Exhibit E

Laird Family Vineyards
Jamieson Vineyard
Hydrology Study
Prepared by Napa Valley Vineyard Engineering, Inc
July 18, 2017
Revised January 25, 2018

INTRODUCTION

This project is the development of approximately 100 gross acres of new vineyard within APN 057-140-016 located at 200 Kirkland Ranch Road, American Canyon.

This hydrology study is to determine the anticipated affect the proposed vineyard development project will have on local hydrology and runoff patterns. Hydrologic modeling of existing and proposed conditions was performed using HydroCad software with the CA-1 rainfall distribution curve. Following is a summary of the data used to complete the hydrologic analysis and the results of this analysis.

RAINFALL DATA

Rainfall depths for the project site were obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6, Version 2, Precipitation Frequency Data for California, which uses the latitude and longitude of a site to determine rainfall depths. The latitude and longitude of this project are estimated to be 38.226° N, 122.235° W, based on information obtained from All Topo V7 USGS mapping software.

The following rainfall data from the NOAA website was used in the analysis:

2 year, 24 hour	3.21 inches
5 year, 24 hour	4.26 inches
10 year, 24 hour	5.13 inches
25 year, 24 hour	6.41 inches
50 year, 24 hour	7.39 inches
100 year, 24 hour	8.43 inches

WATERSHED AREAS

The project site is located within eight watersheds as shown on the Drainage Area Maps in the Appendix. The watersheds are modeled separately, except for Watershed 3, which is broken into two subareas, both draining to a common point of interest (POI), and Watershed 4, which is broken into 3 subareas draining to a common POI. Watershed 4 contains a water storage reservoir located along the flow path used in this analysis. However, the project area draining into the reservoir is minimal, with no significant impact to flows; therefore, any attenuation which occurs at the reservoir is not

considered in either the pre-project or post-project modeling. Each watershed was determined based on Napa County contour mapping (2002).

PRE-PROJECT WATERSHED CONDITIONS

Soil Types

The United States Department of Agriculture Soil Conservation Service Soils Map for Napa County, August 1978, maps the following soil types within the watersheds:

SCS #132, 134, Fagan clay loam (Hydrologic Soil Group(HSG) C)
SCS #116, Clear Lake clay, drained (HSG D)
SCS #146, Haire loam (HSG D)
SCS #152, Hambright rock-outcrop complex (HSG D)

Land Use

Land use within each watershed was analyzed based on the 2011 aerial photograph obtained from the Napa County GIS website, and Google Earth. All watersheds are composed largely of grazed pasture with pockets of tree canopy and existing vineyard. The existing vineyard is tilled and sprayed, and is considered a "fair" hydrologic condition. The pasture land is alternately grazed, and the condition is dependent upon cattle access, but the ground cover is generally less than 75%, which is considered a "fair" hydrologic condition. There are a few small pockets where there is significant disturbance, and this analysis uses a "poor" hydrologic condition for those areas. In the grassland areas where cattle have no, or limited access, a "good" hydrological condition is used. A detailed breakdown of land uses by area and hydrologic soil group is included in the HydroCad reports in the Appendix, and is shown on the Drainage Area Maps.

Time of Concentration

The time of concentration represents the time it takes for rainfall in the most hydraulically remote portion of the watershed to reach the POI. The time of concentration is estimated assuming sheet flow up to 100 feet in the uppermost reaches of each watershed. A shallow concentrated flow regime is used to model the runoff down to a channel if one exists, or to the POI. Channel flow data was determined using a typical cross section of each channel. Due to the historical grazing in the project area, the flow paths within several of the watersheds alternate between eroded channels, and shallow concentrated flow, and are modeled accordingly. A detailed breakdown of the time of concentration parameters is included in the HydroCad reports, and is shown on the Drainage Area Maps.

POST-PROJECT WATERSHED CONDITIONS

Soil Types

Land preparation for the proposed vineyard development does not alter the permeability of the mapped soil types. The post-project HSG remains the same as pre-project HSG.

Land Use

The proposed project will convert approximately 100 acres of pasture and grassland to vineyard. All other areas within the subject watersheds remain unchanged. The project proposes a no-till cover crop with spot spray only, which is considered a "good" hydrologic condition. Vineyard avenues/turnspaces will be maintained in no-till cover and are modeled as part of the vineyard. Access drives are existing. A detailed breakdown of land uses by area and hydrologic soil group is included in the Appendix.

Time of Concentration

With the proposed cover crop maintenance, no ditching is required to meet pre-project conditions, and vineyard development will not otherwise alter the flow paths used in this analysis. Time of concentration under post-project conditions are considered the same as pre-project conditions. A detailed breakdown of time of concentration parameters is included in the Appendix.

CALCULATED RUNOFF RATE

Using the rainfall data, watershed area, land use and time of concentration parameters described above and included in the Appendix, the following runoff rates were calculated:

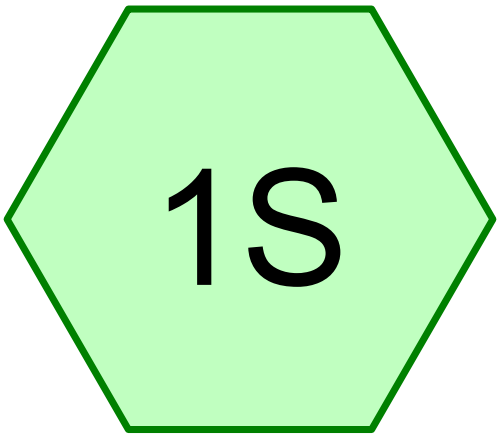
HydroCad Calculated Peak Runoff Rate (cfs)

24 hr. storm event	2 yr.		5 yr.		10 yr.		25 yr.		50 yr.		100 yr.	
Project Condition	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post
Watershed 1	6.07	5.16	9.82	8.73	13.07	11.88	17.94	16.67	21.70	20.40	25.70	25.70
Watershed 2	4.19	4.19	7.22	7.22	9.91	9.91	14.01	14.01	17.21	17.21	20.64	20.64
Watershed 3	42.31	41.29	68.13	66.94	90.39	89.11	123.77	122.43	149.52	148.16	176.88	175.53
Watershed 4	35.16	34.35	57.37	56.40	76.63	75.57	105.60	104.47	128.01	126.86	151.86	150.69
Watershed 5	8.09	7.28	13.10	12.13	17.42	16.37	23.91	22.79	28.92	27.78	34.24	33.10
Watershed 6	0.71	0.63	1.18	1.08	1.59	1.49	2.21	2.10	2.69	2.58	3.21	3.09
Watershed 7	0.87	0.71	1.52	1.32	2.09	1.87	2.98	2.73	3.67	3.41	4.42	4.15
Watershed 8	11.66	11.66	18.86	18.86	25.09	25.09	34.44	34.44	41.65	41.65	49.33	49.33

CONCLUSION

The hydrologic analysis presented above, and supporting information in the Appendix, demonstrate that the proposed vineyard development will not increase the peak runoff rate in the affected watersheds.

HydroCad REPORTS & MAP
APPENDIX



WS 1 - pre project

Subcat Reach Pond Link

Routing Diagram for WS1 preR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS 1 - pre project

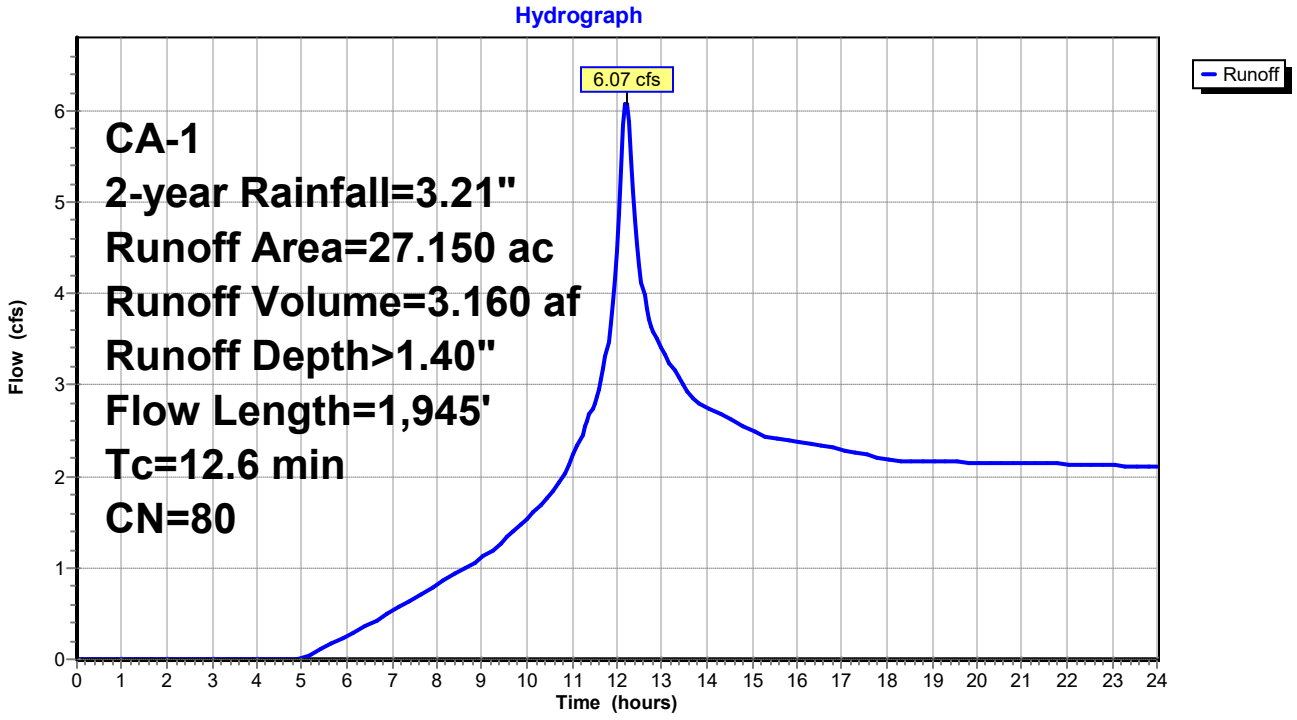
Runoff = 6.07 cfs @ 12.20 hrs, Volume= 3.160 af, Depth> 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
*	4.770	79	Vineyard, Fair, HSG C
*	0.880	84	Vineyard, Fair, HSG D
	14.750	79	Pasture/grassland/range, Fair, HSG C
	6.410	84	Pasture/grassland/range, Fair, HSG D
	0.020	74	Pasture/grassland/range, Good, HSG C
	0.320	77	Woods, Good, HSG D
	27.150	80	Weighted Average
	27.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	100	0.1300	0.40		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.9	576	0.1000	5.09		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.6	1,269	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.6	1,945	Total			

Subcatchment 1S: WS 1 - pre project



Summary for Subcatchment 1S: WS 1 - pre project

Runoff = 9.82 cfs @ 12.20 hrs, Volume= 5.067 af, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
*	4.770	79	Vineyard, Fair, HSG C
*	0.880	84	Vineyard, Fair, HSG D
	14.750	79	Pasture/grassland/range, Fair, HSG C
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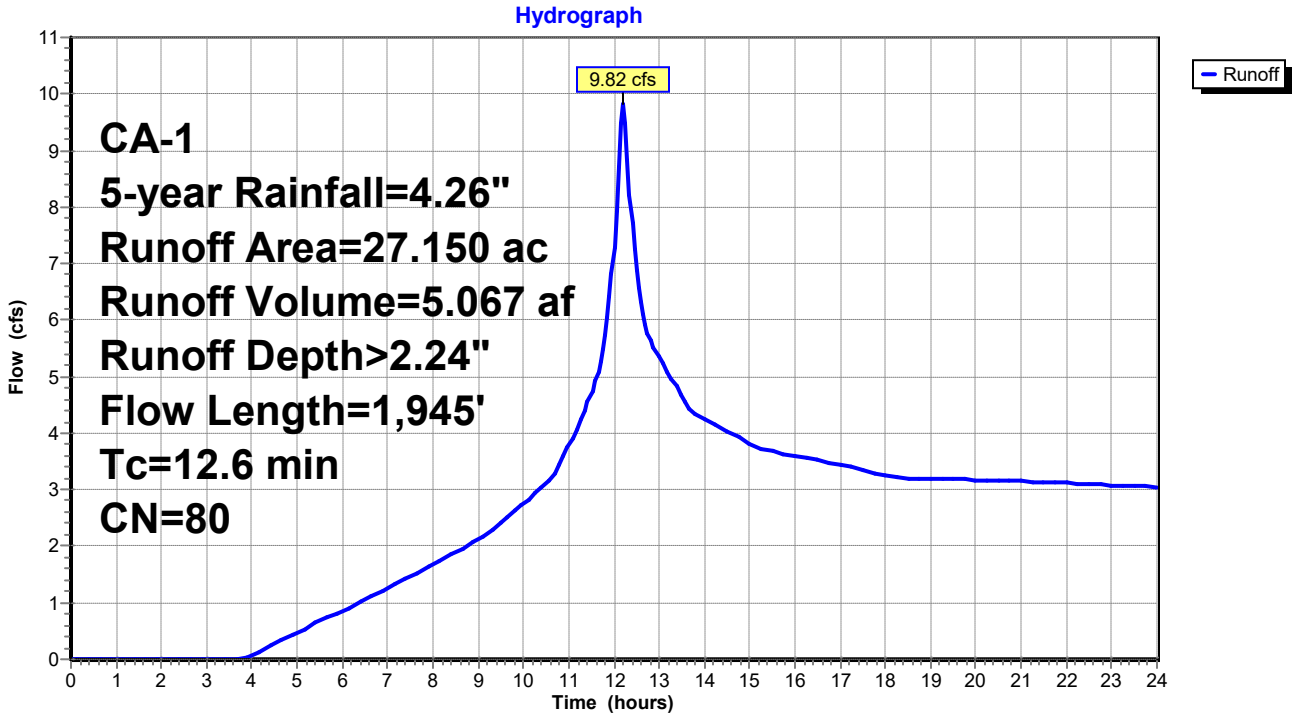

Summary for Subcatchment 1S: WS 1 - pre project

Runoff = 13.07 cfs @ 12.20 hrs, Volume= 6.748 af, Depth> 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
*	4.770	79	Vineyard, Fair, HSG C
*	0.880	84	Vineyard, Fair, HSG D
	14.750	79	Pasture/grassland/range, Fair, HSG C
	6.410	84	Pasture/grassland/range, Fair, HSG D
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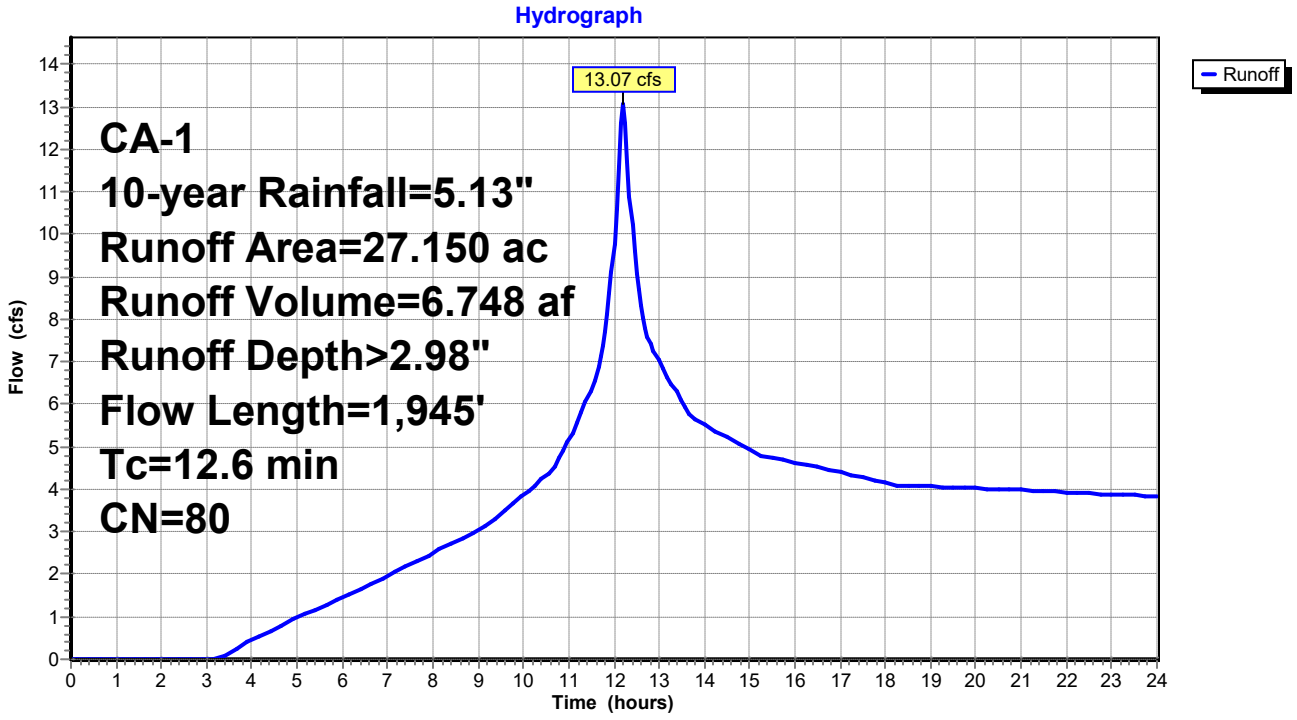
Subcatchment 1S: WS 1 - pre project



Summary for Subcatchment 1S: WS 1 - pre project

Runoff = 17.94 cfs @ 12.20 hrs, Volume= 9.326 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
*	4.770	79	Vineyard, Fair, HSG C
*	0.880	84	Vineyard, Fair, HSG D
	14.750	79	Pasture/grassland/range, Fair, HSG C
	6.410	84	Pasture/grassland/range, Fair, HSG D
	0.020	74	Pasture/grassland/range, Good, HSG C
	0.320	77	Woods, Good, HSG D
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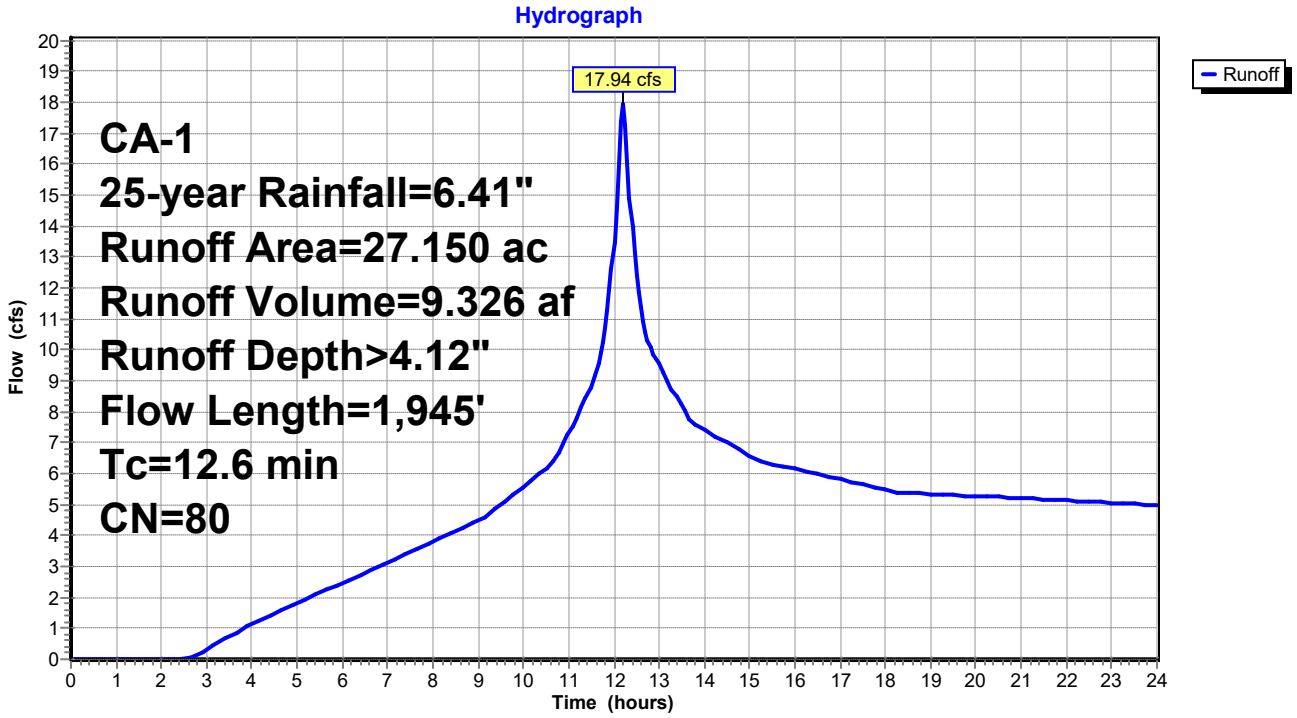
6.6	1,269	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.6	1,945	Total			

Subcatchment 1S: WS 1 - pre project



Summary for Subcatchment 1S: WS 1 - pre project

Runoff = 21.70 cfs @ 12.20 hrs, Volume= 11.356 af, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
*	4.770	79	Vineyard, Fair, HSG C
*	0.880	84	Vineyard, Fair, HSG D
	14.750	79	Pasture/grassland/range, Fair, HSG C
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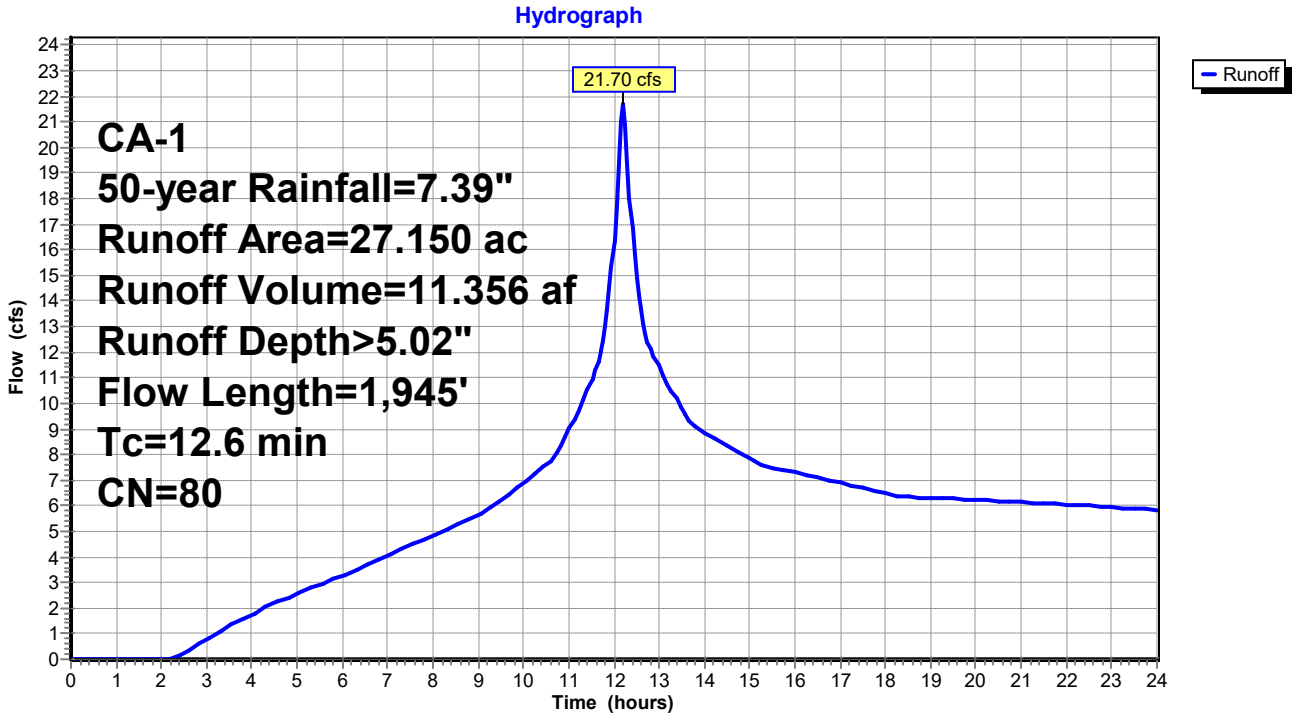
12.6	1,945	Total			

Subcatchment 1S: WS 1 - pre project



Summary for Subcatchment 1S: WS 1 - pre project

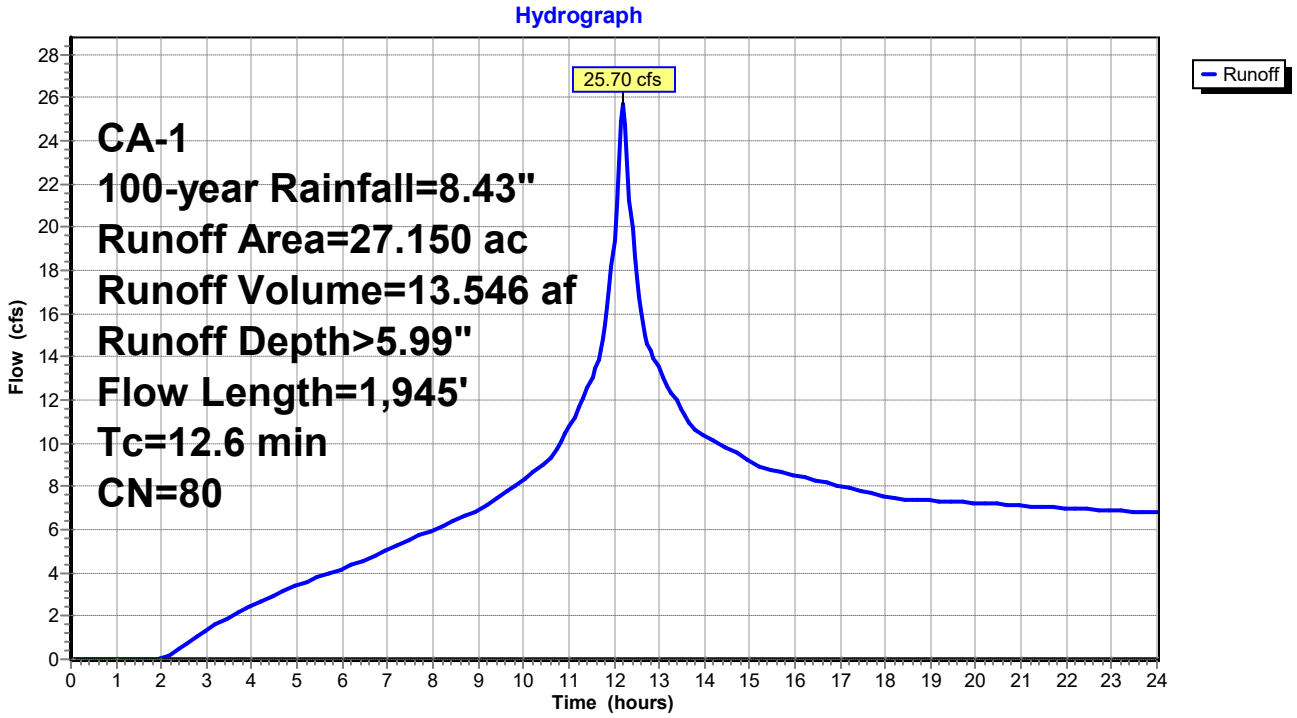
Runoff = 25.70 cfs @ 12.20 hrs, Volume= 13.546 af, Depth> 5.99"

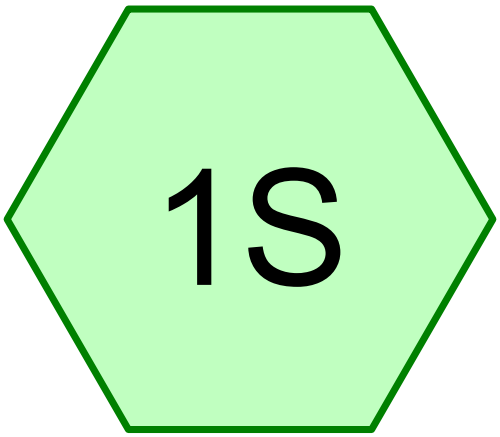
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
*	4.770	79	Vineyard, Fair, HSG C
*	0.880	84	Vineyard, Fair, HSG D
	14.750	79	Pasture/grassland/range, Fair, HSG C
	6.410	84	Pasture/grassland/range, Fair, HSG D
	0.020	74	Pasture/grassland/range, Good, HSG C
	0.320	77	Woods, Good, HSG D
	27.150	80	Weighted Average
	27.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	100	0.1300	0.40		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.9	576	0.1000	5.09		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.6	1,269	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.6	1,945	Total			

Subcatchment 1S: WS 1 - pre project





WS1 - post project

Subcat Reach Pond Link

Routing Diagram for WS1 postR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS1 - post project

Runoff = 6.07 cfs @ 12.20 hrs, Volume= 3.160 af, Depth> 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
*	1.420	75	Vineyard, Good, HSG C
*	4.770	79	Vineyard, Fair, HSG C
*	0.880	84	Vineyard, Fair, HSG D
	13.330	79	Pasture/grassland/range, Fair, HSG C
	6.410	84	Pasture/grassland/range, Fair, HSG D
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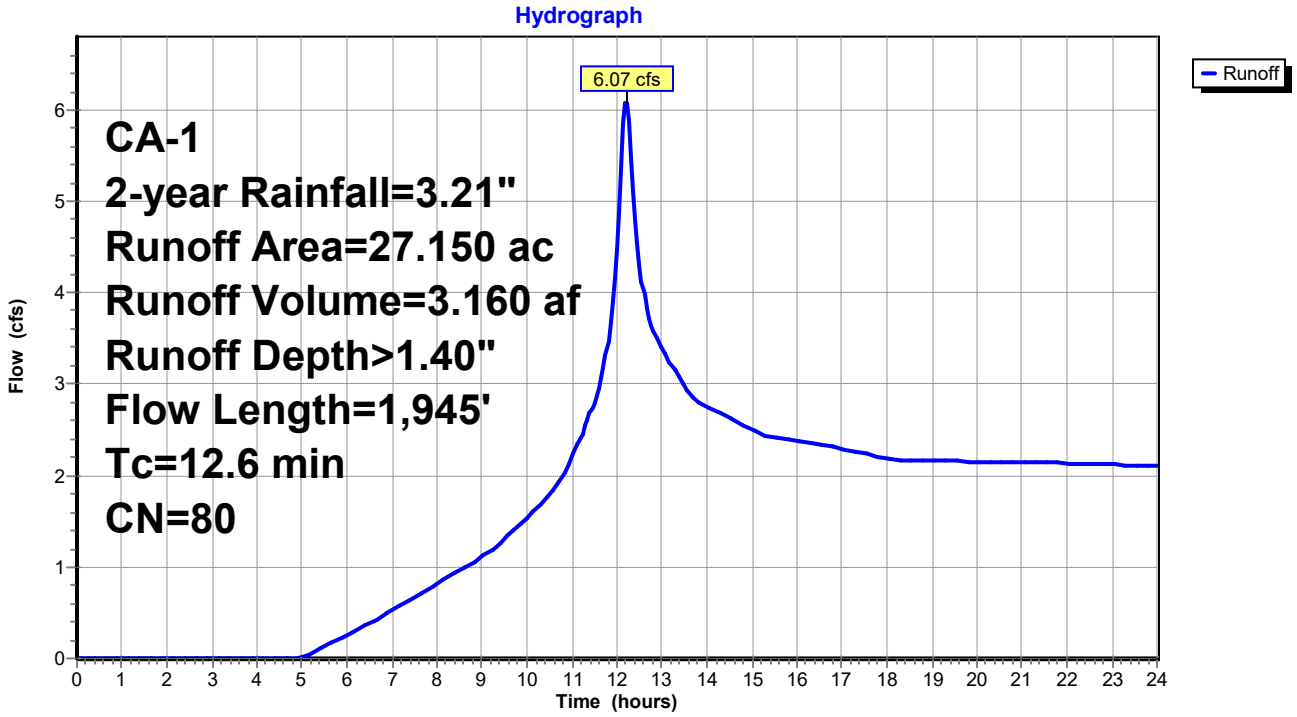

Summary for Subcatchment 1S: WS1 - post project

Runoff = 9.82 cfs @ 12.20 hrs, Volume= 5.067 af, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
*	1.420	75	Vineyard, Good, HSG C
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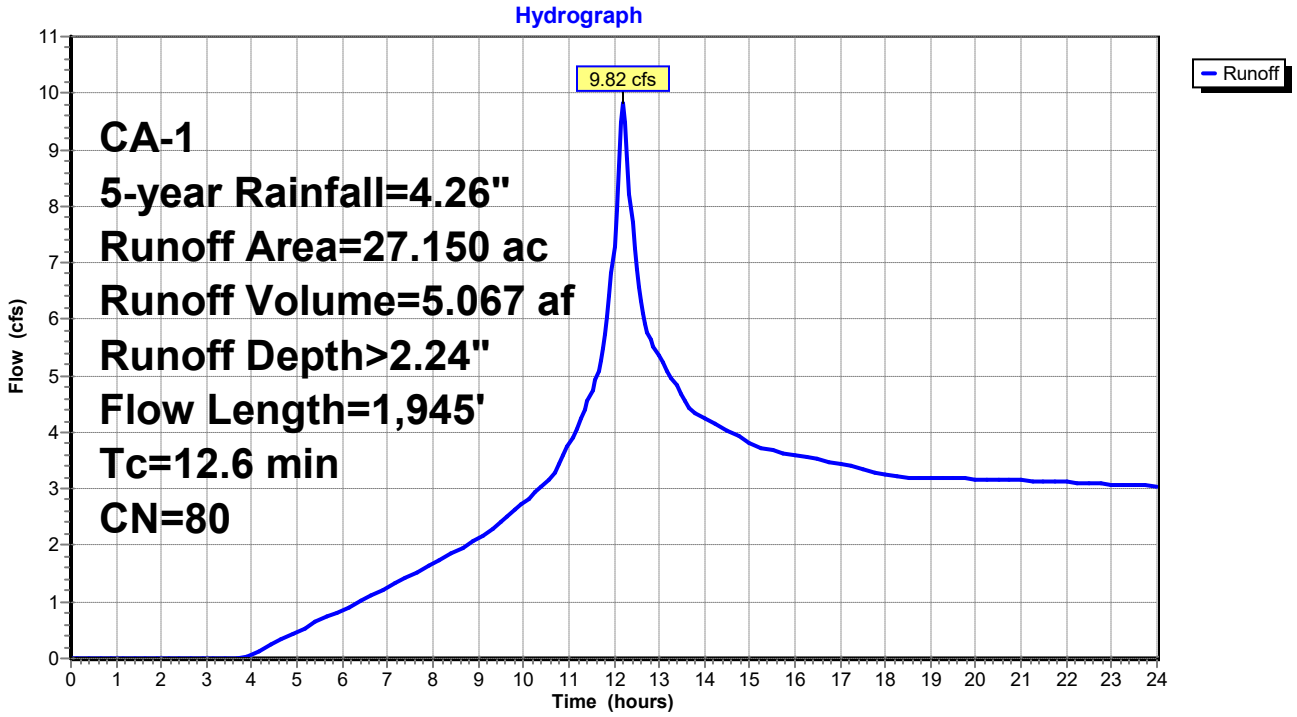

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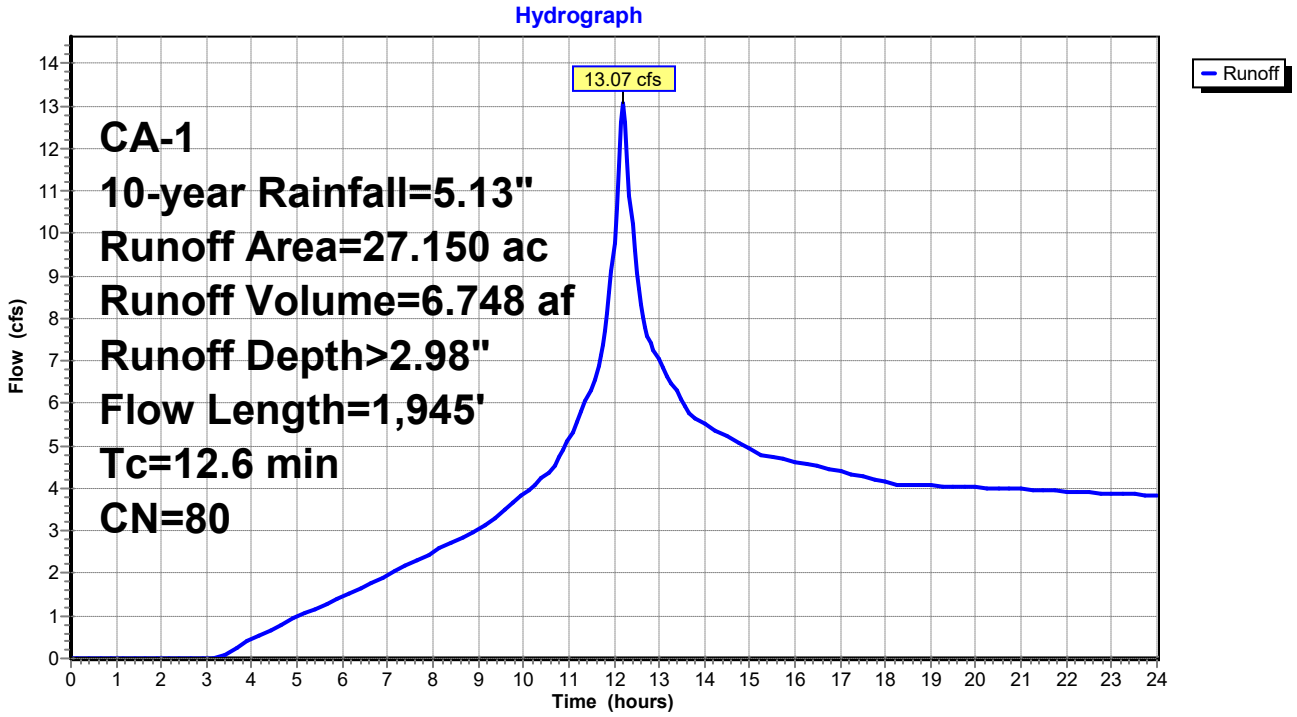

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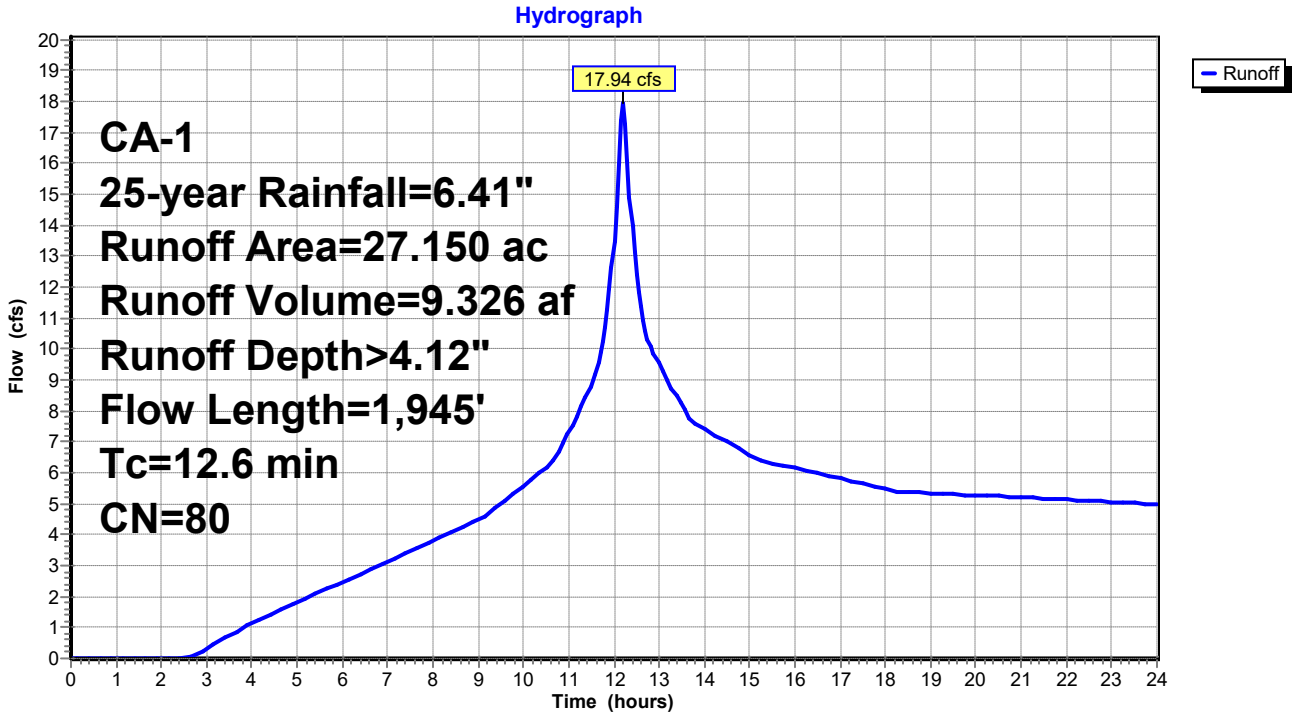

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CA-1 50-year Rainfall=7.39"

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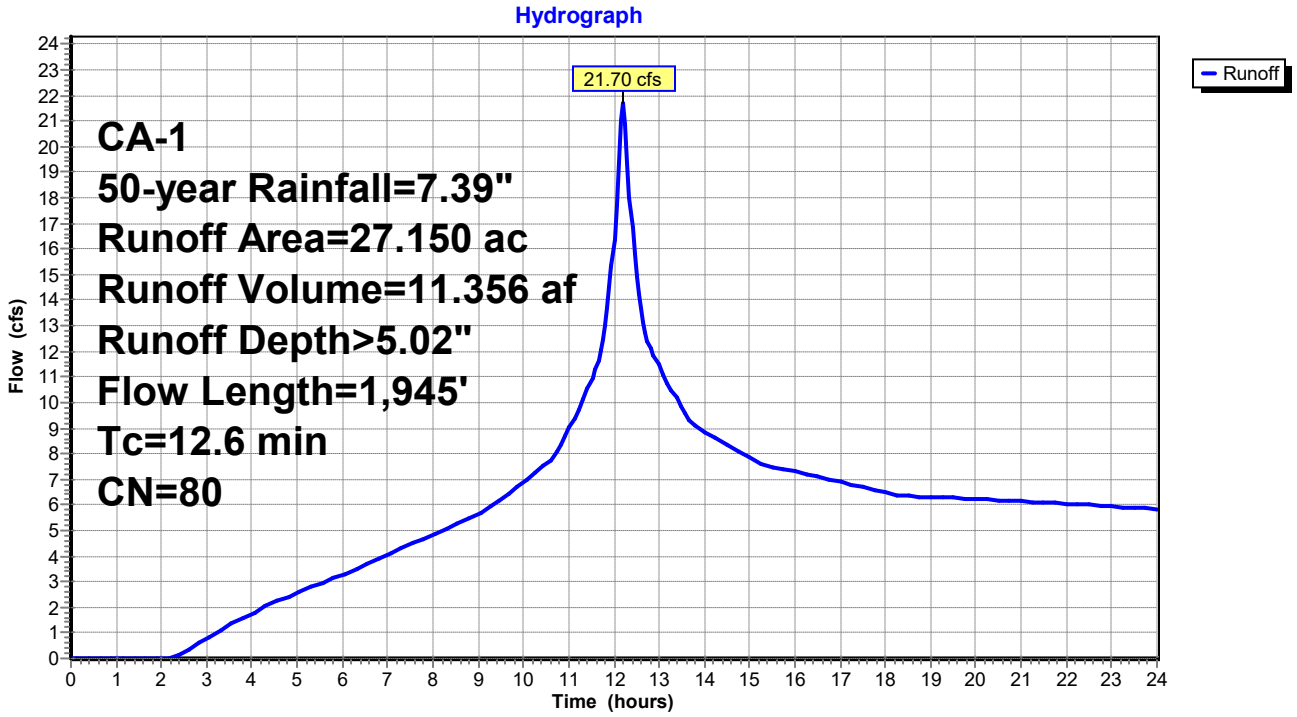
	27.150	80	Weighted Average
	27.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	100	0.1300	0.40		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.9	576	0.1000	5.09		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.6	1,269	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.6	1,945	Total			

Subcatchment 1S: WS1 - post project



Summary for Subcatchment 1S: WS1 - post project

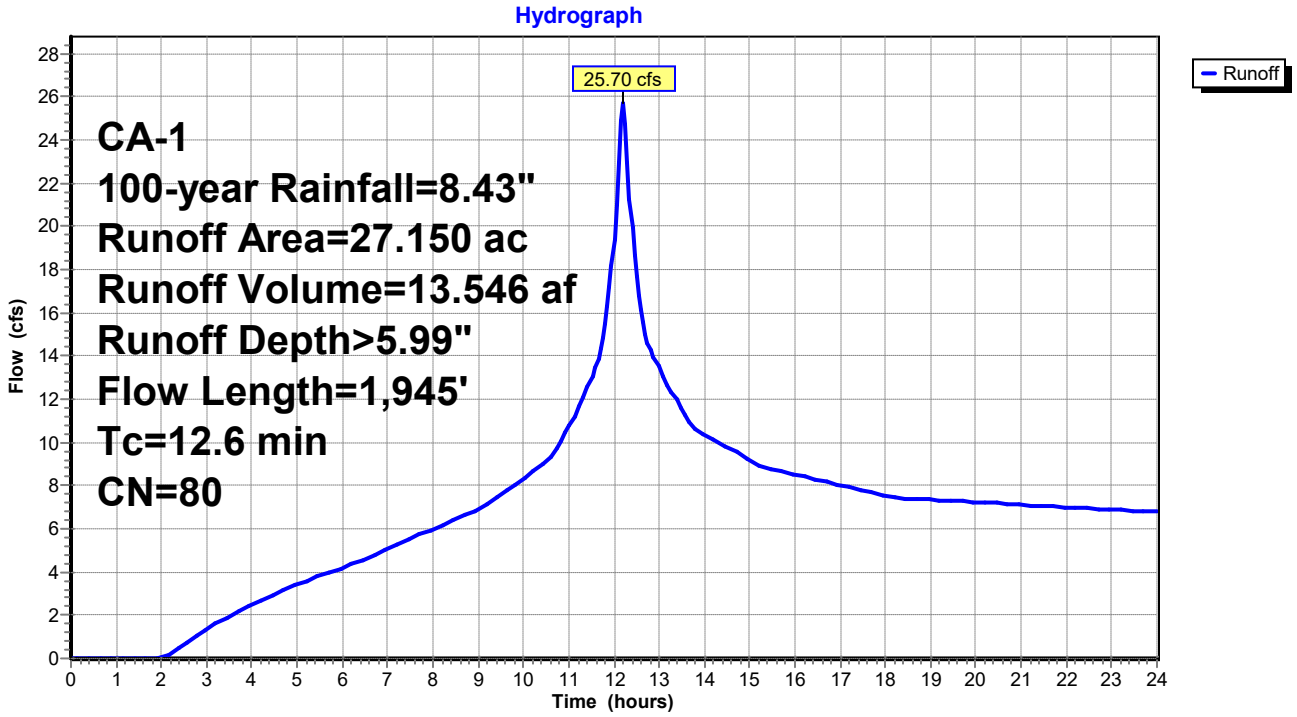
Runoff = 25.70 cfs @ 12.20 hrs, Volume= 13.546 af, Depth> 5.99"

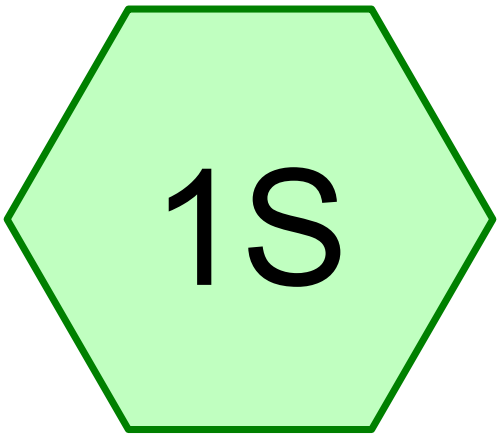
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
*	1.420	75	Vineyard, Good, HSG C
*	4.770	79	Vineyard, Fair, HSG C
*	0.880	84	Vineyard, Fair, HSG D
	13.330	79	Pasture/grassland/range, Fair, HSG C
	6.410	84	Pasture/grassland/range, Fair, HSG D
	0.020	74	Pasture/grassland/range, Good, HSG C
	0.320	70	Woods, Good, HSG C
	27.150	80	Weighted Average
	27.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	100	0.1300	0.40		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.9	576	0.1000	5.09		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.6	1,269	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.6	1,945	Total			

Subcatchment 1S: WS1 - post project





WS2 - pre project

Subcat Reach Pond Link

Routing Diagram for WS2 preR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS2 - pre project

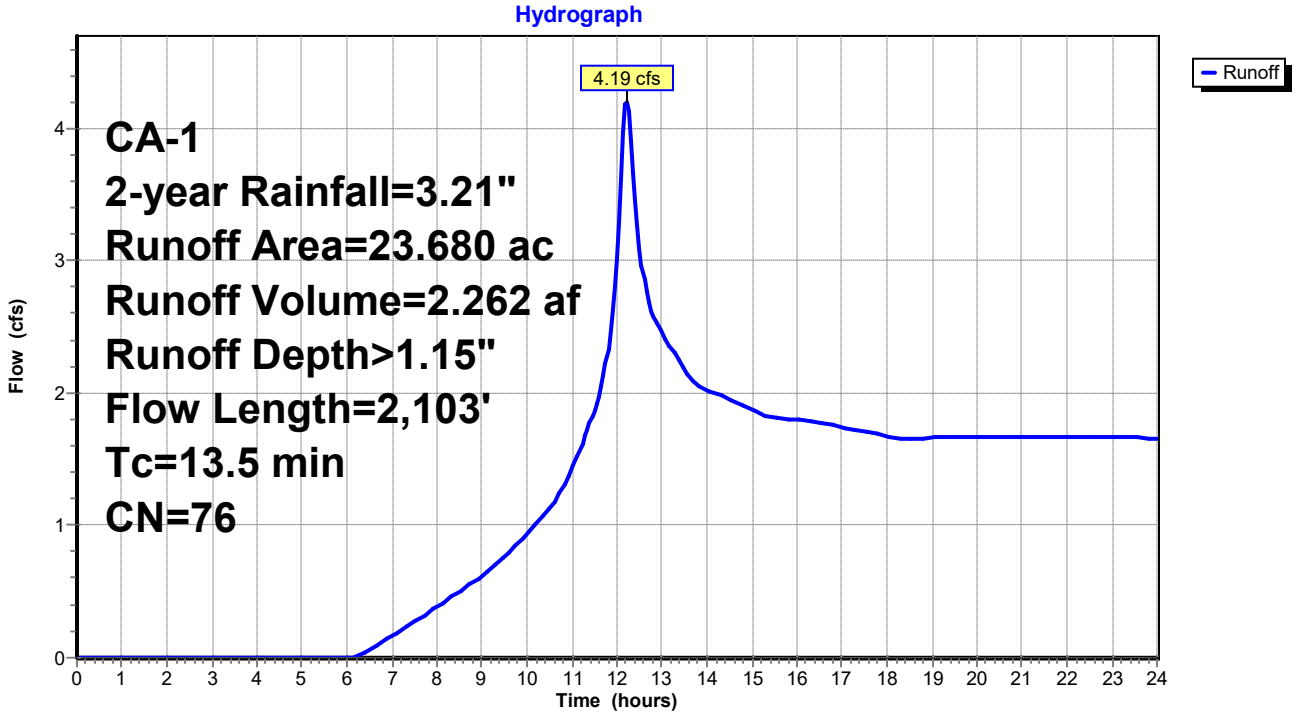
Runoff = 4.19 cfs @ 12.22 hrs, Volume= 2.262 af, Depth> 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
*	7.360	79	Vineyard, Fair, HSG C
	3.180	79	Pasture/grassland/range, Fair, HSG C
	11.720	74	Pasture/grassland/range, Good, HSG C
	0.670	86	Pasture/grassland/range, Poor, HSG C
	0.750	70	Woods, Good, HSG C
	23.680	76	Weighted Average
	23.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.9	1,120	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.6	883	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	2,103	Total			

Subcatchment 1S: WS2 - pre project



Summary for Subcatchment 1S: WS2 - pre project

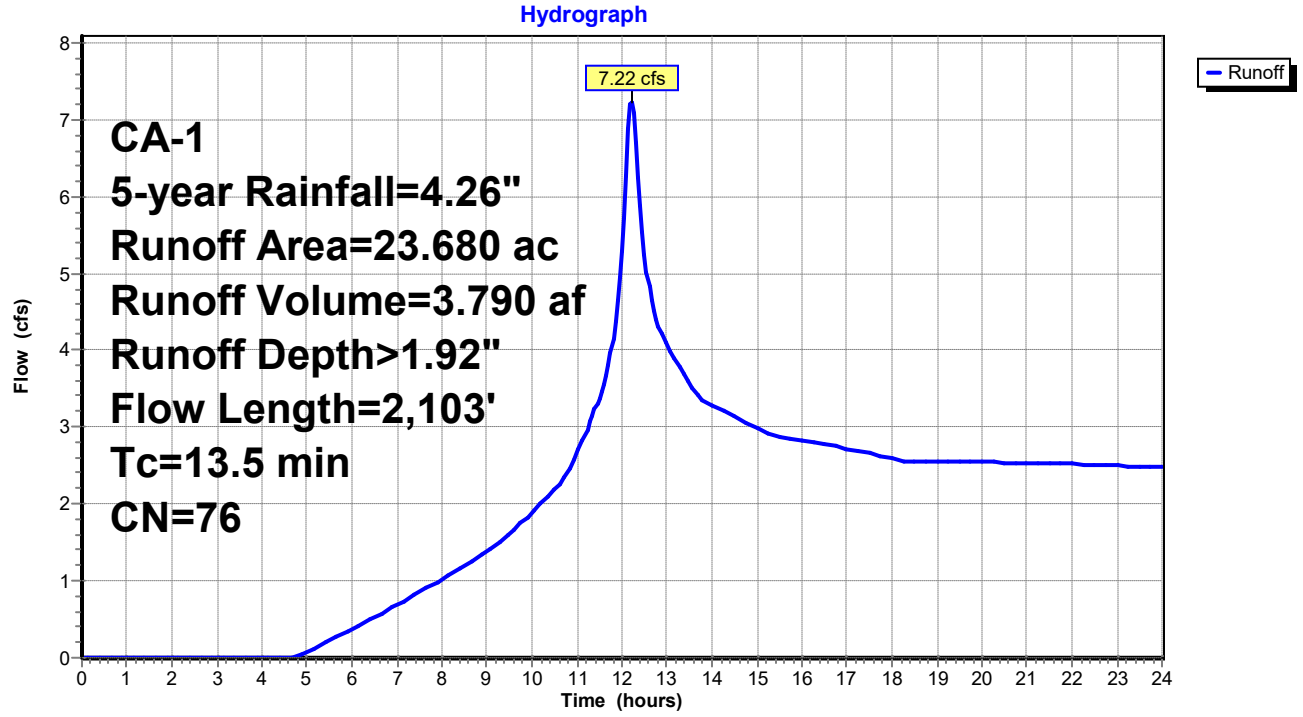
Runoff = 7.22 cfs @ 12.21 hrs, Volume= 3.790 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
*	7.360	79	Vineyard, Fair, HSG C
	3.180	79	Pasture/grassland/range, Fair, HSG C
	11.720	74	Pasture/grassland/range, Good, HSG C
	0.670	86	Pasture/grassland/range, Poor, HSG C
	0.750	70	Woods, Good, HSG C
	23.680	76	Weighted Average
	23.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.9	1,120	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.6	883	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	2,103	Total			

Subcatchment 1S: WS2 - pre project



Summary for Subcatchment 1S: WS2 - pre project

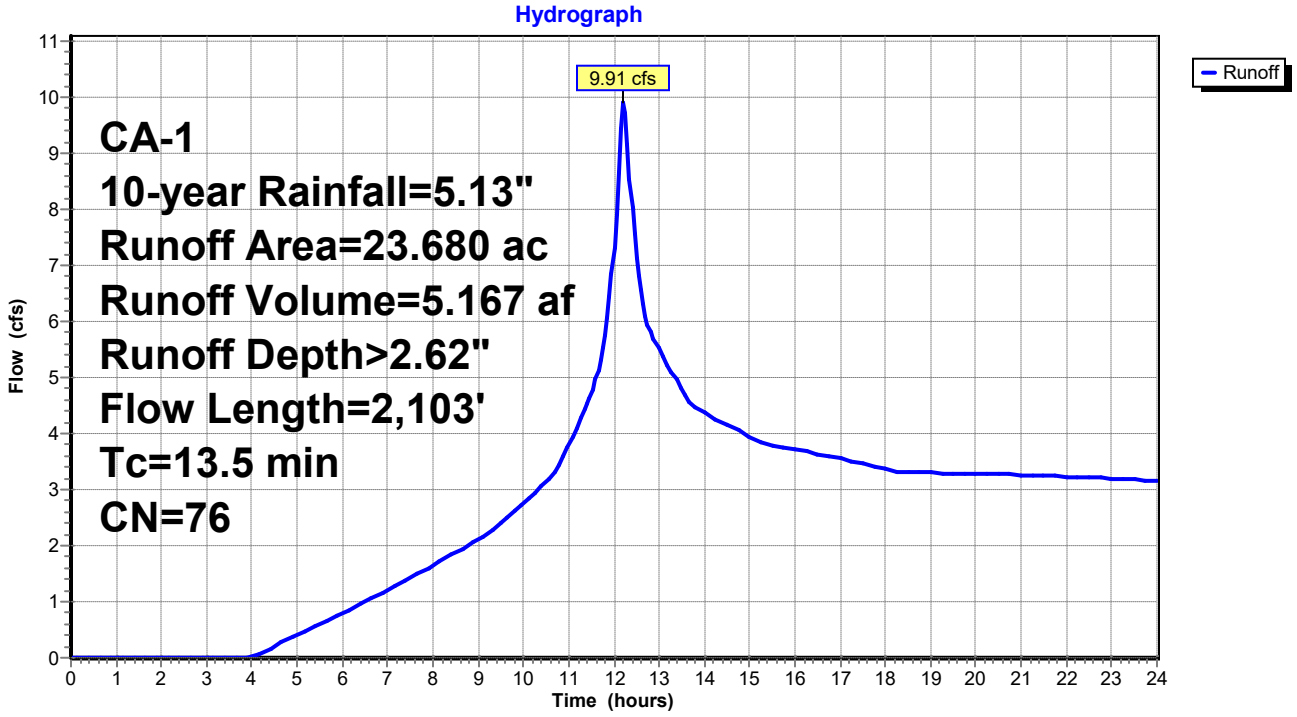
Runoff = 9.91 cfs @ 12.21 hrs, Volume= 5.167 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
*	7.360	79	Vineyard, Fair, HSG C
	3.180	79	Pasture/grassland/range, Fair, HSG C
	11.720	74	Pasture/grassland/range, Good, HSG C
	0.670	86	Pasture/grassland/range, Poor, HSG C
	0.750	70	Woods, Good, HSG C
	23.680	76	Weighted Average
	23.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.9	1,120	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.6	883	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	2,103	Total			

Subcatchment 1S: WS2 - pre project



Summary for Subcatchment 1S: WS2 - pre project

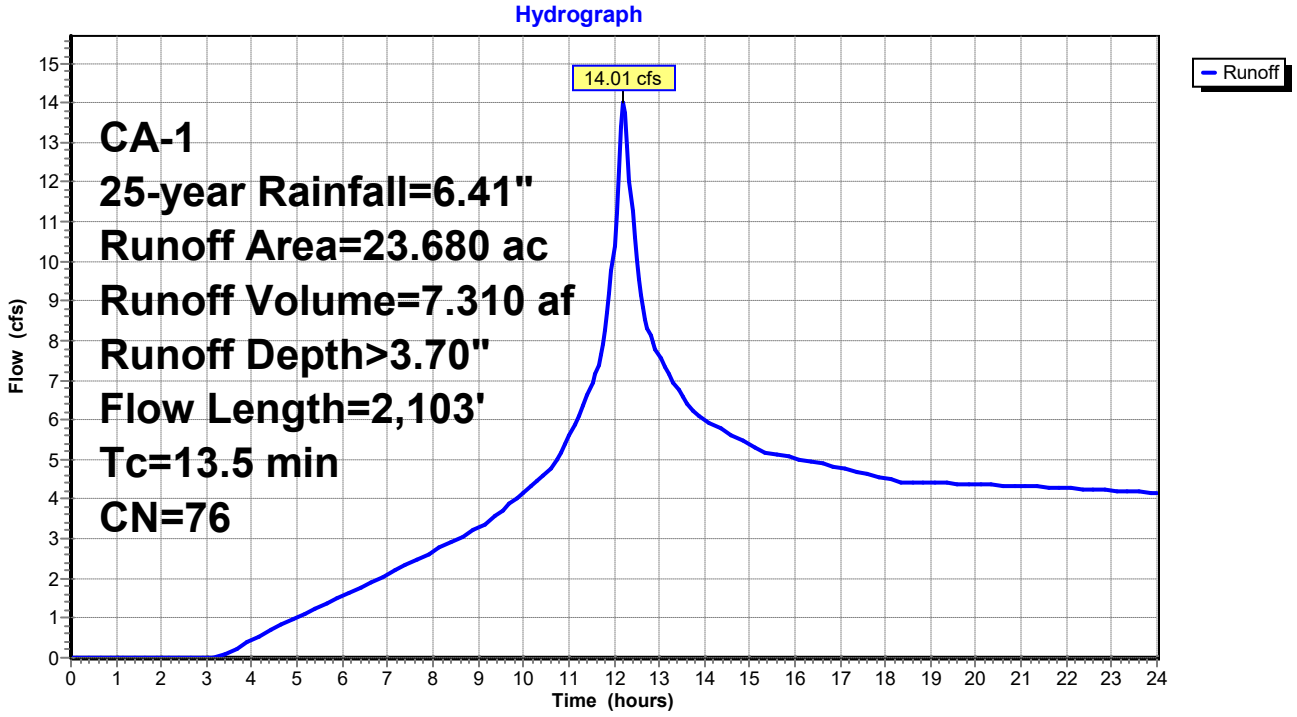
Runoff = 14.01 cfs @ 12.21 hrs, Volume= 7.310 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
*	7.360	79	Vineyard, Fair, HSG C
	3.180	79	Pasture/grassland/range, Fair, HSG C
	11.720	74	Pasture/grassland/range, Good, HSG C
	0.670	86	Pasture/grassland/range, Poor, HSG C
	0.750	70	Woods, Good, HSG C
	23.680	76	Weighted Average
	23.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.9	1,120	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.6	883	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	2,103	Total			

Subcatchment 1S: WS2 - pre project



Summary for Subcatchment 1S: WS2 - pre project

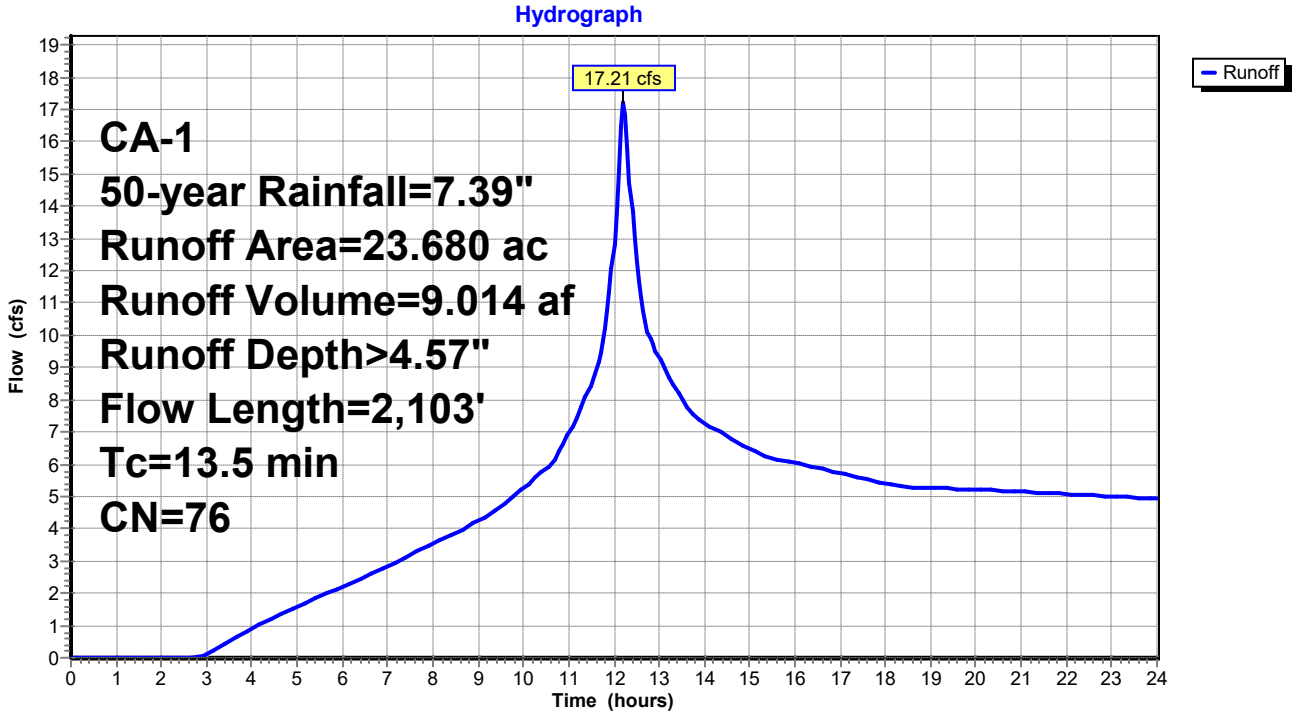
Runoff = 17.21 cfs @ 12.21 hrs, Volume= 9.014 af, Depth> 4.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
*	7.360	79	Vineyard, Fair, HSG C
	3.180	79	Pasture/grassland/range, Fair, HSG C
	11.720	74	Pasture/grassland/range, Good, HSG C
	0.670	86	Pasture/grassland/range, Poor, HSG C
	0.750	70	Woods, Good, HSG C
	23.680	76	Weighted Average
	23.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.9	1,120	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.6	883	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	2,103	Total			

Subcatchment 1S: WS2 - pre project



Summary for Subcatchment 1S: WS2 - pre project

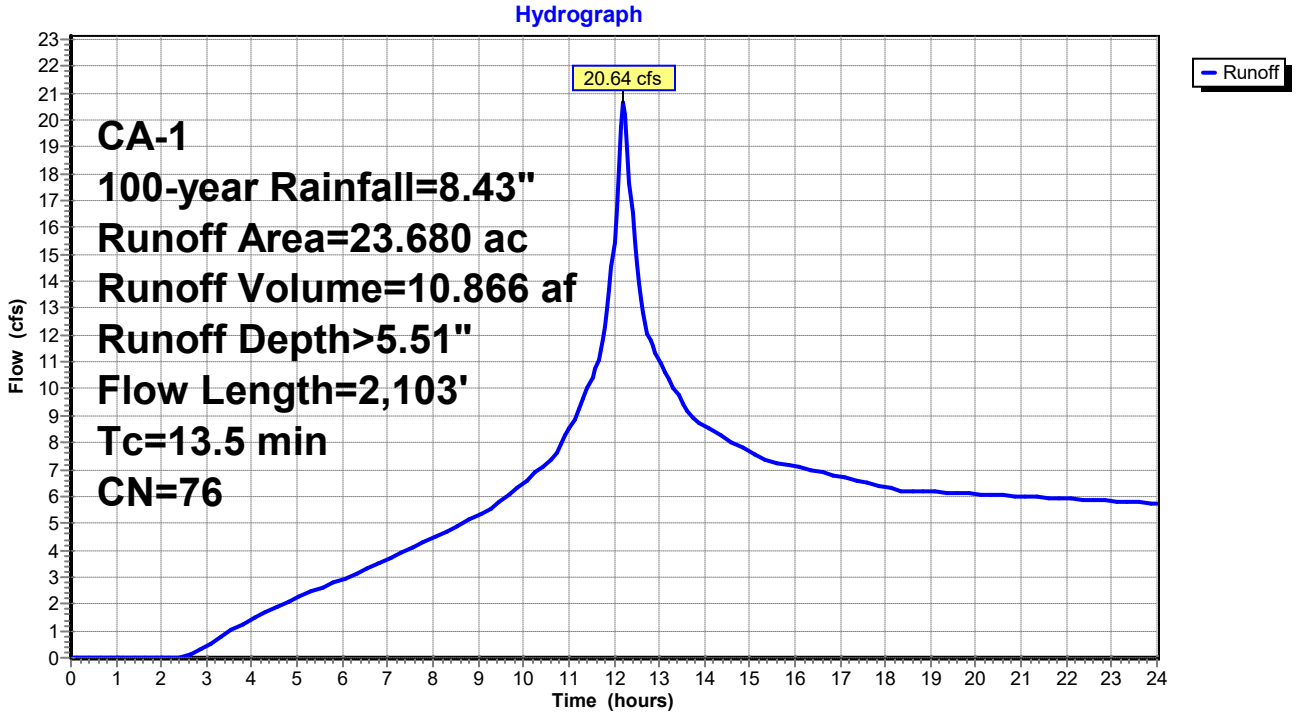
Runoff = 20.64 cfs @ 12.21 hrs, Volume= 10.866 af, Depth> 5.51"

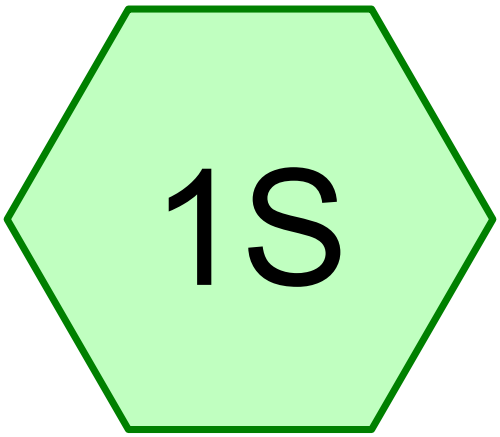
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
*	7.360	79	Vineyard, Fair, HSG C
	3.180	79	Pasture/grassland/range, Fair, HSG C
	11.720	74	Pasture/grassland/range, Good, HSG C
	0.670	86	Pasture/grassland/range, Poor, HSG C
	0.750	70	Woods, Good, HSG C
	23.680	76	Weighted Average
	23.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.9	1,120	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.6	883	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	2,103	Total			

Subcatchment 1S: WS2 - pre project





WS2 - post project

Subcat Reach Pond Link

Routing Diagram for WS2 postR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS2 - post project

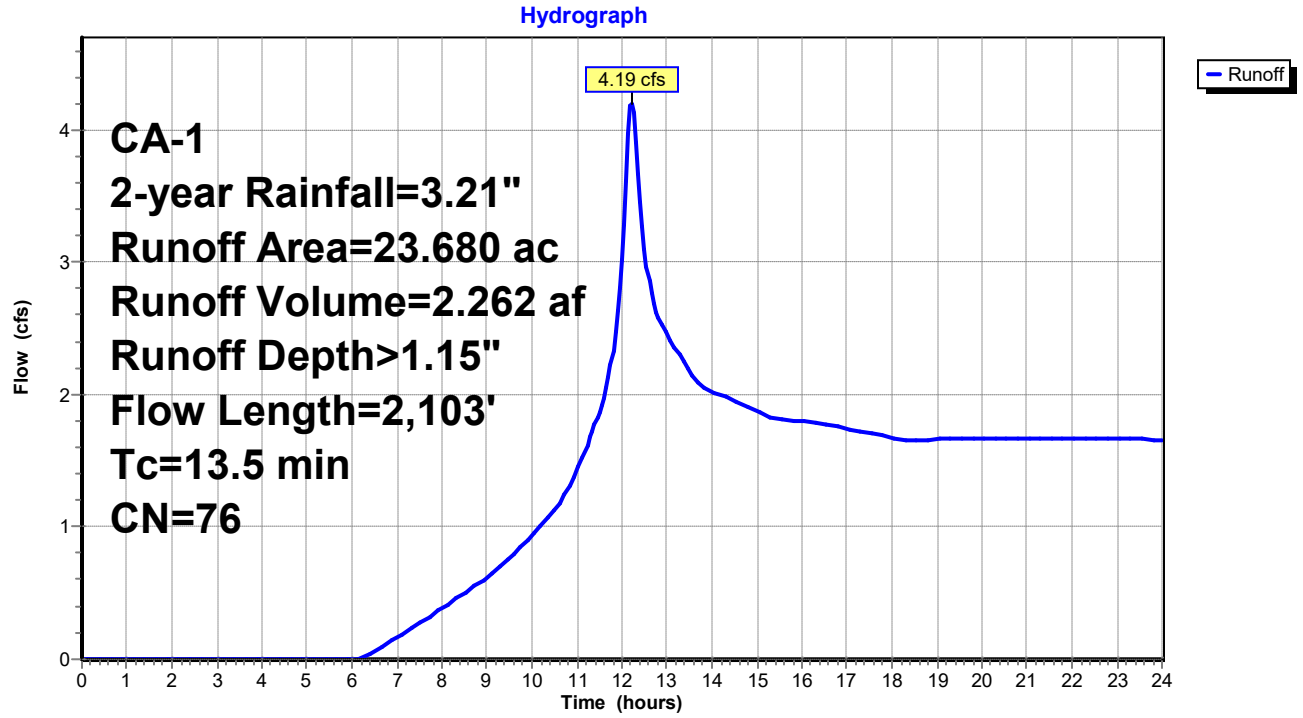
Runoff = 4.19 cfs @ 12.22 hrs, Volume= 2.262 af, Depth> 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
*	1.530	75	Vineyard, Good HSG C
*	7.360	79	Vineyard, Fair, HSG C
	1.650	79	Pasture/grassland/range, Fair, HSG C
	0.670	86	Pasture/grassland/range, Poor, HSG C
	11.720	74	Pasture/grassland/range, Good, HSG C
	0.750	70	Woods, Good, HSG C
	23.680	76	Weighted Average
	23.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.9	1,120	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.6	883	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	2,103	Total			

Subcatchment 1S: WS2 - post project



Summary for Subcatchment 1S: WS2 - post project

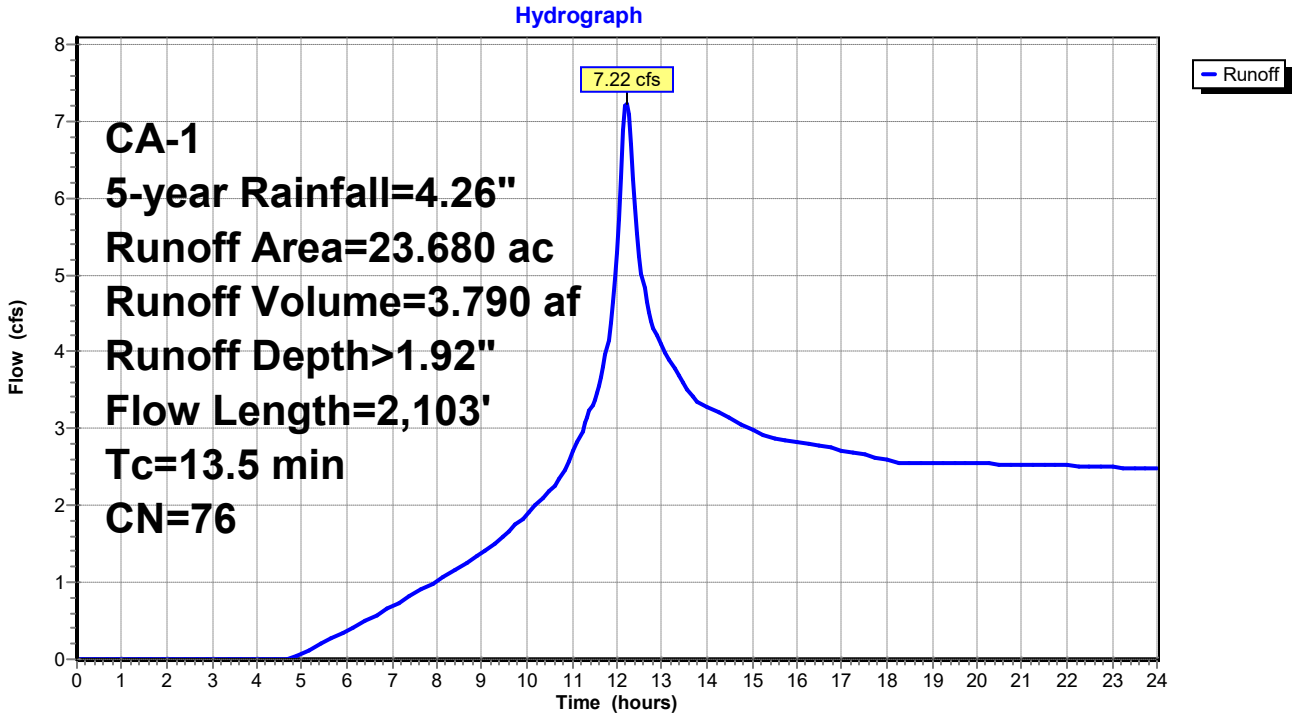
Runoff = 7.22 cfs @ 12.21 hrs, Volume= 3.790 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
*	1.530	75	Vineyard, Good HSG C
*	7.360	79	Vineyard, Fair, HSG C
	1.650	79	Pasture/grassland/range, Fair, HSG C
	0.670	86	Pasture/grassland/range, Poor, HSG C
	11.720	74	Pasture/grassland/range, Good, HSG C
	0.750	70	Woods, Good, HSG C
	23.680	76	Weighted Average
	23.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.9	1,120	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.6	883	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	2,103	Total			

Subcatchment 1S: WS2 - post project



Summary for Subcatchment 1S: WS2 - post project

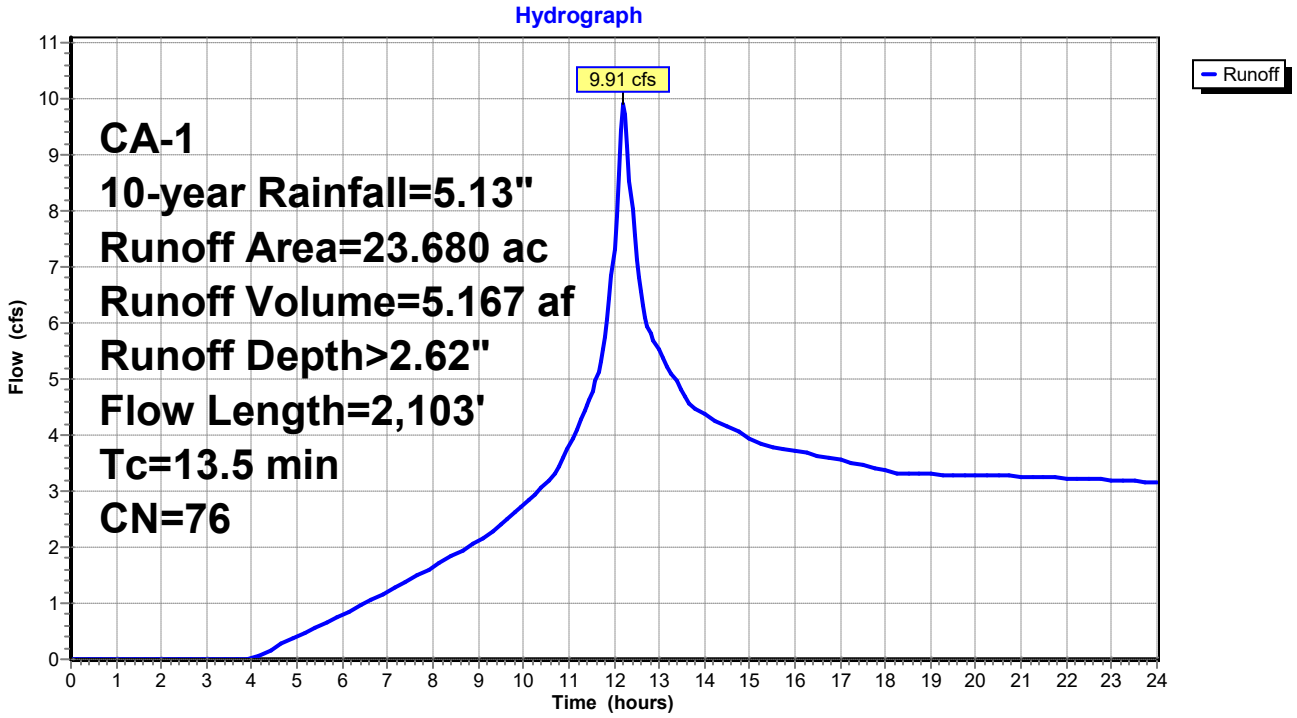
Runoff = 9.91 cfs @ 12.21 hrs, Volume= 5.167 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
*	1.530	75	Vineyard, Good HSG C
*	7.360	79	Vineyard, Fair, HSG C
	1.650	79	Pasture/grassland/range, Fair, HSG C
	0.670	86	Pasture/grassland/range, Poor, HSG C
	11.720	74	Pasture/grassland/range, Good, HSG C
	0.750	70	Woods, Good, HSG C
	23.680	76	Weighted Average
	23.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.9	1,120	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.6	883	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	2,103	Total			

Subcatchment 1S: WS2 - post project



Summary for Subcatchment 1S: WS2 - post project

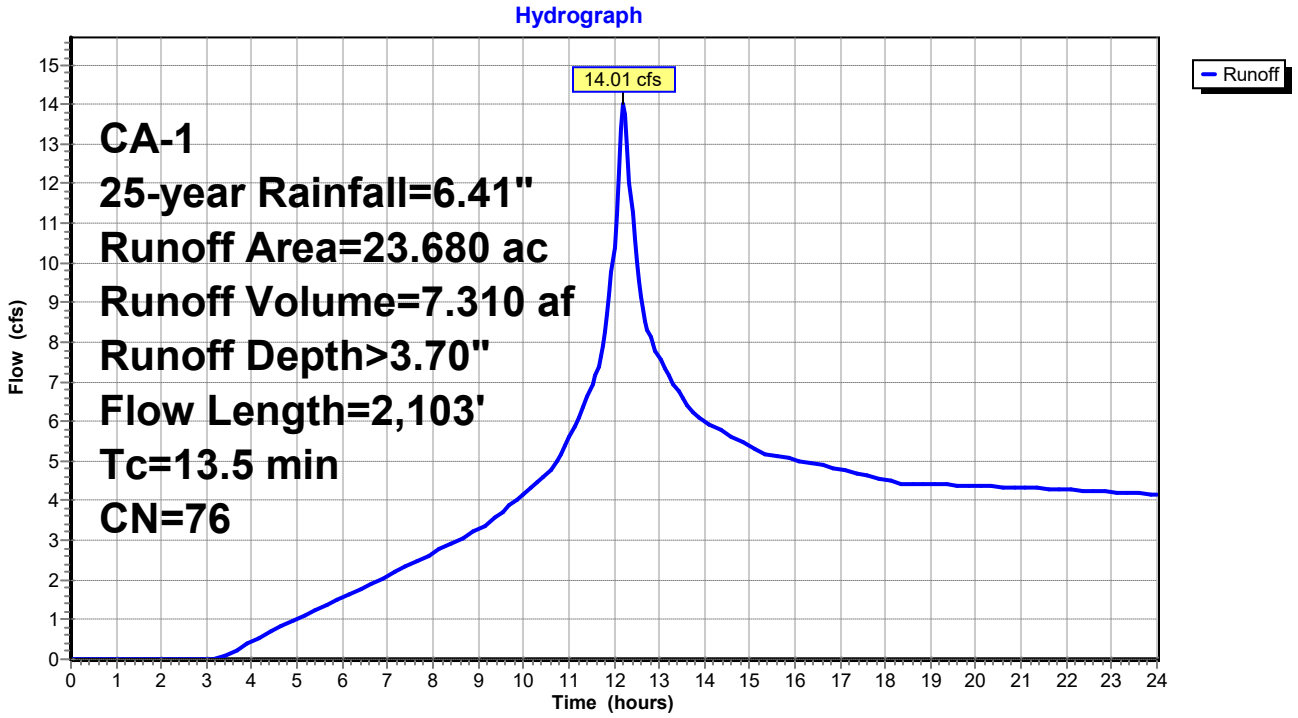
Runoff = 14.01 cfs @ 12.21 hrs, Volume= 7.310 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
*	1.530	75	Vineyard, Good HSG C
*	7.360	79	Vineyard, Fair, HSG C
	1.650	79	Pasture/grassland/range, Fair, HSG C
	0.670	86	Pasture/grassland/range, Poor, HSG C
	11.720	74	Pasture/grassland/range, Good, HSG C
	0.750	70	Woods, Good, HSG C
	23.680	76	Weighted Average
	23.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.9	1,120	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.6	883	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	2,103	Total			

Subcatchment 1S: WS2 - post project



Summary for Subcatchment 1S: WS2 - post project

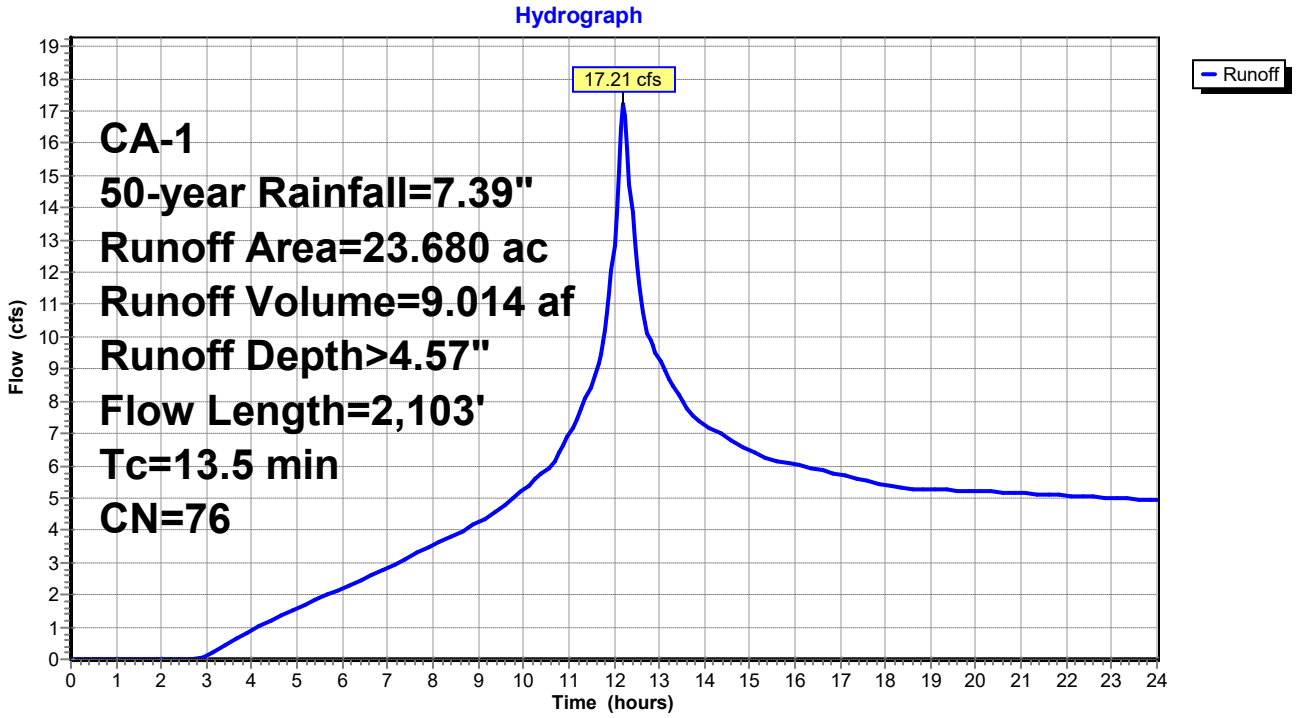
Runoff = 17.21 cfs @ 12.21 hrs, Volume= 9.014 af, Depth> 4.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
*	1.530	75	Vineyard, Good HSG C
*	7.360	79	Vineyard, Fair, HSG C
	1.650	79	Pasture/grassland/range, Fair, HSG C
	0.670	86	Pasture/grassland/range, Poor, HSG C
	11.720	74	Pasture/grassland/range, Good, HSG C
	0.750	70	Woods, Good, HSG C
	23.680	76	Weighted Average
	23.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.9	1,120	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.6	883	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	2,103	Total			

Subcatchment 1S: WS2 - post project



Summary for Subcatchment 1S: WS2 - post project

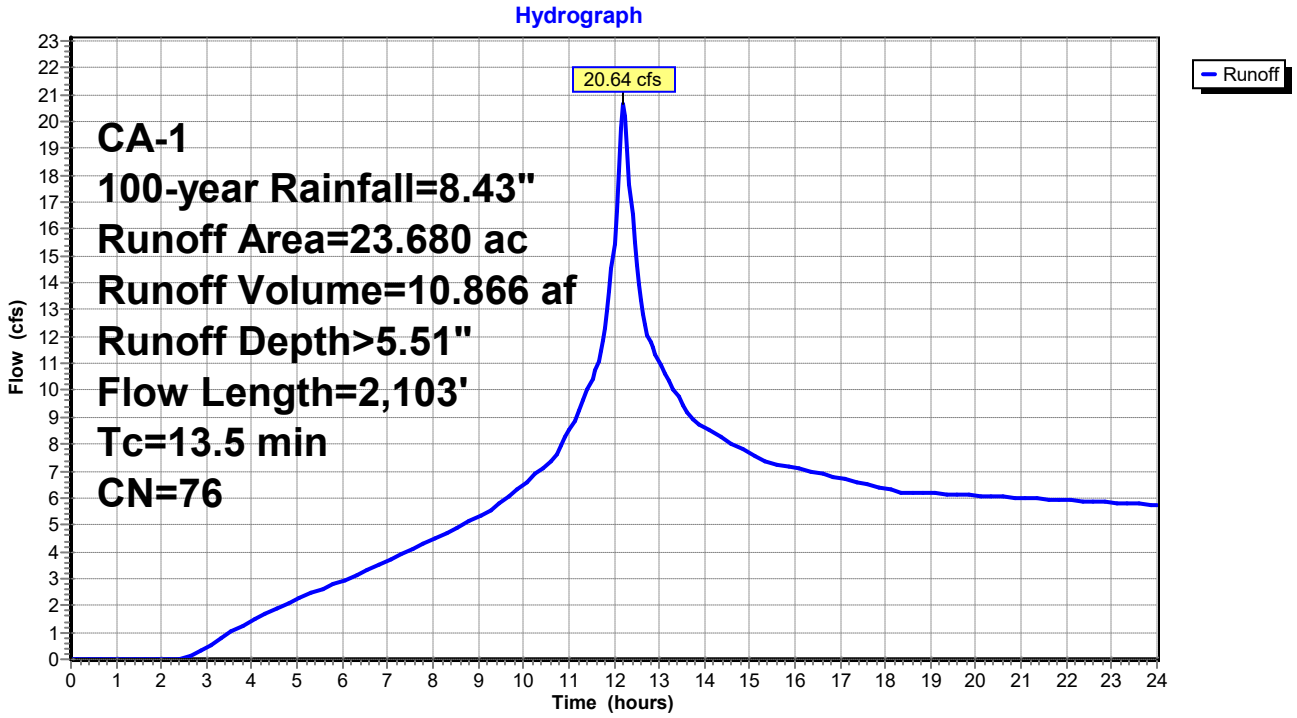
Runoff = 20.64 cfs @ 12.21 hrs, Volume= 10.866 af, Depth> 5.51"

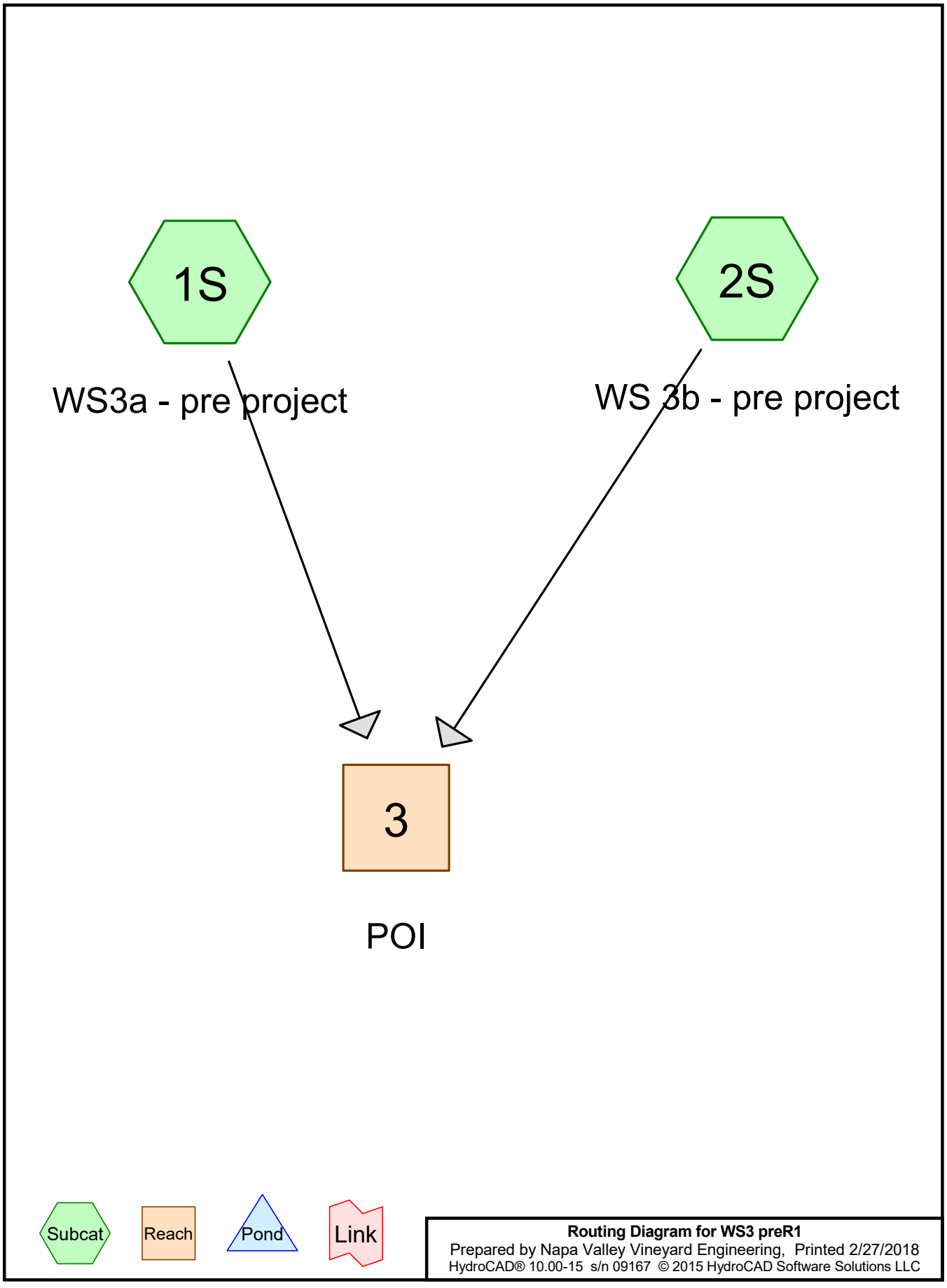
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
*	1.530	75	Vineyard, Good HSG C
*	7.360	79	Vineyard, Fair, HSG C
	1.650	79	Pasture/grassland/range, Fair, HSG C
	0.670	86	Pasture/grassland/range, Poor, HSG C
	11.720	74	Pasture/grassland/range, Good, HSG C
	0.750	70	Woods, Good, HSG C
	23.680	76	Weighted Average
	23.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.9	1,120	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.6	883	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	2,103	Total			

Subcatchment 1S: WS2 - post project





Routing Diagram for WS3 preR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS3a - pre project

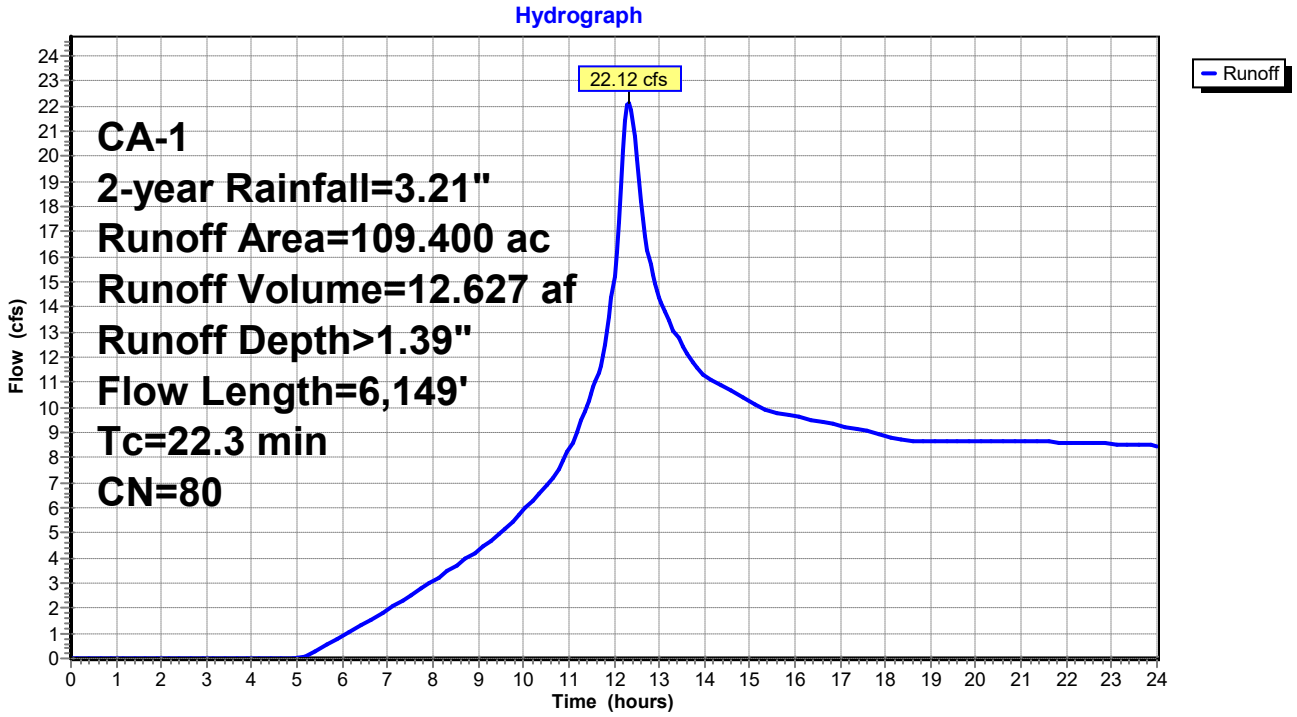
Runoff = 22.12 cfs @ 12.33 hrs, Volume= 12.627 af, Depth> 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
*	15.690	79	Vineyard, Fair, HSG C
*	6.470	84	Vineyard, Fair, HSG D
	62.240	79	Pasture/grassland/range, Fair, HSG C
	22.980	84	Pasture/grassland/range, Fair, HSG D
	0.290	74	Pasture/grassland/range, Good, HSG C
	0.810	80	Pasture/grassland/range, Good, HSG D
	0.920	77	Woods, Good, HSG D
	109.400	80	Weighted Average
	109.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
7.2	2,934	0.1800	6.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,150	0.1100	18.03	540.80	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
10.2	1,965	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
22.3	6,149	Total			

Subcatchment 1S: WS3a - pre project



Summary for Subcatchment 2S: WS 3b - pre project

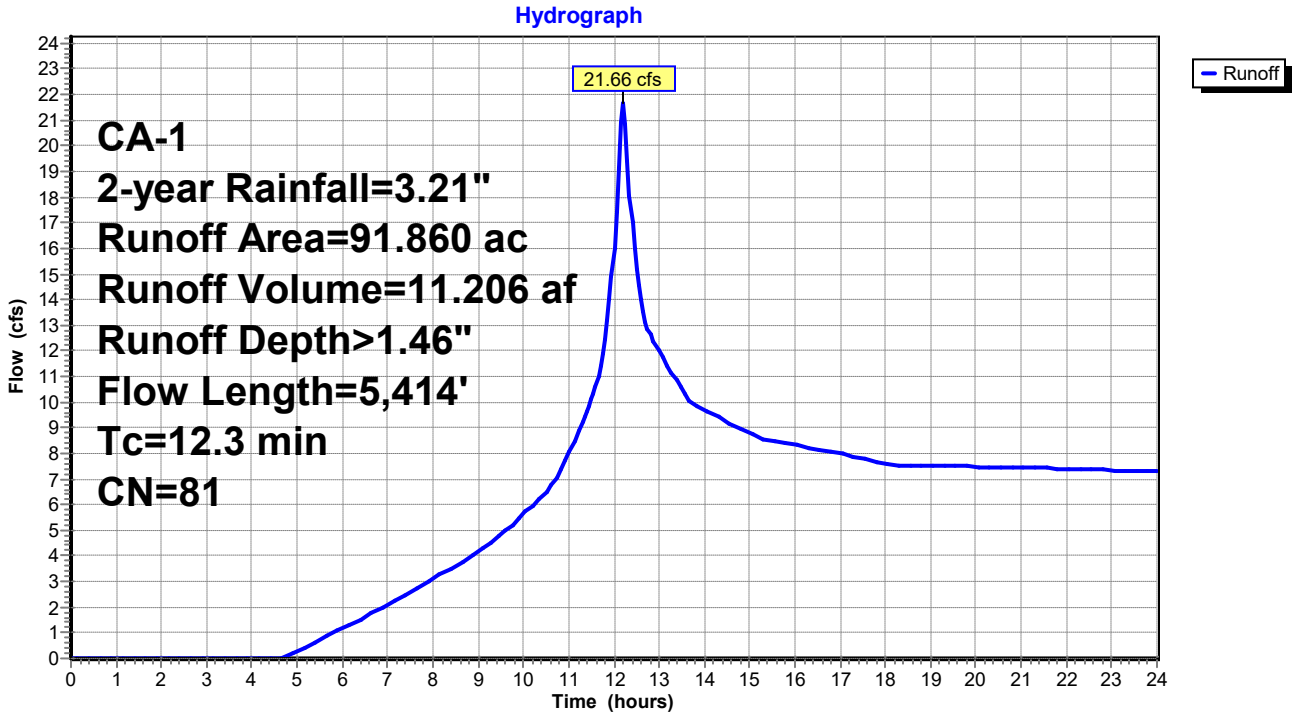
Runoff = 21.66 cfs @ 12.20 hrs, Volume= 11.206 af, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
	3.040	98	Paved parking, HSG C
*	2.490	79	Vineyard, Fair, HSG C
*	4.730	84	Vineyard, Fair, HSG D
	46.080	79	Pasture/grassland/range, Fair, HSG C
	27.920	84	Pasture/grassland/range, Fair, HSG D
	4.370	74	Pasture/grassland/range, Good, HSG C
	0.260	80	Pasture/grassland/range, Good, HSG D
	2.970	77	Woods, Good, HSG D
	91.860	81	Weighted Average
	88.820		96.69% Pervious Area
	3.040		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	100	0.4400	0.66		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.7	1,732	0.2300	7.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,442	0.1500	21.05	631.52	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.0	2,140	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
12.3	5,414	Total			

Subcatchment 2S: WS 3b - pre project

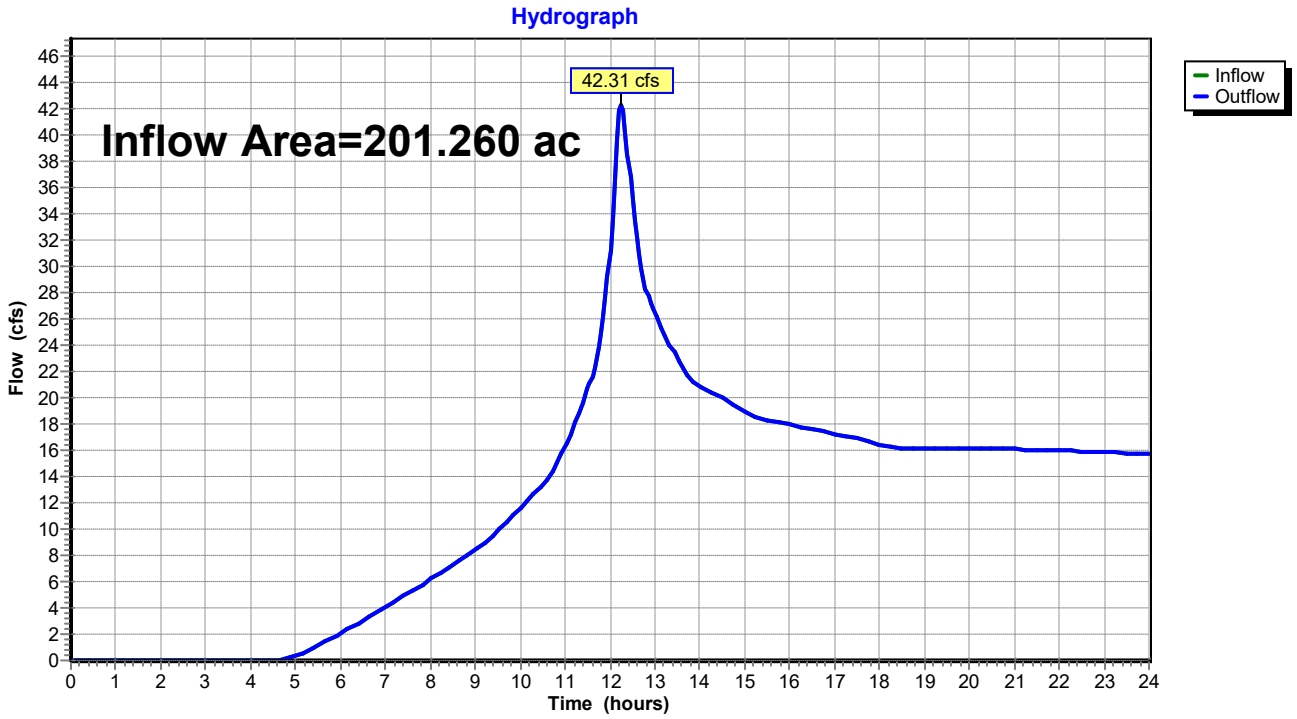


Summary for Reach 3: POI

Inflow Area = 201.260 ac, 1.51% Impervious, Inflow Depth > 1.42" for 2-year event
Inflow = 42.31 cfs @ 12.24 hrs, Volume= 23.833 af
Outflow = 42.31 cfs @ 12.24 hrs, Volume= 23.833 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3: POI



Summary for Subcatchment 1S: WS3a - pre project

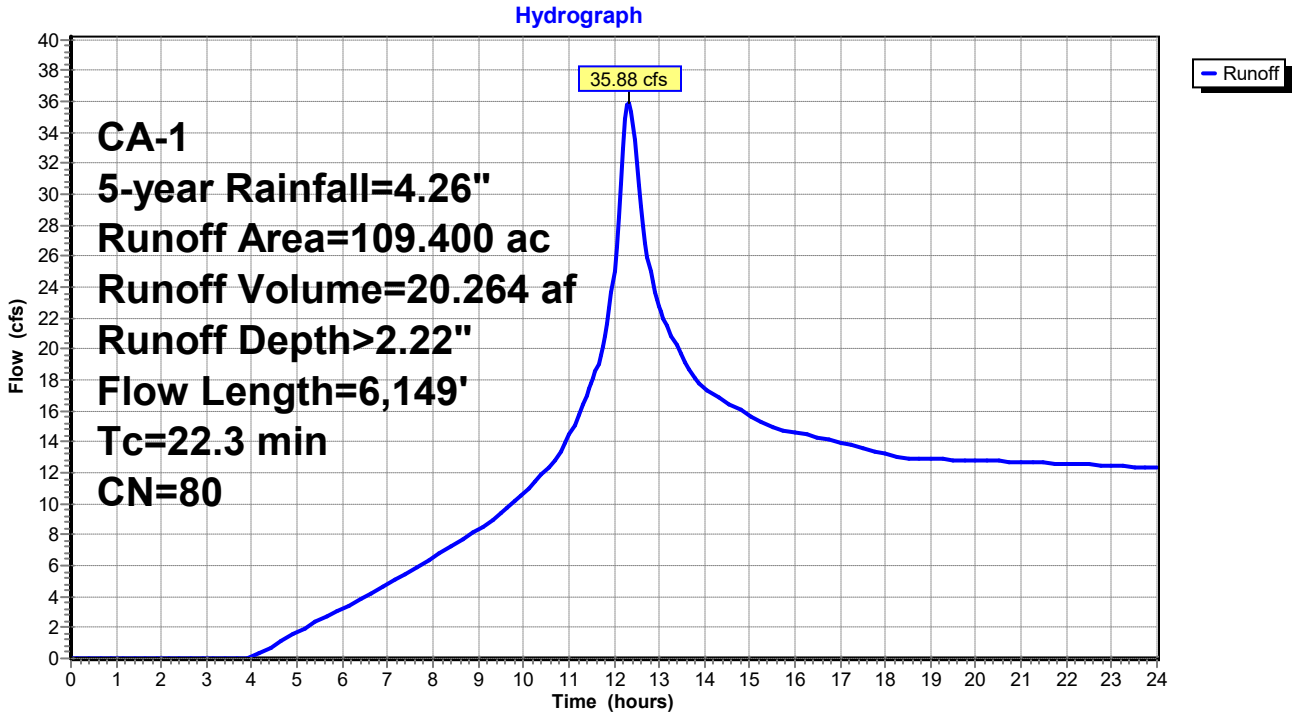
Runoff = 35.88 cfs @ 12.32 hrs, Volume= 20.264 af, Depth> 2.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
*	15.690	79	Vineyard, Fair, HSG C
*	6.470	84	Vineyard, Fair, HSG D
	62.240	79	Pasture/grassland/range, Fair, HSG C
	22.980	84	Pasture/grassland/range, Fair, HSG D
	0.290	74	Pasture/grassland/range, Good, HSG C
	0.810	80	Pasture/grassland/range, Good, HSG D
	0.920	77	Woods, Good, HSG D
	109.400	80	Weighted Average
	109.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
7.2	2,934	0.1800	6.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,150	0.1100	18.03	540.80	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
10.2	1,965	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
22.3	6,149	Total			

Subcatchment 1S: WS3a - pre project



Summary for Subcatchment 2S: WS 3b - pre project

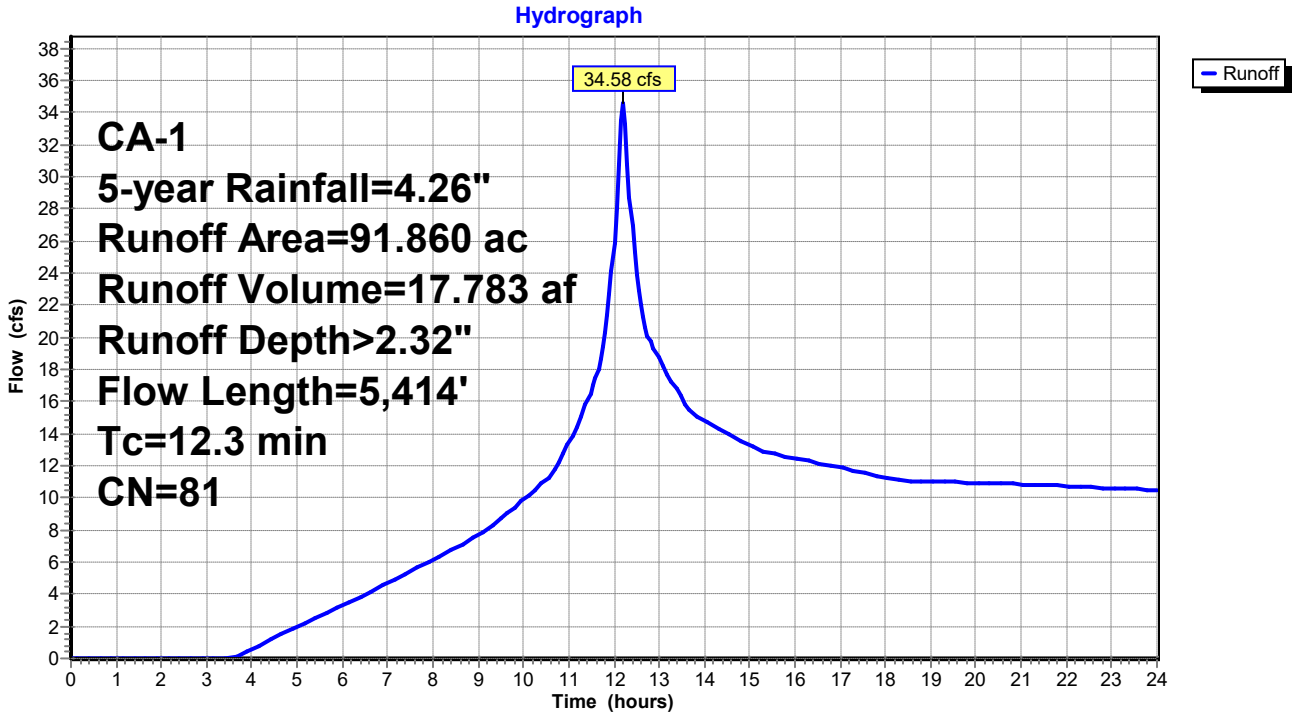
Runoff = 34.58 cfs @ 12.20 hrs, Volume= 17.783 af, Depth> 2.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
	3.040	98	Paved parking, HSG C
*	2.490	79	Vineyard, Fair, HSG C
*	4.730	84	Vineyard, Fair, HSG D
	46.080	79	Pasture/grassland/range, Fair, HSG C
	27.920	84	Pasture/grassland/range, Fair, HSG D
	4.370	74	Pasture/grassland/range, Good, HSG C
	0.260	80	Pasture/grassland/range, Good, HSG D
	2.970	77	Woods, Good, HSG D
	91.860	81	Weighted Average
	88.820		96.69% Pervious Area
	3.040		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	100	0.4400	0.66		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.7	1,732	0.2300	7.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,442	0.1500	21.05	631.52	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.0	2,140	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
12.3	5,414	Total			

Subcatchment 2S: WS 3b - pre project

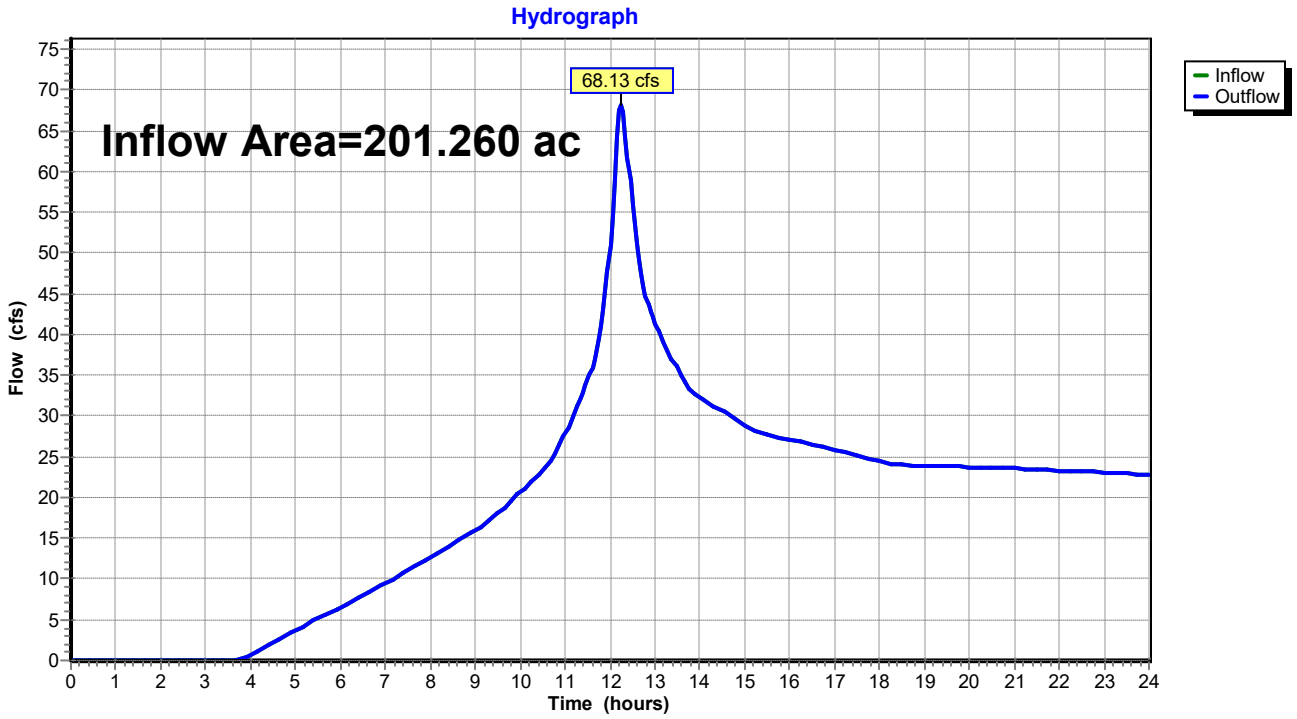


Summary for Reach 3: POI

Inflow Area = 201.260 ac, 1.51% Impervious, Inflow Depth > 2.27" for 5-year event
Inflow = 68.13 cfs @ 12.24 hrs, Volume= 38.047 af
Outflow = 68.13 cfs @ 12.24 hrs, Volume= 38.047 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3: POI



Summary for Subcatchment 1S: WS3a - pre project

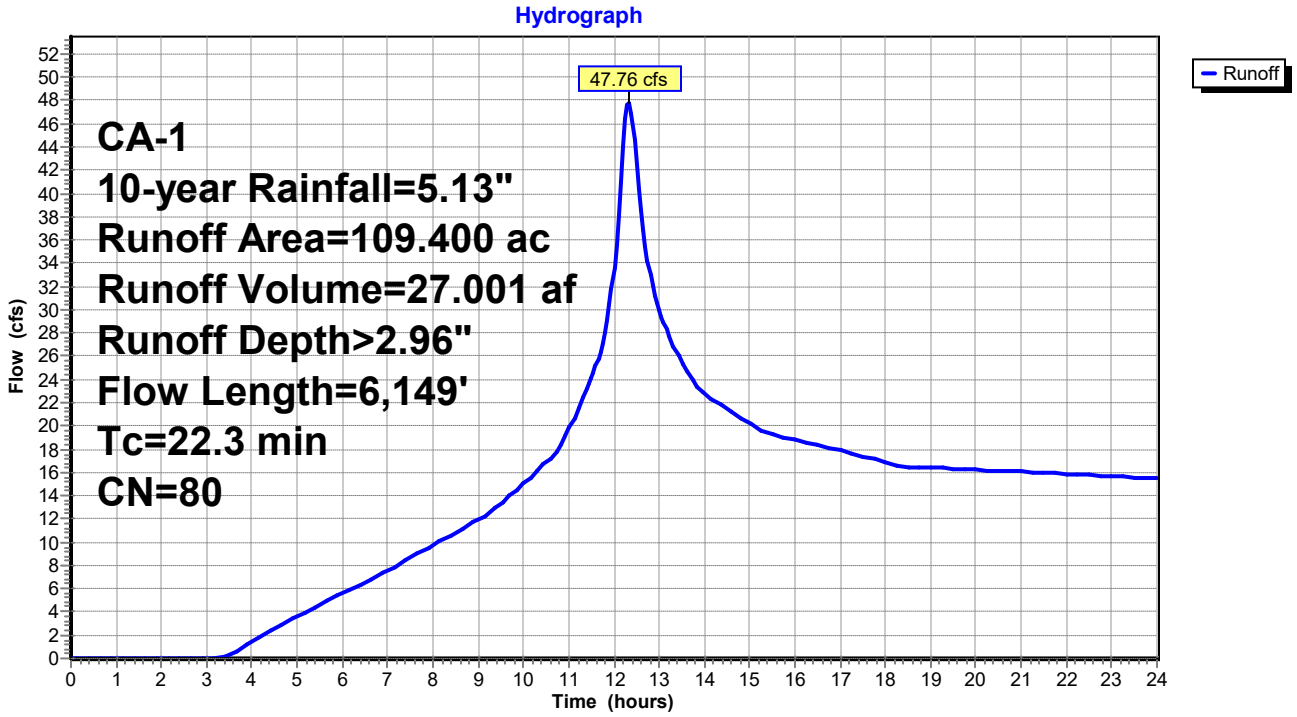
Runoff = 47.76 cfs @ 12.32 hrs, Volume= 27.001 af, Depth> 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
*	15.690	79	Vineyard, Fair, HSG C
*	6.470	84	Vineyard, Fair, HSG D
	62.240	79	Pasture/grassland/range, Fair, HSG C
	22.980	84	Pasture/grassland/range, Fair, HSG D
	0.290	74	Pasture/grassland/range, Good, HSG C
	0.810	80	Pasture/grassland/range, Good, HSG D
	0.920	77	Woods, Good, HSG D
	109.400	80	Weighted Average
	109.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
7.2	2,934	0.1800	6.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,150	0.1100	18.03	540.80	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
10.2	1,965	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
22.3	6,149	Total			

Subcatchment 1S: WS3a - pre project



Summary for Subcatchment 2S: WS 3b - pre project

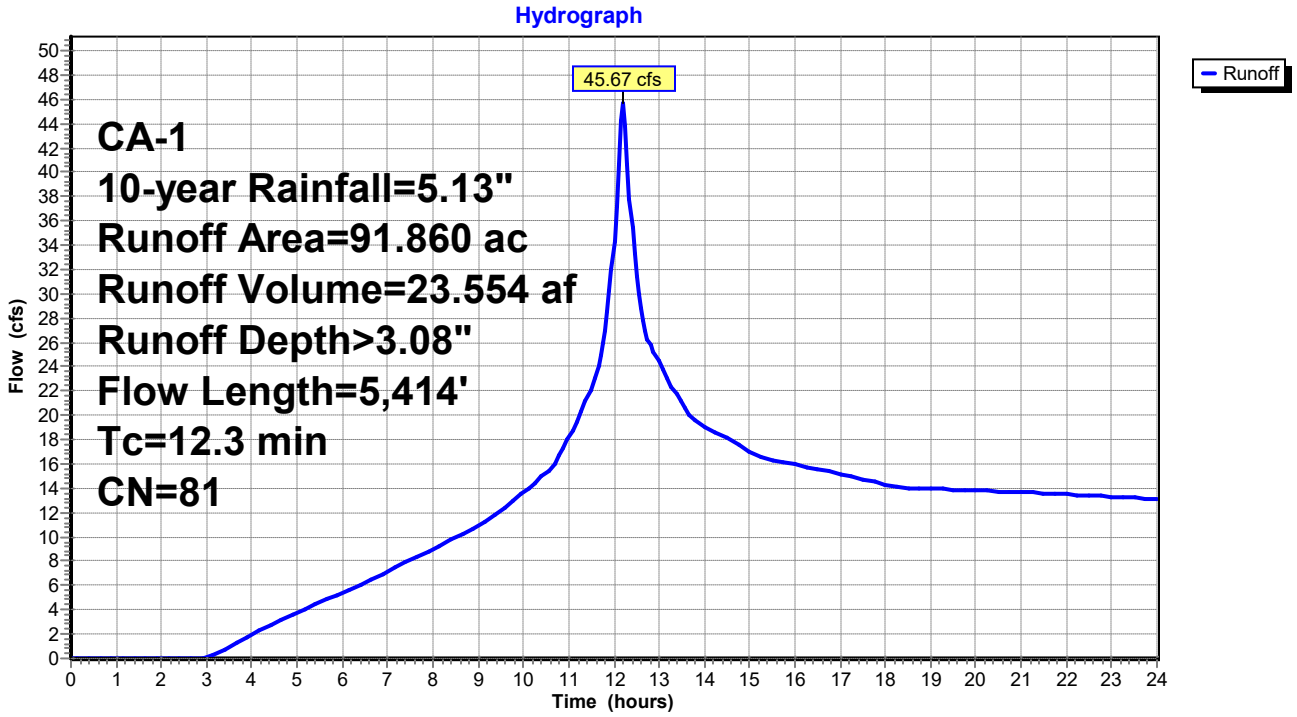
Runoff = 45.67 cfs @ 12.20 hrs, Volume= 23.554 af, Depth> 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
	3.040	98	Paved parking, HSG C
*	2.490	79	Vineyard, Fair, HSG C
*	4.730	84	Vineyard, Fair, HSG D
	46.080	79	Pasture/grassland/range, Fair, HSG C
	27.920	84	Pasture/grassland/range, Fair, HSG D
	4.370	74	Pasture/grassland/range, Good, HSG C
	0.260	80	Pasture/grassland/range, Good, HSG D
	2.970	77	Woods, Good, HSG D
	91.860	81	Weighted Average
	88.820		96.69% Pervious Area
	3.040		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	100	0.4400	0.66		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.7	1,732	0.2300	7.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,442	0.1500	21.05	631.52	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.0	2,140	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
12.3	5,414	Total			

Subcatchment 2S: WS 3b - pre project

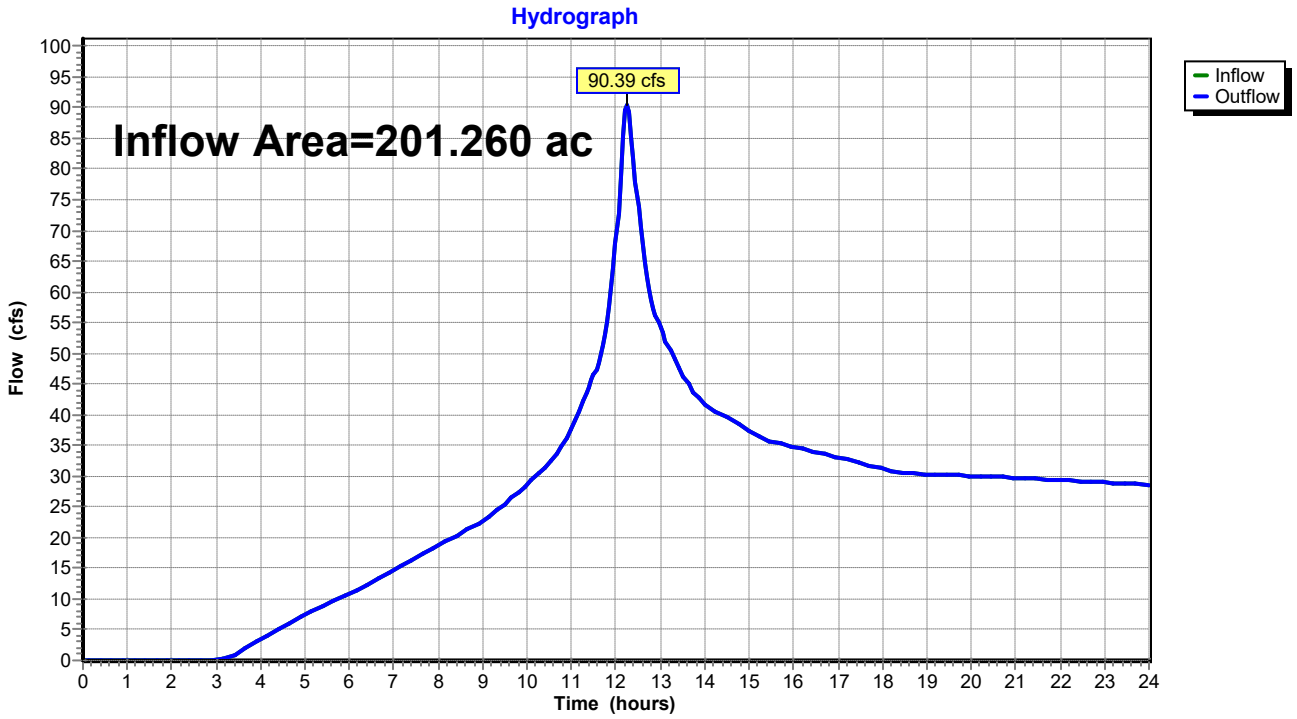


Summary for Reach 3: POI

Inflow Area = 201.260 ac, 1.51% Impervious, Inflow Depth > 3.01" for 10-year event
Inflow = 90.39 cfs @ 12.24 hrs, Volume= 50.555 af
Outflow = 90.39 cfs @ 12.24 hrs, Volume= 50.555 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3: POI



Summary for Subcatchment 1S: WS3a - pre project

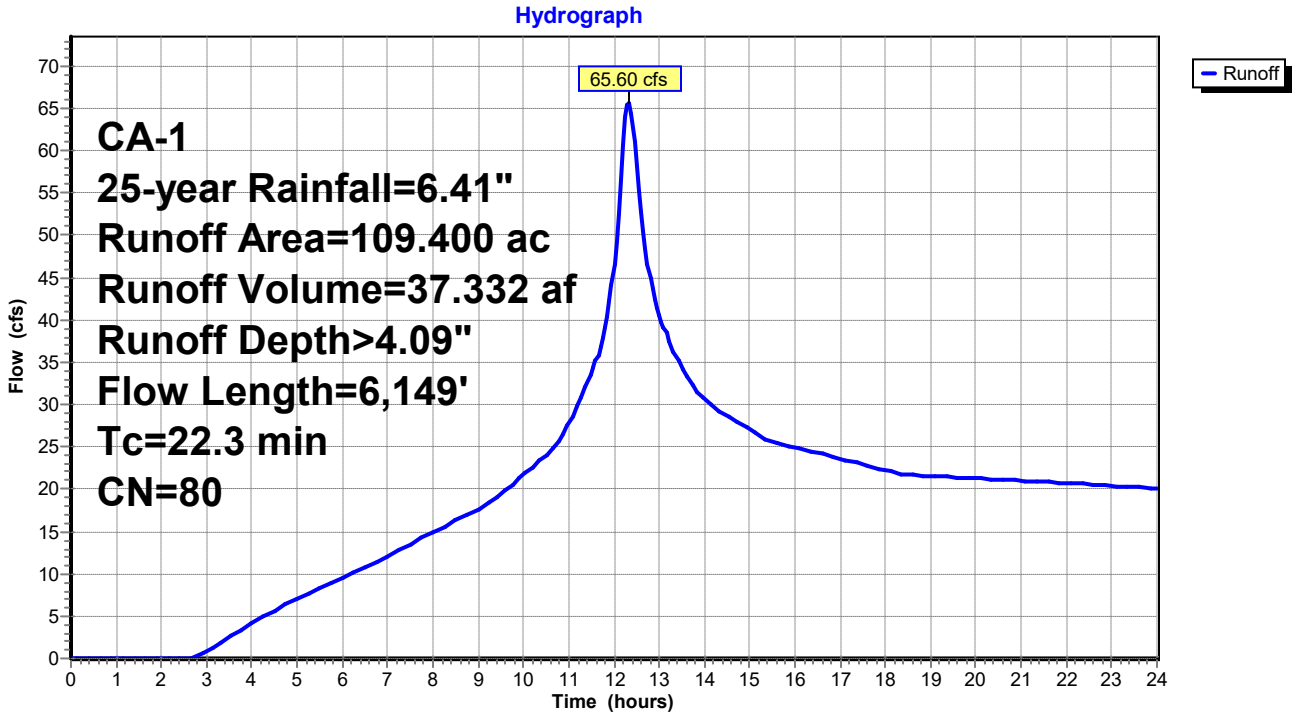
Runoff = 65.60 cfs @ 12.32 hrs, Volume= 37.332 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
*	15.690	79	Vineyard, Fair, HSG C
*	6.470	84	Vineyard, Fair, HSG D
	62.240	79	Pasture/grassland/range, Fair, HSG C
	22.980	84	Pasture/grassland/range, Fair, HSG D
	0.290	74	Pasture/grassland/range, Good, HSG C
	0.810	80	Pasture/grassland/range, Good, HSG D
	0.920	77	Woods, Good, HSG D
	109.400	80	Weighted Average
	109.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
7.2	2,934	0.1800	6.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,150	0.1100	18.03	540.80	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
10.2	1,965	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
22.3	6,149	Total			

Subcatchment 1S: WS3a - pre project



Summary for Subcatchment 2S: WS 3b - pre project

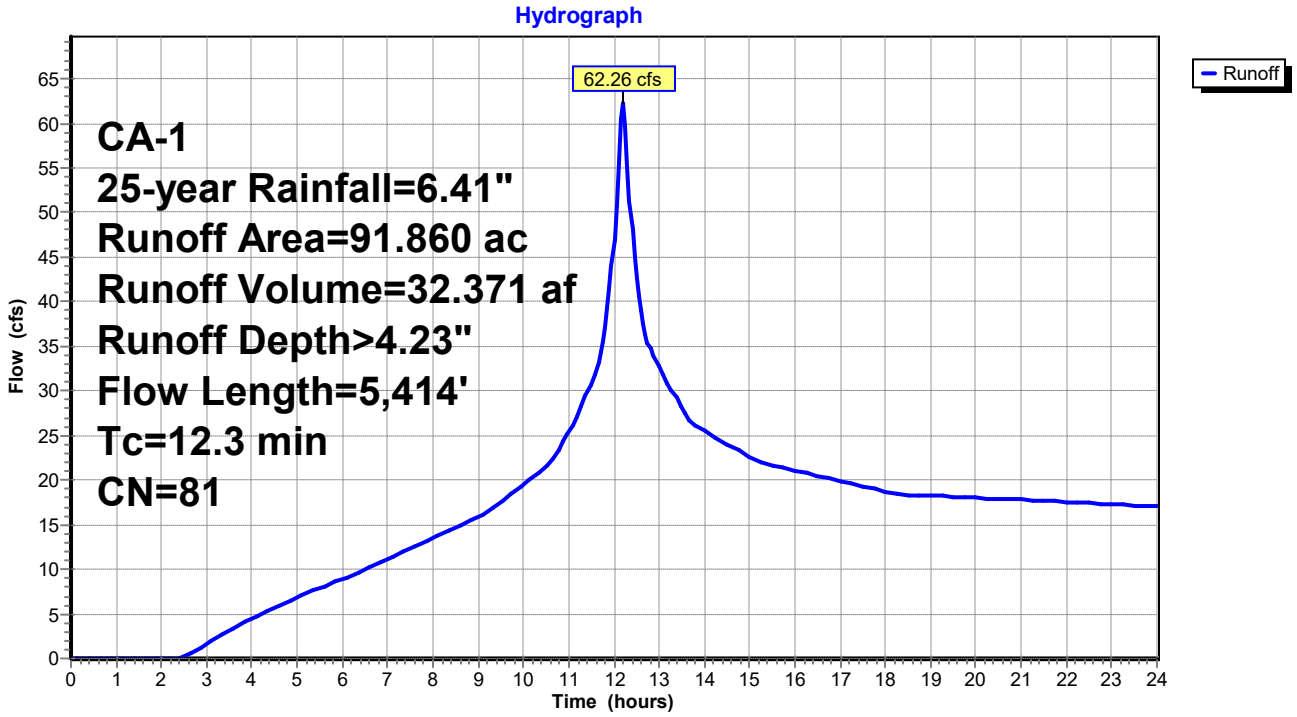
Runoff = 62.26 cfs @ 12.20 hrs, Volume= 32.371 af, Depth> 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
	3.040	98	Paved parking, HSG C
*	2.490	79	Vineyard, Fair, HSG C
*	4.730	84	Vineyard, Fair, HSG D
	46.080	79	Pasture/grassland/range, Fair, HSG C
	27.920	84	Pasture/grassland/range, Fair, HSG D
	4.370	74	Pasture/grassland/range, Good, HSG C
	0.260	80	Pasture/grassland/range, Good, HSG D
	2.970	77	Woods, Good, HSG D
	91.860	81	Weighted Average
	88.820		96.69% Pervious Area
	3.040		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	100	0.4400	0.66		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.7	1,732	0.2300	7.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,442	0.1500	21.05	631.52	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.0	2,140	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
12.3	5,414	Total			

Subcatchment 2S: WS 3b - pre project

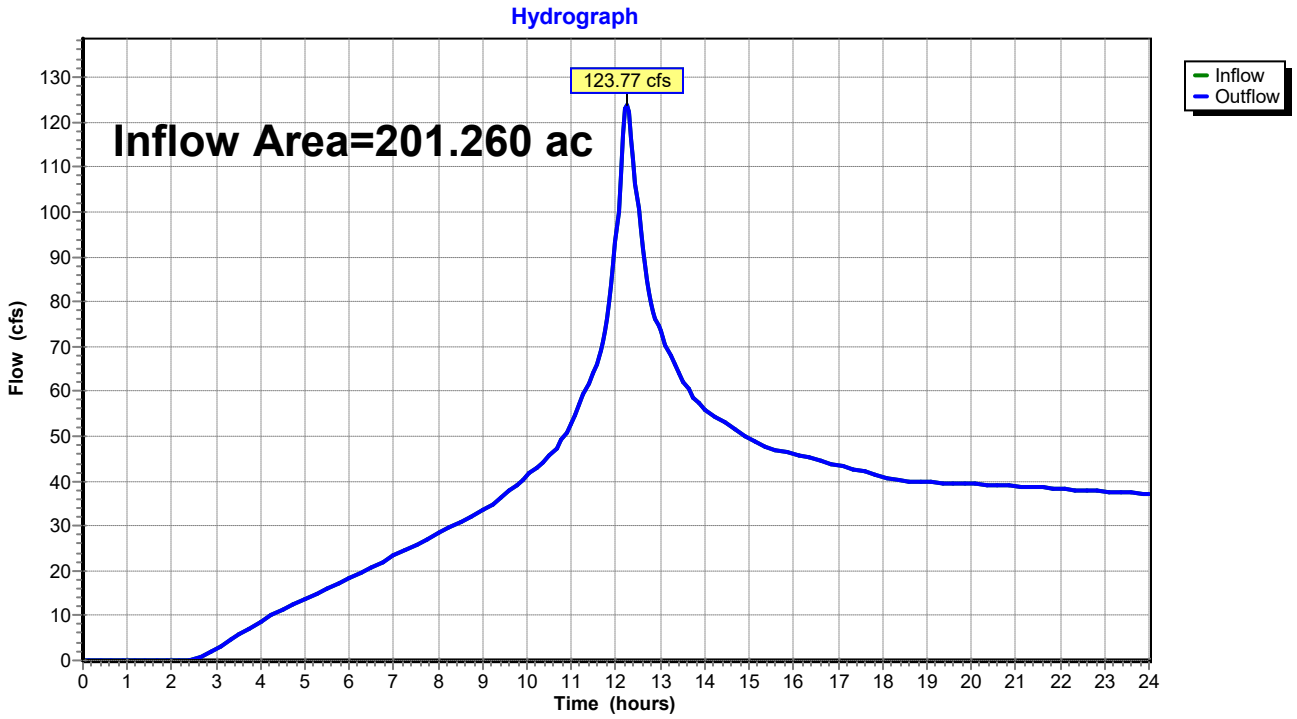


Summary for Reach 3: POI

Inflow Area = 201.260 ac, 1.51% Impervious, Inflow Depth > 4.16" for 25-year event
Inflow = 123.77 cfs @ 12.23 hrs, Volume= 69.703 af
Outflow = 123.77 cfs @ 12.23 hrs, Volume= 69.703 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3: POI



Summary for Subcatchment 1S: WS3a - pre project

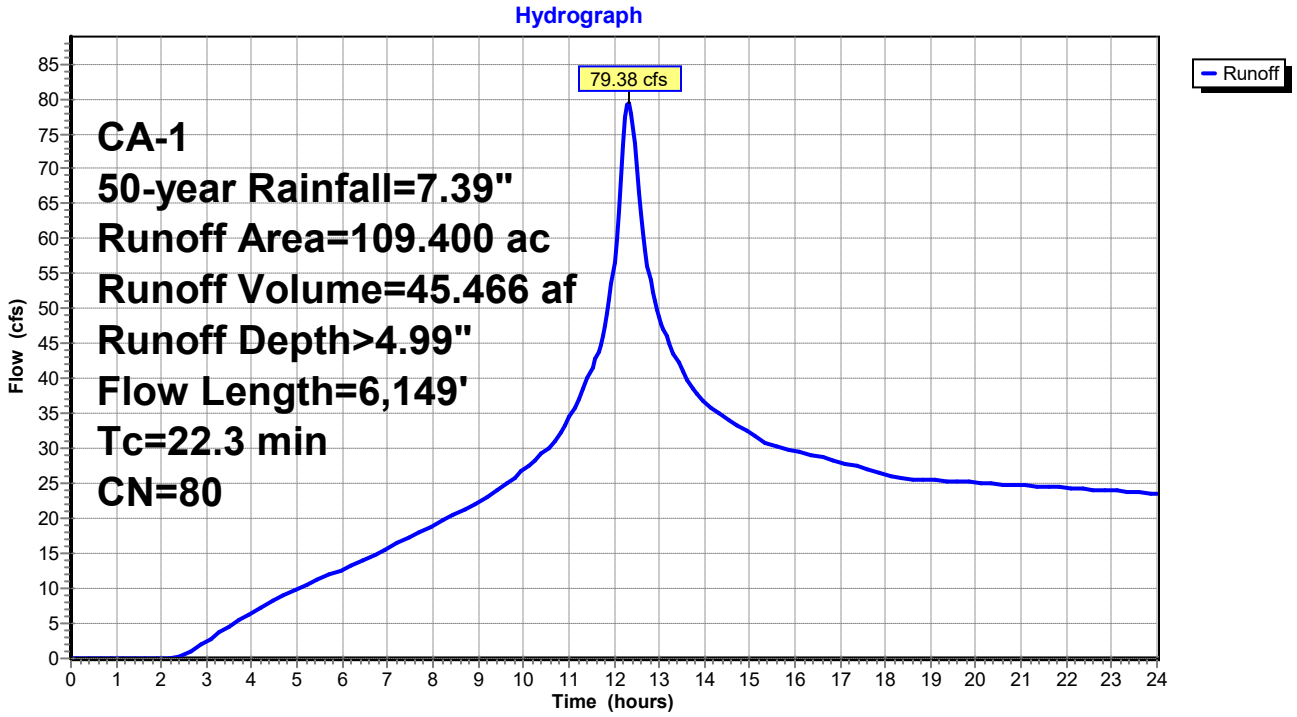
Runoff = 79.38 cfs @ 12.32 hrs, Volume= 45.466 af, Depth> 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
*	15.690	79	Vineyard, Fair, HSG C
*	6.470	84	Vineyard, Fair, HSG D
	62.240	79	Pasture/grassland/range, Fair, HSG C
	22.980	84	Pasture/grassland/range, Fair, HSG D
	0.290	74	Pasture/grassland/range, Good, HSG C
	0.810	80	Pasture/grassland/range, Good, HSG D
	0.920	77	Woods, Good, HSG D
	109.400	80	Weighted Average
	109.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
7.2	2,934	0.1800	6.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,150	0.1100	18.03	540.80	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
10.2	1,965	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
22.3	6,149	Total			

Subcatchment 1S: WS3a - pre project



Summary for Subcatchment 2S: WS 3b - pre project

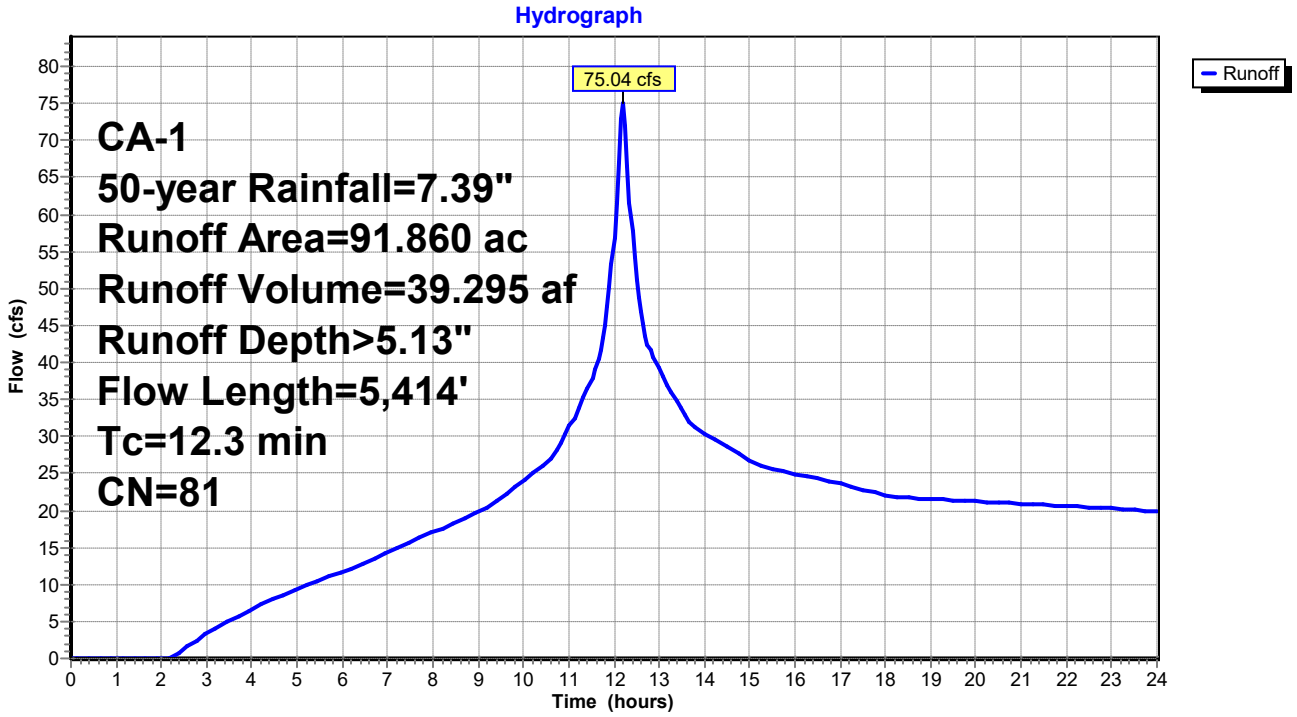
Runoff = 75.04 cfs @ 12.20 hrs, Volume= 39.295 af, Depth> 5.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
	3.040	98	Paved parking, HSG C
*	2.490	79	Vineyard, Fair, HSG C
*	4.730	84	Vineyard, Fair, HSG D
	46.080	79	Pasture/grassland/range, Fair, HSG C
	27.920	84	Pasture/grassland/range, Fair, HSG D
	4.370	74	Pasture/grassland/range, Good, HSG C
	0.260	80	Pasture/grassland/range, Good, HSG D
	2.970	77	Woods, Good, HSG D
	91.860	81	Weighted Average
	88.820		96.69% Pervious Area
	3.040		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	100	0.4400	0.66		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.7	1,732	0.2300	7.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,442	0.1500	21.05	631.52	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.0	2,140	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
12.3	5,414	Total			

Subcatchment 2S: WS 3b - pre project

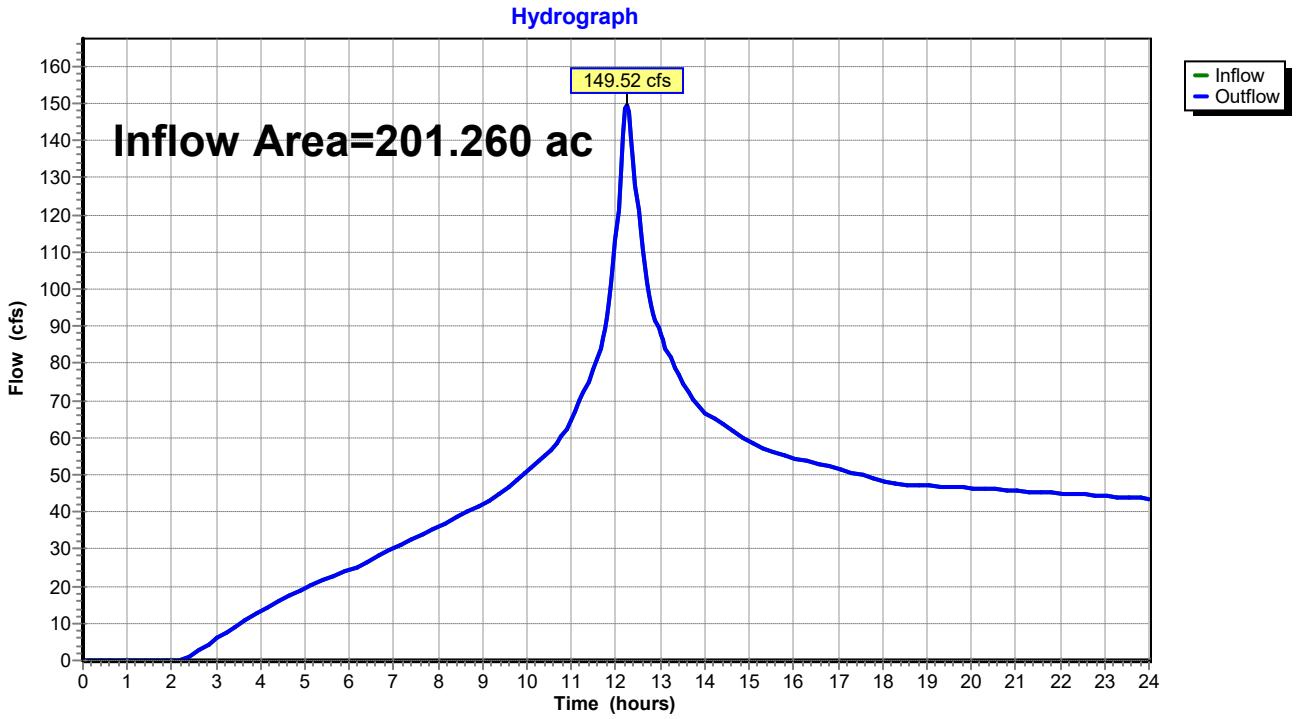


Summary for Reach 3: POI

Inflow Area = 201.260 ac, 1.51% Impervious, Inflow Depth > 5.05" for 50-year event
Inflow = 149.52 cfs @ 12.23 hrs, Volume= 84.761 af
Outflow = 149.52 cfs @ 12.23 hrs, Volume= 84.761 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3: POI



Summary for Subcatchment 1S: WS3a - pre project

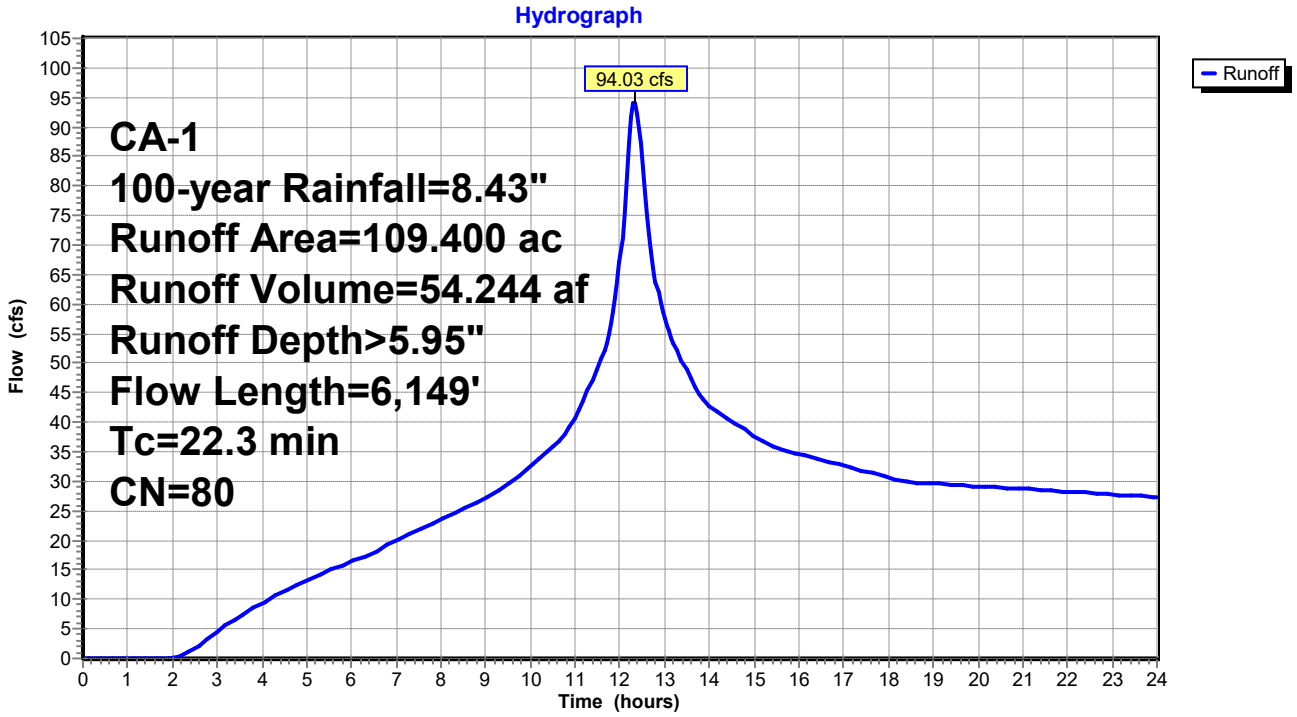
Runoff = 94.03 cfs @ 12.32 hrs, Volume= 54.244 af, Depth> 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
*	15.690	79	Vineyard, Fair, HSG C
*	6.470	84	Vineyard, Fair, HSG D
	62.240	79	Pasture/grassland/range, Fair, HSG C
	22.980	84	Pasture/grassland/range, Fair, HSG D
	0.290	74	Pasture/grassland/range, Good, HSG C
	0.810	80	Pasture/grassland/range, Good, HSG D
	0.920	77	Woods, Good, HSG D
	109.400	80	Weighted Average
	109.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
7.2	2,934	0.1800	6.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,150	0.1100	18.03	540.80	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
10.2	1,965	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
22.3	6,149	Total			

Subcatchment 1S: WS3a - pre project



Summary for Subcatchment 2S: WS 3b - pre project

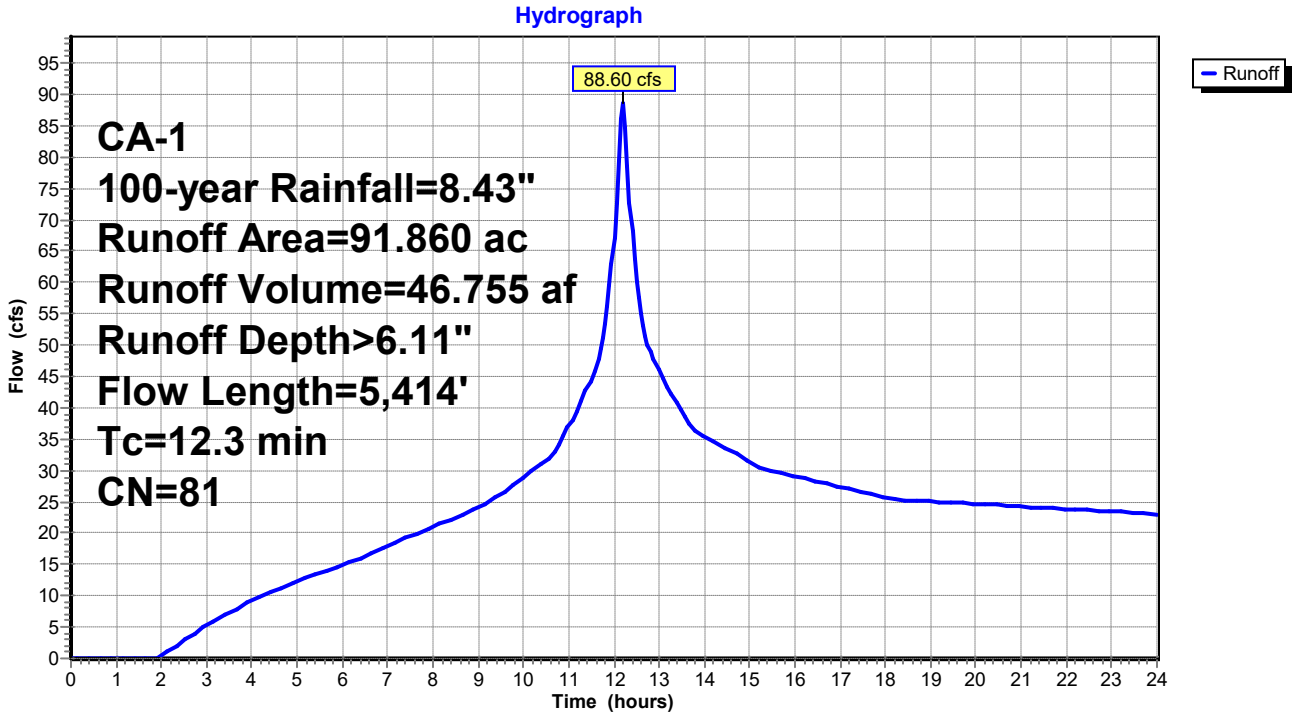
Runoff = 88.60 cfs @ 12.19 hrs, Volume= 46.755 af, Depth> 6.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
	3.040	98	Paved parking, HSG C
*	2.490	79	Vineyard, Fair, HSG C
*	4.730	84	Vineyard, Fair, HSG D
	46.080	79	Pasture/grassland/range, Fair, HSG C
	27.920	84	Pasture/grassland/range, Fair, HSG D
	4.370	74	Pasture/grassland/range, Good, HSG C
	0.260	80	Pasture/grassland/range, Good, HSG D
	2.970	77	Woods, Good, HSG D
	91.860	81	Weighted Average
	88.820		96.69% Pervious Area
	3.040		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	100	0.4400	0.66		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.7	1,732	0.2300	7.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,442	0.1500	21.05	631.52	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.0	2,140	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
12.3	5,414	Total			

Subcatchment 2S: WS 3b - pre project

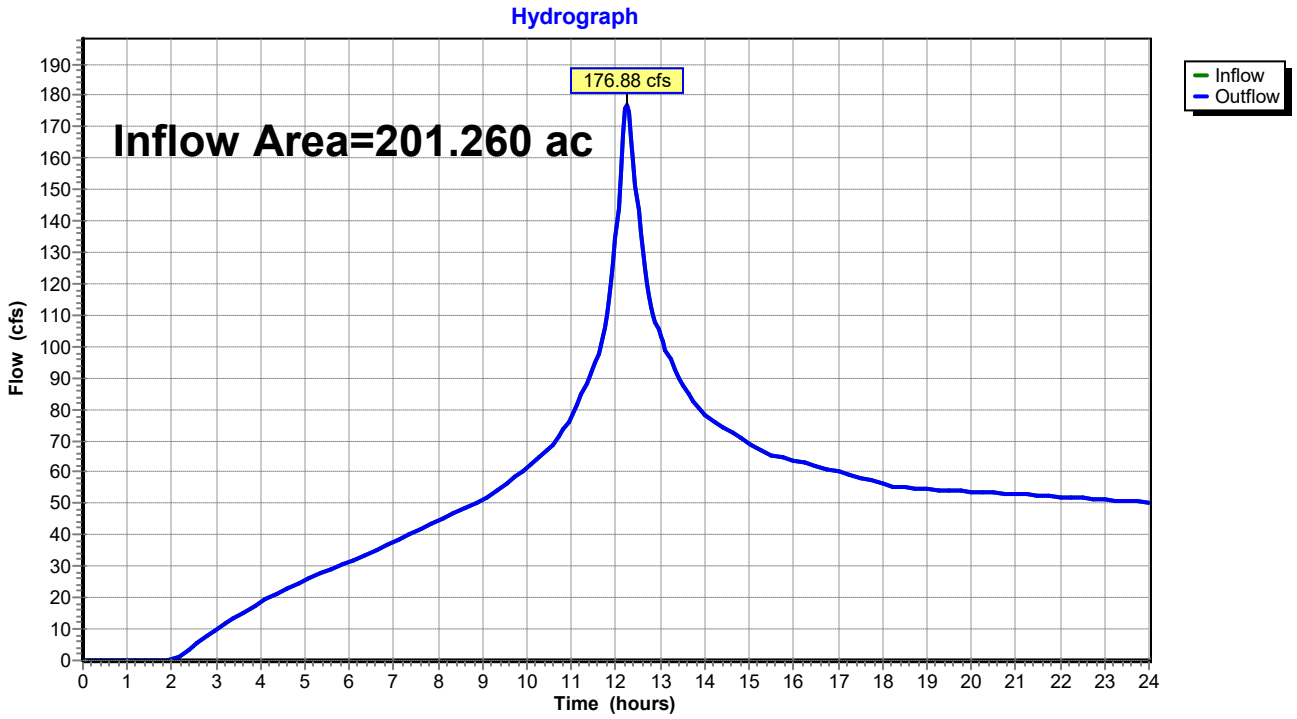


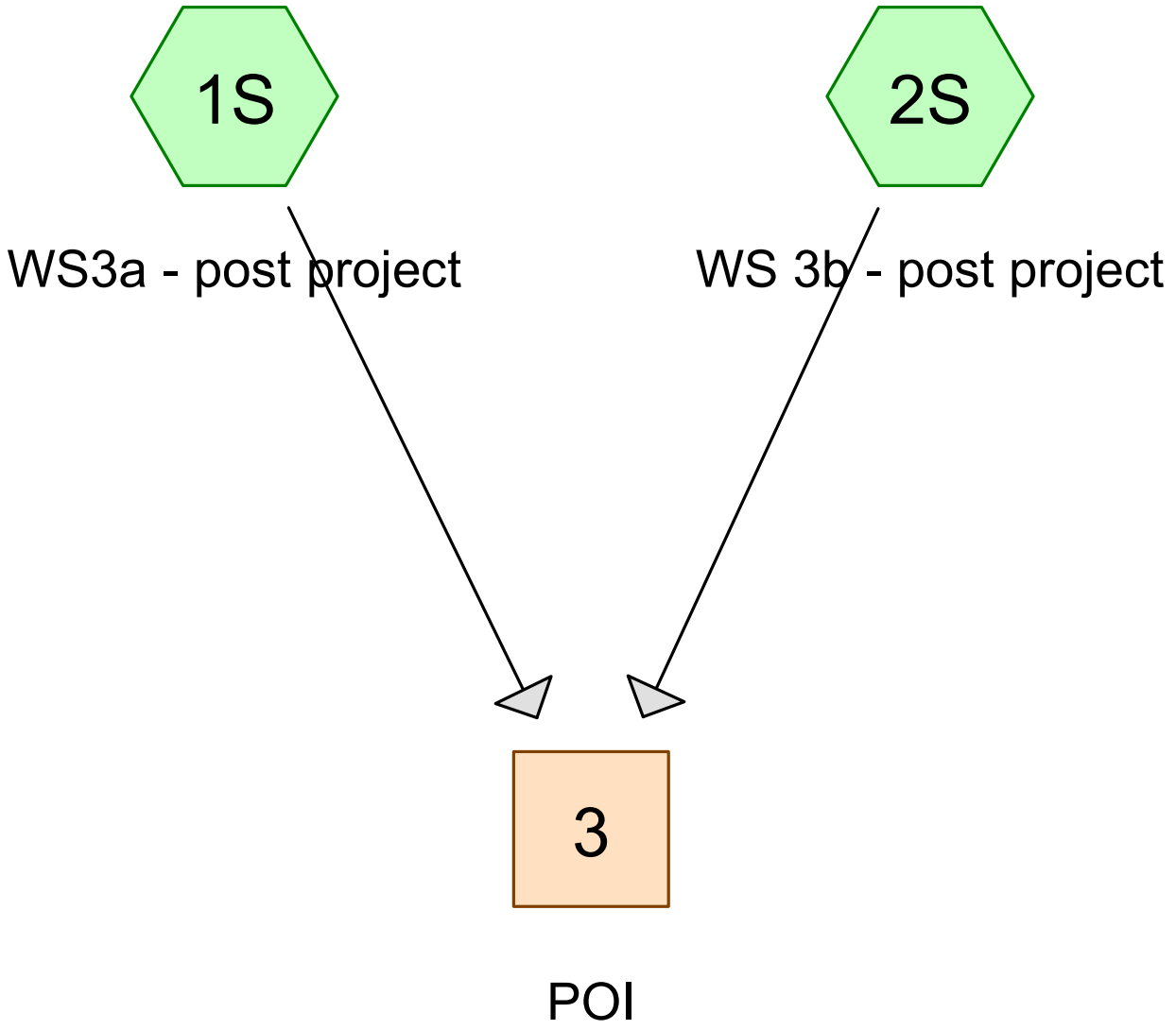
Summary for Reach 3: POI

Inflow Area = 201.260 ac, 1.51% Impervious, Inflow Depth > 6.02" for 100-year event
Inflow = 176.88 cfs @ 12.23 hrs, Volume= 100.999 af
Outflow = 176.88 cfs @ 12.23 hrs, Volume= 100.999 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3: POI





Subcat Reach Pond Link

Routing Diagram for WS3 postR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS3a - post project

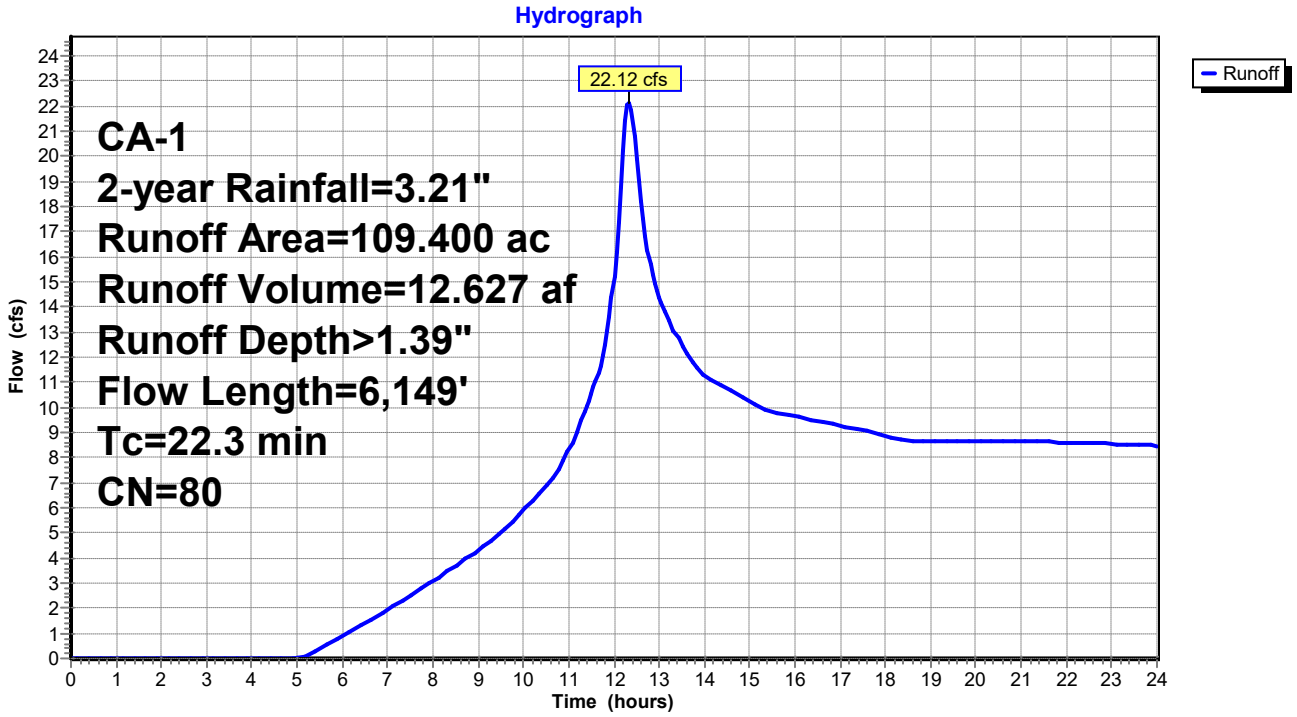
Runoff = 22.12 cfs @ 12.33 hrs, Volume= 12.627 af, Depth> 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
*	15.690	79	Vineyard, Fair, HSG C
*	6.470	84	Vineyard, Fair, HSG D
*	16.990	75	Vineyard, Good, HSG C
*	2.740	81	Vineyard, Good, HSG D
	45.390	79	Pasture/grassland/range, Fair, HSG C
	20.250	84	Pasture/grassland/range, Fair, HSG D
	0.150	74	Pasture/grassland/range, Good, HSG C
	0.800	80	Pasture/grassland/range, Good, HSG D
	0.920	77	Woods, Good, HSG D
	109.400	80	Weighted Average
	109.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
7.2	2,934	0.1800	6.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,150	0.1100	18.03	540.80	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
10.2	1,965	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
22.3	6,149	Total			

Subcatchment 1S: WS3a - post project



Summary for Subcatchment 2S: WS 3b - post project

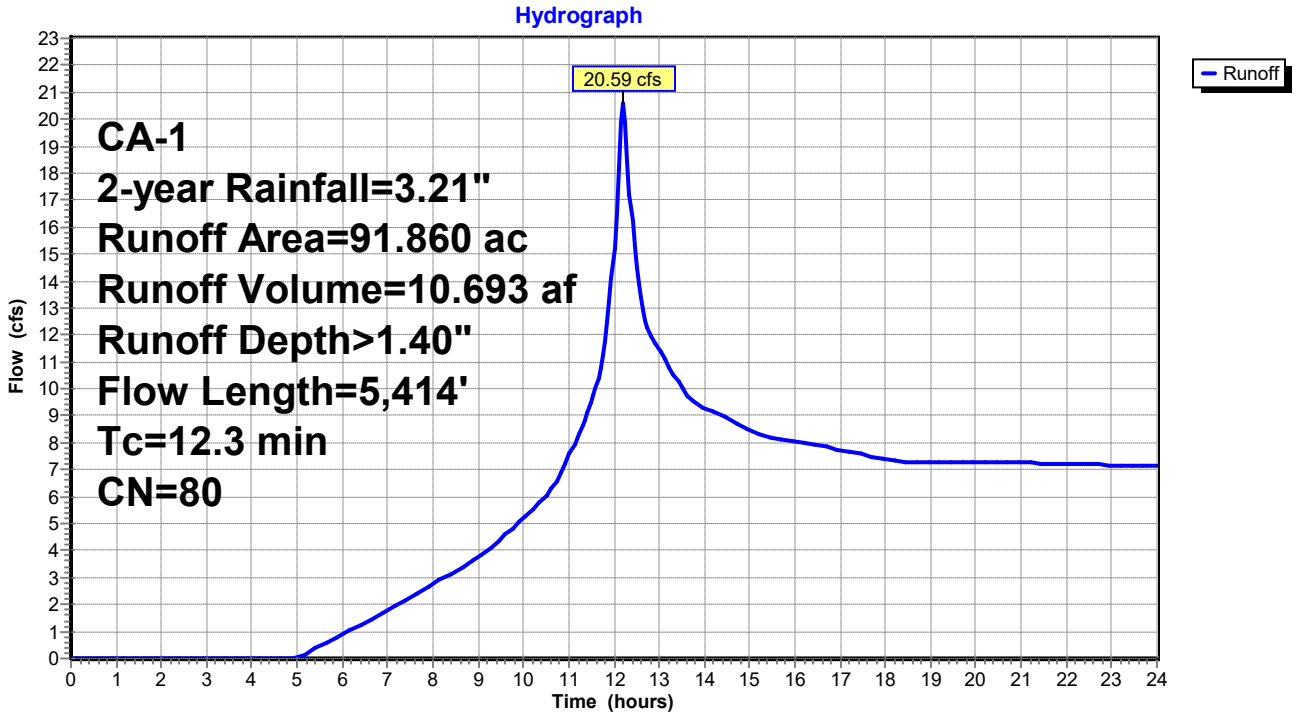
Runoff = 20.59 cfs @ 12.20 hrs, Volume= 10.693 af, Depth> 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
	3.040	98	Paved parking, HSG C
*	2.490	79	Vineyard, Fair, HSG C
*	4.730	84	Vineyard, Fair, HSG D
*	21.330	75	Vineyard, Good, HSG C
*	0.070	81	Vineyard, Good, HSG D
	26.320	79	Pasture/grassland/range, Fair, HSG C
	28.180	84	Pasture/grassland/range, Fair, HSG D
	2.540	74	Pasture/grassland/range, Good, HSG C
	0.190	80	Pasture/grassland/range, Good, HSG D
	2.970	77	Woods, Good, HSG D
	91.860	80	Weighted Average
	88.820		96.69% Pervious Area
	3.040		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	100	0.4400	0.66		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.7	1,732	0.2300	7.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,442	0.1500	21.05	631.52	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.0	2,140	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
12.3	5,414	Total			

Subcatchment 2S: WS 3b - post project

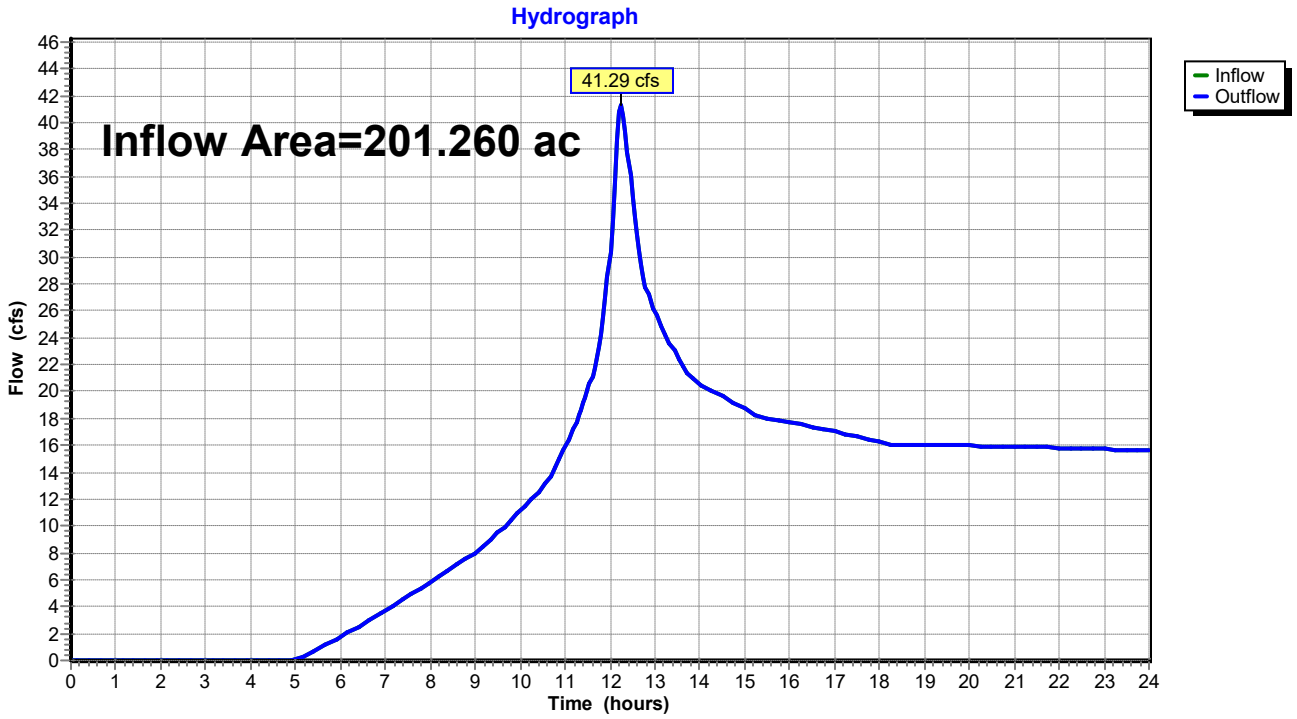


Summary for Reach 3: POI

Inflow Area = 201.260 ac, 1.51% Impervious, Inflow Depth > 1.39" for 2-year event
Inflow = 41.29 cfs @ 12.24 hrs, Volume= 23.320 af
Outflow = 41.29 cfs @ 12.24 hrs, Volume= 23.320 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3: POI



Summary for Subcatchment 1S: WS3a - post project

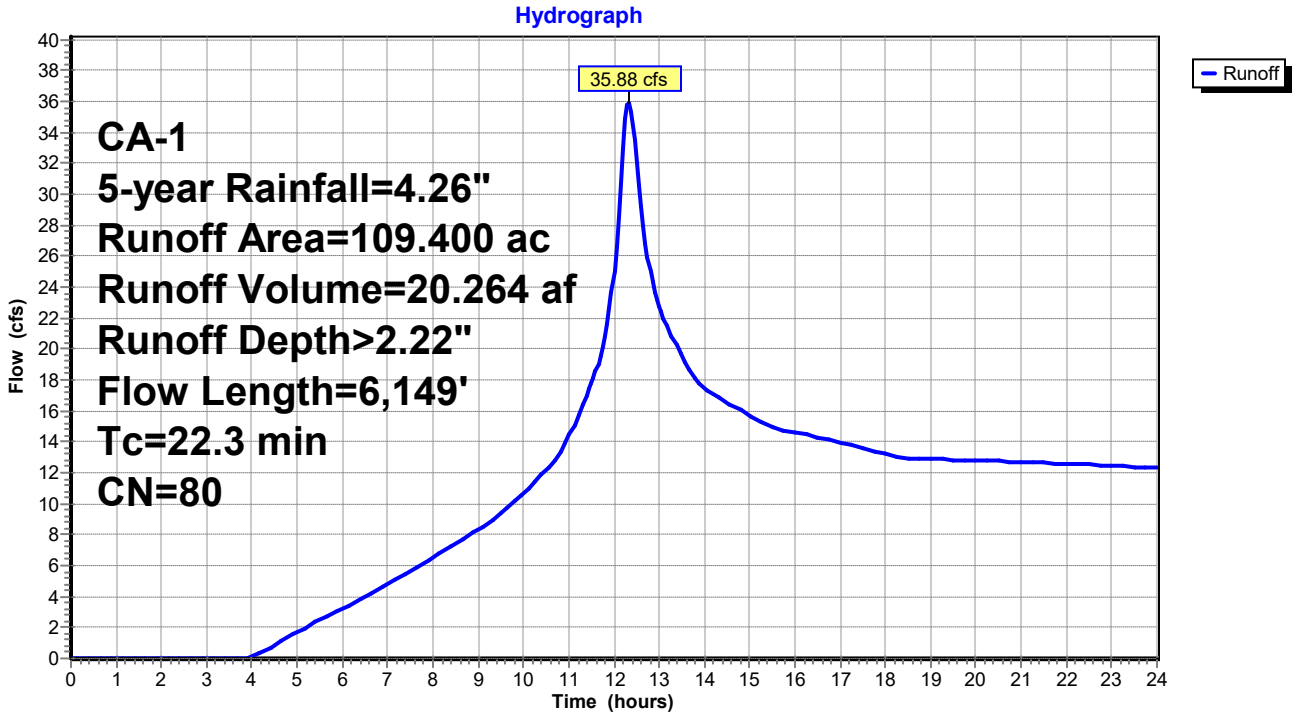
Runoff = 35.88 cfs @ 12.32 hrs, Volume= 20.264 af, Depth> 2.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
*	15.690	79	Vineyard, Fair, HSG C
*	6.470	84	Vineyard, Fair, HSG D
*	16.990	75	Vineyard, Good, HSG C
*	2.740	81	Vineyard, Good, HSG D
	45.390	79	Pasture/grassland/range, Fair, HSG C
	20.250	84	Pasture/grassland/range, Fair, HSG D
	0.150	74	Pasture/grassland/range, Good, HSG C
	0.800	80	Pasture/grassland/range, Good, HSG D
	0.920	77	Woods, Good, HSG D
	109.400	80	Weighted Average
	109.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
7.2	2,934	0.1800	6.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,150	0.1100	18.03	540.80	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
10.2	1,965	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
22.3	6,149	Total			

Subcatchment 1S: WS3a - post project



Summary for Subcatchment 2S: WS 3b - post project

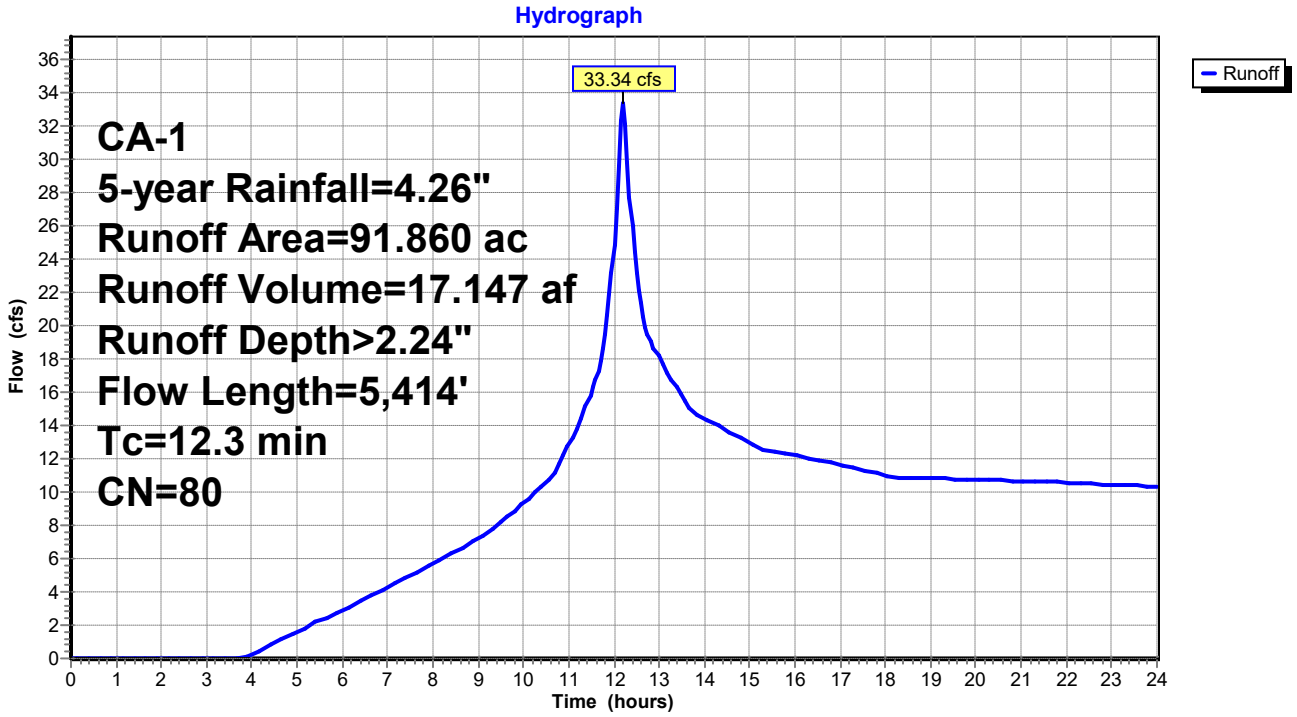
Runoff = 33.34 cfs @ 12.20 hrs, Volume= 17.147 af, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
	3.040	98	Paved parking, HSG C
*	2.490	79	Vineyard, Fair, HSG C
*	4.730	84	Vineyard, Fair, HSG D
*	21.330	75	Vineyard, Good, HSG C
*	0.070	81	Vineyard, Good, HSG D
	26.320	79	Pasture/grassland/range, Fair, HSG C
	28.180	84	Pasture/grassland/range, Fair, HSG D
	2.540	74	Pasture/grassland/range, Good, HSG C
	0.190	80	Pasture/grassland/range, Good, HSG D
	2.970	77	Woods, Good, HSG D
	91.860	80	Weighted Average
	88.820		96.69% Pervious Area
	3.040		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	100	0.4400	0.66		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.7	1,732	0.2300	7.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,442	0.1500	21.05	631.52	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.0	2,140	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
12.3	5,414	Total			

Subcatchment 2S: WS 3b - post project

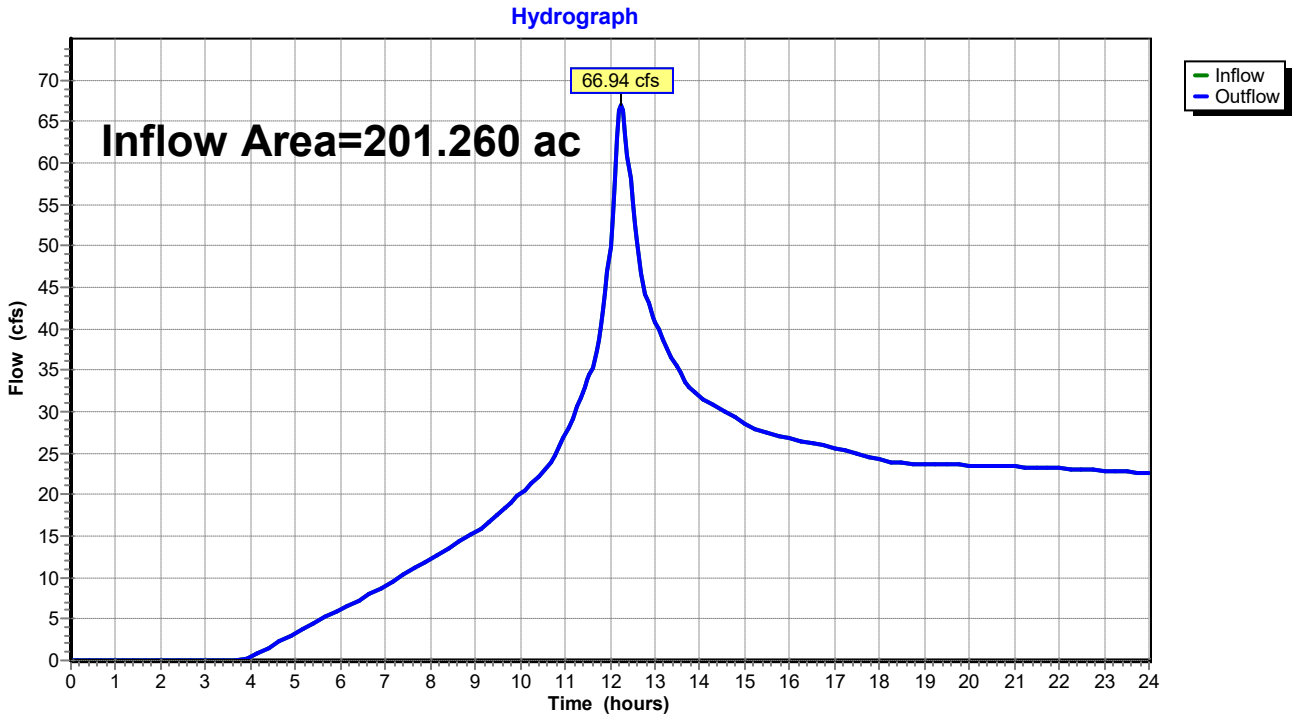


Summary for Reach 3: POI

Inflow Area = 201.260 ac, 1.51% Impervious, Inflow Depth > 2.23" for 5-year event
Inflow = 66.94 cfs @ 12.24 hrs, Volume= 37.410 af
Outflow = 66.94 cfs @ 12.24 hrs, Volume= 37.410 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3: POI



Summary for Subcatchment 1S: WS3a - post project

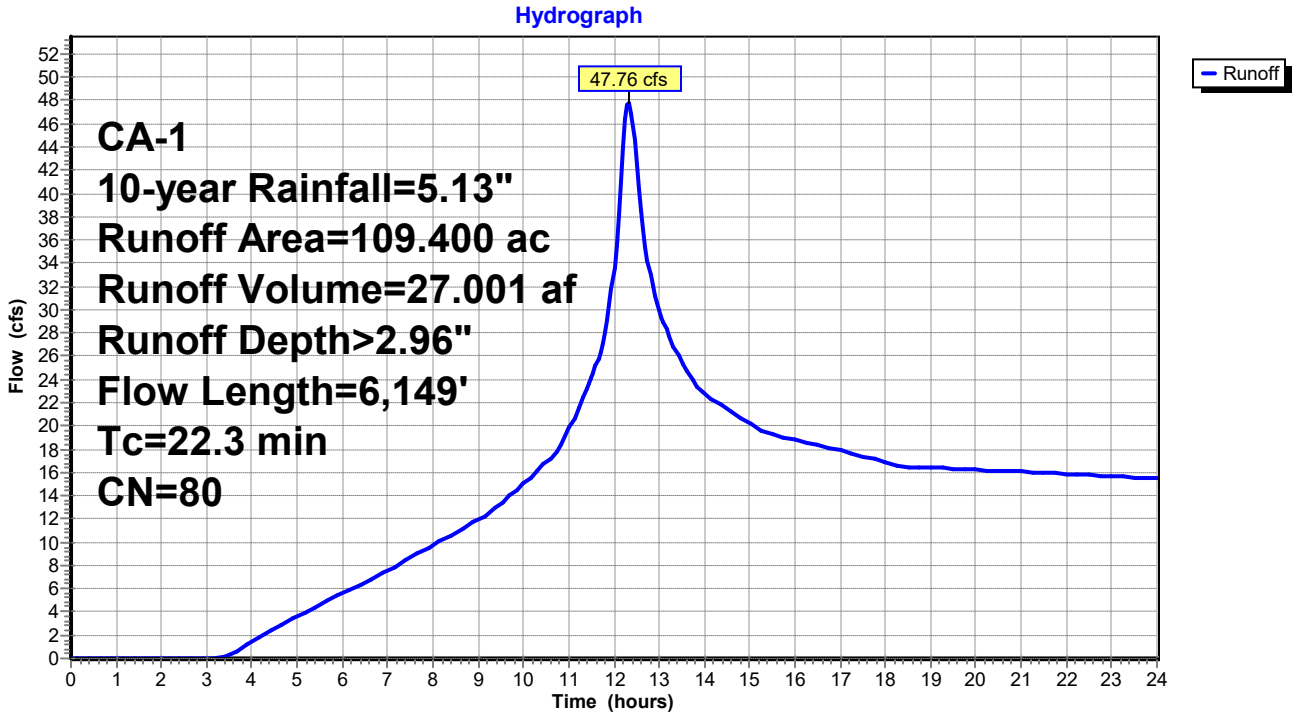
Runoff = 47.76 cfs @ 12.32 hrs, Volume= 27.001 af, Depth> 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
*	15.690	79	Vineyard, Fair, HSG C
*	6.470	84	Vineyard, Fair, HSG D
*	16.990	75	Vineyard, Good, HSG C
*	2.740	81	Vineyard, Good, HSG D
	45.390	79	Pasture/grassland/range, Fair, HSG C
	20.250	84	Pasture/grassland/range, Fair, HSG D
	0.150	74	Pasture/grassland/range, Good, HSG C
	0.800	80	Pasture/grassland/range, Good, HSG D
	0.920	77	Woods, Good, HSG D
	109.400	80	Weighted Average
	109.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
7.2	2,934	0.1800	6.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,150	0.1100	18.03	540.80	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
10.2	1,965	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
22.3	6,149	Total			

Subcatchment 1S: WS3a - post project



Summary for Subcatchment 2S: WS 3b - post project

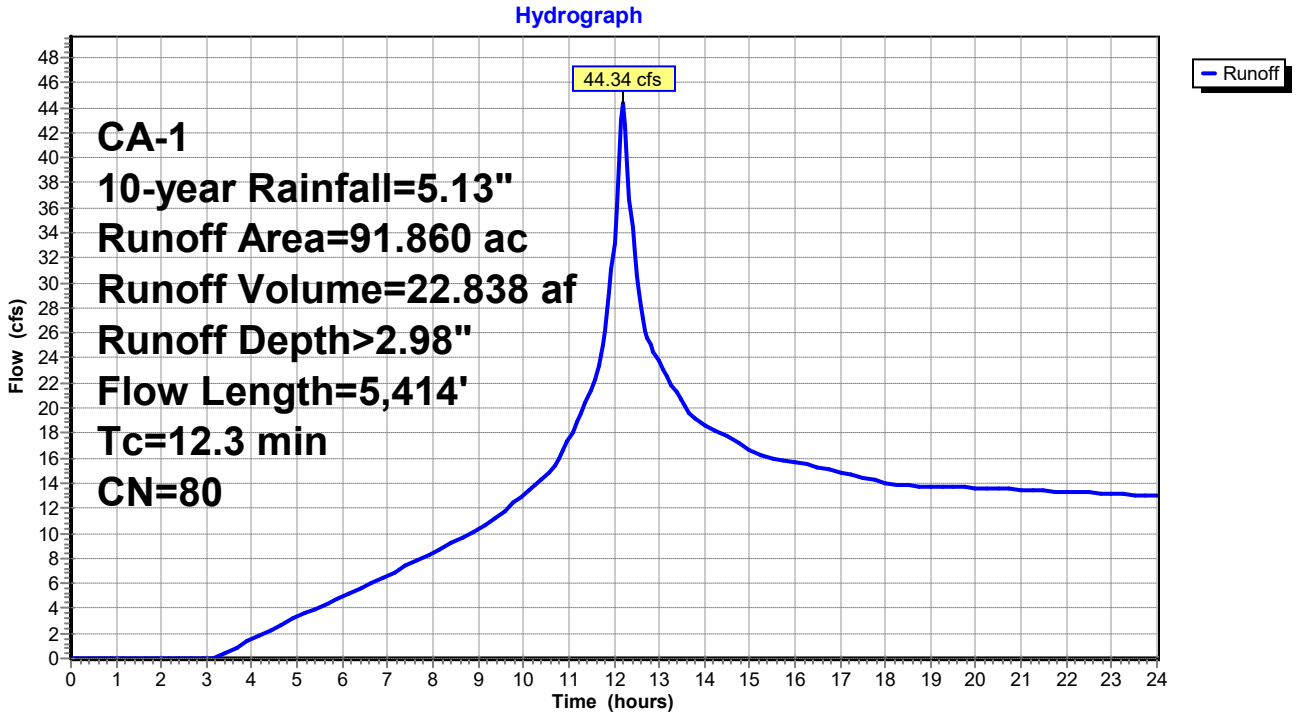
Runoff = 44.34 cfs @ 12.20 hrs, Volume= 22.838 af, Depth> 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
	3.040	98	Paved parking, HSG C
*	2.490	79	Vineyard, Fair, HSG C
*	4.730	84	Vineyard, Fair, HSG D
*	21.330	75	Vineyard, Good, HSG C
*	0.070	81	Vineyard, Good, HSG D
	26.320	79	Pasture/grassland/range, Fair, HSG C
	28.180	84	Pasture/grassland/range, Fair, HSG D
	2.540	74	Pasture/grassland/range, Good, HSG C
	0.190	80	Pasture/grassland/range, Good, HSG D
	2.970	77	Woods, Good, HSG D
	91.860	80	Weighted Average
	88.820		96.69% Pervious Area
	3.040		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	100	0.4400	0.66		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.7	1,732	0.2300	7.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,442	0.1500	21.05	631.52	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.0	2,140	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
12.3	5,414	Total			

Subcatchment 2S: WS 3b - post project

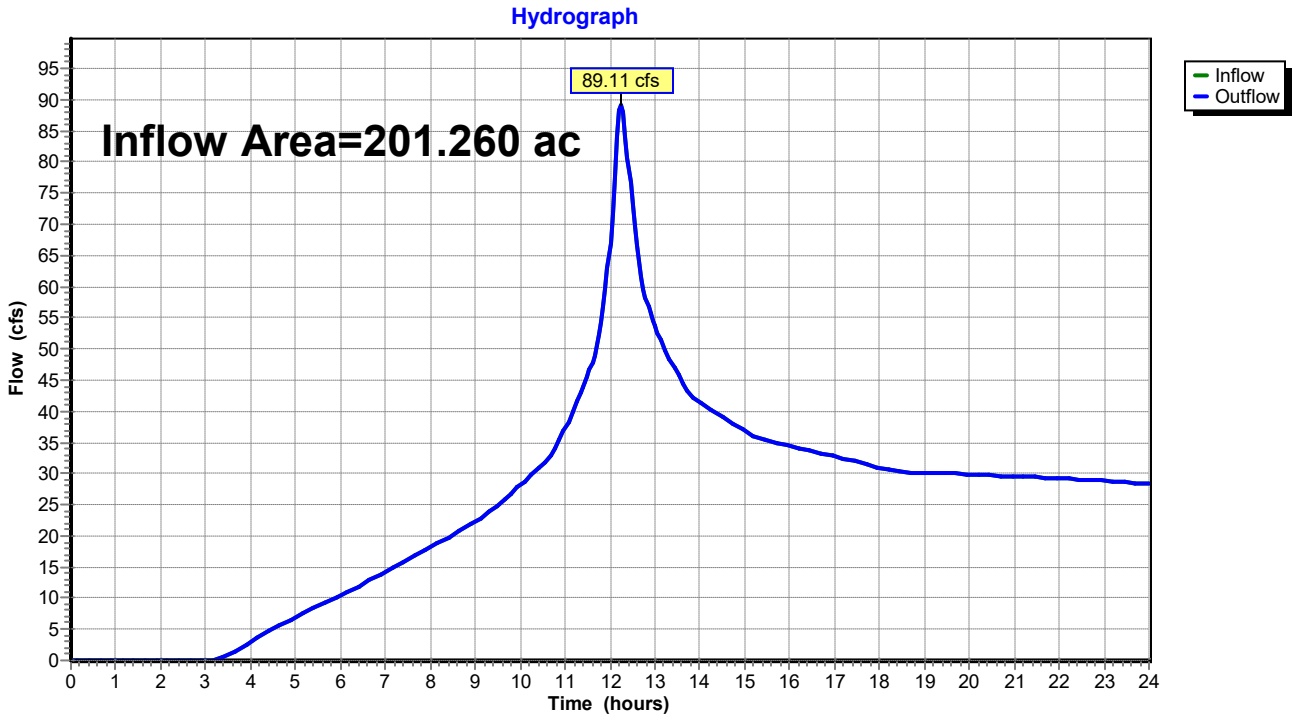


Summary for Reach 3: POI

Inflow Area = 201.260 ac, 1.51% Impervious, Inflow Depth > 2.97" for 10-year event
Inflow = 89.11 cfs @ 12.24 hrs, Volume= 49.839 af
Outflow = 89.11 cfs @ 12.24 hrs, Volume= 49.839 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3: POI



Summary for Subcatchment 1S: WS3a - post project

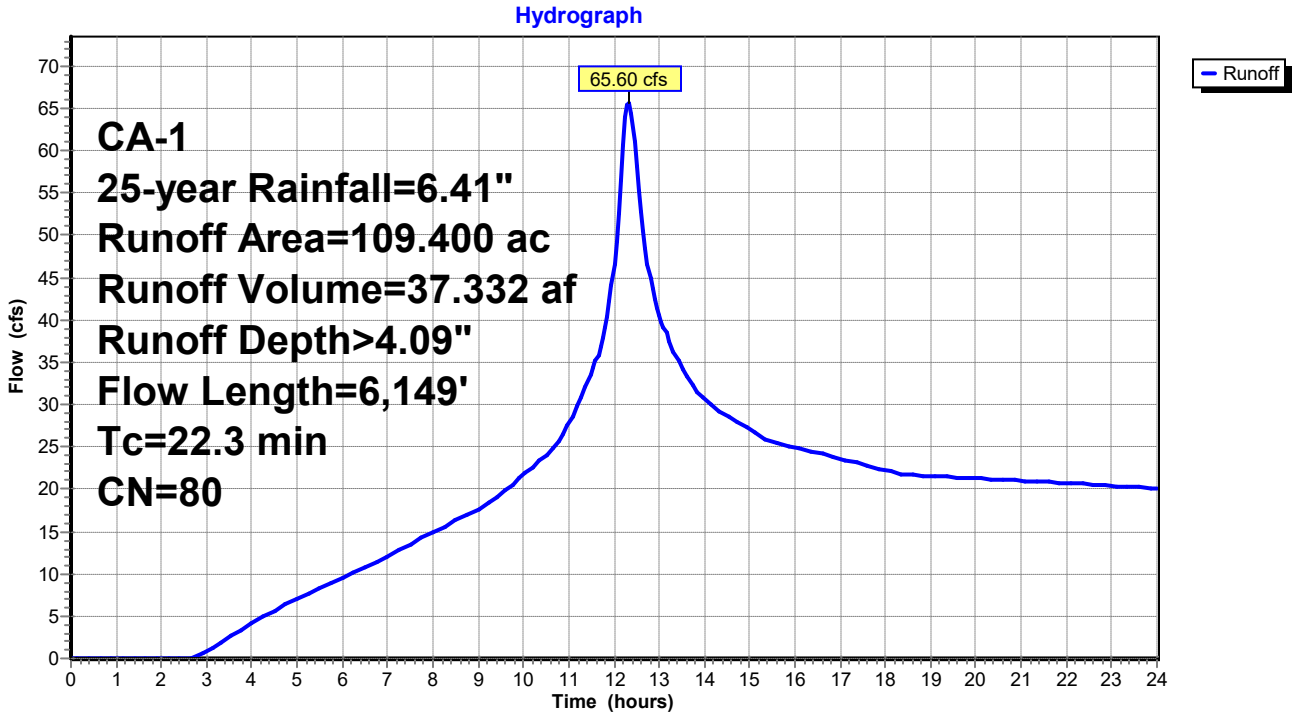
Runoff = 65.60 cfs @ 12.32 hrs, Volume= 37.332 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
*	15.690	79	Vineyard, Fair, HSG C
*	6.470	84	Vineyard, Fair, HSG D
*	16.990	75	Vineyard, Good, HSG C
*	2.740	81	Vineyard, Good, HSG D
	45.390	79	Pasture/grassland/range, Fair, HSG C
	20.250	84	Pasture/grassland/range, Fair, HSG D
	0.150	74	Pasture/grassland/range, Good, HSG C
	0.800	80	Pasture/grassland/range, Good, HSG D
	0.920	77	Woods, Good, HSG D
	109.400	80	Weighted Average
	109.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
7.2	2,934	0.1800	6.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,150	0.1100	18.03	540.80	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
10.2	1,965	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
22.3	6,149	Total			

Subcatchment 1S: WS3a - post project



Summary for Subcatchment 2S: WS 3b - post project

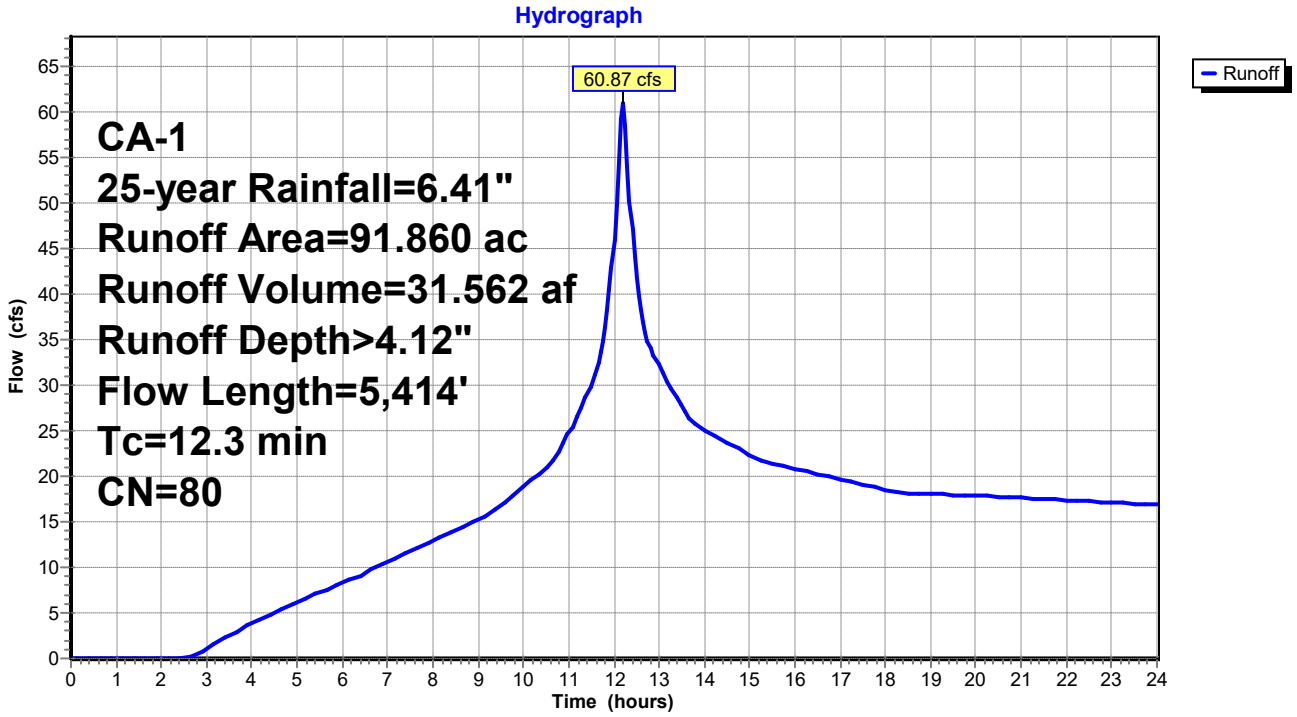
Runoff = 60.87 cfs @ 12.20 hrs, Volume= 31.562 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
	3.040	98	Paved parking, HSG C
*	2.490	79	Vineyard, Fair, HSG C
*	4.730	84	Vineyard, Fair, HSG D
*	21.330	75	Vineyard, Good, HSG C
*	0.070	81	Vineyard, Good, HSG D
	26.320	79	Pasture/grassland/range, Fair, HSG C
	28.180	84	Pasture/grassland/range, Fair, HSG D
	2.540	74	Pasture/grassland/range, Good, HSG C
	0.190	80	Pasture/grassland/range, Good, HSG D
	2.970	77	Woods, Good, HSG D
	91.860	80	Weighted Average
	88.820		96.69% Pervious Area
	3.040		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	100	0.4400	0.66		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.7	1,732	0.2300	7.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,442	0.1500	21.05	631.52	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.0	2,140	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
12.3	5,414	Total			

Subcatchment 2S: WS 3b - post project

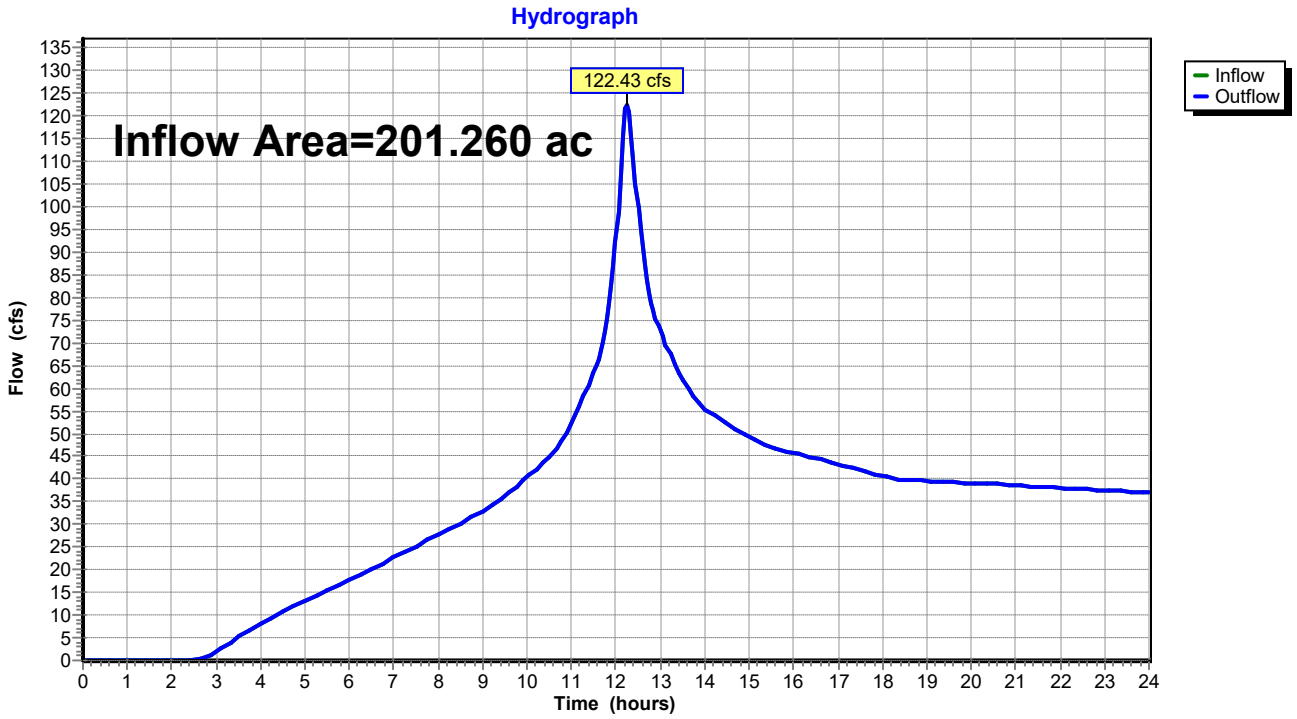


Summary for Reach 3: POI

Inflow Area = 201.260 ac, 1.51% Impervious, Inflow Depth > 4.11" for 25-year event
Inflow = 122.43 cfs @ 12.24 hrs, Volume= 68.893 af
Outflow = 122.43 cfs @ 12.24 hrs, Volume= 68.893 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3: POI



Summary for Subcatchment 1S: WS3a - post project

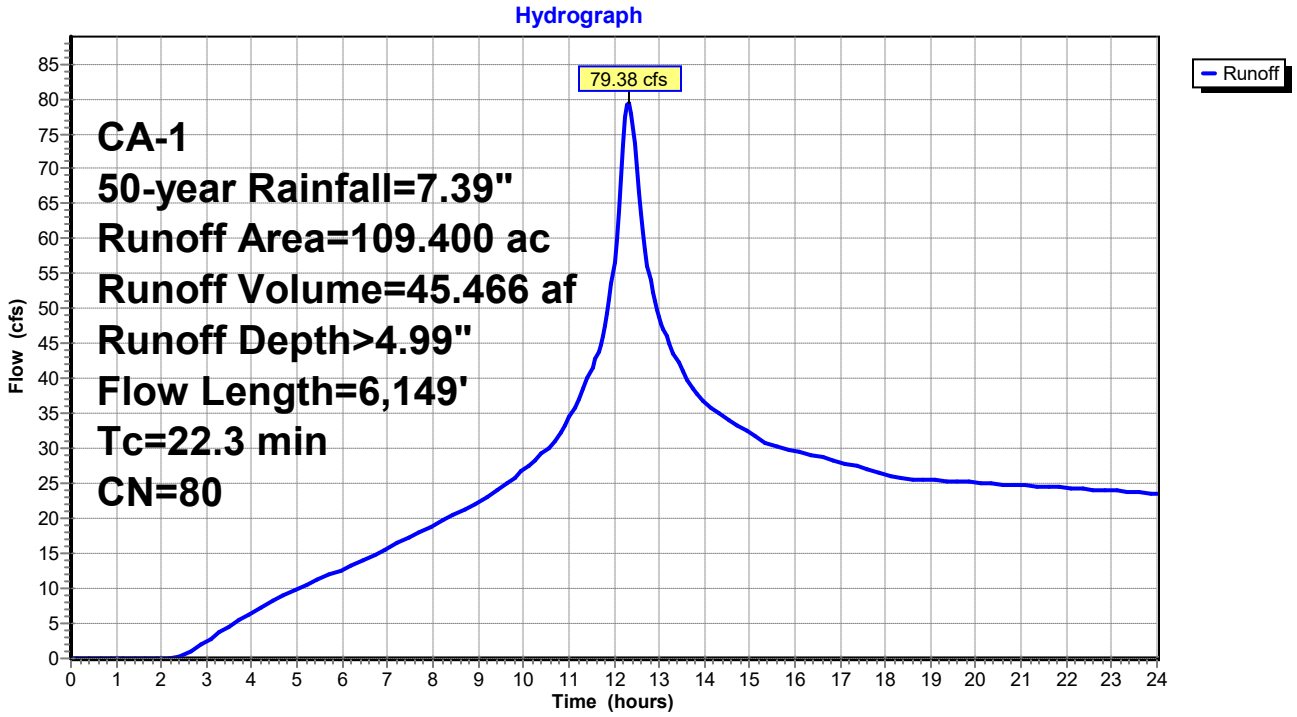
Runoff = 79.38 cfs @ 12.32 hrs, Volume= 45.466 af, Depth> 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
*	15.690	79	Vineyard, Fair, HSG C
*	6.470	84	Vineyard, Fair, HSG D
*	16.990	75	Vineyard, Good, HSG C
*	2.740	81	Vineyard, Good, HSG D
	45.390	79	Pasture/grassland/range, Fair, HSG C
	20.250	84	Pasture/grassland/range, Fair, HSG D
	0.150	74	Pasture/grassland/range, Good, HSG C
	0.800	80	Pasture/grassland/range, Good, HSG D
	0.920	77	Woods, Good, HSG D
	109.400	80	Weighted Average
	109.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
7.2	2,934	0.1800	6.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,150	0.1100	18.03	540.80	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
10.2	1,965	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
22.3	6,149	Total			

Subcatchment 1S: WS3a - post project



Summary for Subcatchment 2S: WS 3b - post project

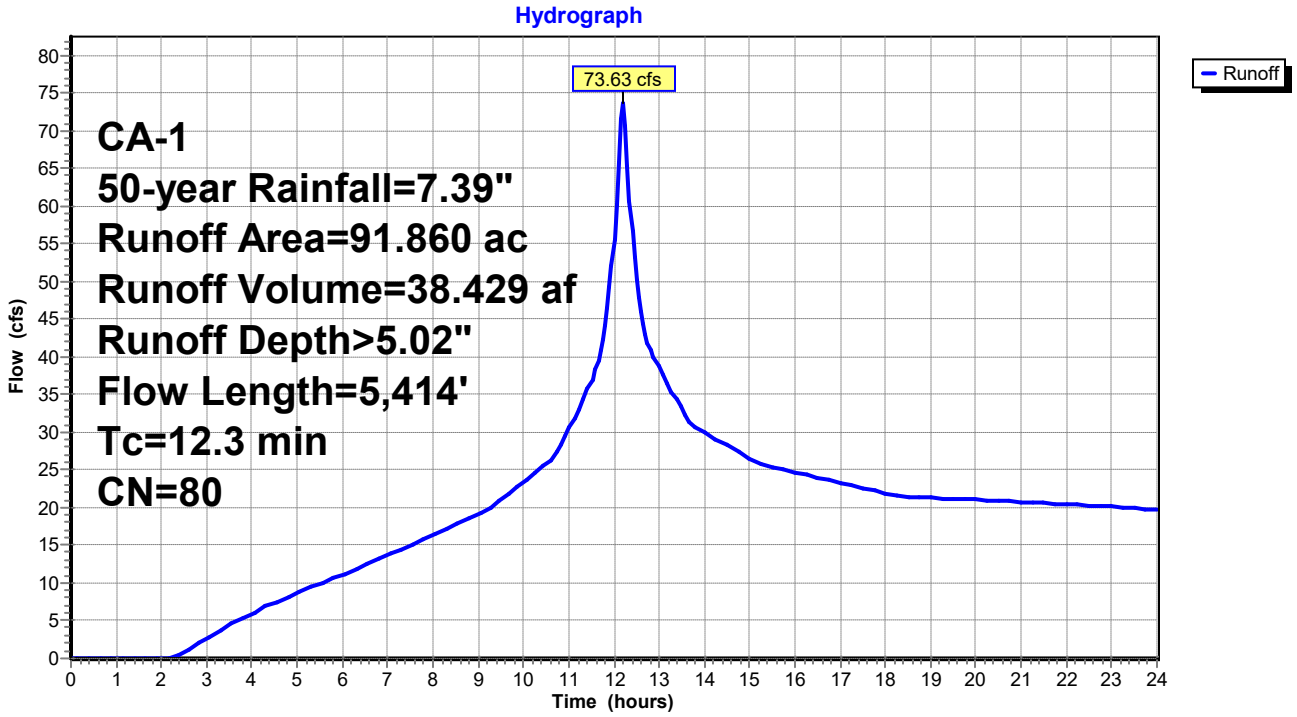
Runoff = 73.63 cfs @ 12.20 hrs, Volume= 38.429 af, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
	3.040	98	Paved parking, HSG C
*	2.490	79	Vineyard, Fair, HSG C
*	4.730	84	Vineyard, Fair, HSG D
*	21.330	75	Vineyard, Good, HSG C
*	0.070	81	Vineyard, Good, HSG D
	26.320	79	Pasture/grassland/range, Fair, HSG C
	28.180	84	Pasture/grassland/range, Fair, HSG D
	2.540	74	Pasture/grassland/range, Good, HSG C
	0.190	80	Pasture/grassland/range, Good, HSG D
	2.970	77	Woods, Good, HSG D
	91.860	80	Weighted Average
	88.820		96.69% Pervious Area
	3.040		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	100	0.4400	0.66		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.7	1,732	0.2300	7.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,442	0.1500	21.05	631.52	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.0	2,140	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
12.3	5,414	Total			

Subcatchment 2S: WS 3b - post project

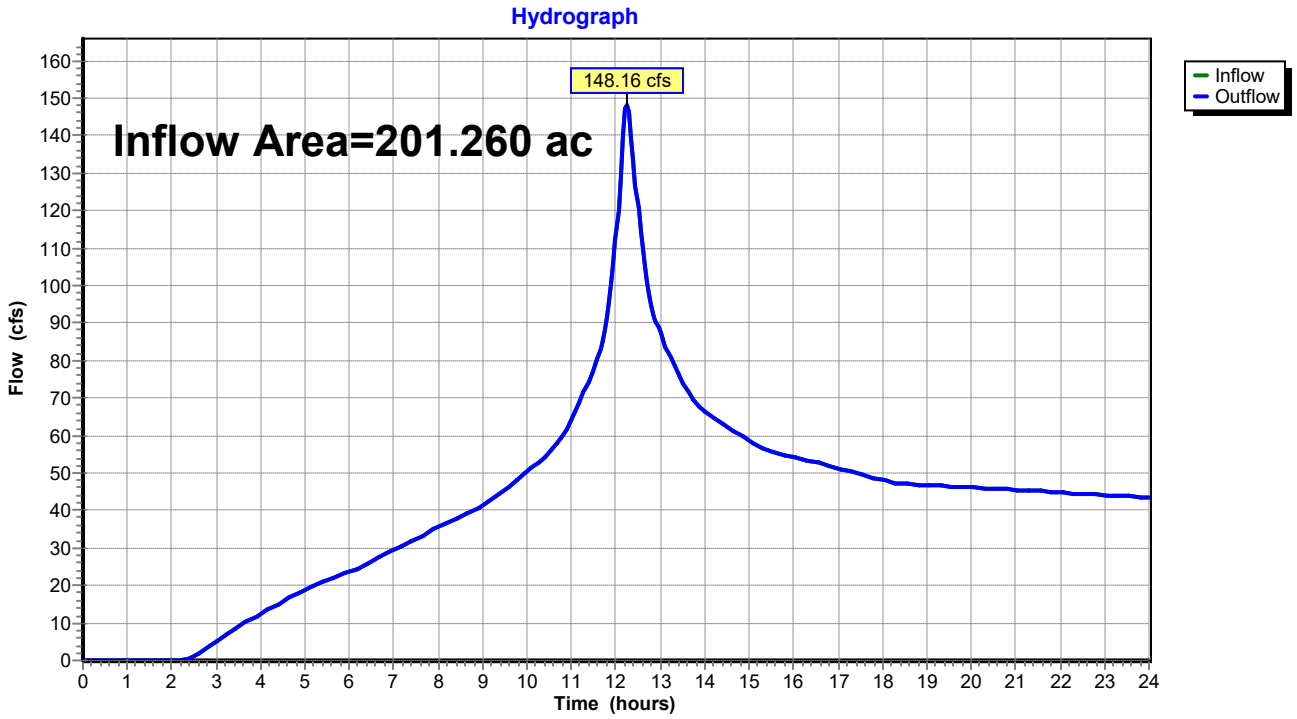


Summary for Reach 3: POI

Inflow Area = 201.260 ac, 1.51% Impervious, Inflow Depth > 5.00" for 50-year event
Inflow = 148.16 cfs @ 12.24 hrs, Volume= 83.895 af
Outflow = 148.16 cfs @ 12.24 hrs, Volume= 83.895 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3: POI



Summary for Subcatchment 1S: WS3a - post project

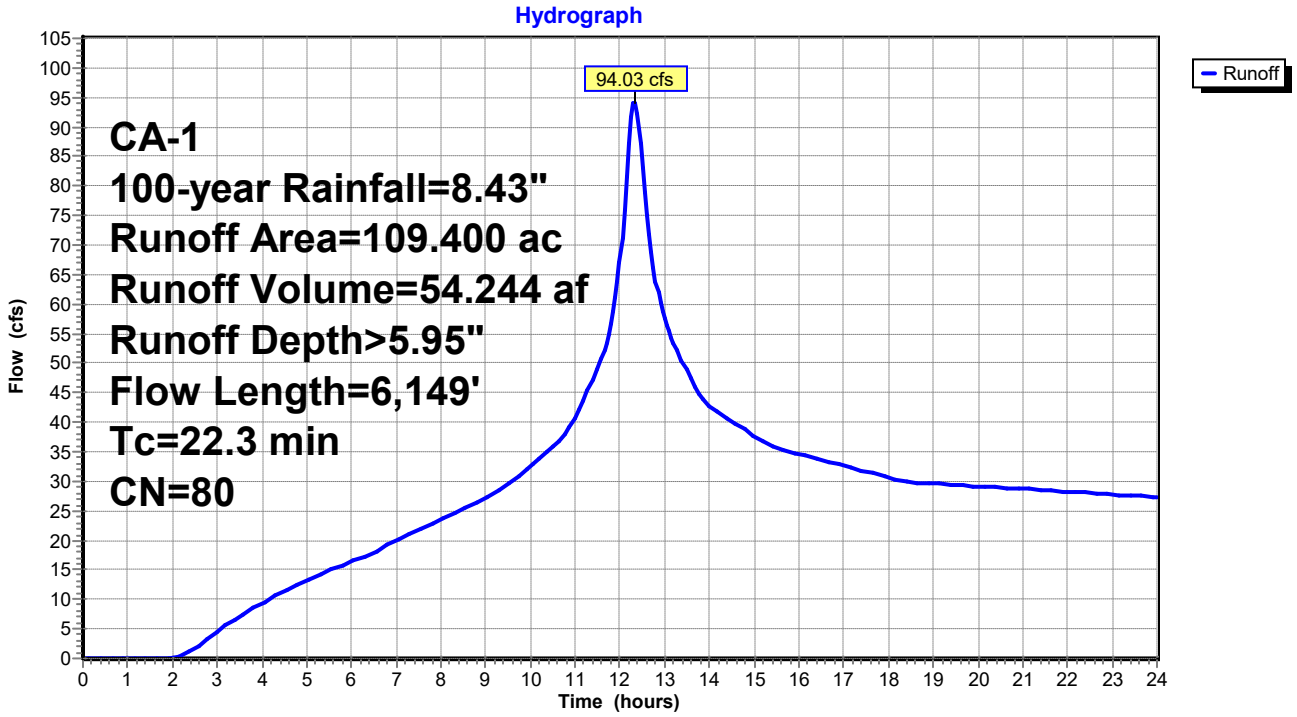
Runoff = 94.03 cfs @ 12.32 hrs, Volume= 54.244 af, Depth> 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
*	15.690	79	Vineyard, Fair, HSG C
*	6.470	84	Vineyard, Fair, HSG D
*	16.990	75	Vineyard, Good, HSG C
*	2.740	81	Vineyard, Good, HSG D
	45.390	79	Pasture/grassland/range, Fair, HSG C
	20.250	84	Pasture/grassland/range, Fair, HSG D
	0.150	74	Pasture/grassland/range, Good, HSG C
	0.800	80	Pasture/grassland/range, Good, HSG D
	0.920	77	Woods, Good, HSG D
	109.400	80	Weighted Average
	109.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
7.2	2,934	0.1800	6.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,150	0.1100	18.03	540.80	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
10.2	1,965	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
22.3	6,149	Total			

Subcatchment 1S: WS3a - post project



Summary for Subcatchment 2S: WS 3b - post project

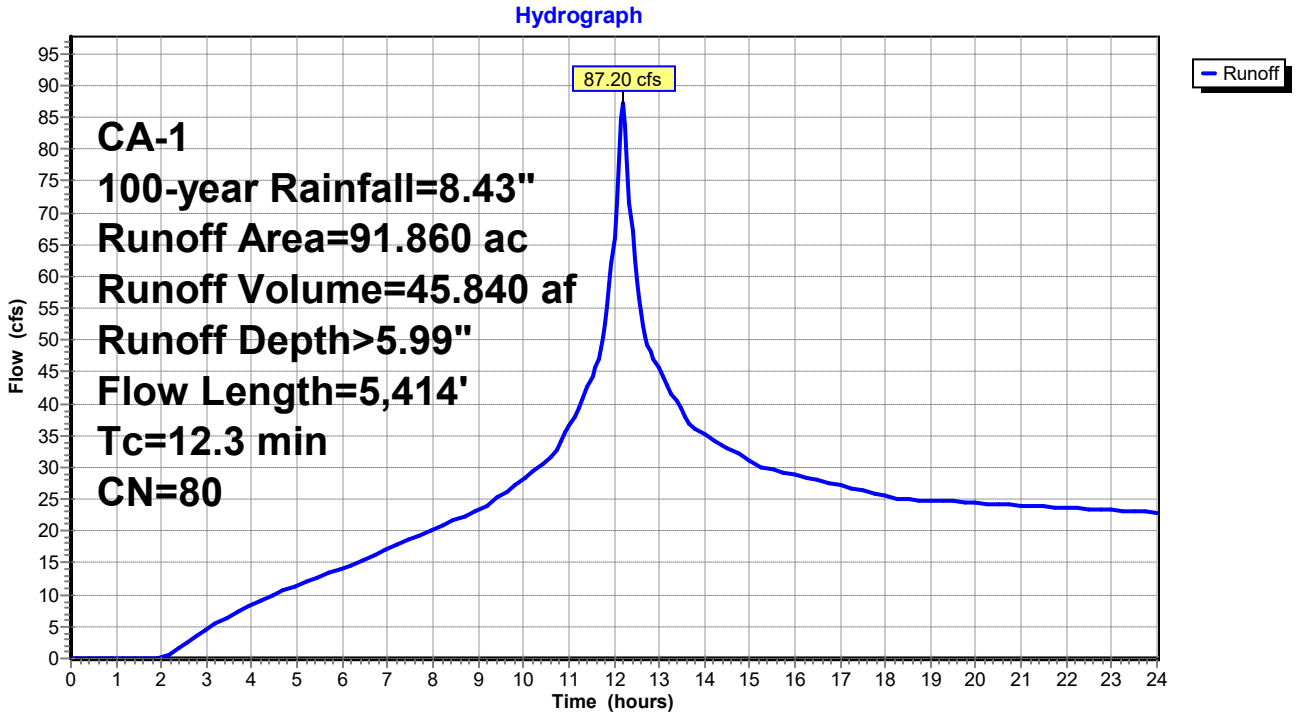
Runoff = 87.20 cfs @ 12.20 hrs, Volume= 45.840 af, Depth> 5.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
	3.040	98	Paved parking, HSG C
*	2.490	79	Vineyard, Fair, HSG C
*	4.730	84	Vineyard, Fair, HSG D
*	21.330	75	Vineyard, Good, HSG C
*	0.070	81	Vineyard, Good, HSG D
	26.320	79	Pasture/grassland/range, Fair, HSG C
	28.180	84	Pasture/grassland/range, Fair, HSG D
	2.540	74	Pasture/grassland/range, Good, HSG C
	0.190	80	Pasture/grassland/range, Good, HSG D
	2.970	77	Woods, Good, HSG D
	91.860	80	Weighted Average
	88.820		96.69% Pervious Area
	3.040		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	100	0.4400	0.66		**Sheet Flow,** Range n= 0.130 P2= 3.21"
3.7	1,732	0.2300	7.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	1,442	0.1500	21.05	631.52	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.0	2,140	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
12.3	5,414	Total			

Subcatchment 2S: WS 3b - post project

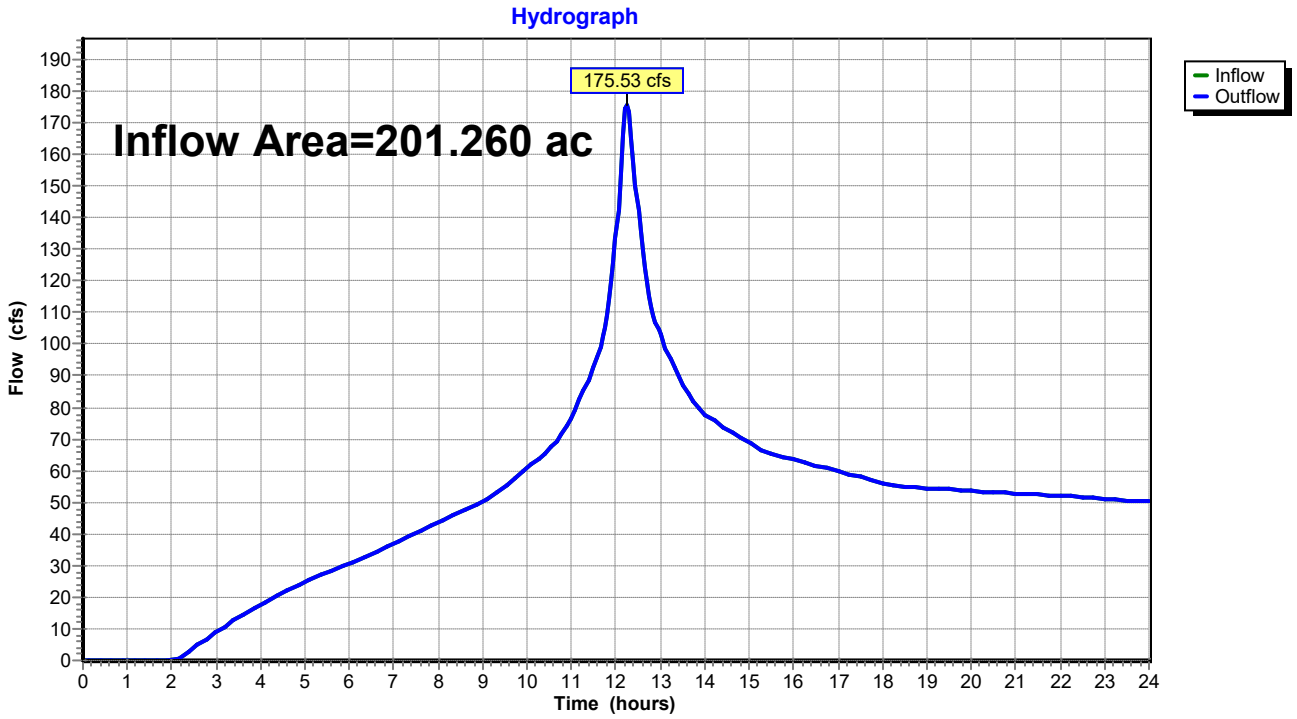


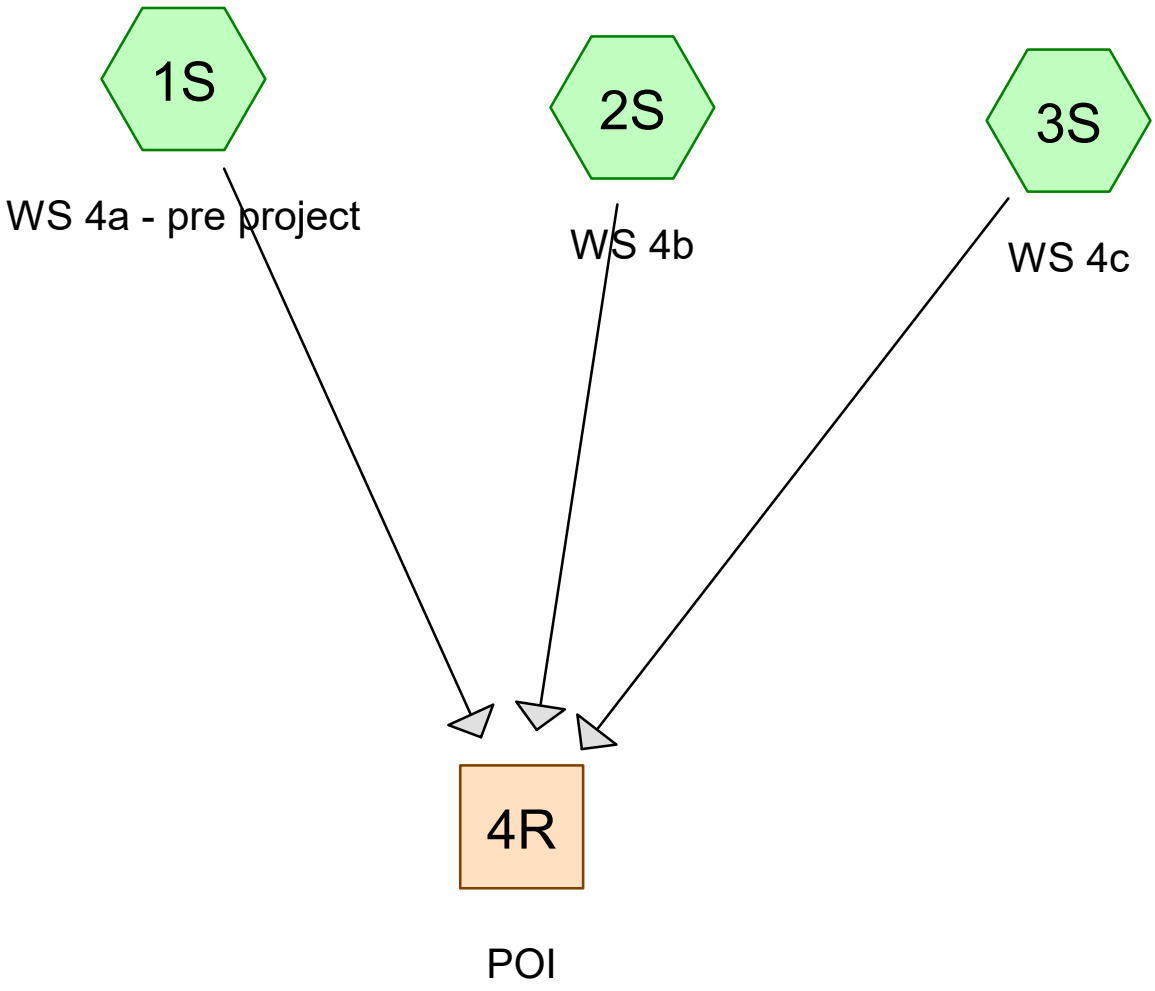
Summary for Reach 3: POI

Inflow Area = 201.260 ac, 1.51% Impervious, Inflow Depth > 5.97" for 100-year event
Inflow = 175.53 cfs @ 12.23 hrs, Volume= 100.084 af
Outflow = 175.53 cfs @ 12.23 hrs, Volume= 100.084 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 3: POI





Subcat Reach Pond Link

Routing Diagram for WS4 preR1

Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS 4a - pre project

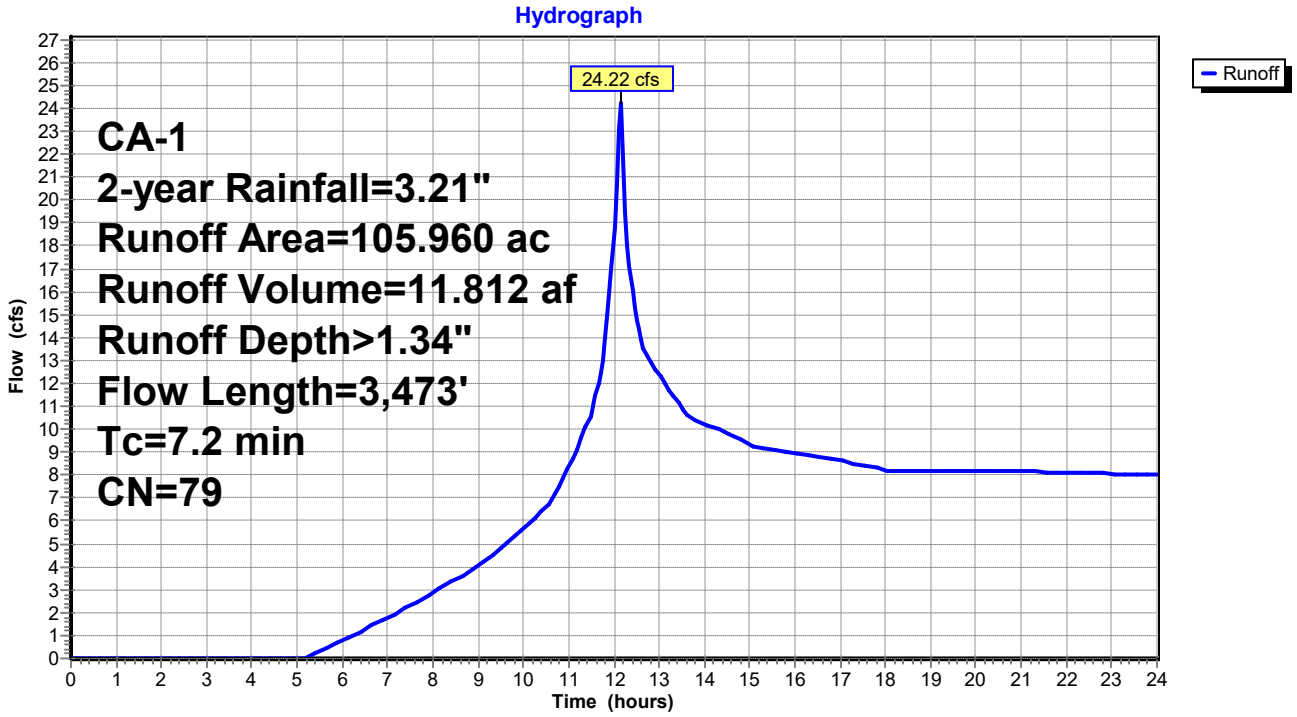
Runoff = 24.22 cfs @ 12.14 hrs, Volume= 11.812 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
*	10.880	79	Vineyard, Fair, HSG C
	93.280	79	Pasture/grassland/range, Fair, HSG C
	1.490	84	Pasture/grassland/range, Fair, HSG D
	0.310	77	Woods, Good, HSG D
	105.960	79	Weighted Average
	105.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.8	485	0.4100	10.31		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	390	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	2,498	0.1800	23.06	691.79	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
7.2	3,473	Total			

Subcatchment 1S: WS 4a - pre project



Summary for Subcatchment 2S: WS 4b

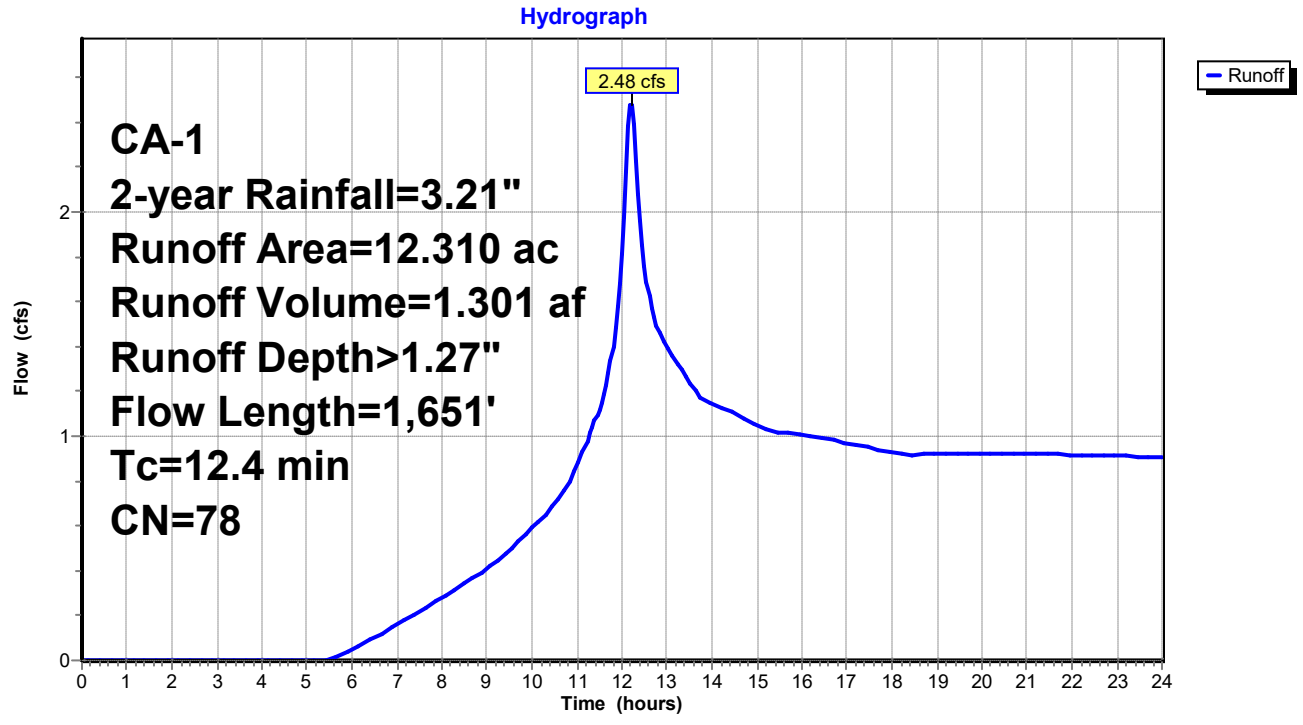
Runoff = 2.48 cfs @ 12.20 hrs, Volume= 1.301 af, Depth> 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

Area (ac)	CN	Description
10.350	79	Pasture/grassland/range, Fair, HSG C
1.960	74	Pasture/grassland/range, Good, HSG C
12.310	78	Weighted Average
12.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	186	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.2	1,365	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	1,651	Total			

Subcatchment 2S: WS 4b



Summary for Subcatchment 3S: WS 4c

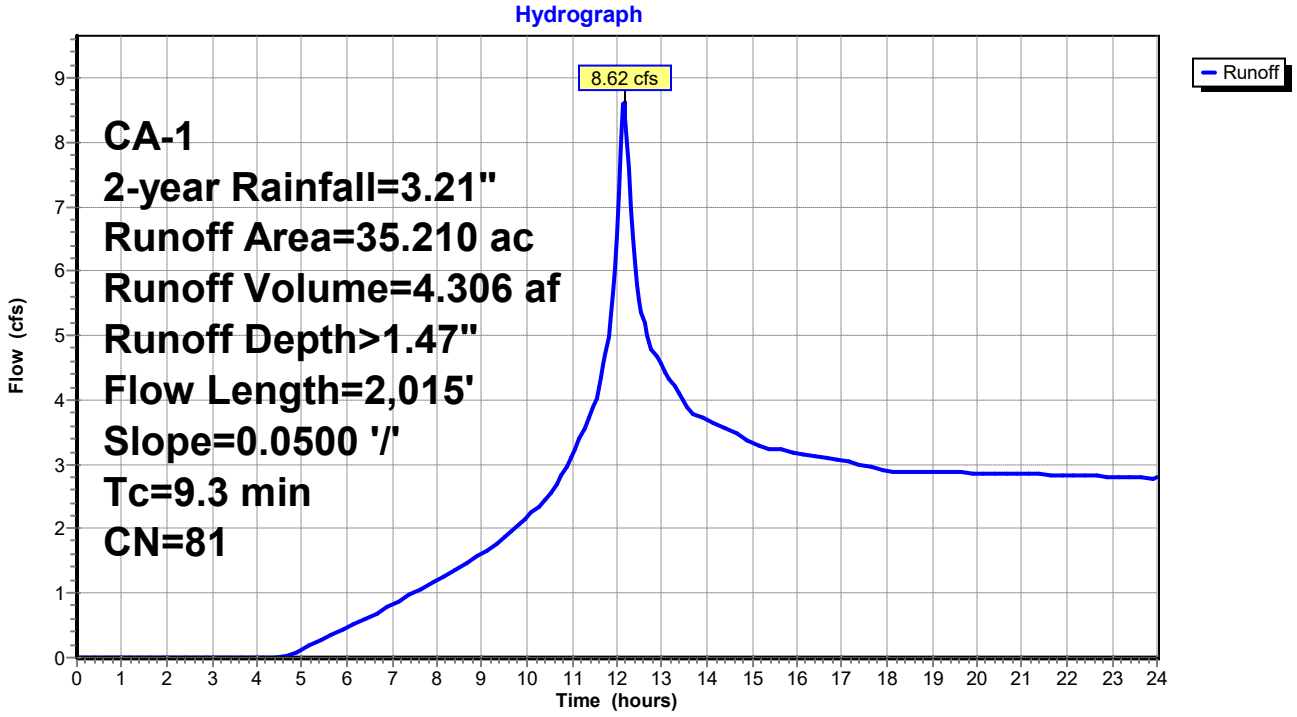
Runoff = 8.62 cfs @ 12.16 hrs, Volume= 4.306 af, Depth> 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
	4.510	98	Water Surface, HSG C
*	0.940	79	Vineyard, Fair, HSG C
	24.020	79	Pasture/grassland/range, Fair, HSG C
	5.280	74	Pasture/grassland/range, Good, HSG C
	0.460	86	Pasture/grassland/range, Poor, HSG C
	35.210	81	Weighted Average
	30.700		87.19% Pervious Area
	4.510		12.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	2,015	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 3S: WS 4c

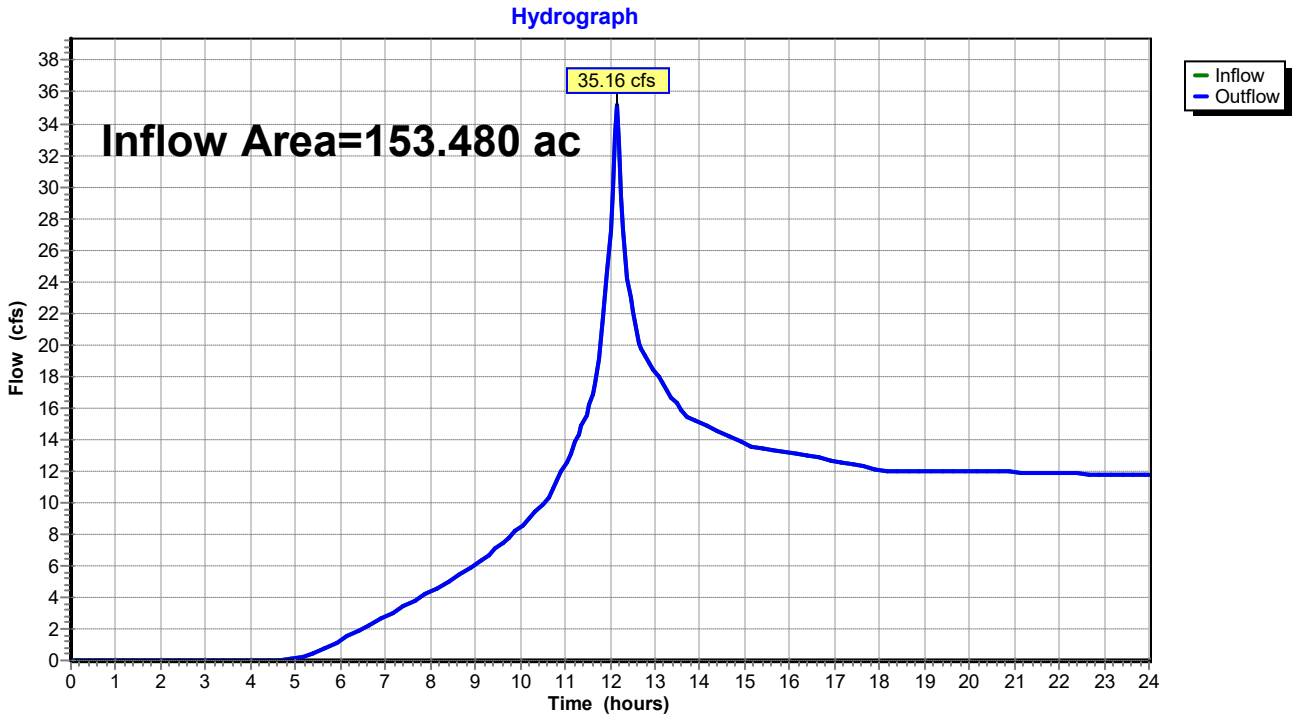


Summary for Reach 4R: POI

Inflow Area = 153.480 ac, 2.94% Impervious, Inflow Depth > 1.36" for 2-year event
Inflow = 35.16 cfs @ 12.15 hrs, Volume= 17.419 af
Outflow = 35.16 cfs @ 12.15 hrs, Volume= 17.419 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4R: POI



Summary for Subcatchment 1S: WS 4a - pre project

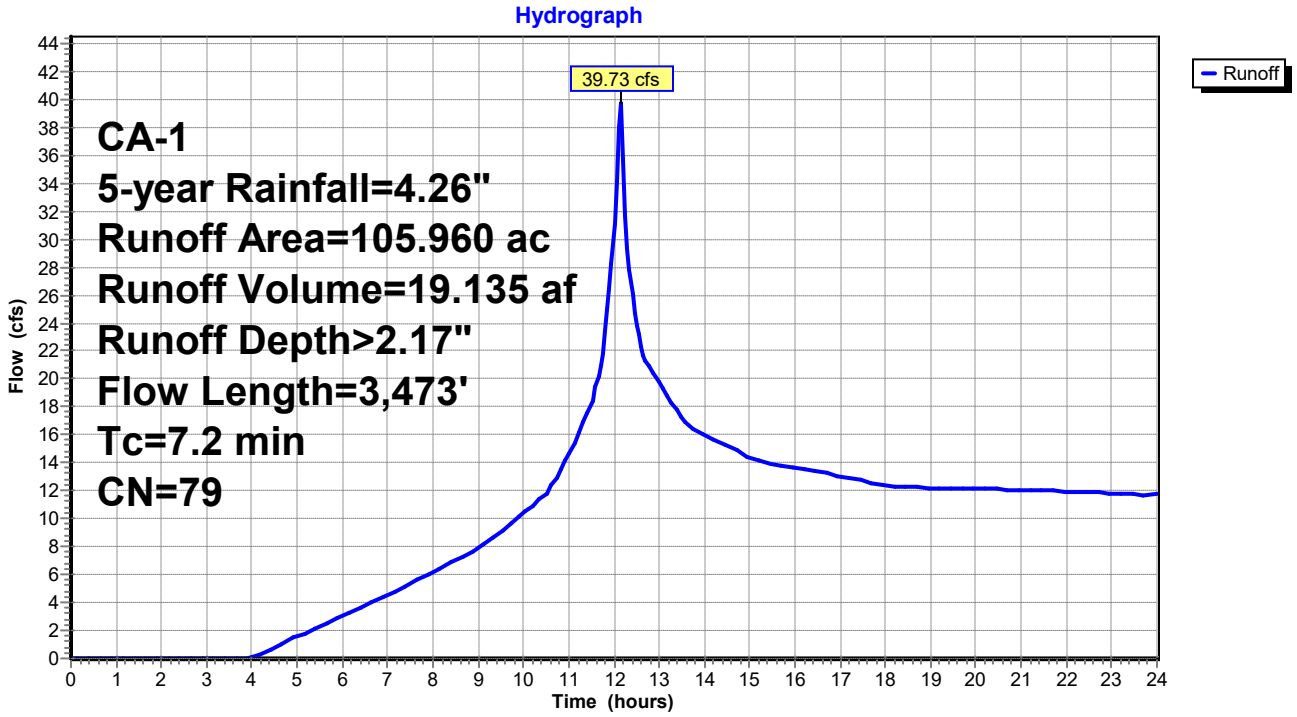
Runoff = 39.73 cfs @ 12.14 hrs, Volume= 19.135 af, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
*	10.880	79	Vineyard, Fair, HSG C
	93.280	79	Pasture/grassland/range, Fair, HSG C
	1.490	84	Pasture/grassland/range, Fair, HSG D
	0.310	77	Woods, Good, HSG D
	105.960	79	Weighted Average
	105.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.8	485	0.4100	10.31		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	390	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	2,498	0.1800	23.06	691.79	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
7.2	3,473	Total			

Subcatchment 1S: WS 4a - pre project



Summary for Subcatchment 2S: WS 4b

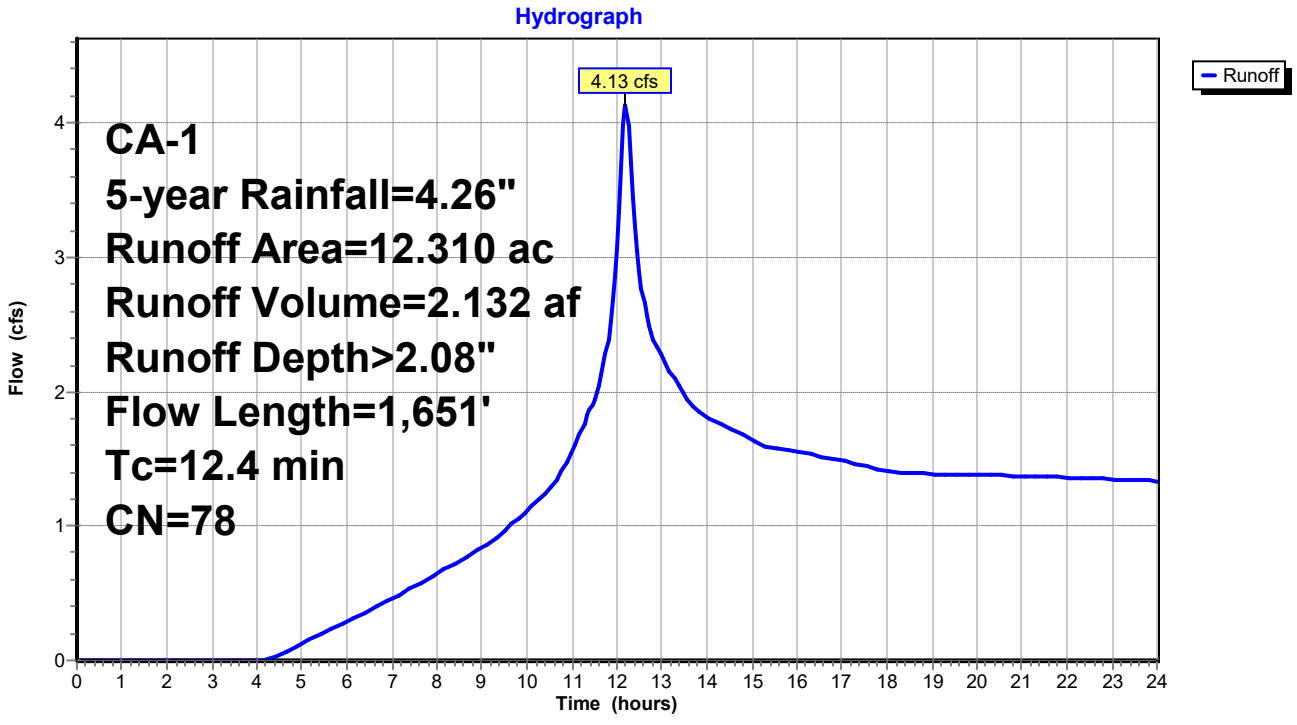
Runoff = 4.13 cfs @ 12.20 hrs, Volume= 2.132 af, Depth> 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

Area (ac)	CN	Description
10.350	79	Pasture/grassland/range, Fair, HSG C
1.960	74	Pasture/grassland/range, Good, HSG C
12.310	78	Weighted Average
12.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	186	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.2	1,365	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	1,651	Total			

Subcatchment 2S: WS 4b



Summary for Subcatchment 3S: WS 4c

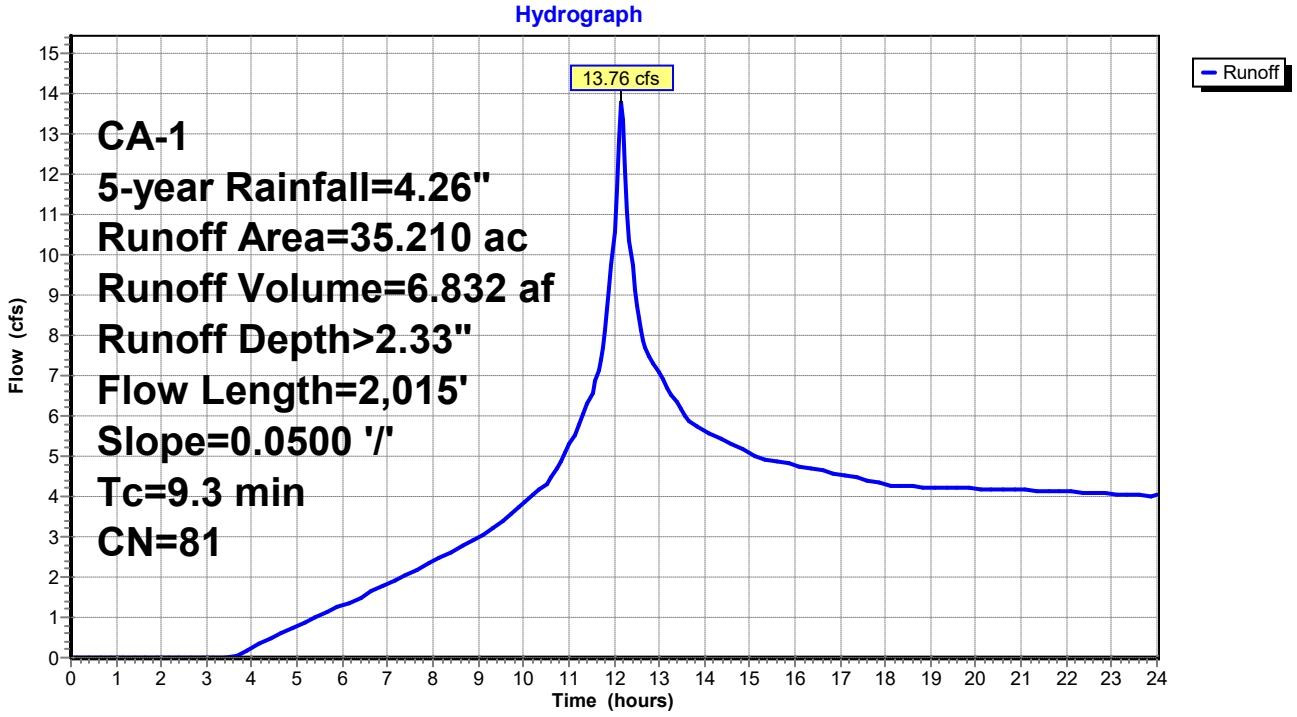
Runoff = 13.76 cfs @ 12.16 hrs, Volume= 6.832 af, Depth> 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
	4.510	98	Water Surface, HSG C
*	0.940	79	Vineyard, Fair, HSG C
	24.020	79	Pasture/grassland/range, Fair, HSG C
	5.280	74	Pasture/grassland/range, Good, HSG C
	0.460	86	Pasture/grassland/range, Poor, HSG C
	35.210	81	Weighted Average
	30.700		87.19% Pervious Area
	4.510		12.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	2,015	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 3S: WS 4c

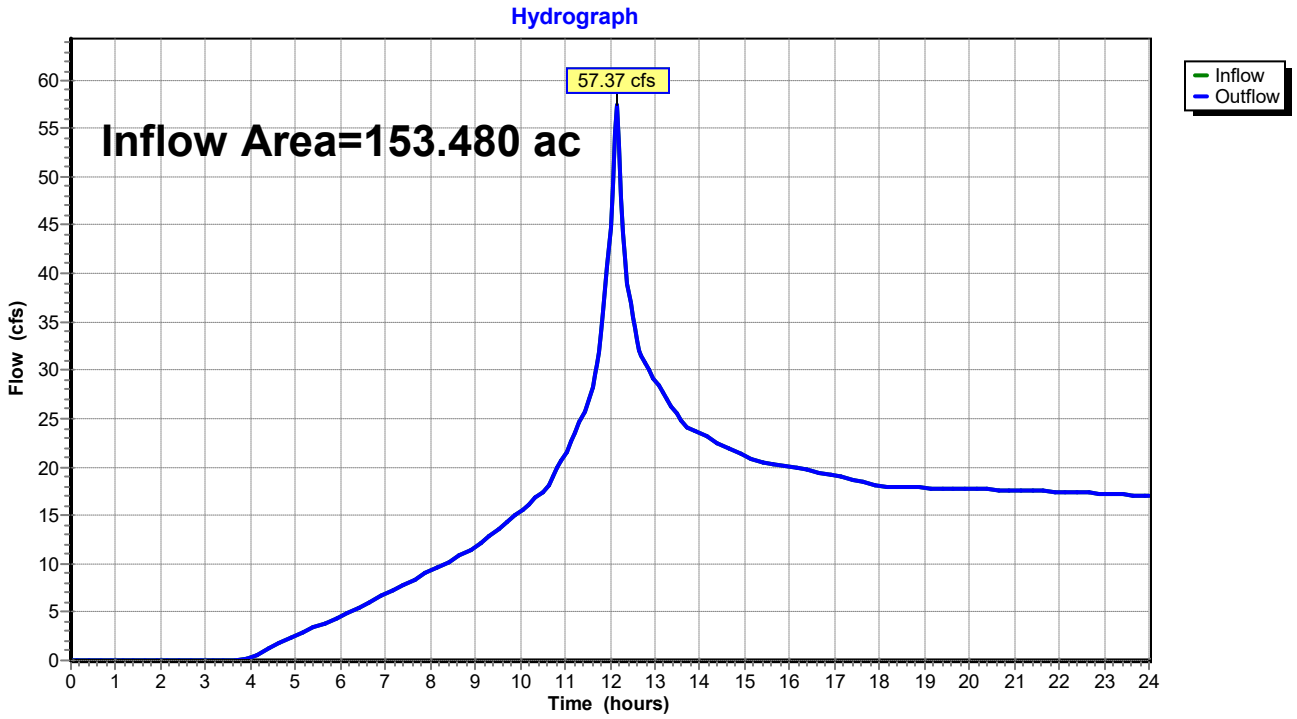


Summary for Reach 4R: POI

Inflow Area = 153.480 ac, 2.94% Impervious, Inflow Depth > 2.20" for 5-year event
Inflow = 57.37 cfs @ 12.15 hrs, Volume= 28.098 af
Outflow = 57.37 cfs @ 12.15 hrs, Volume= 28.098 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4R: POI



Summary for Subcatchment 1S: WS 4a - pre project

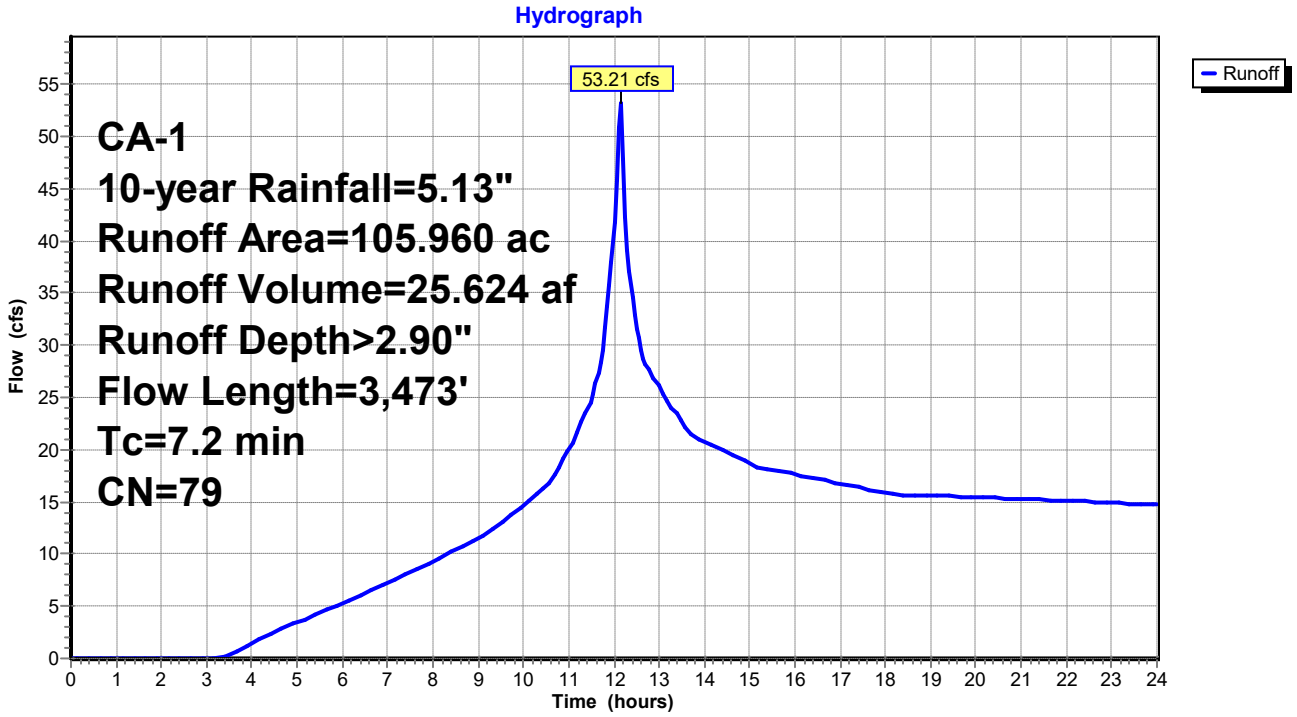
Runoff = 53.21 cfs @ 12.14 hrs, Volume= 25.624 af, Depth> 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
*	10.880	79	Vineyard, Fair, HSG C
	93.280	79	Pasture/grassland/range, Fair, HSG C
	1.490	84	Pasture/grassland/range, Fair, HSG D
	0.310	77	Woods, Good, HSG D
	105.960	79	Weighted Average
	105.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.8	485	0.4100	10.31		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	390	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	2,498	0.1800	23.06	691.79	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
7.2	3,473	Total			

Subcatchment 1S: WS 4a - pre project



Summary for Subcatchment 2S: WS 4b

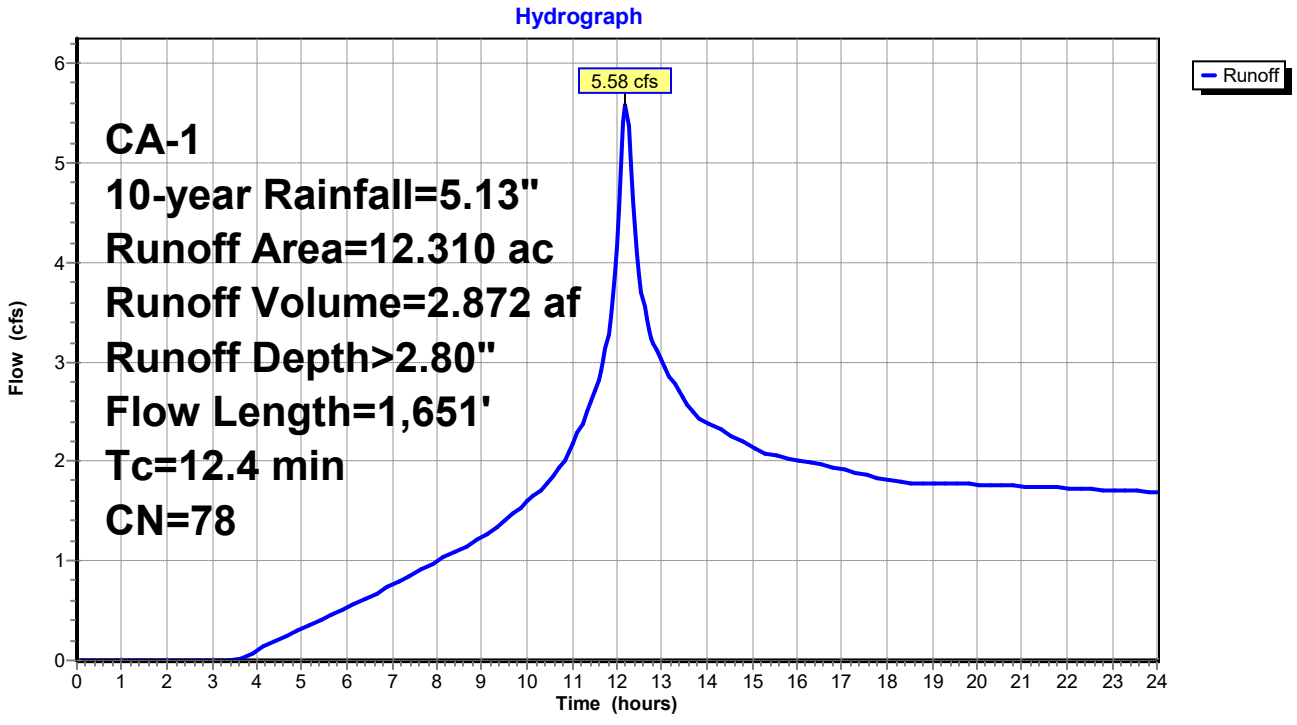
Runoff = 5.58 cfs @ 12.20 hrs, Volume= 2.872 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

Area (ac)	CN	Description
10.350	79	Pasture/grassland/range, Fair, HSG C
1.960	74	Pasture/grassland/range, Good, HSG C
12.310	78	Weighted Average
12.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	186	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.2	1,365	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	1,651	Total			

Subcatchment 2S: WS 4b



Summary for Subcatchment 3S: WS 4c

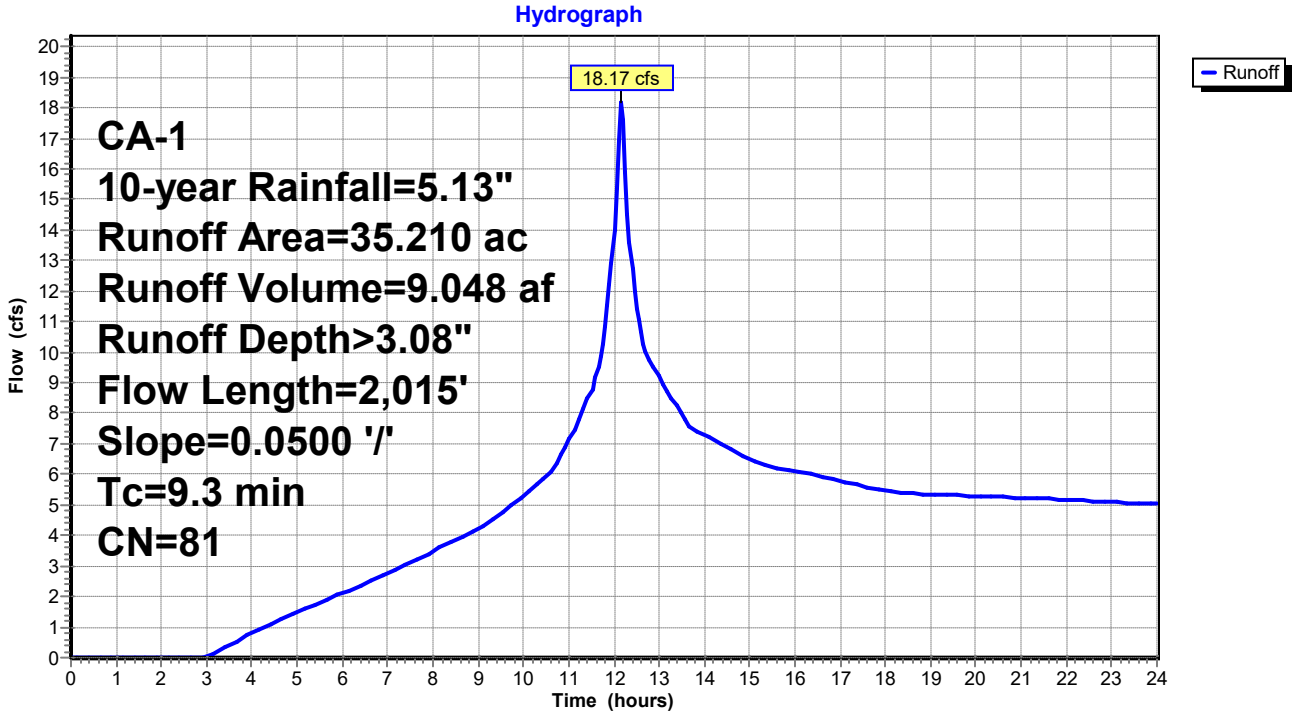
Runoff = 18.17 cfs @ 12.16 hrs, Volume= 9.048 af, Depth> 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
	4.510	98	Water Surface, HSG C
*	0.940	79	Vineyard, Fair, HSG C
	24.020	79	Pasture/grassland/range, Fair, HSG C
	5.280	74	Pasture/grassland/range, Good, HSG C
	0.460	86	Pasture/grassland/range, Poor, HSG C
	35.210	81	Weighted Average
	30.700		87.19% Pervious Area
	4.510		12.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	2,015	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 3S: WS 4c

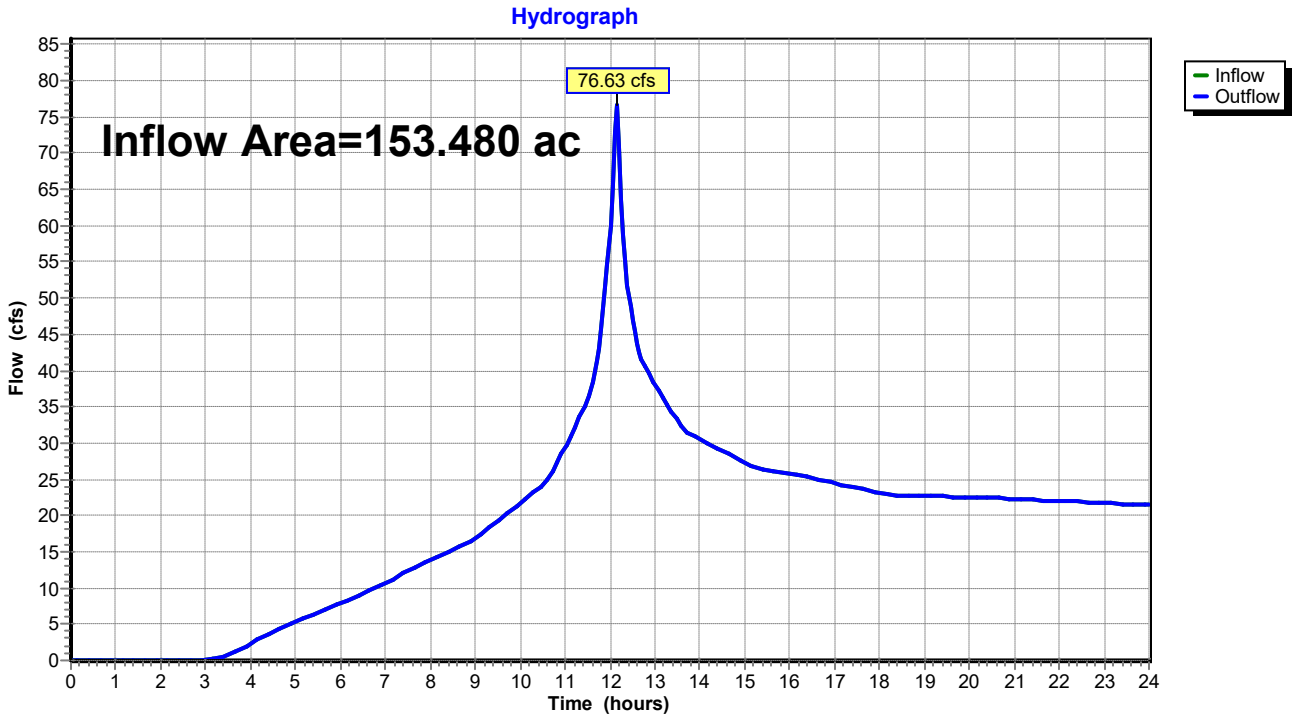


Summary for Reach 4R: POI

Inflow Area = 153.480 ac, 2.94% Impervious, Inflow Depth > 2.94" for 10-year event
Inflow = 76.63 cfs @ 12.15 hrs, Volume= 37.543 af
Outflow = 76.63 cfs @ 12.15 hrs, Volume= 37.543 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4R: POI



Summary for Subcatchment 1S: WS 4a - pre project

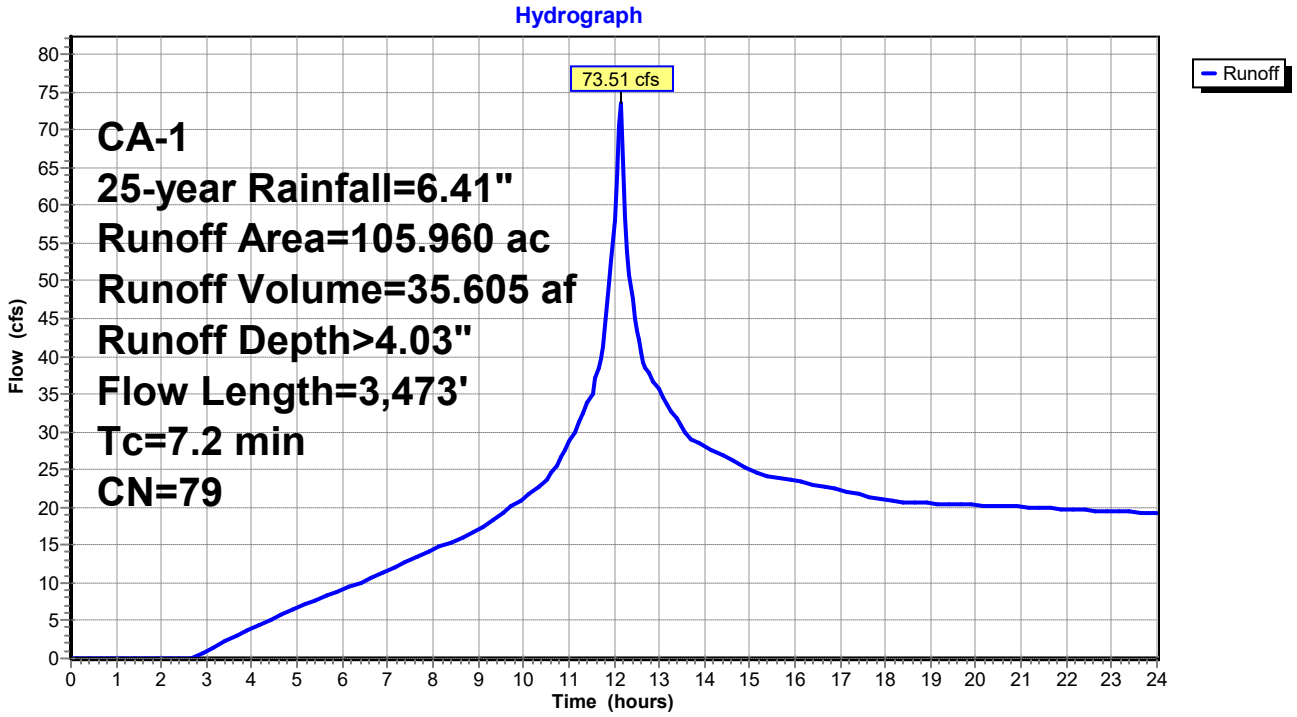
Runoff = 73.51 cfs @ 12.14 hrs, Volume= 35.605 af, Depth> 4.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
*	10.880	79	Vineyard, Fair, HSG C
	93.280	79	Pasture/grassland/range, Fair, HSG C
	1.490	84	Pasture/grassland/range, Fair, HSG D
	0.310	77	Woods, Good, HSG D
	105.960	79	Weighted Average
	105.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.8	485	0.4100	10.31		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	390	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	2,498	0.1800	23.06	691.79	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
7.2	3,473	Total			

Subcatchment 1S: WS 4a - pre project



Summary for Subcatchment 2S: WS 4b

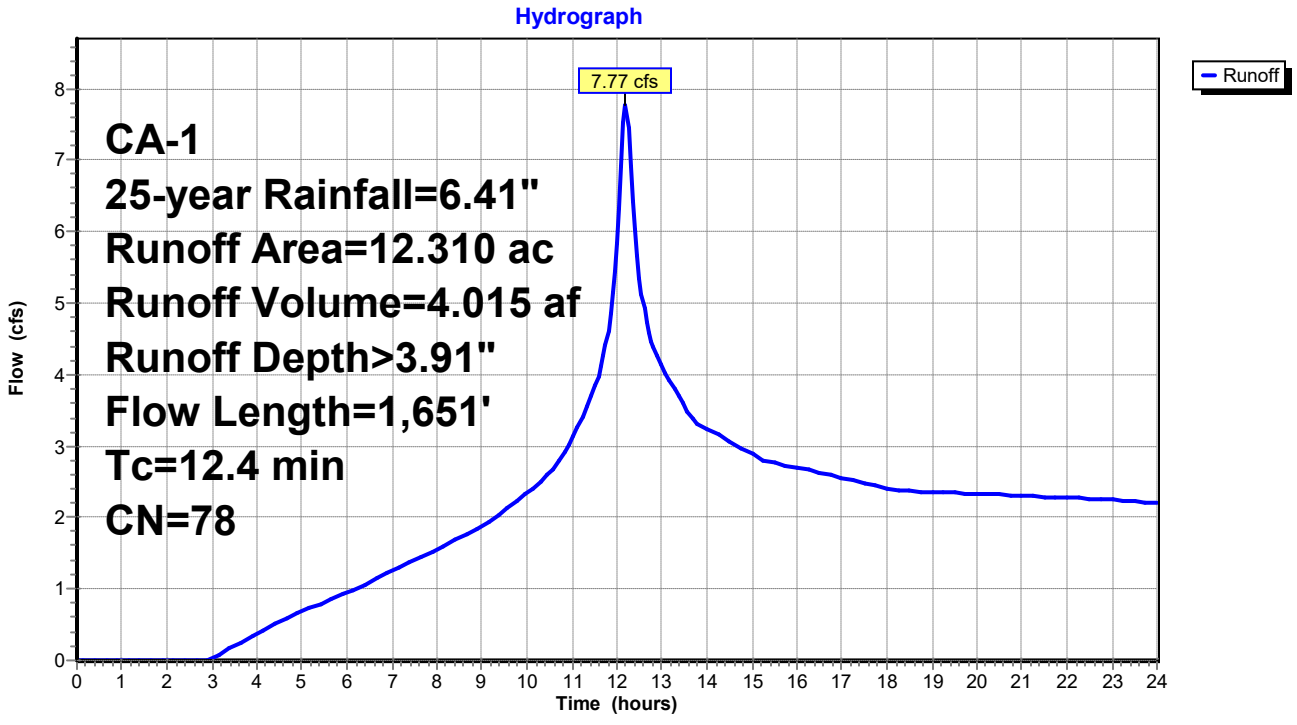
Runoff = 7.77 cfs @ 12.20 hrs, Volume= 4.015 af, Depth> 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

Area (ac)	CN	Description
10.350	79	Pasture/grassland/range, Fair, HSG C
1.960	74	Pasture/grassland/range, Good, HSG C
12.310	78	Weighted Average
12.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	186	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.2	1,365	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	1,651	Total			

Subcatchment 2S: WS 4b



Summary for Subcatchment 3S: WS 4c

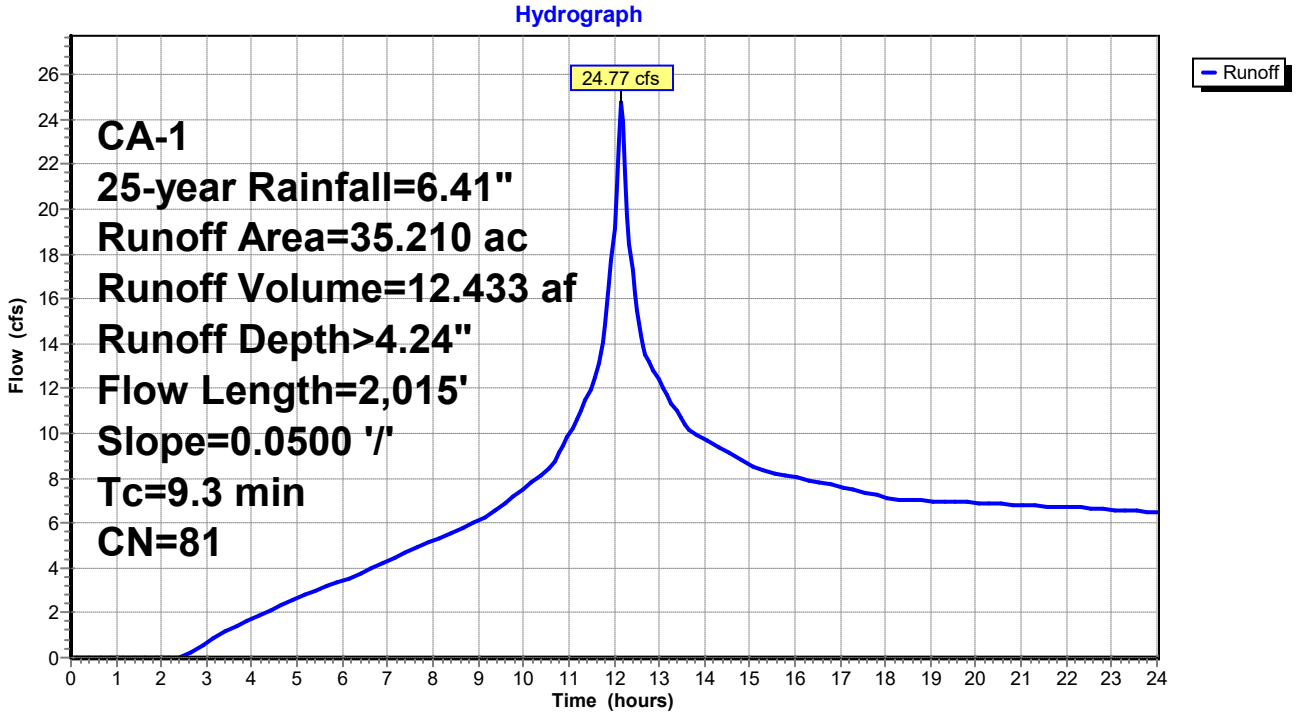
Runoff = 24.77 cfs @ 12.16 hrs, Volume= 12.433 af, Depth> 4.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
	4.510	98	Water Surface, HSG C
*	0.940	79	Vineyard, Fair, HSG C
	24.020	79	Pasture/grassland/range, Fair, HSG C
	5.280	74	Pasture/grassland/range, Good, HSG C
	0.460	86	Pasture/grassland/range, Poor, HSG C
	35.210	81	Weighted Average
	30.700		87.19% Pervious Area
	4.510		12.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	2,015	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 3S: WS 4c

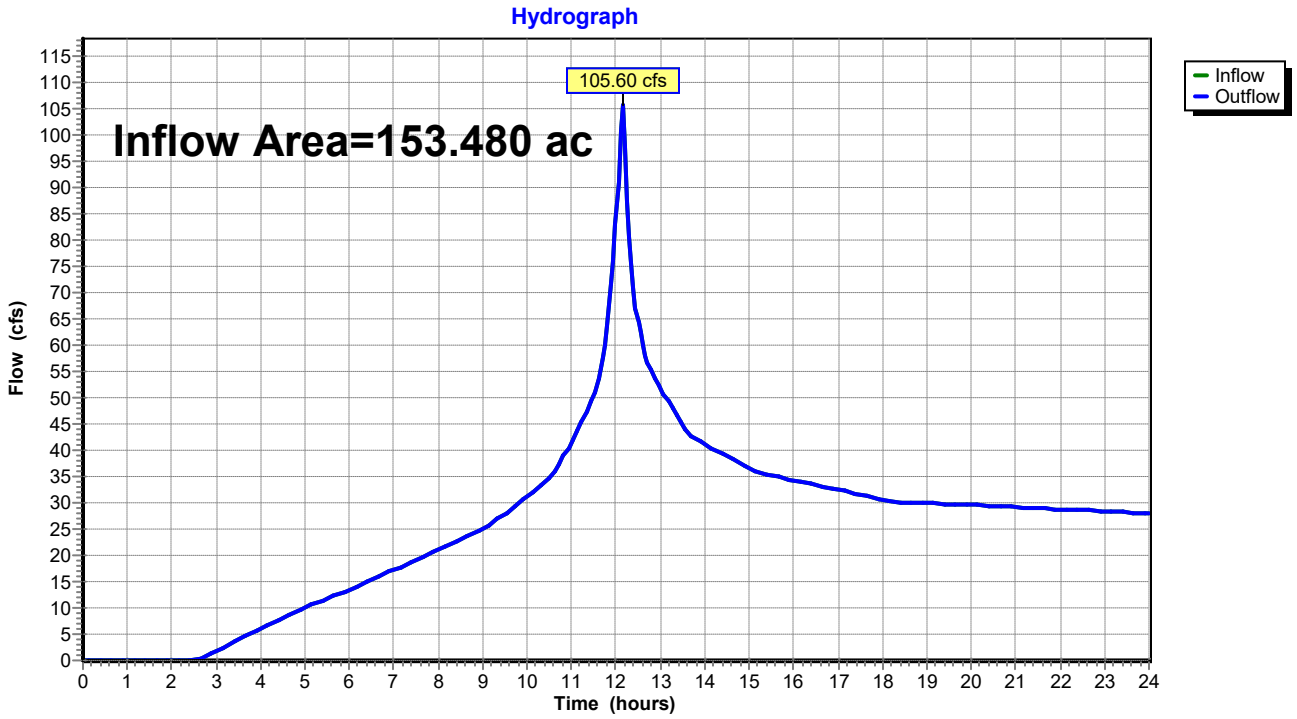


Summary for Reach 4R: POI

Inflow Area = 153.480 ac, 2.94% Impervious, Inflow Depth > 4.07" for 25-year event
Inflow = 105.60 cfs @ 12.14 hrs, Volume= 52.052 af
Outflow = 105.60 cfs @ 12.14 hrs, Volume= 52.052 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4R: POI



Summary for Subcatchment 1S: WS 4a - pre project

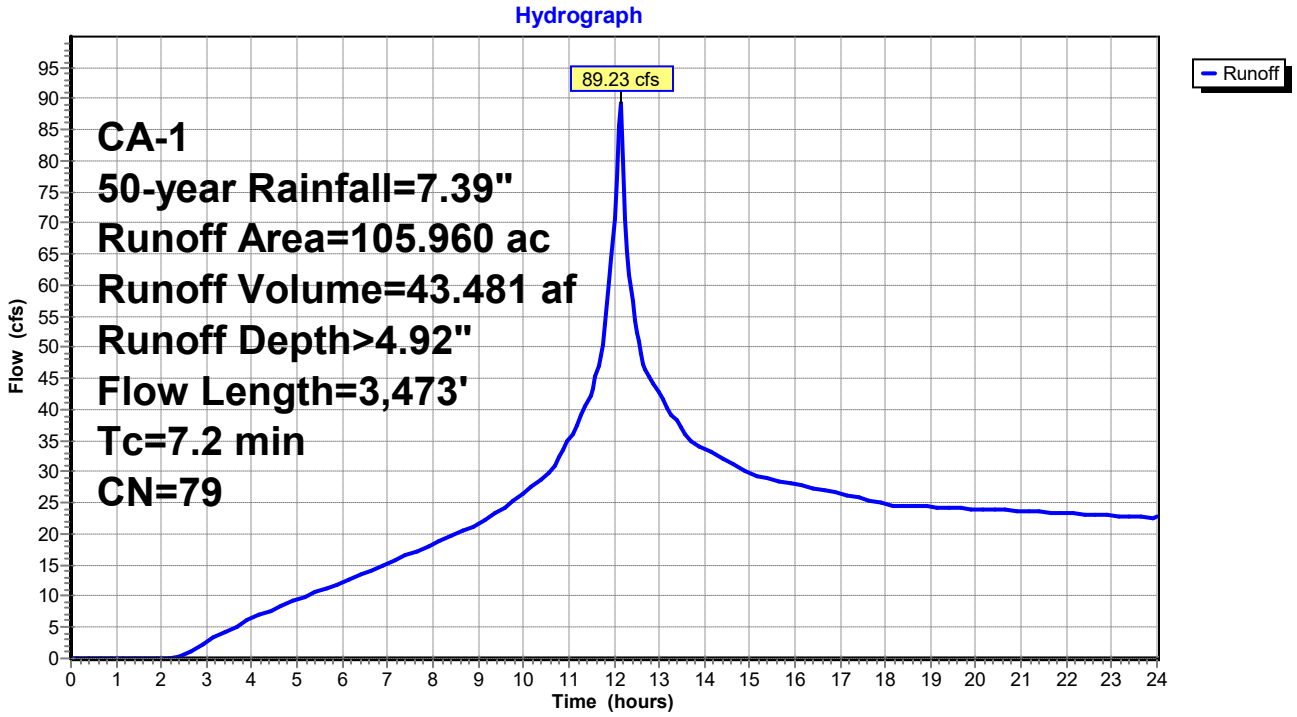
Runoff = 89.23 cfs @ 12.14 hrs, Volume= 43.481 af, Depth> 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
*	10.880	79	Vineyard, Fair, HSG C
	93.280	79	Pasture/grassland/range, Fair, HSG C
	1.490	84	Pasture/grassland/range, Fair, HSG D
	0.310	77	Woods, Good, HSG D
	105.960	79	Weighted Average
	105.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.8	485	0.4100	10.31		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	390	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	2,498	0.1800	23.06	691.79	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
7.2	3,473	Total			

Subcatchment 1S: WS 4a - pre project



Summary for Subcatchment 2S: WS 4b

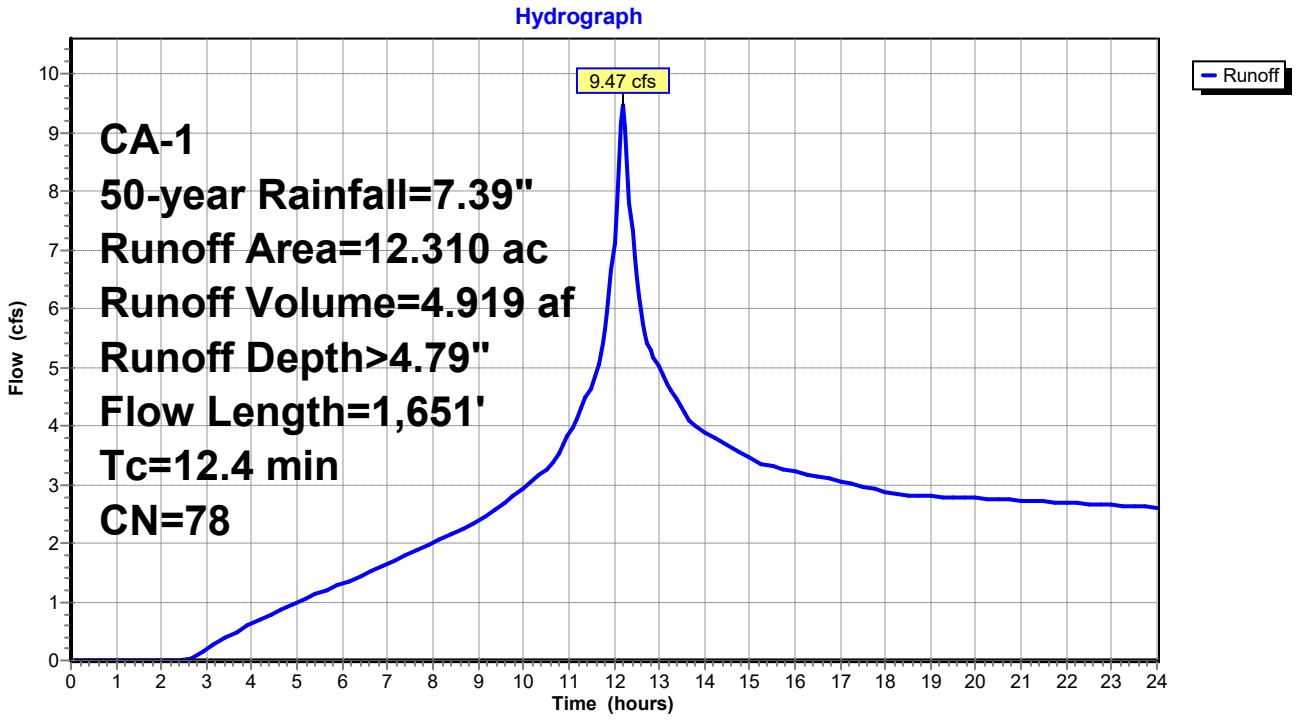
Runoff = 9.47 cfs @ 12.20 hrs, Volume= 4.919 af, Depth> 4.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

Area (ac)	CN	Description
10.350	79	Pasture/grassland/range, Fair, HSG C
1.960	74	Pasture/grassland/range, Good, HSG C
12.310	78	Weighted Average
12.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	186	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.2	1,365	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	1,651	Total			

Subcatchment 2S: WS 4b



Summary for Subcatchment 3S: WS 4c

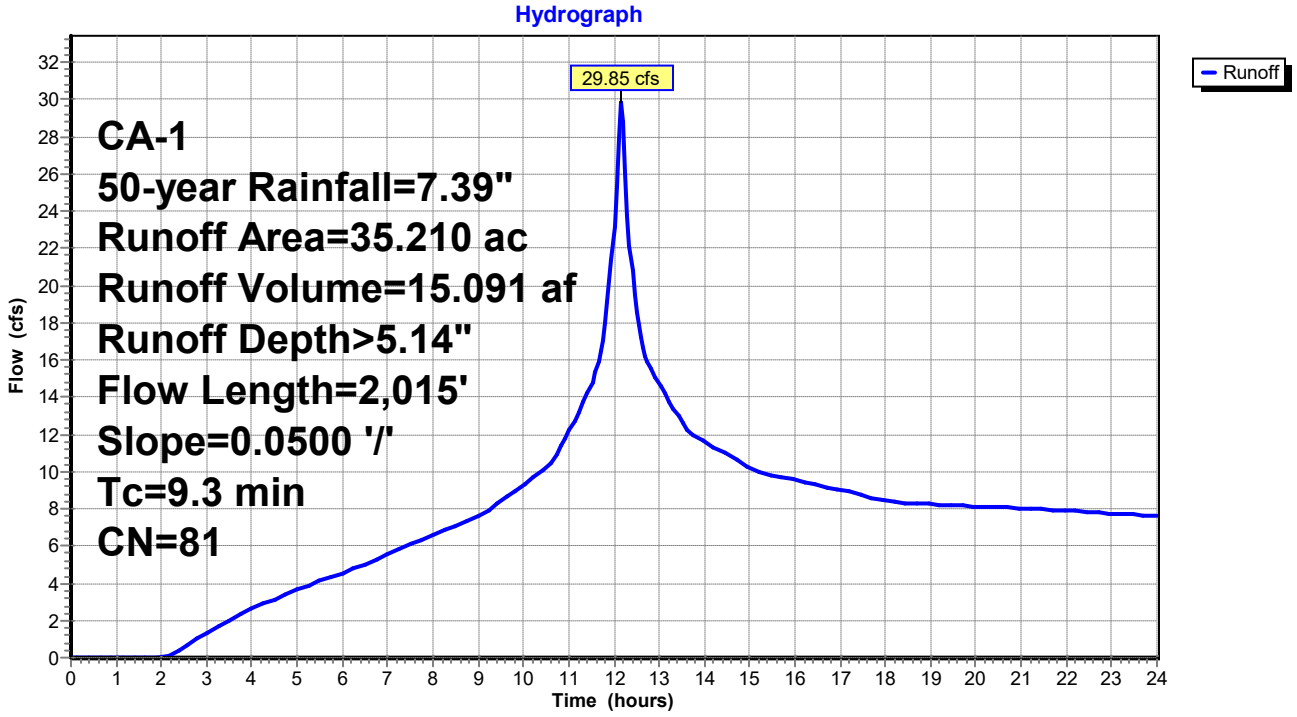
Runoff = 29.85 cfs @ 12.16 hrs, Volume= 15.091 af, Depth> 5.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
	4.510	98	Water Surface, HSG C
*	0.940	79	Vineyard, Fair, HSG C
	24.020	79	Pasture/grassland/range, Fair, HSG C
	5.280	74	Pasture/grassland/range, Good, HSG C
	0.460	86	Pasture/grassland/range, Poor, HSG C
	35.210	81	Weighted Average
	30.700		87.19% Pervious Area
	4.510		12.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	2,015	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 3S: WS 4c

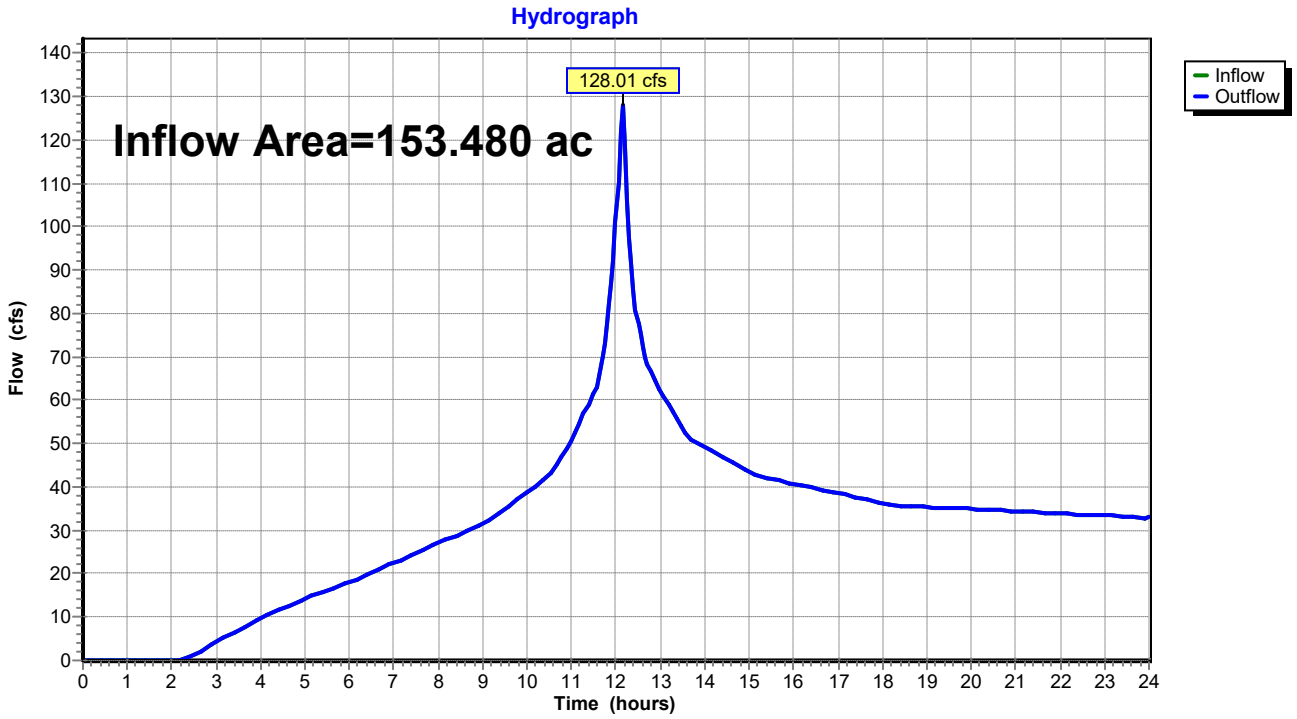


Summary for Reach 4R: POI

Inflow Area = 153.480 ac, 2.94% Impervious, Inflow Depth > 4.96" for 50-year event
Inflow = 128.01 cfs @ 12.14 hrs, Volume= 63.491 af
Outflow = 128.01 cfs @ 12.14 hrs, Volume= 63.491 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4R: POI



Summary for Subcatchment 1S: WS 4a - pre project

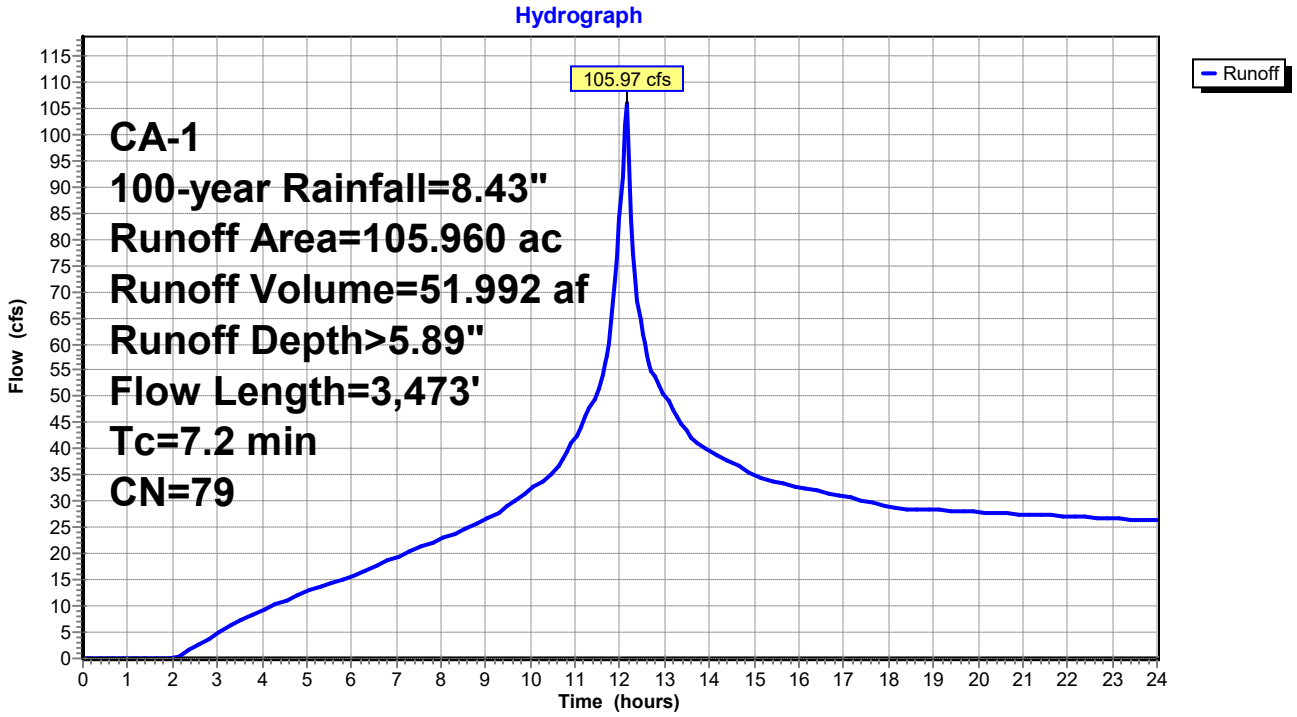
Runoff = 105.97 cfs @ 12.14 hrs, Volume= 51.992 af, Depth> 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
*	10.880	79	Vineyard, Fair, HSG C
	93.280	79	Pasture/grassland/range, Fair, HSG C
	1.490	84	Pasture/grassland/range, Fair, HSG D
	0.310	77	Woods, Good, HSG D
	105.960	79	Weighted Average
	105.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.8	485	0.4100	10.31		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	390	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	2,498	0.1800	23.06	691.79	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
7.2	3,473	Total			

Subcatchment 1S: WS 4a - pre project



Summary for Subcatchment 2S: WS 4b

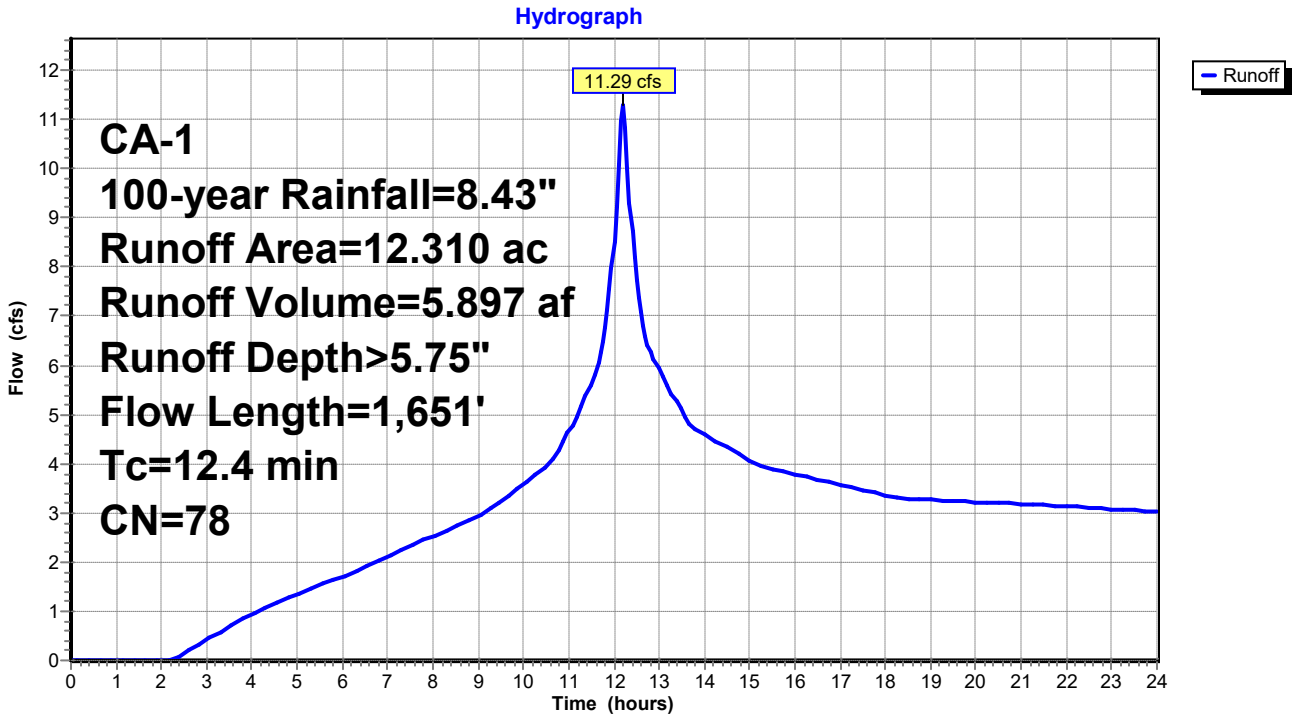
Runoff = 11.29 cfs @ 12.20 hrs, Volume= 5.897 af, Depth> 5.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

Area (ac)	CN	Description
10.350	79	Pasture/grassland/range, Fair, HSG C
1.960	74	Pasture/grassland/range, Good, HSG C
12.310	78	Weighted Average
12.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	186	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.2	1,365	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	1,651	Total			

Subcatchment 2S: WS 4b



Summary for Subcatchment 3S: WS 4c

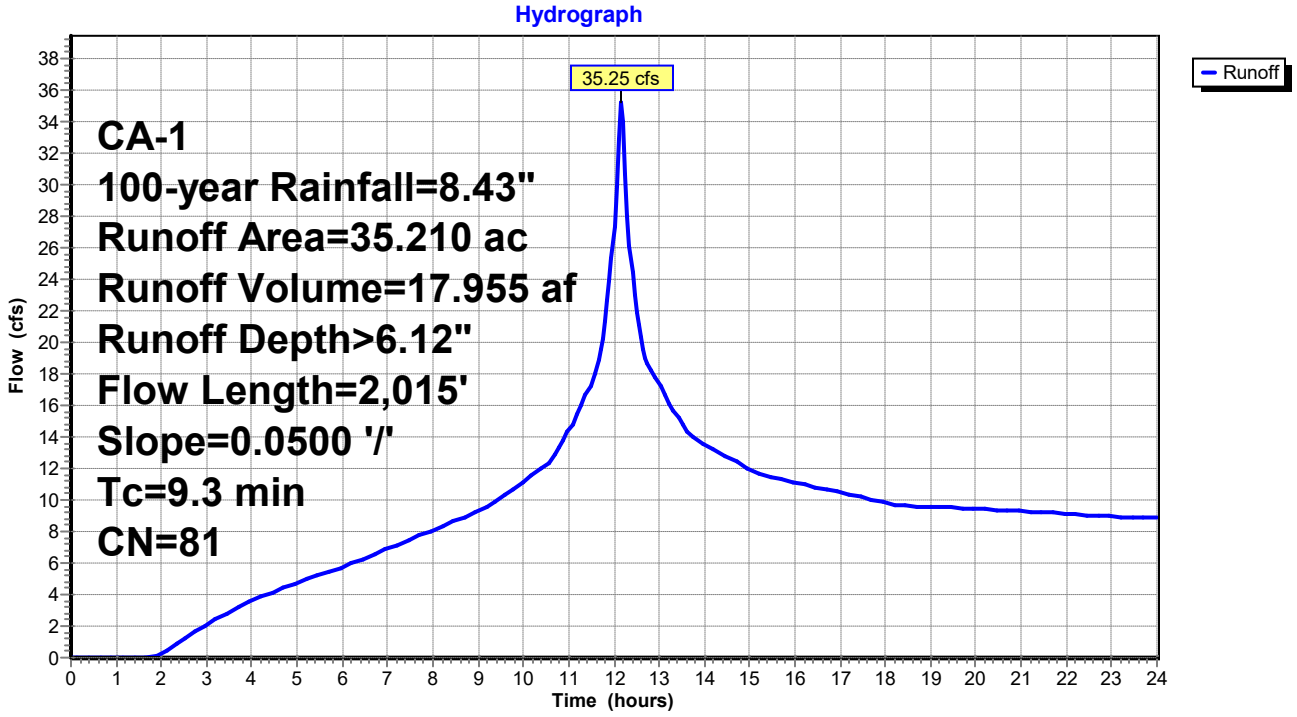
Runoff = 35.25 cfs @ 12.16 hrs, Volume= 17.955 af, Depth> 6.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
	4.510	98	Water Surface, HSG C
*	0.940	79	Vineyard, Fair, HSG C
	24.020	79	Pasture/grassland/range, Fair, HSG C
	5.280	74	Pasture/grassland/range, Good, HSG C
	0.460	86	Pasture/grassland/range, Poor, HSG C
	35.210	81	Weighted Average
	30.700		87.19% Pervious Area
	4.510		12.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	2,015	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 3S: WS 4c

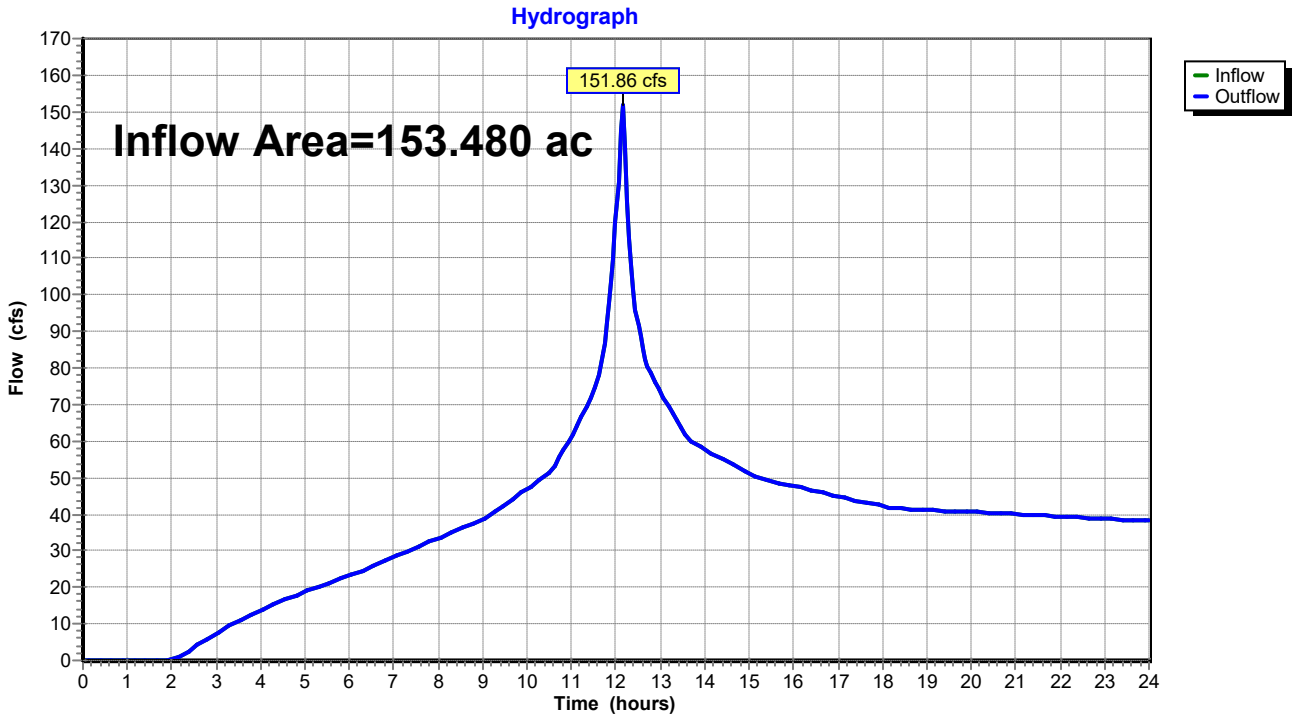


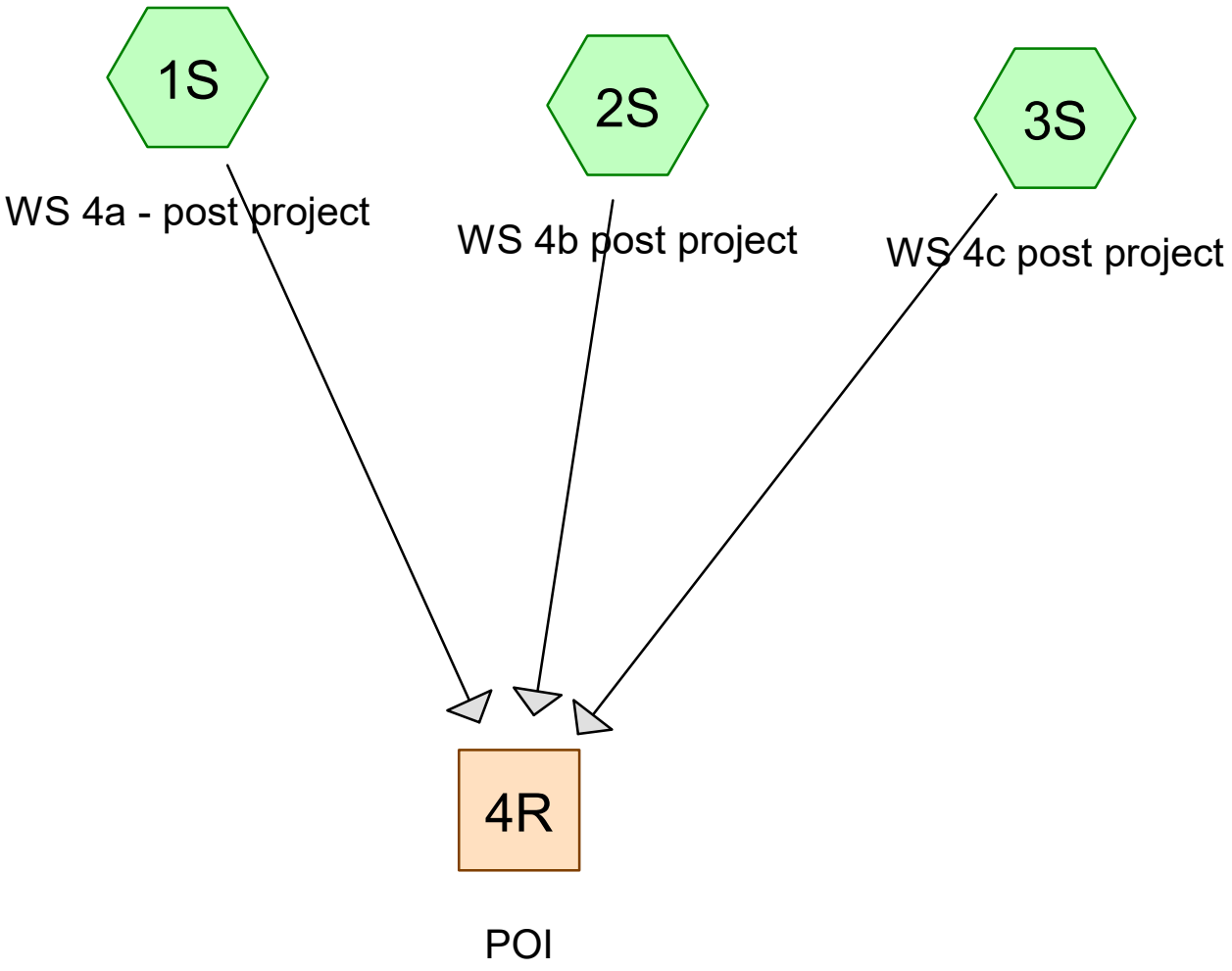
Summary for Reach 4R: POI

Inflow Area = 153.480 ac, 2.94% Impervious, Inflow Depth > 5.93" for 100-year event
Inflow = 151.86 cfs @ 12.14 hrs, Volume= 75.845 af
Outflow = 151.86 cfs @ 12.14 hrs, Volume= 75.845 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4R: POI





Subcat Reach Pond Link

Routing Diagram for WS4 postR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS 4a - post project

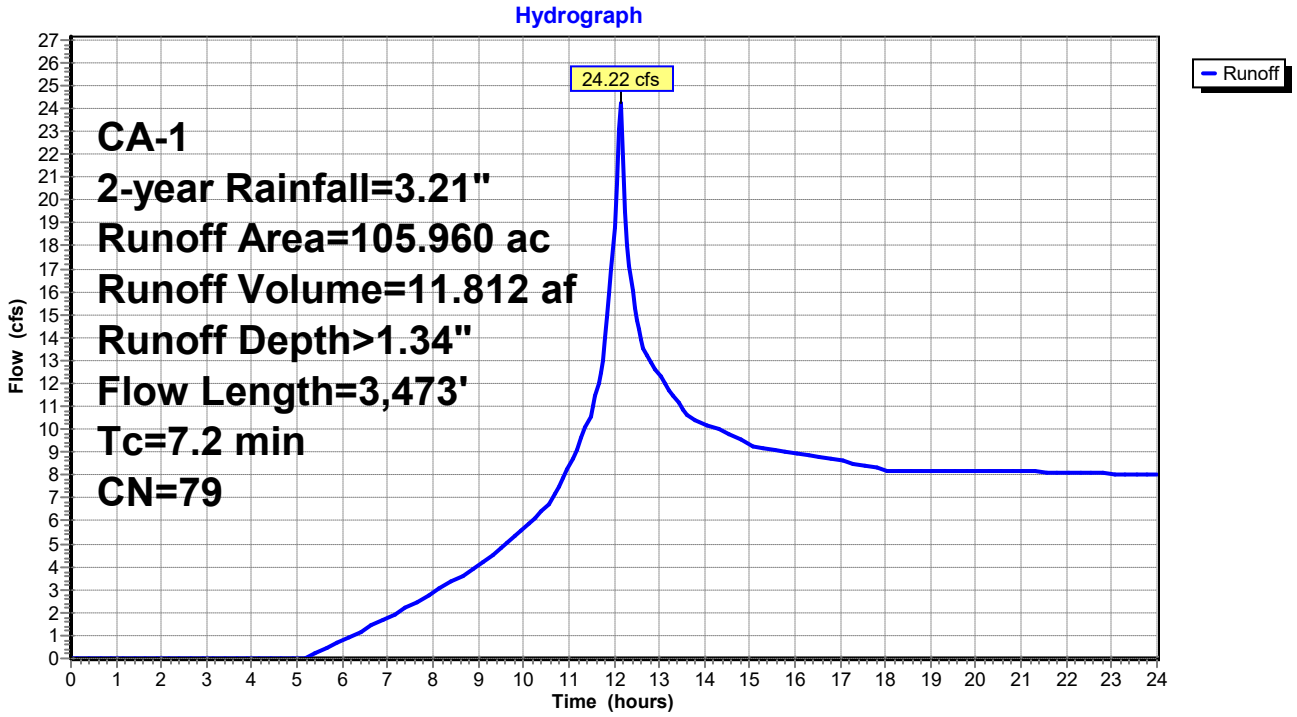
Runoff = 24.22 cfs @ 12.14 hrs, Volume= 11.812 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
*	10.880	79	Vineyard, Fair, HSG C
*	2.720	75	Vineyard, Good, HSG C
	90.560	79	Pasture/grassland/range, Fair, HSG C
	1.490	84	Pasture/grassland/range, Fair, HSG D
	0.310	77	Woods, Good, HSG D
	105.960	79	Weighted Average
	105.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.8	485	0.4100	10.31		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	390	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	2,498	0.1800	23.06	691.79	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
7.2	3,473	Total			

Subcatchment 1S: WS 4a - post project



Summary for Subcatchment 2S: WS 4b post project

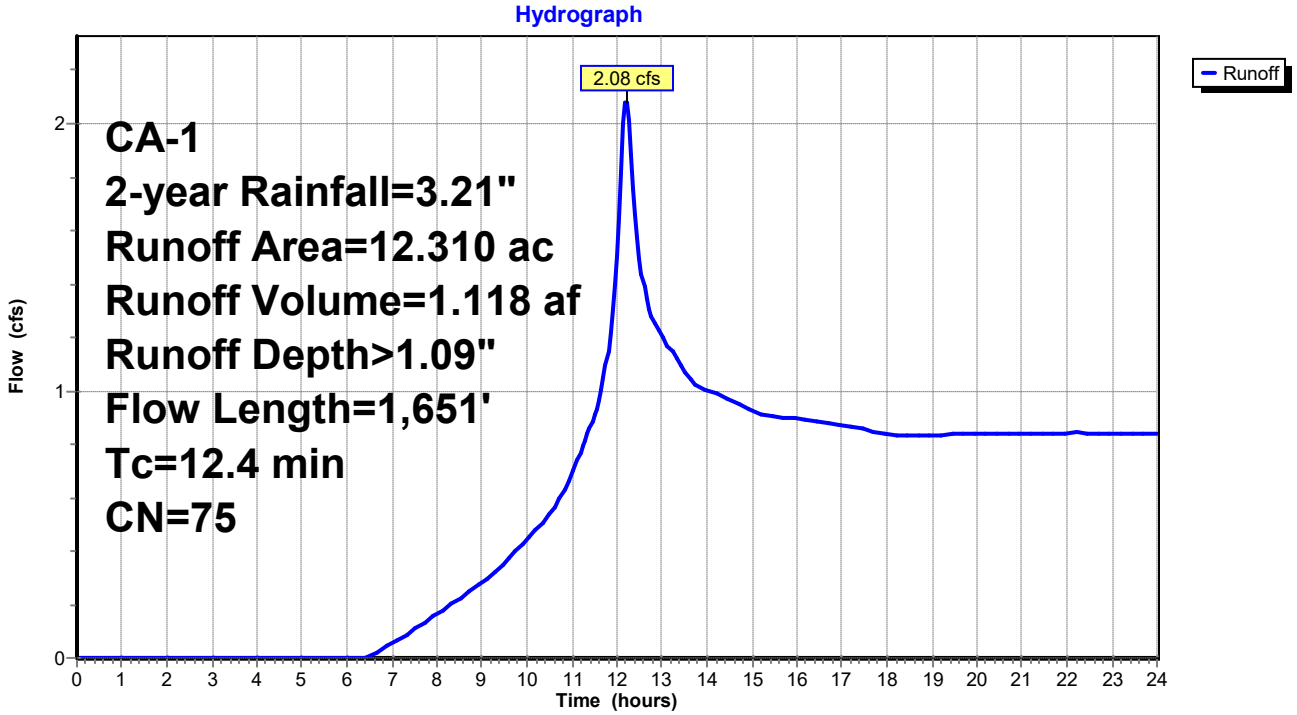
Runoff = 2.08 cfs @ 12.20 hrs, Volume= 1.118 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
*	10.410	75	Vineyard, Good, HSG C
	1.470	79	Pasture/grassland/range, Fair, HSG C
	0.430	74	Pasture/grassland/range, Good, HSG C
	12.310	75	Weighted Average
	12.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	186	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.2	1,365	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	1,651	Total			

Subcatchment 2S: WS 4b post project



Summary for Subcatchment 3S: WS 4c post project

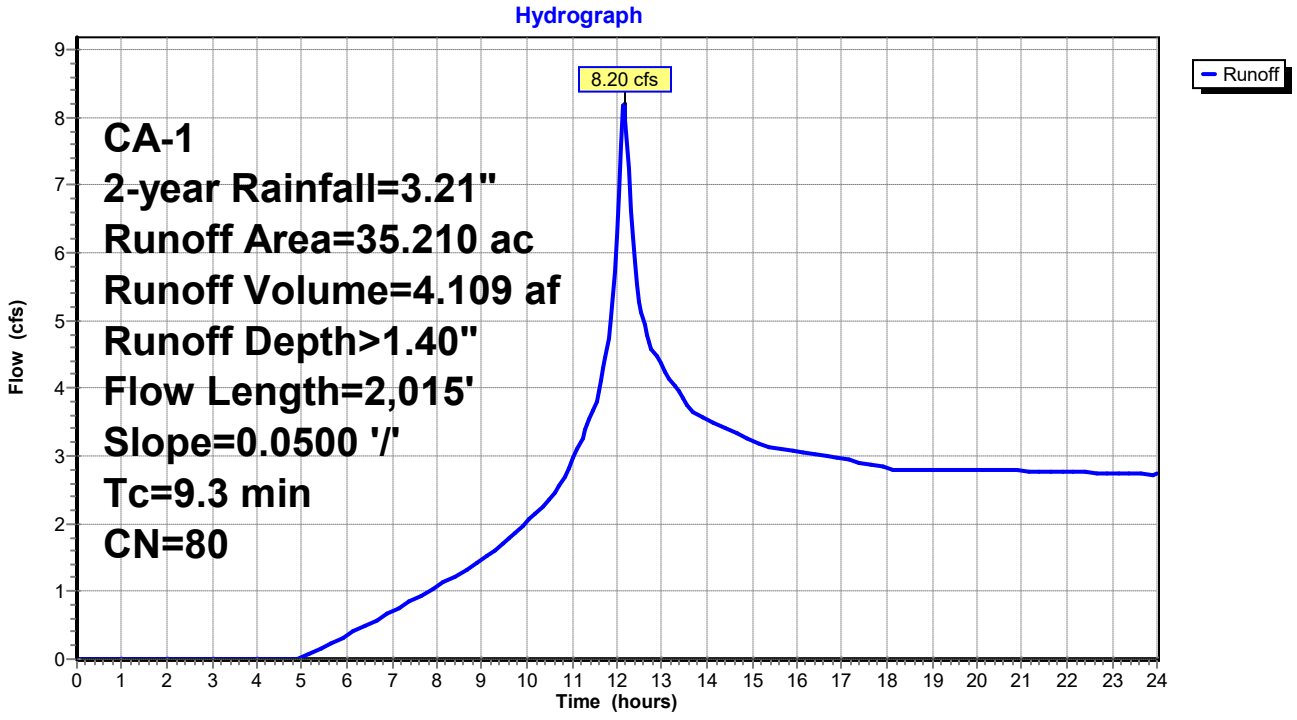
Runoff = 8.20 cfs @ 12.16 hrs, Volume= 4.109 af, Depth> 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
	4.510	98	Water Surface, HSG C
*	13.920	75	Vineyard, Good, HSG C
*	0.940	79	Vineyard, Fair, HSG C
	15.780	79	Pasture/grassland/range, Fair, HSG C
	0.010	74	Pasture/grassland/range, Good, HSG C
	0.050	86	Pasture/grassland/range, Poor, HSG C
	35.210	80	Weighted Average
	30.700		87.19% Pervious Area
	4.510		12.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	2,015	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 3S: WS 4c post project

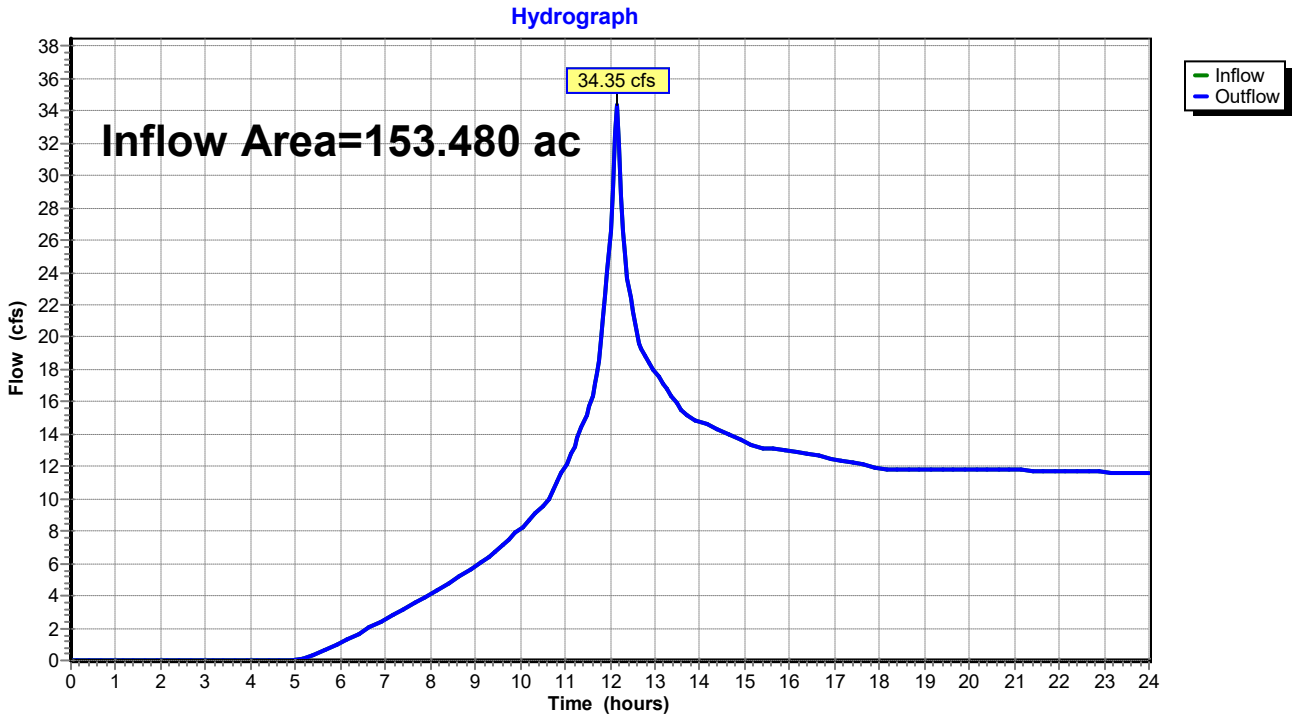


Summary for Reach 4R: POI

Inflow Area = 153.480 ac, 2.94% Impervious, Inflow Depth > 1.33" for 2-year event
Inflow = 34.35 cfs @ 12.15 hrs, Volume= 17.039 af
Outflow = 34.35 cfs @ 12.15 hrs, Volume= 17.039 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4R: POI



Summary for Subcatchment 1S: WS 4a - post project

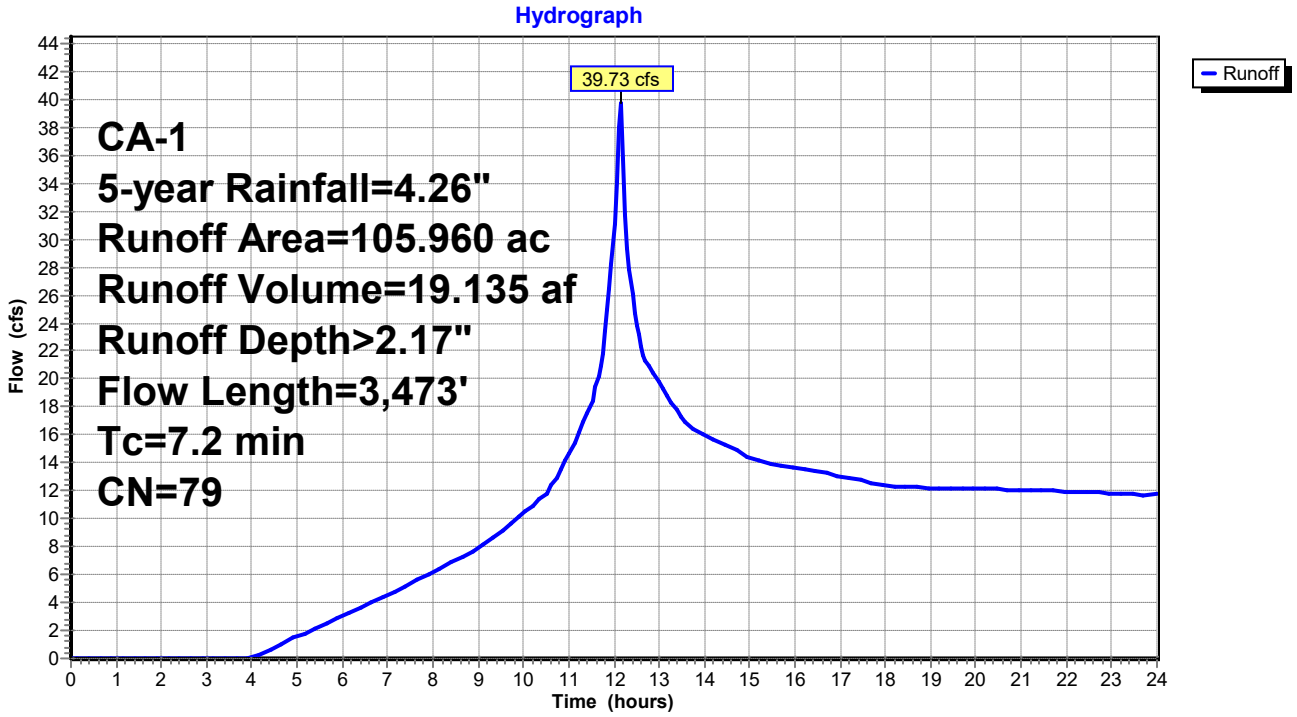
Runoff = 39.73 cfs @ 12.14 hrs, Volume= 19.135 af, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
*	10.880	79	Vineyard, Fair, HSG C
*	2.720	75	Vineyard, Good, HSG C
	90.560	79	Pasture/grassland/range, Fair, HSG C
	1.490	84	Pasture/grassland/range, Fair, HSG D
	0.310	77	Woods, Good, HSG D
	105.960	79	Weighted Average
	105.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.8	485	0.4100	10.31		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	390	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	2,498	0.1800	23.06	691.79	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
7.2	3,473	Total			

Subcatchment 1S: WS 4a - post project



Summary for Subcatchment 2S: WS 4b post project

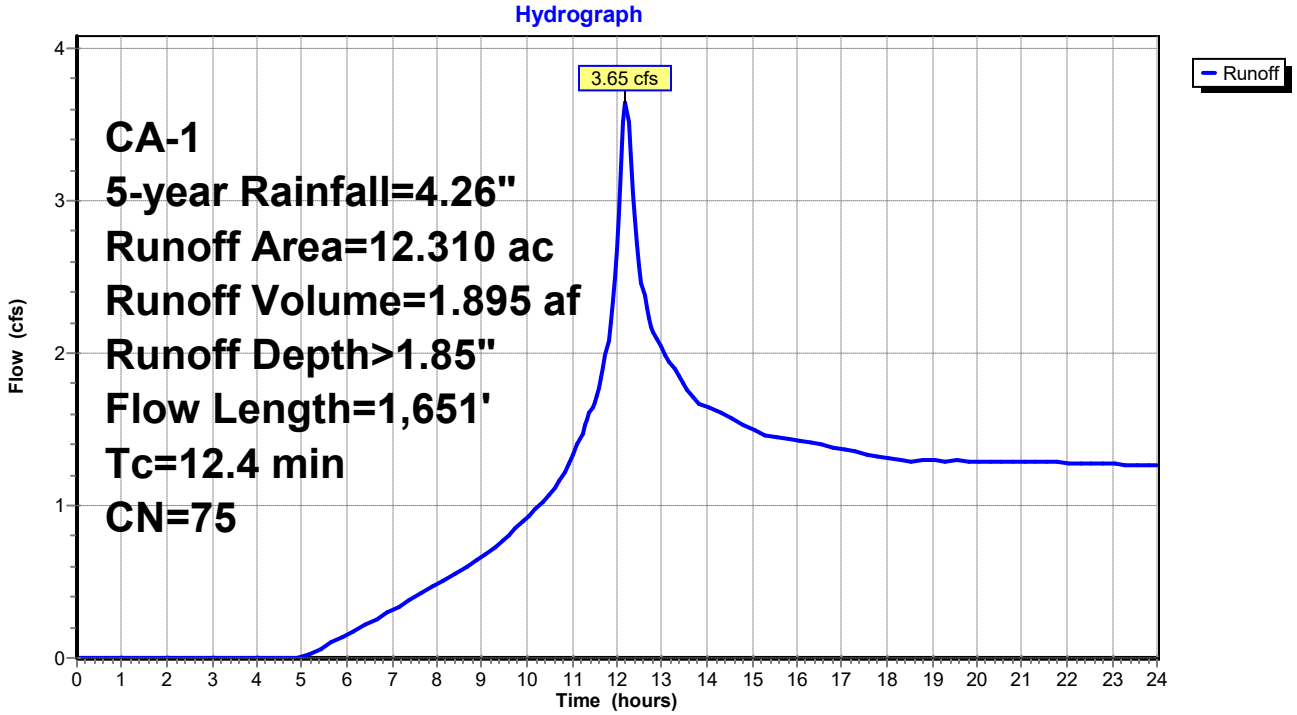
Runoff = 3.65 cfs @ 12.20 hrs, Volume= 1.895 af, Depth> 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
*	10.410	75	Vineyard, Good, HSG C
	1.470	79	Pasture/grassland/range, Fair, HSG C
	0.430	74	Pasture/grassland/range, Good, HSG C
	12.310	75	Weighted Average
	12.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	186	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.2	1,365	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	1,651	Total			

Subcatchment 2S: WS 4b post project



Summary for Subcatchment 3S: WS 4c post project

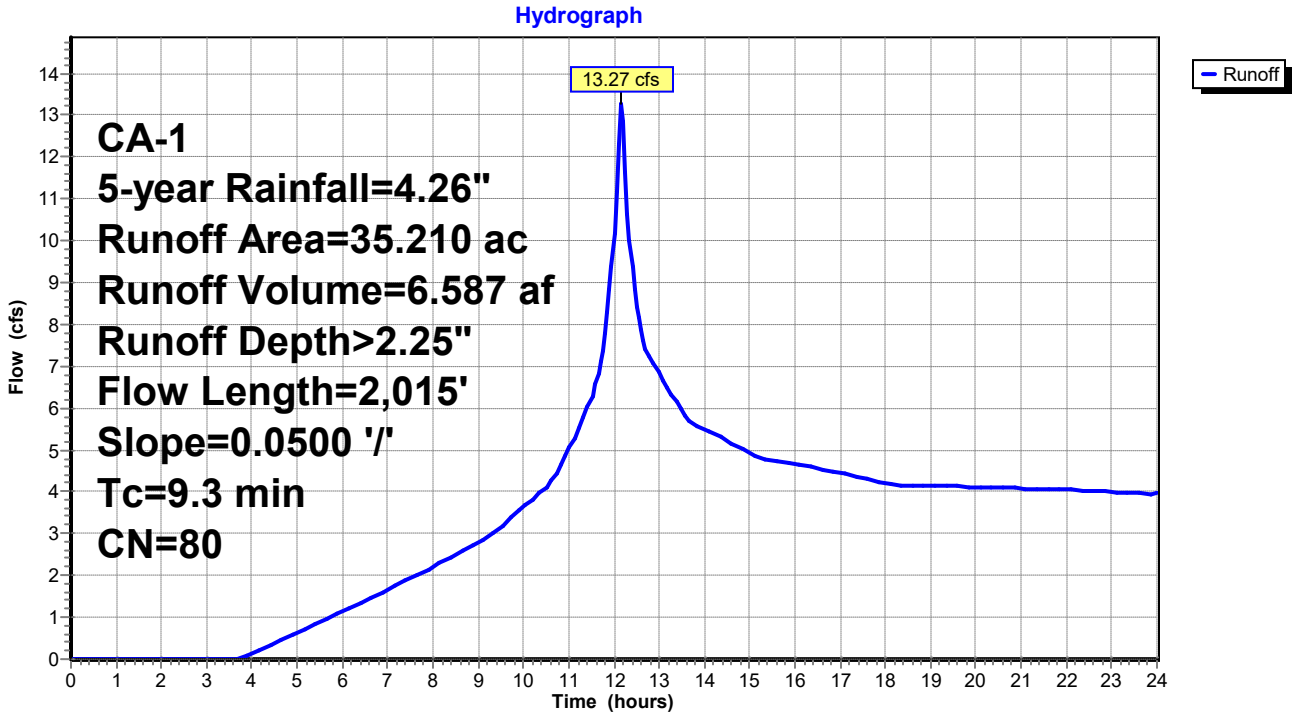
Runoff = 13.27 cfs @ 12.16 hrs, Volume= 6.587 af, Depth> 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
	4.510	98	Water Surface, HSG C
*	13.920	75	Vineyard, Good, HSG C
*	0.940	79	Vineyard, Fair, HSG C
	15.780	79	Pasture/grassland/range, Fair, HSG C
	0.010	74	Pasture/grassland/range, Good, HSG C
	0.050	86	Pasture/grassland/range, Poor, HSG C
	35.210	80	Weighted Average
	30.700		87.19% Pervious Area
	4.510		12.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	2,015	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 3S: WS 4c post project

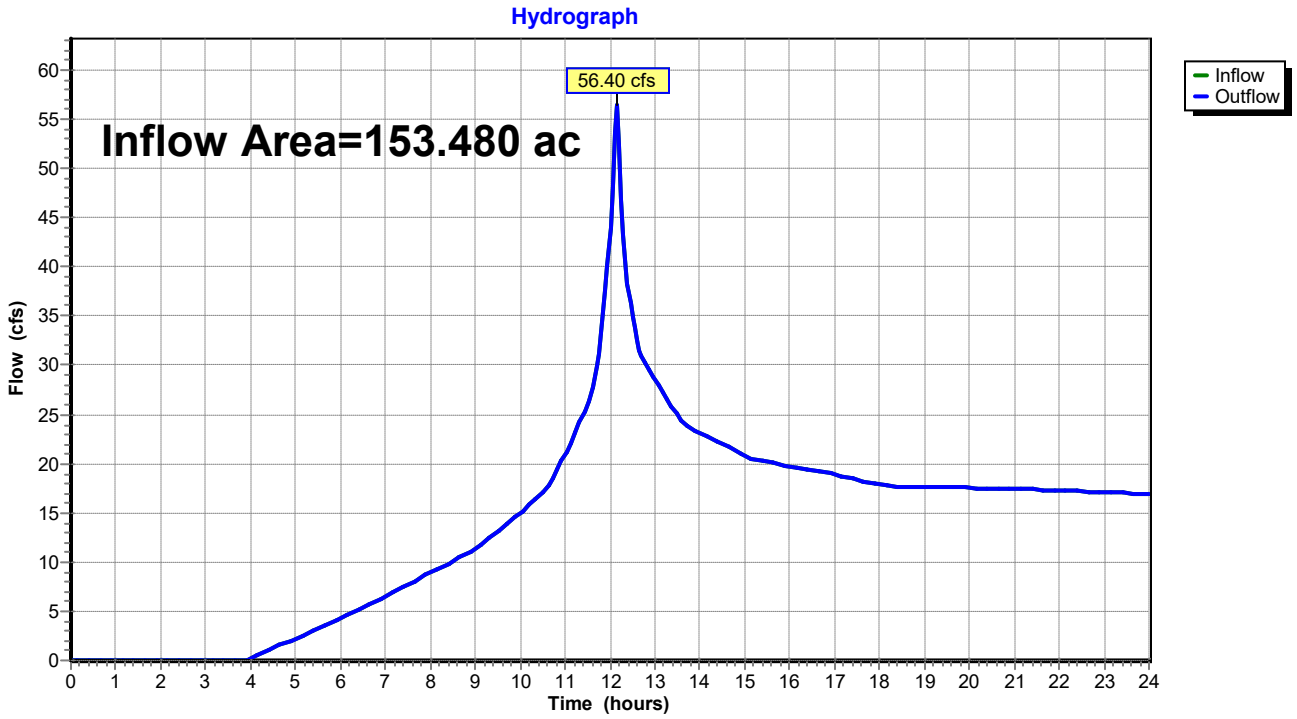


Summary for Reach 4R: POI

Inflow Area = 153.480 ac, 2.94% Impervious, Inflow Depth > 2.16" for 5-year event
Inflow = 56.40 cfs @ 12.15 hrs, Volume= 27.617 af
Outflow = 56.40 cfs @ 12.15 hrs, Volume= 27.617 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4R: POI



Summary for Subcatchment 1S: WS 4a - post project

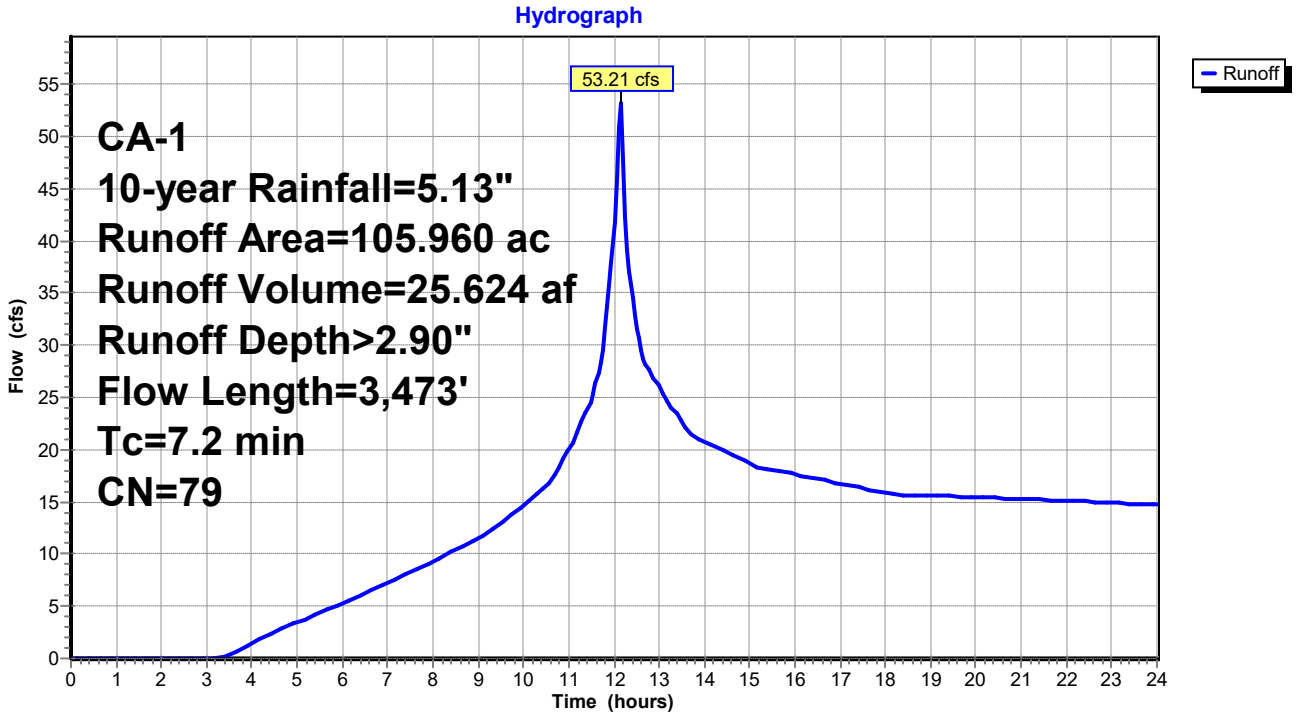
Runoff = 53.21 cfs @ 12.14 hrs, Volume= 25.624 af, Depth> 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
*	10.880	79	Vineyard, Fair, HSG C
*	2.720	75	Vineyard, Good, HSG C
	90.560	79	Pasture/grassland/range, Fair, HSG C
	1.490	84	Pasture/grassland/range, Fair, HSG D
	0.310	77	Woods, Good, HSG D
	105.960	79	Weighted Average
	105.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.8	485	0.4100	10.31		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	390	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	2,498	0.1800	23.06	691.79	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
7.2	3,473	Total			

Subcatchment 1S: WS 4a - post project



Summary for Subcatchment 2S: WS 4b post project

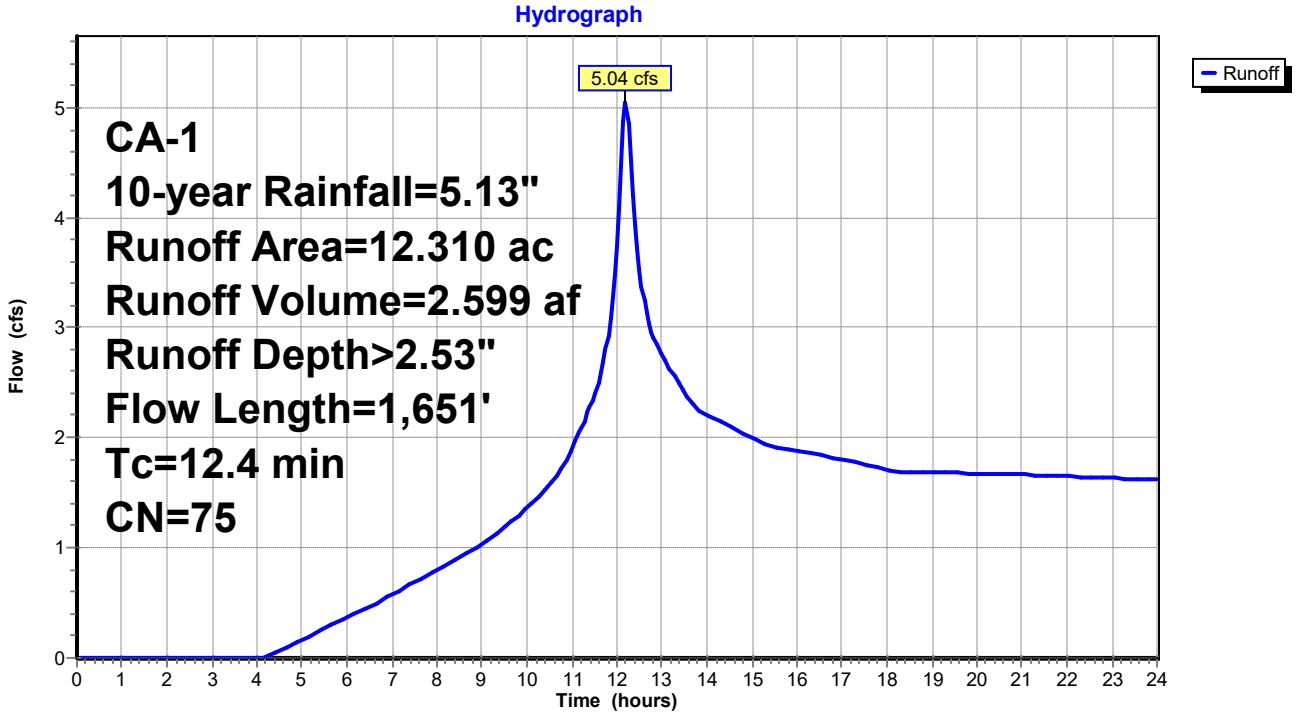
Runoff = 5.04 cfs @ 12.20 hrs, Volume= 2.599 af, Depth> 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
*	10.410	75	Vineyard, Good, HSG C
	1.470	79	Pasture/grassland/range, Fair, HSG C
	0.430	74	Pasture/grassland/range, Good, HSG C
	12.310	75	Weighted Average
	12.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	186	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.2	1,365	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	1,651	Total			

Subcatchment 2S: WS 4b post project



Summary for Subcatchment 3S: WS 4c post project

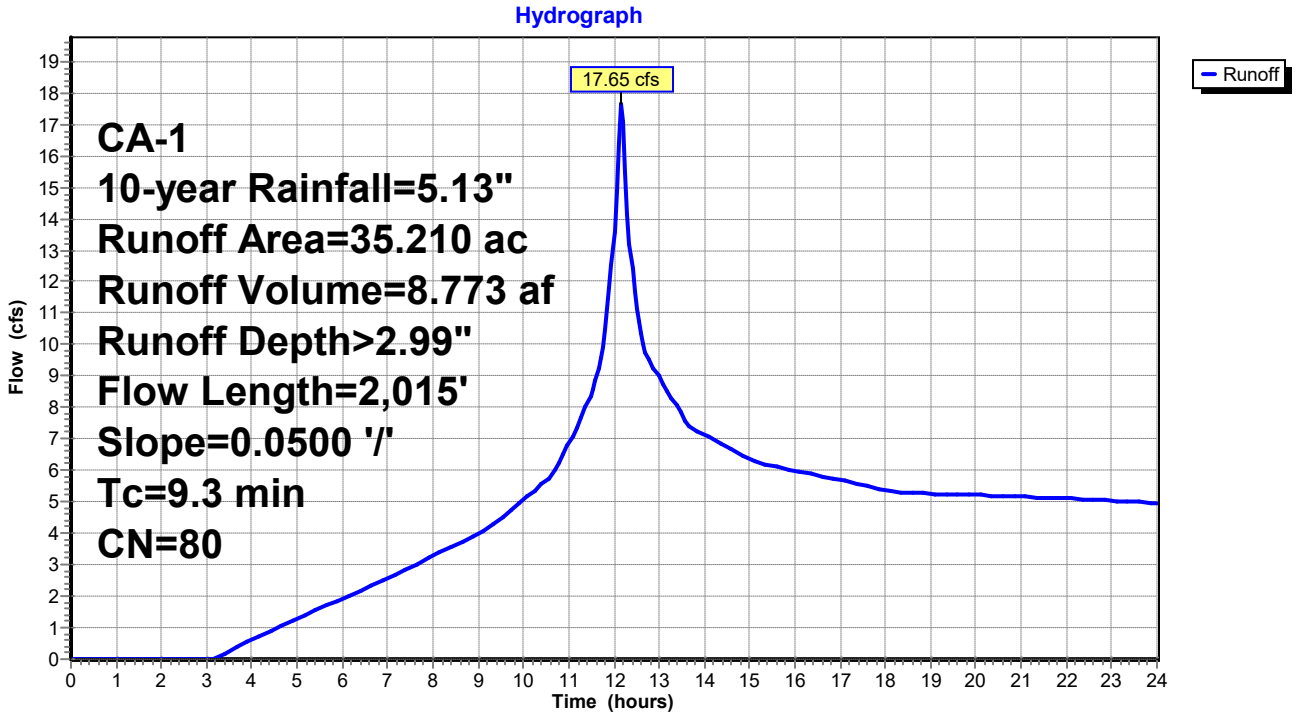
Runoff = 17.65 cfs @ 12.16 hrs, Volume= 8.773 af, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
	4.510	98	Water Surface, HSG C
*	13.920	75	Vineyard, Good, HSG C
*	0.940	79	Vineyard, Fair, HSG C
	15.780	79	Pasture/grassland/range, Fair, HSG C
	0.010	74	Pasture/grassland/range, Good, HSG C
	0.050	86	Pasture/grassland/range, Poor, HSG C
	35.210	80	Weighted Average
	30.700		87.19% Pervious Area
	4.510		12.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	2,015	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 3S: WS 4c post project

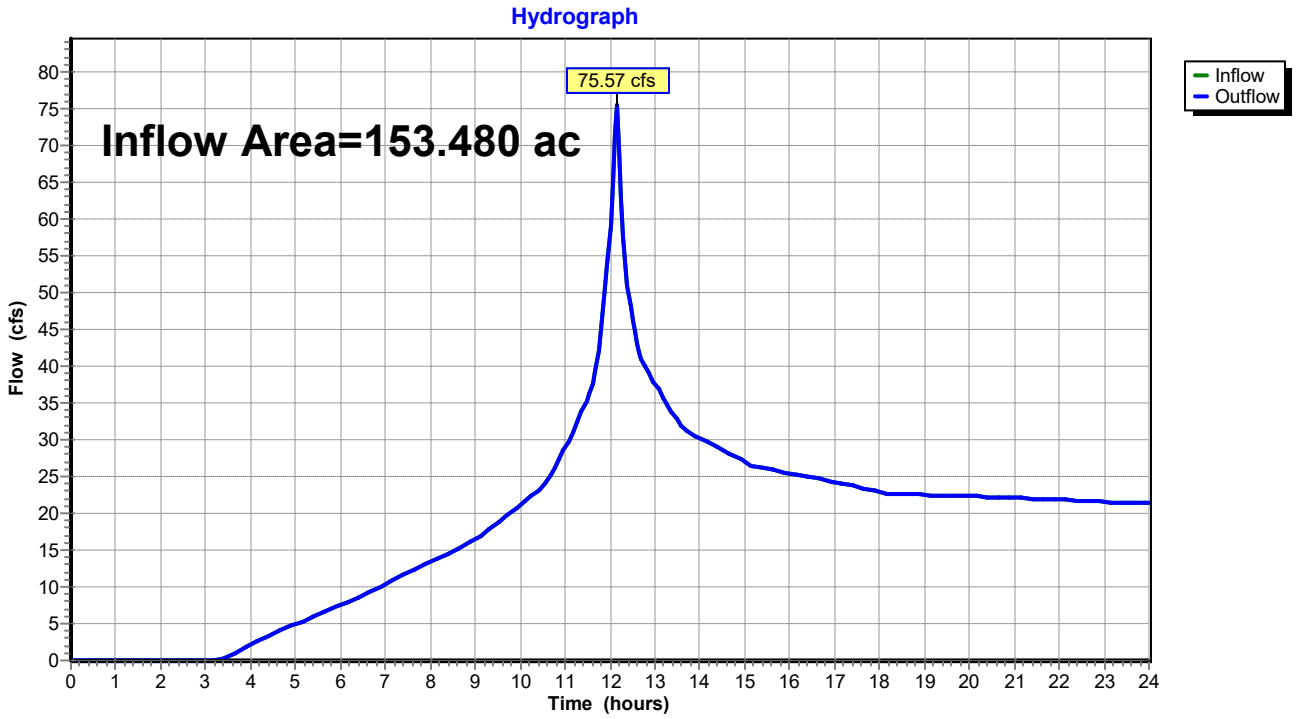


Summary for Reach 4R: POI

Inflow Area = 153.480 ac, 2.94% Impervious, Inflow Depth > 2.89" for 10-year event
Inflow = 75.57 cfs @ 12.14 hrs, Volume= 36.995 af
Outflow = 75.57 cfs @ 12.14 hrs, Volume= 36.995 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4R: POI



Summary for Subcatchment 1S: WS 4a - post project

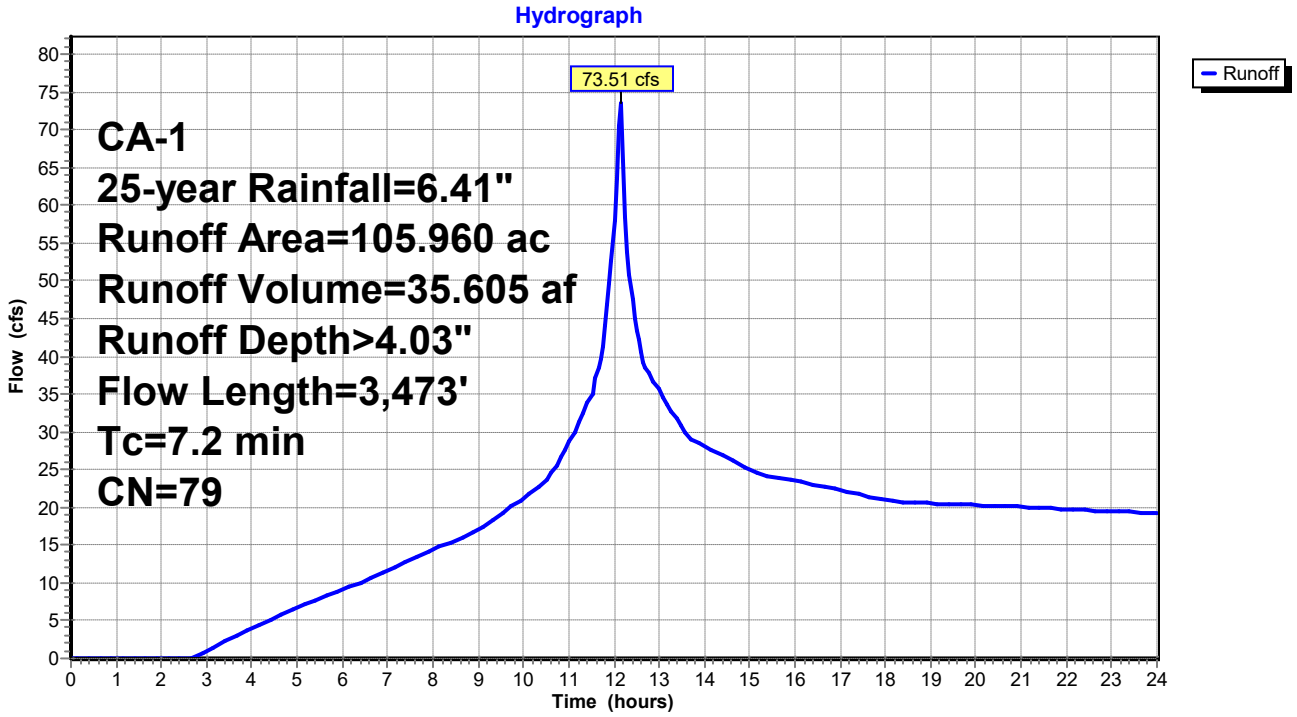
Runoff = 73.51 cfs @ 12.14 hrs, Volume= 35.605 af, Depth> 4.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
*	10.880	79	Vineyard, Fair, HSG C
*	2.720	75	Vineyard, Good, HSG C
	90.560	79	Pasture/grassland/range, Fair, HSG C
	1.490	84	Pasture/grassland/range, Fair, HSG D
	0.310	77	Woods, Good, HSG D
	105.960	79	Weighted Average
	105.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.8	485	0.4100	10.31		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	390	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	2,498	0.1800	23.06	691.79	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
7.2	3,473	Total			

Subcatchment 1S: WS 4a - post project



Summary for Subcatchment 2S: WS 4b post project

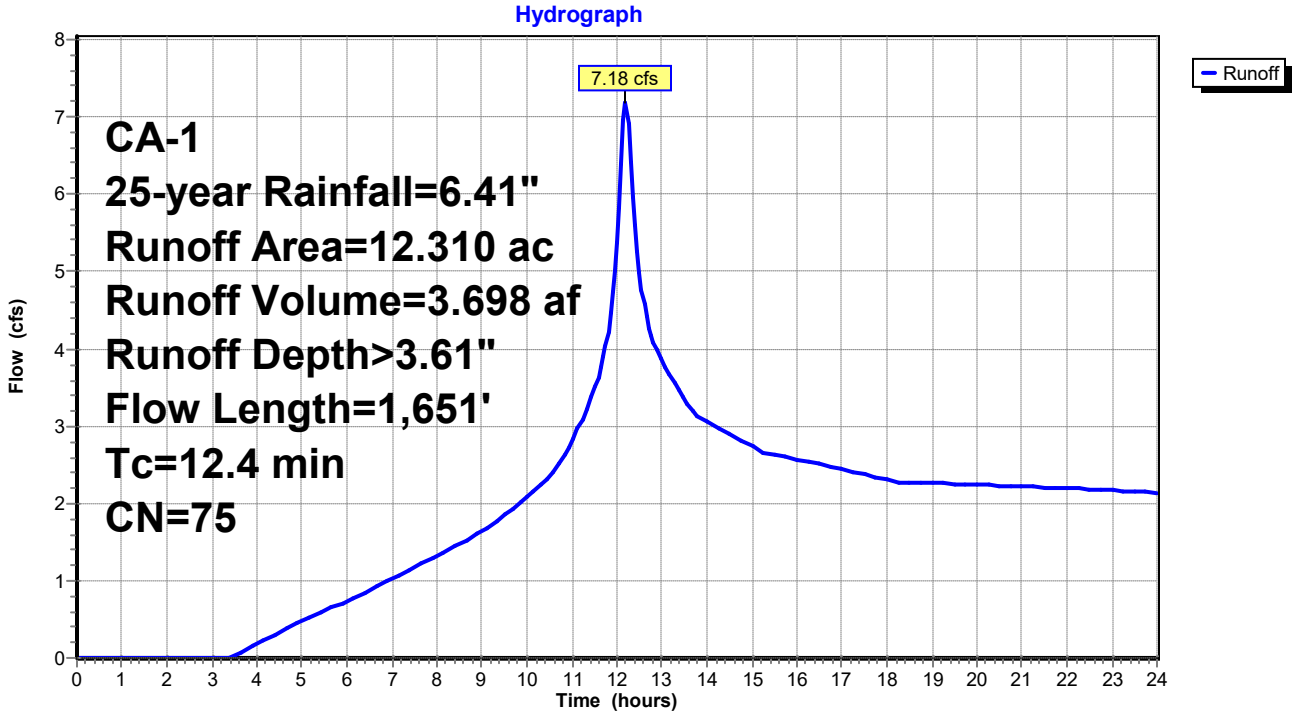
Runoff = 7.18 cfs @ 12.20 hrs, Volume= 3.698 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
*	10.410	75	Vineyard, Good, HSG C
	1.470	79	Pasture/grassland/range, Fair, HSG C
	0.430	74	Pasture/grassland/range, Good, HSG C
	12.310	75	Weighted Average
	12.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	186	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.2	1,365	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	1,651	Total			

Subcatchment 2S: WS 4b post project



Summary for Subcatchment 3S: WS 4c post project

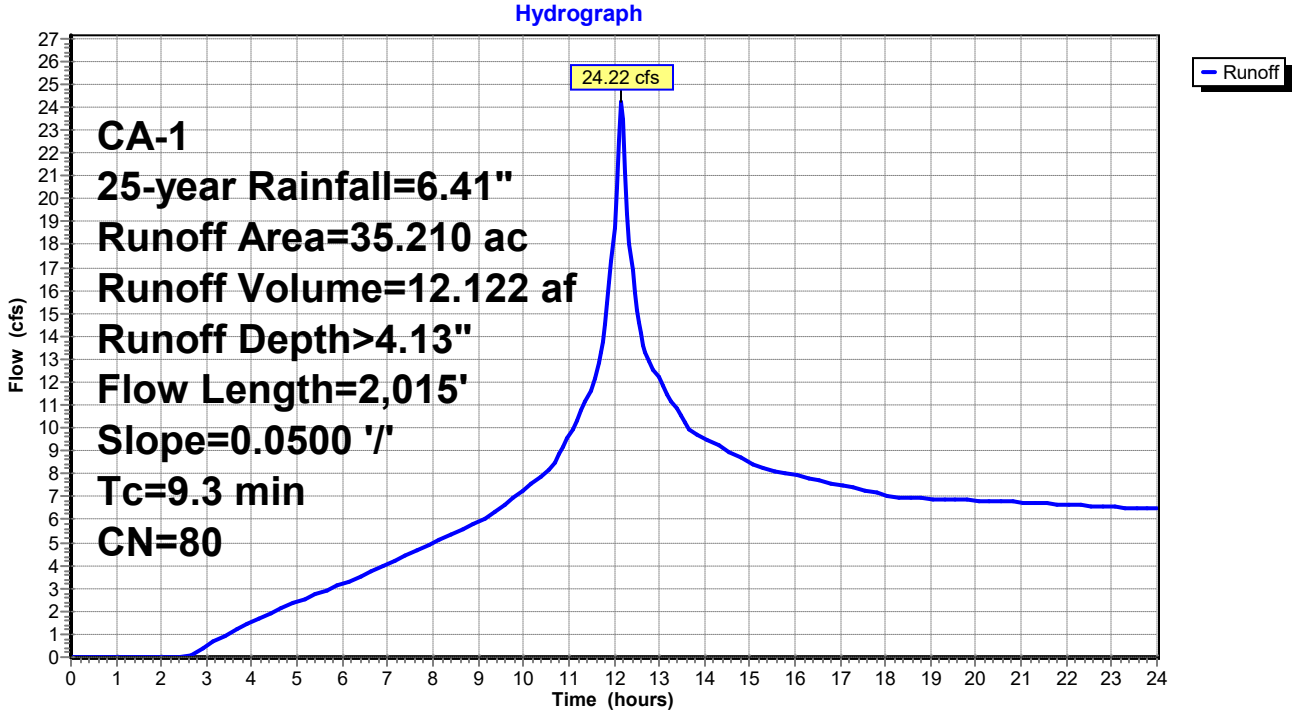
Runoff = 24.22 cfs @ 12.16 hrs, Volume= 12.122 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
	4.510	98	Water Surface, HSG C
*	13.920	75	Vineyard, Good, HSG C
*	0.940	79	Vineyard, Fair, HSG C
	15.780	79	Pasture/grassland/range, Fair, HSG C
	0.010	74	Pasture/grassland/range, Good, HSG C
	0.050	86	Pasture/grassland/range, Poor, HSG C
	35.210	80	Weighted Average
	30.700		87.19% Pervious Area
	4.510		12.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	2,015	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 3S: WS 4c post project

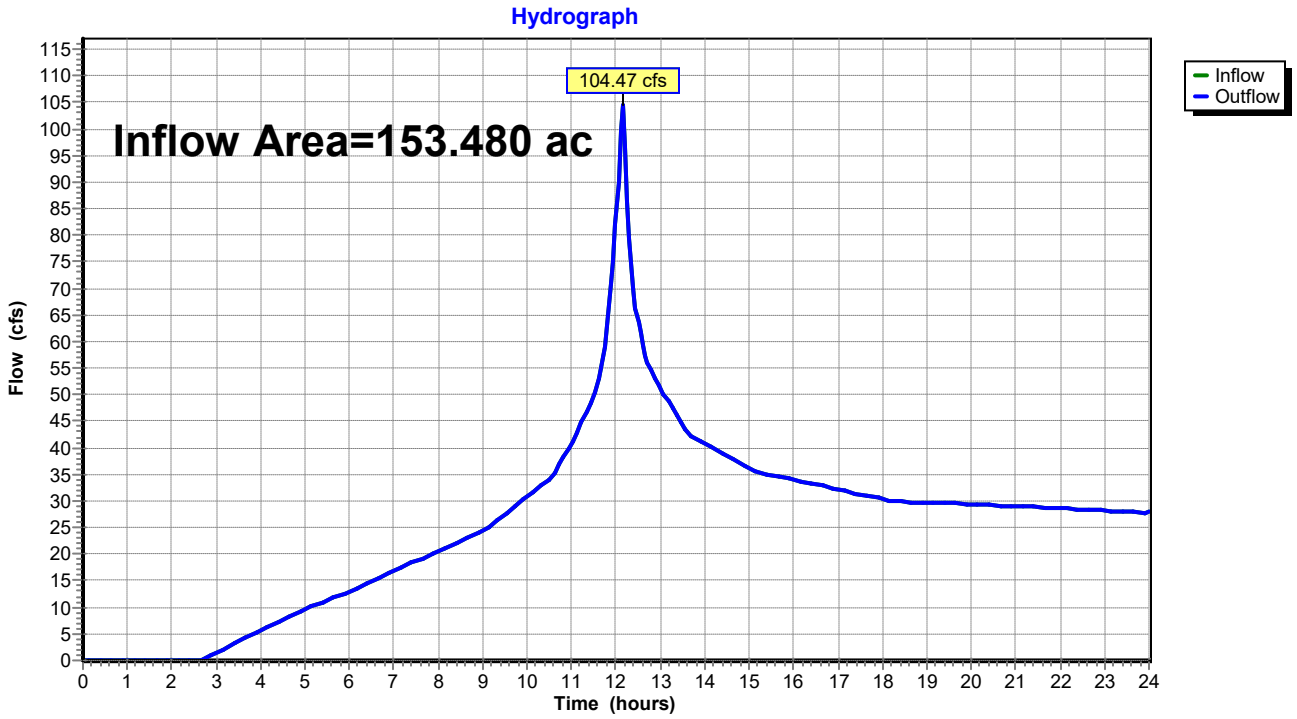


Summary for Reach 4R: POI

Inflow Area = 153.480 ac, 2.94% Impervious, Inflow Depth > 4.02" for 25-year event
Inflow = 104.47 cfs @ 12.14 hrs, Volume= 51.425 af
Outflow = 104.47 cfs @ 12.14 hrs, Volume= 51.425 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4R: POI



Summary for Subcatchment 1S: WS 4a - post project

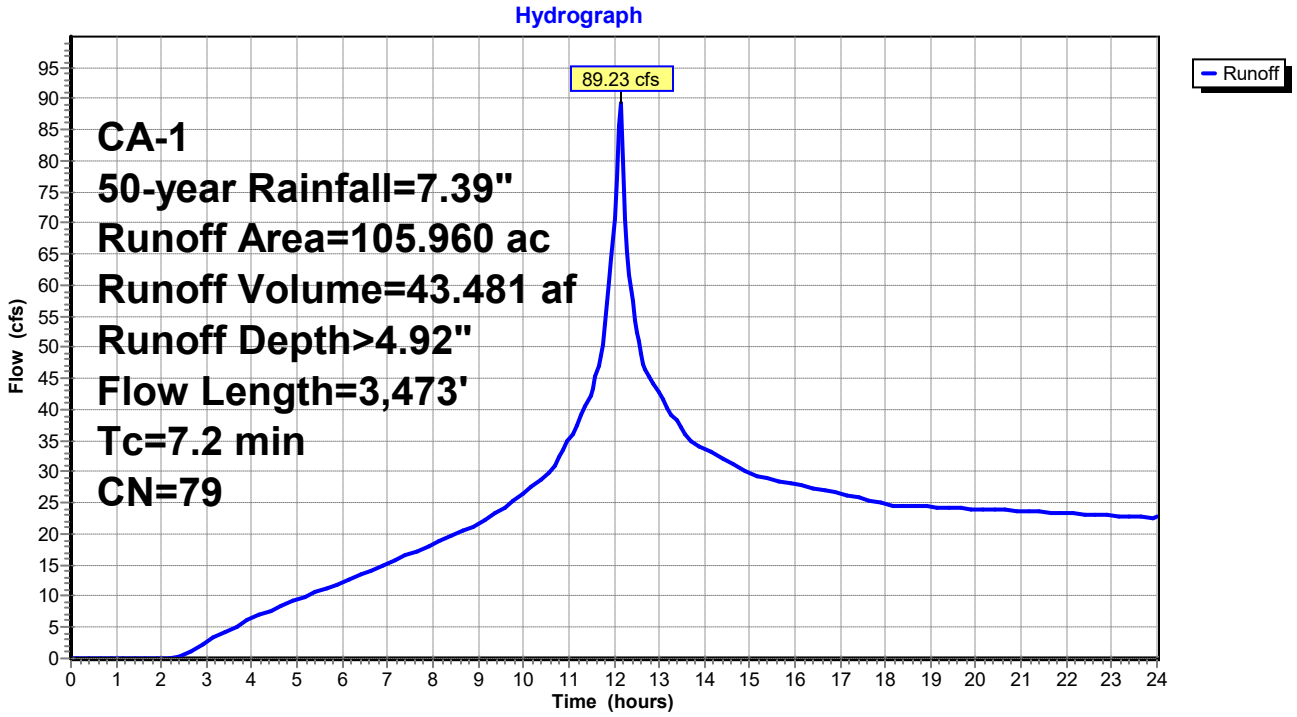
Runoff = 89.23 cfs @ 12.14 hrs, Volume= 43.481 af, Depth> 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
*	10.880	79	Vineyard, Fair, HSG C
*	2.720	75	Vineyard, Good, HSG C
	90.560	79	Pasture/grassland/range, Fair, HSG C
	1.490	84	Pasture/grassland/range, Fair, HSG D
	0.310	77	Woods, Good, HSG D
	105.960	79	Weighted Average
	105.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.8	485	0.4100	10.31		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	390	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	2,498	0.1800	23.06	691.79	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
7.2	3,473	Total			

Subcatchment 1S: WS 4a - post project



Summary for Subcatchment 2S: WS 4b post project

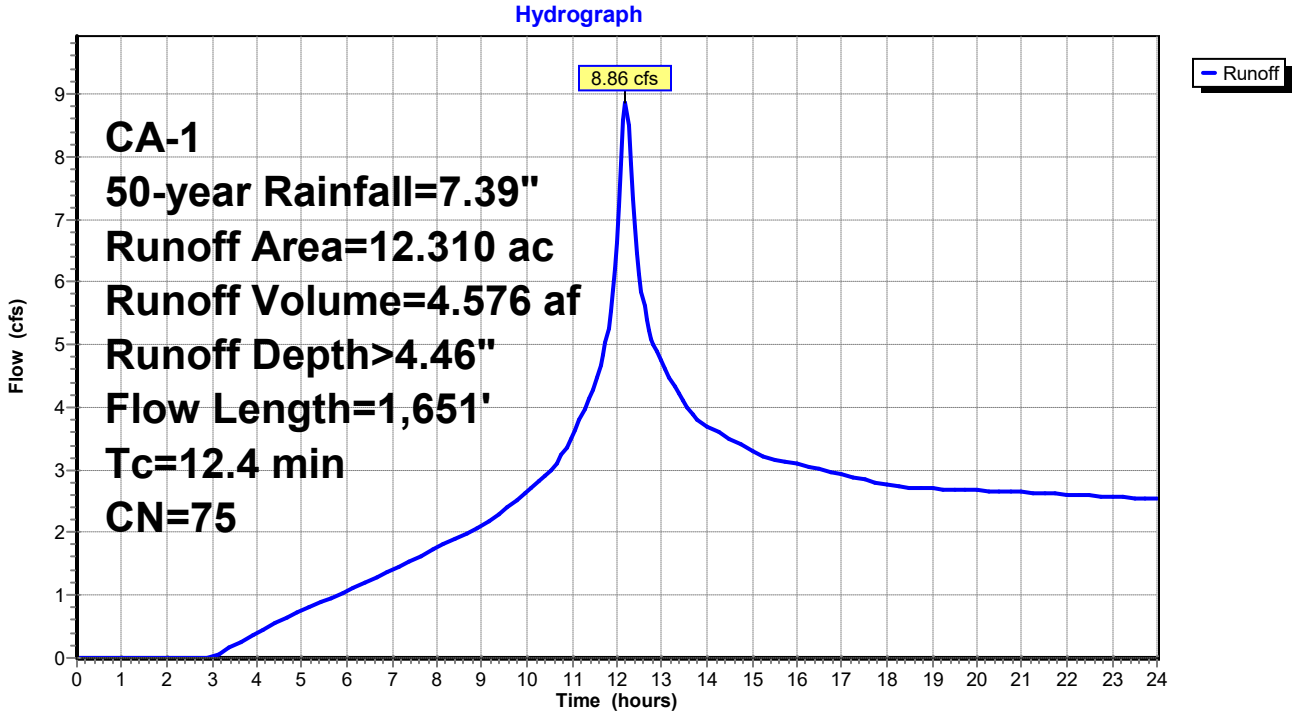
Runoff = 8.86 cfs @ 12.20 hrs, Volume= 4.576 af, Depth> 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
*	10.410	75	Vineyard, Good, HSG C
	1.470	79	Pasture/grassland/range, Fair, HSG C
	0.430	74	Pasture/grassland/range, Good, HSG C
	12.310	75	Weighted Average
	12.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	186	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.2	1,365	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	1,651	Total			

Subcatchment 2S: WS 4b post project



Summary for Subcatchment 3S: WS 4c post project

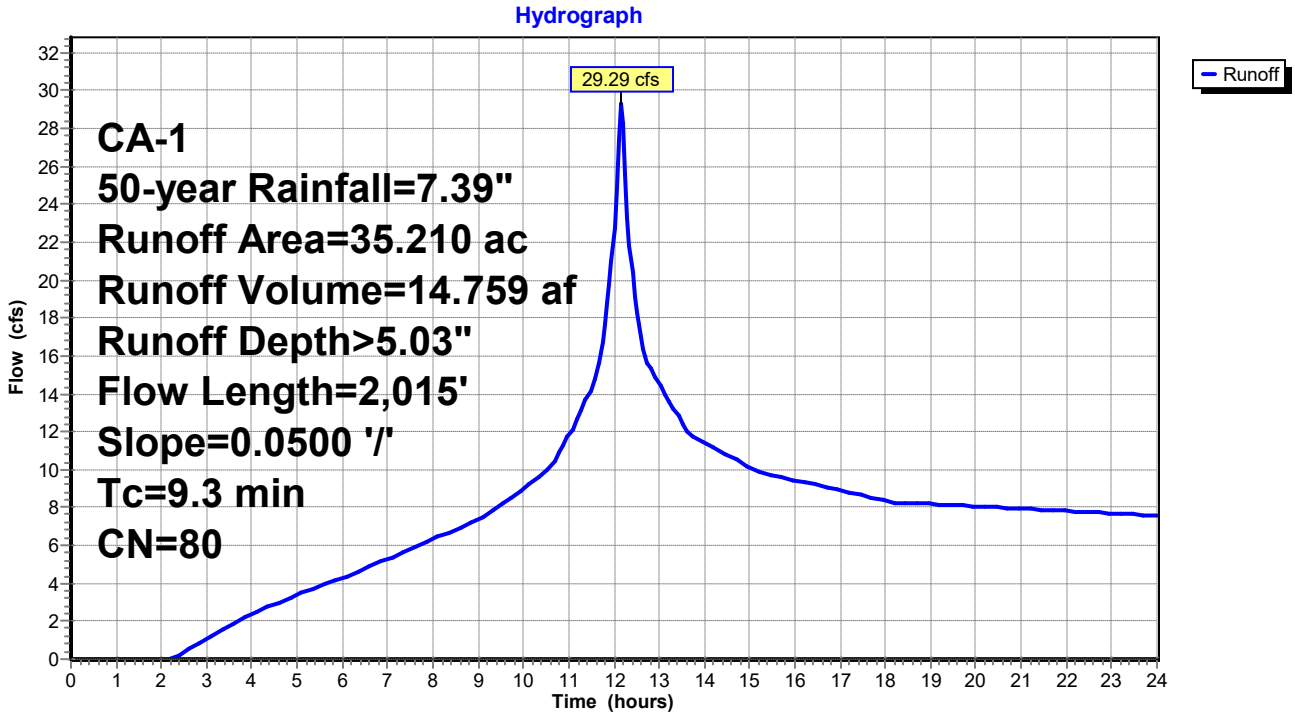
Runoff = 29.29 cfs @ 12.16 hrs, Volume= 14.759 af, Depth> 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
	4.510	98	Water Surface, HSG C
*	13.920	75	Vineyard, Good, HSG C
*	0.940	79	Vineyard, Fair, HSG C
	15.780	79	Pasture/grassland/range, Fair, HSG C
	0.010	74	Pasture/grassland/range, Good, HSG C
	0.050	86	Pasture/grassland/range, Poor, HSG C
	35.210	80	Weighted Average
	30.700		87.19% Pervious Area
	4.510		12.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	2,015	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 3S: WS 4c post project

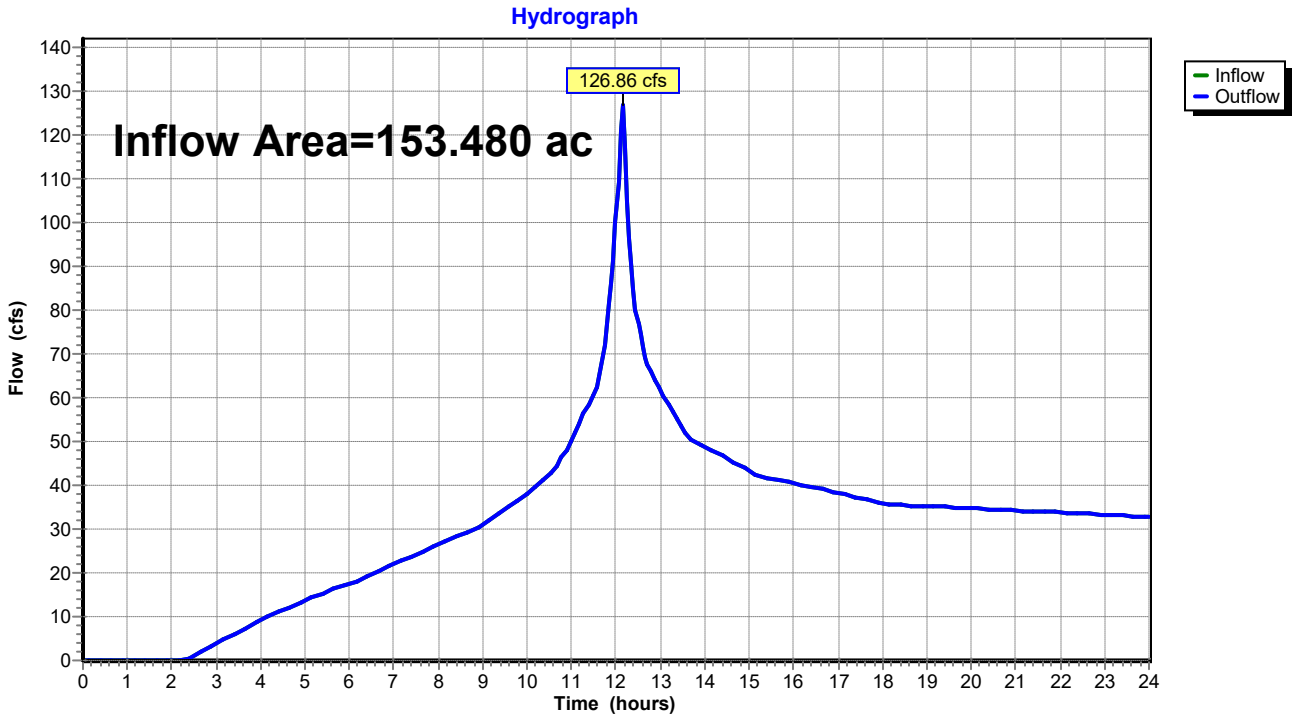


Summary for Reach 4R: POI

Inflow Area = 153.480 ac, 2.94% Impervious, Inflow Depth > 4.91" for 50-year event
Inflow = 126.86 cfs @ 12.14 hrs, Volume= 62.816 af
Outflow = 126.86 cfs @ 12.14 hrs, Volume= 62.816 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4R: POI



Summary for Subcatchment 1S: WS 4a - post project

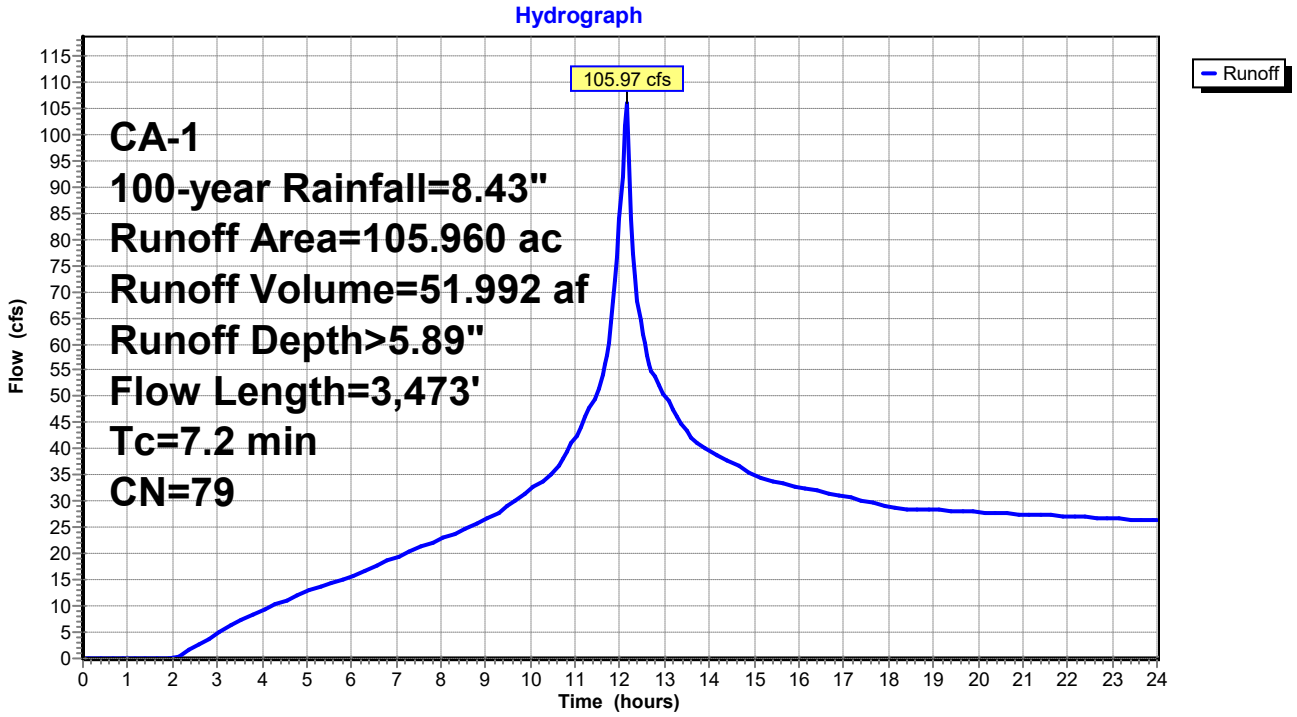
Runoff = 105.97 cfs @ 12.14 hrs, Volume= 51.992 af, Depth> 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
*	10.880	79	Vineyard, Fair, HSG C
*	2.720	75	Vineyard, Good, HSG C
	90.560	79	Pasture/grassland/range, Fair, HSG C
	1.490	84	Pasture/grassland/range, Fair, HSG D
	0.310	77	Woods, Good, HSG D
	105.960	79	Weighted Average
	105.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.8	485	0.4100	10.31		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	390	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	2,498	0.1800	23.06	691.79	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
7.2	3,473	Total			

Subcatchment 1S: WS 4a - post project



Summary for Subcatchment 2S: WS 4b post project

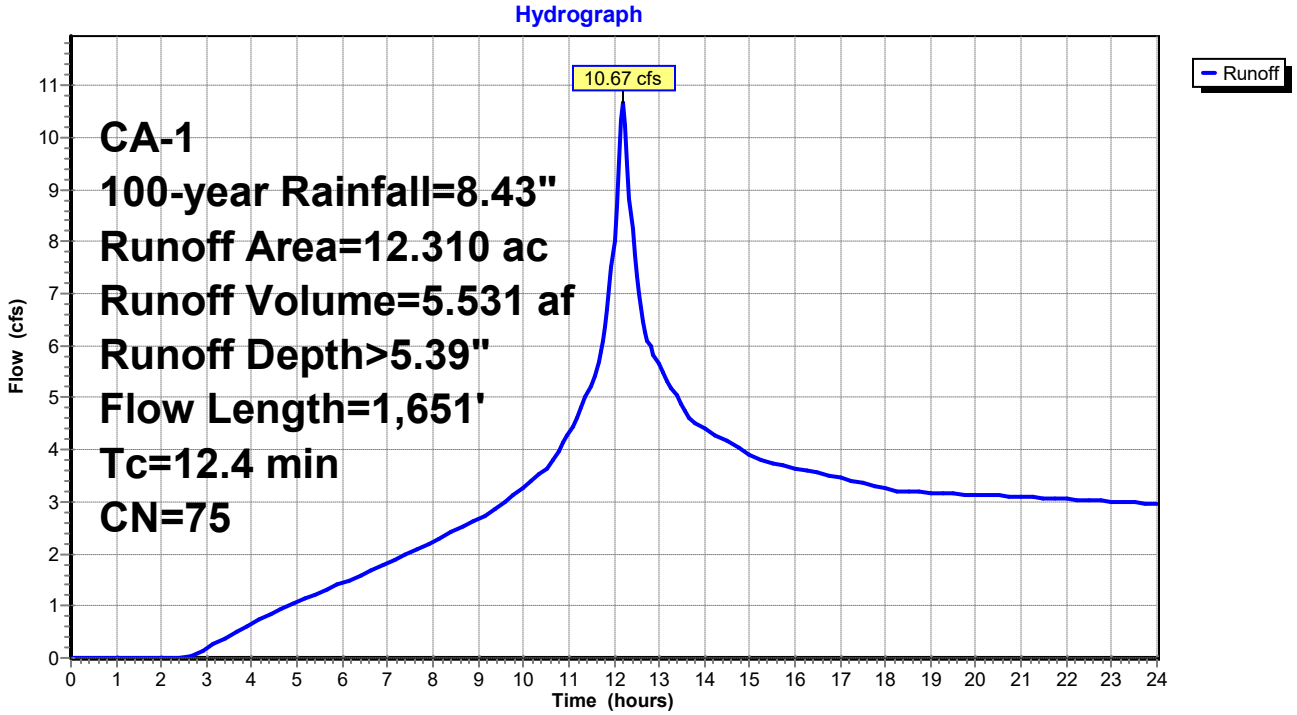
Runoff = 10.67 cfs @ 12.20 hrs, Volume= 5.531 af, Depth> 5.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
*	10.410	75	Vineyard, Good, HSG C
	1.470	79	Pasture/grassland/range, Fair, HSG C
	0.430	74	Pasture/grassland/range, Good, HSG C
	12.310	75	Weighted Average
	12.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	186	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.2	1,365	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	1,651	Total			

Subcatchment 2S: WS 4b post project



Summary for Subcatchment 3S: WS 4c post project

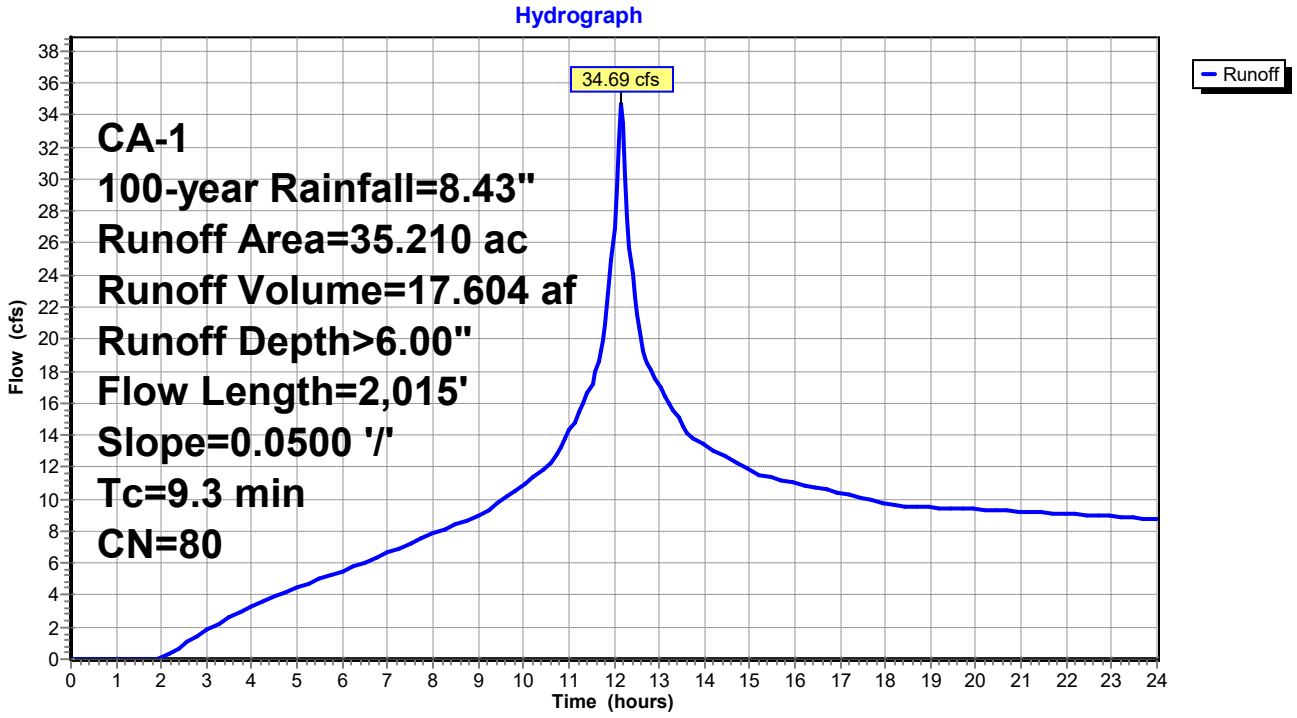
Runoff = 34.69 cfs @ 12.16 hrs, Volume= 17.604 af, Depth> 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
	4.510	98	Water Surface, HSG C
*	13.920	75	Vineyard, Good, HSG C
*	0.940	79	Vineyard, Fair, HSG C
	15.780	79	Pasture/grassland/range, Fair, HSG C
	0.010	74	Pasture/grassland/range, Good, HSG C
	0.050	86	Pasture/grassland/range, Poor, HSG C
	35.210	80	Weighted Average
	30.700		87.19% Pervious Area
	4.510		12.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	2,015	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 3S: WS 4c post project

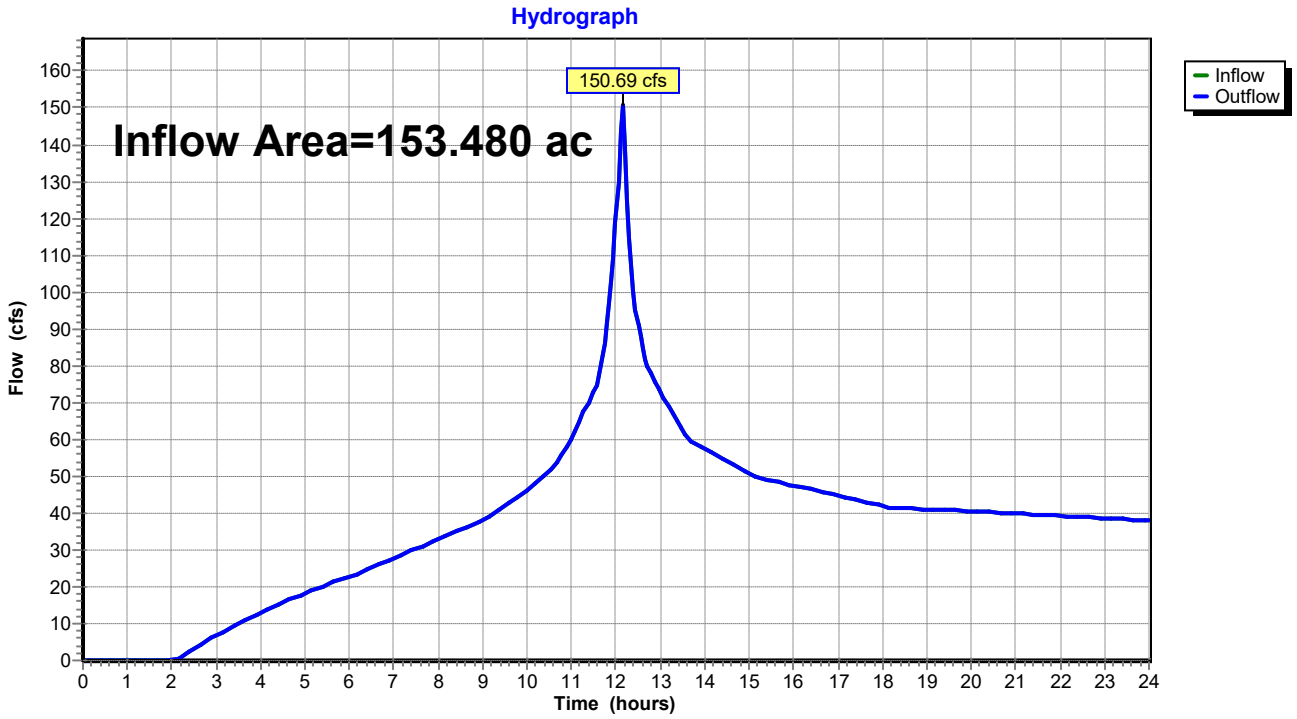


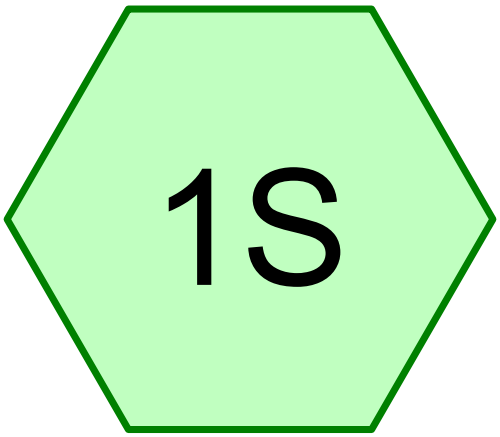
Summary for Reach 4R: POI

Inflow Area = 153.480 ac, 2.94% Impervious, Inflow Depth > 5.87" for 100-year event
Inflow = 150.69 cfs @ 12.14 hrs, Volume= 75.127 af
Outflow = 150.69 cfs @ 12.14 hrs, Volume= 75.127 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 4R: POI





WS 5 - pre project

Subcat Reach Pond Link

Routing Diagram for WS5 preR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS 5 - pre project

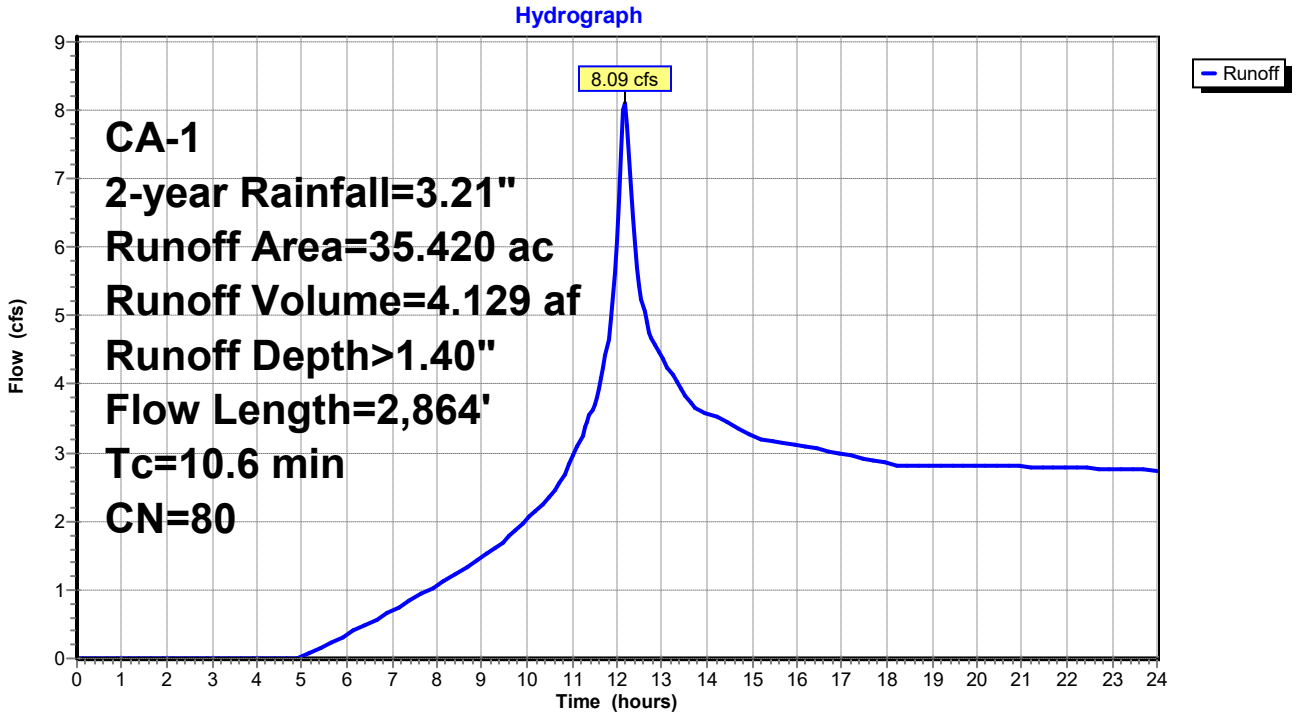
Runoff = 8.09 cfs @ 12.18 hrs, Volume= 4.129 af, Depth> 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
	3.580	98	Paved parking, HSG C
*	3.950	79	Vineyard, Fair, HSG C
	20.010	79	Pasture/grassland/range, Fair, HSG C
	5.990	74	Pasture/grassland/range, Good, HSG C
	1.890	86	Pasture/grassland/range, Poor, HSG C
	35.420	80	Weighted Average
	31.840		89.89% Pervious Area
	3.580		10.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.5	661	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.2	648	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.1	1,455	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
10.6	2,864	Total			

Subcatchment 1S: WS 5 - pre project



Summary for Subcatchment 1S: WS 5 - pre project

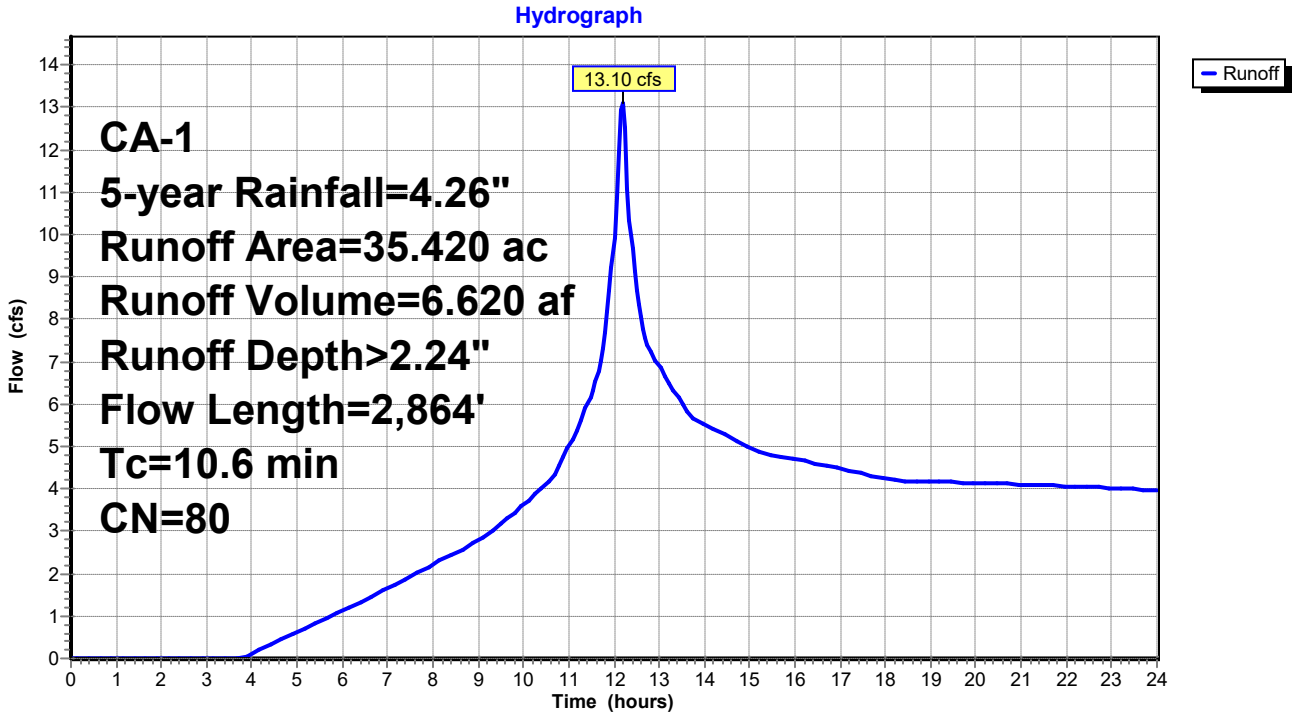
Runoff = 13.10 cfs @ 12.18 hrs, Volume= 6.620 af, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
	3.580	98	Paved parking, HSG C
*	3.950	79	Vineyard, Fair, HSG C
	20.010	79	Pasture/grassland/range, Fair, HSG C
	5.990	74	Pasture/grassland/range, Good, HSG C
	1.890	86	Pasture/grassland/range, Poor, HSG C
	35.420	80	Weighted Average
	31.840		89.89% Pervious Area
	3.580		10.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.5	661	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.2	648	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.1	1,455	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
10.6	2,864	Total			

Subcatchment 1S: WS 5 - pre project



Summary for Subcatchment 1S: WS 5 - pre project

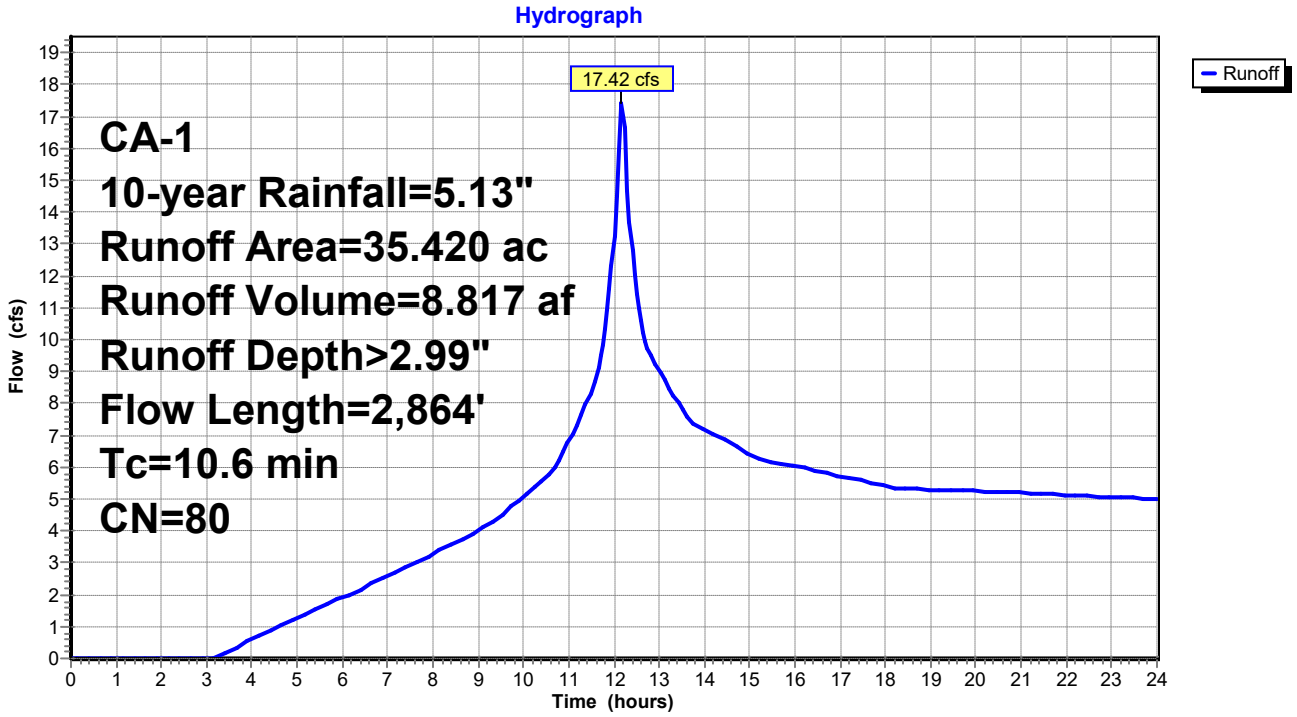
Runoff = 17.42 cfs @ 12.18 hrs, Volume= 8.817 af, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
	3.580	98	Paved parking, HSG C
*	3.950	79	Vineyard, Fair, HSG C
	20.010	79	Pasture/grassland/range, Fair, HSG C
	5.990	74	Pasture/grassland/range, Good, HSG C
	1.890	86	Pasture/grassland/range, Poor, HSG C
	35.420	80	Weighted Average
	31.840		89.89% Pervious Area
	3.580		10.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.5	661	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.2	648	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.1	1,455	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
10.6	2,864	Total			

Subcatchment 1S: WS 5 - pre project



Summary for Subcatchment 1S: WS 5 - pre project

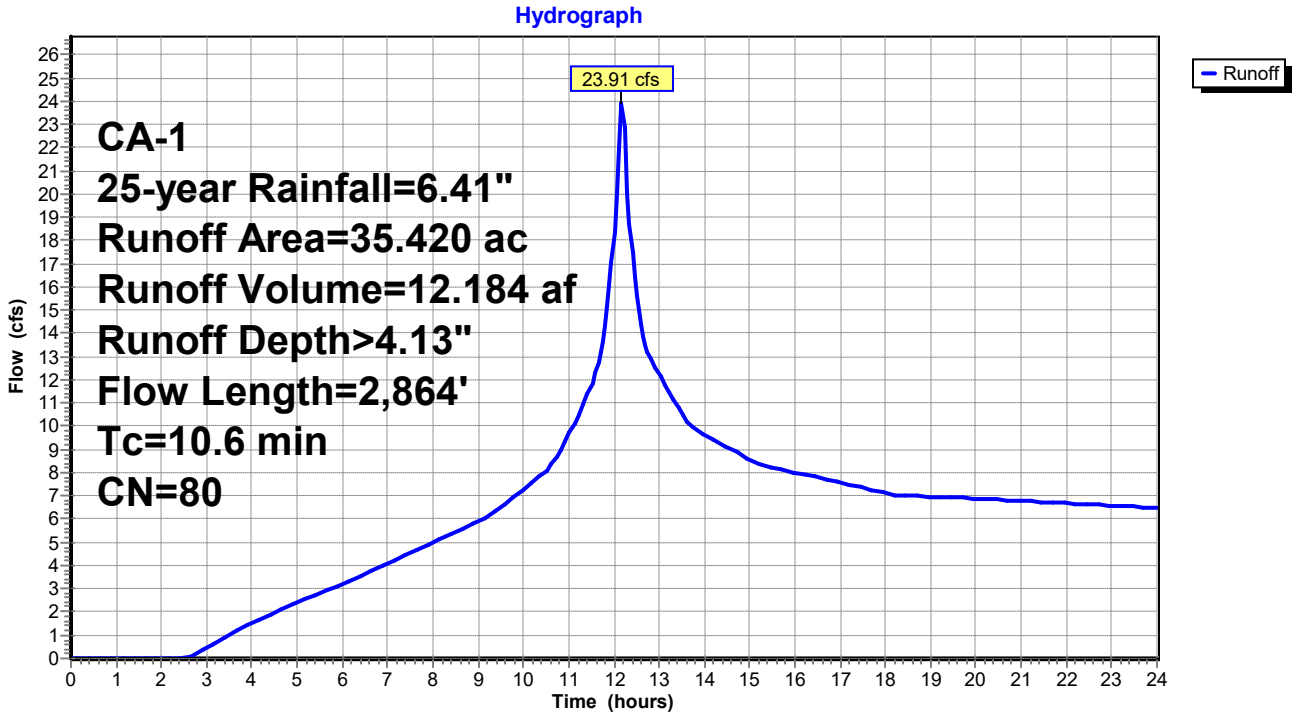
Runoff = 23.91 cfs @ 12.18 hrs, Volume= 12.184 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
	3.580	98	Paved parking, HSG C
*	3.950	79	Vineyard, Fair, HSG C
	20.010	79	Pasture/grassland/range, Fair, HSG C
	5.990	74	Pasture/grassland/range, Good, HSG C
	1.890	86	Pasture/grassland/range, Poor, HSG C
	35.420	80	Weighted Average
	31.840		89.89% Pervious Area
	3.580		10.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.5	661	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.2	648	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.1	1,455	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
10.6	2,864	Total			

Subcatchment 1S: WS 5 - pre project



Summary for Subcatchment 1S: WS 5 - pre project

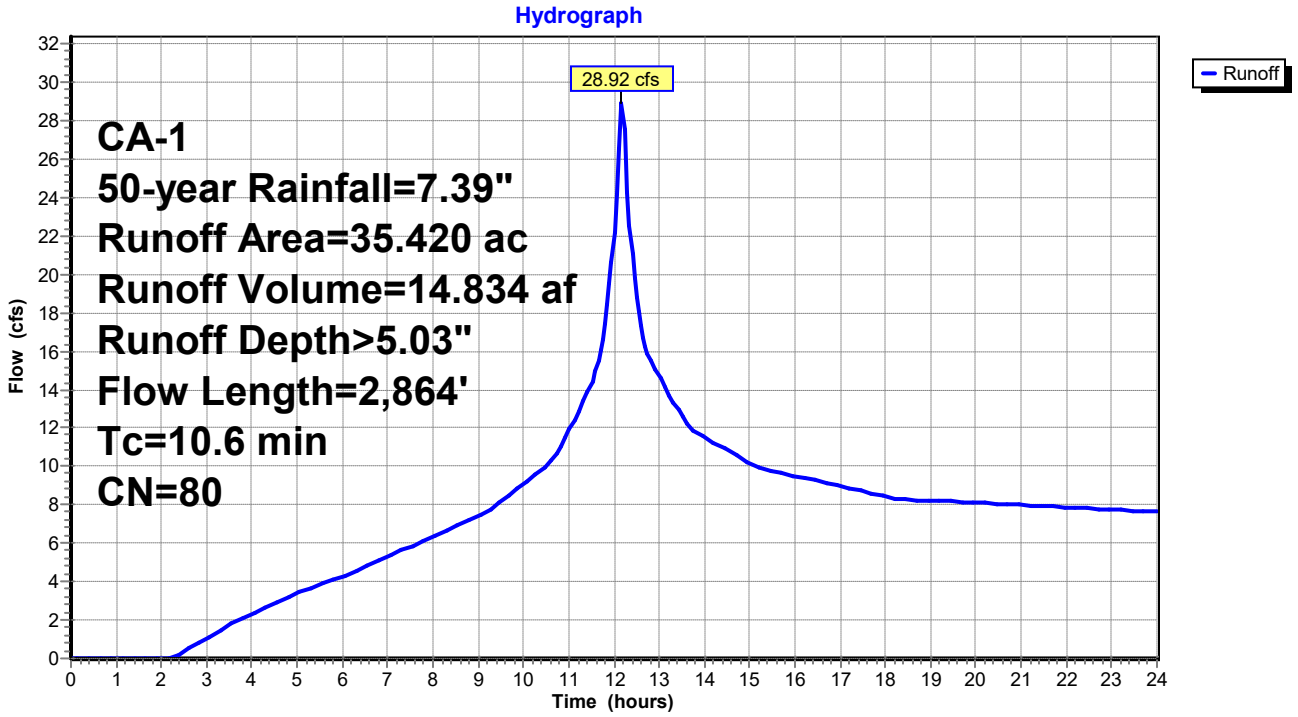
Runoff = 28.92 cfs @ 12.18 hrs, Volume= 14.834 af, Depth> 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
	3.580	98	Paved parking, HSG C
*	3.950	79	Vineyard, Fair, HSG C
	20.010	79	Pasture/grassland/range, Fair, HSG C
	5.990	74	Pasture/grassland/range, Good, HSG C
	1.890	86	Pasture/grassland/range, Poor, HSG C
	35.420	80	Weighted Average
	31.840		89.89% Pervious Area
	3.580		10.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.5	661	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.2	648	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.1	1,455	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
10.6	2,864	Total			

Subcatchment 1S: WS 5 - pre project



Summary for Subcatchment 1S: WS 5 - pre project

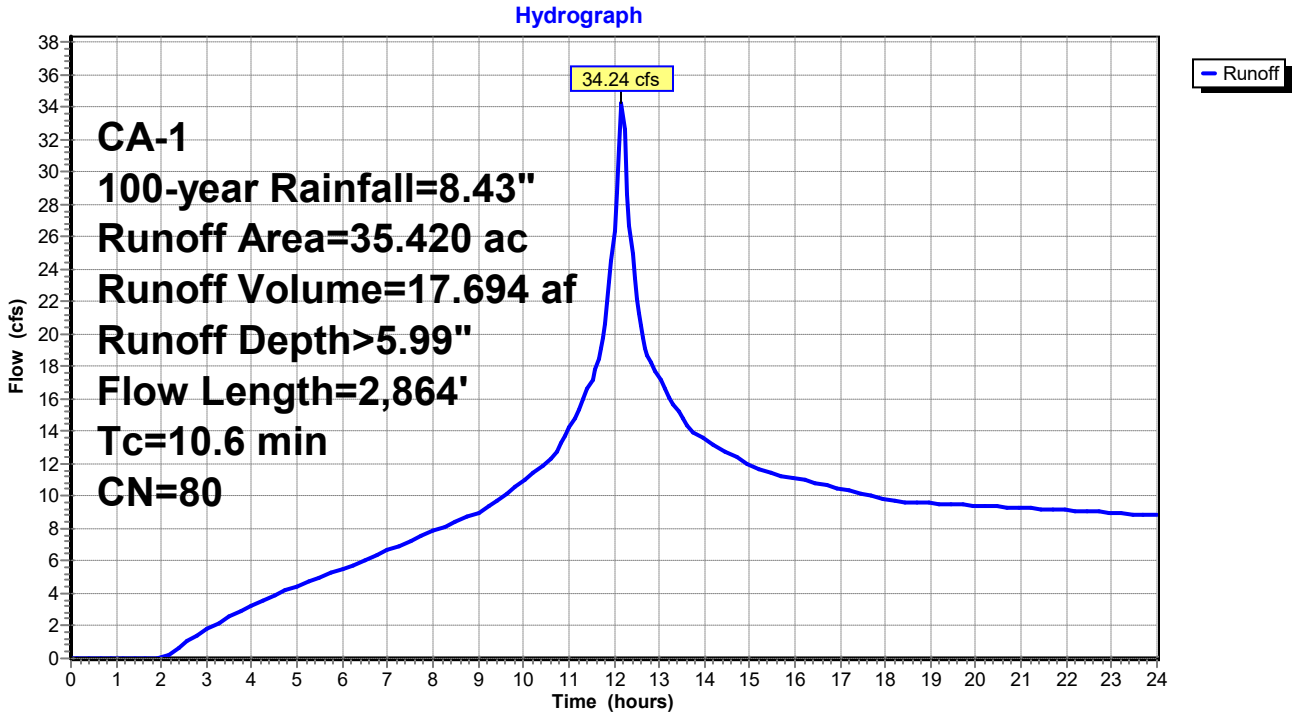
Runoff = 34.24 cfs @ 12.17 hrs, Volume= 17.694 af, Depth> 5.99"

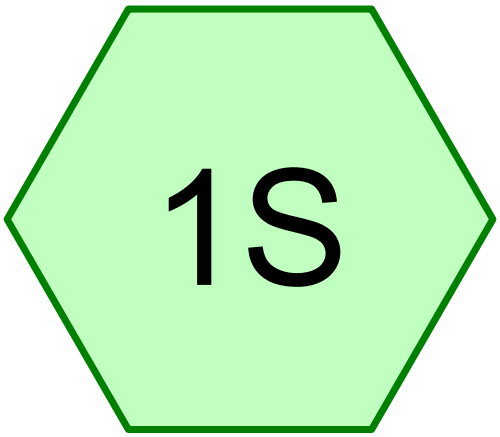
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
	3.580	98	Paved parking, HSG C
*	3.950	79	Vineyard, Fair, HSG C
	20.010	79	Pasture/grassland/range, Fair, HSG C
	5.990	74	Pasture/grassland/range, Good, HSG C
	1.890	86	Pasture/grassland/range, Poor, HSG C
	35.420	80	Weighted Average
	31.840		89.89% Pervious Area
	3.580		10.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.5	661	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.2	648	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.1	1,455	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
10.6	2,864	Total			

Subcatchment 1S: WS 5 - pre project





WS 5 - post project

Subcat Reach Pond Link

Routing Diagram for WS5 postR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS 5 - post project

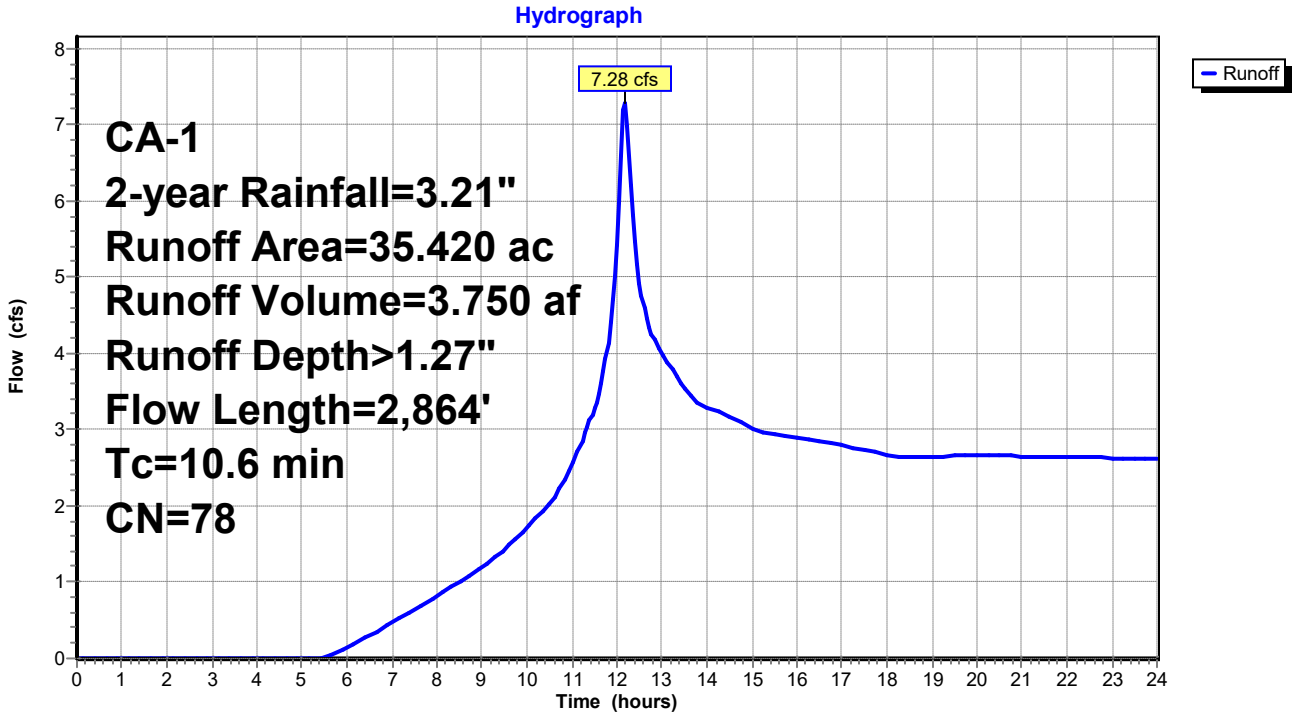
Runoff = 7.28 cfs @ 12.18 hrs, Volume= 3.750 af, Depth> 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
	3.580	98	Paved parking, HSG C
*	3.950	79	Vineyard, Fair, HSG C
*	16.950	75	Vineyard, Good, HSG C
	3.920	79	Pasture/grassland/range, Fair, HSG C
	5.980	74	Pasture/grassland/range, Good, HSG C
	1.040	86	Pasture/grassland/range, Poor, HSG C
	35.420	78	Weighted Average
	31.840		89.89% Pervious Area
	3.580		10.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.5	661	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.2	648	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.1	1,455	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
10.6	2,864	Total			

Subcatchment 1S: WS 5 - post project



Summary for Subcatchment 1S: WS 5 - post project

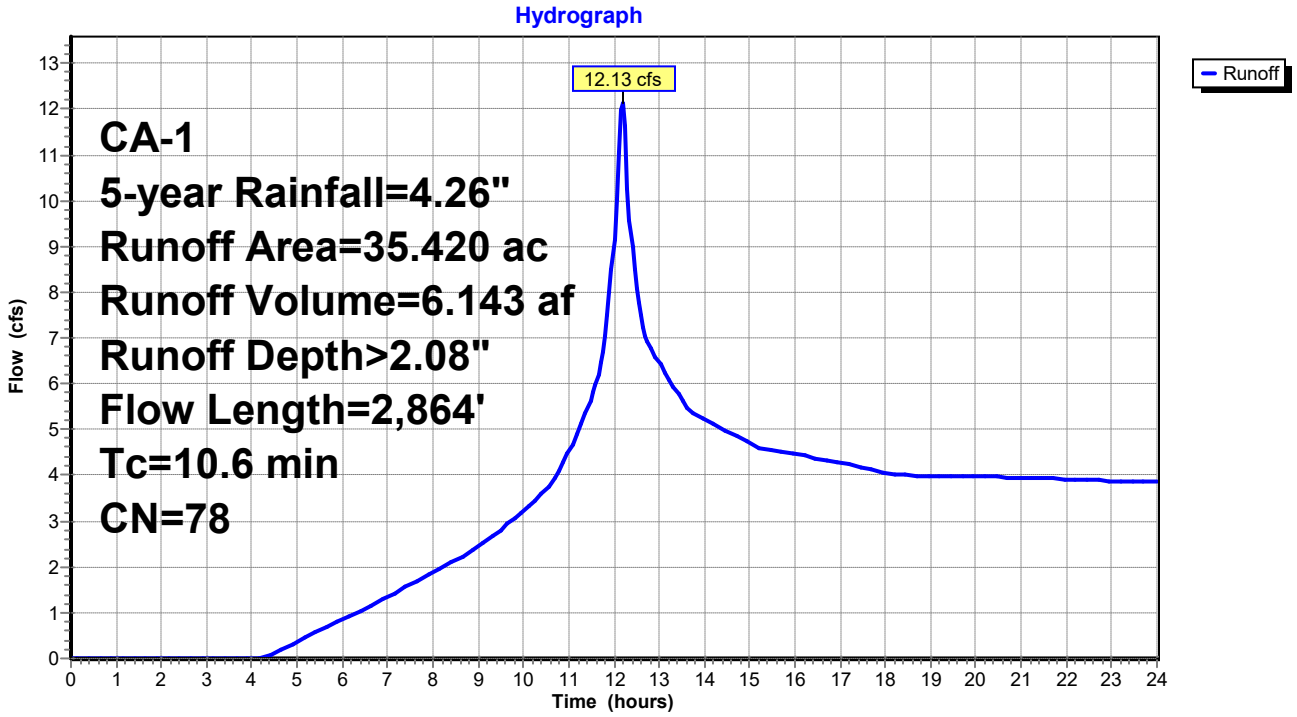
Runoff = 12.13 cfs @ 12.18 hrs, Volume= 6.143 af, Depth> 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
	3.580	98	Paved parking, HSG C
*	3.950	79	Vineyard, Fair, HSG C
*	16.950	75	Vineyard, Good, HSG C
	3.920	79	Pasture/grassland/range, Fair, HSG C
	5.980	74	Pasture/grassland/range, Good, HSG C
	1.040	86	Pasture/grassland/range, Poor, HSG C
	35.420	78	Weighted Average
	31.840		89.89% Pervious Area
	3.580		10.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.5	661	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.2	648	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.1	1,455	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
10.6	2,864	Total			

Subcatchment 1S: WS 5 - post project



Summary for Subcatchment 1S: WS 5 - post project

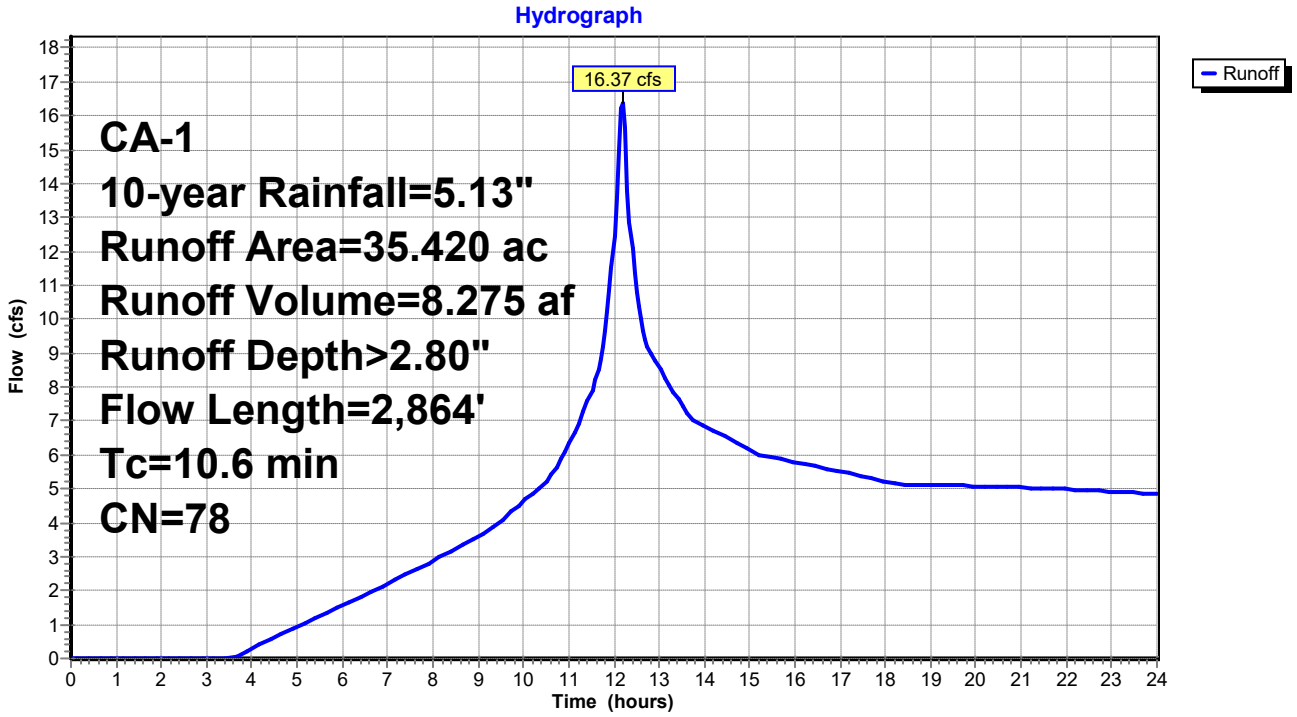
Runoff = 16.37 cfs @ 12.18 hrs, Volume= 8.275 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
	3.580	98	Paved parking, HSG C
*	3.950	79	Vineyard, Fair, HSG C
*	16.950	75	Vineyard, Good, HSG C
	3.920	79	Pasture/grassland/range, Fair, HSG C
	5.980	74	Pasture/grassland/range, Good, HSG C
	1.040	86	Pasture/grassland/range, Poor, HSG C
	35.420	78	Weighted Average
	31.840		89.89% Pervious Area
	3.580		10.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.5	661	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.2	648	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.1	1,455	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
10.6	2,864	Total			

Subcatchment 1S: WS 5 - post project



Summary for Subcatchment 1S: WS 5 - post project

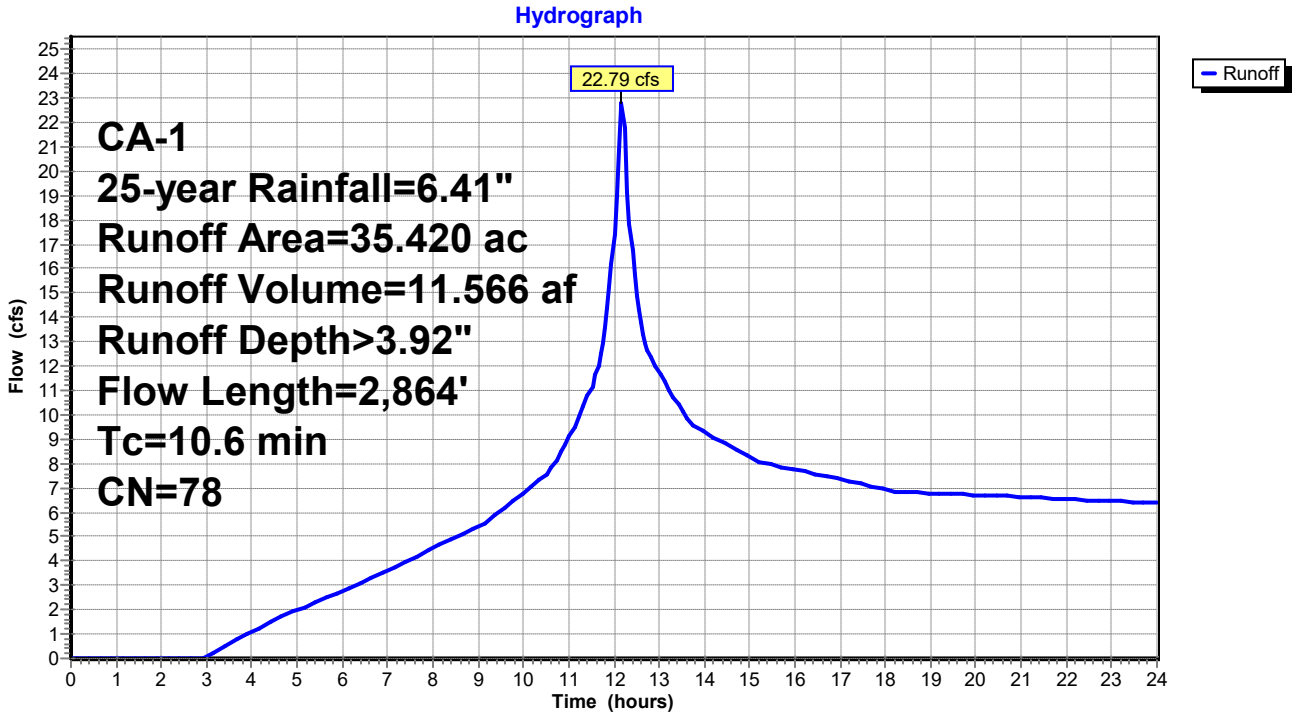
Runoff = 22.79 cfs @ 12.18 hrs, Volume= 11.566 af, Depth> 3.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
	3.580	98	Paved parking, HSG C
*	3.950	79	Vineyard, Fair, HSG C
*	16.950	75	Vineyard, Good, HSG C
	3.920	79	Pasture/grassland/range, Fair, HSG C
	5.980	74	Pasture/grassland/range, Good, HSG C
	1.040	86	Pasture/grassland/range, Poor, HSG C
	35.420	78	Weighted Average
	31.840		89.89% Pervious Area
	3.580		10.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.5	661	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.2	648	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.1	1,455	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
10.6	2,864	Total			

Subcatchment 1S: WS 5 - post project



Summary for Subcatchment 1S: WS 5 - post project

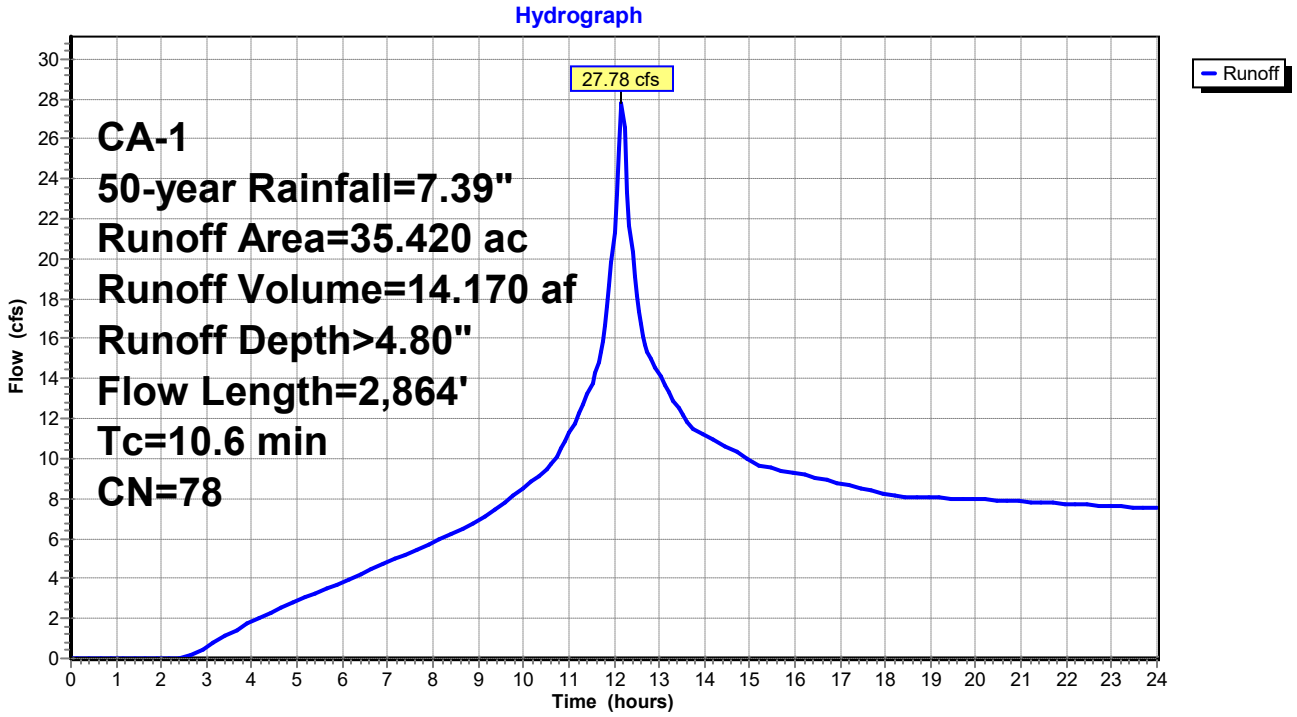
Runoff = 27.78 cfs @ 12.18 hrs, Volume= 14.170 af, Depth> 4.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
	3.580	98	Paved parking, HSG C
*	3.950	79	Vineyard, Fair, HSG C
*	16.950	75	Vineyard, Good, HSG C
	3.920	79	Pasture/grassland/range, Fair, HSG C
	5.980	74	Pasture/grassland/range, Good, HSG C
	1.040	86	Pasture/grassland/range, Poor, HSG C
	35.420	78	Weighted Average
	31.840		89.89% Pervious Area
	3.580		10.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.5	661	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.2	648	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.1	1,455	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
10.6	2,864	Total			

Subcatchment 1S: WS 5 - post project



Summary for Subcatchment 1S: WS 5 - post project

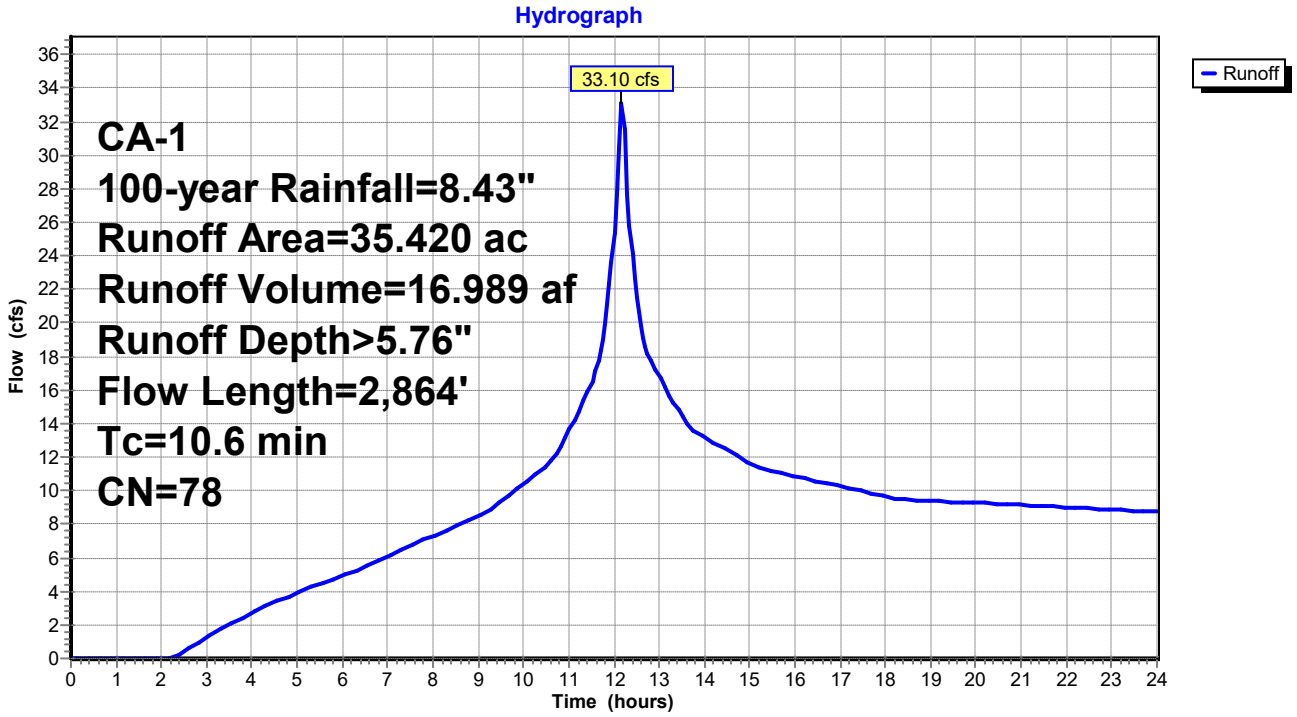
Runoff = 33.10 cfs @ 12.18 hrs, Volume= 16.989 af, Depth> 5.76"

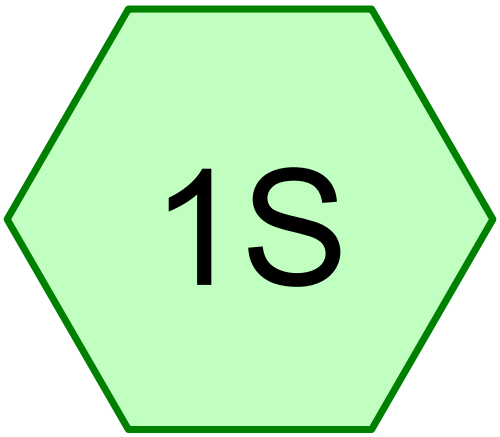
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
	3.580	98	Paved parking, HSG C
*	3.950	79	Vineyard, Fair, HSG C
*	16.950	75	Vineyard, Good, HSG C
	3.920	79	Pasture/grassland/range, Fair, HSG C
	5.980	74	Pasture/grassland/range, Good, HSG C
	1.040	86	Pasture/grassland/range, Poor, HSG C
	35.420	78	Weighted Average
	31.840		89.89% Pervious Area
	3.580		10.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Range n= 0.130 P2= 3.21"
1.5	661	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.2	648	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.1	1,455	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
10.6	2,864	Total			

Subcatchment 1S: WS 5 - post project





WS 6 - pre project

Subcat Reach Pond Link

Routing Diagram for WS6 preR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS 6 - pre project

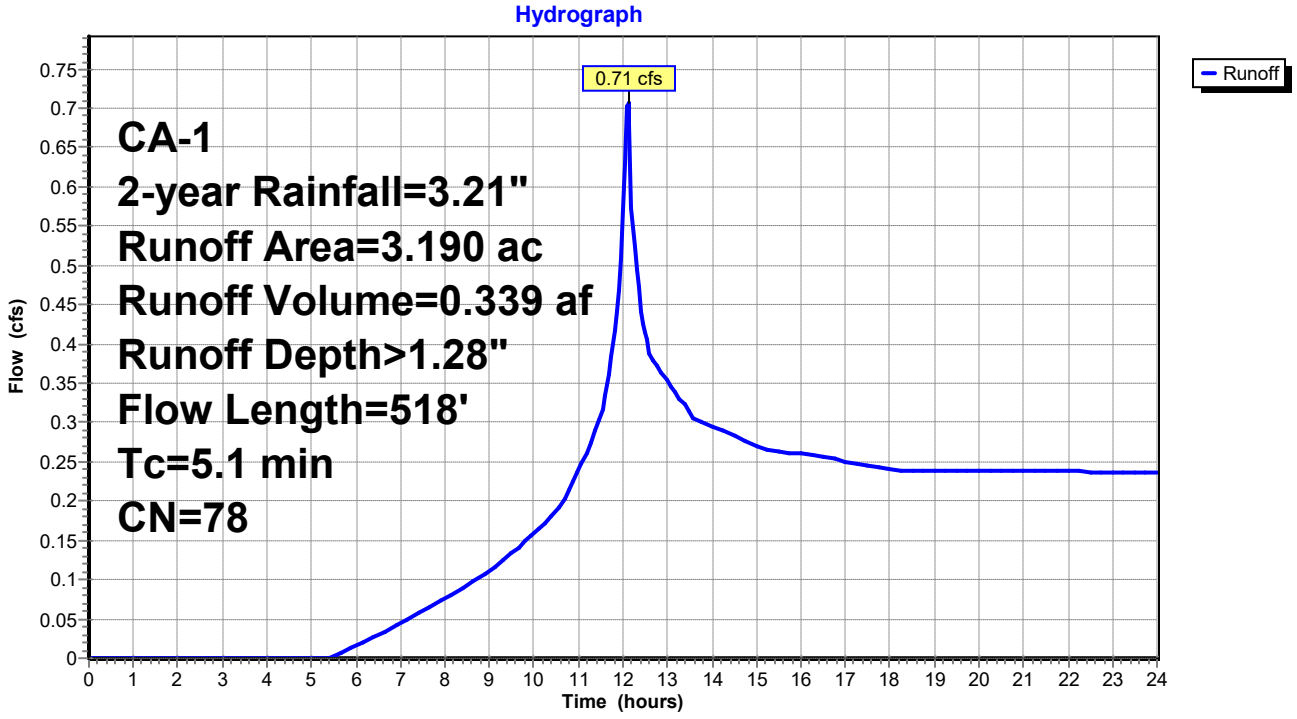
Runoff = 0.71 cfs @ 12.11 hrs, Volume= 0.339 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

Area (ac)	CN	Description
1.840	79	Pasture/grassland/range, Fair, HSG C
0.490	86	Pasture/grassland/range, Poor, HSG C
0.860	70	Woods, Good, HSG C
3.190	78	Weighted Average
3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	207	0.2600	8.21		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	211	0.0300	9.41	282.42	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.1	518	Total			

Subcatchment 1S: WS 6 - pre project



Summary for Subcatchment 1S: WS 6 - pre project

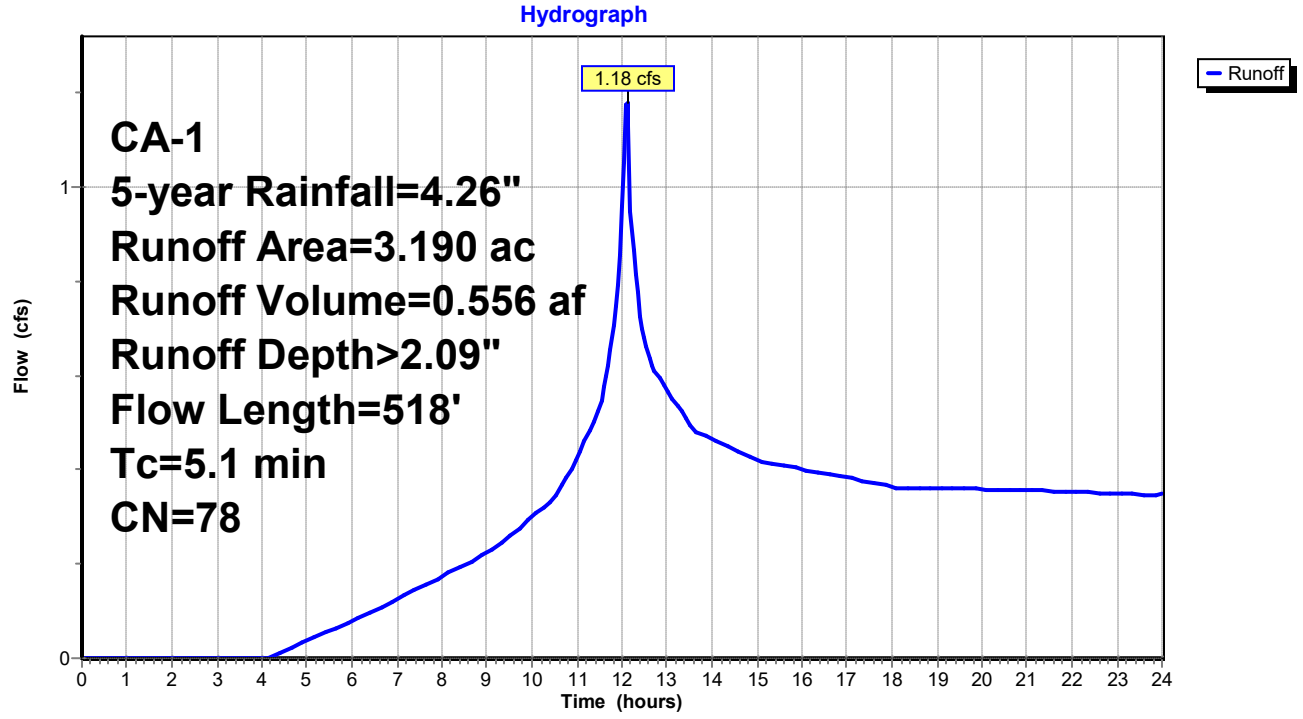
Runoff = 1.18 cfs @ 12.11 hrs, Volume= 0.556 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

Area (ac)	CN	Description
1.840	79	Pasture/grassland/range, Fair, HSG C
0.490	86	Pasture/grassland/range, Poor, HSG C
0.860	70	Woods, Good, HSG C
3.190	78	Weighted Average
3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	207	0.2600	8.21		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	211	0.0300	9.41	282.42	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.1	518	Total			

Subcatchment 1S: WS 6 - pre project



Summary for Subcatchment 1S: WS 6 - pre project

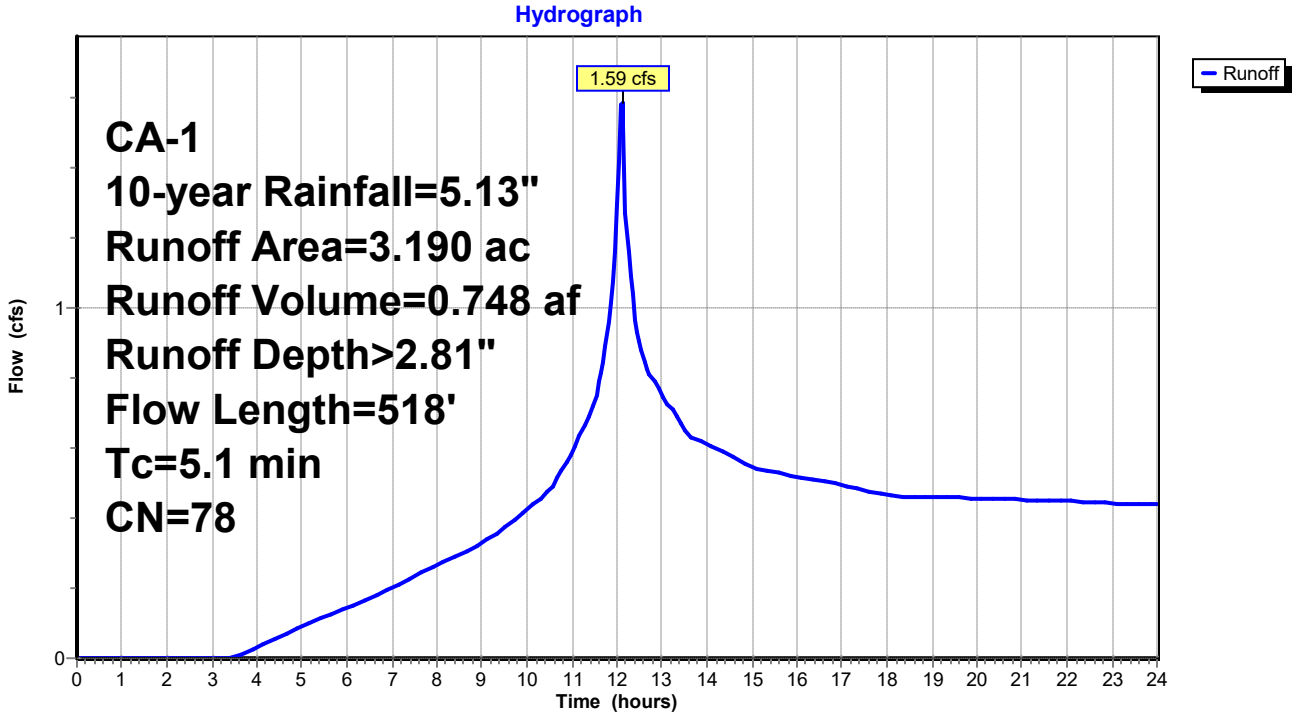
Runoff = 1.59 cfs @ 12.11 hrs, Volume= 0.748 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

Area (ac)	CN	Description
1.840	79	Pasture/grassland/range, Fair, HSG C
0.490	86	Pasture/grassland/range, Poor, HSG C
0.860	70	Woods, Good, HSG C
3.190	78	Weighted Average
3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	207	0.2600	8.21		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	211	0.0300	9.41	282.42	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.1	518	Total			

Subcatchment 1S: WS 6 - pre project



Summary for Subcatchment 1S: WS 6 - pre project

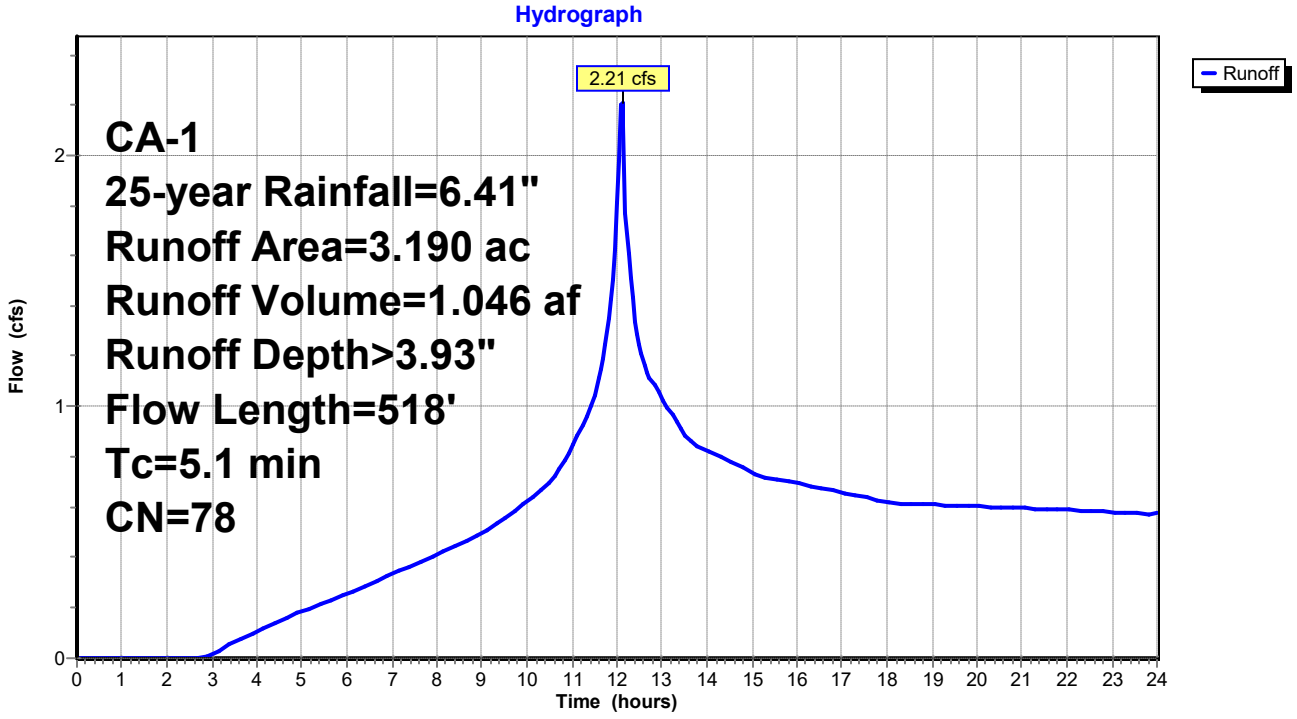
Runoff = 2.21 cfs @ 12.11 hrs, Volume= 1.046 af, Depth> 3.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

Area (ac)	CN	Description
1.840	79	Pasture/grassland/range, Fair, HSG C
0.490	86	Pasture/grassland/range, Poor, HSG C
0.860	70	Woods, Good, HSG C
3.190	78	Weighted Average
3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	207	0.2600	8.21		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	211	0.0300	9.41	282.42	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.1	518	Total			

Subcatchment 1S: WS 6 - pre project



Summary for Subcatchment 1S: WS 6 - pre project

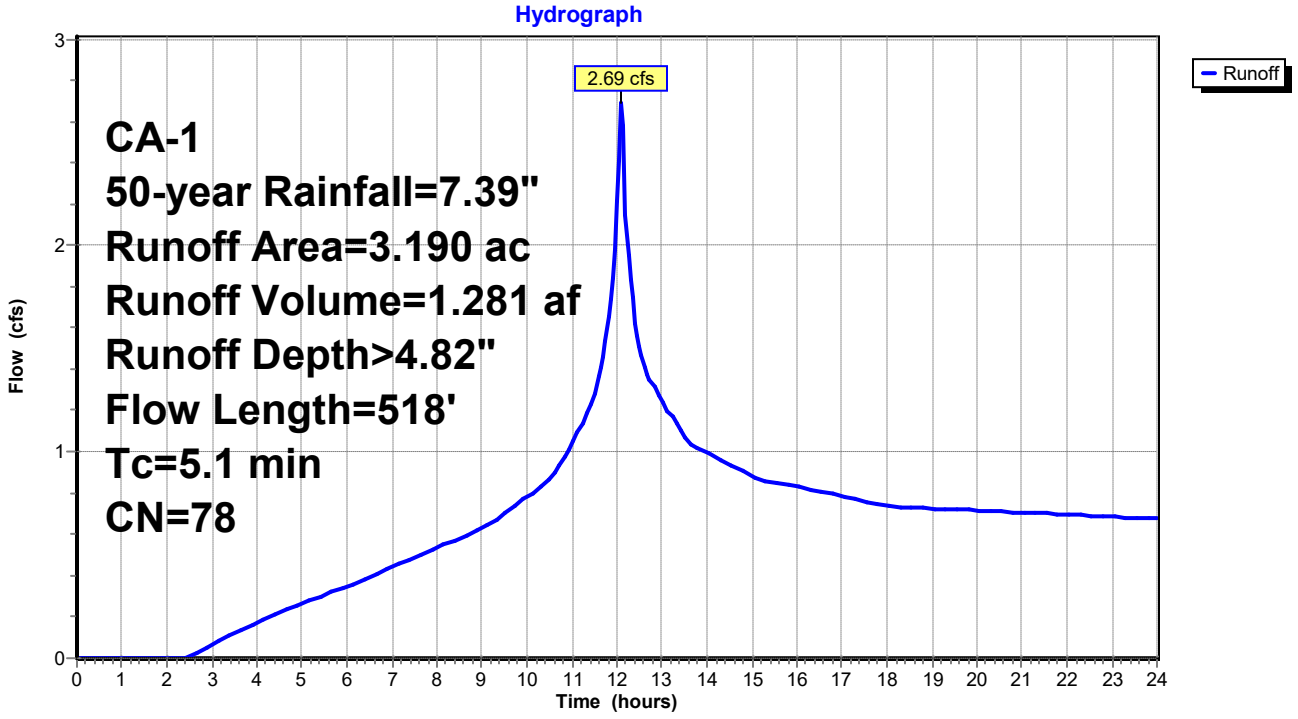
Runoff = 2.69 cfs @ 12.11 hrs, Volume= 1.281 af, Depth> 4.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

Area (ac)	CN	Description
1.840	79	Pasture/grassland/range, Fair, HSG C
0.490	86	Pasture/grassland/range, Poor, HSG C
0.860	70	Woods, Good, HSG C
3.190	78	Weighted Average
3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	207	0.2600	8.21		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	211	0.0300	9.41	282.42	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.1	518	Total			

Subcatchment 1S: WS 6 - pre project



Summary for Subcatchment 1S: WS 6 - pre project

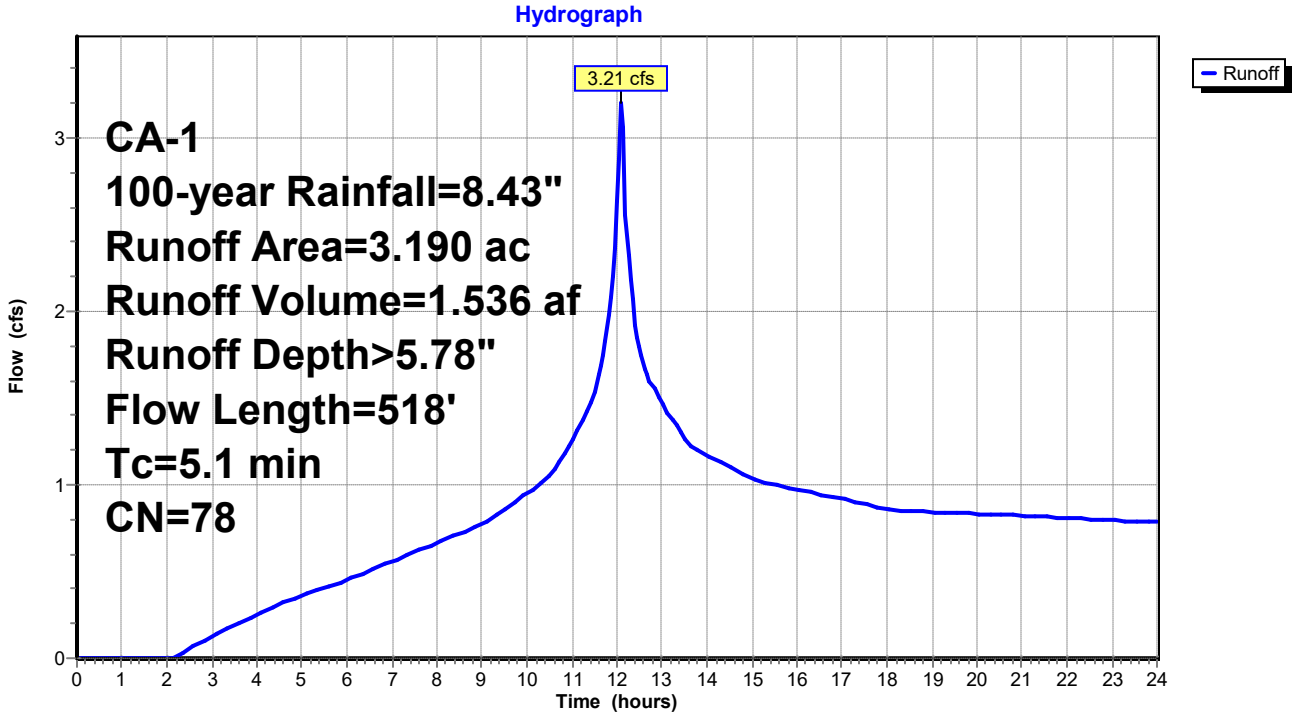
Runoff = 3.21 cfs @ 12.11 hrs, Volume= 1.536 af, Depth> 5.78"

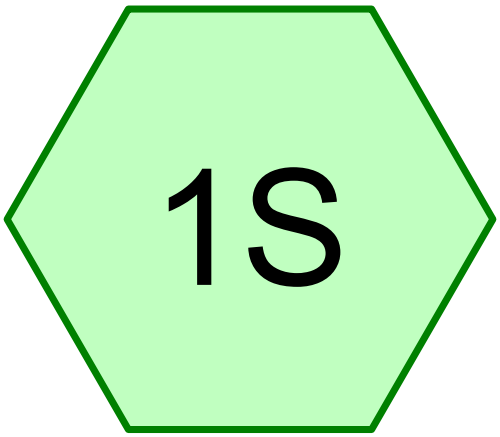
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

Area (ac)	CN	Description
1.840	79	Pasture/grassland/range, Fair, HSG C
0.490	86	Pasture/grassland/range, Poor, HSG C
0.860	70	Woods, Good, HSG C
3.190	78	Weighted Average
3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	207	0.2600	8.21		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	211	0.0300	9.41	282.42	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.1	518	Total			

Subcatchment 1S: WS 6 - pre project





WS 6 - post project

Subcat Reach Pond Link

Routing Diagram for WS6 postR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS 6 - post project

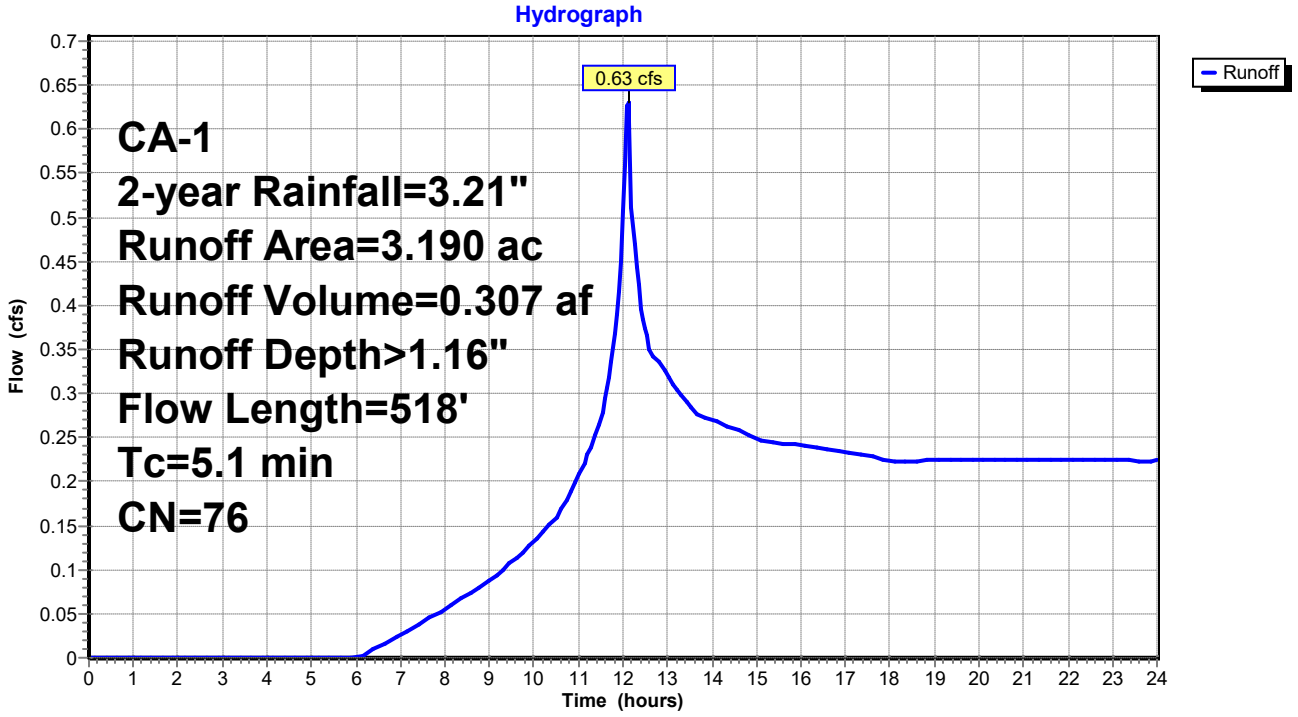
Runoff = 0.63 cfs @ 12.11 hrs, Volume= 0.307 af, Depth> 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
*	1.030	75	Vineyard, Good, HSG C
	0.810	79	Pasture/grassland/range, Fair, HSG C
	0.490	86	Pasture/grassland/range, Poor, HSG C
	0.860	70	Woods, Good, HSG C
	3.190	76	Weighted Average
	3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	207	0.2600	8.21		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	211	0.0300	9.41	282.42	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.1	518	Total			

Subcatchment 1S: WS 6 - post project



Summary for Subcatchment 1S: WS 6 - post project

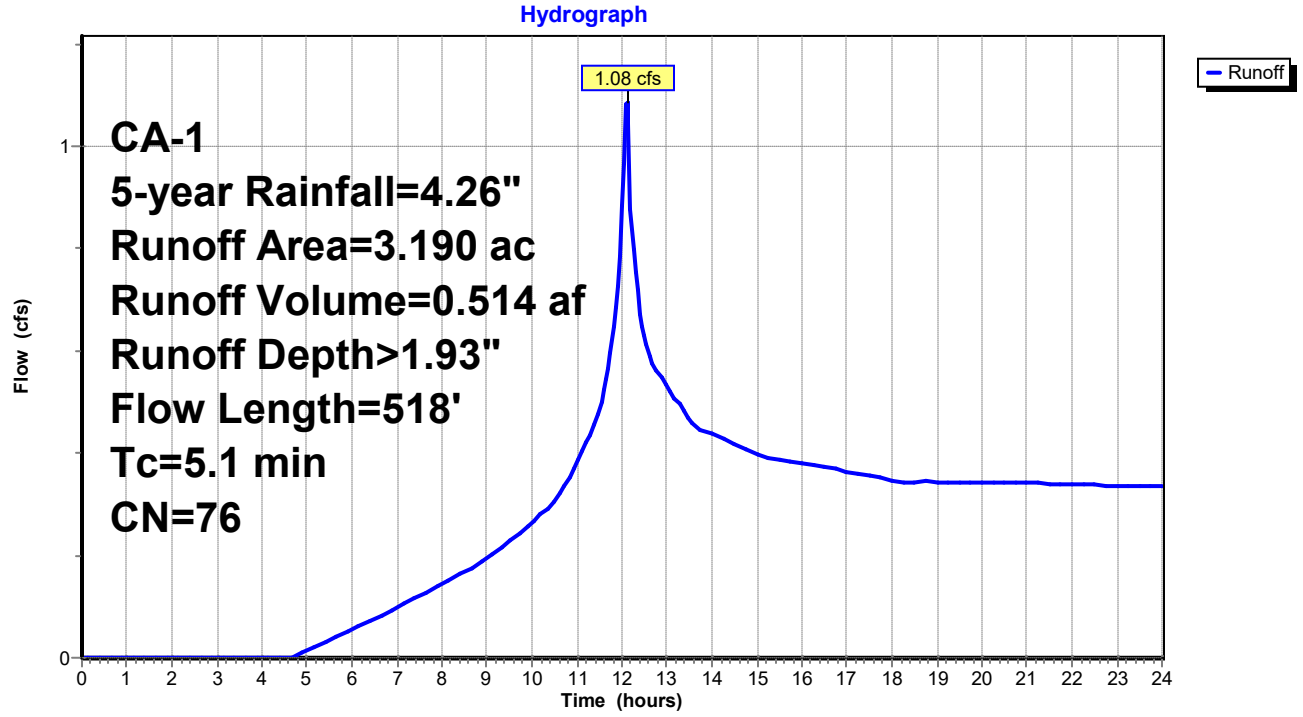
Runoff = 1.08 cfs @ 12.11 hrs, Volume= 0.514 af, Depth> 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
*	1.030	75	Vineyard, Good, HSG C
	0.810	79	Pasture/grassland/range, Fair, HSG C
	0.490	86	Pasture/grassland/range, Poor, HSG C
	0.860	70	Woods, Good, HSG C
	3.190	76	Weighted Average
	3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	207	0.2600	8.21		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	211	0.0300	9.41	282.42	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.1	518	Total			

Subcatchment 1S: WS 6 - post project



Summary for Subcatchment 1S: WS 6 - post project

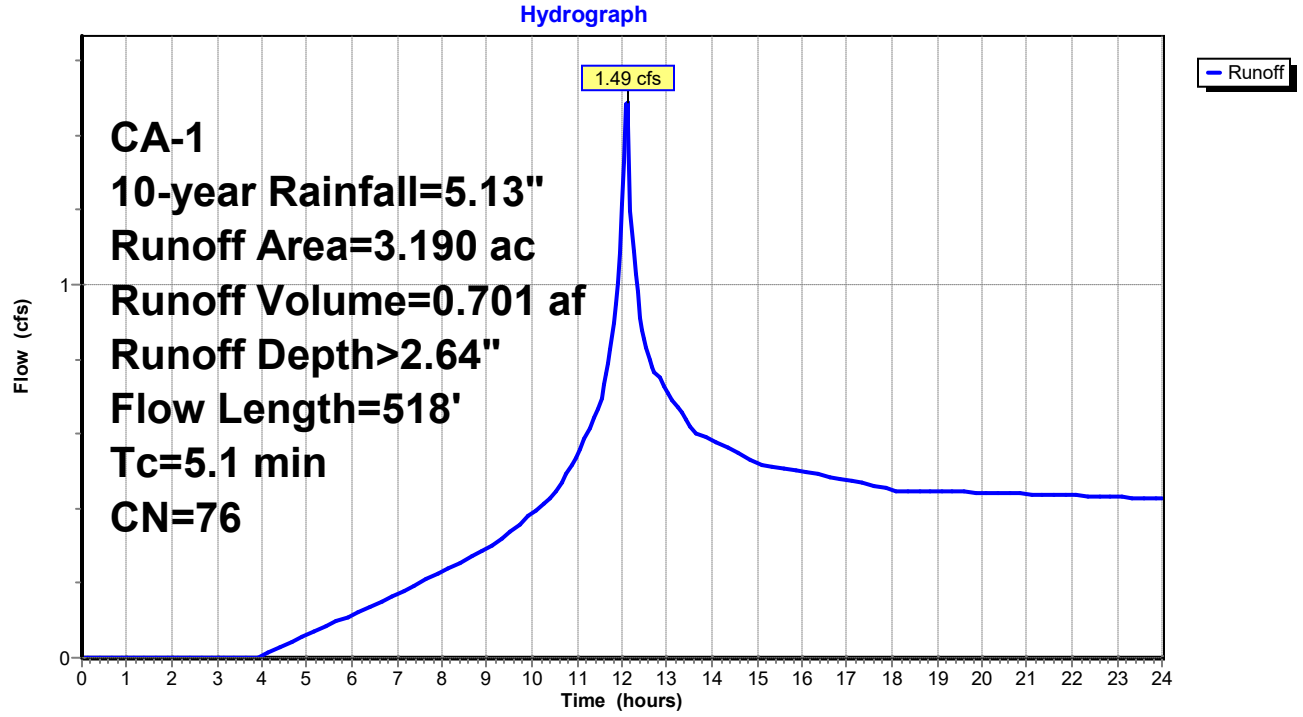
Runoff = 1.49 cfs @ 12.11 hrs, Volume= 0.701 af, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
*	1.030	75	Vineyard, Good, HSG C
	0.810	79	Pasture/grassland/range, Fair, HSG C
	0.490	86	Pasture/grassland/range, Poor, HSG C
	0.860	70	Woods, Good, HSG C
	3.190	76	Weighted Average
	3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	207	0.2600	8.21		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	211	0.0300	9.41	282.42	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.1	518	Total			

Subcatchment 1S: WS 6 - post project



Summary for Subcatchment 1S: WS 6 - post project

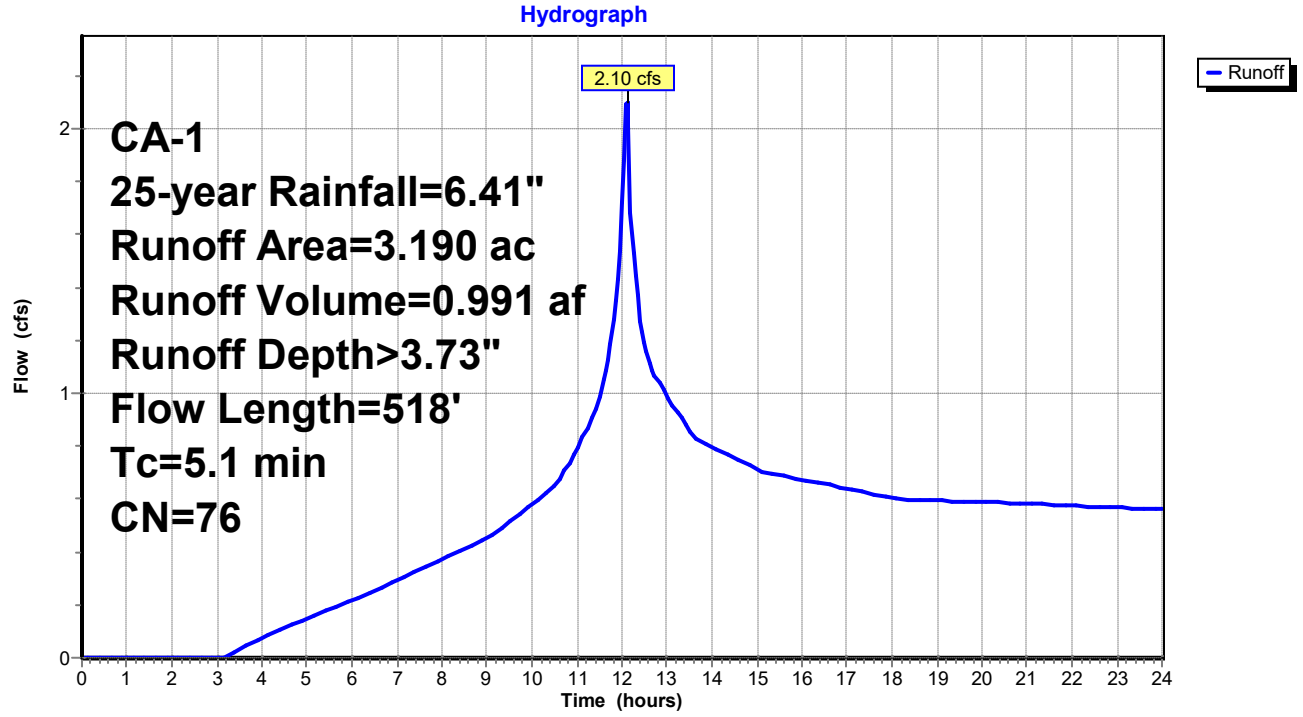
Runoff = 2.10 cfs @ 12.11 hrs, Volume= 0.991 af, Depth> 3.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
*	1.030	75	Vineyard, Good, HSG C
	0.810	79	Pasture/grassland/range, Fair, HSG C
	0.490	86	Pasture/grassland/range, Poor, HSG C
	0.860	70	Woods, Good, HSG C
	3.190	76	Weighted Average
	3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	207	0.2600	8.21		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	211	0.0300	9.41	282.42	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.1	518	Total			

Subcatchment 1S: WS 6 - post project



Summary for Subcatchment 1S: WS 6 - post project

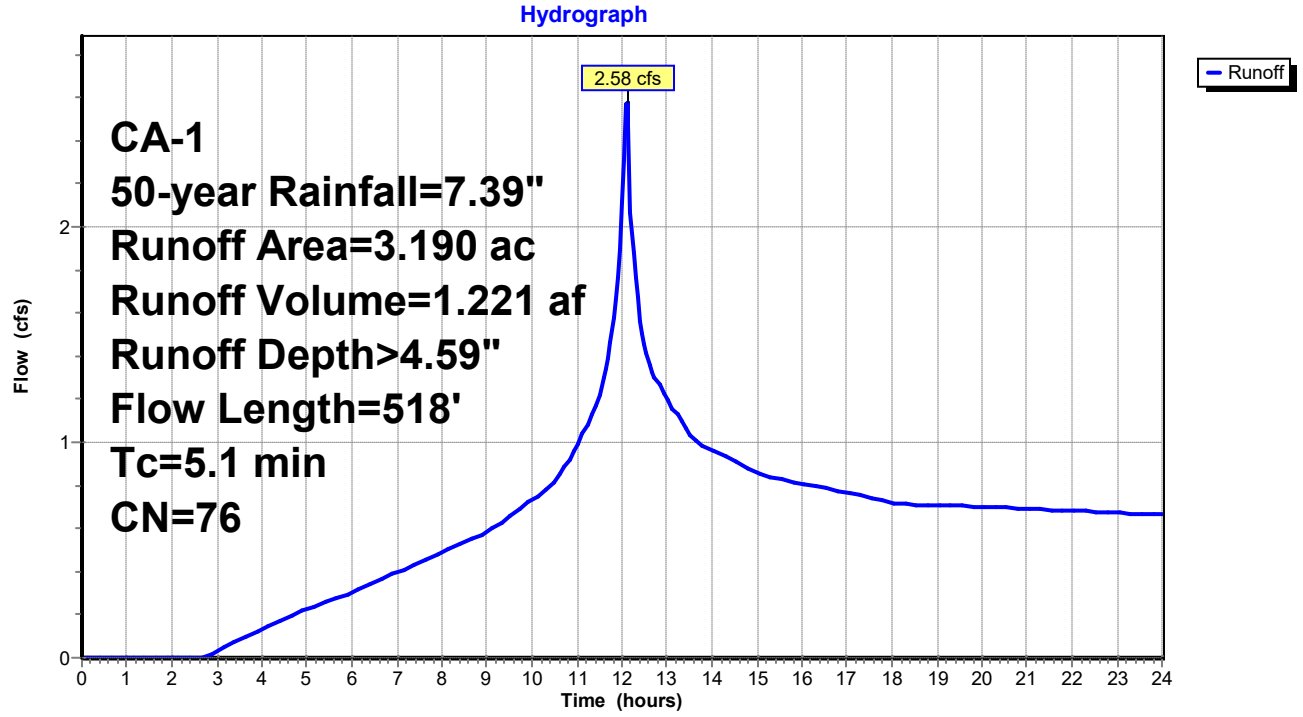
Runoff = 2.58 cfs @ 12.11 hrs, Volume= 1.221 af, Depth> 4.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
*	1.030	75	Vineyard, Good, HSG C
	0.810	79	Pasture/grassland/range, Fair, HSG C
	0.490	86	Pasture/grassland/range, Poor, HSG C
	0.860	70	Woods, Good, HSG C
	3.190	76	Weighted Average
	3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	207	0.2600	8.21		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	211	0.0300	9.41	282.42	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.1	518	Total			

Subcatchment 1S: WS 6 - post project



Summary for Subcatchment 1S: WS 6 - post project

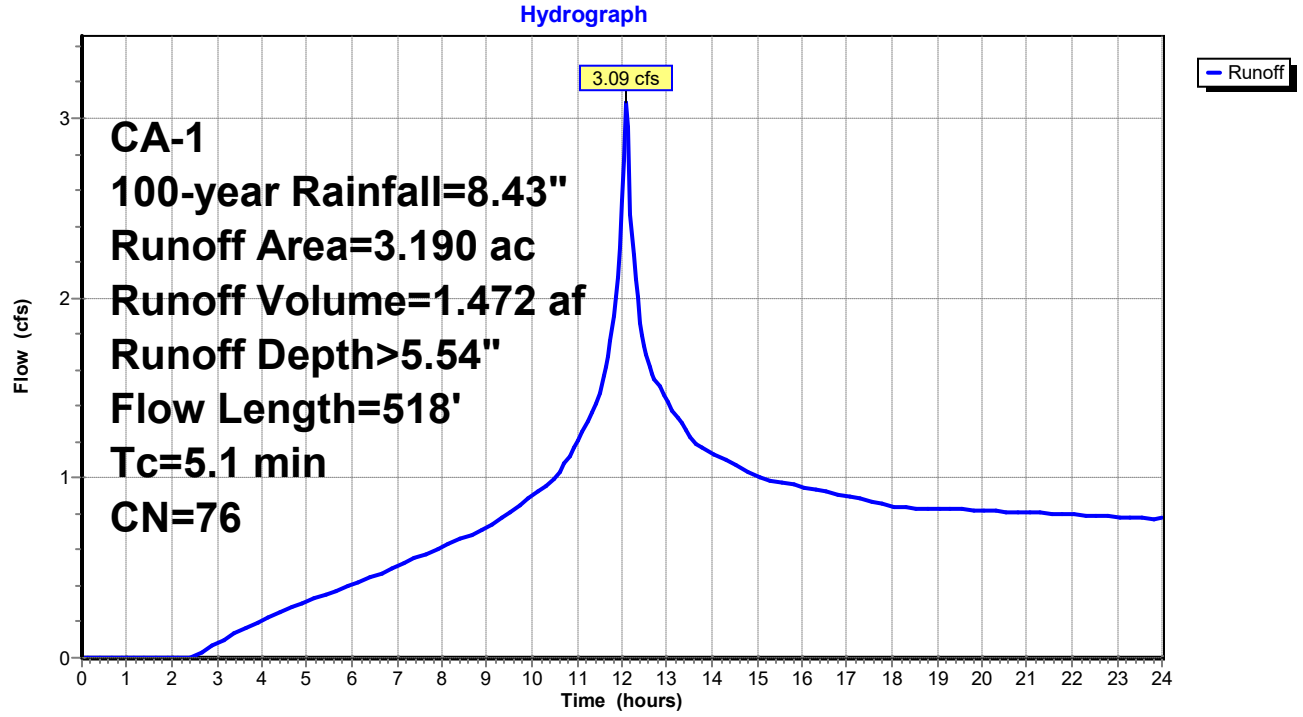
Runoff = 3.09 cfs @ 12.11 hrs, Volume= 1.472 af, Depth> 5.54"

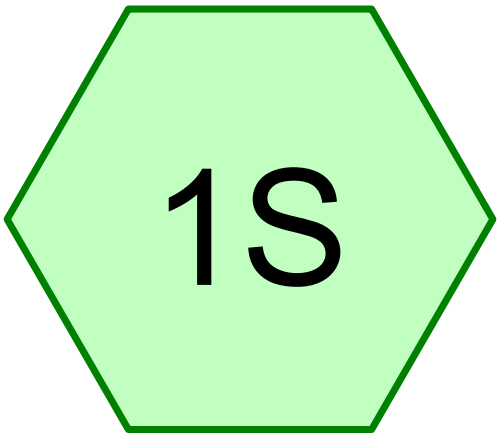
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
*	1.030	75	Vineyard, Good, HSG C
	0.810	79	Pasture/grassland/range, Fair, HSG C
	0.490	86	Pasture/grassland/range, Poor, HSG C
	0.860	70	Woods, Good, HSG C
	3.190	76	Weighted Average
	3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.4	207	0.2600	8.21		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	211	0.0300	9.41	282.42	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
5.1	518	Total			

Subcatchment 1S: WS 6 - post project





WS 7 - pre project

Subcat Reach Pond Link

Routing Diagram for WS7 preR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS 7 - pre project

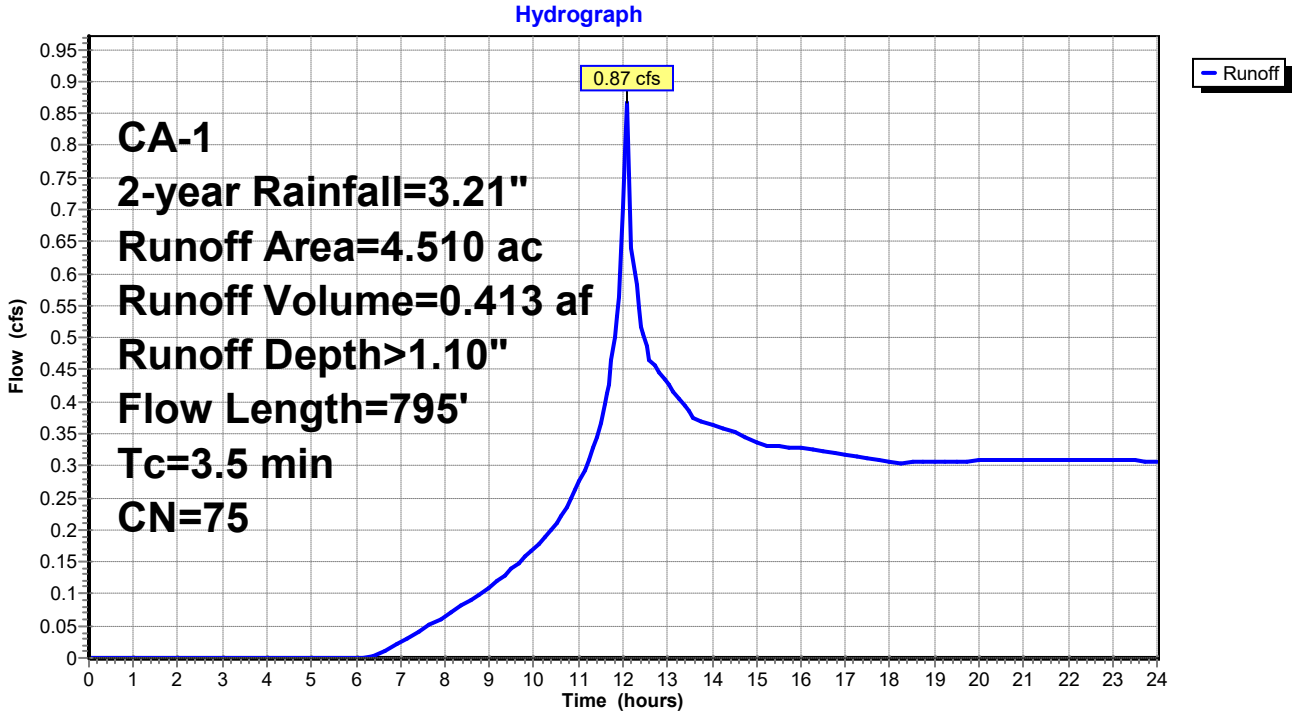
Runoff = 0.87 cfs @ 12.10 hrs, Volume= 0.413 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

Area (ac)	CN	Description
2.470	79	Pasture/grassland/range, Fair, HSG C
2.040	70	Woods, Good, HSG C
4.510	75	Weighted Average
4.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	100	0.3800	0.62		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.2	171	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	524	0.0700	14.38	431.41	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
3.5	795	Total			

Subcatchment 1S: WS 7 - pre project



Summary for Subcatchment 1S: WS 7 - pre project

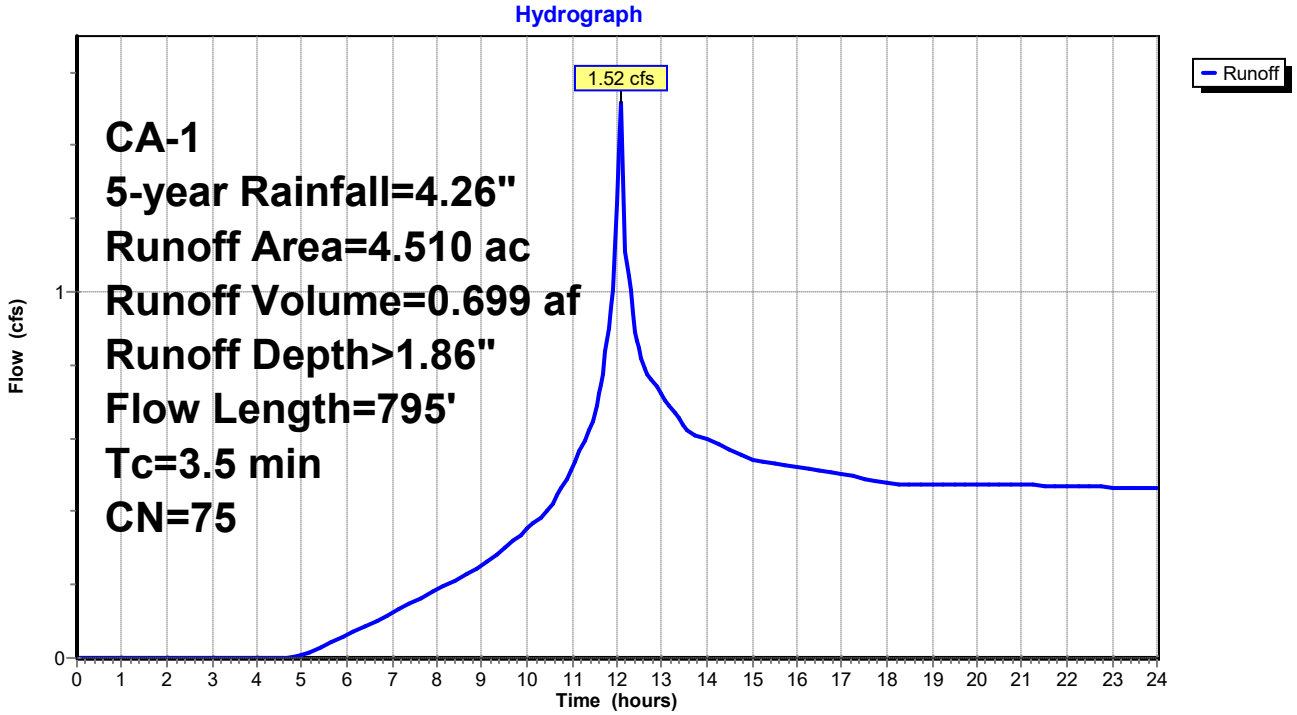
Runoff = 1.52 cfs @ 12.09 hrs, Volume= 0.699 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

Area (ac)	CN	Description
2.470	79	Pasture/grassland/range, Fair, HSG C
2.040	70	Woods, Good, HSG C
4.510	75	Weighted Average
4.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	100	0.3800	0.62		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.2	171	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	524	0.0700	14.38	431.41	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
3.5	795	Total			

Subcatchment 1S: WS 7 - pre project



Summary for Subcatchment 1S: WS 7 - pre project

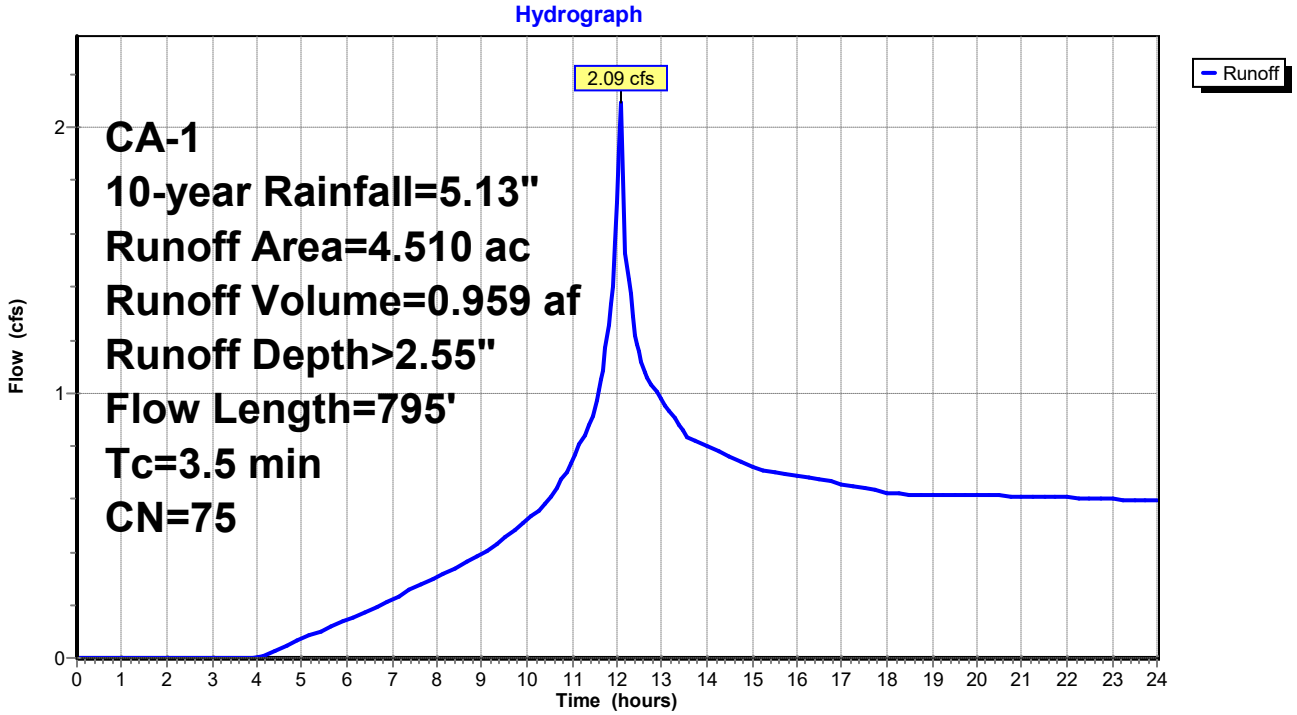
Runoff = 2.09 cfs @ 12.09 hrs, Volume= 0.959 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

Area (ac)	CN	Description
2.470	79	Pasture/grassland/range, Fair, HSG C
2.040	70	Woods, Good, HSG C
4.510	75	Weighted Average
4.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	100	0.3800	0.62		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.2	171	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	524	0.0700	14.38	431.41	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
3.5	795	Total			

Subcatchment 1S: WS 7 - pre project



Summary for Subcatchment 1S: WS 7 - pre project

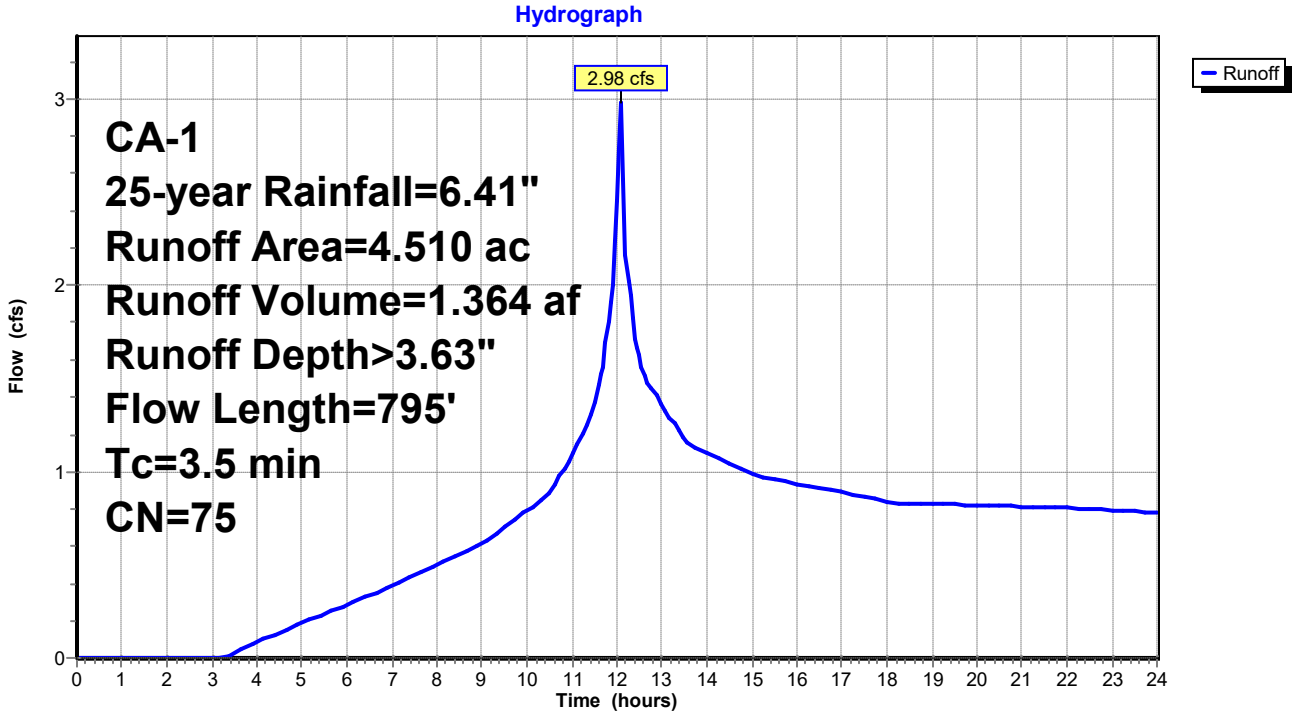
Runoff = 2.98 cfs @ 12.09 hrs, Volume= 1.364 af, Depth> 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

Area (ac)	CN	Description
2.470	79	Pasture/grassland/range, Fair, HSG C
2.040	70	Woods, Good, HSG C
4.510	75	Weighted Average
4.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	100	0.3800	0.62		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.2	171	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	524	0.0700	14.38	431.41	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
3.5	795	Total			

Subcatchment 1S: WS 7 - pre project



Summary for Subcatchment 1S: WS 7 - pre project

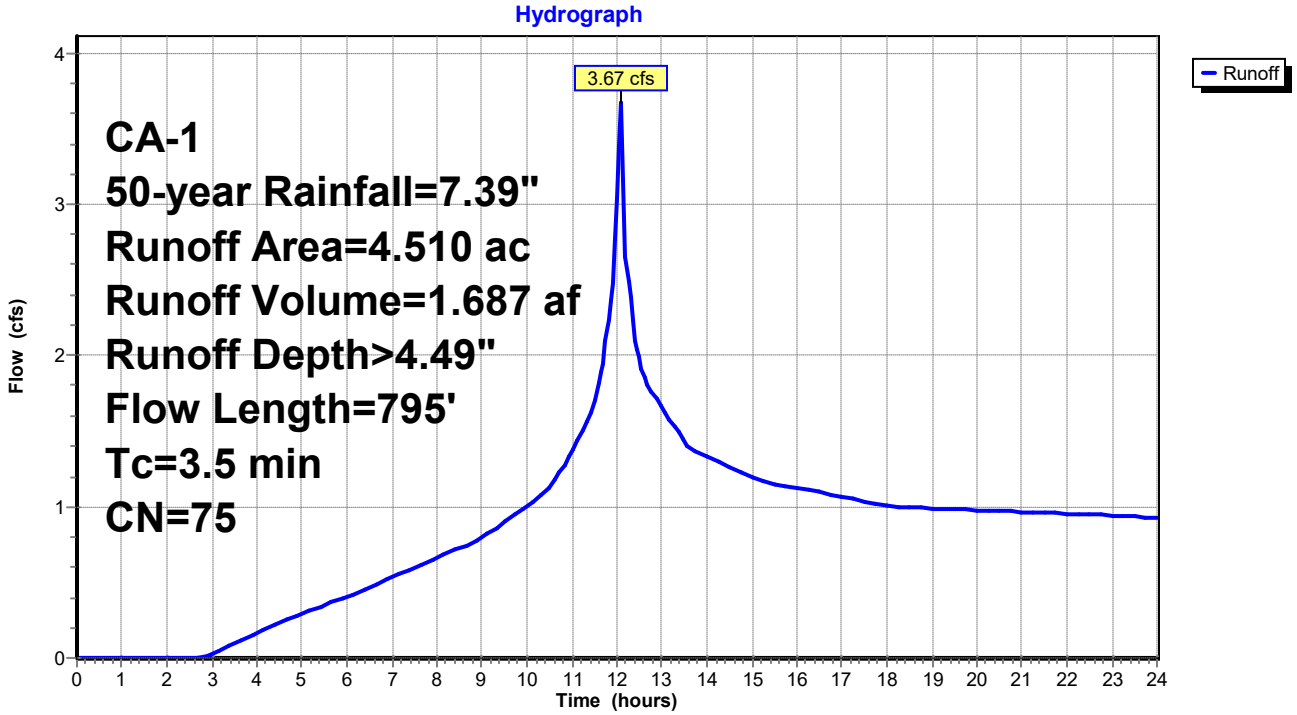
Runoff = 3.67 cfs @ 12.09 hrs, Volume= 1.687 af, Depth> 4.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

Area (ac)	CN	Description
2.470	79	Pasture/grassland/range, Fair, HSG C
2.040	70	Woods, Good, HSG C
4.510	75	Weighted Average
4.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	100	0.3800	0.62		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.2	171	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	524	0.0700	14.38	431.41	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
3.5	795	Total			

Subcatchment 1S: WS 7 - pre project



Summary for Subcatchment 1S: WS 7 - pre project

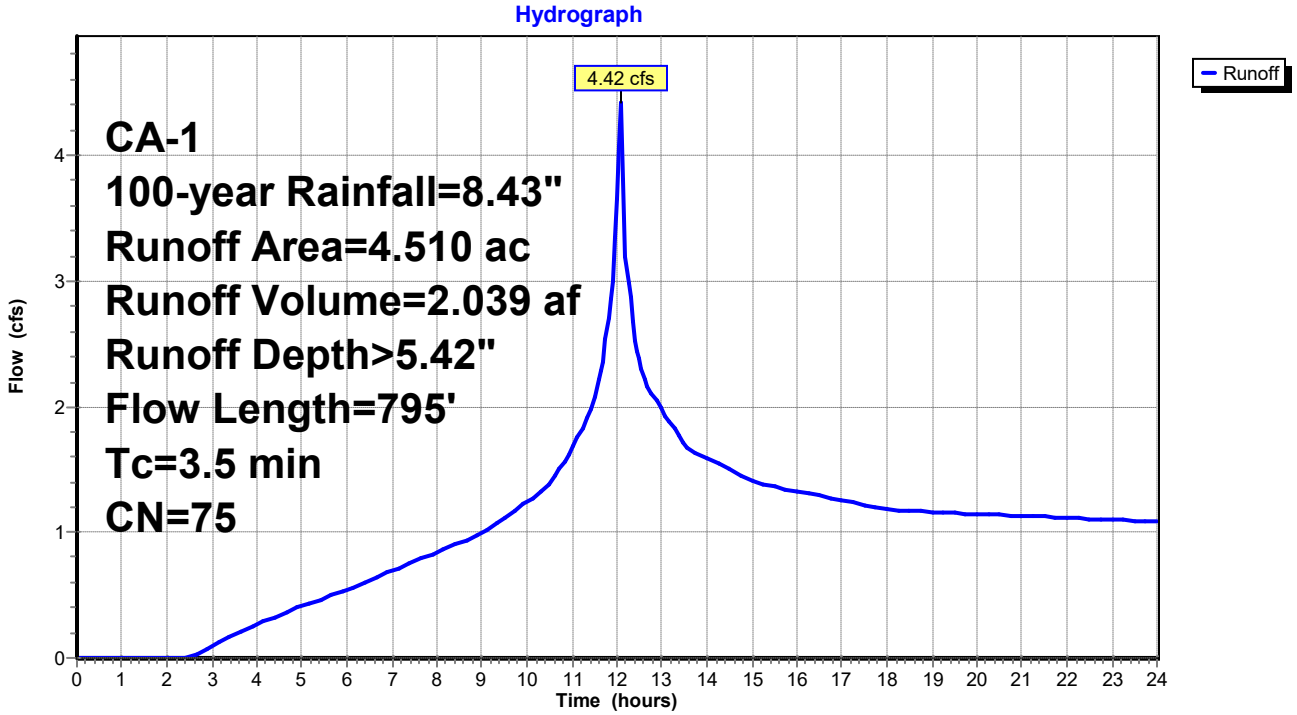
Runoff = 4.42 cfs @ 12.09 hrs, Volume= 2.039 af, Depth> 5.42"

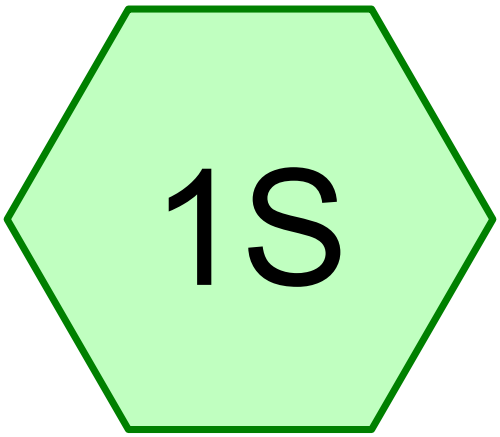
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

Area (ac)	CN	Description
2.470	79	Pasture/grassland/range, Fair, HSG C
2.040	70	Woods, Good, HSG C
4.510	75	Weighted Average
4.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	100	0.3800	0.62		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.2	171	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	524	0.0700	14.38	431.41	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
3.5	795	Total			

Subcatchment 1S: WS 7 - pre project





WS 7 - post project

Subcat Reach Pond Link

Routing Diagram for WS7 postR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS 7 - post project

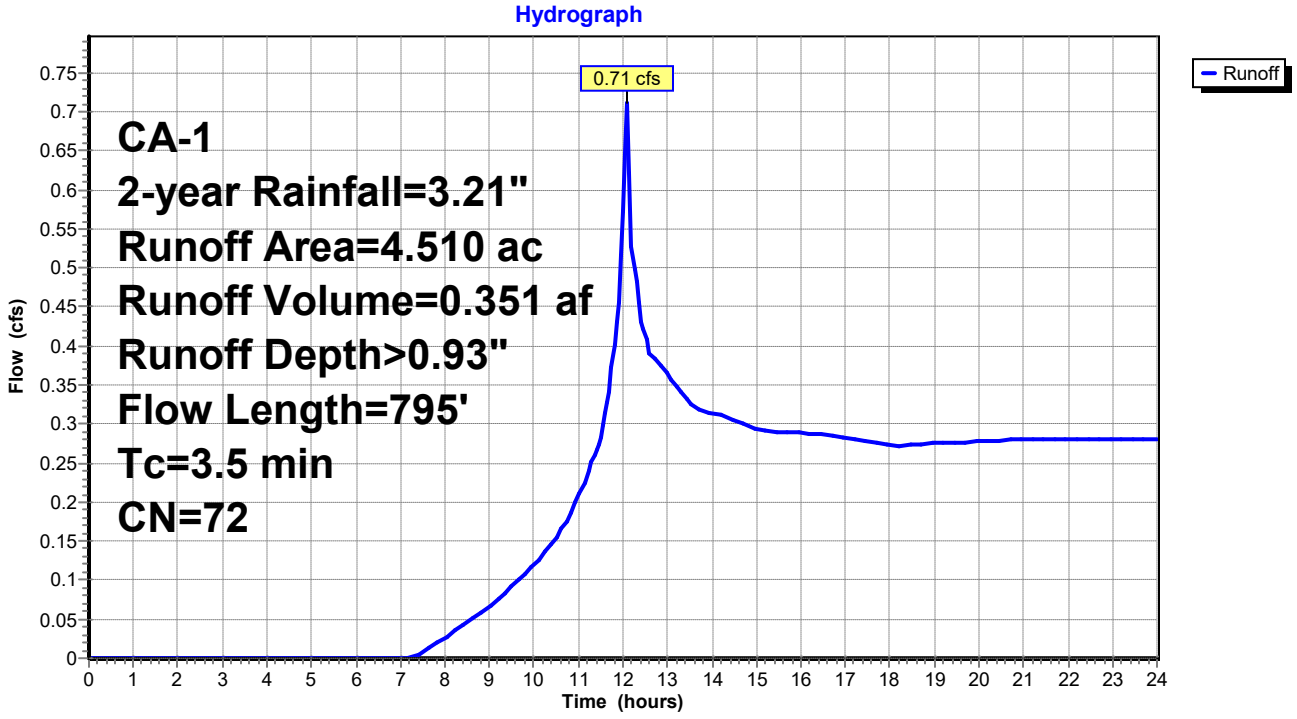
Runoff = 0.71 cfs @ 12.10 hrs, Volume= 0.351 af, Depth> 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
*	0.520	75	Vineyard, Good, HSG C
	1.950	74	Pasture/grassland/range, Good, HSG C
	2.040	70	Woods, Good, HSG C
	4.510	72	Weighted Average
	4.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	100	0.3800	0.62		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.2	171	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	524	0.0700	14.38	431.41	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
3.5	795	Total			

Subcatchment 1S: WS 7 - post project



Summary for Subcatchment 1S: WS 7 - post project

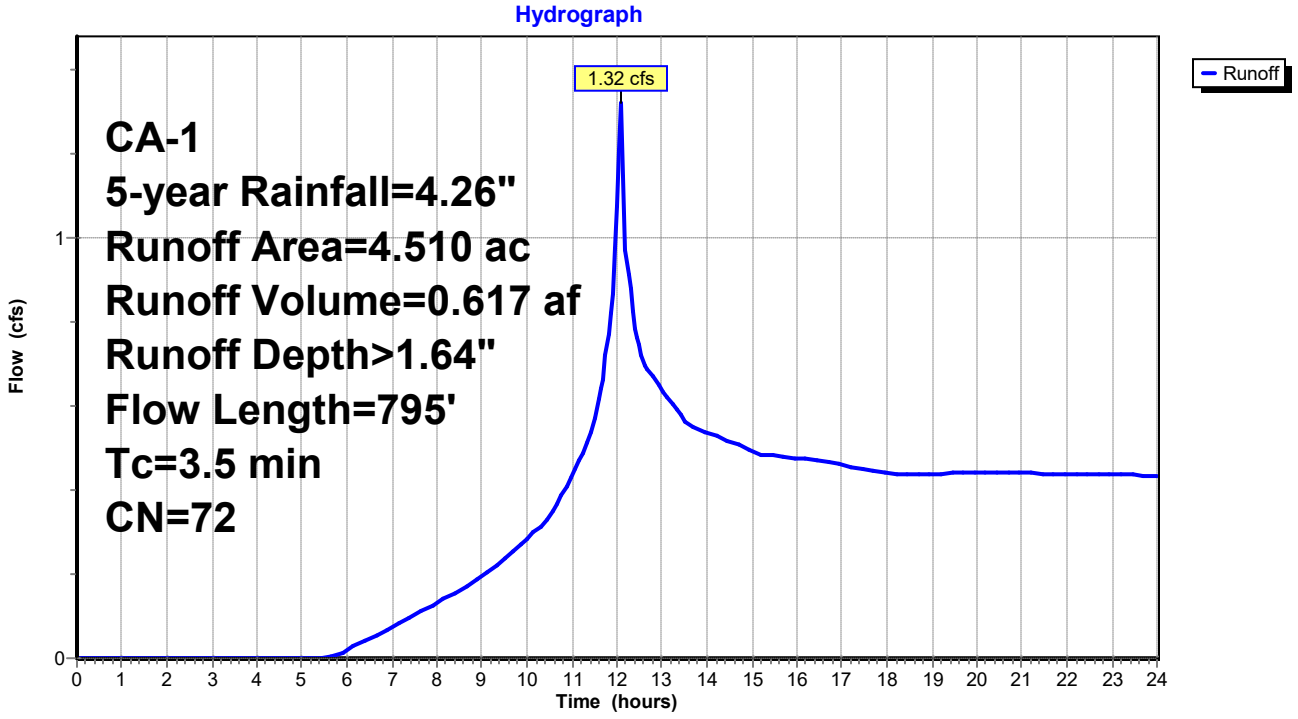
Runoff = 1.32 cfs @ 12.09 hrs, Volume= 0.617 af, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
*	0.520	75	Vineyard, Good, HSG C
	1.950	74	Pasture/grassland/range, Good, HSG C
	2.040	70	Woods, Good, HSG C
	4.510	72	Weighted Average
	4.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	100	0.3800	0.62		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.2	171	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	524	0.0700	14.38	431.41	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
3.5	795	Total			

Subcatchment 1S: WS 7 - post project



Summary for Subcatchment 1S: WS 7 - post project

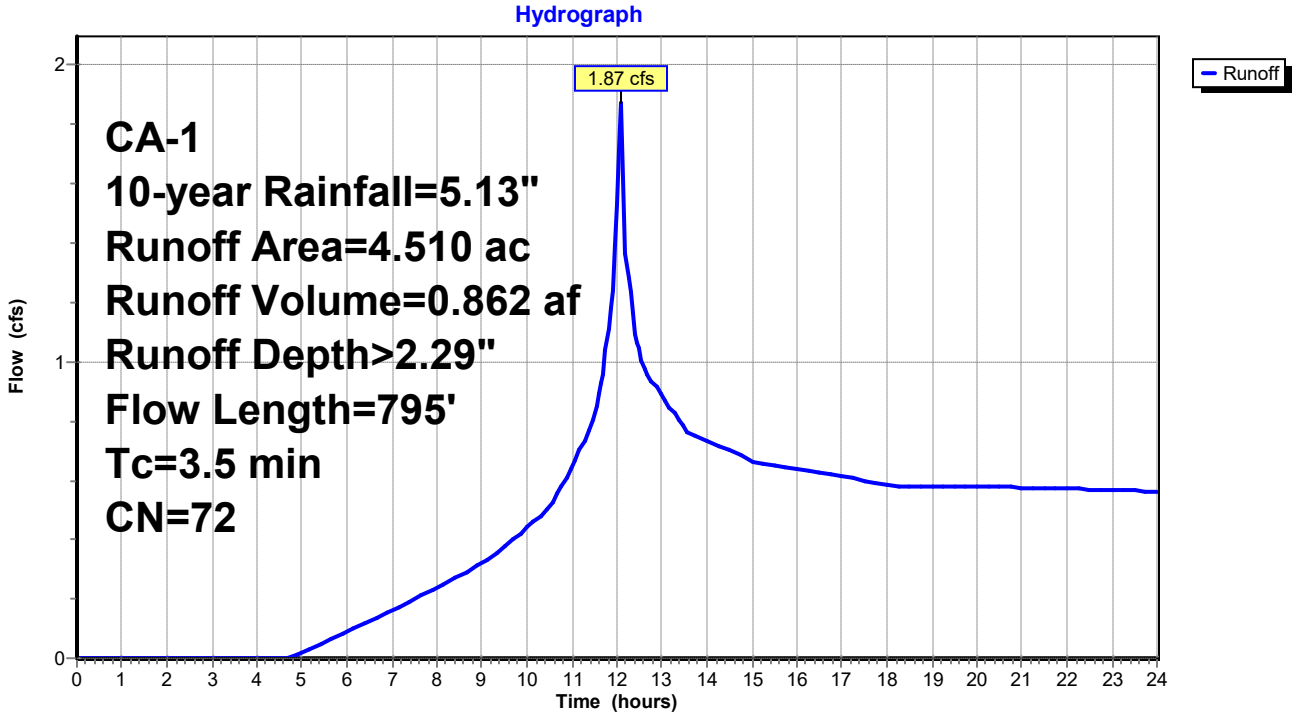
Runoff = 1.87 cfs @ 12.09 hrs, Volume= 0.862 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
*	0.520	75	Vineyard, Good, HSG C
	1.950	74	Pasture/grassland/range, Good, HSG C
	2.040	70	Woods, Good, HSG C
	4.510	72	Weighted Average
	4.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	100	0.3800	0.62		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.2	171	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	524	0.0700	14.38	431.41	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
3.5	795	Total			

Subcatchment 1S: WS 7 - post project



Summary for Subcatchment 1S: WS 7 - post project

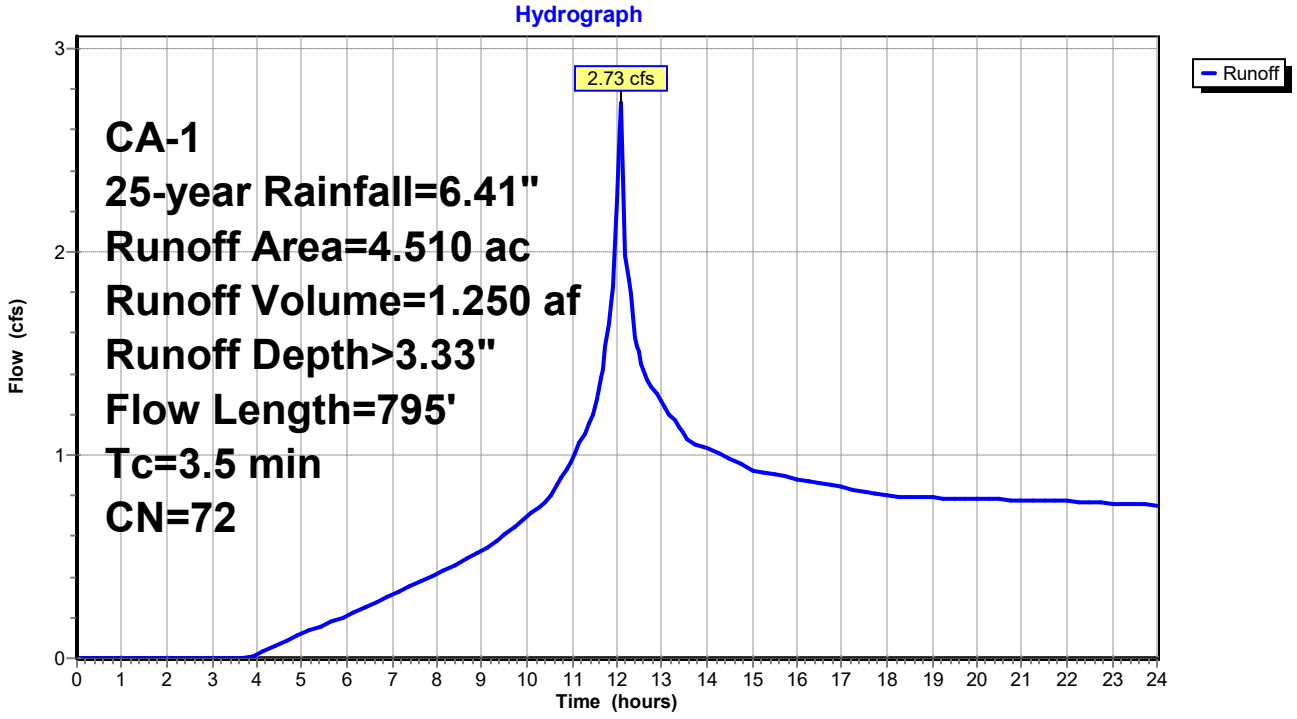
Runoff = 2.73 cfs @ 12.09 hrs, Volume= 1.250 af, Depth> 3.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
*	0.520	75	Vineyard, Good, HSG C
	1.950	74	Pasture/grassland/range, Good, HSG C
	2.040	70	Woods, Good, HSG C
	4.510	72	Weighted Average
	4.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	100	0.3800	0.62		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.2	171	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	524	0.0700	14.38	431.41	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
3.5	795	Total			

Subcatchment 1S: WS 7 - post project



Summary for Subcatchment 1S: WS 7 - post project

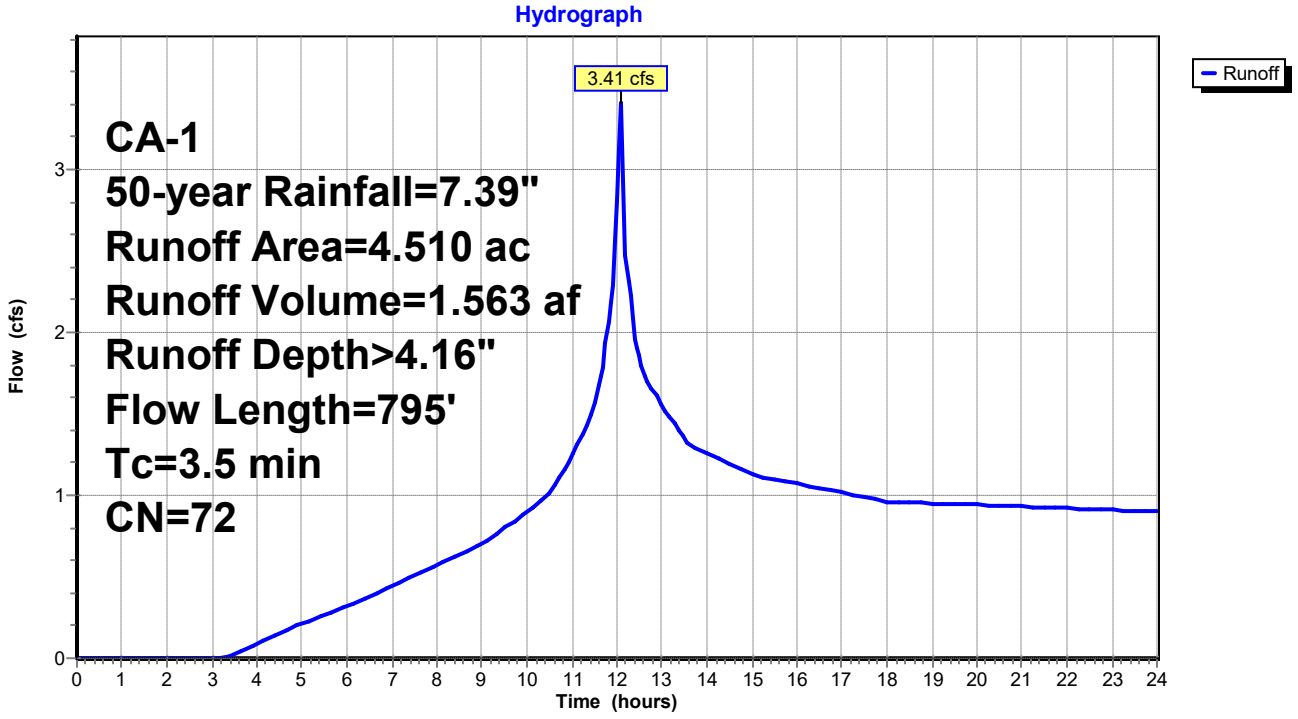
Runoff = 3.41 cfs @ 12.09 hrs, Volume= 1.563 af, Depth> 4.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
*	0.520	75	Vineyard, Good, HSG C
	1.950	74	Pasture/grassland/range, Good, HSG C
	2.040	70	Woods, Good, HSG C
	4.510	72	Weighted Average
	4.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	100	0.3800	0.62		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.2	171	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	524	0.0700	14.38	431.41	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
3.5	795	Total			

Subcatchment 1S: WS 7 - post project



Summary for Subcatchment 1S: WS 7 - post project

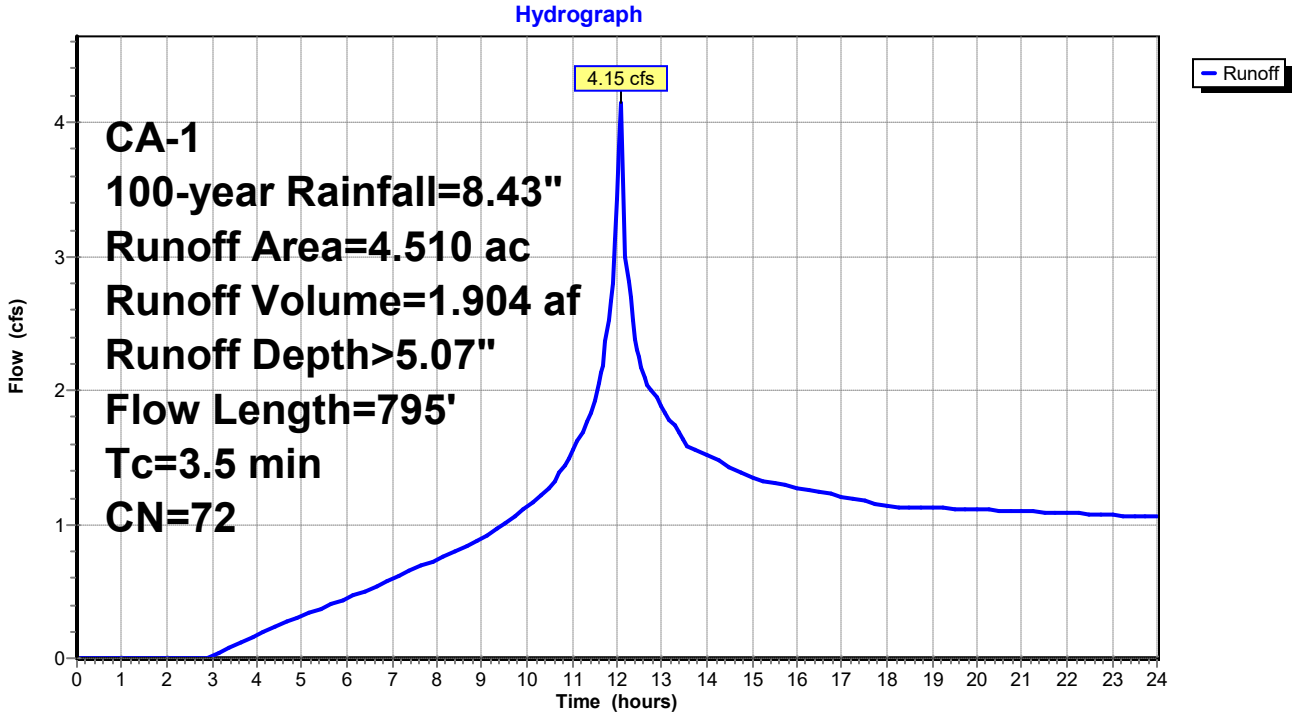
Runoff = 4.15 cfs @ 12.09 hrs, Volume= 1.904 af, Depth> 5.07"

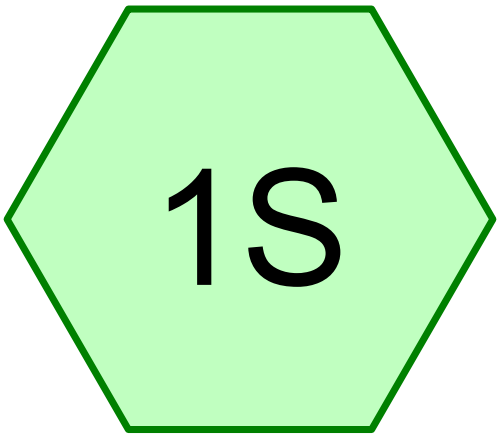
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
*	0.520	75	Vineyard, Good, HSG C
	1.950	74	Pasture/grassland/range, Good, HSG C
	2.040	70	Woods, Good, HSG C
	4.510	72	Weighted Average
	4.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	100	0.3800	0.62		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.2	171	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	524	0.0700	14.38	431.41	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.030 Earth, grassed & winding
3.5	795	Total			

Subcatchment 1S: WS 7 - post project





WS 8 - pre project

Subcat Reach Pond Link

Routing Diagram for WS8 preR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS 8 - pre project

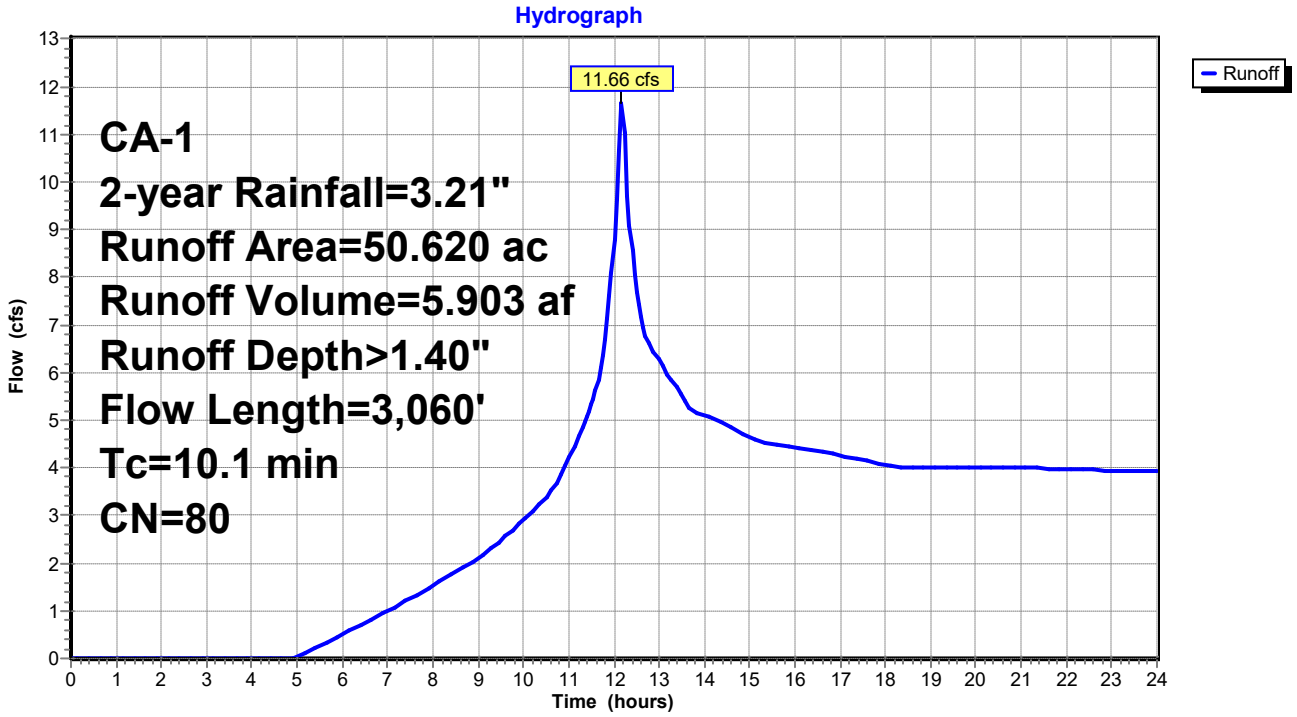
Runoff = 11.66 cfs @ 12.17 hrs, Volume= 5.903 af, Depth> 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

Area (ac)	CN	Description
0.490	98	Paved parking, HSG C
26.560	79	Pasture/grassland/range, Fair, HSG C
5.620	84	Pasture/grassland/range, Fair, HSG D
13.820	80	Pasture/grassland/range, Good, HSG D
4.130	77	Woods, Good, HSG D
50.620	80	Weighted Average
50.130		99.03% Pervious Area
0.490		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1400	0.42		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.5	173	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	171	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	840	0.2100	14.54	87.26	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.3	598	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
0.0	50	0.2000	16.75	52.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
1.3	556	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.7	572	0.0200	5.76	172.95	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.040 Winding stream, pools & shoals
10.1	3,060	Total			

Subcatchment 1S: WS 8 - pre project



Summary for Subcatchment 1S: WS 8 - pre project

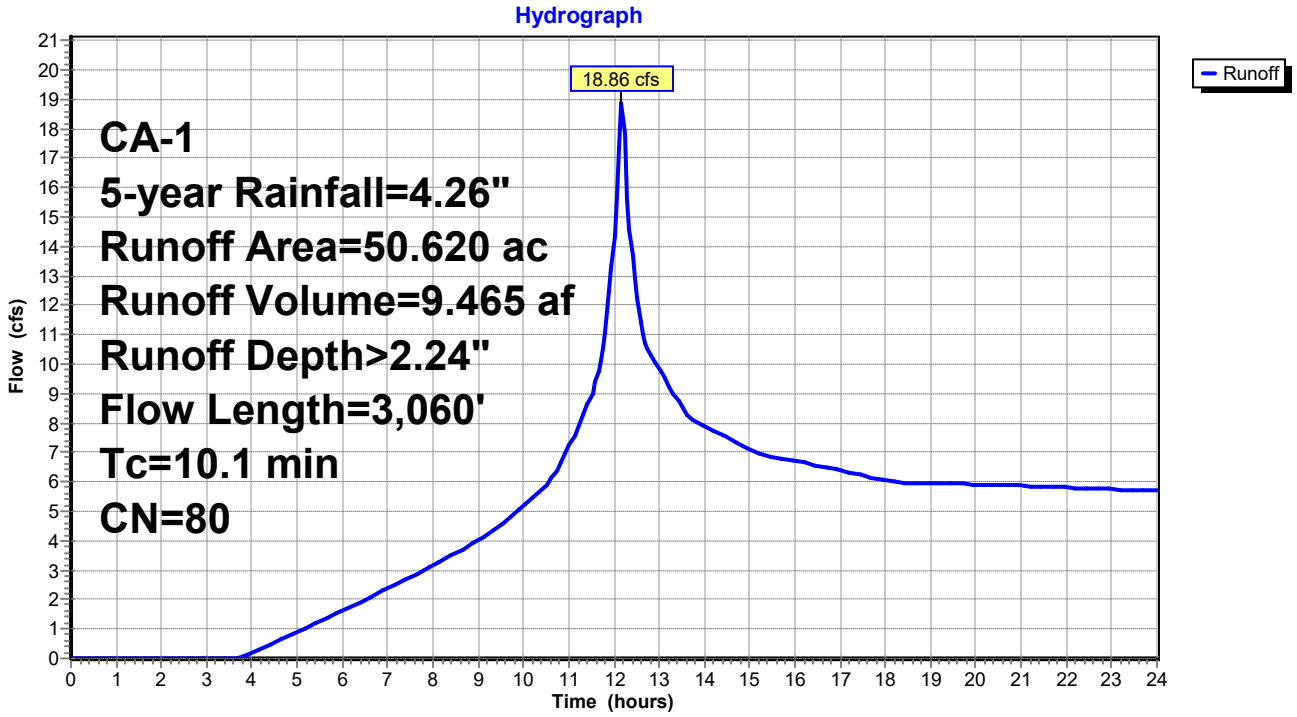
Runoff = 18.86 cfs @ 12.17 hrs, Volume= 9.465 af, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

Area (ac)	CN	Description
0.490	98	Paved parking, HSG C
26.560	79	Pasture/grassland/range, Fair, HSG C
5.620	84	Pasture/grassland/range, Fair, HSG D
13.820	80	Pasture/grassland/range, Good, HSG D
4.130	77	Woods, Good, HSG D
50.620	80	Weighted Average
50.130		99.03% Pervious Area
0.490		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1400	0.42		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.5	173	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	171	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	840	0.2100	14.54	87.26	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.3	598	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
0.0	50	0.2000	16.75	52.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
1.3	556	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.7	572	0.0200	5.76	172.95	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.040 Winding stream, pools & shoals
10.1	3,060	Total			

Subcatchment 1S: WS 8 - pre project



Summary for Subcatchment 1S: WS 8 - pre project

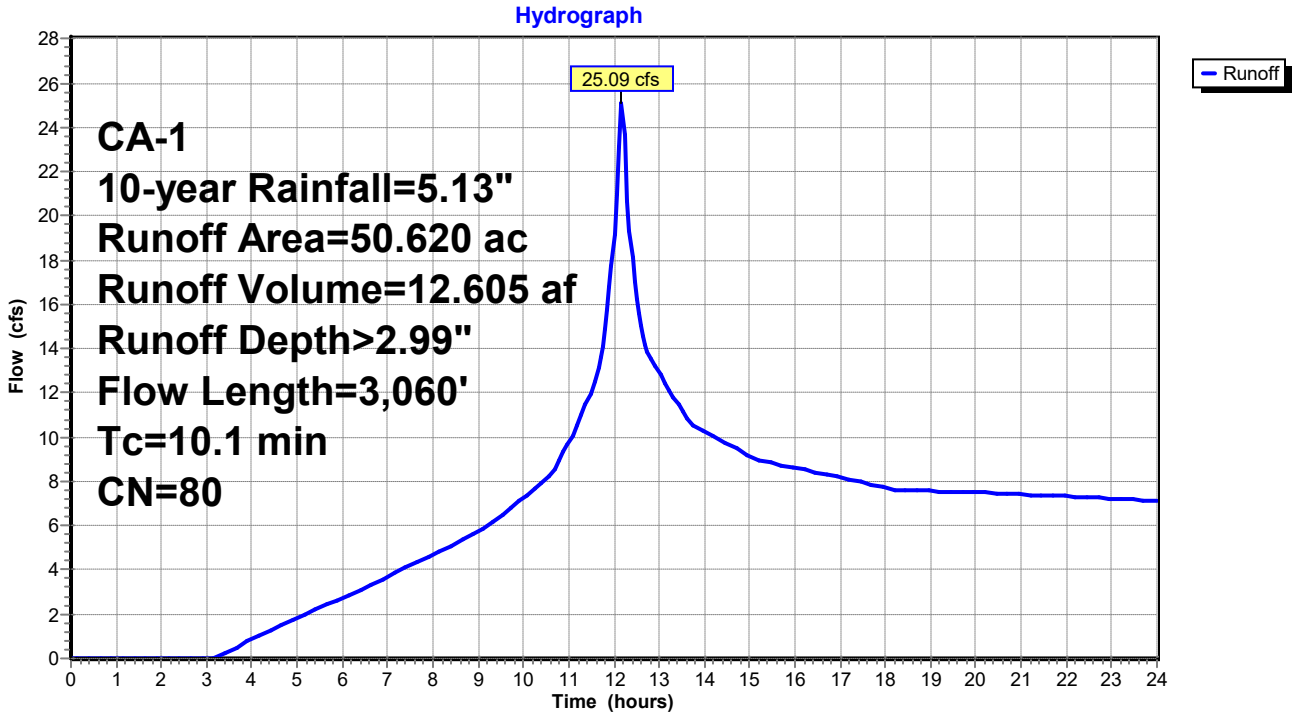
Runoff = 25.09 cfs @ 12.17 hrs, Volume= 12.605 af, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

Area (ac)	CN	Description
0.490	98	Paved parking, HSG C
26.560	79	Pasture/grassland/range, Fair, HSG C
5.620	84	Pasture/grassland/range, Fair, HSG D
13.820	80	Pasture/grassland/range, Good, HSG D
4.130	77	Woods, Good, HSG D
50.620	80	Weighted Average
50.130		99.03% Pervious Area
0.490		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1400	0.42		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.5	173	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	171	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	840	0.2100	14.54	87.26	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.3	598	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
0.0	50	0.2000	16.75	52.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
1.3	556	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.7	572	0.0200	5.76	172.95	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.040 Winding stream, pools & shoals
10.1	3,060	Total			

Subcatchment 1S: WS 8 - pre project



Summary for Subcatchment 1S: WS 8 - pre project

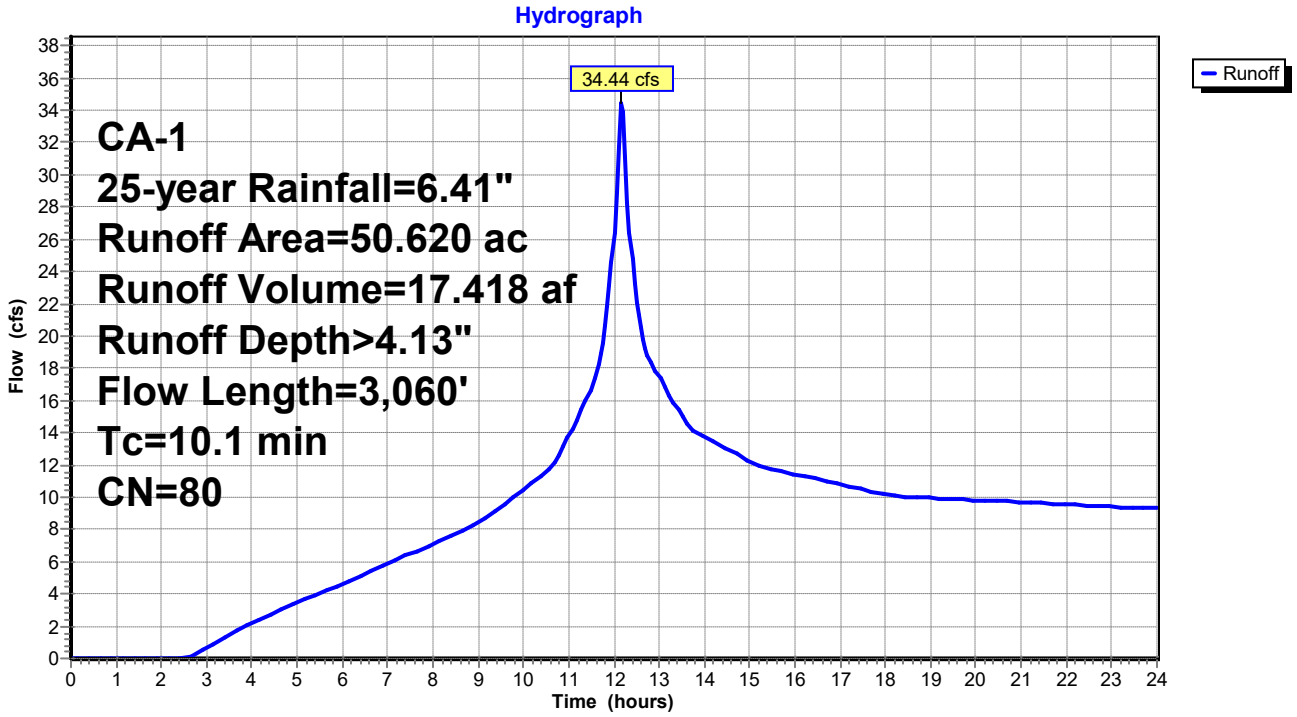
Runoff = 34.44 cfs @ 12.17 hrs, Volume= 17.418 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

Area (ac)	CN	Description
0.490	98	Paved parking, HSG C
26.560	79	Pasture/grassland/range, Fair, HSG C
5.620	84	Pasture/grassland/range, Fair, HSG D
13.820	80	Pasture/grassland/range, Good, HSG D
4.130	77	Woods, Good, HSG D
50.620	80	Weighted Average
50.130		99.03% Pervious Area
0.490		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1400	0.42		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.5	173	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	171	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	840	0.2100	14.54	87.26	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.3	598	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
0.0	50	0.2000	16.75	52.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
1.3	556	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.7	572	0.0200	5.76	172.95	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.040 Winding stream, pools & shoals
10.1	3,060	Total			

Subcatchment 1S: WS 8 - pre project



Summary for Subcatchment 1S: WS 8 - pre project

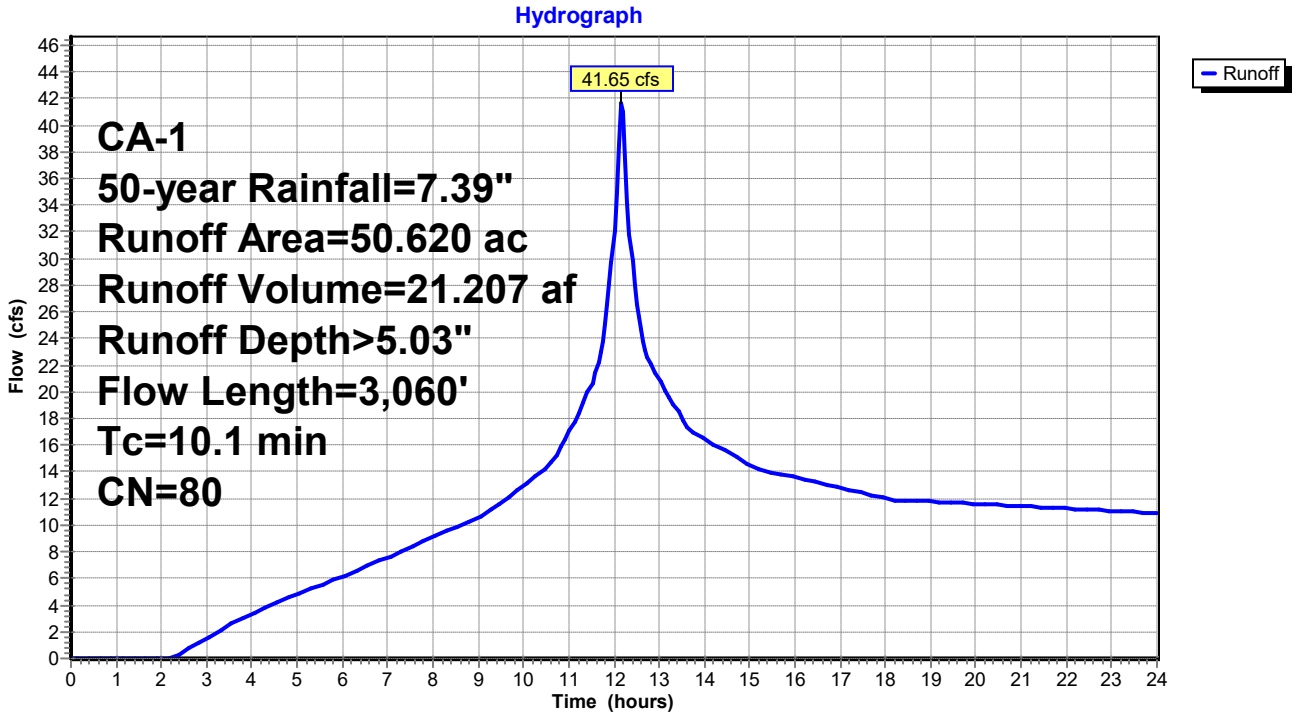
Runoff = 41.65 cfs @ 12.17 hrs, Volume= 21.207 af, Depth> 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

Area (ac)	CN	Description
0.490	98	Paved parking, HSG C
26.560	79	Pasture/grassland/range, Fair, HSG C
5.620	84	Pasture/grassland/range, Fair, HSG D
13.820	80	Pasture/grassland/range, Good, HSG D
4.130	77	Woods, Good, HSG D
50.620	80	Weighted Average
50.130		99.03% Pervious Area
0.490		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1400	0.42		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.5	173	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	171	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	840	0.2100	14.54	87.26	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.3	598	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
0.0	50	0.2000	16.75	52.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
1.3	556	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.7	572	0.0200	5.76	172.95	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.040 Winding stream, pools & shoals
10.1	3,060	Total			

Subcatchment 1S: WS 8 - pre project



Summary for Subcatchment 1S: WS 8 - pre project

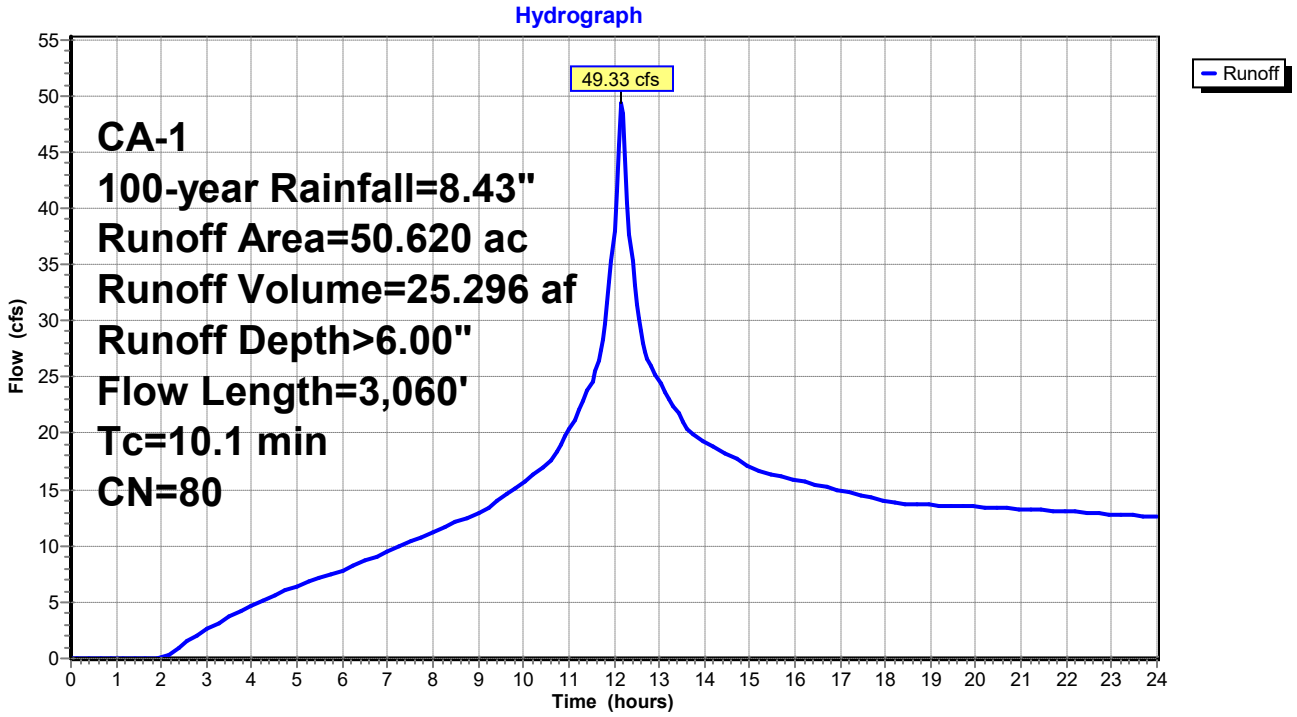
Runoff = 49.33 cfs @ 12.17 hrs, Volume= 25.296 af, Depth> 6.00"

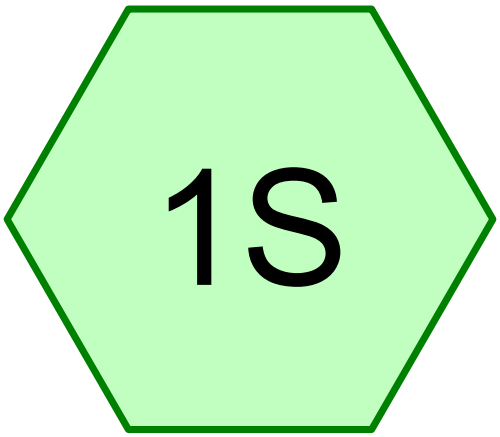
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

Area (ac)	CN	Description
0.490	98	Paved parking, HSG C
26.560	79	Pasture/grassland/range, Fair, HSG C
5.620	84	Pasture/grassland/range, Fair, HSG D
13.820	80	Pasture/grassland/range, Good, HSG D
4.130	77	Woods, Good, HSG D
50.620	80	Weighted Average
50.130		99.03% Pervious Area
0.490		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1400	0.42		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.5	173	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	171	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	840	0.2100	14.54	87.26	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.3	598	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
0.0	50	0.2000	16.75	52.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
1.3	556	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.7	572	0.0200	5.76	172.95	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.040 Winding stream, pools & shoals
10.1	3,060	Total			

Subcatchment 1S: WS 8 - pre project





WS 8 - post project

Subcat Reach Pond Link

Routing Diagram for WS8 postR1
Prepared by Napa Valley Vineyard Engineering, Printed 2/27/2018

Summary for Subcatchment 1S: WS 8 - post project

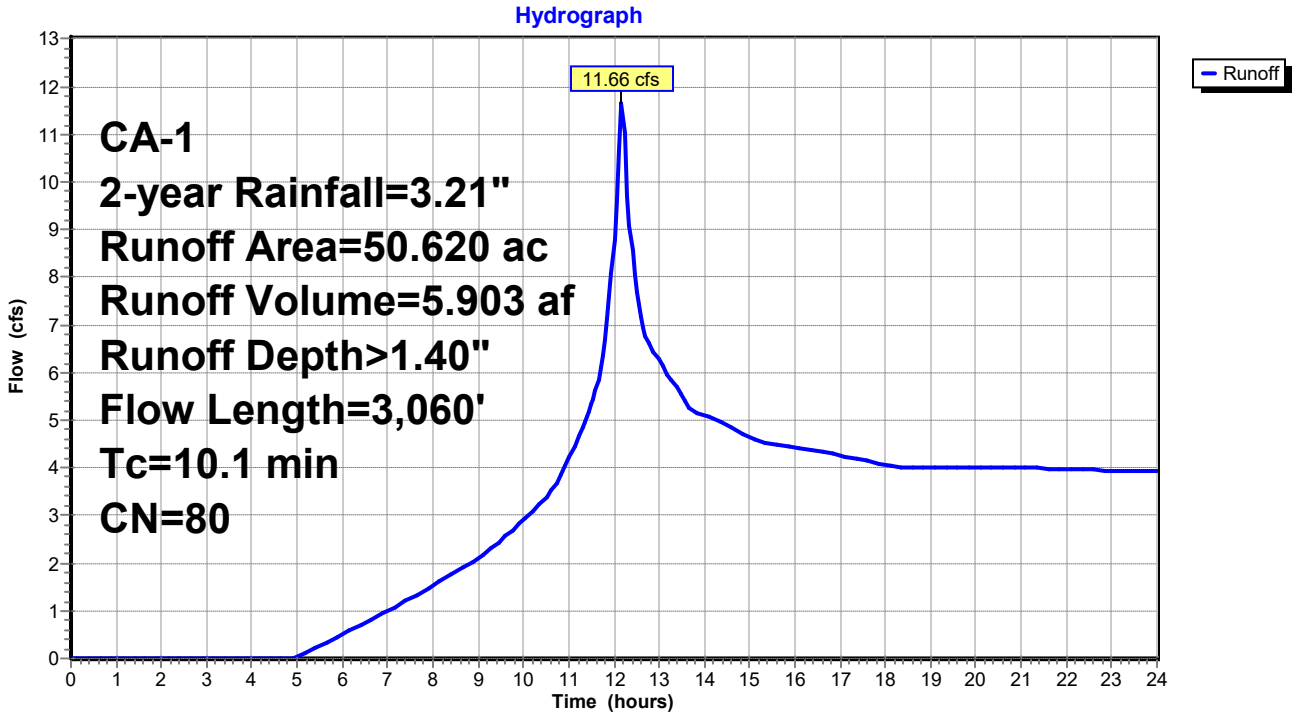
Runoff = 11.66 cfs @ 12.17 hrs, Volume= 5.903 af, Depth> 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 2-year Rainfall=3.21"

	Area (ac)	CN	Description
	0.490	98	Paved parking, HSG C
*	10.490	81	Vineyard, Good, HSG D
	26.560	79	Pasture/grassland/range, Fair, HSG C
	5.620	80	Pasture/grassland/range, Good, HSG D
	3.330	80	Pasture/grassland/range, Good, HSG D
	4.130	77	Woods, Good, HSG D
	50.620	80	Weighted Average
	50.130		99.03% Pervious Area
	0.490		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1400	0.42		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.5	173	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	171	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	840	0.2100	14.54	87.26	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.3	598	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
0.0	50	0.2000	16.75	52.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
1.3	556	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.7	572	0.0200	5.76	172.95	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.040 Winding stream, pools & shoals
10.1	3,060	Total			

Subcatchment 1S: WS 8 - post project



Summary for Subcatchment 1S: WS 8 - post project

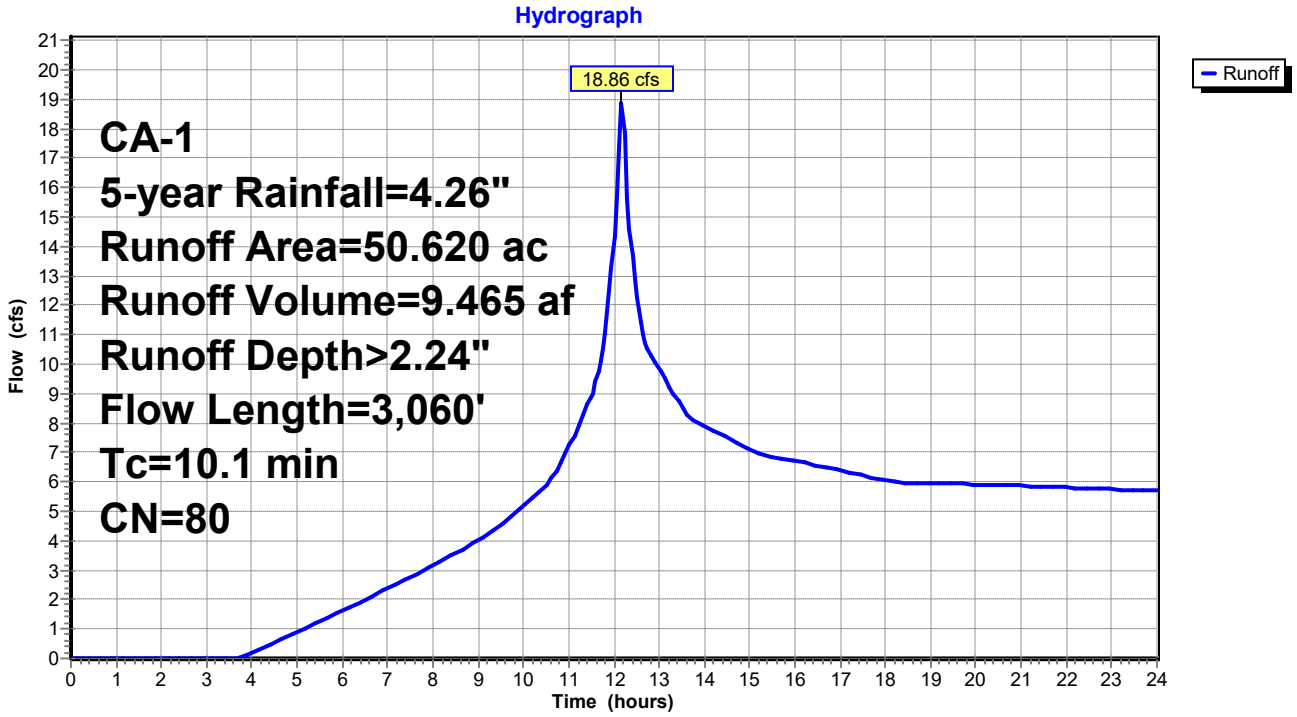
Runoff = 18.86 cfs @ 12.17 hrs, Volume= 9.465 af, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 5-year Rainfall=4.26"

	Area (ac)	CN	Description
	0.490	98	Paved parking, HSG C
*	10.490	81	Vineyard, Good, HSG D
	26.560	79	Pasture/grassland/range, Fair, HSG C
	5.620	80	Pasture/grassland/range, Good, HSG D
	3.330	80	Pasture/grassland/range, Good, HSG D
	4.130	77	Woods, Good, HSG D
	50.620	80	Weighted Average
	50.130		99.03% Pervious Area
	0.490		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1400	0.42		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.5	173	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	171	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	840	0.2100	14.54	87.26	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.3	598	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
0.0	50	0.2000	16.75	52.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
1.3	556	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.7	572	0.0200	5.76	172.95	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.040 Winding stream, pools & shoals
10.1	3,060	Total			

Subcatchment 1S: WS 8 - post project



Summary for Subcatchment 1S: WS 8 - post project

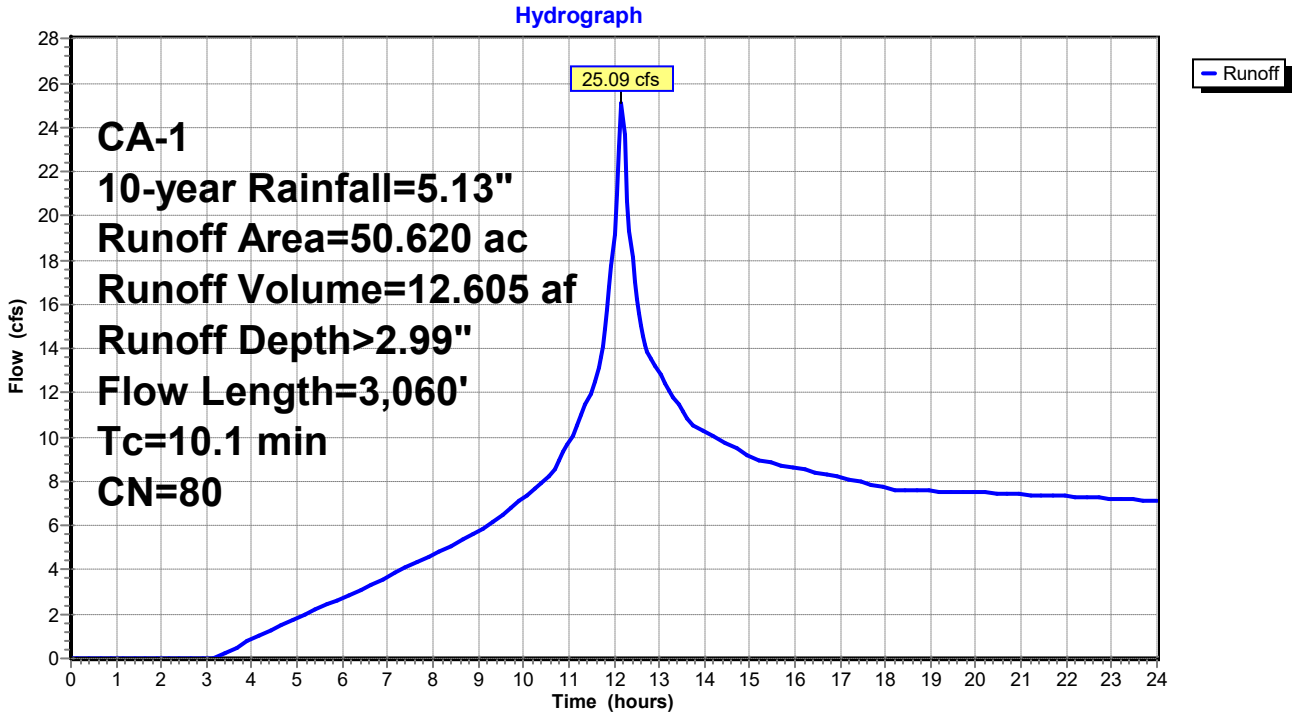
Runoff = 25.09 cfs @ 12.17 hrs, Volume= 12.605 af, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 10-year Rainfall=5.13"

	Area (ac)	CN	Description
	0.490	98	Paved parking, HSG C
*	10.490	81	Vineyard, Good, HSG D
	26.560	79	Pasture/grassland/range, Fair, HSG C
	5.620	80	Pasture/grassland/range, Good, HSG D
	3.330	80	Pasture/grassland/range, Good, HSG D
	4.130	77	Woods, Good, HSG D
	50.620	80	Weighted Average
	50.130		99.03% Pervious Area
	0.490		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1400	0.42		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.5	173	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	171	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	840	0.2100	14.54	87.26	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.3	598	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
0.0	50	0.2000	16.75	52.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
1.3	556	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.7	572	0.0200	5.76	172.95	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.040 Winding stream, pools & shoals
10.1	3,060	Total			

Subcatchment 1S: WS 8 - post project



Summary for Subcatchment 1S: WS 8 - post project

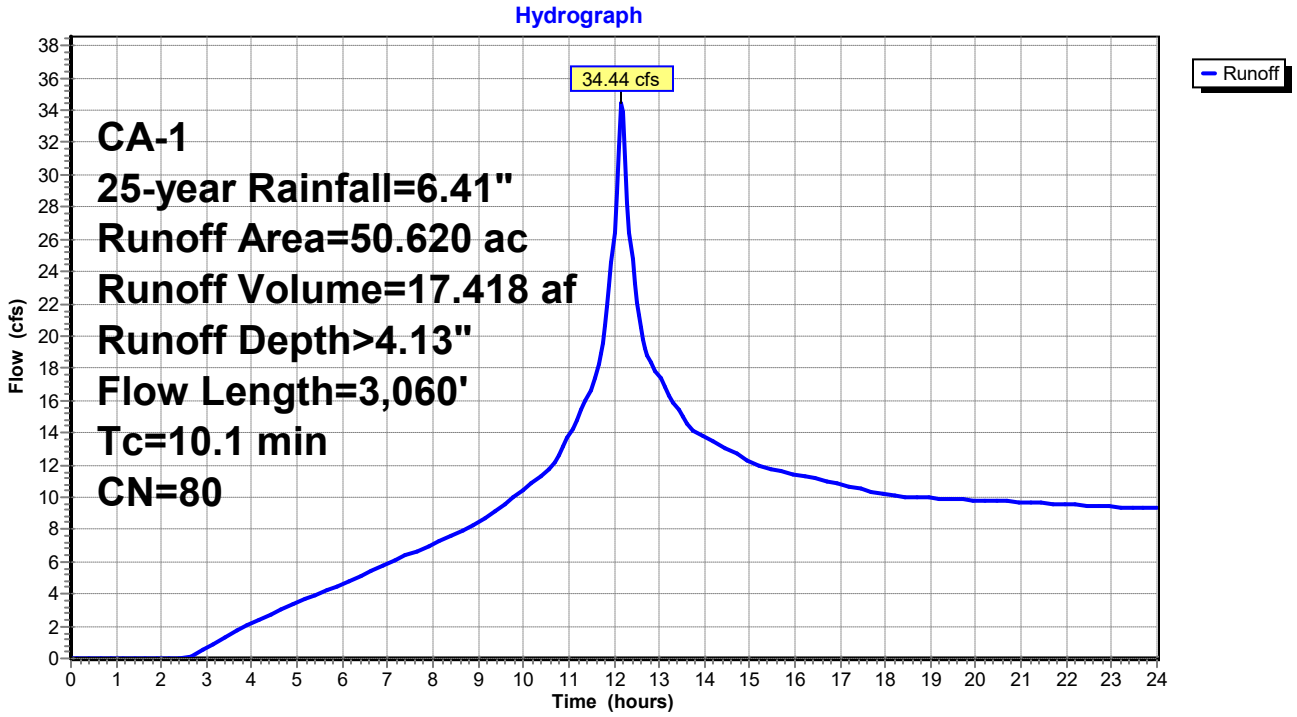
Runoff = 34.44 cfs @ 12.17 hrs, Volume= 17.418 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 25-year Rainfall=6.41"

	Area (ac)	CN	Description
	0.490	98	Paved parking, HSG C
*	10.490	81	Vineyard, Good, HSG D
	26.560	79	Pasture/grassland/range, Fair, HSG C
	5.620	80	Pasture/grassland/range, Good, HSG D
	3.330	80	Pasture/grassland/range, Good, HSG D
	4.130	77	Woods, Good, HSG D
	50.620	80	Weighted Average
	50.130		99.03% Pervious Area
	0.490		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1400	0.42		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.5	173	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	171	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	840	0.2100	14.54	87.26	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.3	598	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
0.0	50	0.2000	16.75	52.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
1.3	556	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.7	572	0.0200	5.76	172.95	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.040 Winding stream, pools & shoals
10.1	3,060	Total			

Subcatchment 1S: WS 8 - post project



Summary for Subcatchment 1S: WS 8 - post project

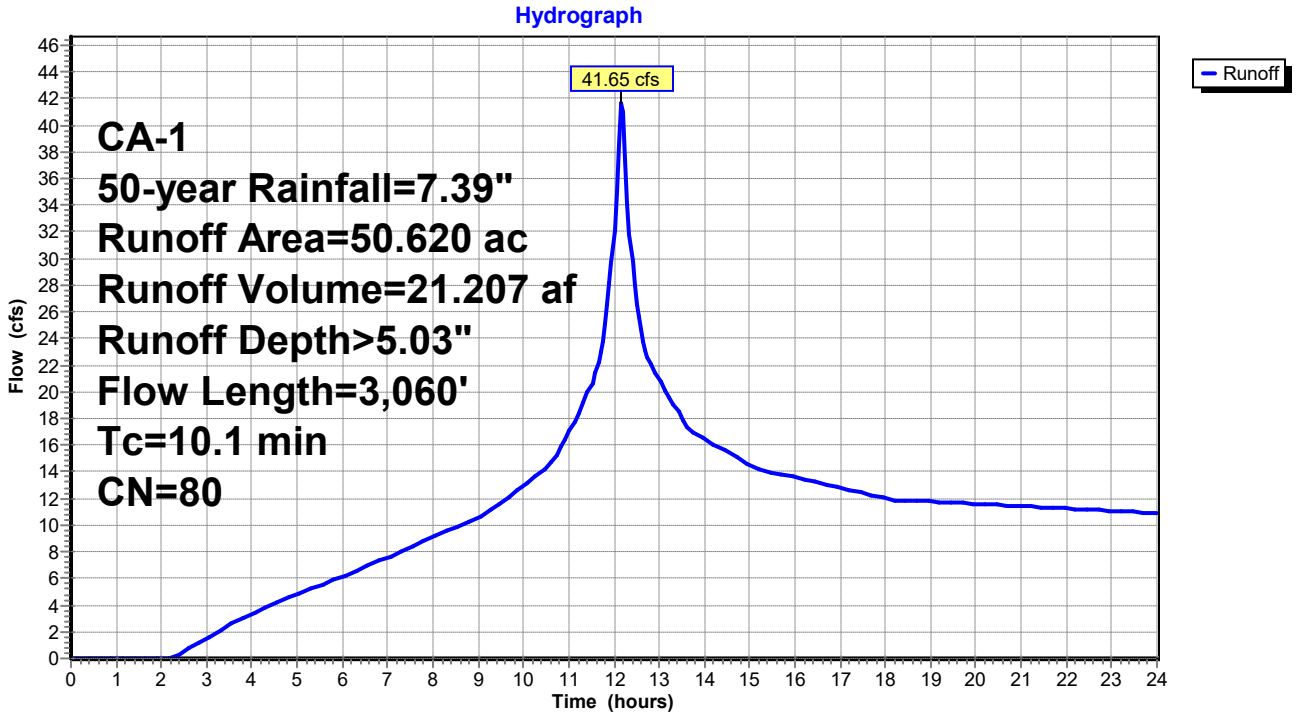
Runoff = 41.65 cfs @ 12.17 hrs, Volume= 21.207 af, Depth> 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 50-year Rainfall=7.39"

	Area (ac)	CN	Description
	0.490	98	Paved parking, HSG C
*	10.490	81	Vineyard, Good, HSG D
	26.560	79	Pasture/grassland/range, Fair, HSG C
	5.620	80	Pasture/grassland/range, Good, HSG D
	3.330	80	Pasture/grassland/range, Good, HSG D
	4.130	77	Woods, Good, HSG D
	50.620	80	Weighted Average
	50.130		99.03% Pervious Area
	0.490		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1400	0.42		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.5	173	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	171	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	840	0.2100	14.54	87.26	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.3	598	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
0.0	50	0.2000	16.75	52.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
1.3	556	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.7	572	0.0200	5.76	172.95	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.040 Winding stream, pools & shoals
10.1	3,060	Total			

Subcatchment 1S: WS 8 - post project



Summary for Subcatchment 1S: WS 8 - post project

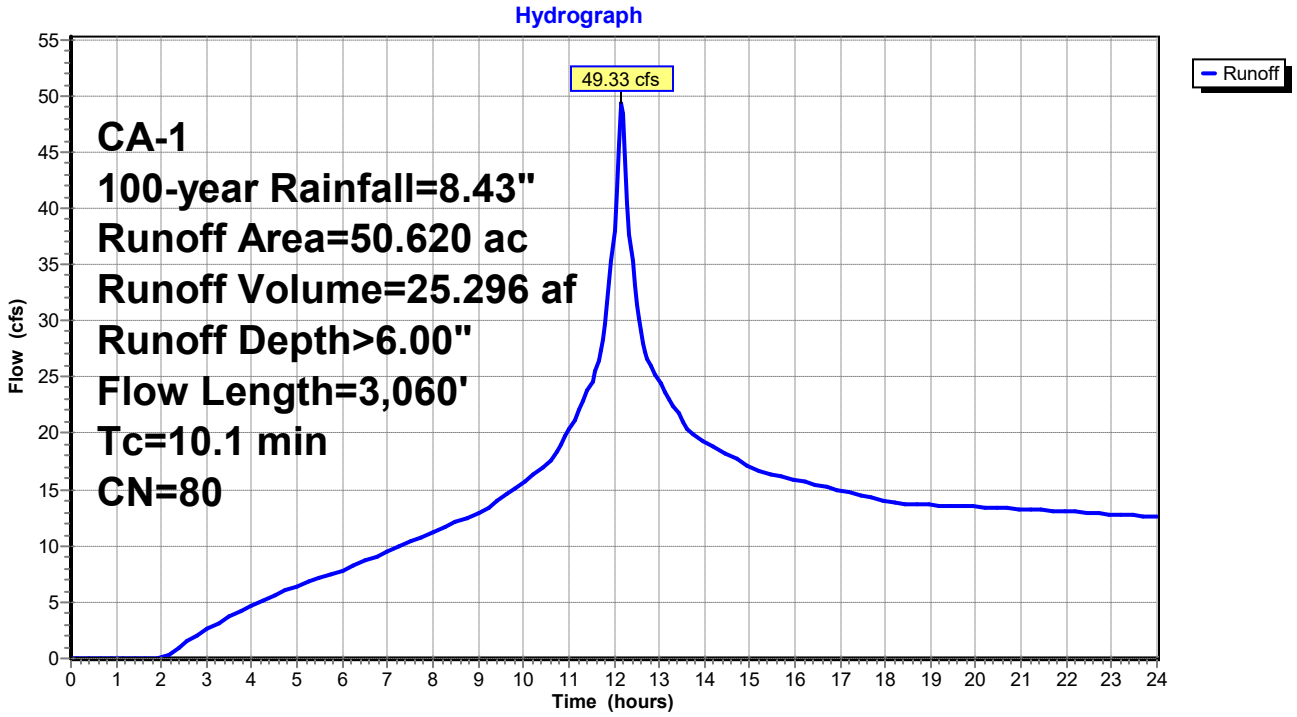
Runoff = 49.33 cfs @ 12.17 hrs, Volume= 25.296 af, Depth> 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=8.43"

	Area (ac)	CN	Description
	0.490	98	Paved parking, HSG C
*	10.490	81	Vineyard, Good, HSG D
	26.560	79	Pasture/grassland/range, Fair, HSG C
	5.620	80	Pasture/grassland/range, Good, HSG D
	3.330	80	Pasture/grassland/range, Good, HSG D
	4.130	77	Woods, Good, HSG D
	50.620	80	Weighted Average
	50.130		99.03% Pervious Area
	0.490		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1400	0.42		**Sheet Flow,** Range n= 0.130 P2= 3.21"
0.5	173	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	171	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	840	0.2100	14.54	87.26	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.3	598	0.0600	7.77	46.64	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
0.0	50	0.2000	16.75	52.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
1.3	556	0.0500	7.10	42.58	**Channel Flow,** Area= 6.0 sf Perim= 11.7' r= 0.51' n= 0.030 Earth, grassed & winding
1.7	572	0.0200	5.76	172.95	**Channel Flow,** Area= 30.0 sf Perim= 26.1' r= 1.15' n= 0.040 Winding stream, pools & shoals
10.1	3,060	Total			

Subcatchment 1S: WS 8 - post project



NTS

PROPOSED VINEYARD

WS 1 = 27.15 ac

WS 2 = 23.68 ac

WS 3a = 109.40 ac

WS 3b = 91.86 ac

WS 4a = 105.96 ac

WS 4b = 12.31 ac

WS 4c = 35.21 ac

WS 5 = 35.42 ac

WS 6 = 3.19 ac

WS 7 = 4.51 ac

WS 8 = 50.62 ac

LAIRD
JAMIESON VINEYARD

Hydrology Analysis
Watershed Layout

NVVE 1-25-2018

WS 1 = 27.15 ac

PRE-PROJECT

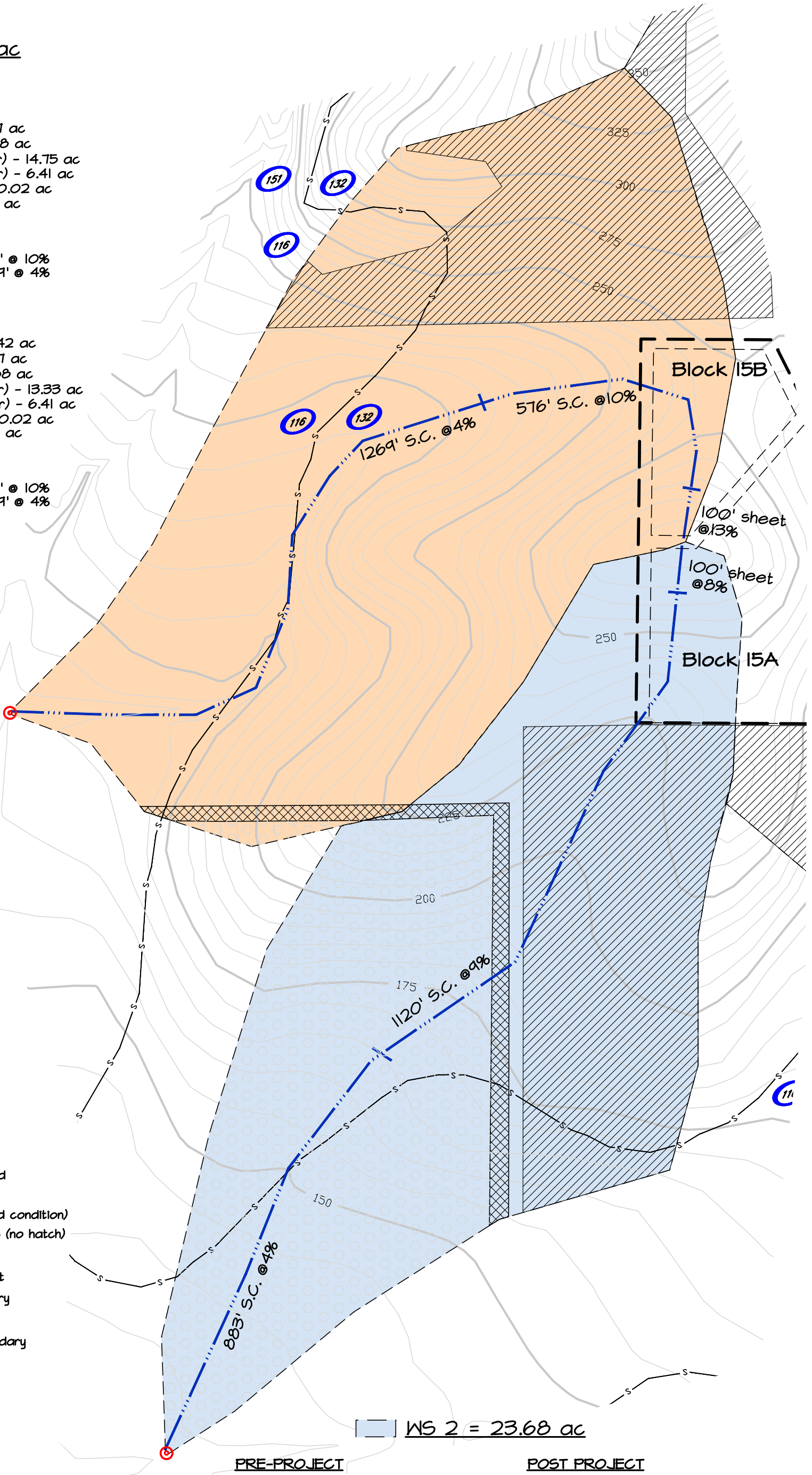
LAND USE:
Vineyard (HSG C, fair) - 4.77 ac
Vineyard (HSG D, fair) - 0.88 ac
Grazed Pasture (HSG C, fair) - 14.75 ac
Grazed Pasture (HSG D, fair) - 6.41 ac
Grassland (HSG C, good) - 0.02 ac
Trees (HSG C, good) - 0.32 ac

TC:
sheet flow 100' @ 13%
shallow concentrated - 576' @ 10%
shallow concentrated - 1269' @ 4%

POST-PROJECT

LAND USE:
Vineyard (HSG C, good) - 1.42 ac
Vineyard (HSG C, fair) - 4.77 ac
Vineyard (HSG D, fair) - 0.88 ac
Grazed Pasture (HSG C, fair) - 13.33 ac
Grazed Pasture (HSG D, fair) - 6.41 ac
Grassland (HSG C, good) - 0.02 ac
Trees (HSG C, good) - 0.32 ac

TC:
sheet flow 100' @ 13%
shallow concentrated - 576' @ 10%
shallow concentrated - 1269' @ 4%



SCALE: 1"=200'

LEGEND

- existing vineyard
- flow path
- grassland (good condition)
- grazed pasture (no hatch)
- impervious
- point of interest
- project boundary
- trees
- watershed boundary

WS 2 = 23.68 ac

PRE-PROJECT

LAND USE:
Vineyard (HSG C, fair) - 7.36 ac
Grazed Pasture (HSG C, fair) - 3.18 ac
Grassland (HSG C, good) - 11.72 ac
Grassland (HSG C, poor) - 0.67 ac
Trees (HSG C, good) - 0.75 ac

TC:
sheet flow 100' @ 8%
shallow concentrated - 1120' @ 9%
shallow concentrated - 883' @ 4%

POST PROJECT

LAND USE:
Vineyard (HSG C, good) - 1.53 ac
Vineyard (HSG C, fair) - 7.36 ac
Grazed Pasture (HSG C, fair) - 1.65 ac
Grassland (HSG C, good) - 11.72 ac
Grassland (HSG C, poor) - 0.67 ac
Trees (HSG C, good) - 0.75 ac

TC:
sheet flow 100' @ 8%
shallow concentrated - 1120' @ 9%
shallow concentrated - 883' @ 4%

LAIRD JAMIESON VINEYARD

Hydrology Analysis
Drainage & Land Use Map
Watersheds 1 & 2
Pre & Post Project

NVVE 7-18-2017
Revised 1-25-2018

WS 3a = 109.40 ac

PRE-PROJECT

LAND USE:

Vineyard (HSG C, fair) - 15.69 ac
Vineyard (HSG D, fair) - 6.47 ac
Grazed Pasture (HSG C, fair) - 62.24 ac
Grazed Pasture (HSG D, fair) - 22.98 ac
Grassland (HSG C, good) - 0.29 ac
Grassland (HSG D, good) - 0.81 ac
Trees (HSG D, good) - 0.92 ac

TC:

sheet flow 100' @ 16%
shallow concentrated - 2934' @ 18%
channel - 1150' @ 11%
shallow concentrated - 1965' @ 4%

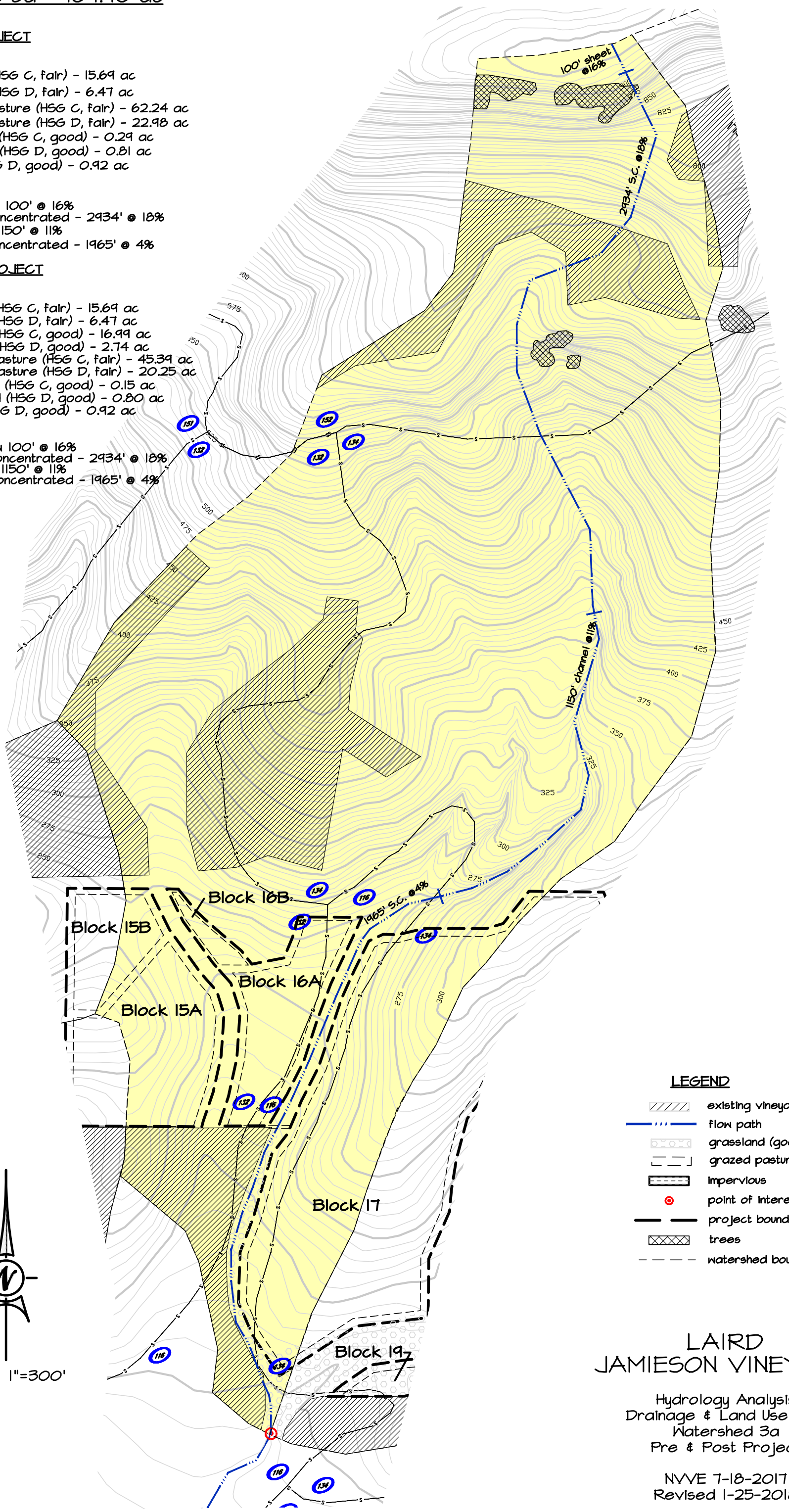
POST-PROJECT

LAND USE:

Vineyard (HSG C, fair) - 15.69 ac
Vineyard (HSG D, fair) - 6.47 ac
Vineyard (HSG C, good) - 16.99 ac
Vineyard (HSG D, good) - 2.74 ac
Grazed Pasture (HSG C, fair) - 45.39 ac
Grazed Pasture (HSG D, fair) - 20.25 ac
Grassland (HSG C, good) - 0.15 ac
Grassland (HSG D, good) - 0.80 ac
Trees (HSG D, good) - 0.92 ac

TC:

sheet flow 100' @ 16%
shallow concentrated - 2934' @ 18%
channel - 1150' @ 11%
shallow concentrated - 1965' @ 4%



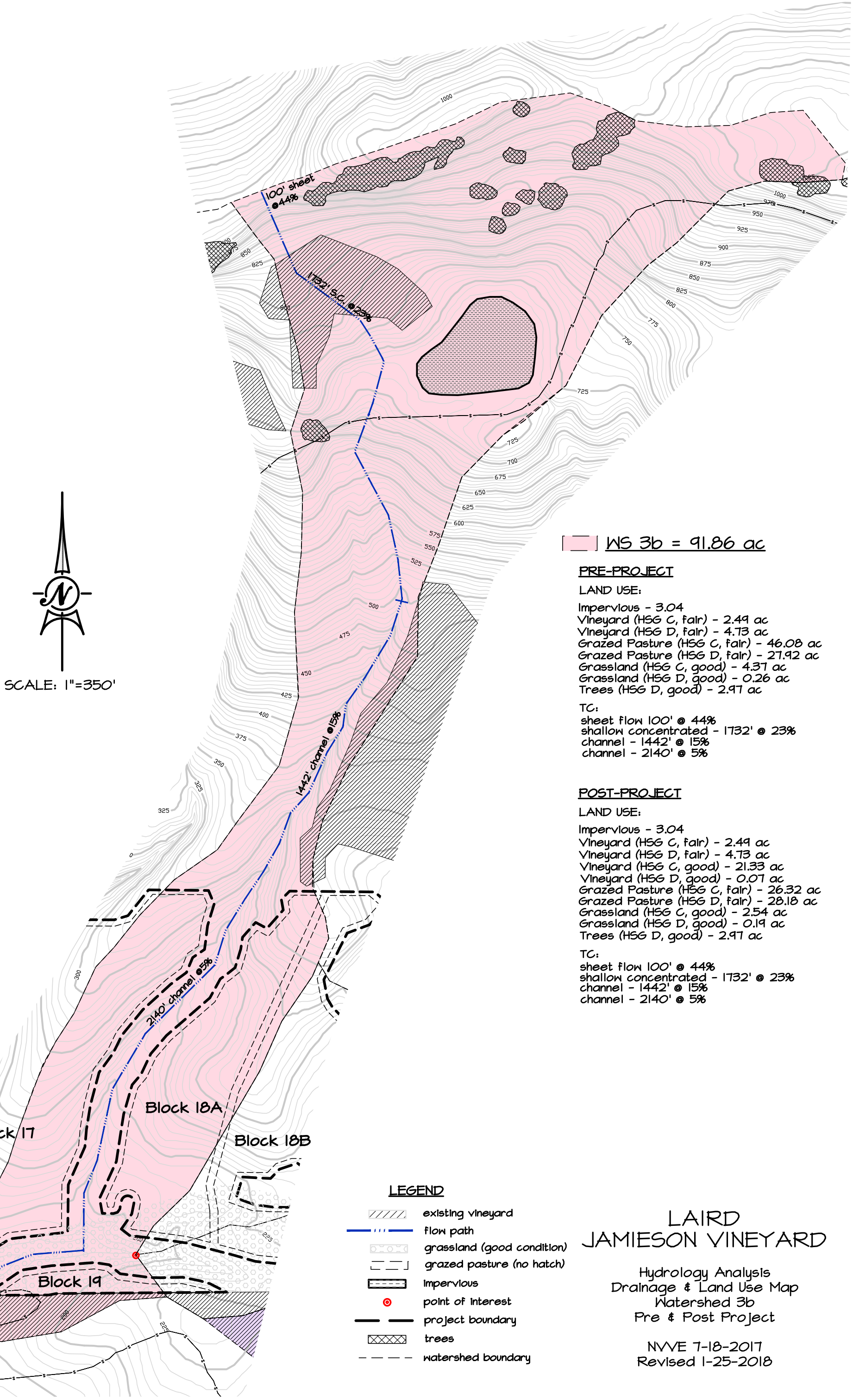
LEGEND

- existing vineyard
- flow path
- grassland (good condition)
- grazed pasture (no hatch)
- impervious
- point of interest
- project boundary
- trees
- watershed boundary

LAIRD JAMIESON VINEYARD

Hydrology Analysis
Drainage & Land Use Map
Watershed 3a
Pre & Post Project

NVVE 7-18-2017
Revised 1-25-2018



WS 3b = 91.86 ac

PRE-PROJECT

LAND USE:

Impervious - 3.04
Vineyard (HSG C, fair) - 2.49 ac
Vineyard (HSG D, fair) - 4.73 ac
Grazed Pasture (HSG C, fair) - 46.08 ac
Grazed Pasture (HSG D, fair) - 27.92 ac
Grassland (HSG C, good) - 4.37 ac
Grassland (HSG D, good) - 0.26 ac
Trees (HSG D, good) - 2.97 ac

TC:
sheet flow 100' @ 44%
shallow concentrated - 1732' @ 23%
channel - 1442' @ 15%
channel - 2140' @ 5%

POST-PROJECT

LAND USE:

Impervious - 3.04
Vineyard (HSG C, fair) - 2.49 ac
Vineyard (HSG D, fair) - 4.73 ac
Vineyard (HSG C, good) - 21.33 ac
Vineyard (HSG D, good) - 0.07 ac
Grazed Pasture (HSG C, fair) - 26.32 ac
Grazed Pasture (HSG D, fair) - 28.18 ac
Grassland (HSG C, good) - 2.54 ac
Grassland (HSG D, good) - 0.19 ac
Trees (HSG D, good) - 2.97 ac

TC:
sheet flow 100' @ 44%
shallow concentrated - 1732' @ 23%
channel - 1442' @ 15%
channel - 2140' @ 5%

LEGEND

- existing vineyard
- flow path
- grassland (good condition)
- grazed pasture (no hatch)
- impervious
- point of interest
- project boundary
- trees
- watershed boundary

LAIRD JAMIESON VINEYARD

Hydrology Analysis
Drainage & Land Use Map
Watershed 3b
Pre & Post Project

NVVE 7-18-2017
Revised 1-25-2018

WS 4a = 105.96 ac

PRE-PROJECT

LAND USE:
Vineyard (HSG C, fair) - 10.88 ac
Grazed Pasture (HSG C, fair) - 93.28 ac
Grazed Pasture (HSG D, fair) - 1.49 ac
Trees (HSG D, good) - 0.31 ac

TC:
sheet flow 100' @ 20%
shallow concentrated - 485' @ 41%
shallow concentrated - 390' @ 13%
channel - 2498' @ 18%

POST-PROJECT

LAND USE:
Vineyard (HSG C, fair) - 10.88 ac
Vineyard (HSG C, good) - 2.72 ac
Grazed Pasture (HSG C, fair) - 90.56 ac
Grazed Pasture (HSG D, fair) - 1.49 ac
Trees (HSG D, good) - 0.31 ac

TC:
sheet flow 100' @ 20%
shallow concentrated - 485' @ 41%
shallow concentrated - 390' @ 13%
channel - 2498' @ 18%

WS 4b = 12.31 ac

PRE-PROJECT

LAND USE:
Grazed Pasture (HSG C, fair) - 10.35 ac
Grassland (HSG C, good) - 1.96 ac

TC:
sheet flow 100' @ 16%
shallow concentrated - 186' @ 22%
shallow concentrated - 1365' @ 6%

POST-PROJECT

LAND USE:
Vineyard (HSG C, good) - 10.41 ac
Grazed Pasture (HSG C, fair) - 1.47 ac
Grassland (HSG C, good) - 0.43 ac

TC:
sheet flow 100' @ 16%
shallow concentrated - 186' @ 22%
shallow concentrated - 1365' @ 6%

WS 4c = 35.21 ac

PRE-PROJECT

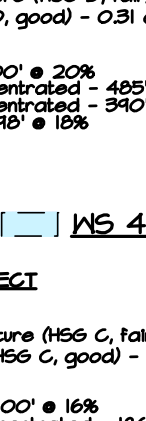
LAND USE:
Impervious - 4.51
Vineyard (HSG C, fair) - 0.94 ac
Grazed Pasture (HSG C, fair) - 24.02 ac
Grassland (HSG C, good) - 5.28 ac
Grassland (HSG C, poor) - 0.46 ac

TC:
shallow concentrated - 2015' @ 5%

POST-PROJECT

LAND USE:
Impervious - 4.51
Vineyard (HSG C, fair) - 0.94 ac
Vineyard (HSG C, good) - 13.92 ac
Grazed Pasture (HSG C, fair) - 15.78 ac
Grassland (HSG C, good) - 0.01 ac
Grassland (HSG C, poor) - 0.05 ac

TC:
shallow concentrated - 2015' @ 5%



SCALE: 1"=300'

LAIRD JAMIESON VINEYARD

Hydrology Analysis
Drainage & Land Use Map
Watershed 4
Pre & Post Project

NVVE 7-18-2017
Revised 1-25-2018

WS 7 = 4.51 ac

PRE-PROJECT

LAND USE:

Grazed Pasture (HSG C, fair) - 2.47 ac
Trees (HSG C, good) - 2.04 ac

TC:

sheet flow 100' @ 38%
shallow concentrated - 171' @ 60%
channel - 524' @ 7%

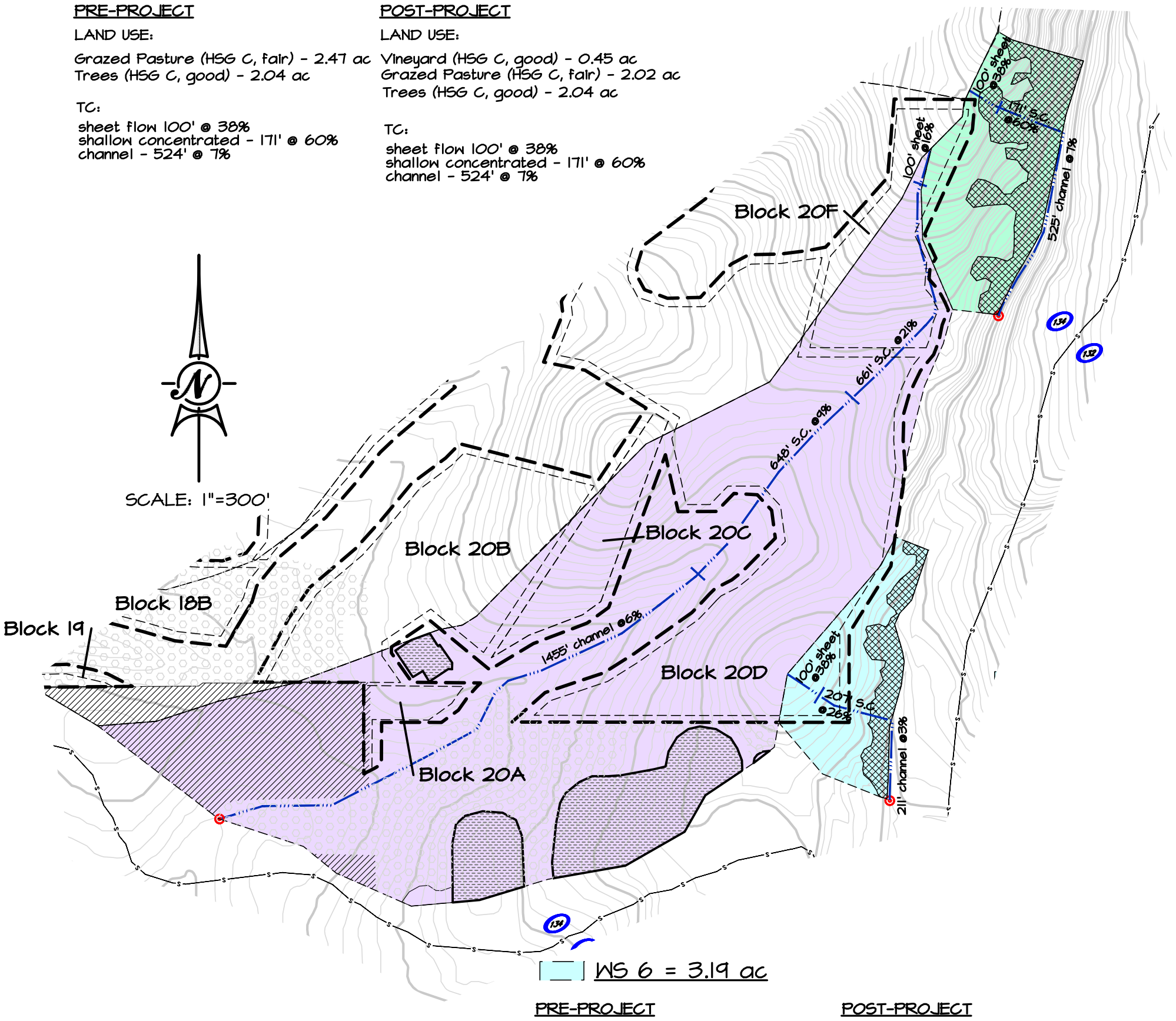
POST-PROJECT

LAND USE:

Vineyard (HSG C, good) - 0.45 ac
Grazed Pasture (HSG C, fair) - 2.02 ac
Trees (HSG C, good) - 2.04 ac

TC:

sheet flow 100' @ 38%
shallow concentrated - 171' @ 60%
channel - 524' @ 7%



WS 6 = 3.19 ac

PRE-PROJECT

LAND USE:

Grazed Pasture (HSG C, fair) - 1.84 ac
Grassland (HSG C, poor) - 0.49 ac
Trees (HSG C, good) - 0.86 ac

TC:

sheet flow 100' @ 12%
shallow concentrated - 207' @ 26%
channel - 211' @ 3%

POST-PROJECT

LAND USE:

Vineyard (HSG C, good) - 1.03 ac
Grazed Pasture (HSG C, fair) - 0.81 ac
Grassland (HSG C, poor) - 0.49 ac
Trees (HSG C, good) - 0.86 ac

TC:

sheet flow 100' @ 12%
shallow concentrated - 207' @ 26%
channel - 211' @ 3%

WS 5 = 35.42 ac

PRE-PROJECT

LAND USE:

Impervious - 3.58
Vineyard (HSG C, fair) - 3.95 ac
Grazed Pasture (HSG C, fair) - 20.01 ac
Grassland (HSG C, good) - 5.99 ac
Grassland (HSG C, poor) - 1.89 ac

TC:

sheet flow 100' @ 16%
shallow concentrated - 661' @ 21%
shallow concentrated - 648' @ 9%
channel - 1455' @ 6%

POST-PROJECT

LAND USE:

Impervious - 3.58
Vineyard (HSG C, fair) - 3.95 ac
Vineyard (HSG C, good) - 16.95 ac
Grazed Pasture (HSG C, fair) - 3.92 ac
Grassland (HSG C, good) - 5.98 ac
Grassland (HSG C, poor) - 1.04 ac

TC:

sheet flow 100' @ 16%
shallow concentrated - 661' @ 21%
shallow concentrated - 648' @ 9%
channel - 1455' @ 6%

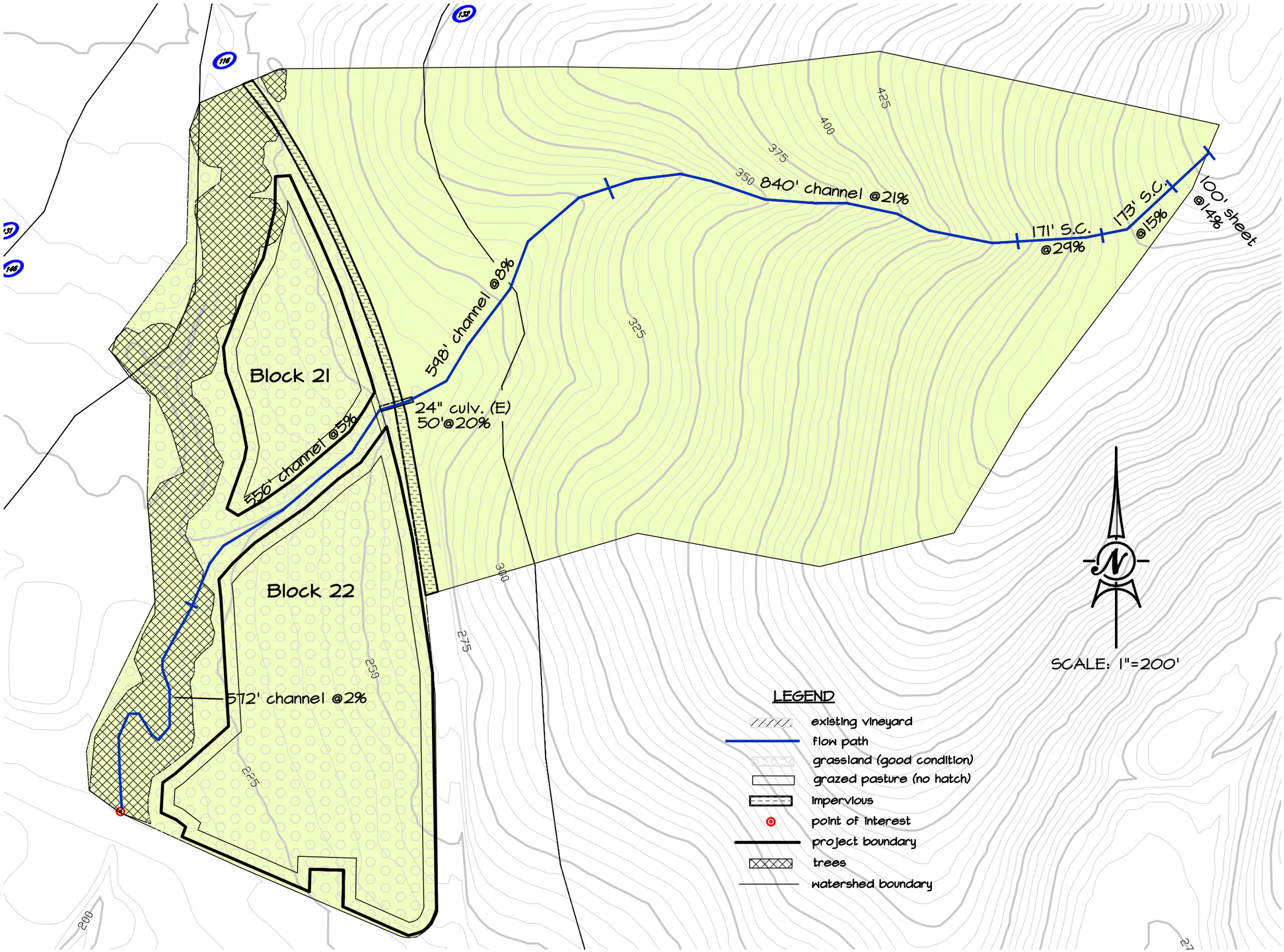
LEGEND

- existing vineyard
- flow path
- grassland (good condition)
- grazed pasture (no hatch)
- impervious
- point of interest
- project boundary
- trees
- watershed boundary

LAIRD JAMIESON VINEYARD

Hydrology Analysis
Drainage & Land Use Map
Watersheds 5 thru 7
Pre & Post Project

NVVE 7-18-2017
Revised 1-25-2018



WS 8 = 50.62 ac

PRE-PROJECT

LAND USE:

Impervious - 0.49 ac
Grazed Pasture (HSG C, fair) - 26.56 ac
Grazed Pasture (HSG D, fair) - 5.62 ac
Grassland (HSG D, good) - 13.82 ac
Trees (HSG D, good) - 4.13 ac

TC:

sheet flow 100' @ 14%
shallow concentrated - 173' @ 15%
shallow concentrated - 171' @ 29%
channel - 840' @ 21%
channel - 598' @ 8%
pipe - 50' @ 20%
channel - 556' @ 5%
channel - 572' @ 2%

POST-PROJECT

LAND USE:

Impervious - 0.49 ac
Vineyard (HSG D, good) - 10.49 ac
Grazed Pasture (HSG C, fair) - 26.56 ac
Grazed Pasture (HSG D, fair) - 5.62 ac
Grassland (HSG D, good) - 3.33 ac
Trees (HSG D, good) - 4.13 ac

TC:

sheet flow 100' @ 14%
shallow concentrated - 173' @ 15%
shallow concentrated - 171' @ 29%
channel - 840' @ 21%
channel - 598' @ 8%
pipe - 50' @ 20%
channel - 556' @ 5%
channel - 572' @ 2%

LAIRD JAMIESON VINEYARD

Hydrology Analysis
Drainage & Land Use Map
Watershed 8
Pre & Post Project

NVVE 7-18-2017
Revised 1-25-2018