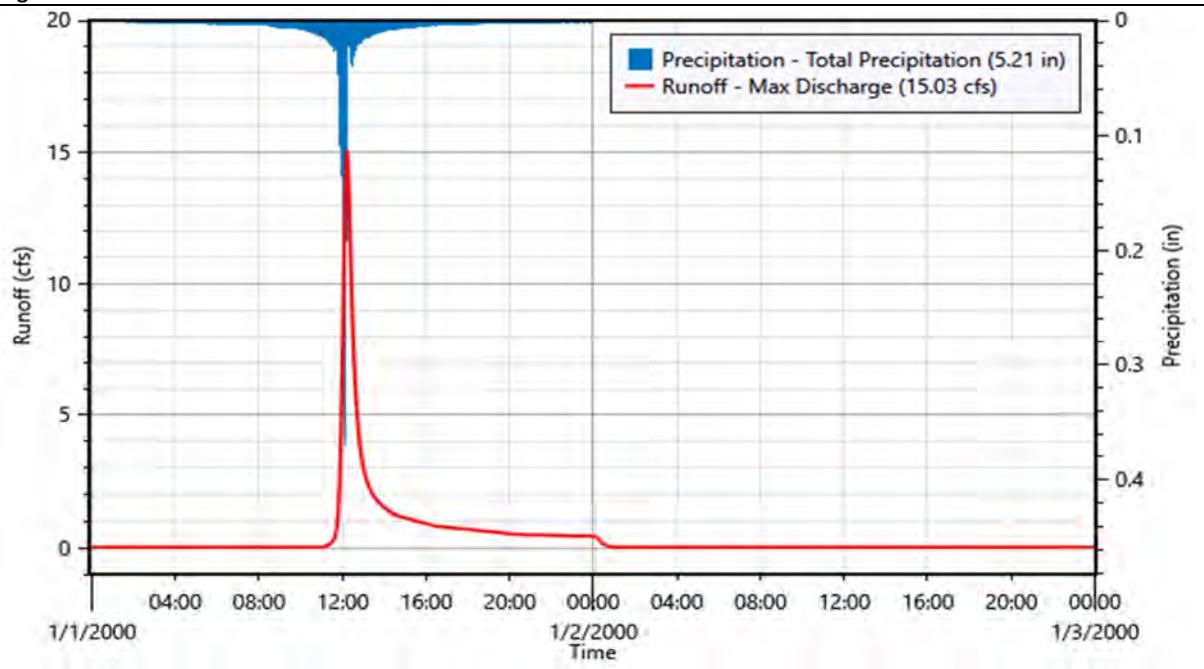
Subbasin ID:	4			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	3.94 cfs	**Time of peak:**	01 Jan 2000, 12:09	
Drainage area:	2.900 acres	**Total rainfall:**	5.21 in	1.259 ac-ft
Initial abstraction:	1.28 in	**Losses:**	3.71 in	0.897 ac-ft
Curve Number:	61.00	**Precip excess:**	1.50 in	0.362 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.50 in	0.362 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	14.70 minutes	**Total runoff:**	1.50 in	0.362 ac-ft



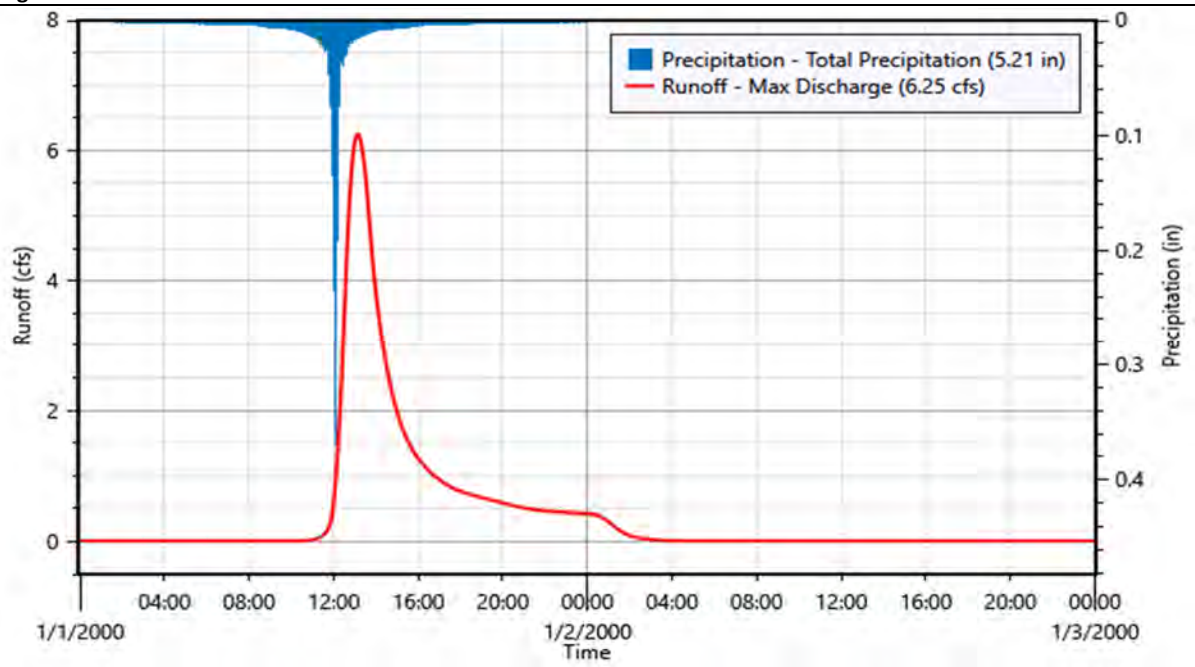
Subbasin ID:	5			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	28.46 cfs	**Time of peak:**	01 Jan 2000, 12:24	
Drainage area:	25.300 acres	**Total rainfall:**	5.21 in	10.984 ac-ft
Initial abstraction:	1.02 in	**Losses:**	3.32 in	7.000 ac-ft
Curve Number:	66.23	**Precip excess:**	1.89 in	3.985 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.89 in	3.985 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	30.50 minutes	**Total runoff:**	1.89 in	3.985 ac-ft



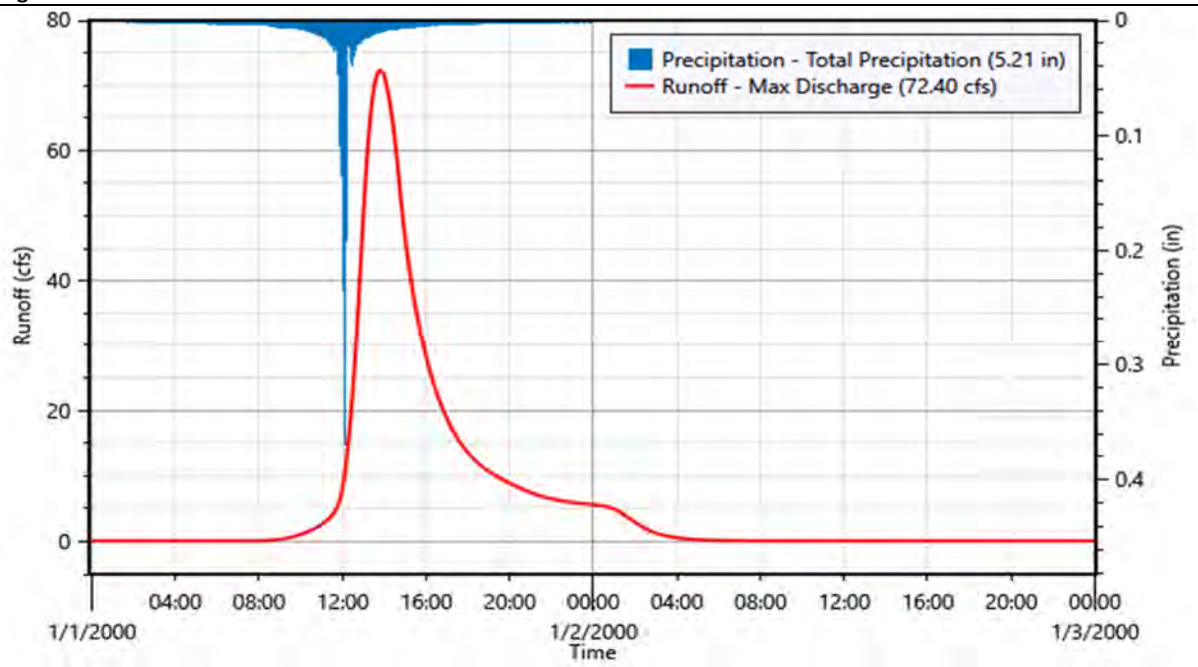
Subbasin ID:	6			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	15.03 cfs	**Time of peak:**	01 Jan 2000, 12:12	
Drainage area:	10.900 acres	**Total rainfall:**	5.21 in	4.732 ac-ft
Initial abstraction:	1.16 in	**Losses:**	3.55 in	3.221 ac-ft
Curve Number:	63.26	**Precip excess:**	1.66 in	1.511 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	1.66 in	1.511 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	17.80 minutes	**Total runoff:**	1.66 in	1.511 ac-ft



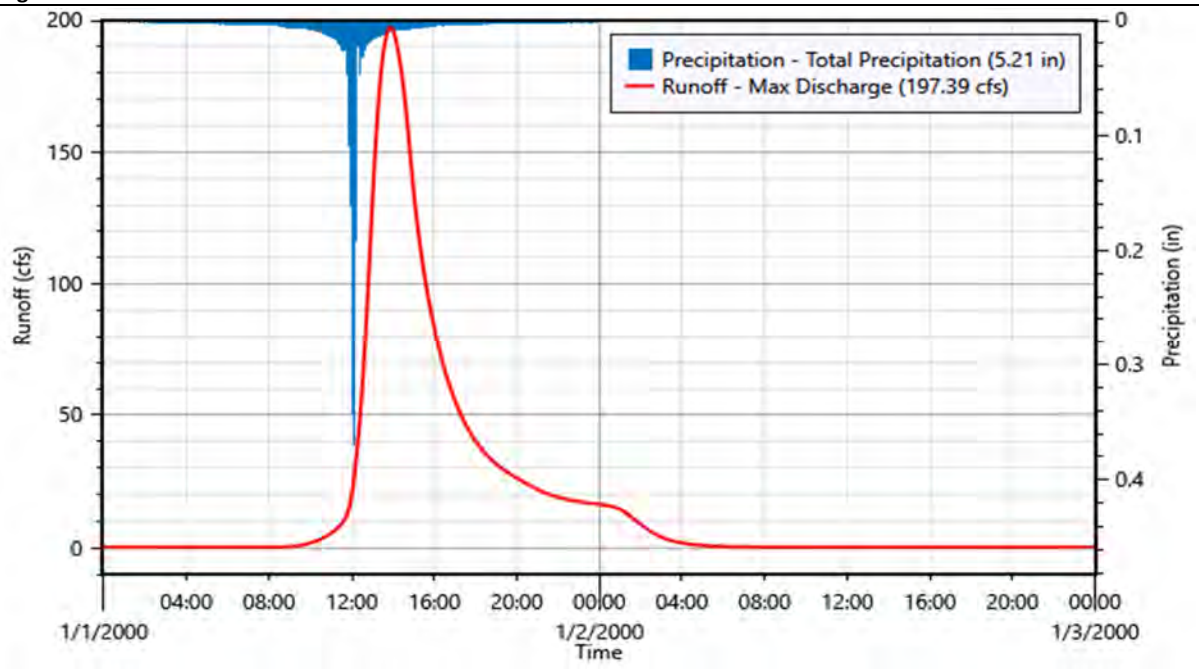
Subbasin ID:	7A			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	6.25 cfs	**Time of peak:**	01 Jan 2000, 01:09	
Drainage area:	9.300 acres	**Total rainfall:**	5.21 in	4.038 ac-ft
Initial abstraction:	0.95 in	**Losses:**	3.19 in	2.474 ac-ft
Curve Number:	67.86	**Precip excess:**	2.02 in	1.563 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.02 in	1.563 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	69.00 minutes	**Total runoff:**	2.02 in	1.563 ac-ft



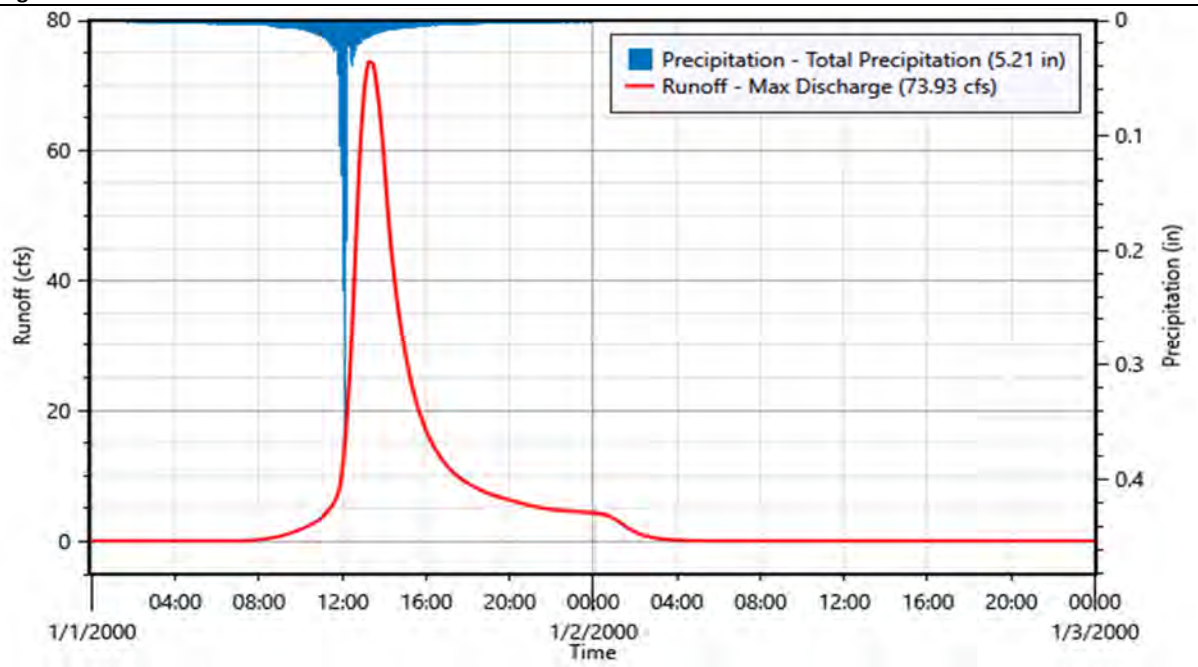
Subbasin ID:	7B			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	72.40 cfs	**Time of peak:**	01 Jan 2000, 01:48	
Drainage area:	96.500 acres	**Total rainfall:**	5.21 in	41.897 ac-ft
Initial abstraction:	0.52 in	**Losses:**	2.19 in	17.599 ac-ft
Curve Number:	79.43	**Precip excess:**	3.02 in	24.298 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.02 in	24.298 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	108.90 minutes	**Total runoff:**	3.02 in	24.298 ac-ft



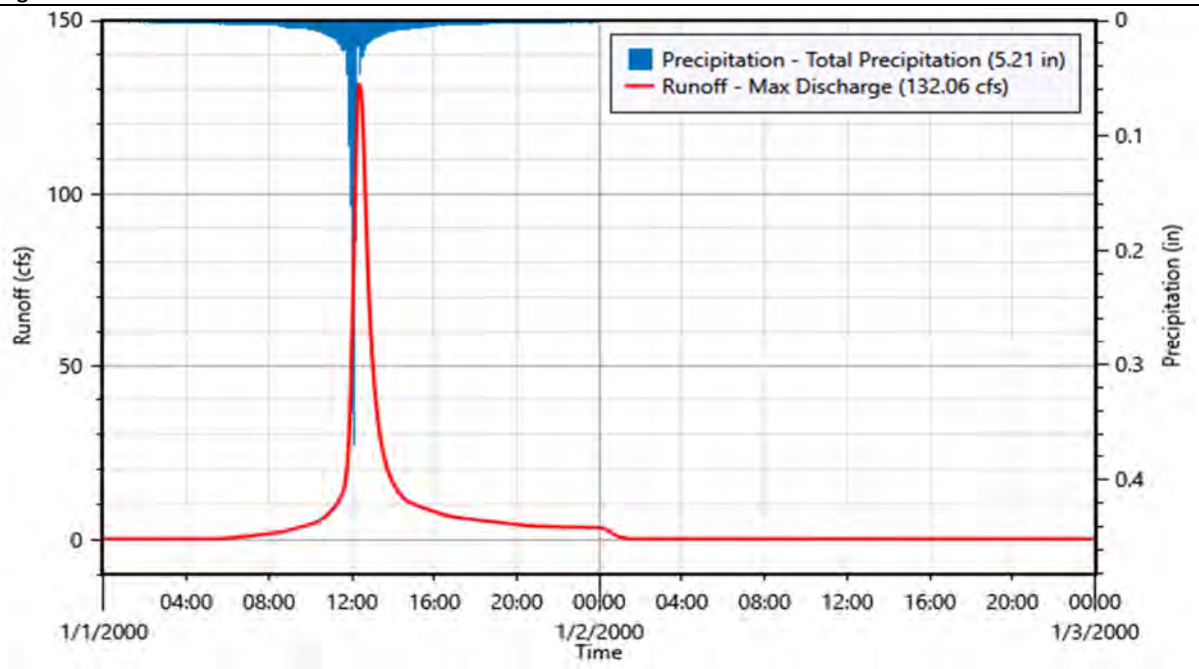
Subbasin ID:	8			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	197.39 cfs	**Time of peak:**	01 Jan 2000, 01:54	
Drainage area:	288.800 acres	**Total rainfall:**	5.21 in	125.387 ac-ft
Initial abstraction:	0.58 in	**Losses:**	2.37 in	57.084 ac-ft
Curve Number:	77.38	**Precip excess:**	2.84 in	68.304 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	2.84 in	68.304 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	112.60 minutes	**Total runoff:**	2.84 in	68.304 ac-ft



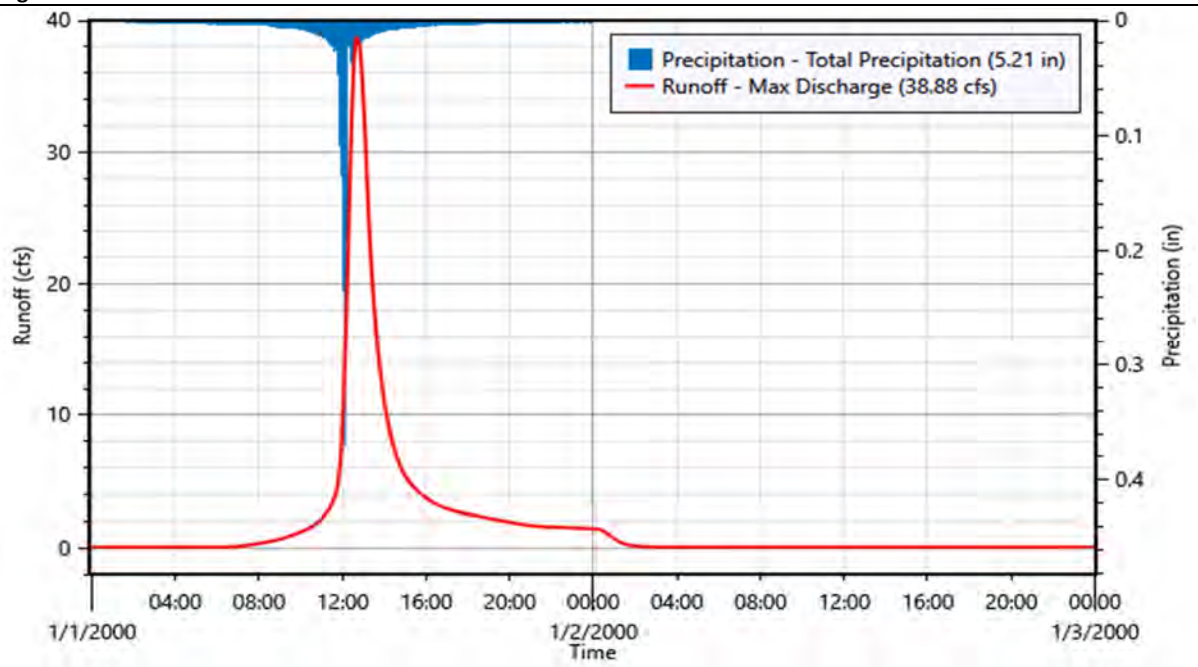
Subbasin ID:	9A			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	73.93 cfs	**Time of peak:**	01 Jan 2000, 01:21	
Drainage area:	75.300 acres	**Total rainfall:**	5.21 in	32.693 ac-ft
Initial abstraction:	0.45 in	**Losses:**	1.98 in	12.455 ac-ft
Curve Number:	81.53	**Precip excess:**	3.23 in	20.237 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.23 in	20.237 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	83.60 minutes	**Total runoff:**	3.23 in	20.237 ac-ft



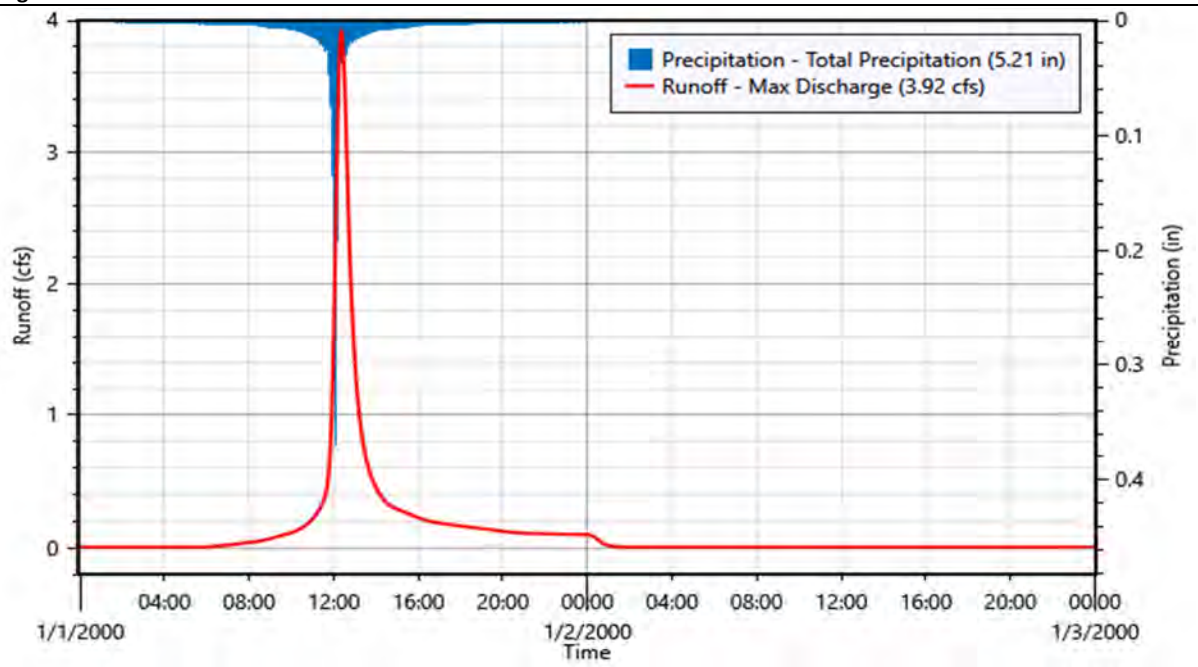
Subbasin ID:	9B			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	132.06 cfs	**Time of peak:**	01 Jan 2000, 12:24	
Drainage area:	57.300 acres	**Total rainfall:**	5.21 in	24.878 ac-ft
Initial abstraction:	0.32 in	**Losses:**	1.51 in	7.218 ac-ft
Curve Number:	86.39	**Precip excess:**	3.70 in	17.660 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.70 in	17.660 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	30.90 minutes	**Total runoff:**	3.70 in	17.660 ac-ft



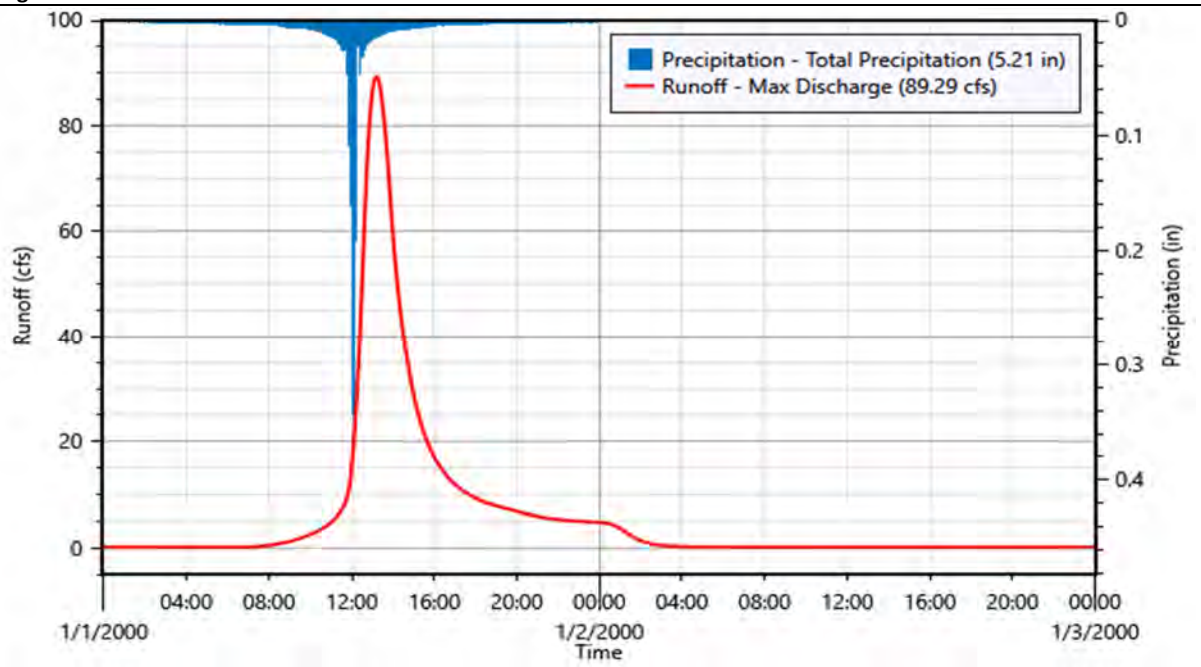
Subbasin ID:	10.1			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	38.88 cfs	**Time of peak:**	01 Jan 2000, 12:42	
Drainage area:	25.200 acres	**Total rainfall:**	5.21 in	10.941 ac-ft
Initial abstraction:	0.40 in	**Losses:**	1.82 in	3.818 ac-ft
Curve Number:	83.26	**Precip excess:**	3.39 in	7.123 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.39 in	7.123 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	48.70 minutes	**Total runoff:**	3.39 in	7.123 ac-ft



Subbasin ID:	10.1F			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	3.92 cfs	**Time of peak:**	01 Jan 2000, 12:21	
Drainage area:	1.700 acres	**Total rainfall:**	5.21 in	0.738 ac-ft
Initial abstraction:	0.36 in	**Losses:**	1.67 in	0.236 ac-ft
Curve Number:	84.82	**Precip excess:**	3.54 in	0.502 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.54 in	0.502 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	29.10 minutes	**Total runoff:**	3.54 in	0.502 ac-ft



Subbasin ID:	10.2			
Scenario:	**10yr Proposed**		**Depth**	**Volume**
Peak discharge:	89.29 cfs	**Time of peak:**	01 Jan 2000, 01:12	
Drainage area:	83.100 acres	**Total rainfall:**	5.21 in	36.079 ac-ft
Initial abstraction:	0.43 in	**Losses:**	1.91 in	13.240 ac-ft
Curve Number:	82.32	**Precip excess:**	3.30 in	22.839 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.30 in	22.839 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	76.50 minutes	**Total runoff:**	3.30 in	22.839 ac-ft



Nodes - Unattenuated

Element ID	Element Type	Outflow Volume (ac-ft)
1PR	Junction	101.9
2PR	Junction	14.2
3PR	Junction	4.7
4PR	Junction	5.5
5PR	Junction	94.2
6PR	Junction	37.9
7PR	Junction	30.5

Nodes - Attenuated

Element ID	Element Type	Outflow Volume (ac-ft)
1PR	Junction	95.4
7PR	Junction	29.5

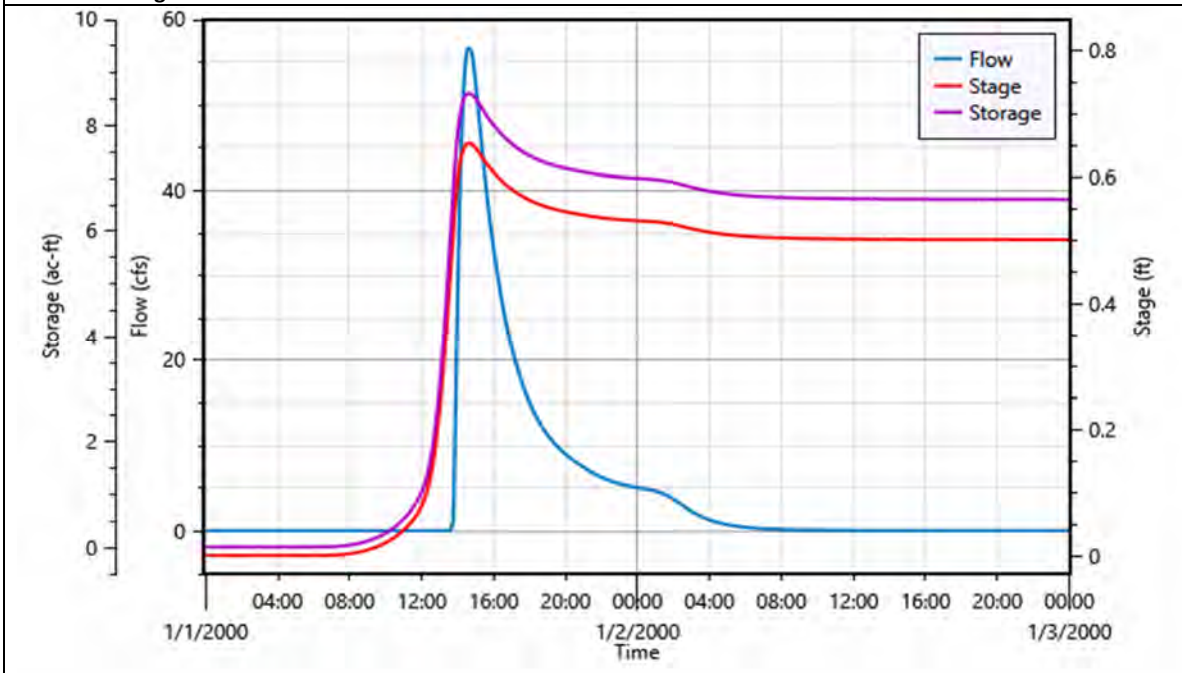
Storage Area Summary

Storage Area ID	Maximum Inflow (cfs)	Maximum Outflow (cfs)	Maximum Storage (ac-ft)	Maximum Pool Elevation (ft)	Minimum Pool Elevation (ft)	Maximum Stage (ft)
1P	67.52	56.88	8.605	829.65	829.00	0.65
10P	41.46	33.97	2.285	828.23	827.00	1.23

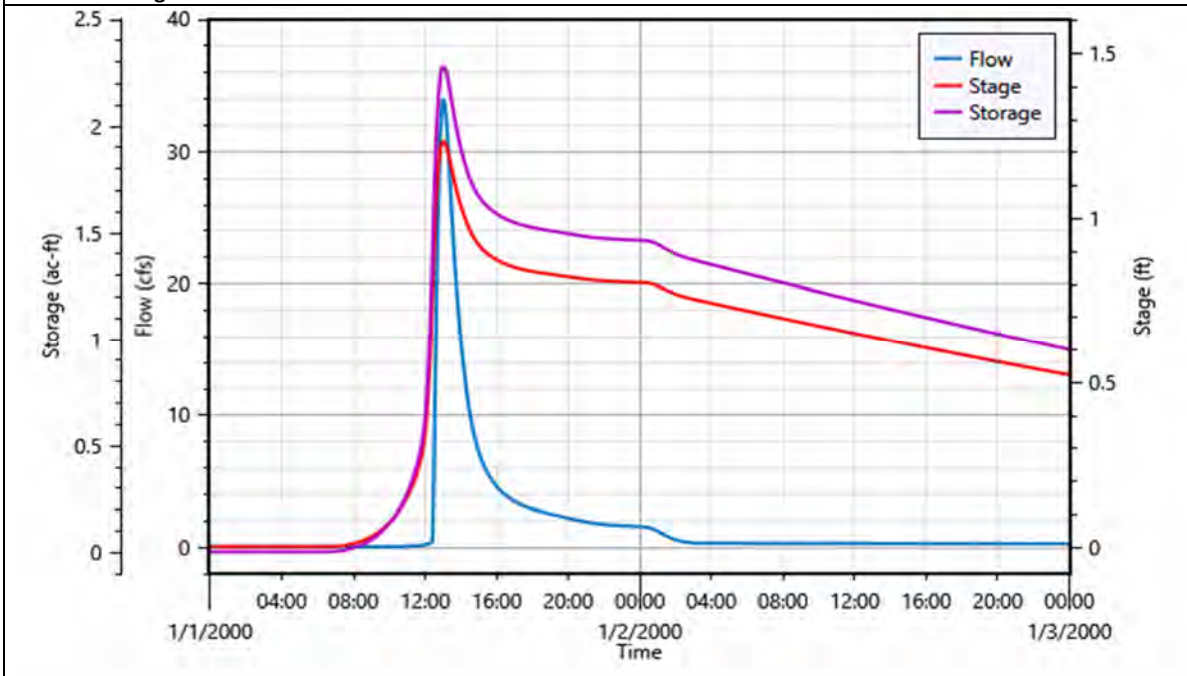
Storage Areas

These are the storage areas that are defined:

Storage Area ID:	**1P**		
Scenario:	**10yr Proposed**		
Maximum storage:	8.605 ac-ft		
Maximum pool elevation:	829.65 ft	**Maximum Volume**	**Time of Peak**
Maximum inflow:	67.52 cfs	23.622 ac-ft	01Jan2000, 13:54
Maximum outflow:	56.88 cfs	17.033 ac-ft	01Jan2000, 14:39
Minimum pool elevation:	829.00 ft		
Maximum stage:	0.65 ft		



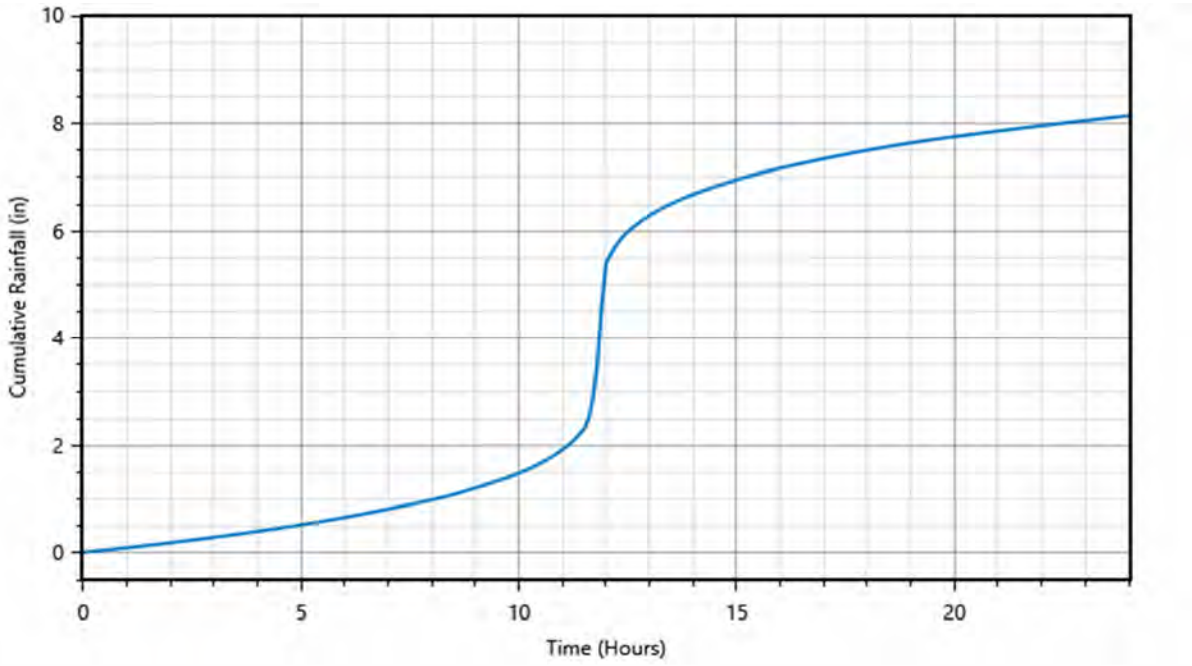
Storage Area ID:	**10P**		
Scenario:	**10yr Proposed**		
Maximum storage:	2.285 ac-ft		
Maximum pool elevation:	828.23 ft	**Maximum Volume**	**Time of Peak**
Maximum inflow:	41.46 cfs	7.625 ac-ft	01Jan2000, 12:39
Maximum outflow:	33.97 cfs	6.677 ac-ft	01Jan2000, 13:03
Minimum pool elevation:	827.00 ft		
Maximum stage:	1.23 ft		



100yr Proposed

Design Storm

Precipitation type: SCS Storm
SCS storm distribution: Type II
Rainfall depth: 8.13 in

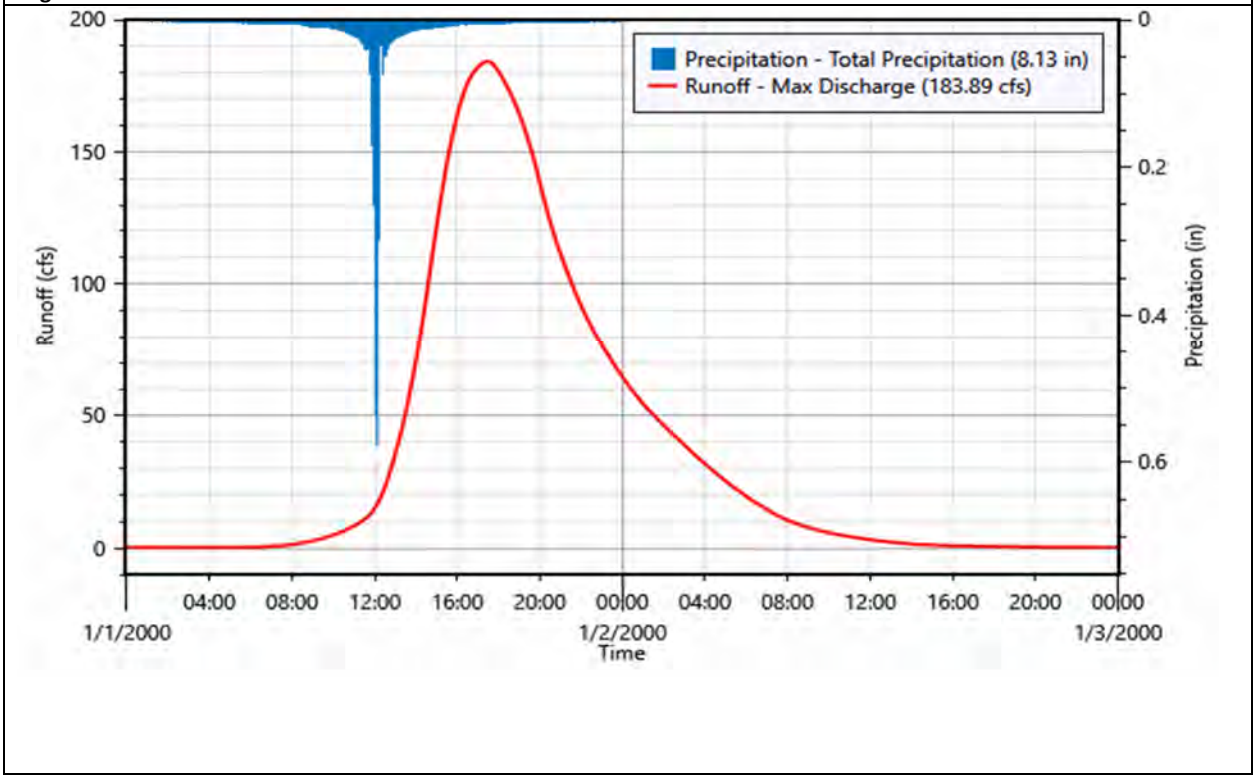


Watershed Summary

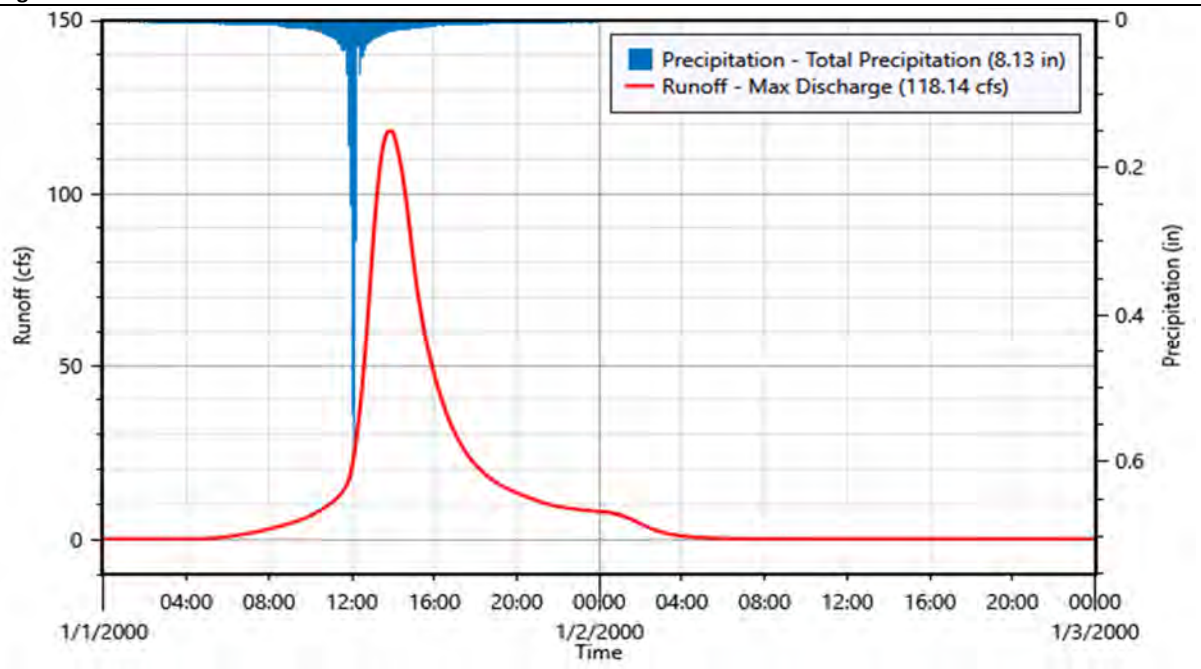
Subbasin ID	Drainage Area (acres)	Initial Abstraction (in)	Curve Number	Impervious Surface (%)	Lag Time (minutes)	Peak Discharge (cfs)
1.1	268.700	0.37	84.34	0.00	313.50	183.89
1.2	77.900	0.33	85.73	0.00	115.60	118.14
2	53.700	0.47	80.93	0.00	24.20	229.55
3	23.400	0.85	70.20	0.00	30.90	67.31
4	2.900	1.28	61.00	0.00	14.70	10.00
5	25.300	1.02	66.23	0.00	30.50	65.63
6	10.900	1.16	63.26	0.00	17.80	36.36
7A	9.300	0.95	67.86	0.00	69.00	14.03
7B	96.500	0.52	79.43	0.00	108.90	136.59
8	288.800	0.58	77.38	0.00	112.60	382.20
9A	75.300	0.45	81.53	0.00	83.60	135.62
9B	57.300	0.32	86.39	0.00	30.90	227.67
10.1	25.200	0.40	83.26	0.00	48.70	69.64
10.1F	1.700	0.36	84.82	0.00	29.10	6.89
10.2	83.100	0.43	82.32	0.00	76.50	162.16

Subbasins

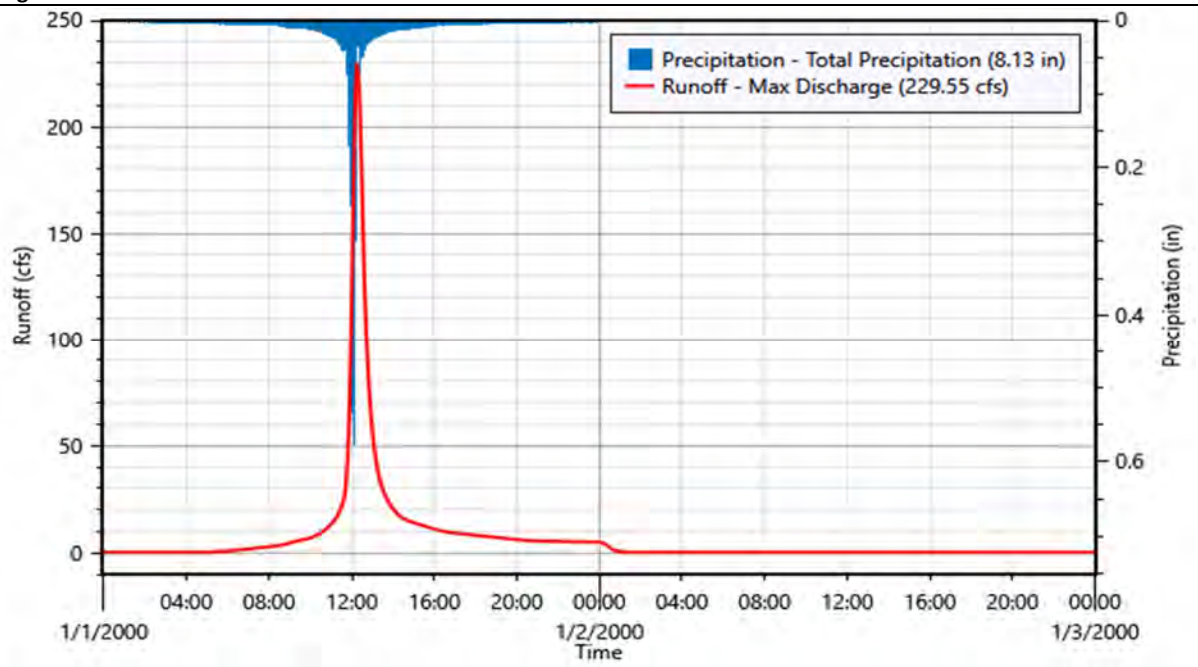
Subbasin ID:	1.1			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	183.89 cfs	**Time of peak:**	01 Jan 2000, 05:27	
Drainage area:	268.700 acres	**Total rainfall:**	8.13 in	182.044 ac-ft
Initial abstraction:	0.37 in	**Losses:**	1.87 in	41.834 ac-ft
Curve Number:	84.34	**Precip excess:**	6.26 in	140.211 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	6.26 in	140.210 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	313.50 minutes	**Total runoff:**	6.26 in	140.210 ac-ft



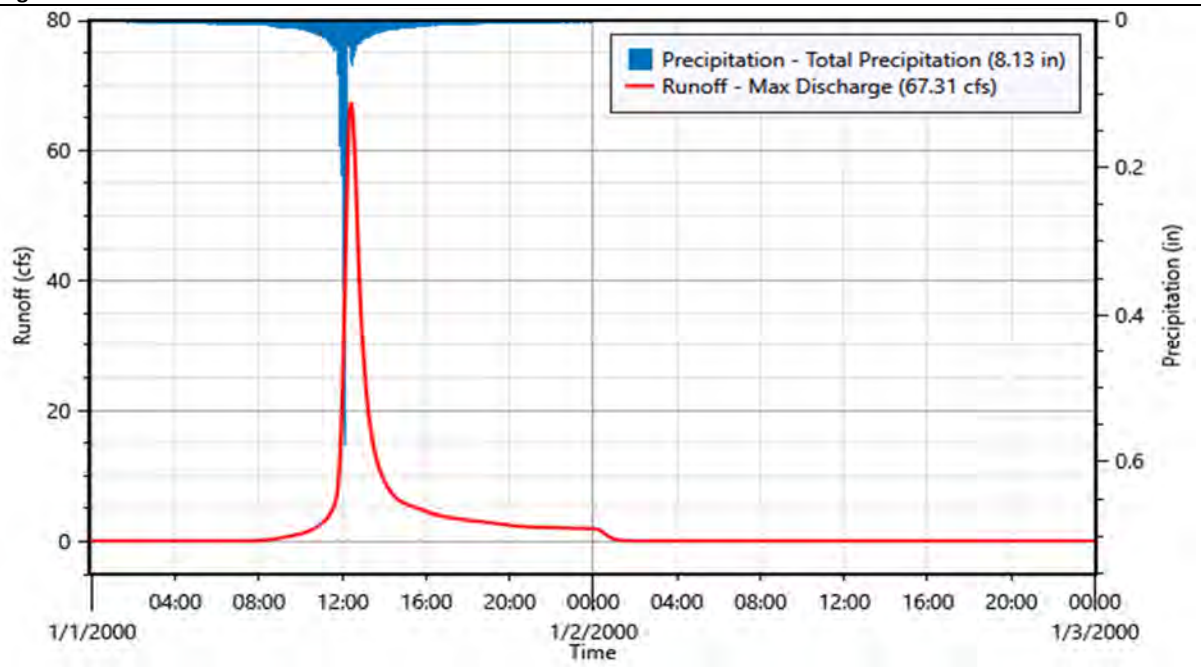
Subbasin ID:	1.2			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	118.14 cfs	**Time of peak:**	01 Jan 2000, 01:51	
Drainage area:	77.900 acres	**Total rainfall:**	8.13 in	52.777 ac-ft
Initial abstraction:	0.33 in	**Losses:**	1.70 in	11.047 ac-ft
Curve Number:	85.73	**Precip excess:**	6.43 in	41.730 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	6.43 in	41.730 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	115.60 minutes	**Total runoff:**	6.43 in	41.730 ac-ft



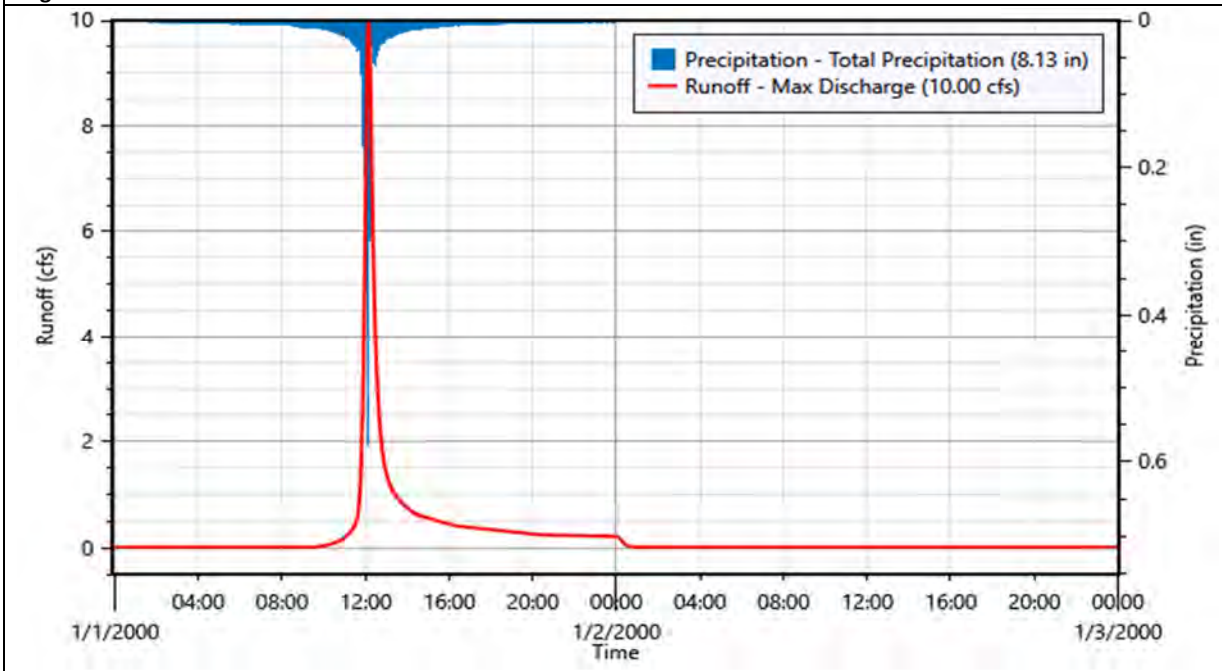
Subbasin ID:	2			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	229.55 cfs	**Time of peak:**	01 Jan 2000, 12:15	
Drainage area:	53.700 acres	**Total rainfall:**	8.13 in	36.382 ac-ft
Initial abstraction:	0.47 in	**Losses:**	2.27 in	10.167 ac-ft
Curve Number:	80.93	**Precip excess:**	5.86 in	26.214 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	5.86 in	26.214 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	24.20 minutes	**Total runoff:**	5.86 in	26.214 ac-ft



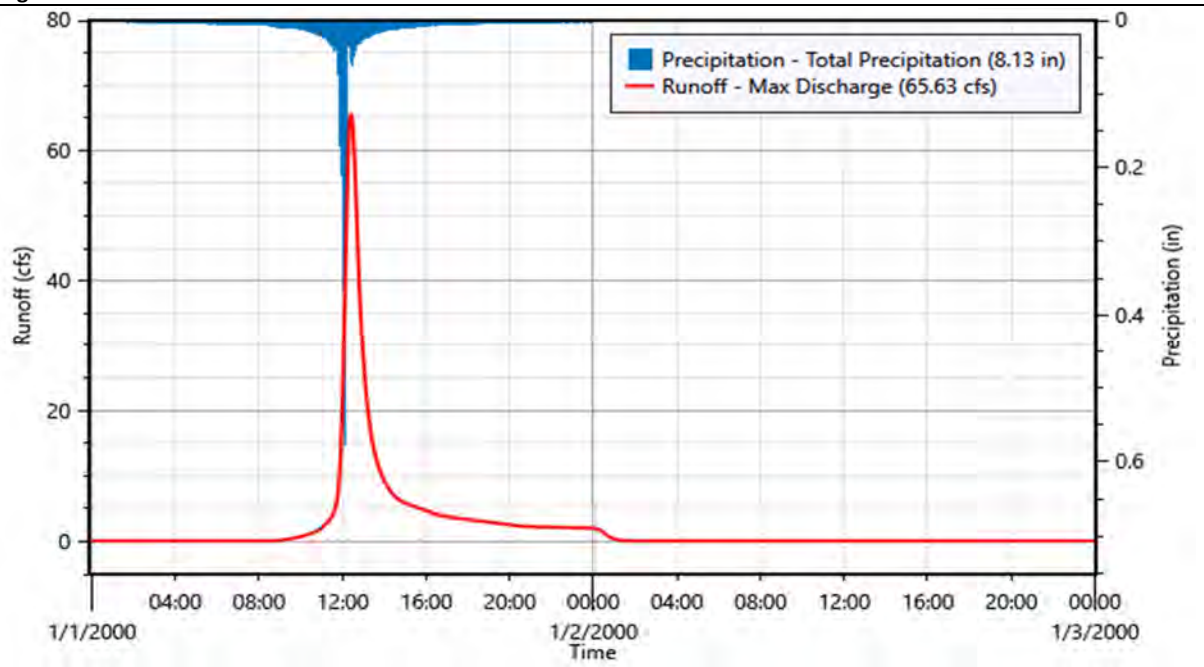
Subbasin ID:	3			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	67.31 cfs	**Time of peak:**	01 Jan 2000, 12:24	
Drainage area:	23.400 acres	**Total rainfall:**	8.13 in	15.854 ac-ft
Initial abstraction:	0.85 in	**Losses:**	3.53 in	6.886 ac-ft
Curve Number:	70.20	**Precip excess:**	4.60 in	8.967 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	4.60 in	8.967 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	30.90 minutes	**Total runoff:**	4.60 in	8.967 ac-ft



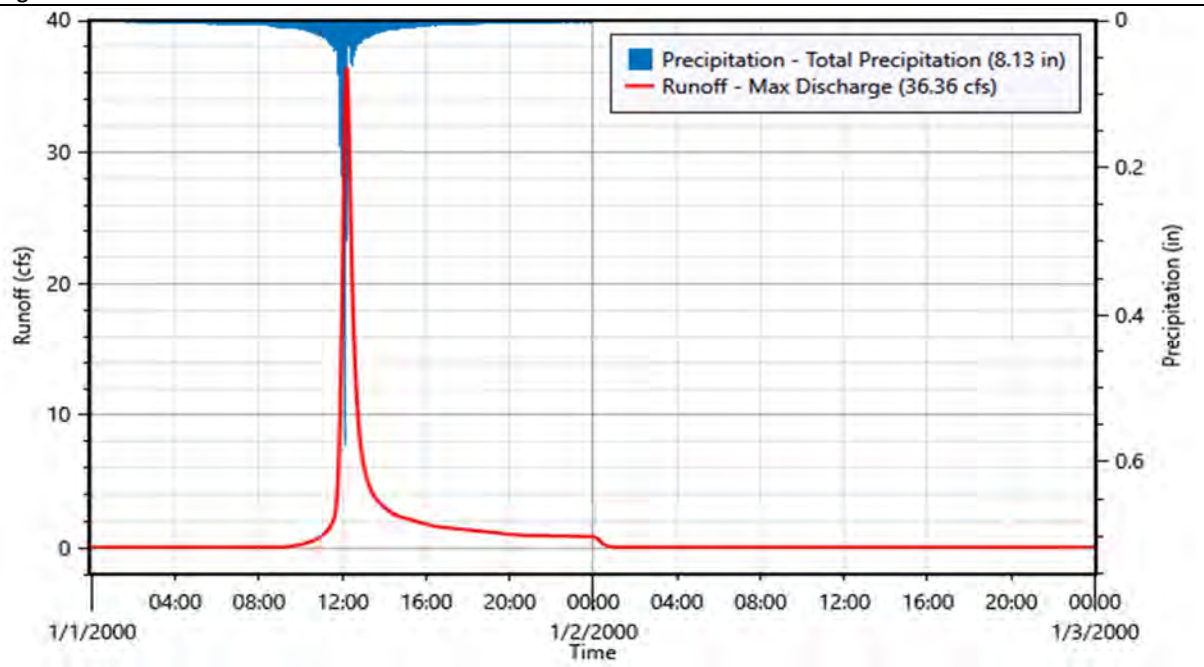
Subbasin ID:	4			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	10.00 cfs	**Time of peak:**	01 Jan 2000, 12:09	
Drainage area:	2.900 acres	**Total rainfall:**	8.13 in	1.965 ac-ft
Initial abstraction:	1.28 in	**Losses:**	4.59 in	1.108 ac-ft
Curve Number:	61.00	**Precip excess:**	3.54 in	0.856 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.54 in	0.856 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	14.70 minutes	**Total runoff:**	3.54 in	0.856 ac-ft



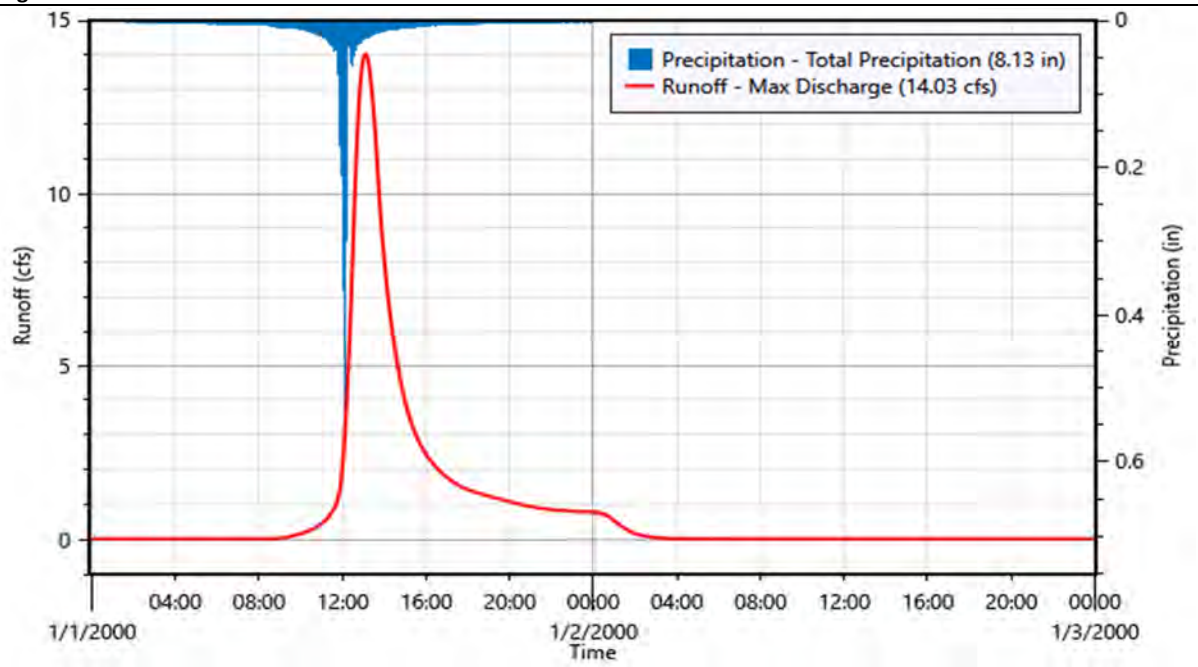
Subbasin ID:	5			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	65.63 cfs	**Time of peak:**	01 Jan 2000, 12:24	
Drainage area:	25.300 acres	**Total rainfall:**	8.13 in	17.141 ac-ft
Initial abstraction:	1.02 in	**Losses:**	3.99 in	8.411 ac-ft
Curve Number:	66.23	**Precip excess:**	4.14 in	8.730 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	4.14 in	8.730 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	30.50 minutes	**Total runoff:**	4.14 in	8.730 ac-ft



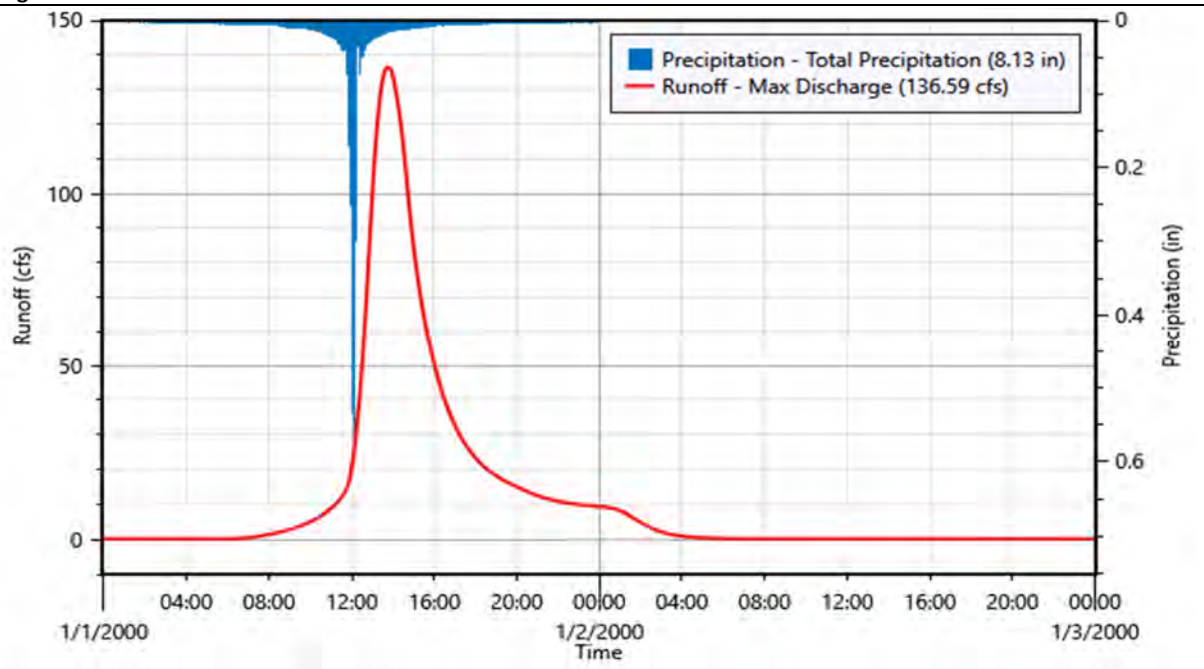
Subbasin ID:	6			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	36.36 cfs	**Time of peak:**	01 Jan 2000, 12:12	
Drainage area:	10.900 acres	**Total rainfall:**	8.13 in	7.385 ac-ft
Initial abstraction:	1.16 in	**Losses:**	4.33 in	3.931 ac-ft
Curve Number:	63.26	**Precip excess:**	3.80 in	3.453 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	3.80 in	3.453 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	17.80 minutes	**Total runoff:**	3.80 in	3.453 ac-ft



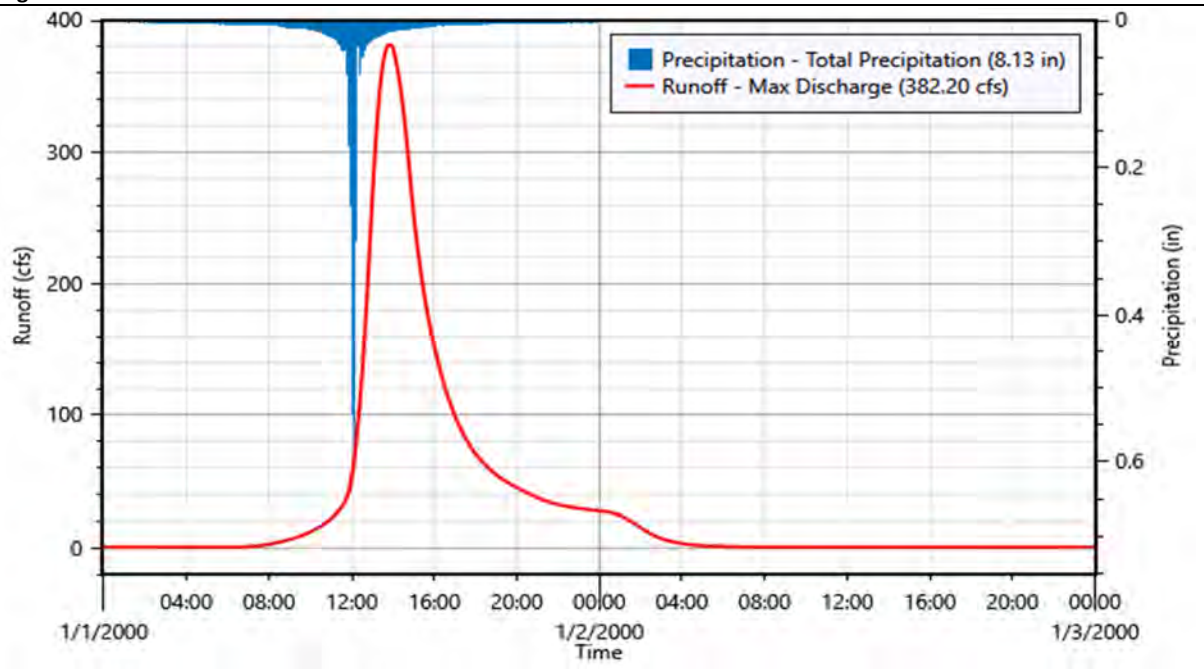
Subbasin ID:	7A			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	14.03 cfs	**Time of peak:**	01 Jan 2000, 01:06	
Drainage area:	9.300 acres	**Total rainfall:**	8.13 in	6.301 ac-ft
Initial abstraction:	0.95 in	**Losses:**	3.80 in	2.948 ac-ft
Curve Number:	67.86	**Precip excess:**	4.33 in	3.353 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	4.33 in	3.353 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	69.00 minutes	**Total runoff:**	4.33 in	3.353 ac-ft



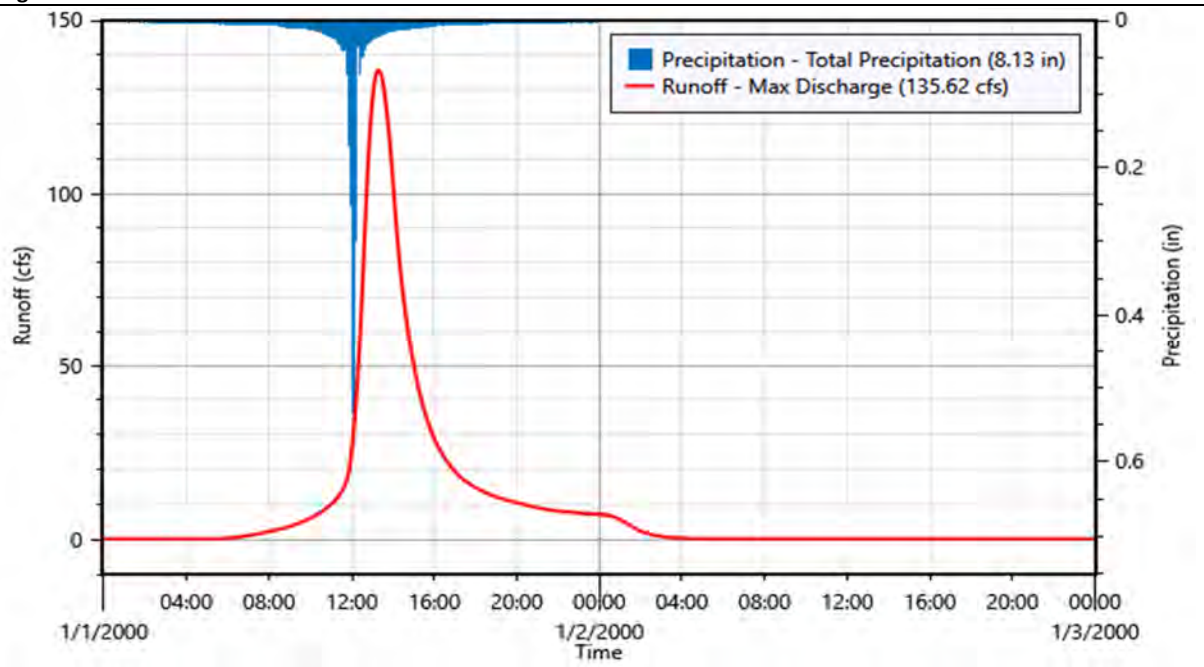
Subbasin ID:	7B			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	136.59 cfs	**Time of peak:**	01 Jan 2000, 01:45	
Drainage area:	96.500 acres	**Total rainfall:**	8.13 in	65.379 ac-ft
Initial abstraction:	0.52 in	**Losses:**	2.45 in	19.720 ac-ft
Curve Number:	79.43	**Precip excess:**	5.68 in	45.659 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	5.68 in	45.659 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	108.90 minutes	**Total runoff:**	5.68 in	45.659 ac-ft



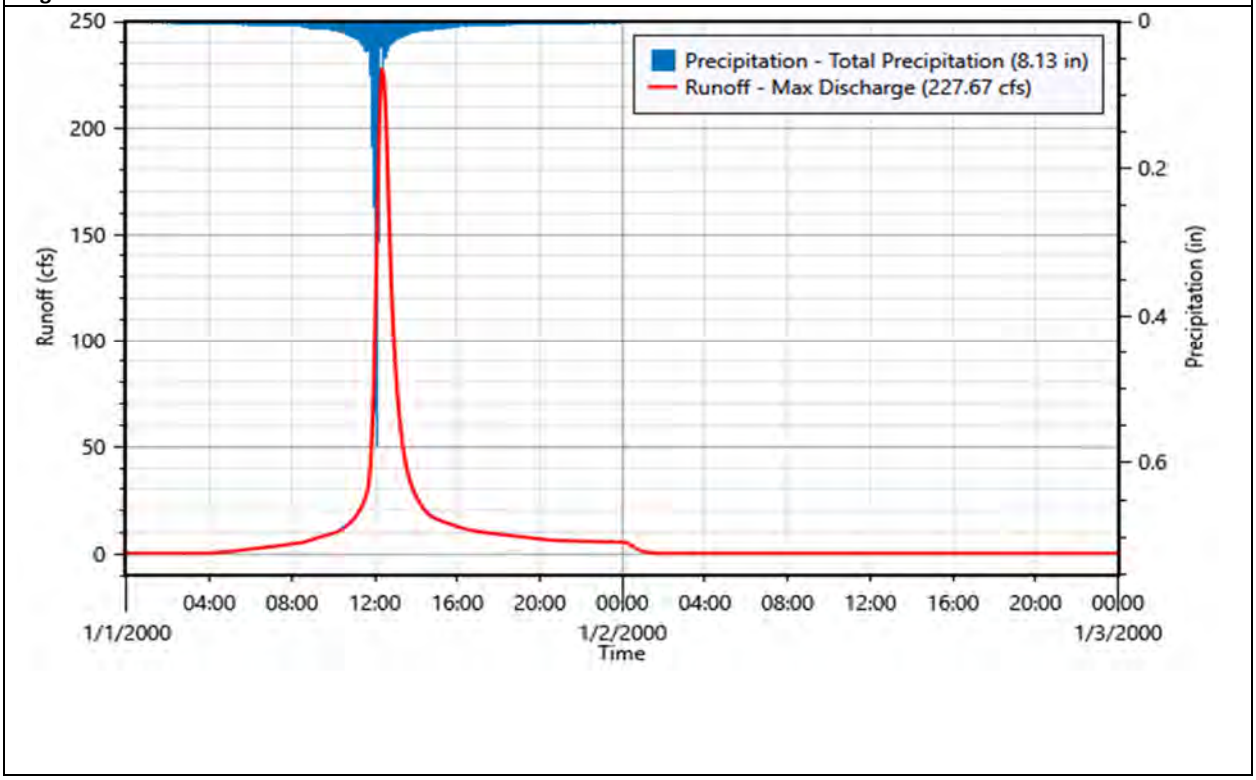
Subbasin ID:	8			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	382.20 cfs	**Time of peak:**	01 Jan 2000, 01:51	
Drainage area:	288.800 acres	**Total rainfall:**	8.13 in	195.662 ac-ft
Initial abstraction:	0.58 in	**Losses:**	2.69 in	64.675 ac-ft
Curve Number:	77.38	**Precip excess:**	5.44 in	130.987 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	5.44 in	130.987 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	112.60 minutes	**Total runoff:**	5.44 in	130.987 ac-ft



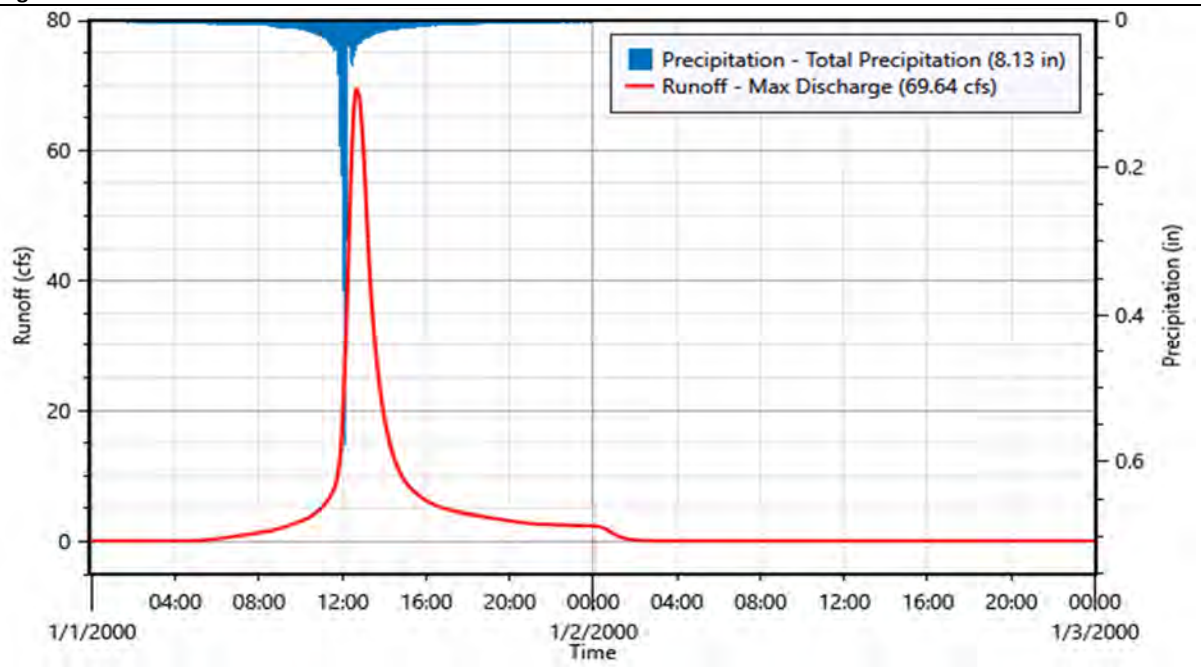
Subbasin ID:	9A			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	135.62 cfs	**Time of peak:**	01 Jan 2000, 01:18	
Drainage area:	75.300 acres	**Total rainfall:**	8.13 in	51.016 ac-ft
Initial abstraction:	0.45 in	**Losses:**	2.20 in	13.801 ac-ft
Curve Number:	81.53	**Precip excess:**	5.93 in	37.214 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	5.93 in	37.214 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	83.60 minutes	**Total runoff:**	5.93 in	37.214 ac-ft



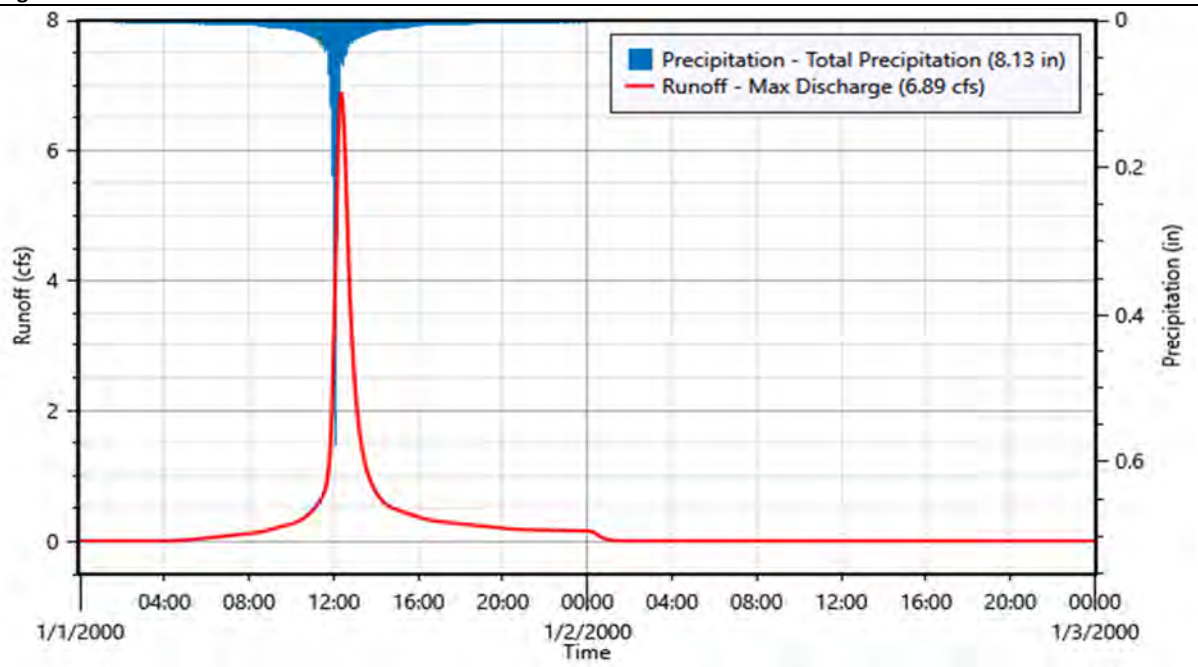
Subbasin ID:	9B			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	227.67 cfs	**Time of peak:**	01 Jan 2000, 12:24	
Drainage area:	57.300 acres	**Total rainfall:**	8.13 in	38.821 ac-ft
Initial abstraction:	0.32 in	**Losses:**	1.63 in	7.788 ac-ft
Curve Number:	86.39	**Precip excess:**	6.50 in	31.033 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	6.50 in	31.033 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	30.90 minutes	**Total runoff:**	6.50 in	31.033 ac-ft



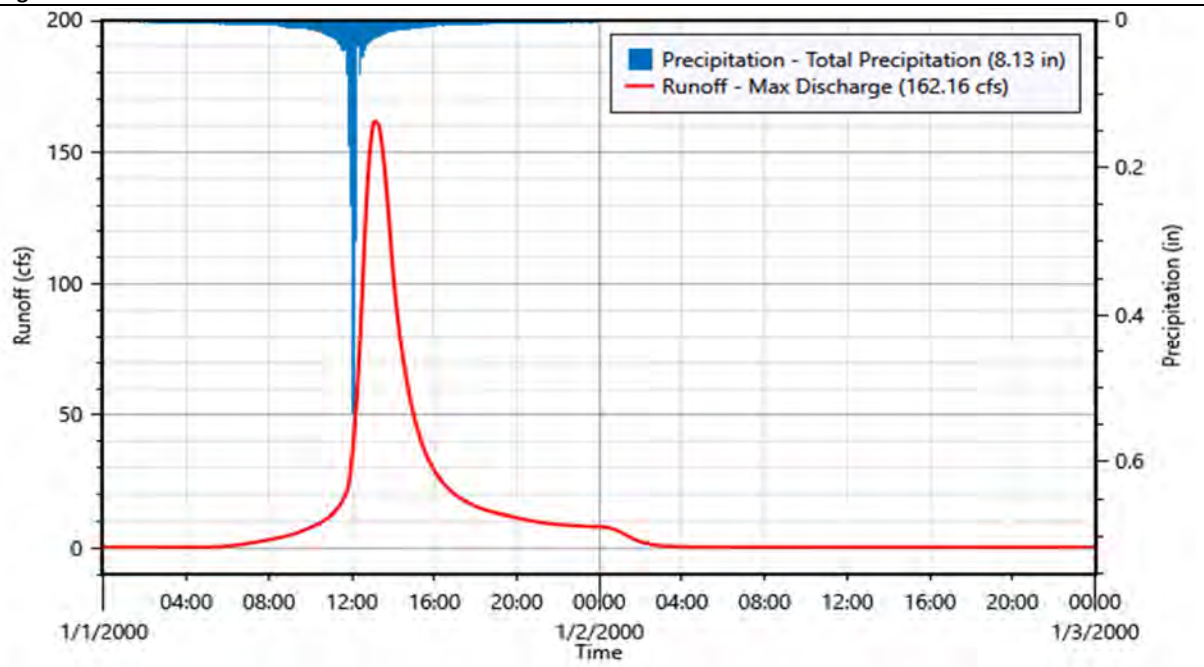
Subbasin ID:	10.1			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	69.64 cfs	**Time of peak:**	01 Jan 2000, 12:42	
Drainage area:	25.200 acres	**Total rainfall:**	8.13 in	17.073 ac-ft
Initial abstraction:	0.40 in	**Losses:**	2.00 in	4.191 ac-ft
Curve Number:	83.26	**Precip excess:**	6.13 in	12.882 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	6.13 in	12.882 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	48.70 minutes	**Total runoff:**	6.13 in	12.882 ac-ft



Subbasin ID:	10.1F			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	6.89 cfs	**Time of peak:**	01 Jan 2000, 12:21	
Drainage area:	1.700 acres	**Total rainfall:**	8.13 in	1.152 ac-ft
Initial abstraction:	0.36 in	**Losses:**	1.81 in	0.257 ac-ft
Curve Number:	84.82	**Precip excess:**	6.32 in	0.895 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	6.32 in	0.895 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	29.10 minutes	**Total runoff:**	6.32 in	0.895 ac-ft



Subbasin ID:	10.2			
Scenario:	**100yr Proposed**		**Depth**	**Volume**
Peak discharge:	162.16 cfs	**Time of peak:**	01 Jan 2000, 01:12	
Drainage area:	83.100 acres	**Total rainfall:**	8.13 in	56.300 ac-ft
Initial abstraction:	0.43 in	**Losses:**	2.11 in	14.607 ac-ft
Curve Number:	82.32	**Precip excess:**	6.02 in	41.693 ac-ft
Impervious surface:	0.00%	**Direct runoff:**	6.02 in	41.693 ac-ft
Peaking factor:	484	**Baseflow:**	0.00 in	0.000 ac-ft
Lag time:	76.50 minutes	**Total runoff:**	6.02 in	41.693 ac-ft



Nodes - Unattenuated

Element ID	Element Type	Outflow Volume (ac-ft)
1PR	Junction	181.9
2PR	Junction	26.2
3PR	Junction	9.8
4PR	Junction	12.2
5PR	Junction	180.0
6PR	Junction	68.2
7PR	Junction	55.5

Nodes - Attenuated

Element ID	Element Type	Outflow Volume (ac-ft)
1PR	Junction	175.3
7PR	Junction	54.5

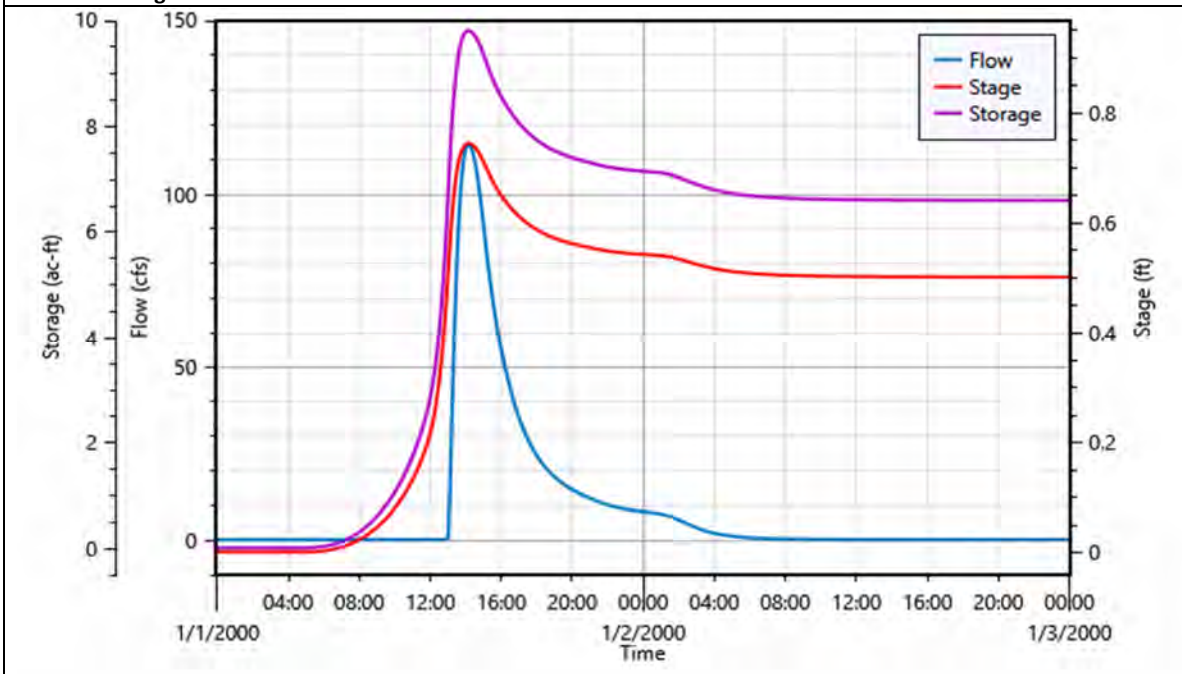
Storage Area Summary

Storage Area ID	Maximum Inflow (cfs)	Maximum Outflow (cfs)	Maximum Storage (ac-ft)	Maximum Pool Elevation (ft)	Minimum Pool Elevation (ft)	Maximum Stage (ft)
1P	118.14	114.41	9.802	829.74	829.00	0.74
10P	74.25	68.83	2.868	828.53	827.00	1.53

Storage Areas

These are the storage areas that are defined:

Storage Area ID:	**1P**		
Scenario:	**100yr Proposed**		
Maximum storage:	9.802 ac-ft		
Maximum pool elevation:	829.74 ft	**Maximum Volume**	**Time of Peak**
Maximum inflow:	118.14 cfs	41.730 ac-ft	01Jan2000, 13:51
Maximum outflow:	114.41 cfs	35.140 ac-ft	01Jan2000, 14:09
Minimum pool elevation:	829.00 ft		
Maximum stage:	0.74 ft		



Storage Area ID:	**10P**		
Scenario:	**100yr Proposed**		
Maximum storage:	2.868 ac-ft		
Maximum pool elevation:	828.53 ft	**Maximum Volume**	**Time of Peak**
Maximum inflow:	74.25 cfs	13.777 ac-ft	01Jan2000, 12:39
Maximum outflow:	68.83 cfs	12.821 ac-ft	01Jan2000, 12:51
Minimum pool elevation:	827.00 ft		
Maximum stage:	1.53 ft