PPI ENGINEERING
VINEYARD DESIGN
EROSION CONTROL
WATER DEVELOPMENT
DRAINAGE
PERMITTING
GPS/GIS

2800 Jefferson Street
Napa, California 94558
707-253-1806
www.ppiengineering.com

MEMORANDUM

Date: November 18, 2020

To: Patrick Ryan, Napa County Planning, Building and Environmental Services

From: James R. Bushey, P.E.
Cody J. Corsetti, P.E.

Cc: John McDowell, Napa County Planning, Building and Environmental Services

Re: Project Pioneer, Track I ECP
APNs 024-080-040, -044, -048 & -049
Hydrologic Analysis

This memo transmits the findings of a hydrologic analysis for the above-referenced Track I Erosion Control Plan (ECP). HydroCAD software was used to estimate pre- and post-project runoff from watersheds containing the proposed development areas. The software uses the Natural Resource Conservation Service (NRCS) TR-20 method to calculate runoff. The analysis uses the Type IA 24-hr storm distribution and includes site-specific National Oceanic and Atmospheric Administration (NOAA) point precipitation data for the ranch.

Eleven (11) watersheds were delineated for the hydrologic modeling. Watershed 1 drains into an unnamed swale that flows towards Howell Mountain Road. Watershed 2 flows into an unnamed ephemeral stream that flows out of the project area towards Howell Mountain Road. Watershed 3 flows into a roadside ditch along the east side of Howell Mountain Road. Runoff in Watershed 4 flows in a ditch west of the runway and enters a series of culverts under the dirt road. From here, runoff flows into an unnamed swale that outlets to the roadside ditch east of Howell Mountain Road. Watershed 5 flows to an unnamed swale, and Watershed 6 flows into a separate unnamed swale, both of which flow toward Howell Mountain Road. Watershed 7 flows through Block 3 and into a nearby reservoir**.** Watershed 8 flows from the southern edge of Block 3 to a culvert on the block's west side. Watershed 9 flows south in a swale that dissipates into a meadow south of Block 3. Watershed 10 flows east to a meadow, and Watershed 11 flows east to a separate meadow. Please see the attached figures for the location of each watershed.

Soils within the watersheds were obtained from the NRCS Web Soil Survey and are classified as the following:

Aiken Loam, 2-15% Slopes (Map Unit Symbol 100)

Aiken Loam, 15-30% Slopes (Map Unit Symbol 101)
Aiken Loam, 30-50% Slopes (Map Unit Symbol 102)
Boomer Loam, Volcanic Bedrock, 2-35% Slopes (Map Unit Symbol 107)

All soils in the project area are classified as Hydrologic Soil Group (HSG) C. Please see the attached figures for soil type delineations within the vicinity of each watershed.

Land use areas were initially delineated based on topographic mapping and aerial imagery. A site visit was then conducted on July 25, 2019 by Jim Bushey and Annalee Sanborn of PPI Engineering to ground truth the orthophotos and determine the existing land use conditions within the project area. A supplemental site visit was conducted on September 5, 2019 by Cody Corsetti and Austin Lemire-Baeten of PPI Engineering to verify the existing land use in other areas. An additional site visit was conducted on December 5, 2019 by Austin Lemire-Baeten of PPI Engineering to determine the existing land use conditions in the areas around Block 3. The land use hydrologic conditions were classified based on the respective covers as poor (less than 50% cover), fair (50%-75% cover), or good (greater than or equal to 75% cover). The HydroCAD software analyzes the land use data along with the corresponding soil HSGs to determine a weighted Curve Number (CN) for runoff calculations. Please see the attached figures for existing and proposed land use delineations.

The Time of Concentration (Tc) flow path within each watershed was determined using both two-foot and one-foot topographic mapping from Terra Firma. The flow path in each watershed was drafted from the hydrologically most distant point (longest travel time) in the watershed to the watershed outlet per NRCS standards. For all watersheds, the Tc did not change from pre- to post-project conditions because the flow path in each of these watersheds did not flow through any proposed drainage/erosion control elements. Please see the attached figures for both the pre- and post-project Tc flow paths by watershed.

Pre- and post-project runoff calculations from the HydroCAD models for each individual watershed are summarized in Tables 1-4 below. Runoff was calculated for the 2-, 10-, 50- and 100-year storms respectively for each watershed.

Table 1. Watersheds 1-3 Summary

	Runoff (cfs)								
	Watershed 1			Watershed 2			Watershed 3		
	Pre-Project	Post-Project	Increase/Decrease	Pre-Project	Post-Project	Increase/Decrease	Pre-Project	Post-Project	Increase/Decrease
2-Year Storm	2.02	2.02	0.00	9.38	9.38	0.00	2.28	2.28	0.00
10-Year Storm	4.23	4.23	0.00	19.64	19.64	0.00	5.15	5.15	0.00
50-Year Storm	6.70	6.70	0.00	31.09	31.09	0.00	8.45	8.45	0.00
100-Year Storm	7.77	7.77	0.00	36.07	36.07	0.00	9.91	9.91	0.00

Table 2. Watersheds 4-6 Summary

	Runoff (cfs)								
	Watershed 4			Watershed 5			Watershed 6		
	Pre-Project	Post-Project	Increase/ Decrease	Pre-Project	Post-Project	Increase/ Decrease	Pre-Project	Post-Project	Increase/ Decrease
2-Year Storm	8.45	8.45	0.00	2.50	2.50	0.00	2.16	2.16	0.00
10-Year Storm	17.34	17.34	0.00	4.88	4.88	0.00	4.22	4.22	0.00
50-Year Storm	27.20	27.20	0.00	7.45	7.45	0.00	6.44	6.44	0.00
100-Year Storm	31.51	31.51	0.00	8.57	8.57	0.00	7.41	7.41	0.00

Table 3. Watersheds 7-9 Summary

	Runoff (cfs)								
	Watershed 7			Watershed 8			Watershed 9		
	Pre-Project	Post-Project	Increase/ Decrease	Pre-Project	Post-Project	Increase/ Decrease	Pre-Project	Post-Project	Increase/ Decrease
2-Year Storm	4.56	4.56	0.00	0.68	0.68	0.00	1.07	1.07	0.00
10-Year Storm	9.32	9.32	0.00	1.39	1.39	0.00	2.31	2.31	0.00
50-Year Storm	14.57	14.57	0.00	2.18	2.18	0.00	3.72	3.72	0.00
100-Year Storm	16.87	16.87	0.00	2.52	2.52	0.00	4.34	4.34	0.00

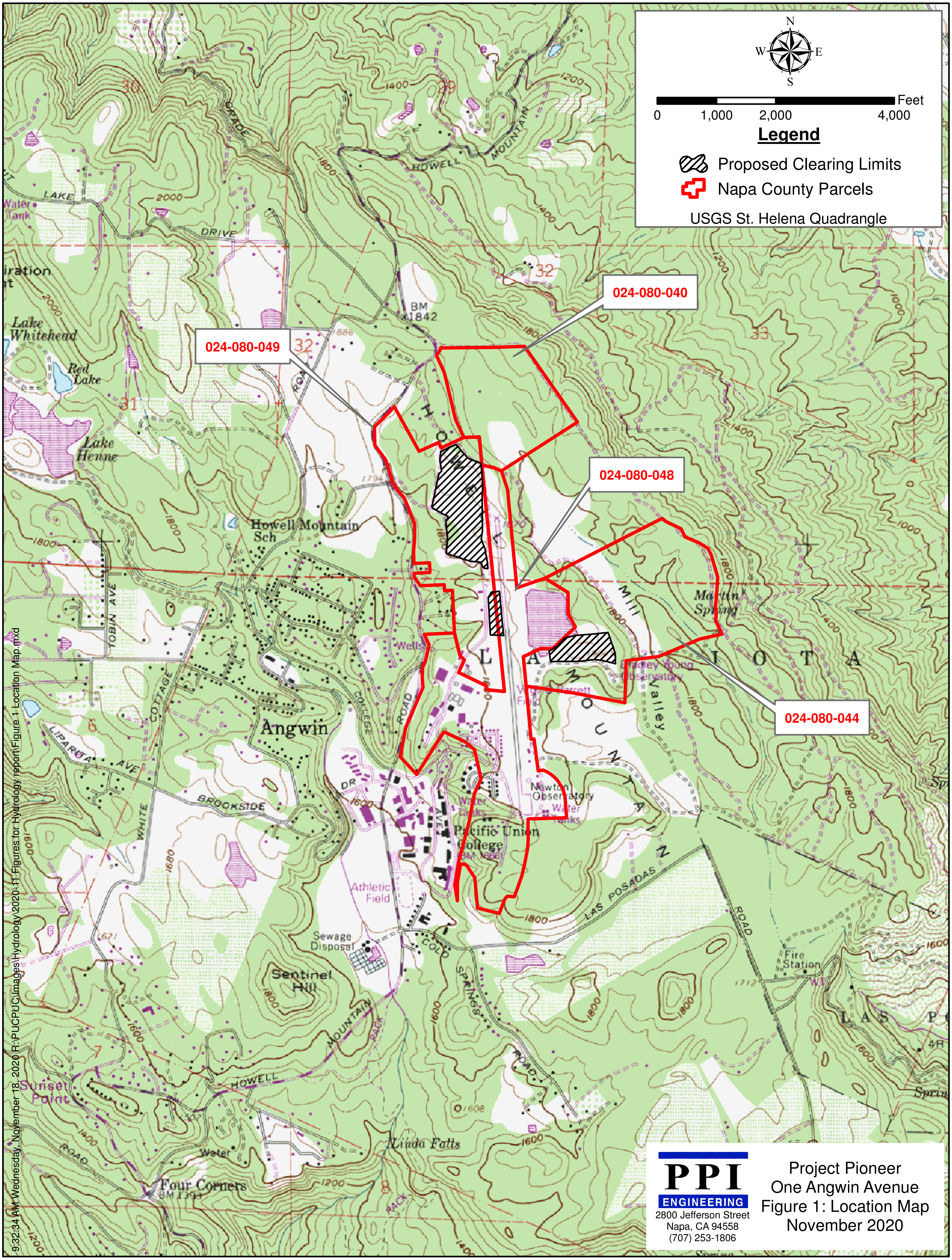
Table 4. Watersheds 10-11 Summary

	Runoff (cfs)					
	Watershed 10			Watershed 11		
	Pre-Project	Post-Project	Increase/ Decrease	Pre-Project	Post-Project	Increase/ Decrease
2-Year Storm	1.36	1.36	0.00	1.02	1.02	0.00
10-Year Storm	2.90	2.90	0.00	2.23	2.23	0.00
50-Year Storm	4.64	4.64	0.00	3.59	3.59	0.00
100-Year Storm	5.41	5.41	0.00	4.18	4.18	0.00

All watersheds show no net change in runoff from pre- to post-project conditions. This is because neither the curve number (CN) nor the time of concentration (Tc) in these respective watersheds changed for post-project analysis. Please see the attached HydroCAD analyses for inputs, details, and summaries of the hydrologic modeling. Based on our analysis, there are no predicted net runoff increases, and no negative hydrologic impacts are expected as a result of this project. The project as proposed is in compliance with Napa County's General Plan policy requiring no net increase in runoff.

ATTACHMENT A

SUPPORTING FIGURES



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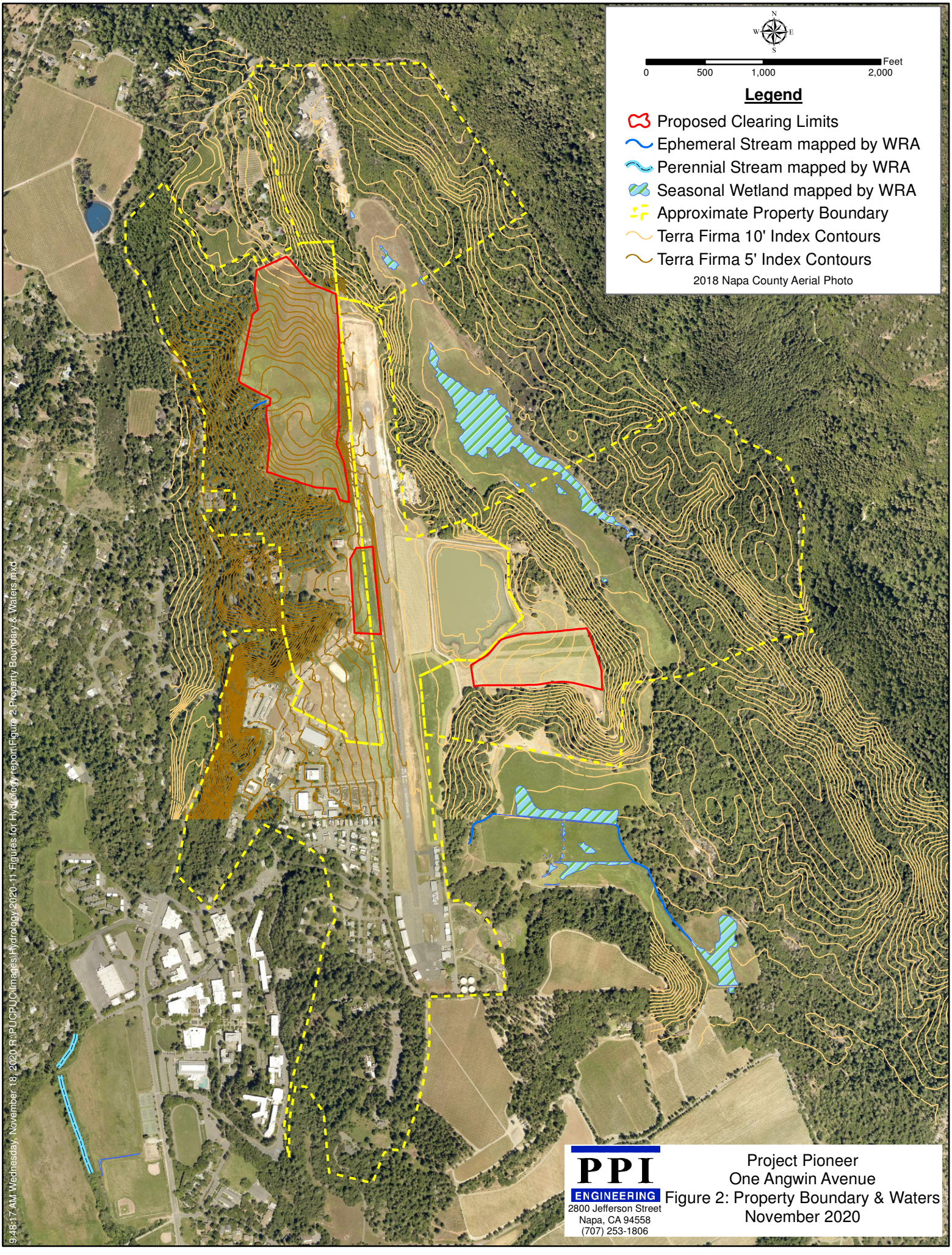
Project Pioneer
One Angwin Avenue
Figure 1: Location Map
November 2020



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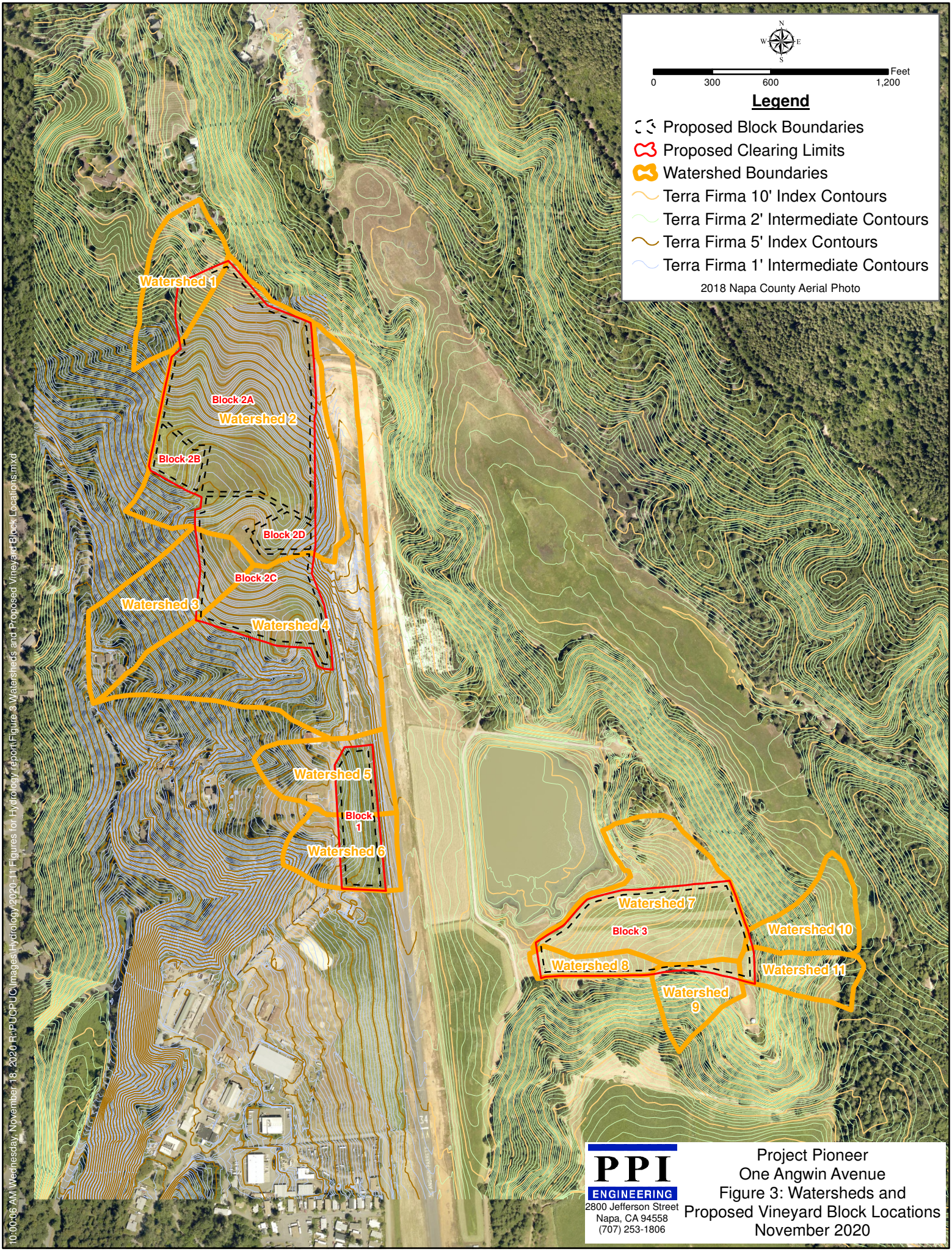
Project Pioneer
One Angwin Avenue
Figure 2: Property Boundary & Waters
November 2020



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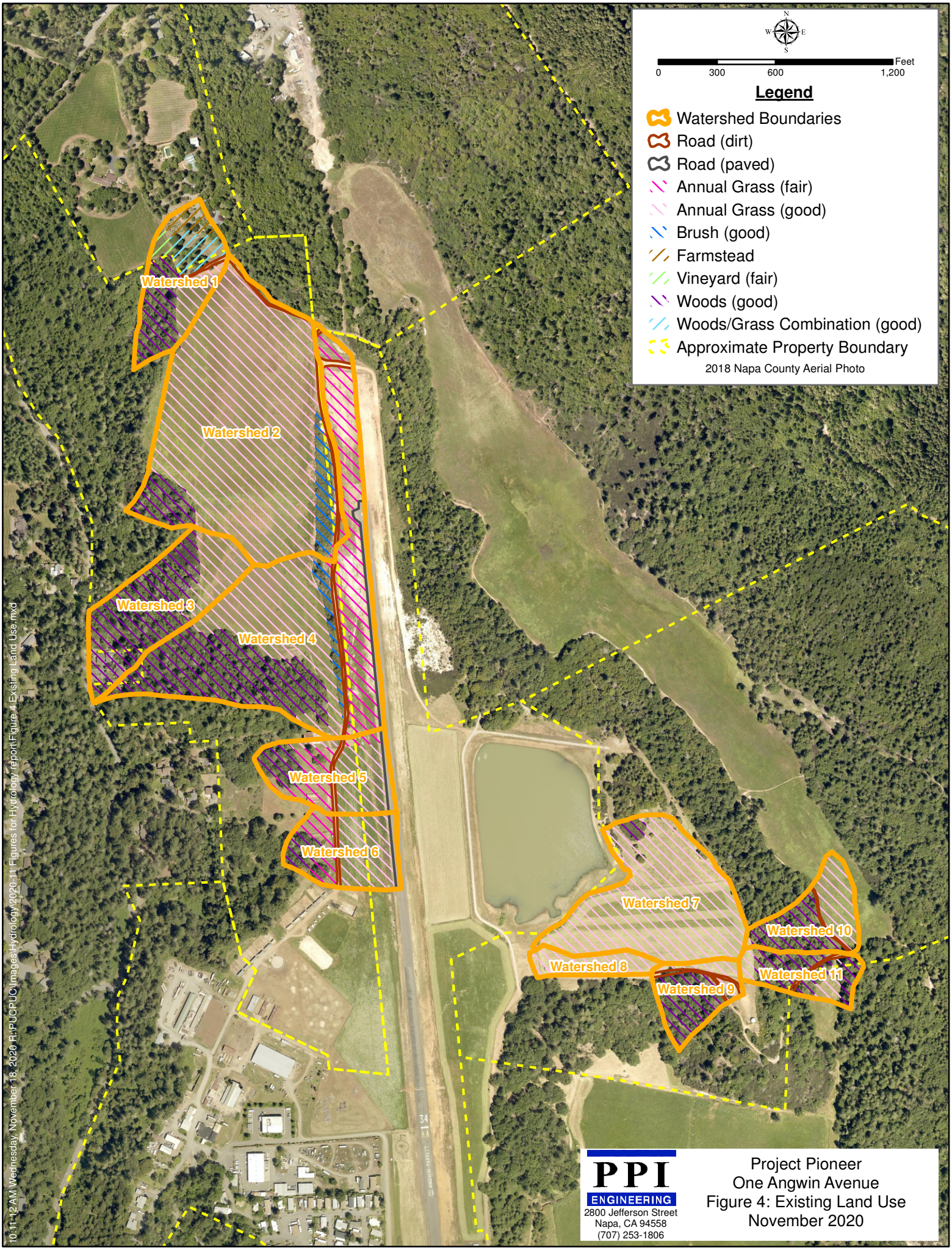
Project Pioneer
One Angwin Avenue
Figure 3: Watersheds and
Proposed Vineyard Block Locations
November 2020



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Project Pioneer
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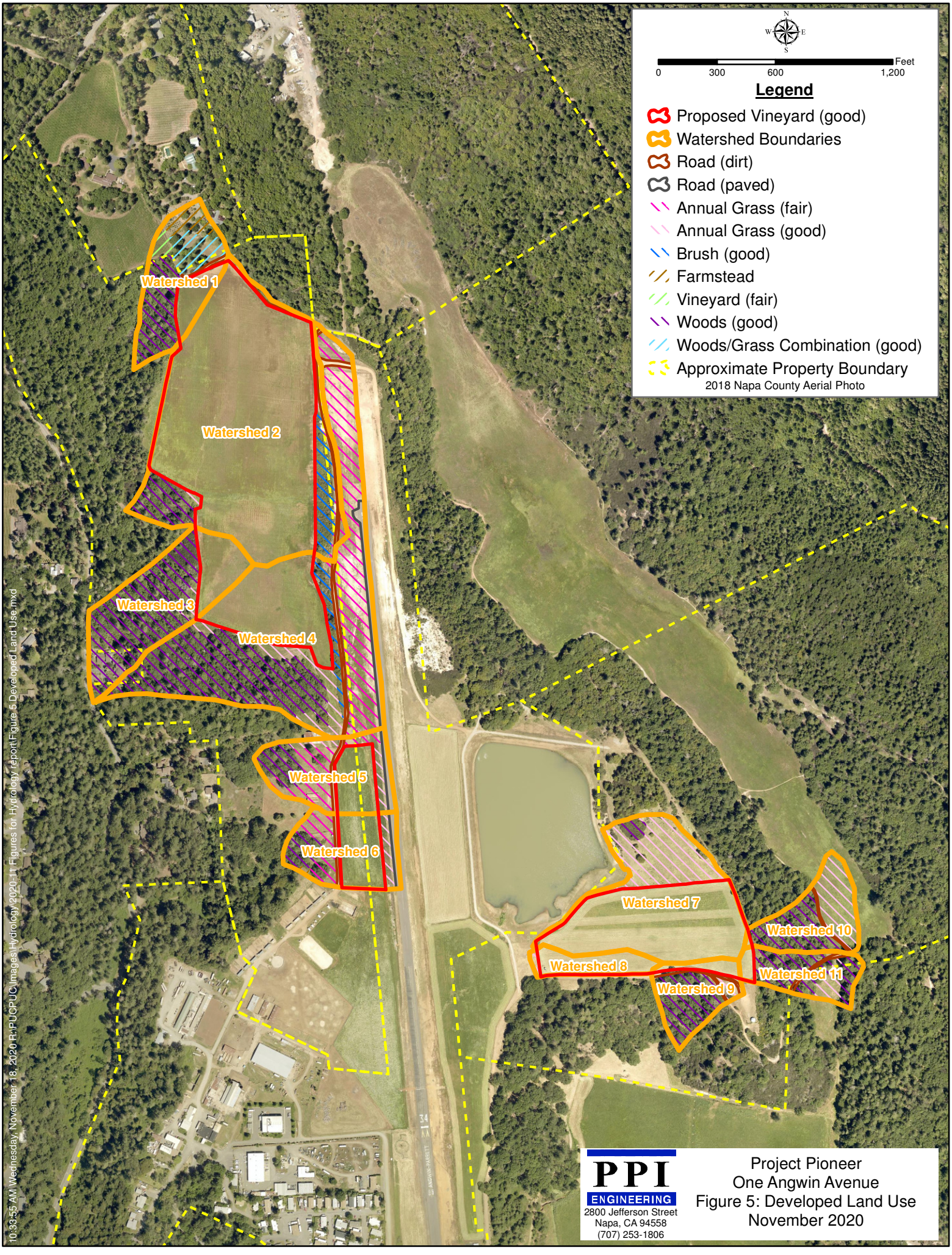
Figure 4: Existing Land Use
November 2020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W
E
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0
300
600
1,200
Feet
Legend
Proposed Vineyard (good)
Watershed Boundaries
Road (dirt)
Road (paved)
Annual Grass (fair)
Annual Grass (good)
Brush (good)
Farmstead
Vineyard (fair)
Woods (good)
Woods/Grass Combination (good)
Approximate Property Boundary
2018 Napa County Aerial Photo
Watershed 1
Watershed 2
Watershed 3
Watershed 4
Watershed 5
Watershed 6
Watershed 7
Watershed 8
Watershed 9
Watershed 10
Watershed 11
10:33:55 AM Wednesday, November 18, 2020 R:\PUCP\UC\Images\Hydrology 2020-11 Figures for Hydrology report\Figure 5 Developed Land Use.mxd
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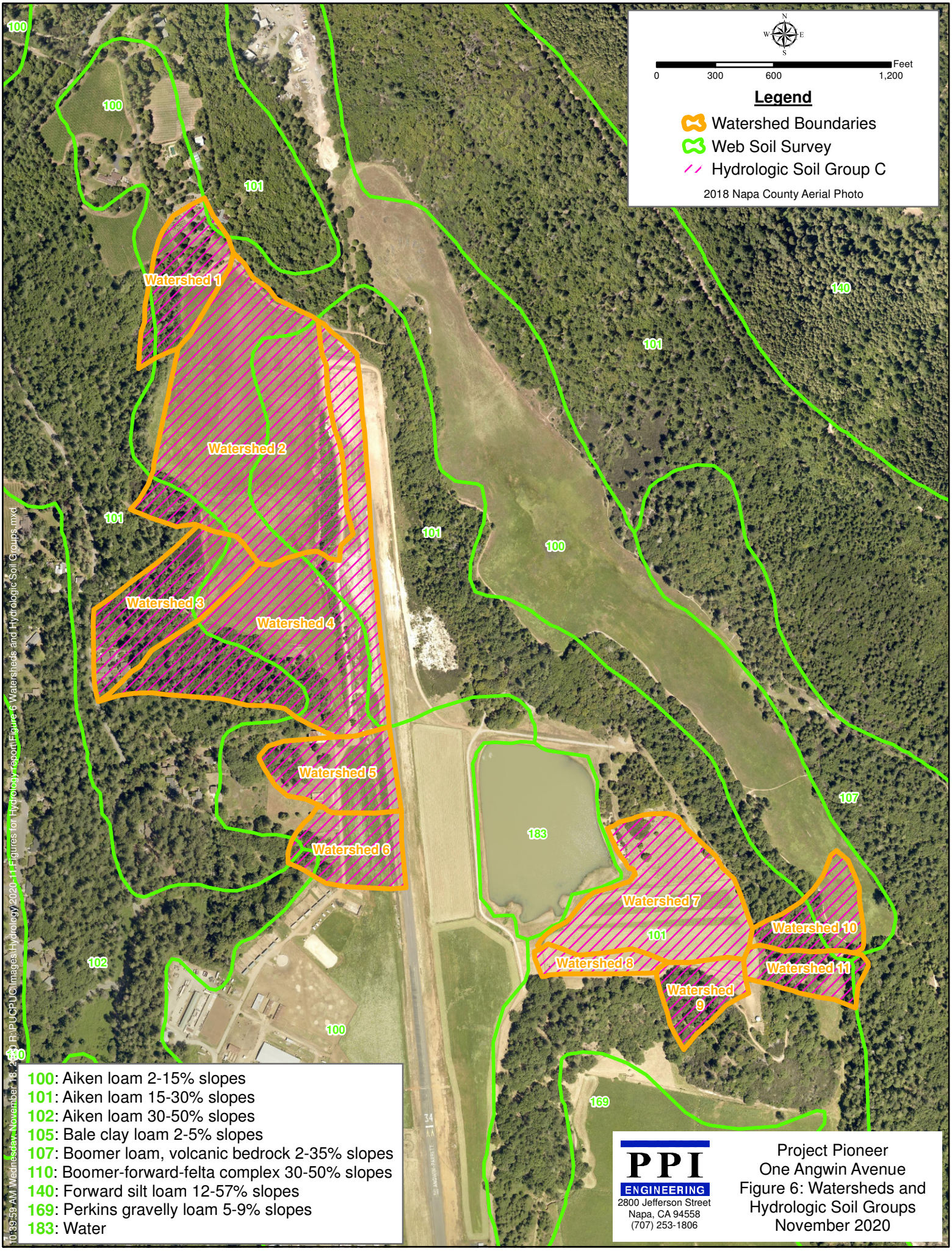
Figure 5: Developed Land Use
November 2020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Legend
Watershed Boundaries
Web Soil Survey
Hydrologic Soil Group C
2018 Napa County Aerial Photo
Watershed 1
Watershed 2
Watershed 3
Watershed 4
Watershed 5
Watershed 6
Watershed 7
Watershed 8
Watershed 9
Watershed 10
Watershed 11
100
101
102
107
140
169
183
100: Aiken loam 2-15% slopes
101: Aiken loam 15-30% slopes
102: Aiken loam 30-50% slopes
105: Bale clay loam 2-5% slopes
107: Boomer loam, volcanic bedrock 2-35% slopes
110: Boomer-forward-felta complex 30-50% slopes
140: Forward silt loam 12-57% slopes
169: Perkins gravelly loam 5-9% slopes
183: Water
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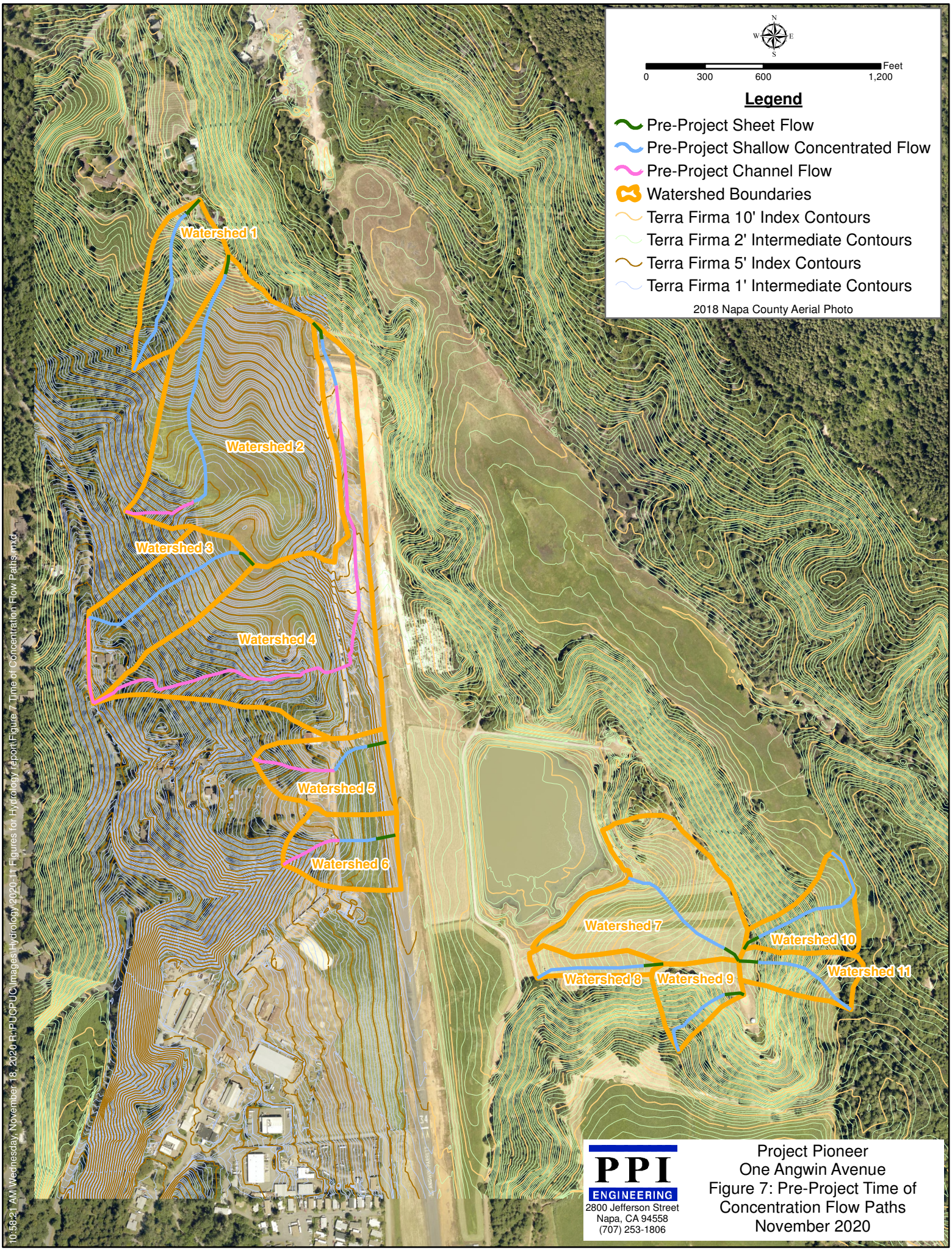
Figure 6: Watersheds and
Hydrologic Soil Groups
November 2020



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Project Pioneer
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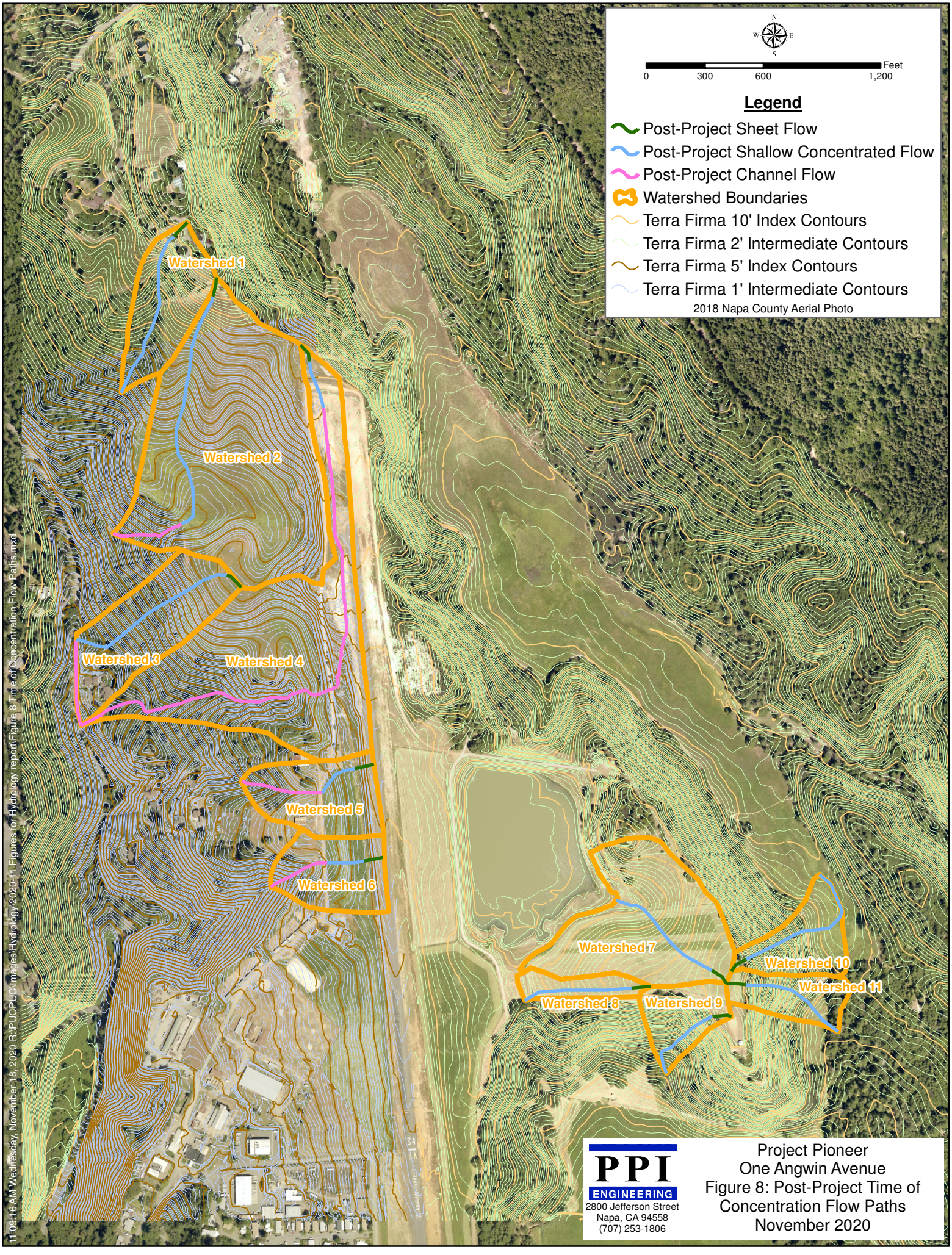
Figure 7: Pre-Project Time of Concentration Flow Paths
November 2020



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Project Pioneer
One Angwin Avenue
Figure 8: Post-Project Time of Concentration Flow Paths
November 2020

ATTACHMENT B

HYDROCAD ANALYSES

WS1

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Pre-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS1: WS1

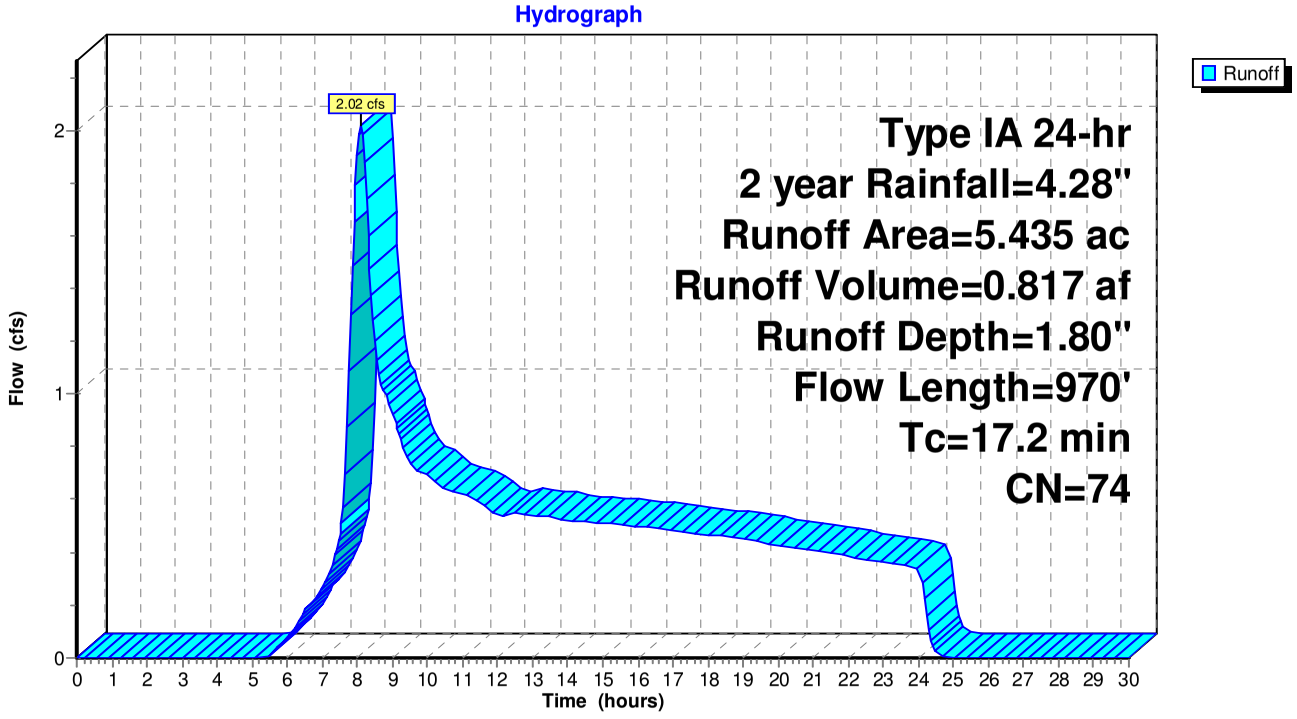
Runoff = 2.02 cfs @ 8.10 hrs, Volume= 0.817 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
1.091	75	Annual Grass, Good, HSG C
0.078	87	Dirt roads, HSG C
0.719	82	Farmsteads, HSG C
0.284	79	Vineyard, Fair, HSG C
2.180	70	Woods, Good, HSG C
1.083	72	Woods/grass comb., Good, HSG C
5.435	74	Weighted Average
5.435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
9.7	870	0.0900	1.50		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
17.2	970	Total			

Subcatchment WS1: WS1



Summary for Subcatchment WS1: WS1

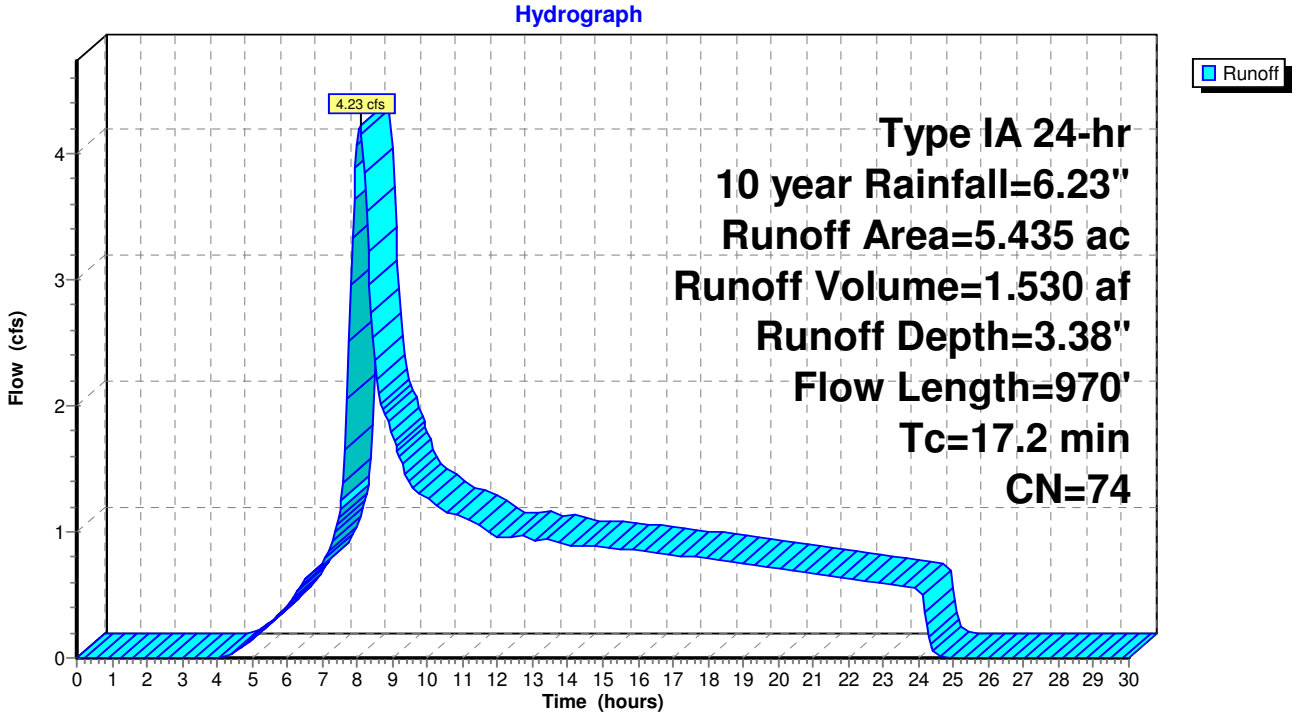
Runoff = 4.23 cfs @ 8.08 hrs, Volume= 1.530 af, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
1.091	75	Annual Grass, Good, HSG C
0.078	87	Dirt roads, HSG C
0.719	82	Farmsteads, HSG C
0.284	79	Vineyard, Fair, HSG C
2.180	70	Woods, Good, HSG C
1.083	72	Woods/grass comb., Good, HSG C
5.435	74	Weighted Average
5.435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
9.7	870	0.0900	1.50		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
17.2	970	Total			

Subcatchment WS1: WS1



Summary for Subcatchment WS1: WS1

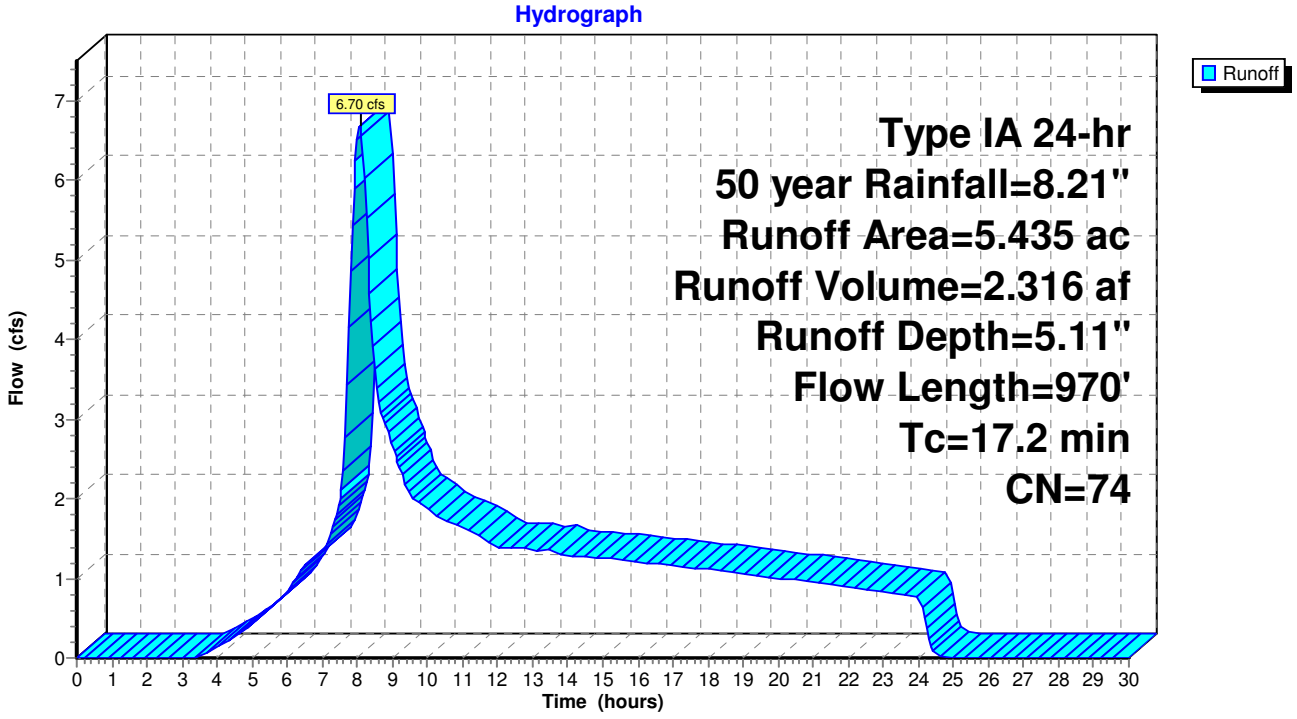
Runoff = 6.70 cfs @ 8.08 hrs, Volume= 2.316 af, Depth= 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
1.091	75	Annual Grass, Good, HSG C
0.078	87	Dirt roads, HSG C
0.719	82	Farmsteads, HSG C
0.284	79	Vineyard, Fair, HSG C
2.180	70	Woods, Good, HSG C
1.083	72	Woods/grass comb., Good, HSG C
5.435	74	Weighted Average
5.435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
9.7	870	0.0900	1.50		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
17.2	970	Total			

Subcatchment WS1: WS1



Summary for Subcatchment WS1: WS1

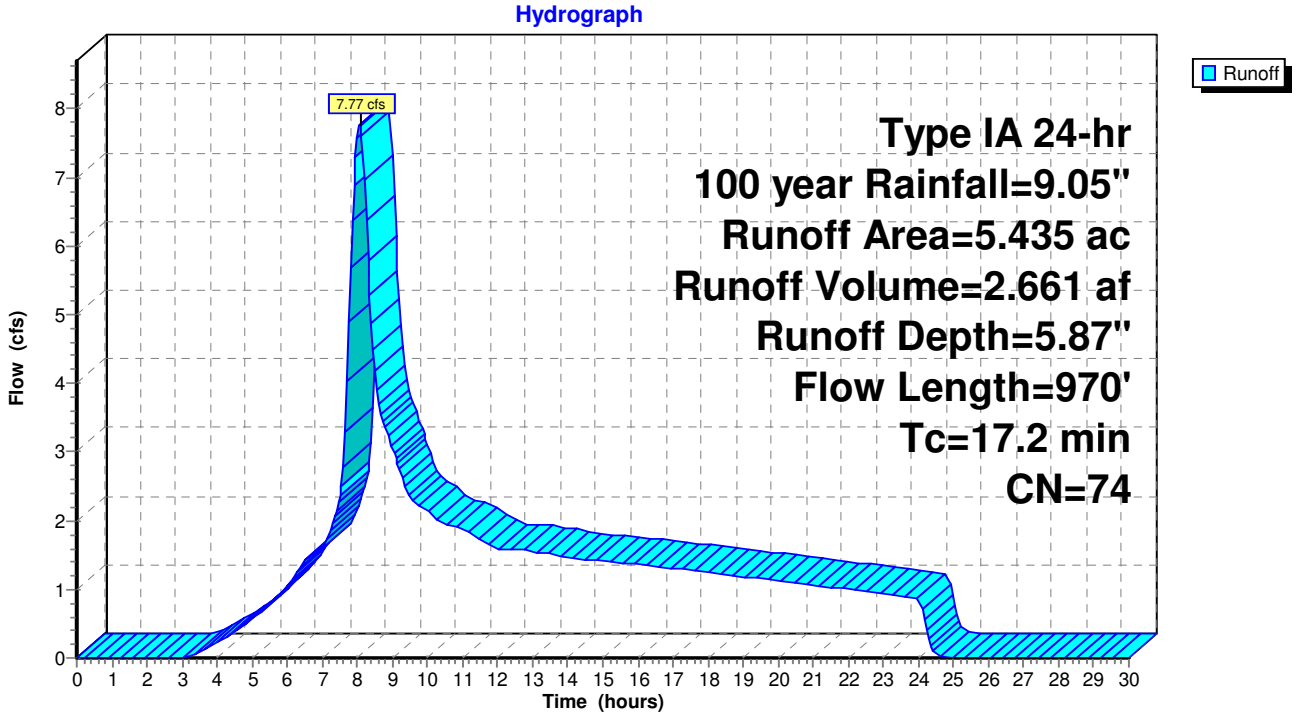
Runoff = 7.77 cfs @ 8.07 hrs, Volume= 2.661 af, Depth= 5.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
1.091	75	Annual Grass, Good, HSG C
0.078	87	Dirt roads, HSG C
0.719	82	Farmsteads, HSG C
0.284	79	Vineyard, Fair, HSG C
2.180	70	Woods, Good, HSG C
1.083	72	Woods/grass comb., Good, HSG C
5.435	74	Weighted Average
5.435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
9.7	870	0.0900	1.50		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
17.2	970	Total			

Subcatchment WS1: WS1



WS1

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Post-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS1: WS1

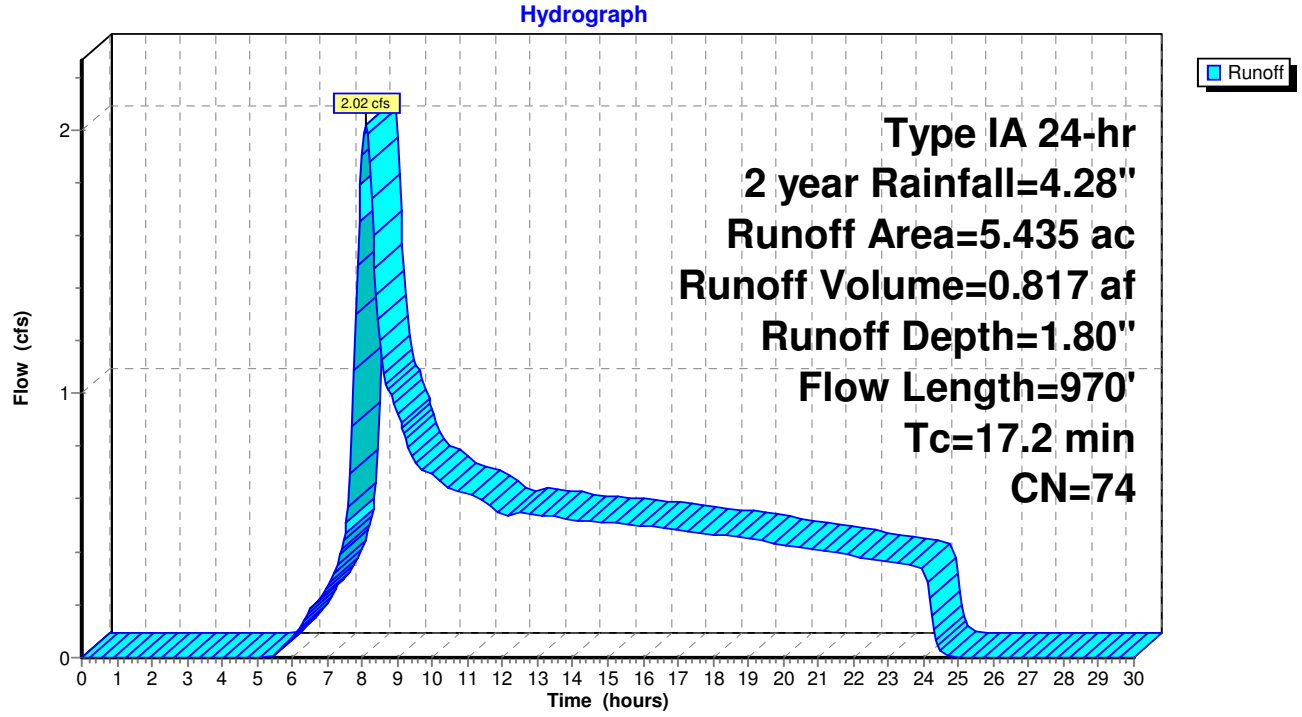
Runoff = 2.02 cfs @ 8.10 hrs, Volume= 0.817 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
0.037	75	Annual Grass, Good, HSG C
0.078	87	Dirt roads, HSG C
0.719	82	Farmsteads, HSG C
0.284	79	Vineyard, Fair, HSG C
1.053	75	Vineyard, Good, HSG C
2.180	70	Woods, Good, HSG C
1.083	72	Woods/grass comb., Good, HSG C
5.435	74	Weighted Average
5.435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
9.7	870	0.0900	1.50		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
17.2	970	Total			

Subcatchment WS1: WS1



Summary for Subcatchment WS1: WS1

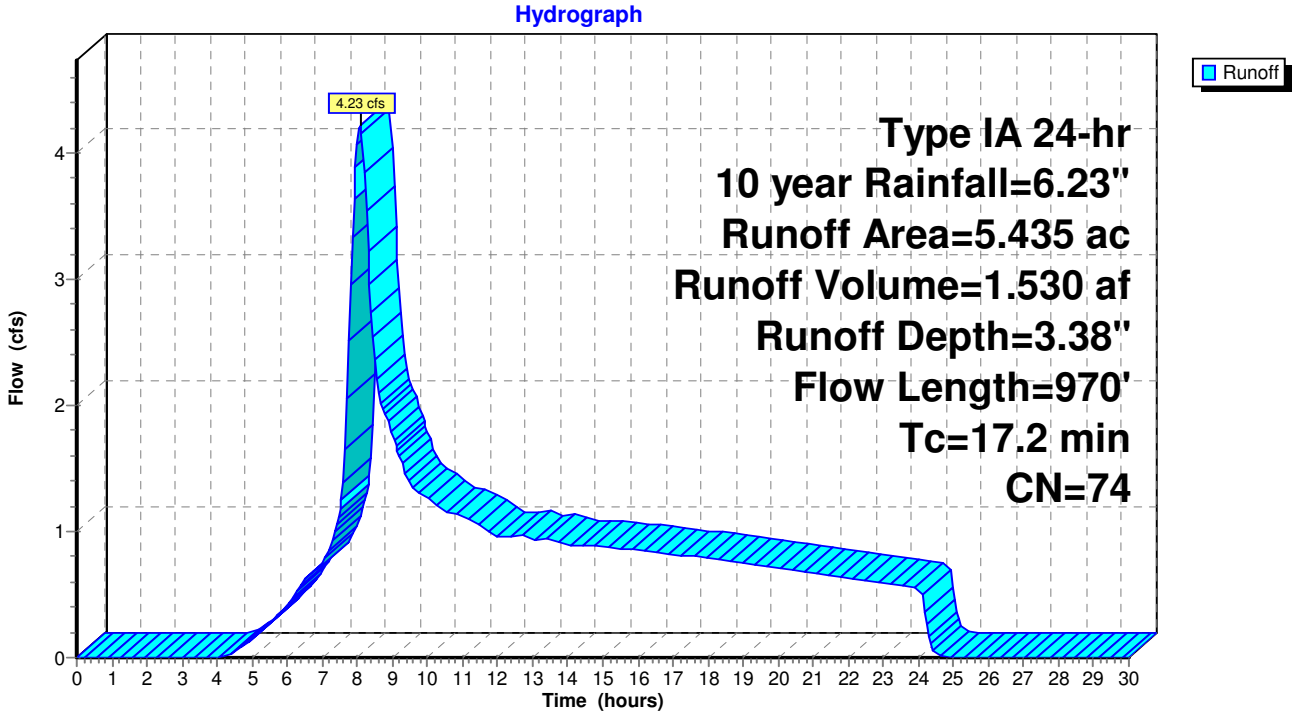
Runoff = 4.23 cfs @ 8.08 hrs, Volume= 1.530 af, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
0.037	75	Annual Grass, Good, HSG C
0.078	87	Dirt roads, HSG C
0.719	82	Farmsteads, HSG C
0.284	79	Vineyard, Fair, HSG C
1.053	75	Vineyard, Good, HSG C
2.180	70	Woods, Good, HSG C
1.083	72	Woods/grass comb., Good, HSG C
5.435	74	Weighted Average
5.435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
9.7	870	0.0900	1.50		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
17.2	970	Total			

Subcatchment WS1: WS1



Summary for Subcatchment WS1: WS1

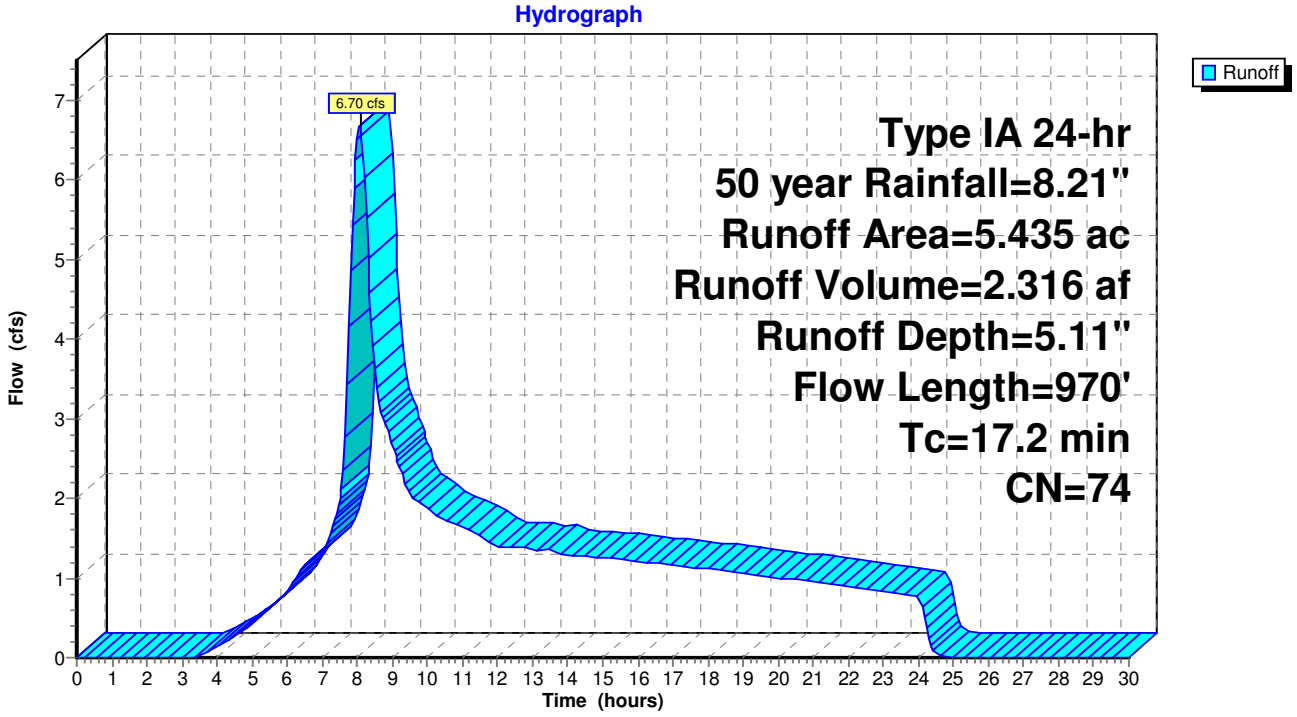
Runoff = 6.70 cfs @ 8.08 hrs, Volume= 2.316 af, Depth= 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
0.037	75	Annual Grass, Good, HSG C
0.078	87	Dirt roads, HSG C
0.719	82	Farmsteads, HSG C
0.284	79	Vineyard, Fair, HSG C
1.053	75	Vineyard, Good, HSG C
2.180	70	Woods, Good, HSG C
1.083	72	Woods/grass comb., Good, HSG C
5.435	74	Weighted Average
5.435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
9.7	870	0.0900	1.50		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
17.2	970	Total			

Subcatchment WS1: WS1



Summary for Subcatchment WS1: WS1

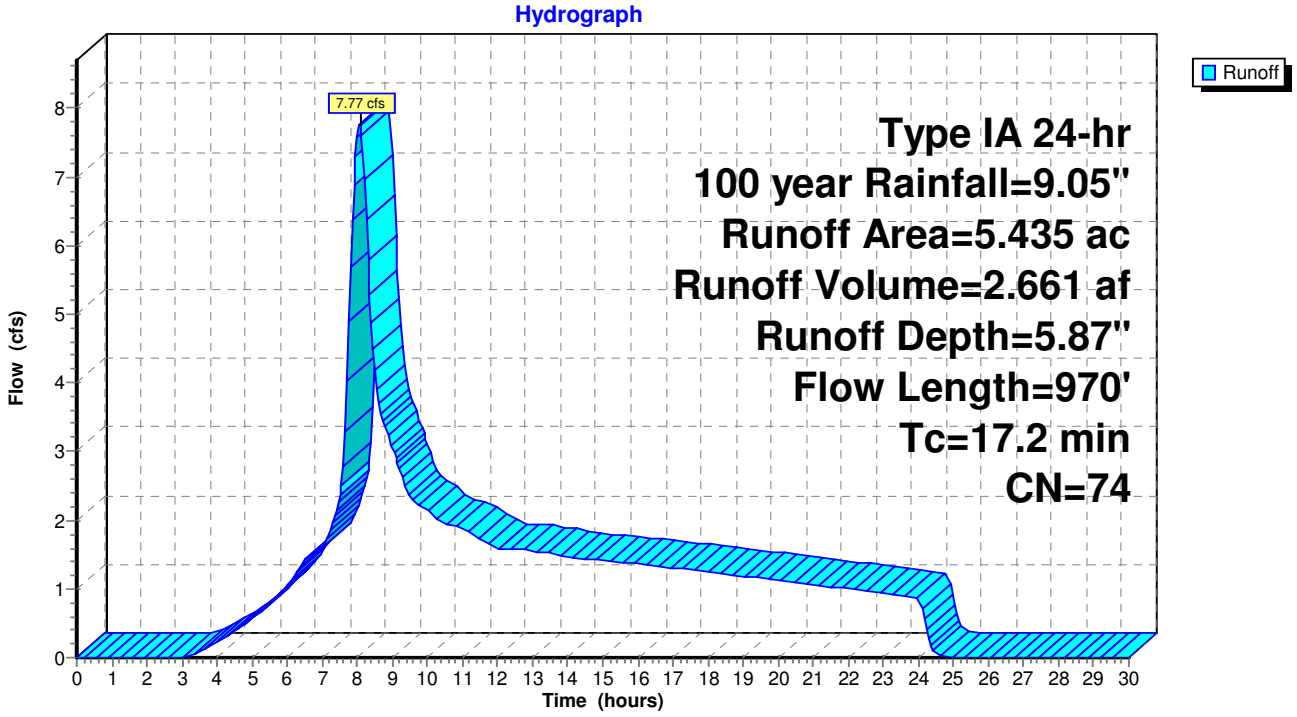
Runoff = 7.77 cfs @ 8.07 hrs, Volume= 2.661 af, Depth= 5.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
0.037	75	Annual Grass, Good, HSG C
0.078	87	Dirt roads, HSG C
0.719	82	Farmsteads, HSG C
0.284	79	Vineyard, Fair, HSG C
1.053	75	Vineyard, Good, HSG C
2.180	70	Woods, Good, HSG C
1.083	72	Woods/grass comb., Good, HSG C
5.435	74	Weighted Average
5.435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
9.7	870	0.0900	1.50		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
17.2	970	Total			

Subcatchment WS1: WS1



WS2

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Pre-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS2: WS2

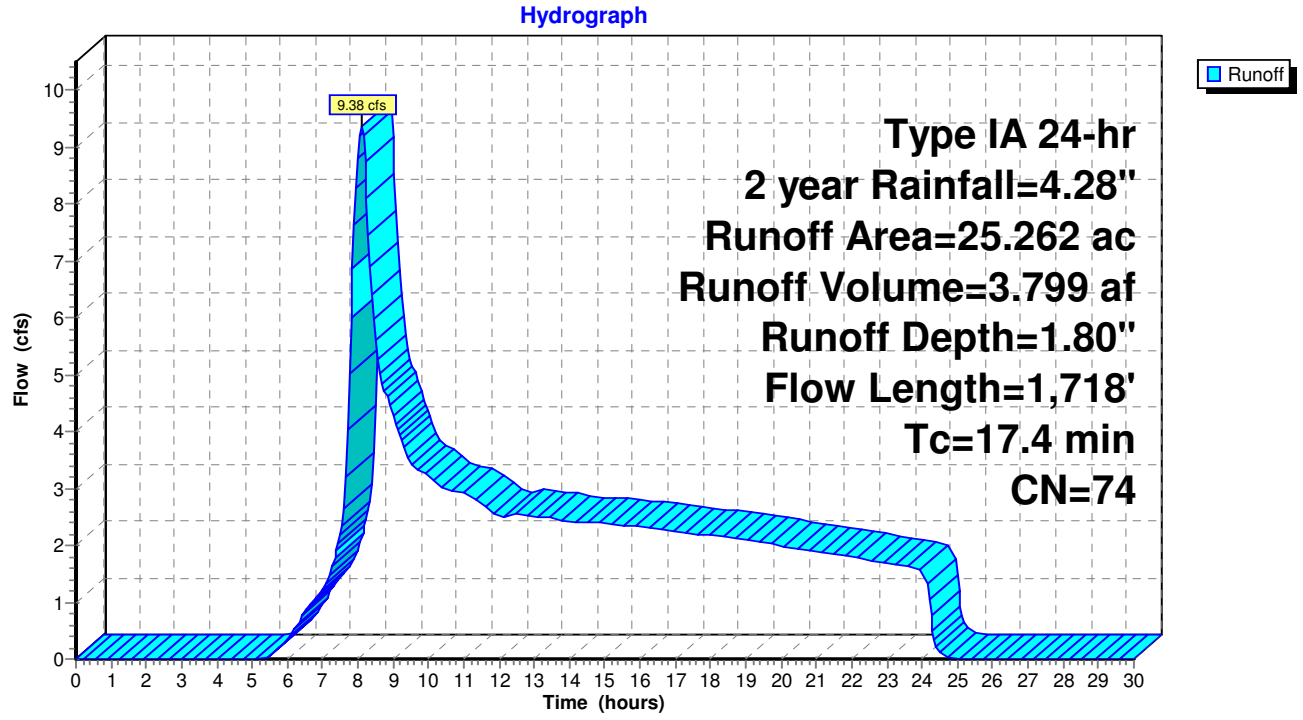
Runoff = 9.38 cfs @ 8.10 hrs, Volume= 3.799 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
0.461	79	Annual Grass, Fair, HSG C
21.327	75	Annual Grass, Good, HSG C
1.363	65	Brush, Good, HSG C
0.485	87	Dirt roads, HSG C
1.625	70	Woods, Good, HSG C
25.262	74	Weighted Average
25.262		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
11.2	1,247	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.5	371	0.0700	11.94	143.33	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
17.4	1,718	Total			

Subcatchment WS2: WS2



Summary for Subcatchment WS2: WS2

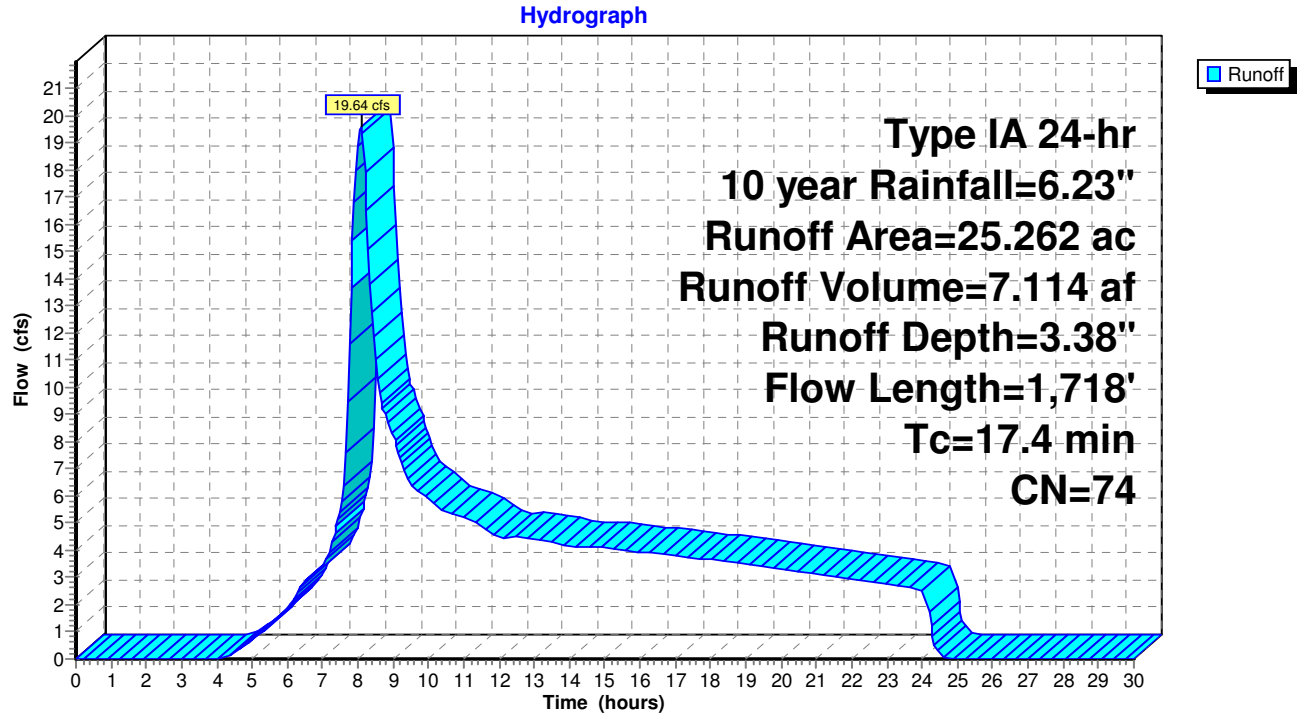
Runoff = 19.64 cfs @ 8.09 hrs, Volume= 7.114 af, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
0.461	79	Annual Grass, Fair, HSG C
21.327	75	Annual Grass, Good, HSG C
1.363	65	Brush, Good, HSG C
0.485	87	Dirt roads, HSG C
1.625	70	Woods, Good, HSG C
25.262	74	Weighted Average
25.262		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
11.2	1,247	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.5	371	0.0700	11.94	143.33	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
17.4	1,718	Total			

Subcatchment WS2: WS2



Summary for Subcatchment WS2: WS2

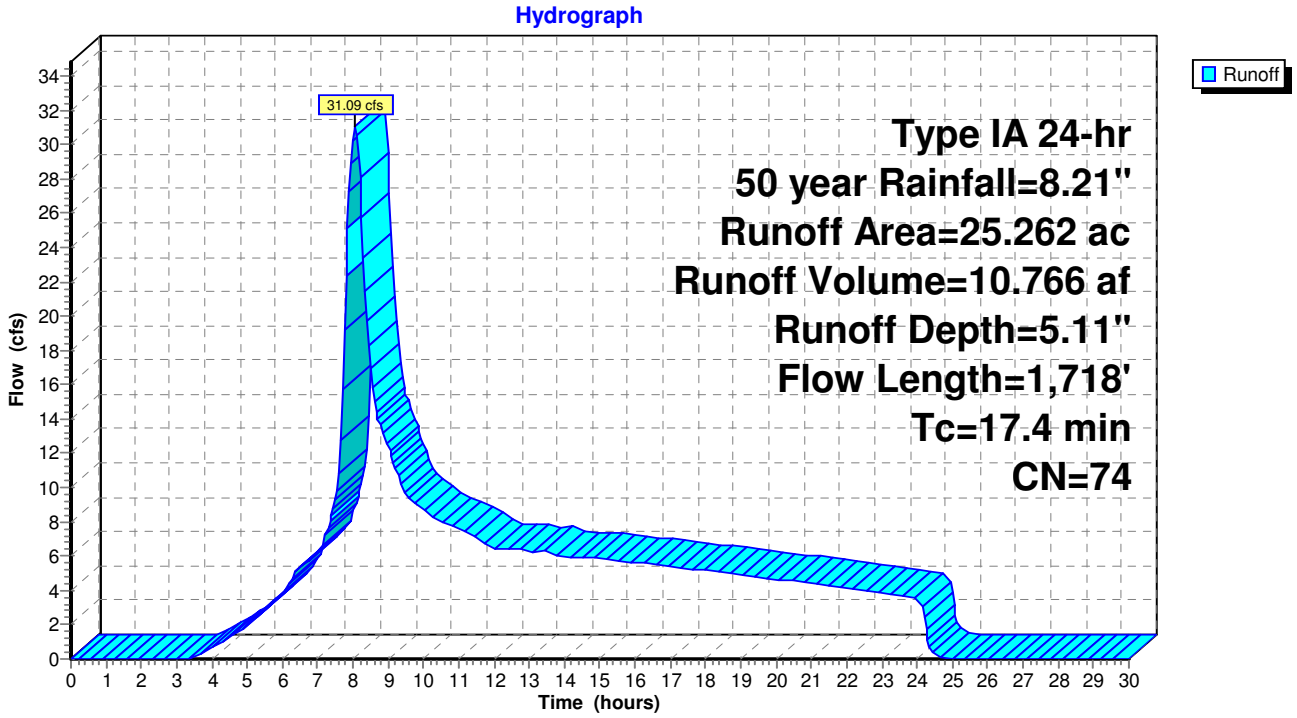
Runoff = 31.09 cfs @ 8.08 hrs, Volume= 10.766 af, Depth= 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
0.461	79	Annual Grass, Fair, HSG C
21.327	75	Annual Grass, Good, HSG C
1.363	65	Brush, Good, HSG C
0.485	87	Dirt roads, HSG C
1.625	70	Woods, Good, HSG C
25.262	74	Weighted Average
25.262		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
11.2	1,247	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.5	371	0.0700	11.94	143.33	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
17.4	1,718	Total			

Subcatchment WS2: WS2



Summary for Subcatchment WS2: WS2

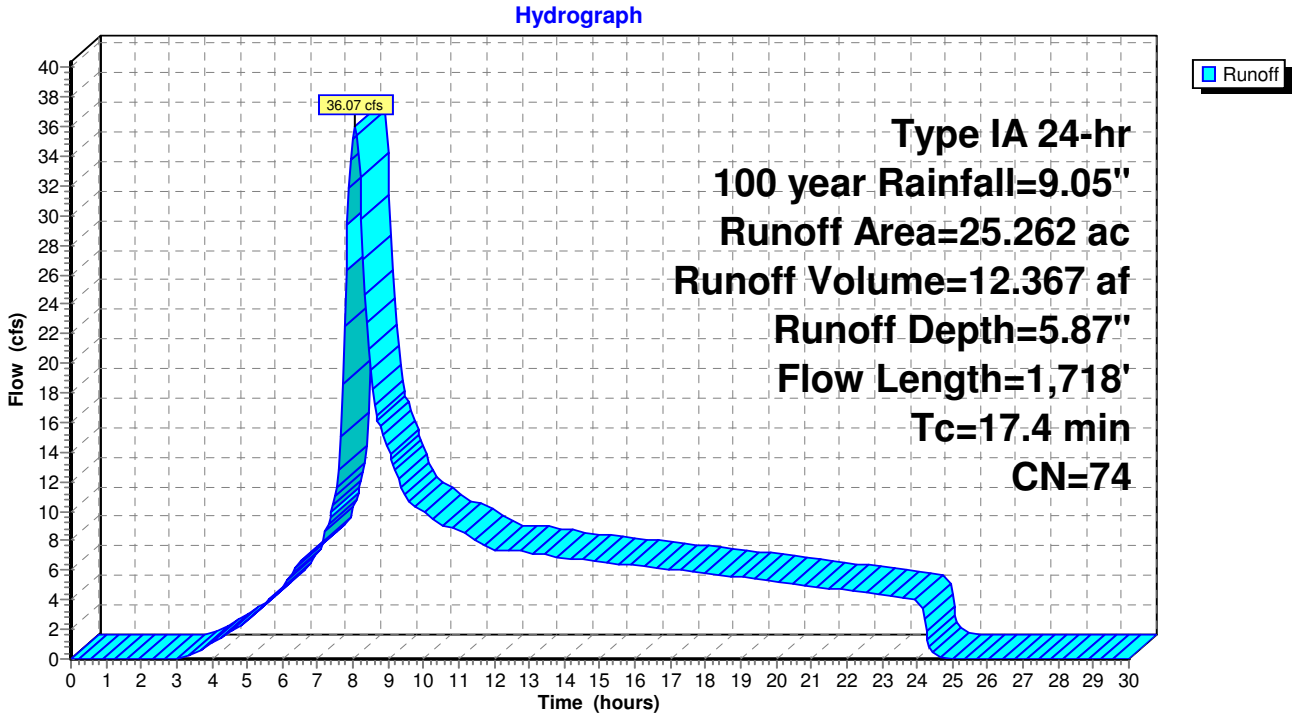
Runoff = 36.07 cfs @ 8.07 hrs, Volume= 12.367 af, Depth= 5.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
0.461	79	Annual Grass, Fair, HSG C
21.327	75	Annual Grass, Good, HSG C
1.363	65	Brush, Good, HSG C
0.485	87	Dirt roads, HSG C
1.625	70	Woods, Good, HSG C
25.262	74	Weighted Average
25.262		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
11.2	1,247	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.5	371	0.0700	11.94	143.33	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
17.4	1,718	Total			

Subcatchment WS2: WS2



WS2

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Post-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS2: WS2

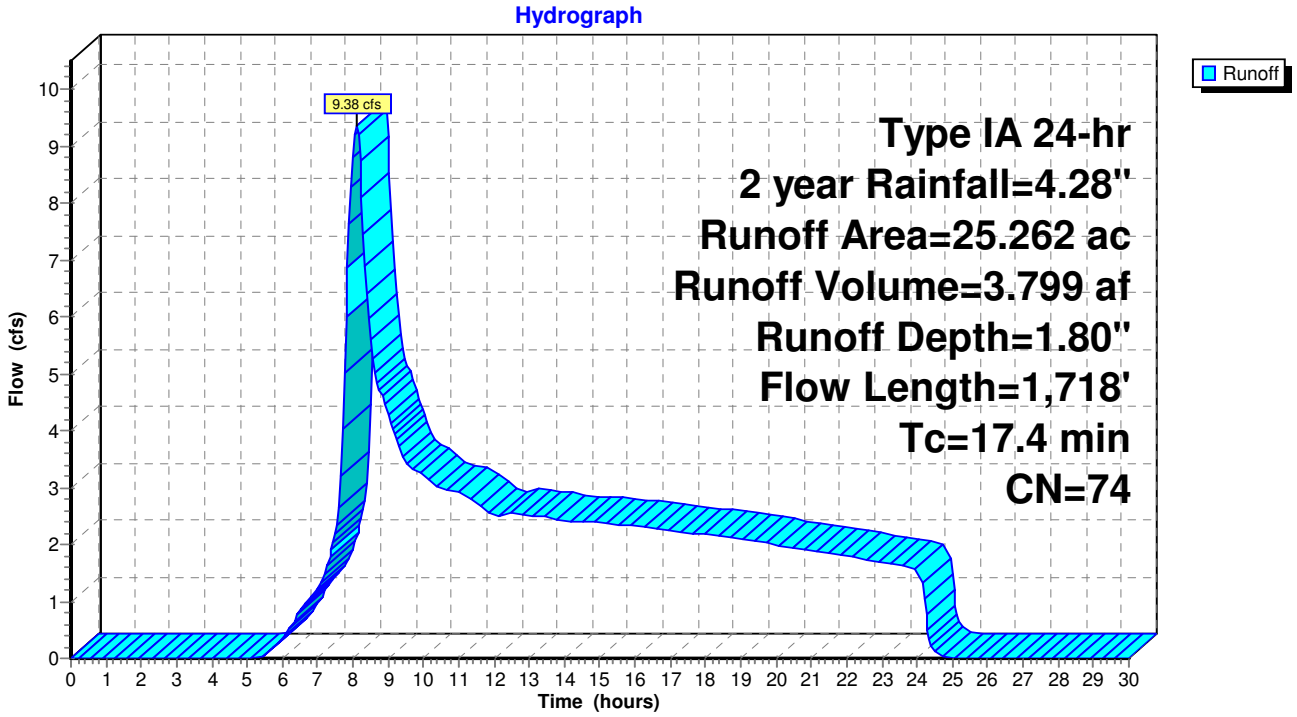
Runoff = 9.38 cfs @ 8.10 hrs, Volume= 3.799 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
0.461	79	Annual Grass, Fair, HSG C
0.281	75	Annual Grass, Good, HSG C
1.363	65	Brush, Good, HSG C
0.485	87	Dirt roads, HSG C
21.052	75	Vineyard, Good, HSG C
1.619	70	Woods, Good, HSG C
25.262	74	Weighted Average
25.262		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
11.2	1,247	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.5	371	0.0700	11.94	143.33	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
17.4	1,718	Total			

Subcatchment WS2: WS2



Summary for Subcatchment WS2: WS2

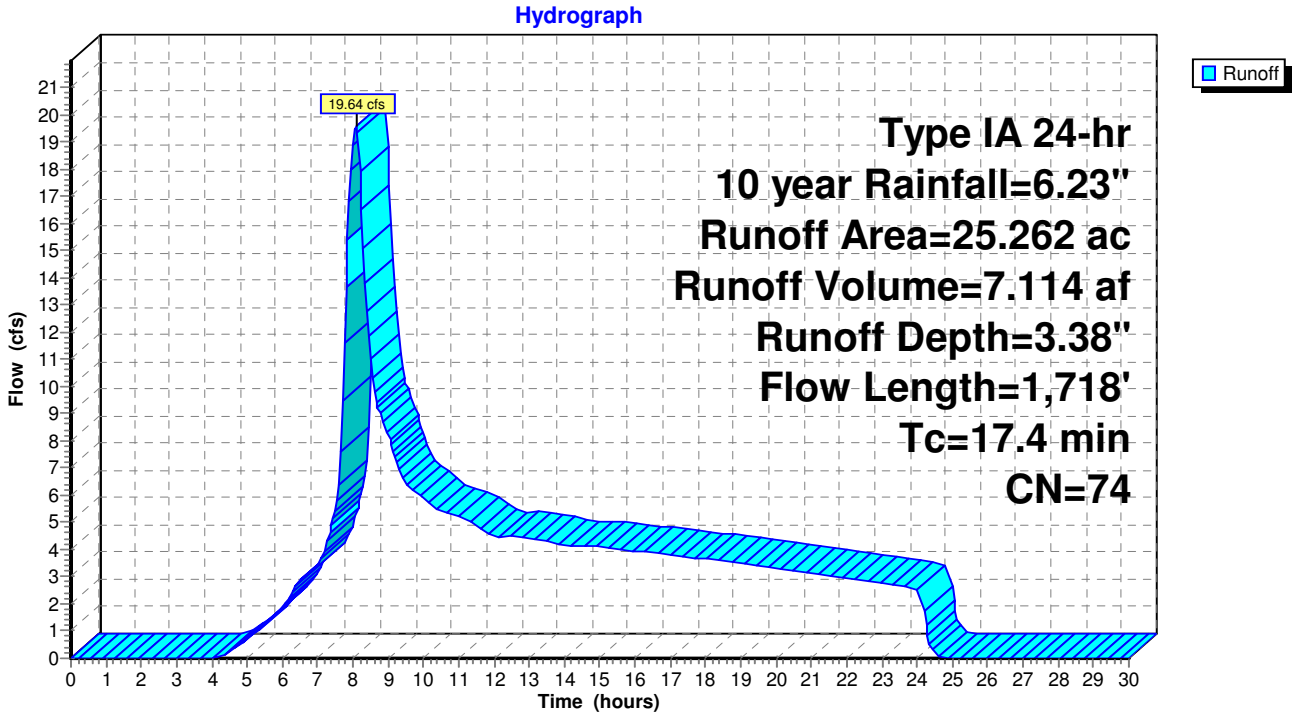
Runoff = 19.64 cfs @ 8.09 hrs, Volume= 7.114 af, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
0.461	79	Annual Grass, Fair, HSG C
0.281	75	Annual Grass, Good, HSG C
1.363	65	Brush, Good, HSG C
0.485	87	Dirt roads, HSG C
21.052	75	Vineyard, Good, HSG C
1.619	70	Woods, Good, HSG C
25.262	74	Weighted Average
25.262		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
11.2	1,247	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.5	371	0.0700	11.94	143.33	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
17.4	1,718	Total			

Subcatchment WS2: WS2



Summary for Subcatchment WS2: WS2

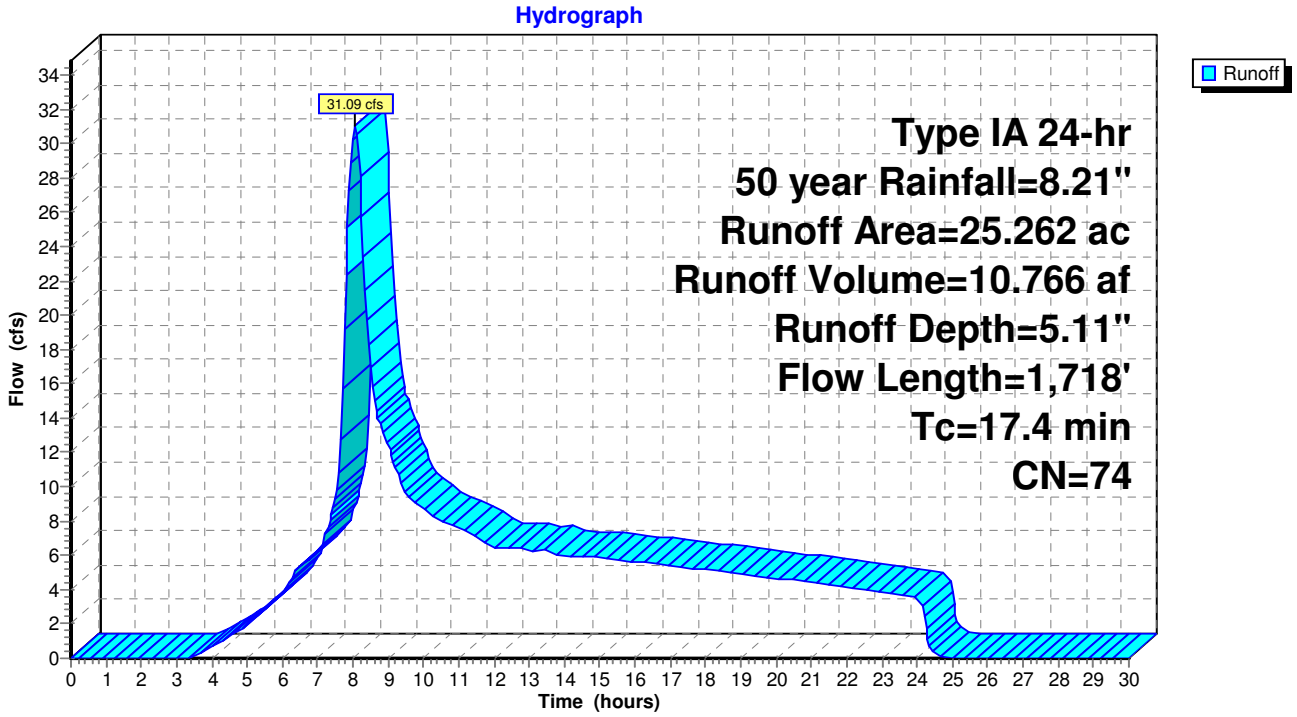
Runoff = 31.09 cfs @ 8.08 hrs, Volume= 10.766 af, Depth= 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
0.461	79	Annual Grass, Fair, HSG C
0.281	75	Annual Grass, Good, HSG C
1.363	65	Brush, Good, HSG C
0.485	87	Dirt roads, HSG C
21.052	75	Vineyard, Good, HSG C
1.619	70	Woods, Good, HSG C
25.262	74	Weighted Average
25.262		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
11.2	1,247	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.5	371	0.0700	11.94	143.33	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
17.4	1,718	Total			

Subcatchment WS2: WS2



Summary for Subcatchment WS2: WS2

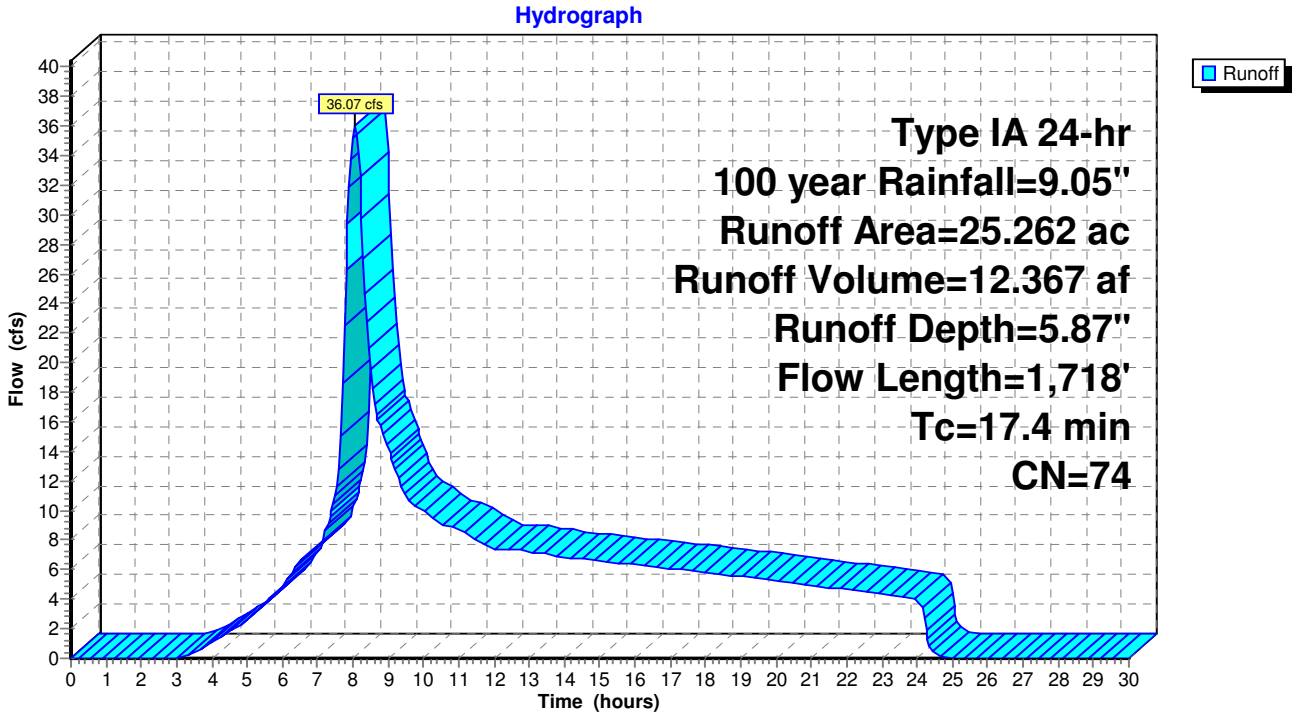
Runoff = 36.07 cfs @ 8.07 hrs, Volume= 12.367 af, Depth= 5.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
0.461	79	Annual Grass, Fair, HSG C
0.281	75	Annual Grass, Good, HSG C
1.363	65	Brush, Good, HSG C
0.485	87	Dirt roads, HSG C
21.052	75	Vineyard, Good, HSG C
1.619	70	Woods, Good, HSG C
25.262	74	Weighted Average
25.262		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
11.2	1,247	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.5	371	0.0700	11.94	143.33	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
17.4	1,718	Total			

Subcatchment WS2: WS2



WS3

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Pre-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS3: WS3

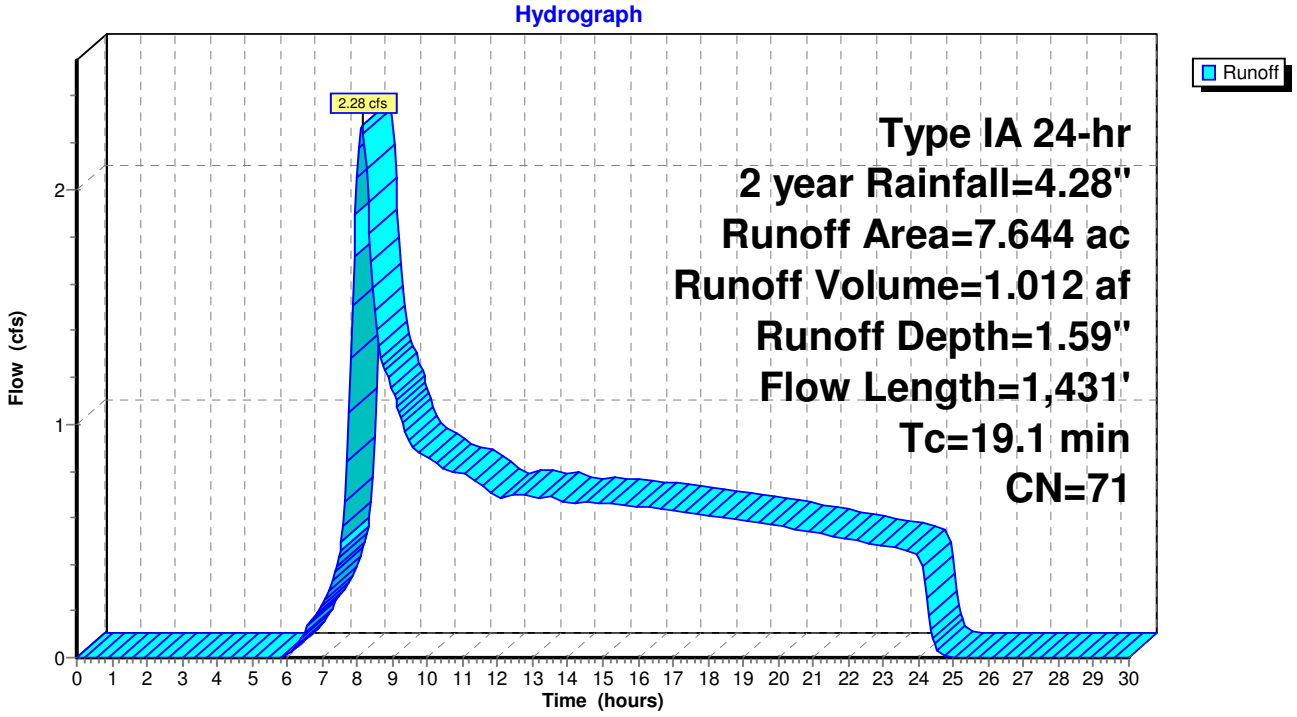
Runoff = 2.28 cfs @ 8.13 hrs, Volume= 1.012 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
1.957	75	Annual Grass, Good, HSG C
5.687	70	Woods, Good, HSG C
7.644	71	Weighted Average
7.644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
2.5	274	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
6.8	676	0.1100	1.66		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.7	439	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
19.1	1,431	Total			

Subcatchment WS3: WS3



Summary for Subcatchment WS3: WS3

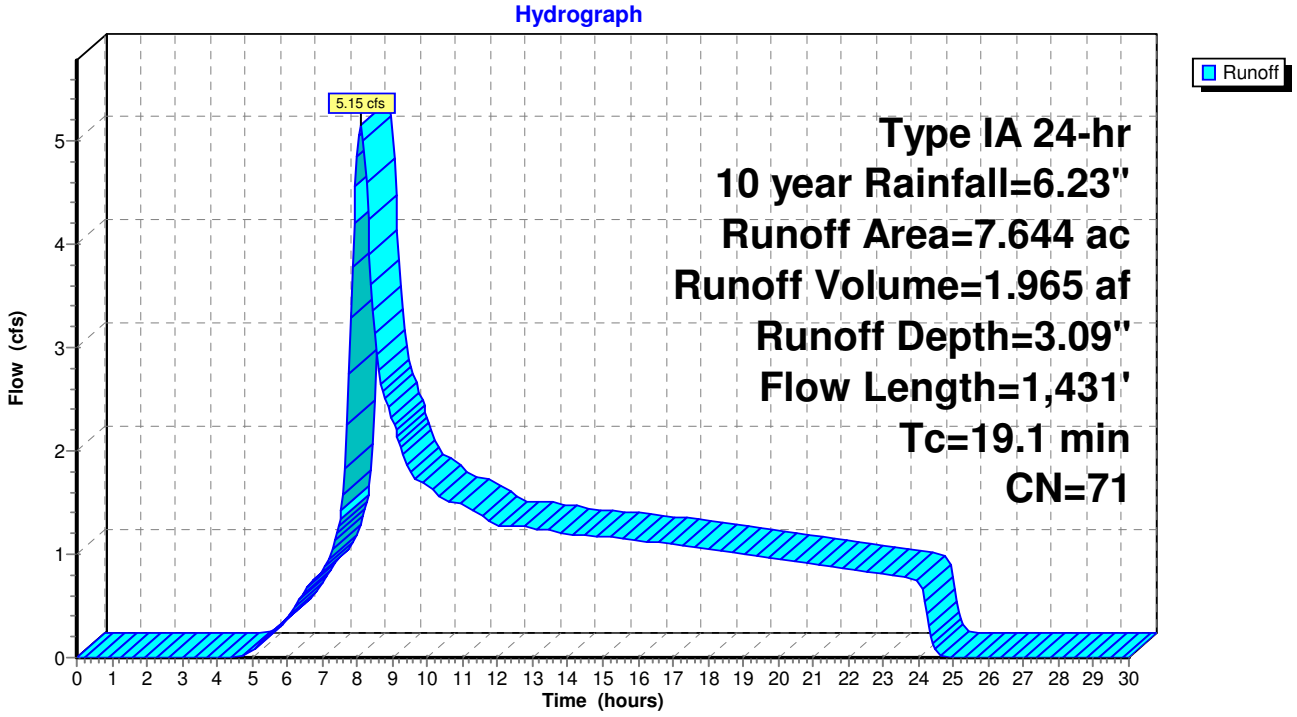
Runoff = 5.15 cfs @ 8.11 hrs, Volume= 1.965 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
1.957	75	Annual Grass, Good, HSG C
5.687	70	Woods, Good, HSG C
7.644	71	Weighted Average
7.644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
2.5	274	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
6.8	676	0.1100	1.66		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.7	439	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
19.1	1,431	Total			

Subcatchment WS3: WS3



Summary for Subcatchment WS3: WS3

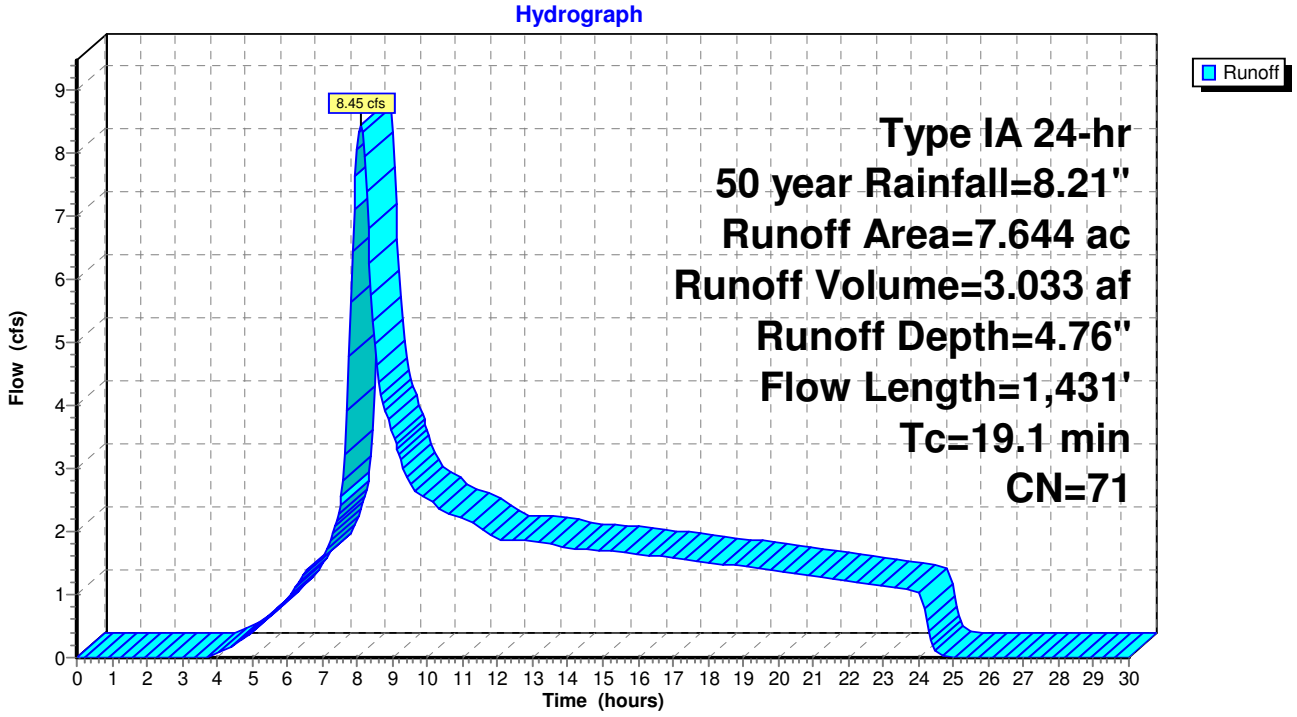
Runoff = 8.45 cfs @ 8.10 hrs, Volume= 3.033 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
1.957	75	Annual Grass, Good, HSG C
5.687	70	Woods, Good, HSG C
7.644	71	Weighted Average
7.644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
2.5	274	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
6.8	676	0.1100	1.66		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.7	439	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
19.1	1,431	Total			

Subcatchment WS3: WS3



Summary for Subcatchment WS3: WS3

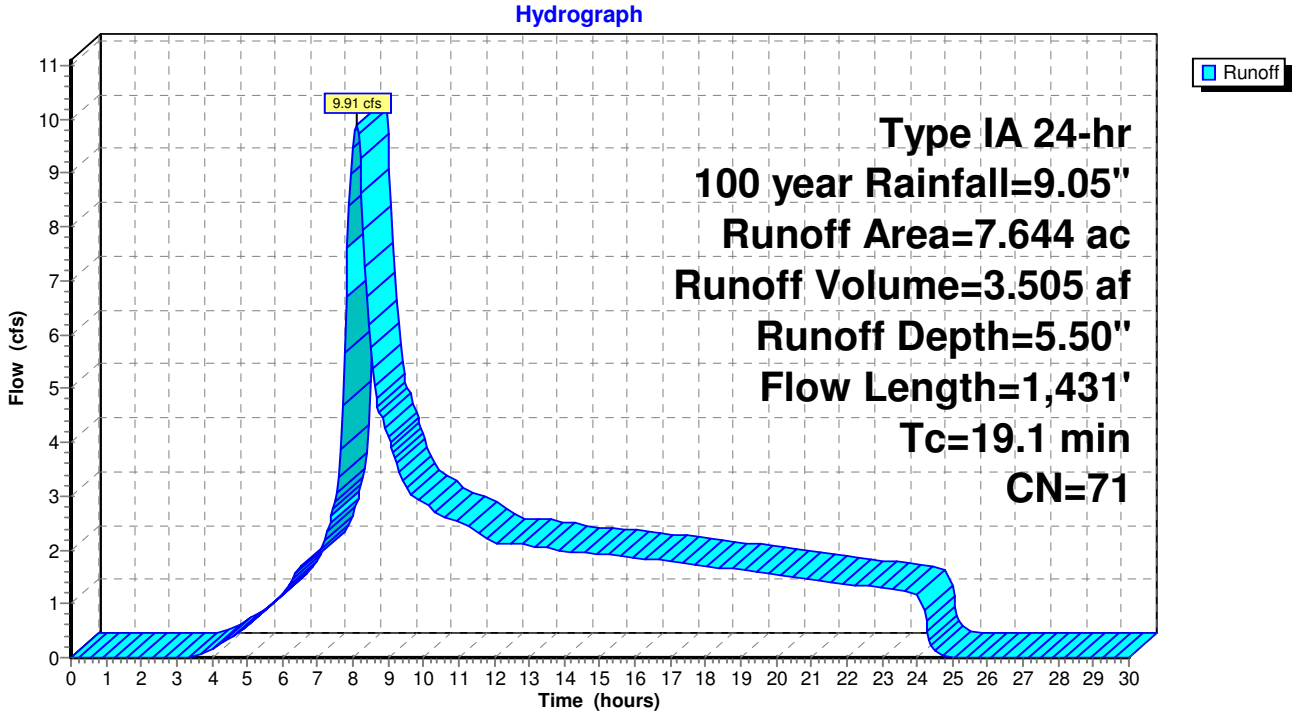
Runoff = 9.91 cfs @ 8.10 hrs, Volume= 3.505 af, Depth= 5.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
1.957	75	Annual Grass, Good, HSG C
5.687	70	Woods, Good, HSG C
7.644	71	Weighted Average
7.644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
2.5	274	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
6.8	676	0.1100	1.66		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.7	439	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
19.1	1,431	Total			

Subcatchment WS3: WS3



WS3

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Post-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS3: WS3

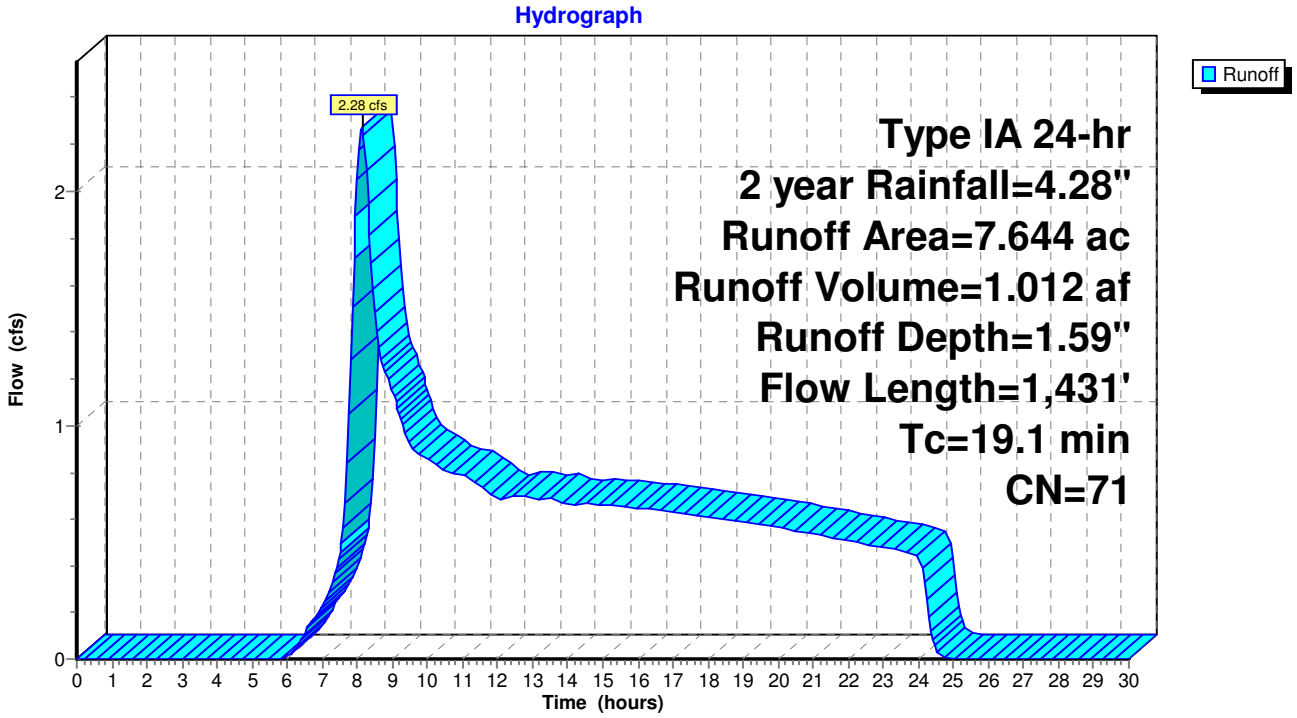
Runoff = 2.28 cfs @ 8.13 hrs, Volume= 1.012 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
0.223	75	Annual Grass, Good, HSG C
1.734	75	Vineyard, Good, HSG C
5.687	70	Woods, Good, HSG C
7.644	71	Weighted Average
7.644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
2.5	274	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
6.8	676	0.1100	1.66		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.7	439	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
19.1	1,431	Total			

Subcatchment WS3: WS3



Summary for Subcatchment WS3: WS3

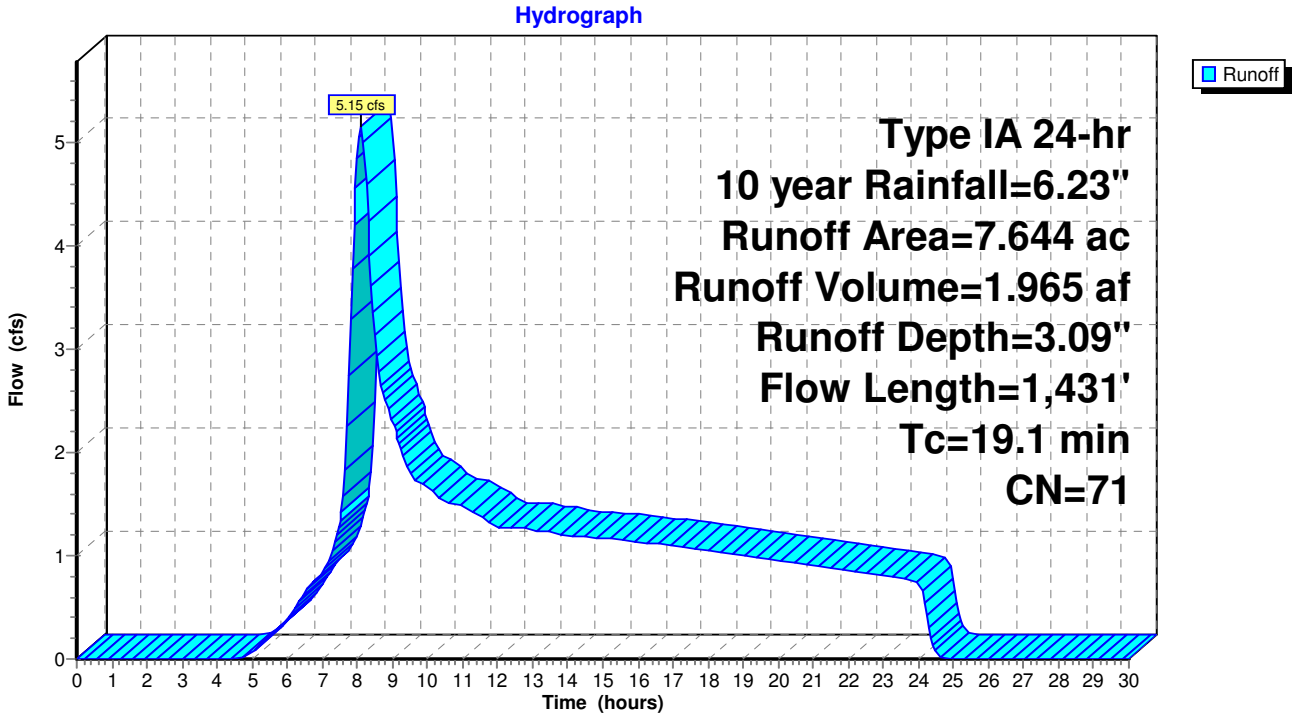
Runoff = 5.15 cfs @ 8.11 hrs, Volume= 1.965 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
0.223	75	Annual Grass, Good, HSG C
1.734	75	Vineyard, Good, HSG C
5.687	70	Woods, Good, HSG C
7.644	71	Weighted Average
7.644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
2.5	274	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
6.8	676	0.1100	1.66		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.7	439	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
19.1	1,431	Total			

Subcatchment WS3: WS3



Summary for Subcatchment WS3: WS3

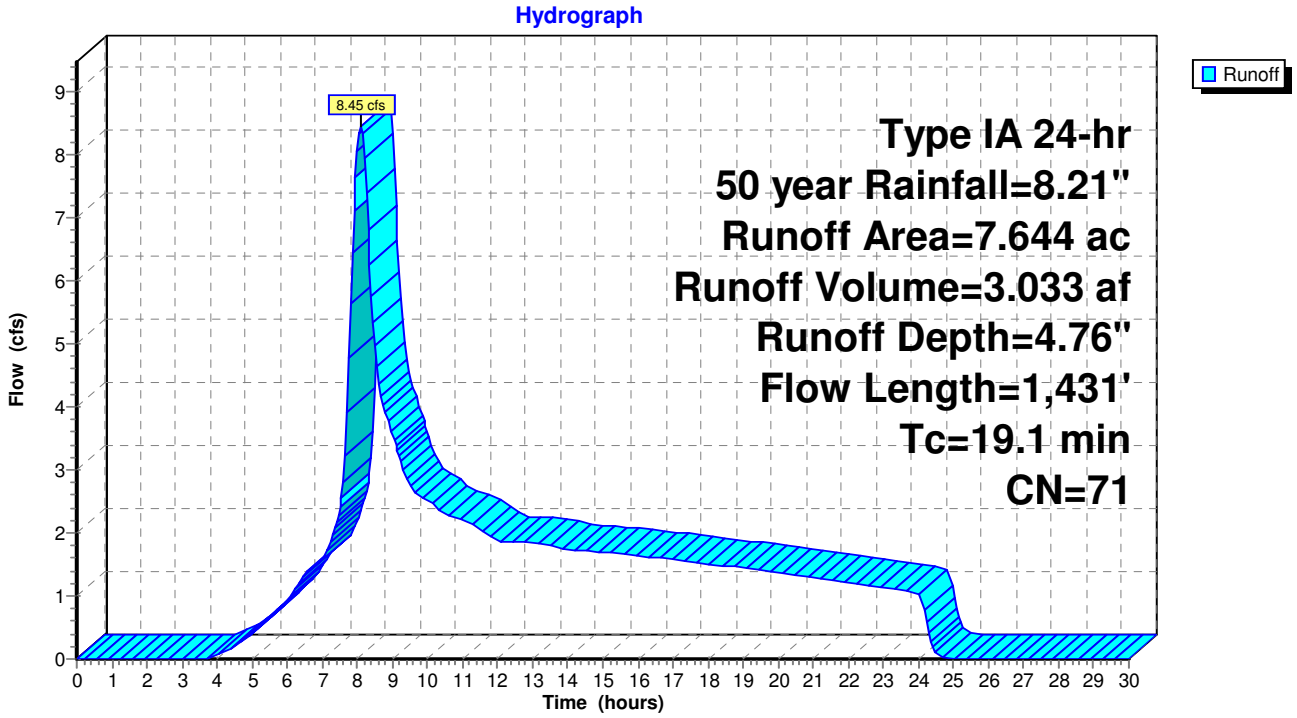
Runoff = 8.45 cfs @ 8.10 hrs, Volume= 3.033 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
0.223	75	Annual Grass, Good, HSG C
1.734	75	Vineyard, Good, HSG C
5.687	70	Woods, Good, HSG C
7.644	71	Weighted Average
7.644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
2.5	274	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
6.8	676	0.1100	1.66		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.7	439	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
19.1	1,431	Total			

Subcatchment WS3: WS3



Summary for Subcatchment WS3: WS3

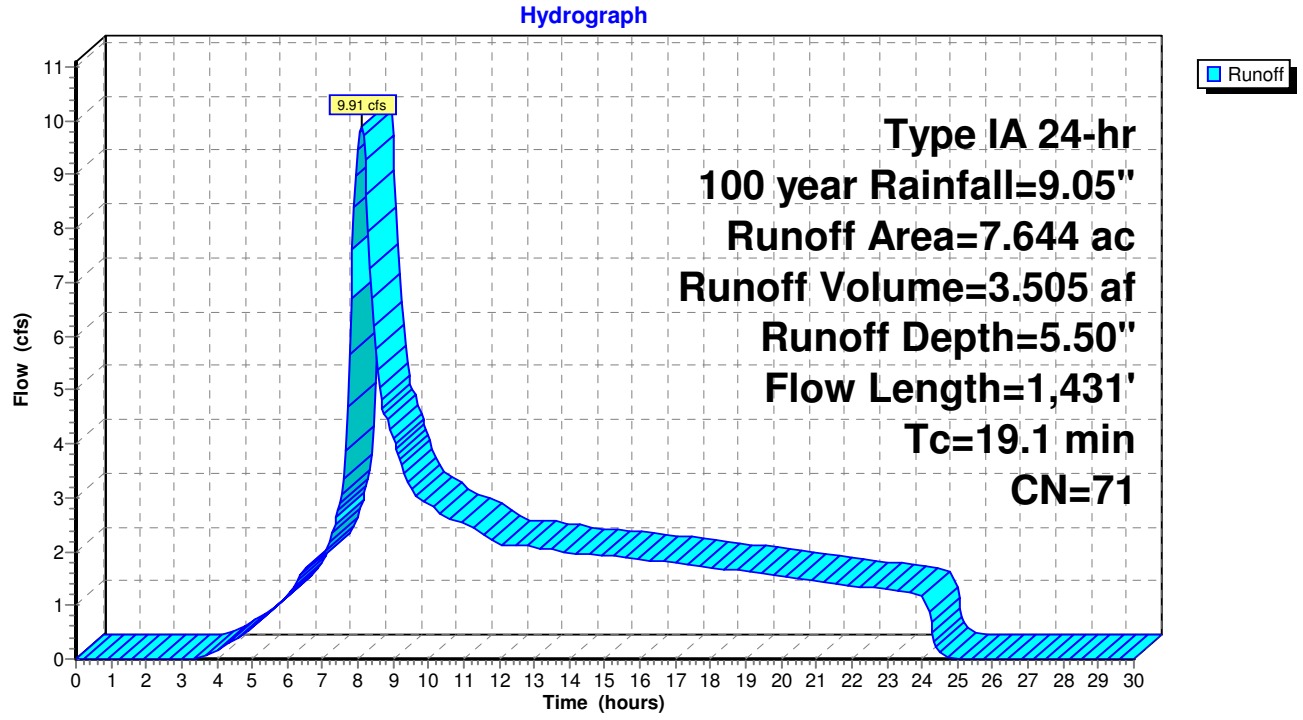
Runoff = 9.91 cfs @ 8.10 hrs, Volume= 3.505 af, Depth= 5.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
0.223	75	Annual Grass, Good, HSG C
1.734	75	Vineyard, Good, HSG C
5.687	70	Woods, Good, HSG C
7.644	71	Weighted Average
7.644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
2.5	274	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
6.8	676	0.1100	1.66		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.7	439	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
19.1	1,431	Total			

Subcatchment WS3: WS3



WS4

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Pre-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS4: WS4

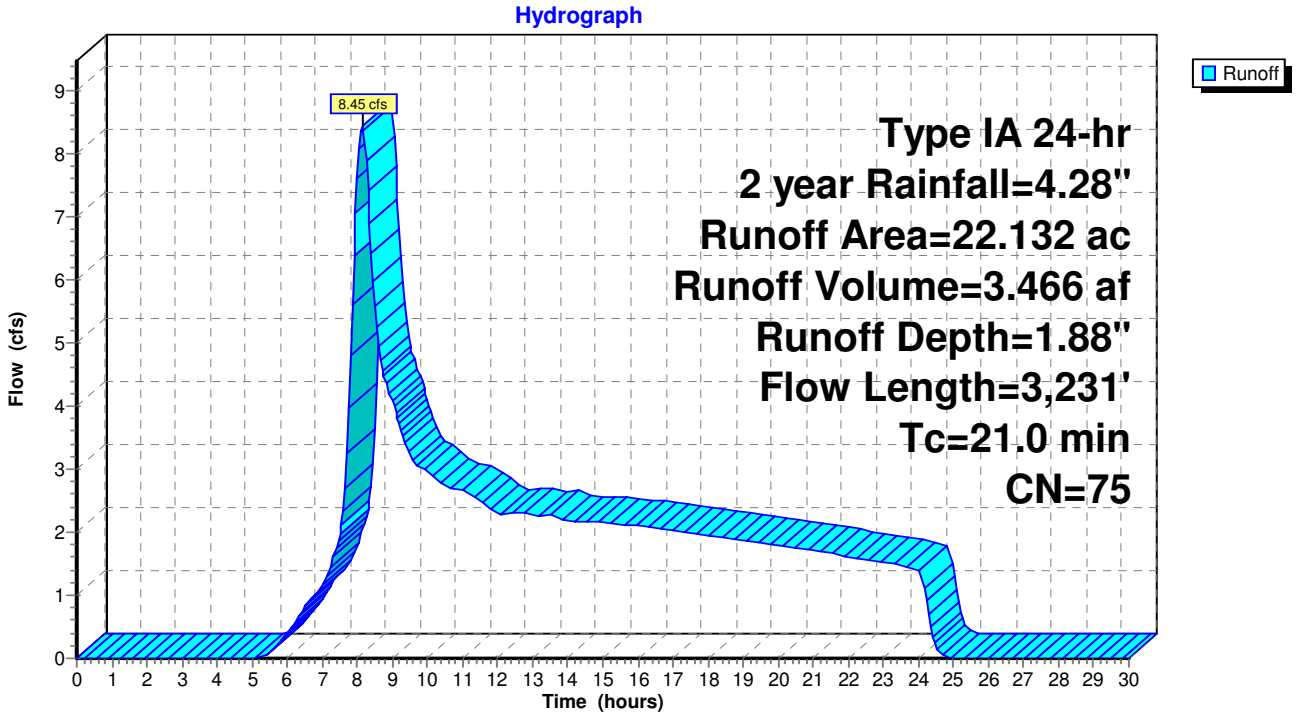
Runoff = 8.45 cfs @ 8.14 hrs, Volume= 3.466 af, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
6.646	79	Annual Grass, Fair, HSG C
6.462	75	Annual Grass, Good, HSG C
0.906	65	Brush, Good, HSG C
0.437	87	Dirt roads, HSG C
0.683	92	Paved roads w/open ditches, 50% imp, HSG C
6.998	70	Woods, Good, HSG C
22.132	75	Weighted Average
21.791		98.46% Pervious Area
0.341		1.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
5.2	308	0.0200	0.99		**Shallow Concentrated Flow, Shallow Short Grass** Short Grass Pasture Kv= 7.0 fps
5.6	1,452	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch-1** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
0.1	90	0.1700	15.44	48.50	**Pipe Channel, 24" CMP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
0.0	23	0.3000	51.27	161.08	**Pipe Channel, 24" DWCPP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PPI Dual Walled CPP
2.0	1,316	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
21.0	3,231	Total			

Subcatchment WS4: WS4



Summary for Subcatchment WS4: WS4

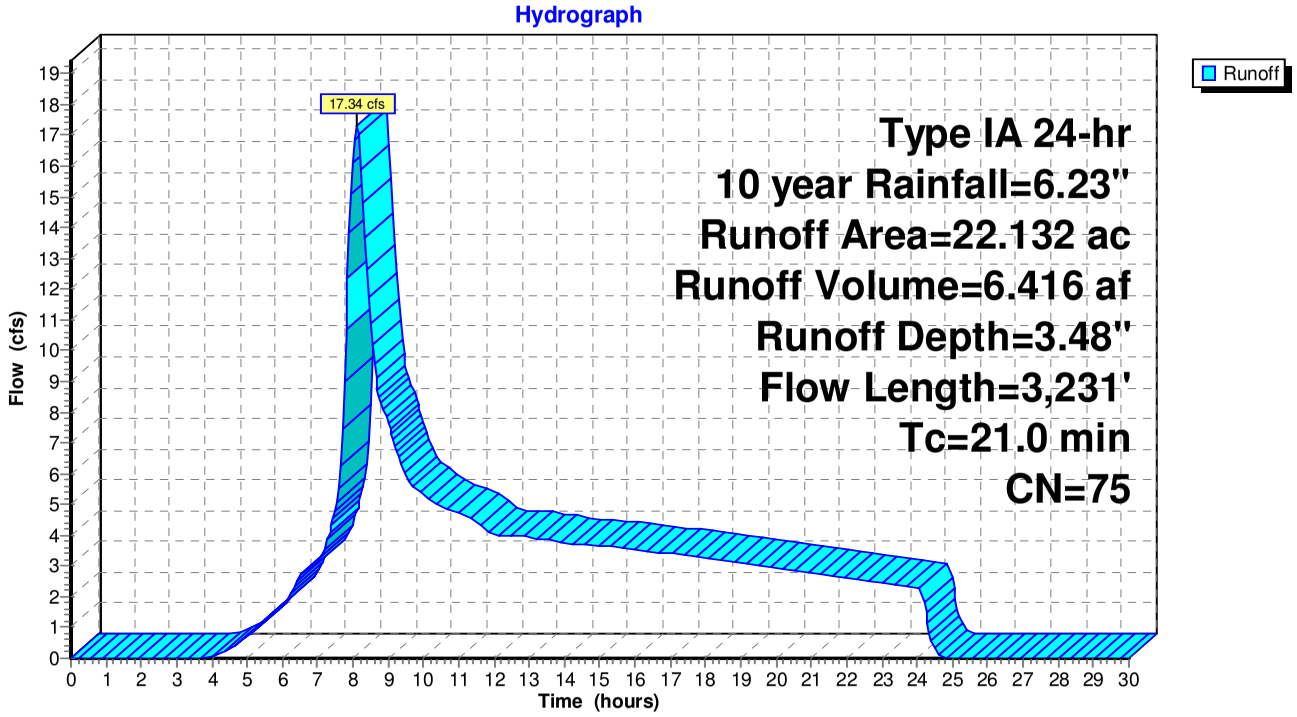
Runoff = 17.34 cfs @ 8.12 hrs, Volume= 6.416 af, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
6.646	79	Annual Grass, Fair, HSG C
6.462	75	Annual Grass, Good, HSG C
0.906	65	Brush, Good, HSG C
0.437	87	Dirt roads, HSG C
0.683	92	Paved roads w/open ditches, 50% imp, HSG C
6.998	70	Woods, Good, HSG C
22.132	75	Weighted Average
21.791		98.46% Pervious Area
0.341		1.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
5.2	308	0.0200	0.99		**Shallow Concentrated Flow, Shallow Short Grass** Short Grass Pasture Kv= 7.0 fps
5.6	1,452	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch-1** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
0.1	90	0.1700	15.44	48.50	**Pipe Channel, 24" CMP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
0.0	23	0.3000	51.27	161.08	**Pipe Channel, 24" DWCPP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PPI Dual Walled CPP
2.0	1,316	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
21.0	3,231	Total			

Subcatchment WS4: WS4



Summary for Subcatchment WS4: WS4

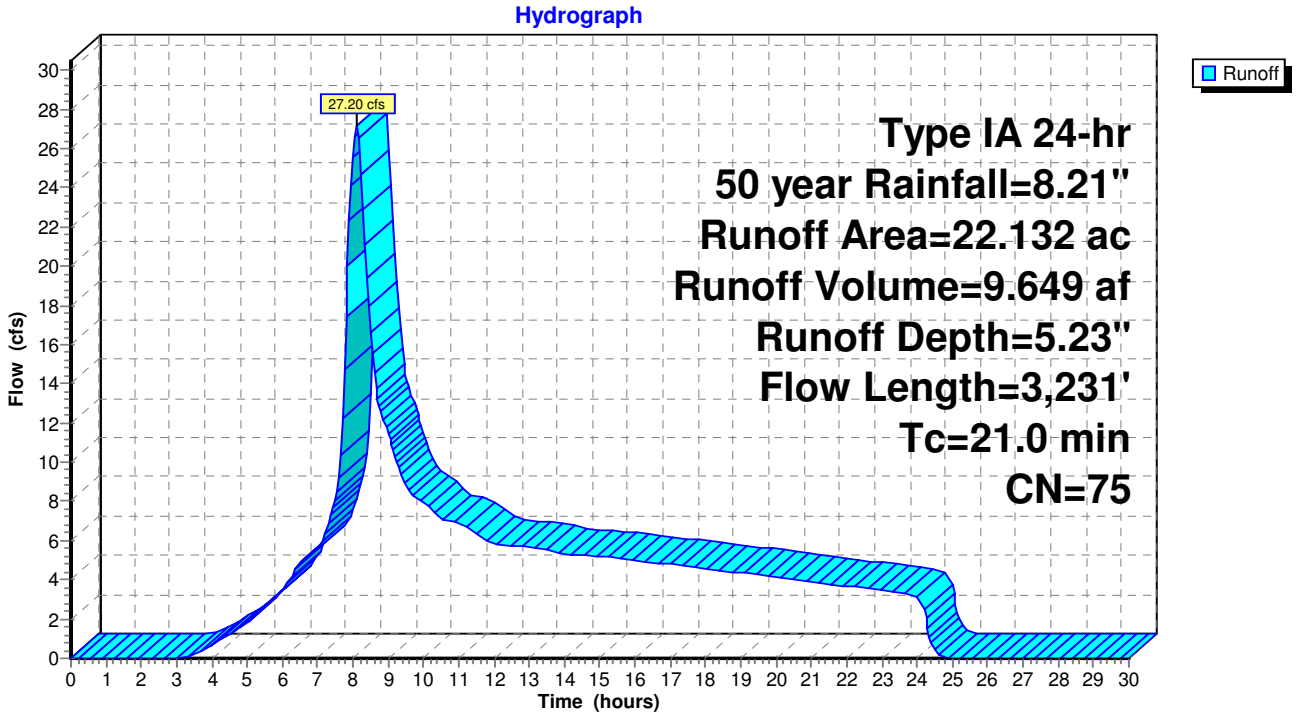
Runoff = 27.20 cfs @ 8.11 hrs, Volume= 9.649 af, Depth= 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
6.646	79	Annual Grass, Fair, HSG C
6.462	75	Annual Grass, Good, HSG C
0.906	65	Brush, Good, HSG C
0.437	87	Dirt roads, HSG C
0.683	92	Paved roads w/open ditches, 50% imp, HSG C
6.998	70	Woods, Good, HSG C
22.132	75	Weighted Average
21.791		98.46% Pervious Area
0.341		1.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
5.2	308	0.0200	0.99		**Shallow Concentrated Flow, Shallow Short Grass** Short Grass Pasture Kv= 7.0 fps
5.6	1,452	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch-1** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
0.1	90	0.1700	15.44	48.50	**Pipe Channel, 24" CMP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
0.0	23	0.3000	51.27	161.08	**Pipe Channel, 24" DWCPP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PPI Dual Walled CPP
2.0	1,316	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
21.0	3,231	Total			

Subcatchment WS4: WS4



Summary for Subcatchment WS4: WS4

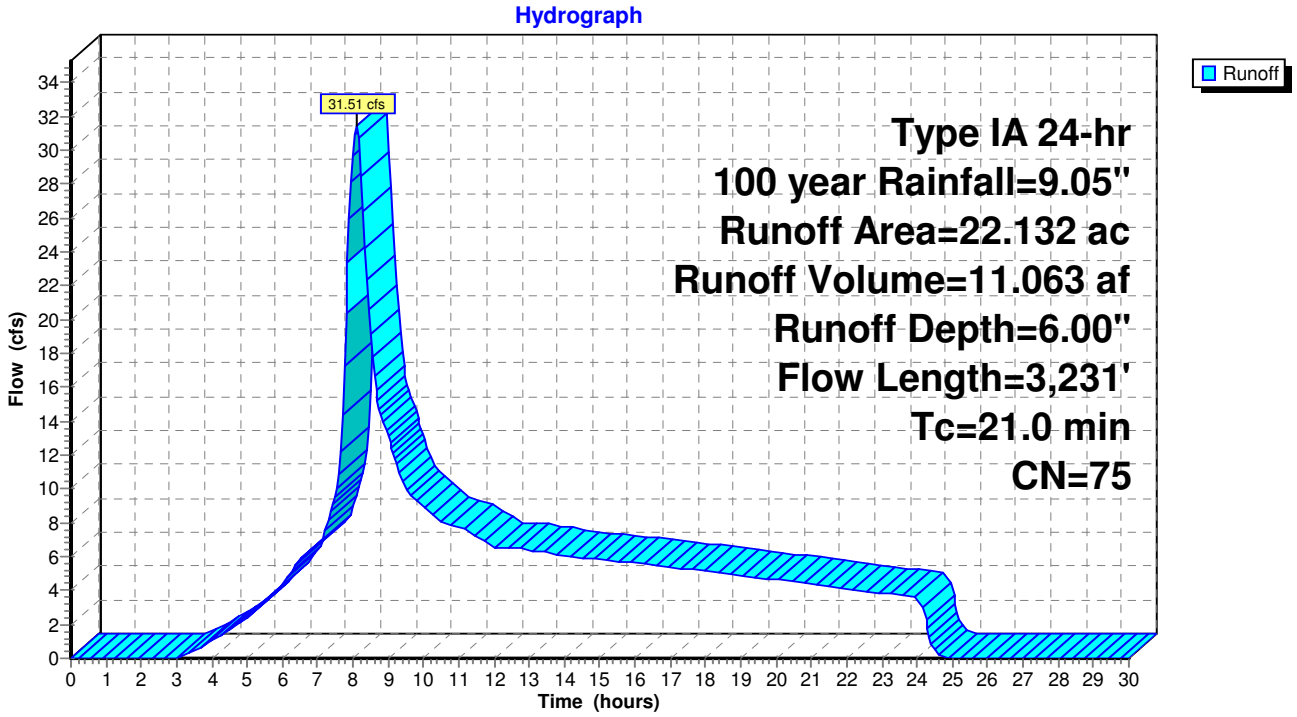
Runoff = 31.51 cfs @ 8.11 hrs, Volume= 11.063 af, Depth= 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
6.646	79	Annual Grass, Fair, HSG C
6.462	75	Annual Grass, Good, HSG C
0.906	65	Brush, Good, HSG C
0.437	87	Dirt roads, HSG C
0.683	92	Paved roads w/open ditches, 50% imp, HSG C
6.998	70	Woods, Good, HSG C
22.132	75	Weighted Average
21.791		98.46% Pervious Area
0.341		1.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
5.2	308	0.0200	0.99		**Shallow Concentrated Flow, Shallow Short Grass** Short Grass Pasture Kv= 7.0 fps
5.6	1,452	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch-1** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
0.1	90	0.1700	15.44	48.50	**Pipe Channel, 24" CMP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
0.0	23	0.3000	51.27	161.08	**Pipe Channel, 24" DWCPP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PPI Dual Walled CPP
2.0	1,316	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
21.0	3,231	Total			

Subcatchment WS4: WS4



WS4

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Post-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS4: WS4

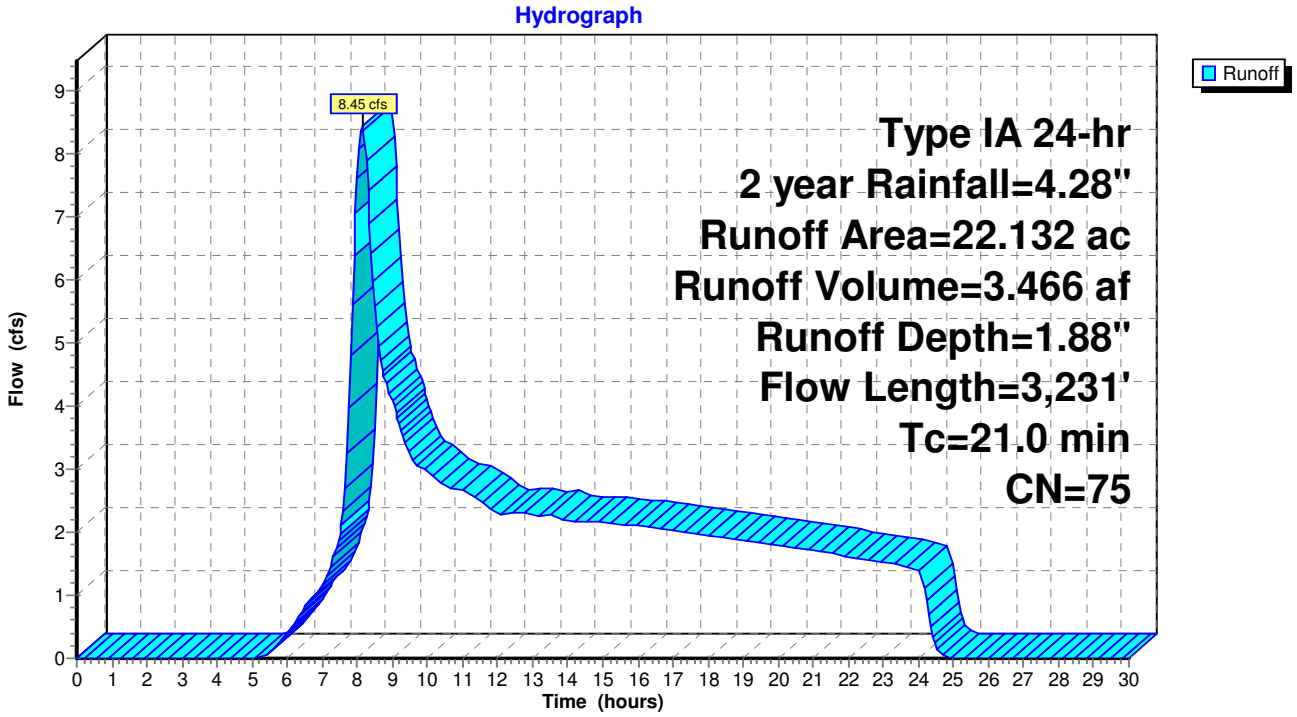
Runoff = 8.45 cfs @ 8.14 hrs, Volume= 3.466 af, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
6.646	79	Annual Grass, Fair, HSG C
1.500	75	Annual Grass, Good, HSG C
0.906	65	Brush, Good, HSG C
0.437	87	Dirt roads, HSG C
0.683	92	Paved roads w/open ditches, 50% imp, HSG C
4.962	75	Vineyard, Good, HSG C
6.998	70	Woods, Good, HSG C
22.132	75	Weighted Average
21.791		98.46% Pervious Area
0.341		1.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
5.2	308	0.0200	0.99		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
5.6	1,452	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch-1** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
0.1	90	0.1700	15.44	48.50	**Pipe Channel, 24" CMP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
0.0	23	0.3000	51.27	161.08	**Pipe Channel, 24" DWCPP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PPI Dual Walled CPP
2.0	1,316	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
21.0	3,231	Total			

Subcatchment WS4: WS4



Summary for Subcatchment WS4: WS4

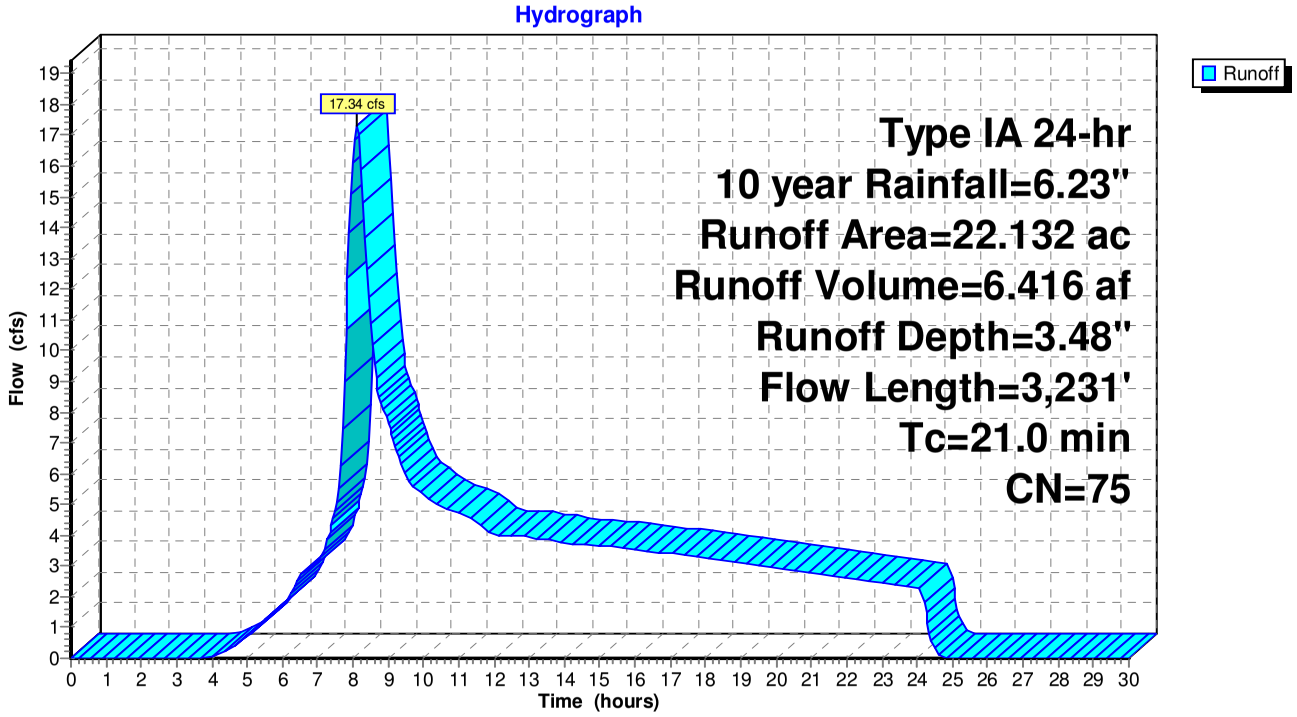
Runoff = 17.34 cfs @ 8.12 hrs, Volume= 6.416 af, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
6.646	79	Annual Grass, Fair, HSG C
1.500	75	Annual Grass, Good, HSG C
0.906	65	Brush, Good, HSG C
0.437	87	Dirt roads, HSG C
0.683	92	Paved roads w/open ditches, 50% imp, HSG C
4.962	75	Vineyard, Good, HSG C
6.998	70	Woods, Good, HSG C
22.132	75	Weighted Average
21.791		98.46% Pervious Area
0.341		1.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
5.2	308	0.0200	0.99		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
5.6	1,452	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch-1** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
0.1	90	0.1700	15.44	48.50	**Pipe Channel, 24" CMP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
0.0	23	0.3000	51.27	161.08	**Pipe Channel, 24" DWCPP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PPI Dual Walled CPP
2.0	1,316	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
21.0	3,231	Total			

Subcatchment WS4: WS4



Summary for Subcatchment WS4: WS4

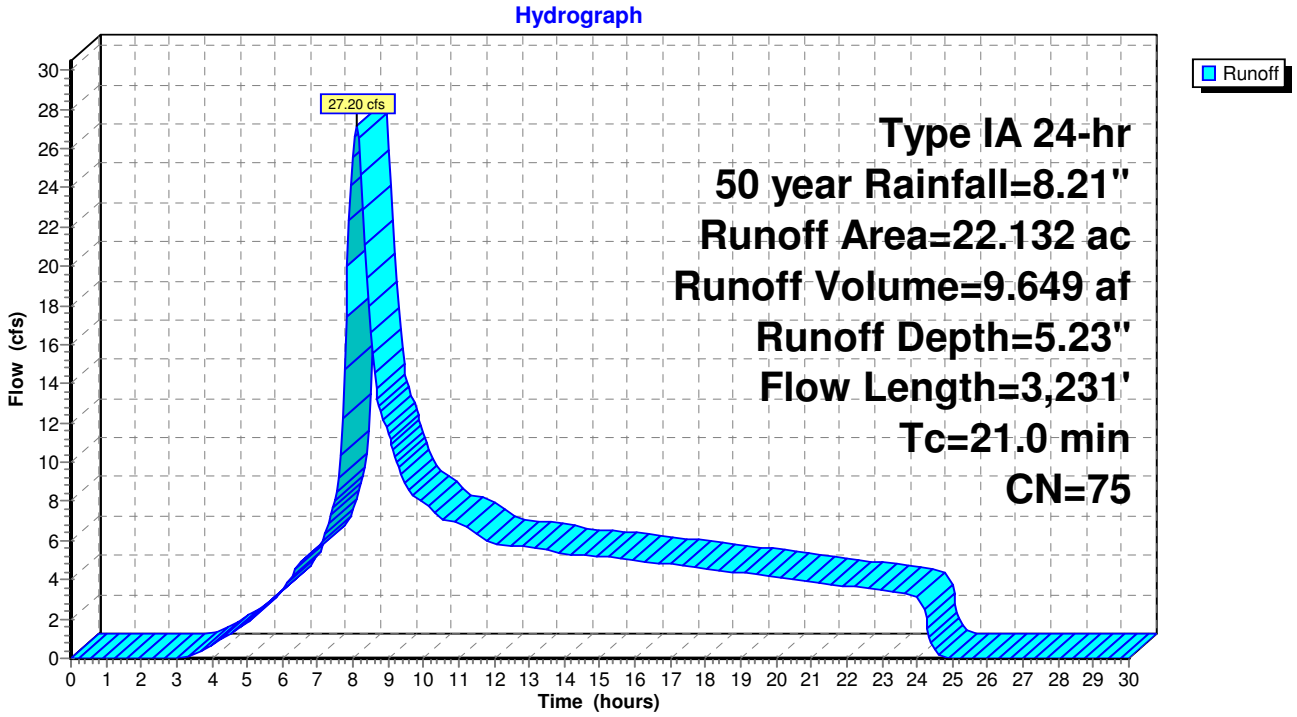
Runoff = 27.20 cfs @ 8.11 hrs, Volume= 9.649 af, Depth= 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
6.646	79	Annual Grass, Fair, HSG C
1.500	75	Annual Grass, Good, HSG C
0.906	65	Brush, Good, HSG C
0.437	87	Dirt roads, HSG C
0.683	92	Paved roads w/open ditches, 50% imp, HSG C
4.962	75	Vineyard, Good, HSG C
6.998	70	Woods, Good, HSG C
22.132	75	Weighted Average
21.791		98.46% Pervious Area
0.341		1.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
5.2	308	0.0200	0.99		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
5.6	1,452	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch-1** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
0.1	90	0.1700	15.44	48.50	**Pipe Channel, 24" CMP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
0.0	23	0.3000	51.27	161.08	**Pipe Channel, 24" DWCPP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PPI Dual Walled CPP
2.0	1,316	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
21.0	3,231	Total			

Subcatchment WS4: WS4



Summary for Subcatchment WS4: WS4

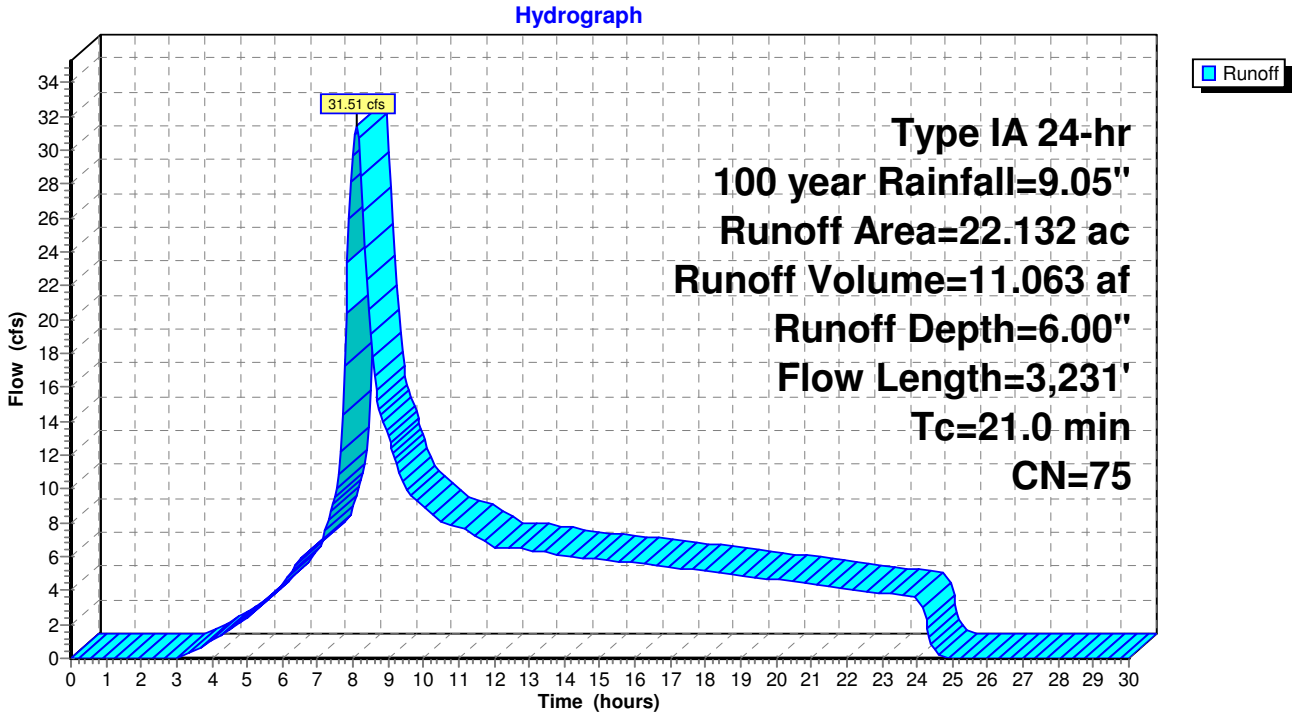
Runoff = 31.51 cfs @ 8.11 hrs, Volume= 11.063 af, Depth= 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
6.646	79	Annual Grass, Fair, HSG C
1.500	75	Annual Grass, Good, HSG C
0.906	65	Brush, Good, HSG C
0.437	87	Dirt roads, HSG C
0.683	92	Paved roads w/open ditches, 50% imp, HSG C
4.962	75	Vineyard, Good, HSG C
6.998	70	Woods, Good, HSG C
22.132	75	Weighted Average
21.791		98.46% Pervious Area
0.341		1.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	42	0.0100	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
5.2	308	0.0200	0.99		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
5.6	1,452	0.0300	4.30	8.60	**Trap/Vee/Rect Channel Flow, Std. Ditch-1** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.035
0.1	90	0.1700	15.44	48.50	**Pipe Channel, 24" CMP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
0.0	23	0.3000	51.27	161.08	**Pipe Channel, 24" DWCPP Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PPI Dual Walled CPP
2.0	1,316	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
21.0	3,231	Total			

Subcatchment WS4: WS4



WS5

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Pre-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS5: WS5

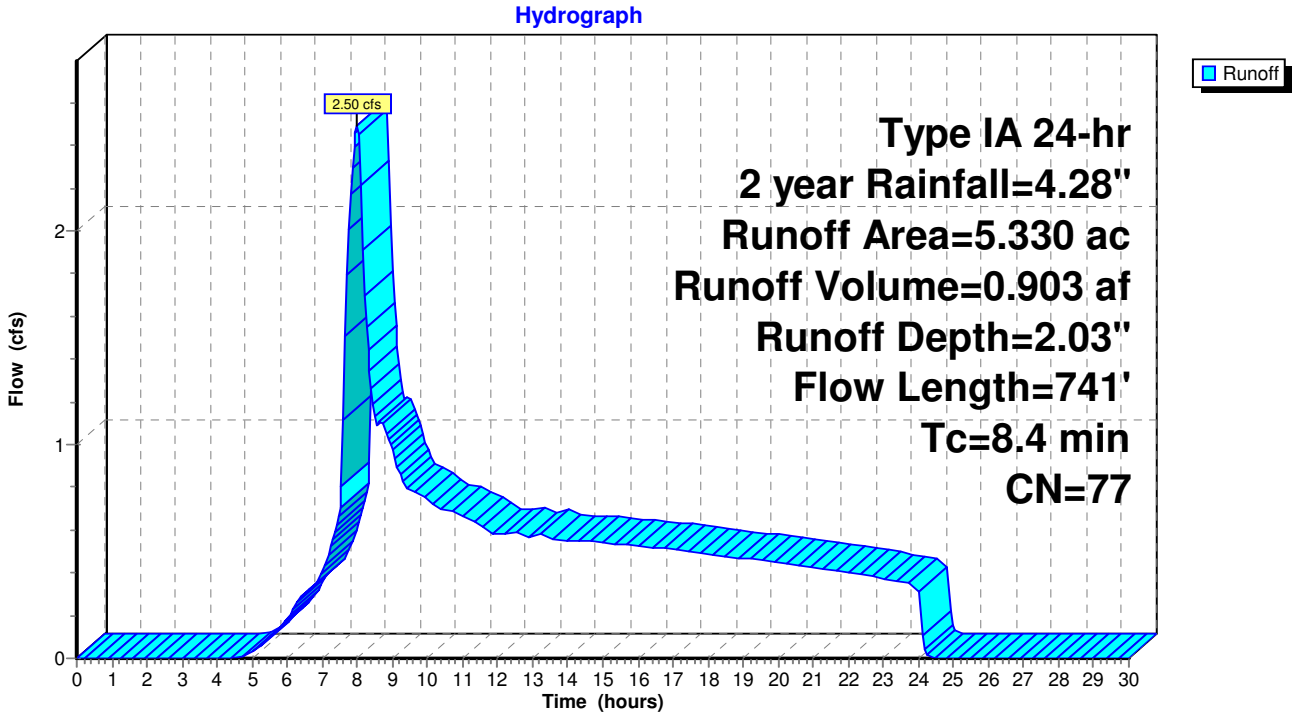
Runoff = 2.50 cfs @ 8.00 hrs, Volume= 0.903 af, Depth= 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
1.631	79	Annual Grass, Fair, HSG C
2.298	75	Annual Grass, Good, HSG C
0.150	87	Dirt roads, HSG C
0.300	92	Paved roads w/open ditches, 50% imp, HSG C
0.951	70	Woods, Good, HSG C
5.330	77	Weighted Average
5.180		97.19% Pervious Area
0.150		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.1	219	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.0	34	0.0600	13.97	17.14	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.6	388	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	741	Total			

Subcatchment WS5: WS5



Summary for Subcatchment WS5: WS5

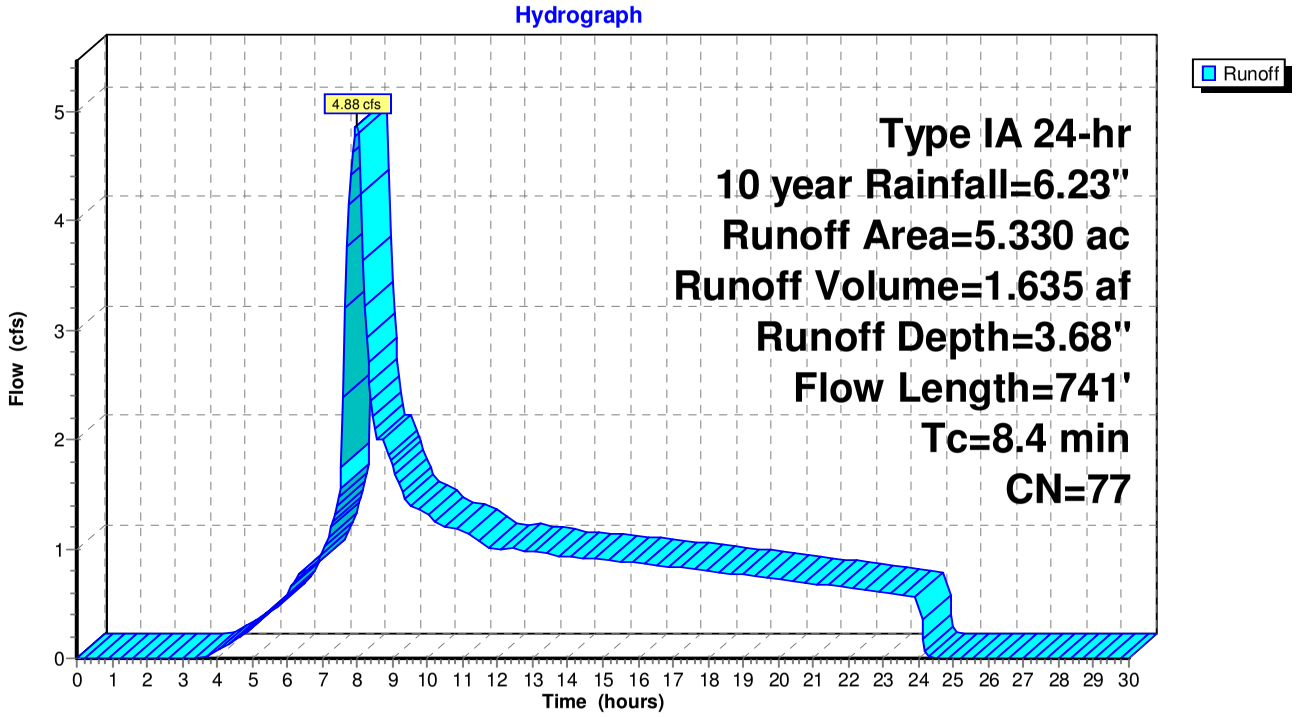
Runoff = 4.88 cfs @ 7.98 hrs, Volume= 1.635 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
1.631	79	Annual Grass, Fair, HSG C
2.298	75	Annual Grass, Good, HSG C
0.150	87	Dirt roads, HSG C
0.300	92	Paved roads w/open ditches, 50% imp, HSG C
0.951	70	Woods, Good, HSG C
5.330	77	Weighted Average
5.180		97.19% Pervious Area
0.150		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.1	219	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.0	34	0.0600	13.97	17.14	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.6	388	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	741	Total			

Subcatchment WS5: WS5



Summary for Subcatchment WS5: WS5

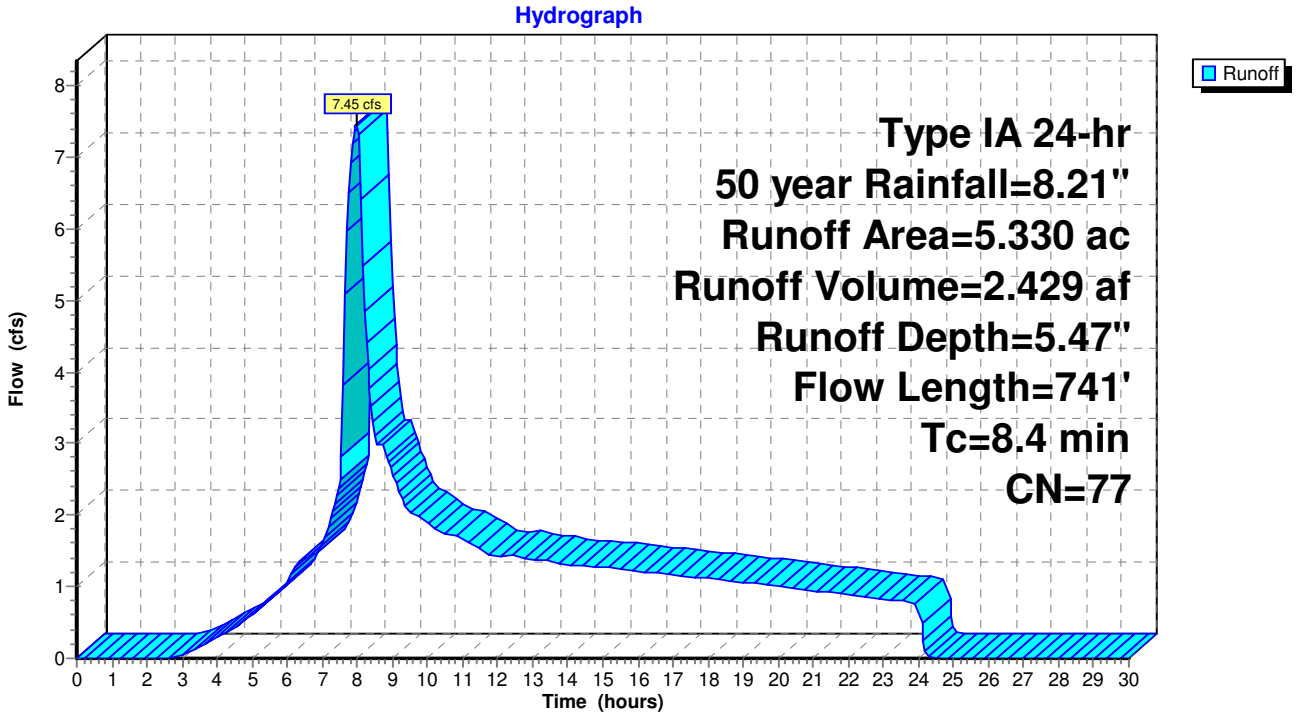
Runoff = 7.45 cfs @ 7.97 hrs, Volume= 2.429 af, Depth= 5.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
1.631	79	Annual Grass, Fair, HSG C
2.298	75	Annual Grass, Good, HSG C
0.150	87	Dirt roads, HSG C
0.300	92	Paved roads w/open ditches, 50% imp, HSG C
0.951	70	Woods, Good, HSG C
5.330	77	Weighted Average
5.180		97.19% Pervious Area
0.150		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.1	219	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.0	34	0.0600	13.97	17.14	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.6	388	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	741	Total			

Subcatchment WS5: WS5



Summary for Subcatchment WS5: WS5

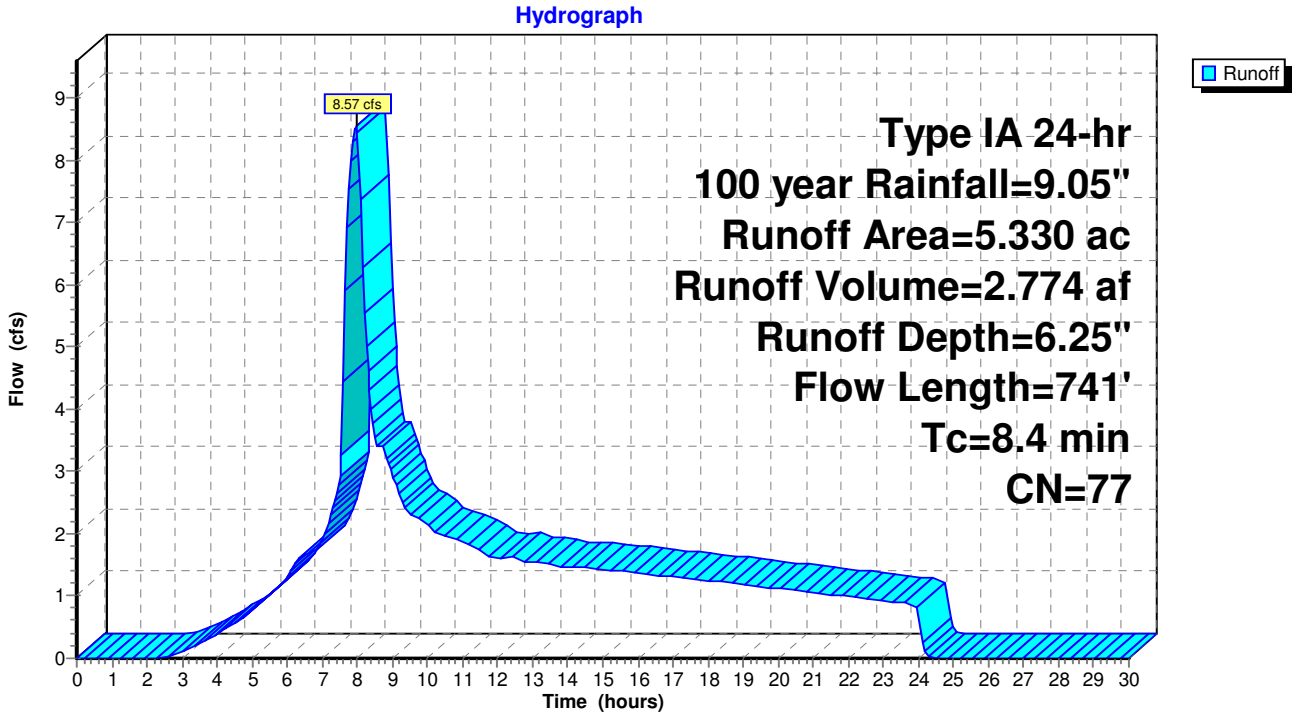
Runoff = 8.57 cfs @ 7.96 hrs, Volume= 2.774 af, Depth= 6.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
1.631	79	Annual Grass, Fair, HSG C
2.298	75	Annual Grass, Good, HSG C
0.150	87	Dirt roads, HSG C
0.300	92	Paved roads w/open ditches, 50% imp, HSG C
0.951	70	Woods, Good, HSG C
5.330	77	Weighted Average
5.180		97.19% Pervious Area
0.150		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.1	219	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.0	34	0.0600	13.97	17.14	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.6	388	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	741	Total			

Subcatchment WS5: WS5



WS5

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Post-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS5: WS5

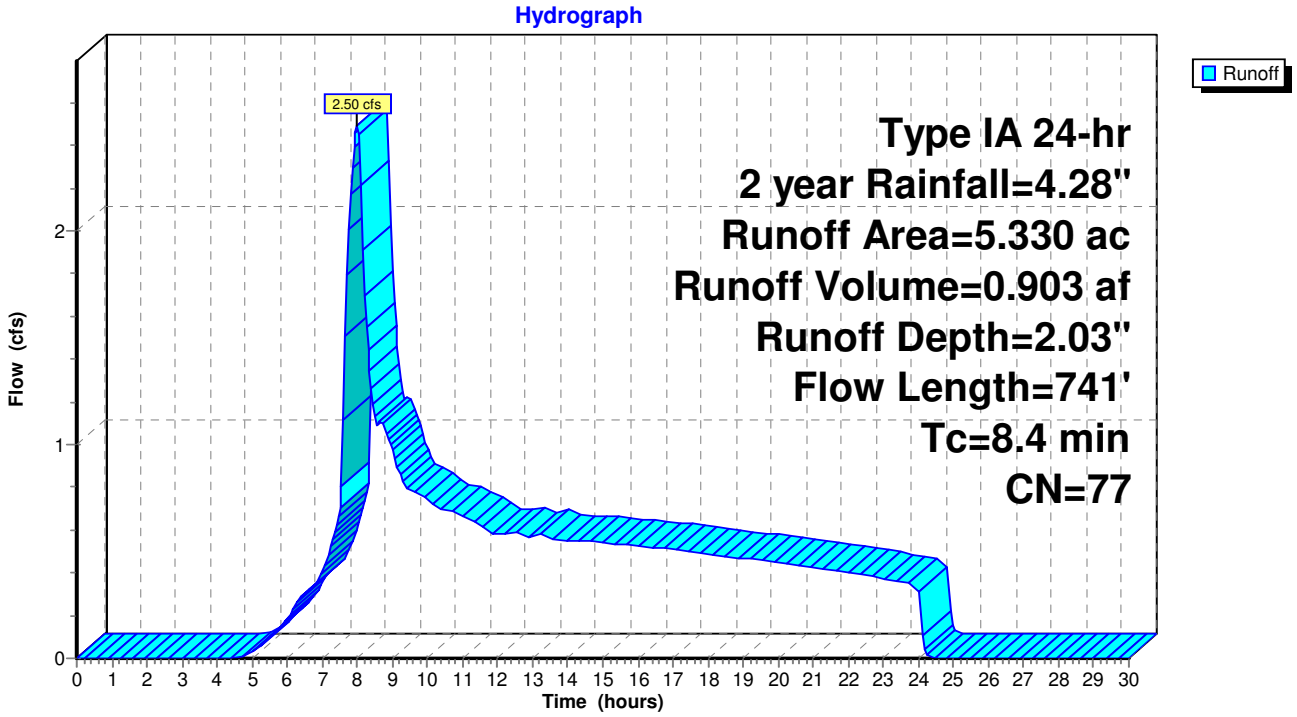
Runoff = 2.50 cfs @ 8.00 hrs, Volume= 0.903 af, Depth= 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
1.631	79	Annual Grass, Fair, HSG C
0.715	75	Annual Grass, Good, HSG C
0.150	87	Dirt roads, HSG C
0.300	92	Paved roads w/open ditches, 50% imp, HSG C
1.583	75	Vineyard, Good, HSG C
0.951	70	Woods, Good, HSG C
5.330	77	Weighted Average
5.180		97.19% Pervious Area
0.150		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
2.1	219	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.0	34	0.0600	13.97	17.14	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.6	388	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	741	Total			

Subcatchment WS5: WS5



Summary for Subcatchment WS5: WS5

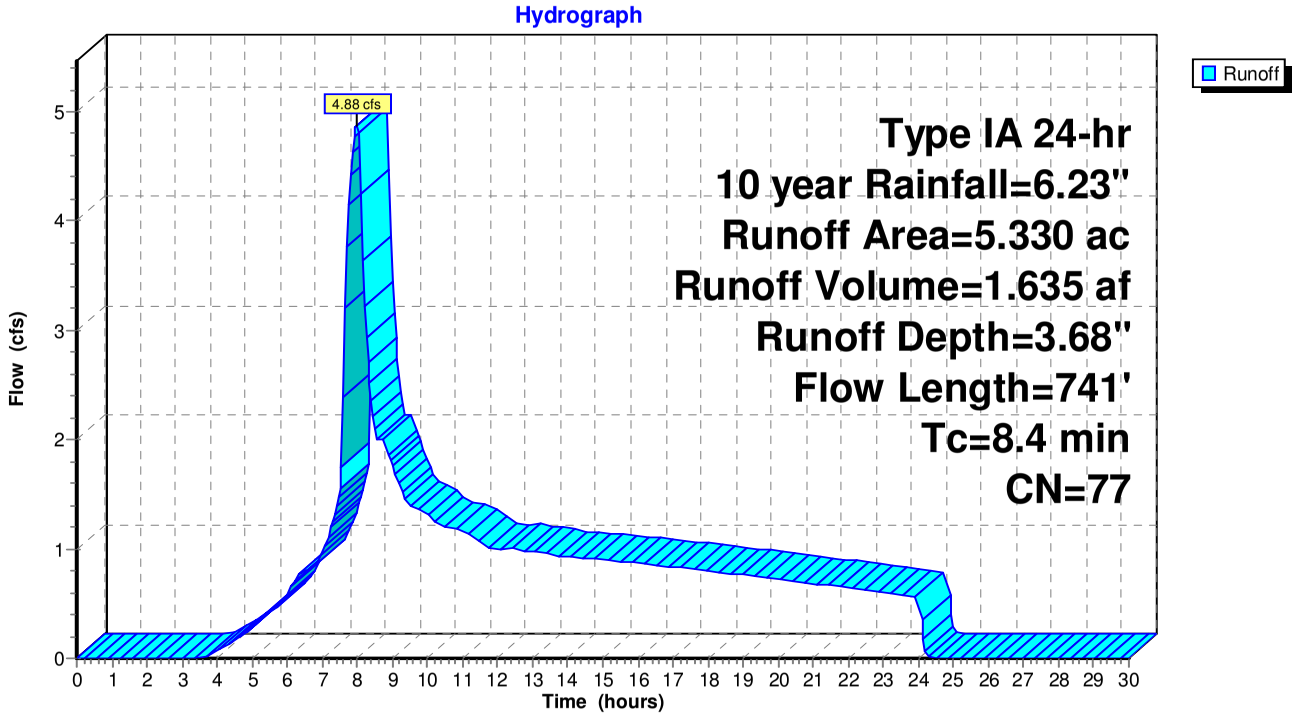
Runoff = 4.88 cfs @ 7.98 hrs, Volume= 1.635 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
1.631	79	Annual Grass, Fair, HSG C
0.715	75	Annual Grass, Good, HSG C
0.150	87	Dirt roads, HSG C
0.300	92	Paved roads w/open ditches, 50% imp, HSG C
1.583	75	Vineyard, Good, HSG C
0.951	70	Woods, Good, HSG C
5.330	77	Weighted Average
5.180		97.19% Pervious Area
0.150		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
2.1	219	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.0	34	0.0600	13.97	17.14	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.6	388	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	741	Total			

Subcatchment WS5: WS5



Summary for Subcatchment WS5: WS5

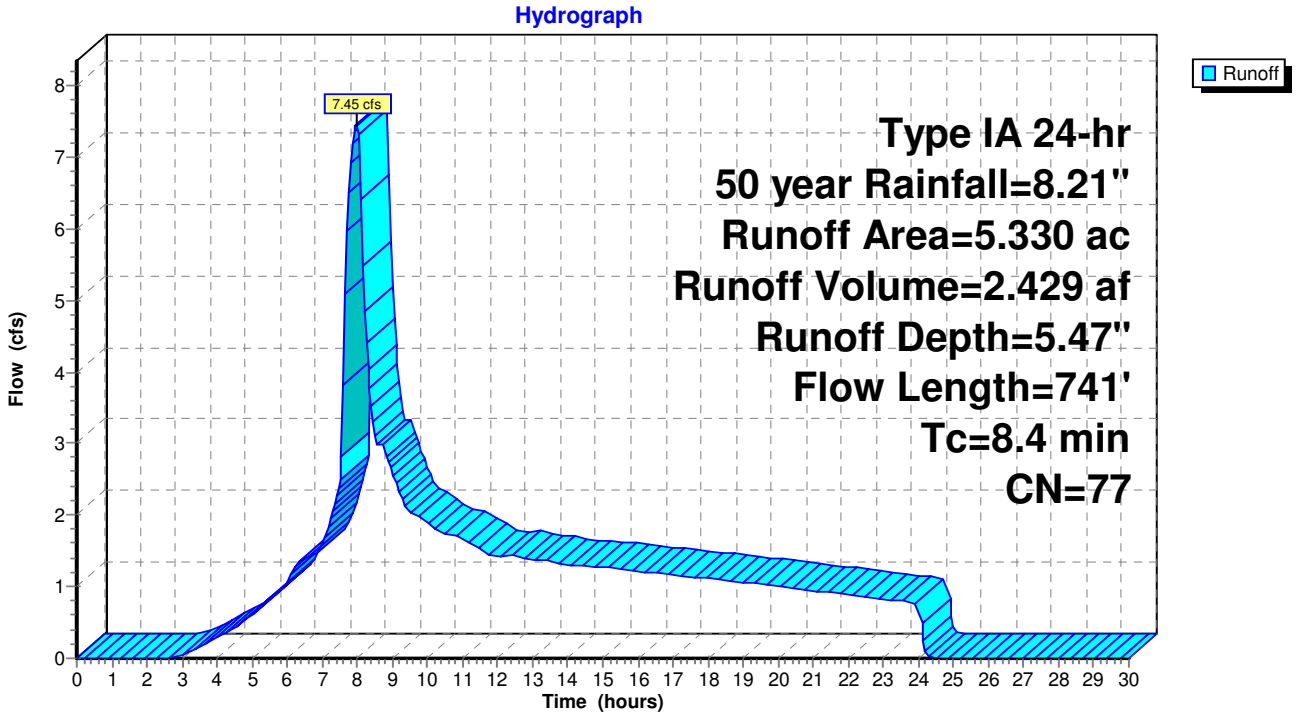
Runoff = 7.45 cfs @ 7.97 hrs, Volume= 2.429 af, Depth= 5.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
1.631	79	Annual Grass, Fair, HSG C
0.715	75	Annual Grass, Good, HSG C
0.150	87	Dirt roads, HSG C
0.300	92	Paved roads w/open ditches, 50% imp, HSG C
1.583	75	Vineyard, Good, HSG C
0.951	70	Woods, Good, HSG C
5.330	77	Weighted Average
5.180		97.19% Pervious Area
0.150		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
2.1	219	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.0	34	0.0600	13.97	17.14	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.6	388	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	741	Total			

Subcatchment WS5: WS5



Summary for Subcatchment WS5: WS5

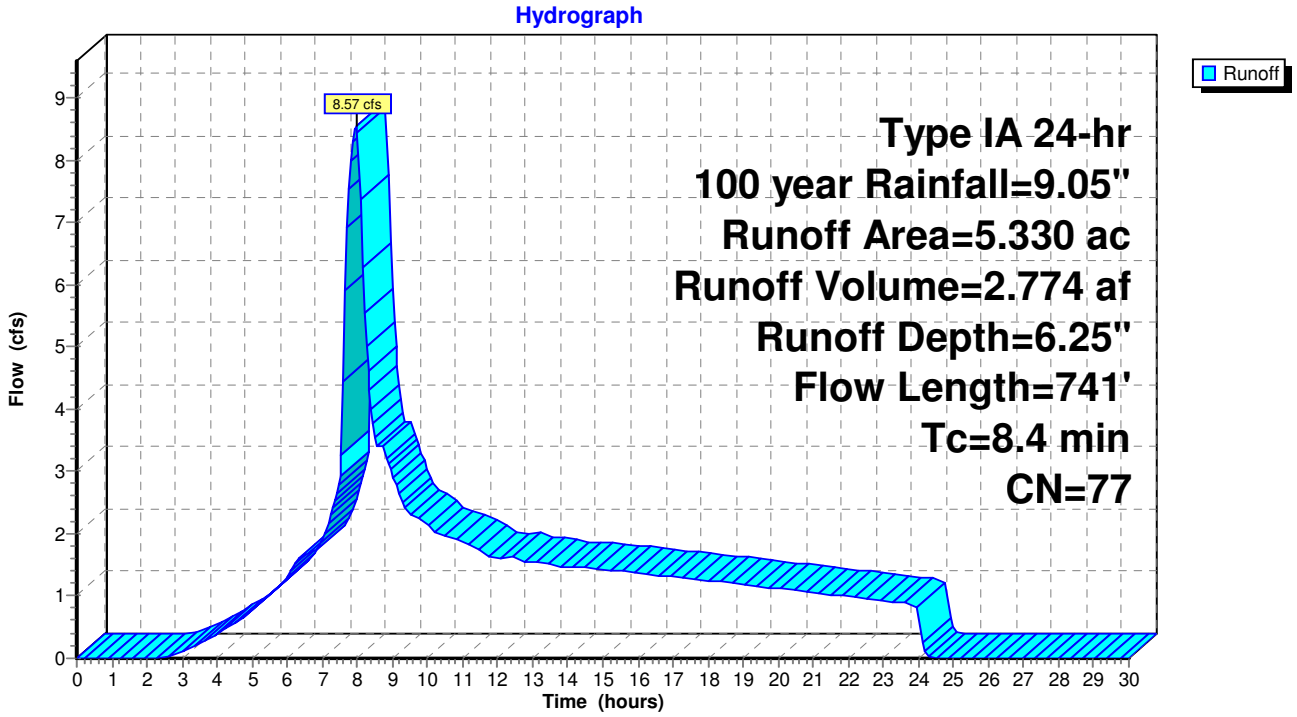
Runoff = 8.57 cfs @ 7.96 hrs, Volume= 2.774 af, Depth= 6.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
1.631	79	Annual Grass, Fair, HSG C
0.715	75	Annual Grass, Good, HSG C
0.150	87	Dirt roads, HSG C
0.300	92	Paved roads w/open ditches, 50% imp, HSG C
1.583	75	Vineyard, Good, HSG C
0.951	70	Woods, Good, HSG C
5.330	77	Weighted Average
5.180		97.19% Pervious Area
0.150		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.1400	0.29		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
2.1	219	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.0	34	0.0600	13.97	17.14	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.6	388	0.0600	11.06	132.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	741	Total			

Subcatchment WS5: WS5



WS6

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Pre-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS6: WS6

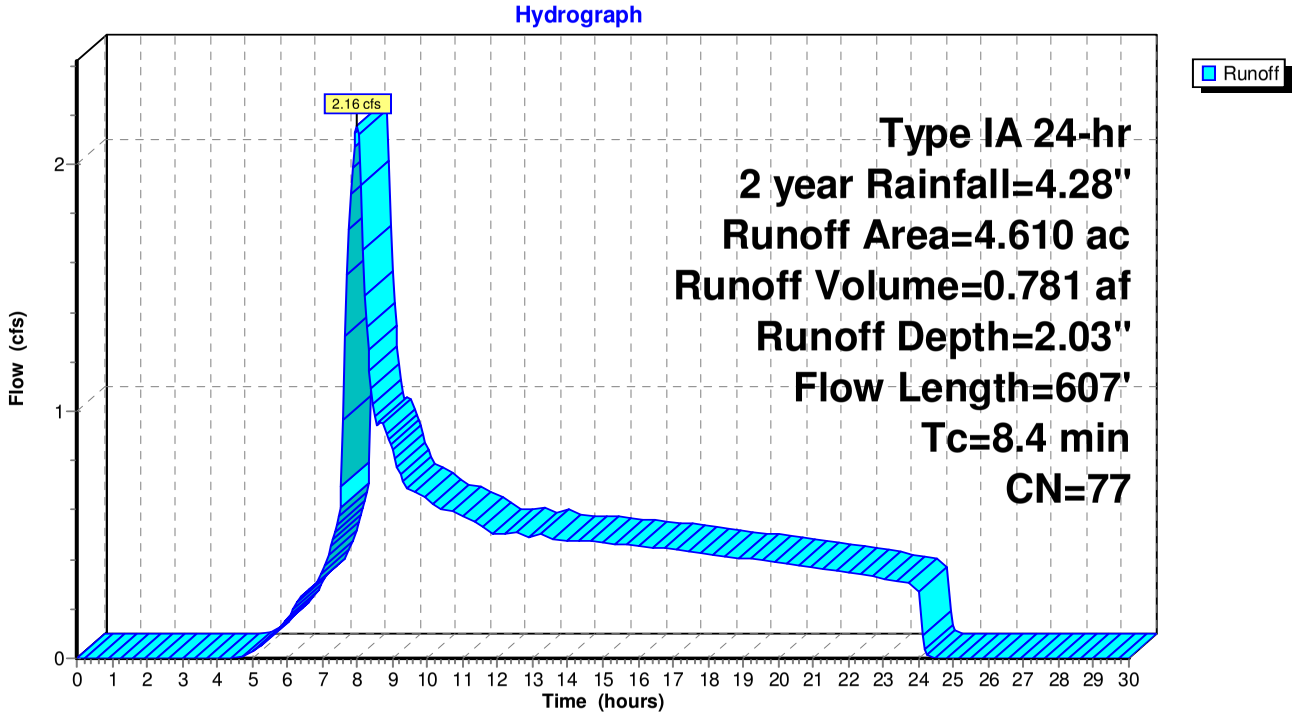
Runoff = 2.16 cfs @ 8.00 hrs, Volume= 0.781 af, Depth= 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
1.064	79	Annual Grass, Fair, HSG C
2.430	75	Annual Grass, Good, HSG C
0.137	87	Dirt roads, HSG C
0.040	82	Farmsteads, HSG C
0.260	92	Paved roads w/open ditches, 50% imp, HSG C
0.679	70	Woods, Good, HSG C
4.610	77	Weighted Average
4.480		97.19% Pervious Area
0.130		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.1100	0.27		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
1.8	187	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.1	40	0.0500	12.75	15.65	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.3	280	0.1400	16.89	202.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	607	Total			

Subcatchment WS6: WS6



Summary for Subcatchment WS6: WS6

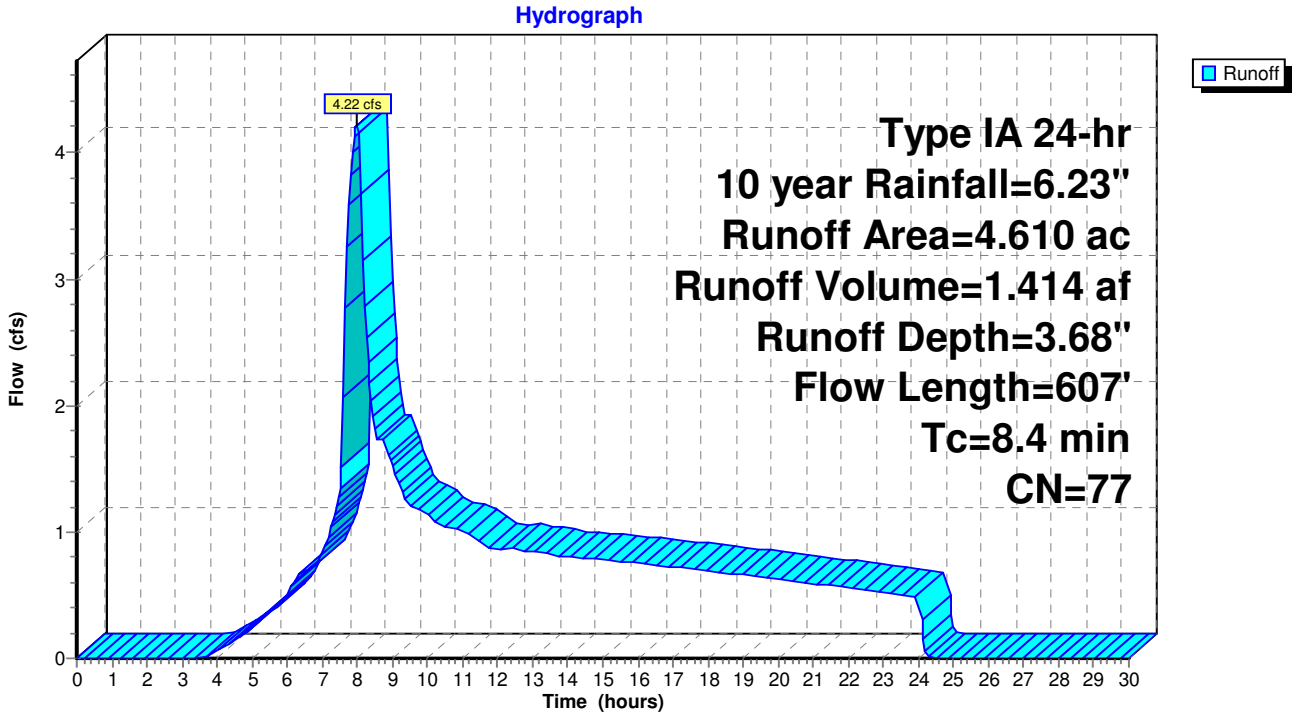
Runoff = 4.22 cfs @ 7.98 hrs, Volume= 1.414 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
1.064	79	Annual Grass, Fair, HSG C
2.430	75	Annual Grass, Good, HSG C
0.137	87	Dirt roads, HSG C
0.040	82	Farmsteads, HSG C
0.260	92	Paved roads w/open ditches, 50% imp, HSG C
0.679	70	Woods, Good, HSG C
4.610	77	Weighted Average
4.480		97.19% Pervious Area
0.130		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.1100	0.27		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
1.8	187	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.1	40	0.0500	12.75	15.65	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.3	280	0.1400	16.89	202.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	607	Total			

Subcatchment WS6: WS6



Summary for Subcatchment WS6: WS6

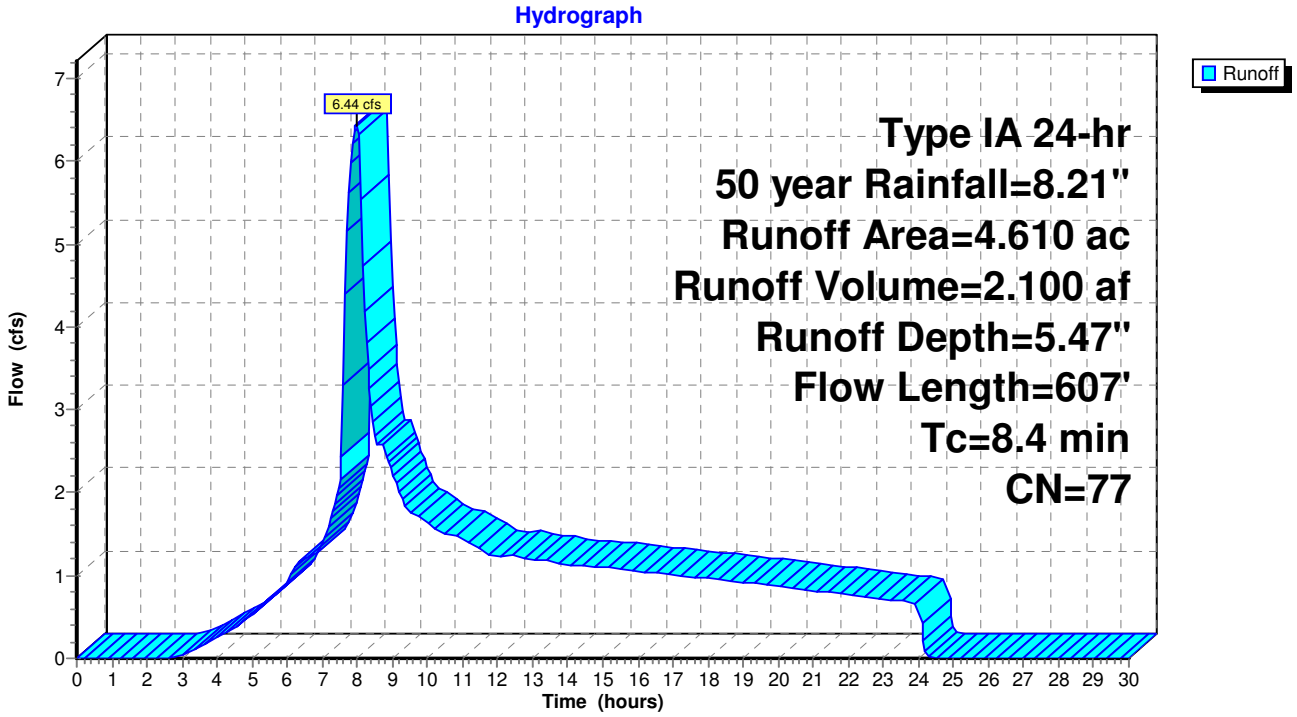
Runoff = 6.44 cfs @ 7.97 hrs, Volume= 2.100 af, Depth= 5.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
1.064	79	Annual Grass, Fair, HSG C
2.430	75	Annual Grass, Good, HSG C
0.137	87	Dirt roads, HSG C
0.040	82	Farmsteads, HSG C
0.260	92	Paved roads w/open ditches, 50% imp, HSG C
0.679	70	Woods, Good, HSG C
4.610	77	Weighted Average
4.480		97.19% Pervious Area
0.130		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.1100	0.27		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
1.8	187	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.1	40	0.0500	12.75	15.65	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.3	280	0.1400	16.89	202.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	607	Total			

Subcatchment WS6: WS6



Summary for Subcatchment WS6: WS6

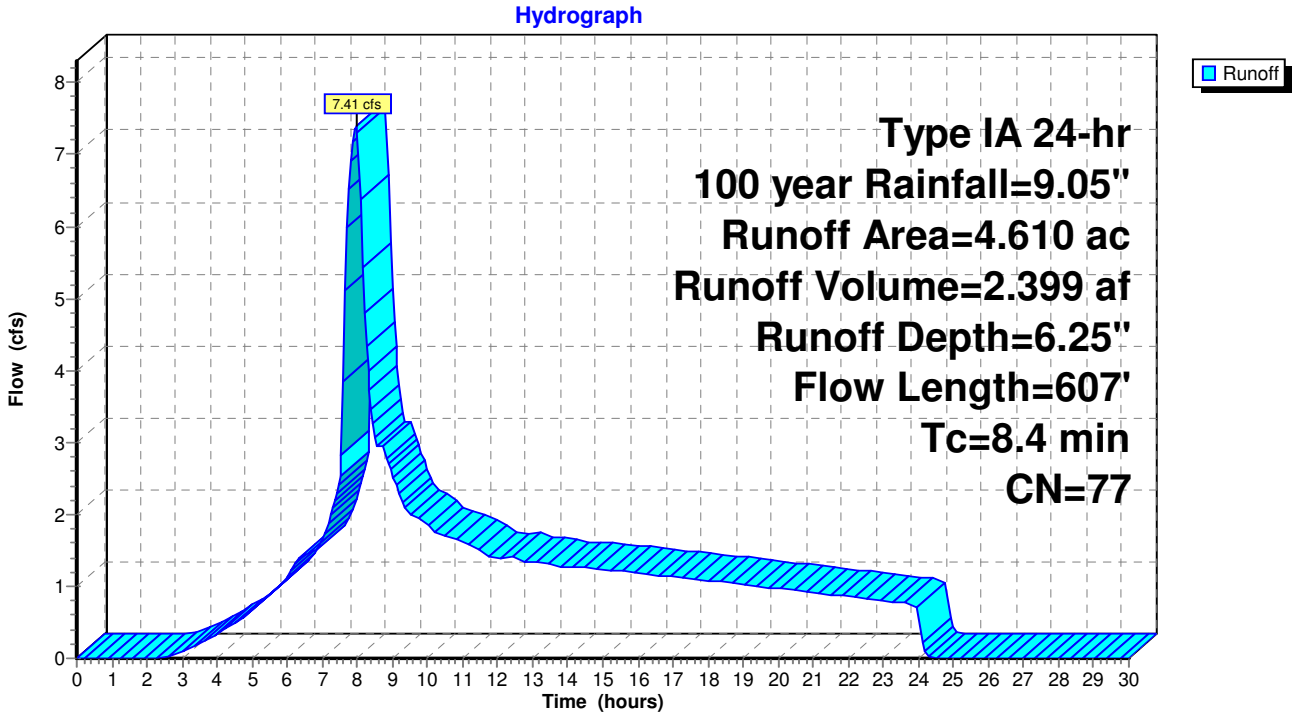
Runoff = 7.41 cfs @ 7.96 hrs, Volume= 2.399 af, Depth= 6.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
1.064	79	Annual Grass, Fair, HSG C
2.430	75	Annual Grass, Good, HSG C
0.137	87	Dirt roads, HSG C
0.040	82	Farmsteads, HSG C
0.260	92	Paved roads w/open ditches, 50% imp, HSG C
0.679	70	Woods, Good, HSG C
4.610	77	Weighted Average
4.480		97.19% Pervious Area
0.130		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.1100	0.27		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
1.8	187	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.1	40	0.0500	12.75	15.65	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.3	280	0.1400	16.89	202.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	607	Total			

Subcatchment WS6: WS6



WS6

Subcat Reach Pond Link

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Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS6: WS6

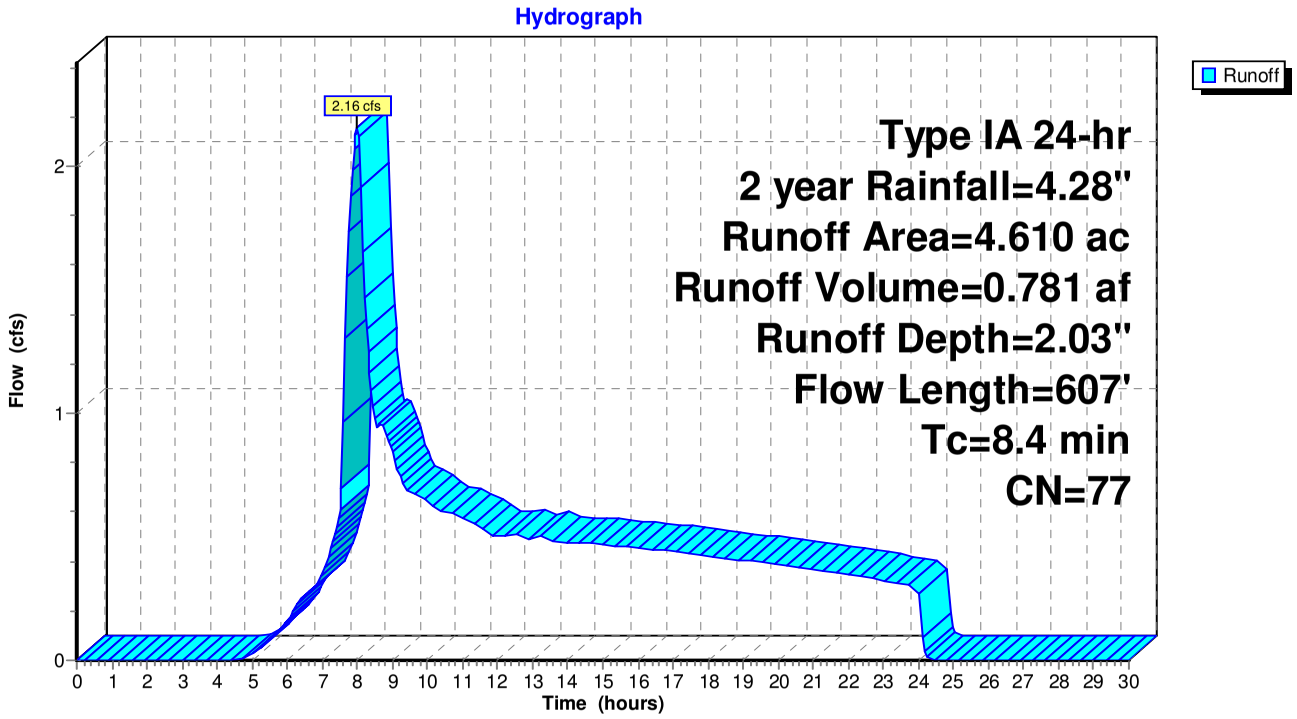
Runoff = 2.16 cfs @ 8.00 hrs, Volume= 0.781 af, Depth= 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
1.064	79	Annual Grass, Fair, HSG C
0.526	75	Annual Grass, Good, HSG C
0.137	87	Dirt roads, HSG C
0.040	82	Farmsteads, HSG C
0.260	92	Paved roads w/open ditches, 50% imp, HSG C
1.904	75	Vineyard, Good, HSG C
0.679	70	Woods, Good, HSG C
4.610	77	Weighted Average
4.480		97.19% Pervious Area
0.130		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.1100	0.27		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
1.8	187	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.1	40	0.0500	12.75	15.65	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.3	280	0.1400	16.89	202.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	607	Total			

Subcatchment WS6: WS6



Summary for Subcatchment WS6: WS6

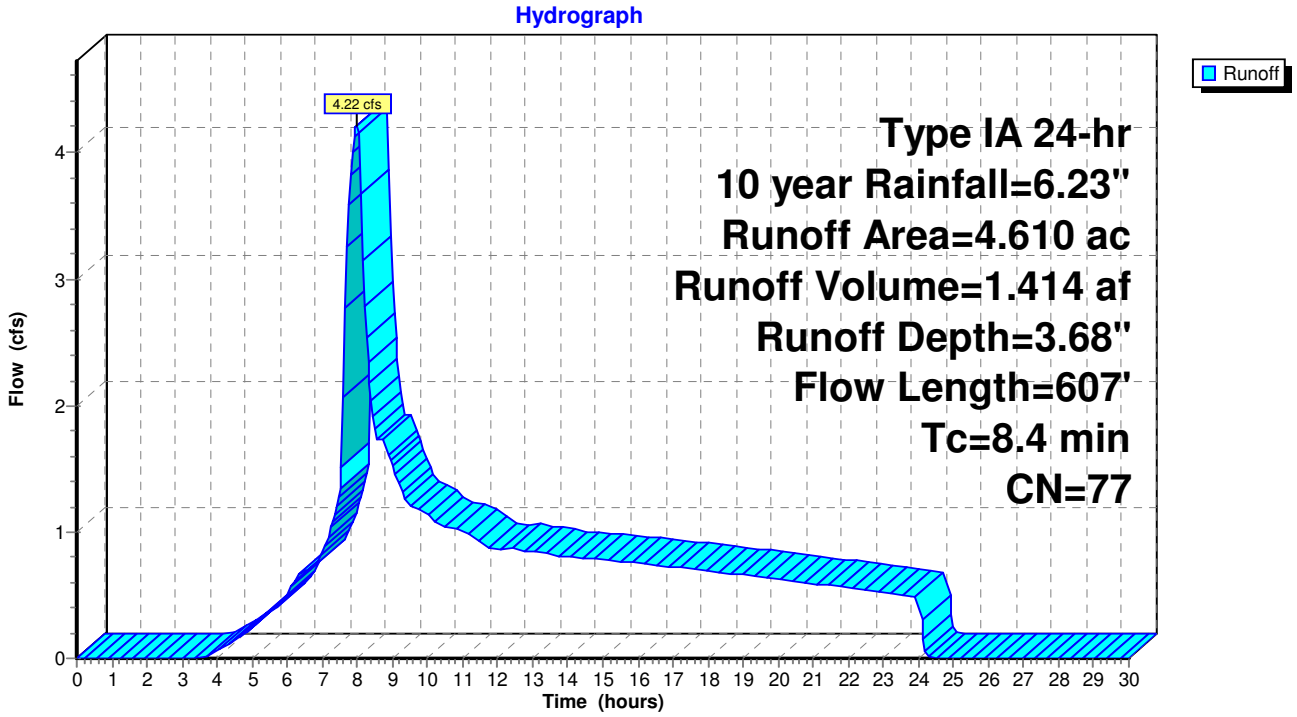
Runoff = 4.22 cfs @ 7.98 hrs, Volume= 1.414 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
1.064	79	Annual Grass, Fair, HSG C
0.526	75	Annual Grass, Good, HSG C
0.137	87	Dirt roads, HSG C
0.040	82	Farmsteads, HSG C
0.260	92	Paved roads w/open ditches, 50% imp, HSG C
1.904	75	Vineyard, Good, HSG C
0.679	70	Woods, Good, HSG C
4.610	77	Weighted Average
4.480		97.19% Pervious Area
0.130		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.1100	0.27		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
1.8	187	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.1	40	0.0500	12.75	15.65	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.3	280	0.1400	16.89	202.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	607	Total			

Subcatchment WS6: WS6



Summary for Subcatchment WS6: WS6

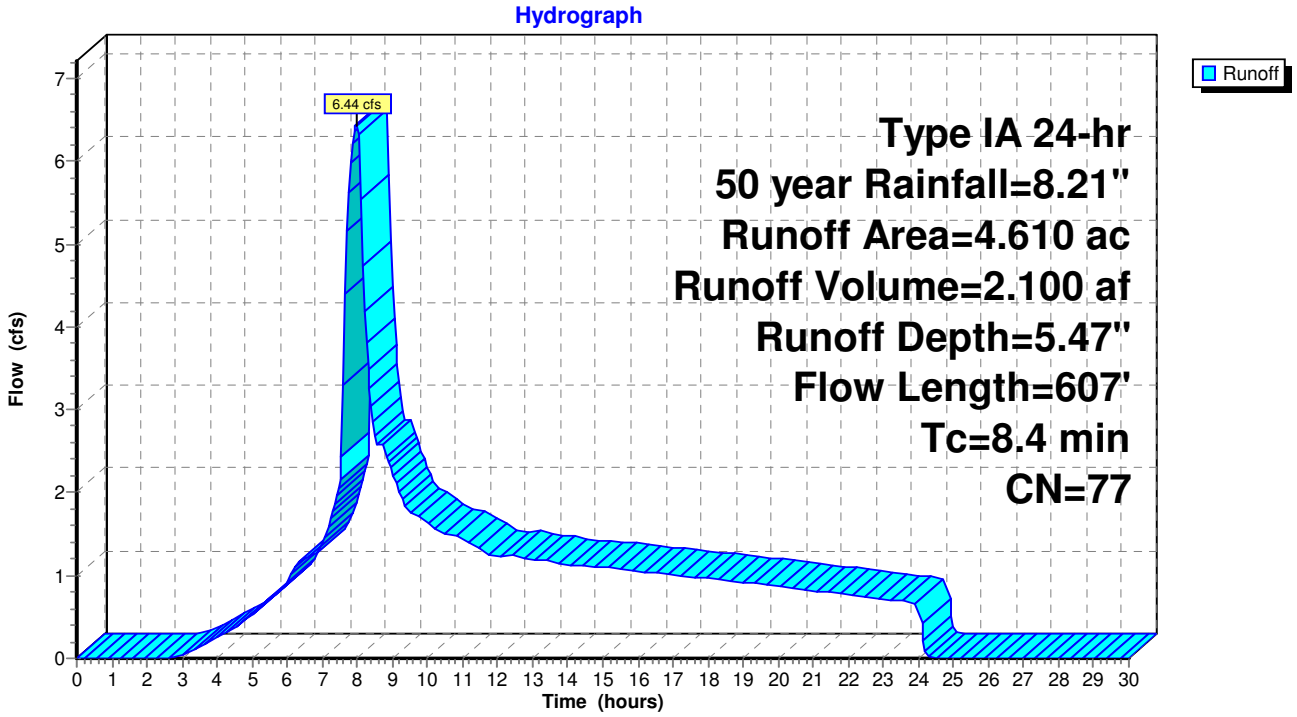
Runoff = 6.44 cfs @ 7.97 hrs, Volume= 2.100 af, Depth= 5.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
1.064	79	Annual Grass, Fair, HSG C
0.526	75	Annual Grass, Good, HSG C
0.137	87	Dirt roads, HSG C
0.040	82	Farmsteads, HSG C
0.260	92	Paved roads w/open ditches, 50% imp, HSG C
1.904	75	Vineyard, Good, HSG C
0.679	70	Woods, Good, HSG C
4.610	77	Weighted Average
4.480		97.19% Pervious Area
0.130		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.1100	0.27		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
1.8	187	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.1	40	0.0500	12.75	15.65	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.3	280	0.1400	16.89	202.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	607	Total			

Subcatchment WS6: WS6



Summary for Subcatchment WS6: WS6

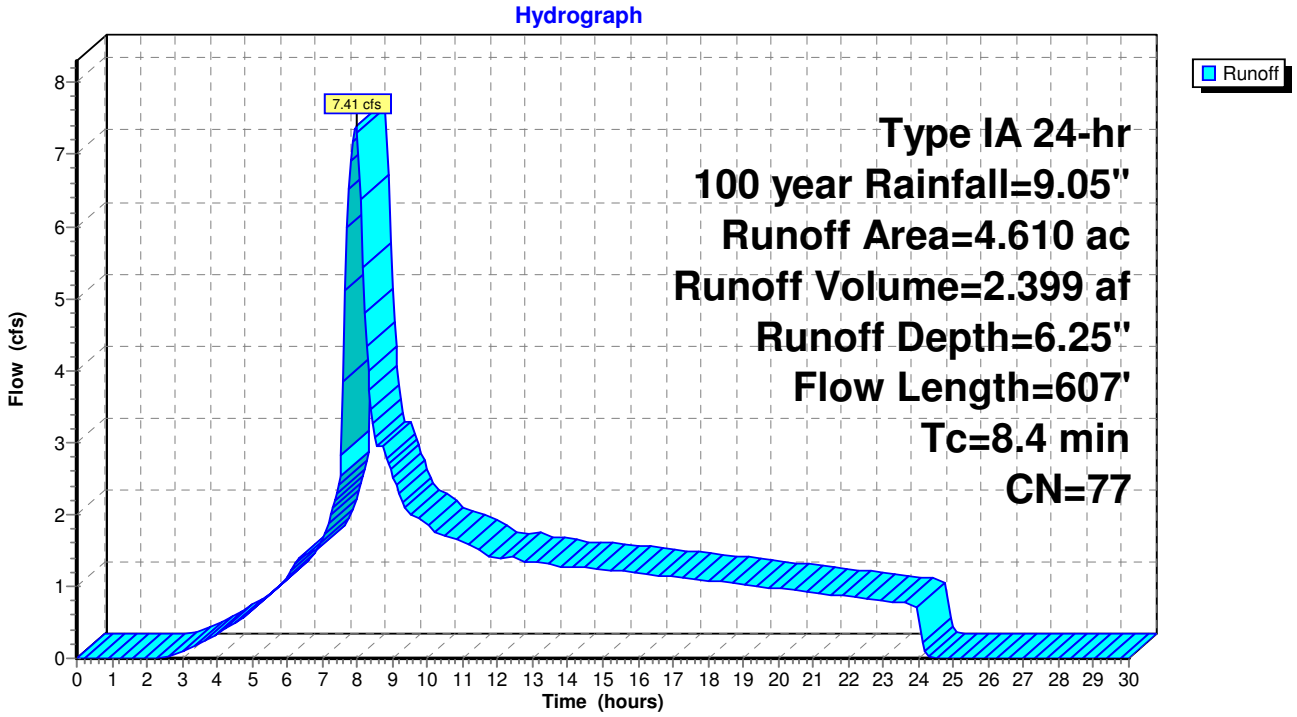
Runoff = 7.41 cfs @ 7.96 hrs, Volume= 2.399 af, Depth= 6.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
1.064	79	Annual Grass, Fair, HSG C
0.526	75	Annual Grass, Good, HSG C
0.137	87	Dirt roads, HSG C
0.040	82	Farmsteads, HSG C
0.260	92	Paved roads w/open ditches, 50% imp, HSG C
1.904	75	Vineyard, Good, HSG C
0.679	70	Woods, Good, HSG C
4.610	77	Weighted Average
4.480		97.19% Pervious Area
0.130		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.1100	0.27		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 4.28"
1.8	187	0.0600	1.71		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
0.1	40	0.0500	12.75	15.65	**Pipe Channel, 15" Steel Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.3	280	0.1400	16.89	202.70	**Trap/Vee/Rect Channel Flow, Channel** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.035
8.4	607	Total			

Subcatchment WS6: WS6



WS7

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Pre-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS7: WS7

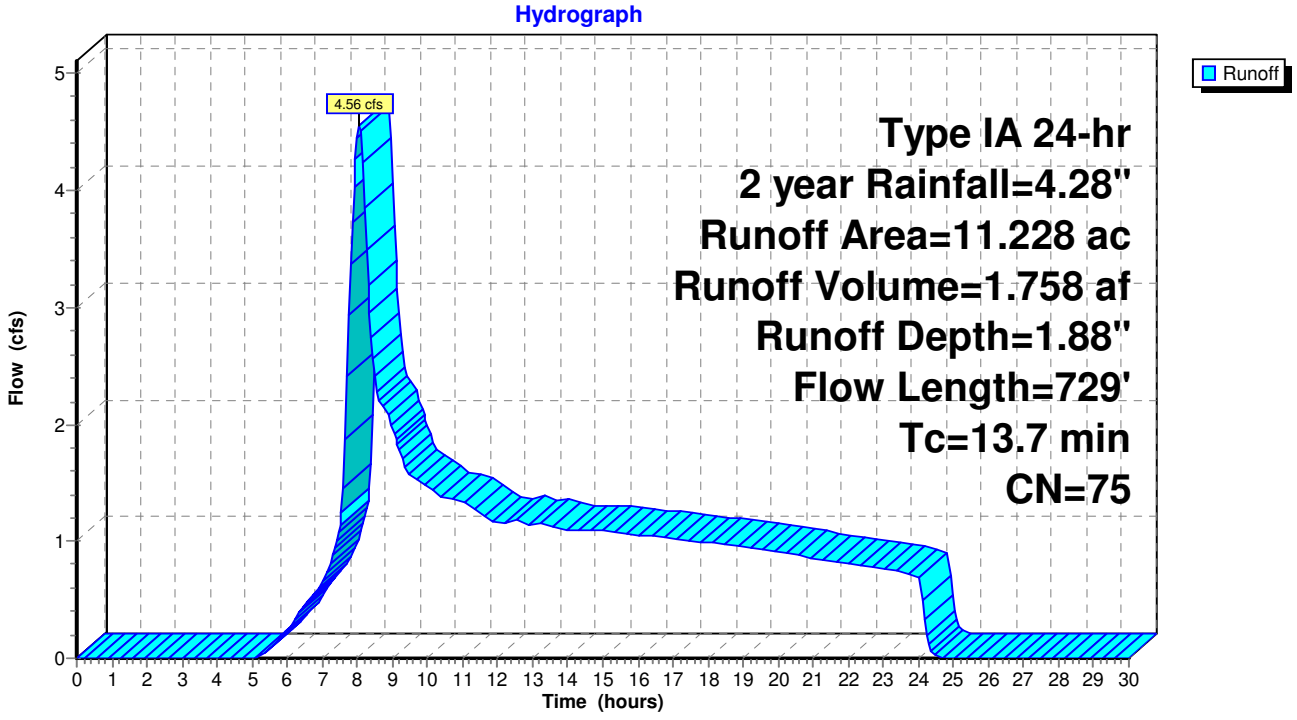
Runoff = 4.56 cfs @ 8.06 hrs, Volume= 1.758 af, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
10.942	75	Annual Grass, Good, HSG C
0.286	70	Woods, Good, HSG C
11.228	75	Weighted Average
11.228		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	59	0.0200	0.12		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.6	670	0.0800	1.98		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.7	729	Total			

Subcatchment WS7: WS7



Summary for Subcatchment WS7: WS7

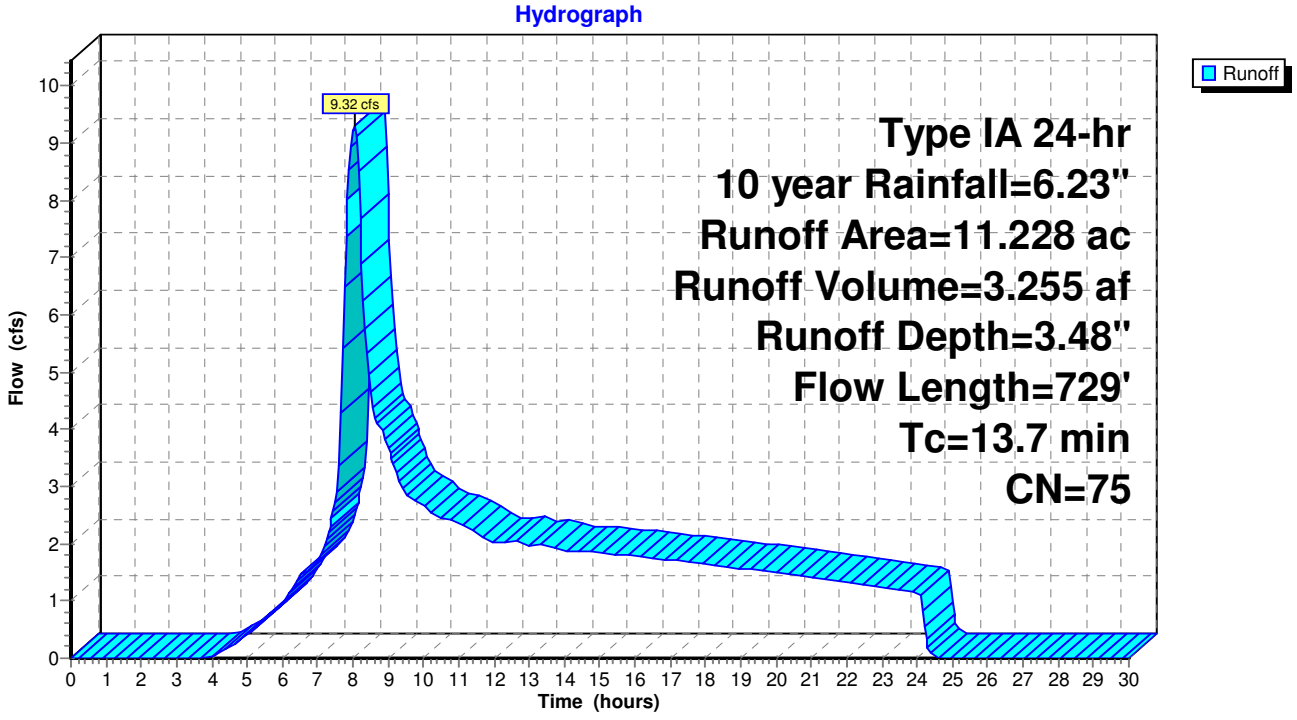
Runoff = 9.32 cfs @ 8.04 hrs, Volume= 3.255 af, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
10.942	75	Annual Grass, Good, HSG C
0.286	70	Woods, Good, HSG C
11.228	75	Weighted Average
11.228		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	59	0.0200	0.12		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.6	670	0.0800	1.98		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.7	729	Total			

Subcatchment WS7: WS7



Summary for Subcatchment WS7: WS7

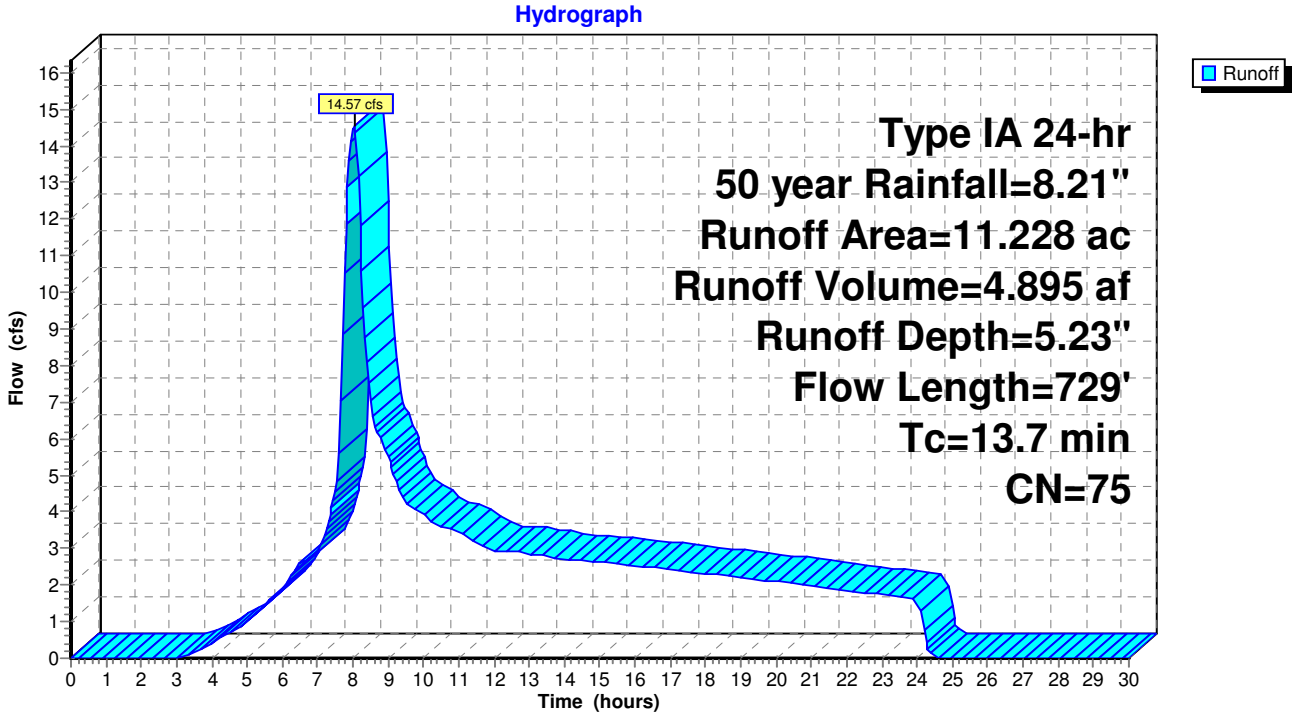
Runoff = 14.57 cfs @ 8.03 hrs, Volume= 4.895 af, Depth= 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
10.942	75	Annual Grass, Good, HSG C
0.286	70	Woods, Good, HSG C
11.228	75	Weighted Average
11.228		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	59	0.0200	0.12		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.6	670	0.0800	1.98		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.7	729	Total			

Subcatchment WS7: WS7



Summary for Subcatchment WS7: WS7

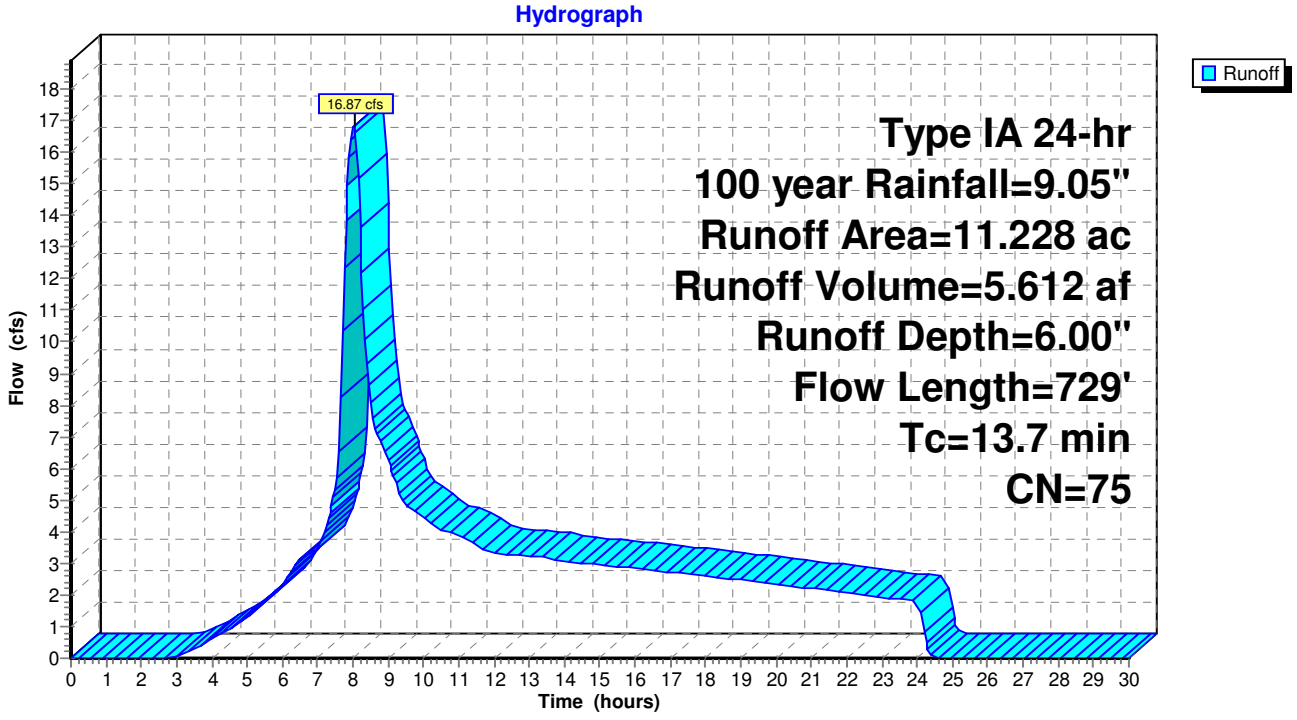
Runoff = 16.87 cfs @ 8.03 hrs, Volume= 5.612 af, Depth= 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
10.942	75	Annual Grass, Good, HSG C
0.286	70	Woods, Good, HSG C
11.228	75	Weighted Average
11.228		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	59	0.0200	0.12		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.6	670	0.0800	1.98		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.7	729	Total			

Subcatchment WS7: WS7



WS7

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Post-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS7: WS7

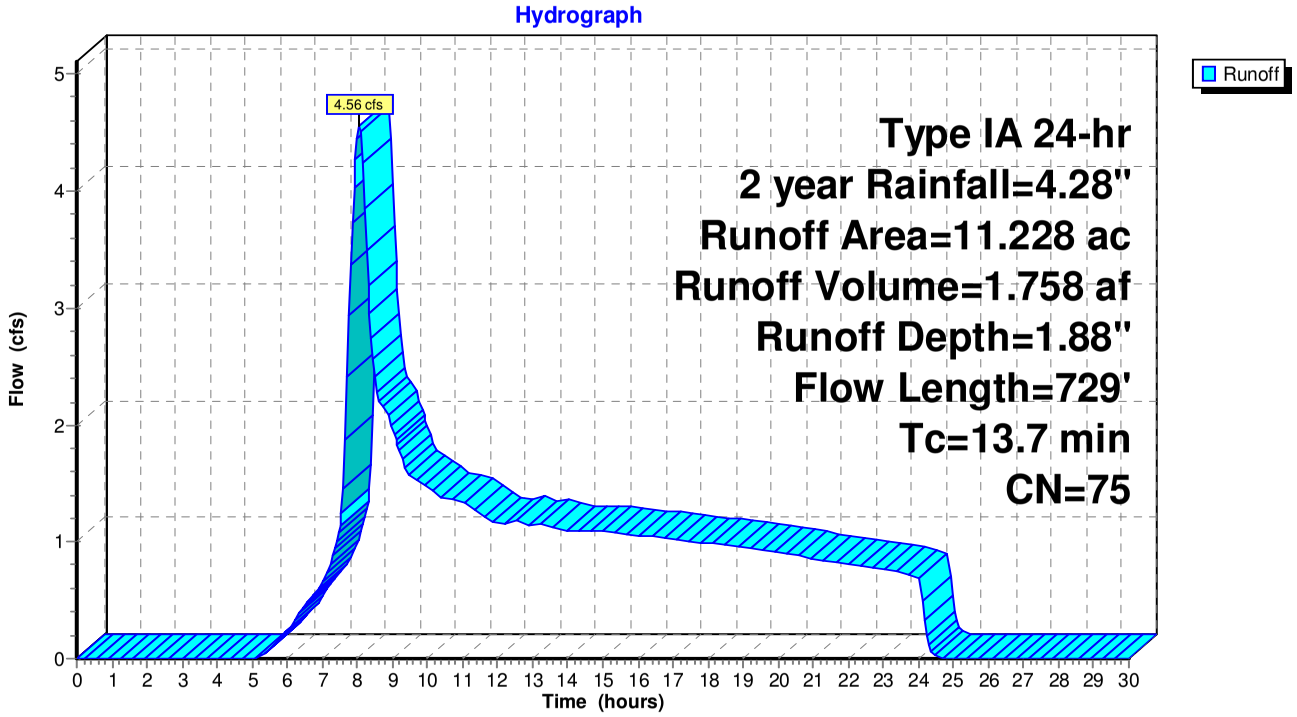
Runoff = 4.56 cfs @ 8.06 hrs, Volume= 1.758 af, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
3.471	75	Annual Grass, Good, HSG C
7.470	75	Vineyard, Good, HSG C
0.286	70	Woods, Good, HSG C
11.228	75	Weighted Average
11.228		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	59	0.0200	0.12		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.6	670	0.0800	1.98		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.7	729	Total			

Subcatchment WS7: WS7



Summary for Subcatchment WS7: WS7

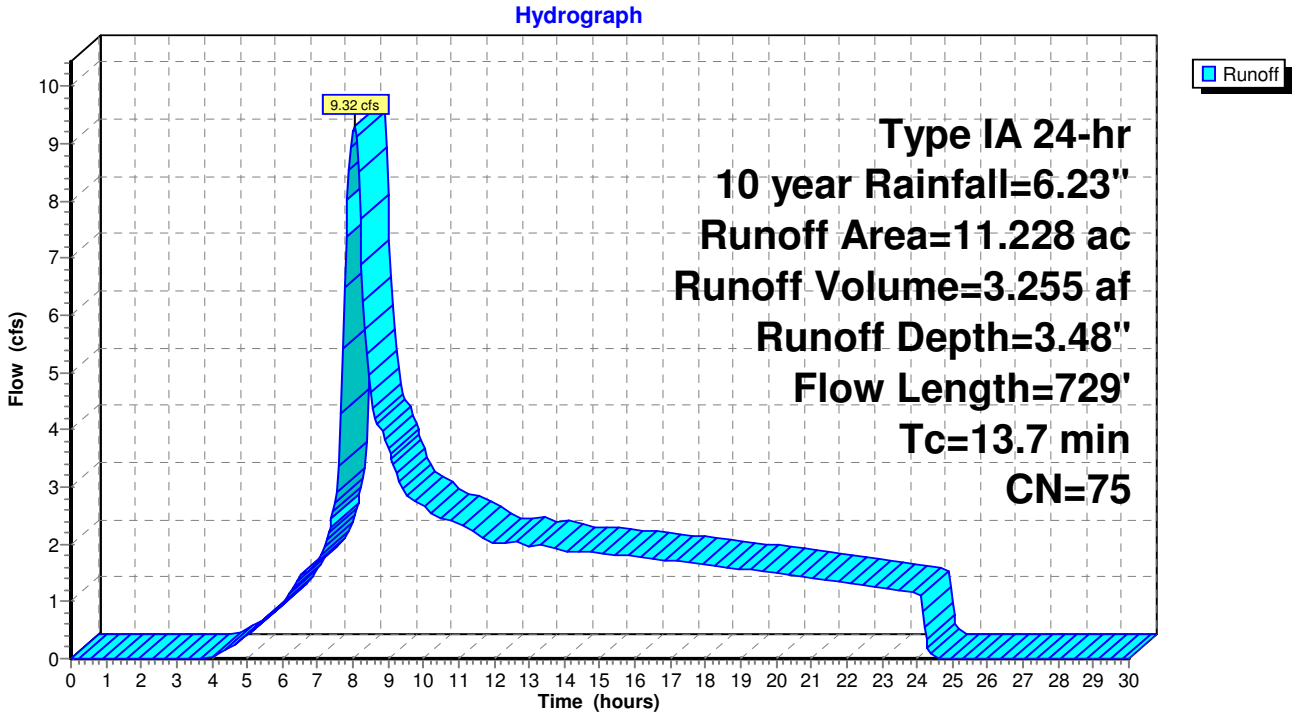
Runoff = 9.32 cfs @ 8.04 hrs, Volume= 3.255 af, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
3.471	75	Annual Grass, Good, HSG C
7.470	75	Vineyard, Good, HSG C
0.286	70	Woods, Good, HSG C
11.228	75	Weighted Average
11.228		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	59	0.0200	0.12		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.6	670	0.0800	1.98		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.7	729	Total			

Subcatchment WS7: WS7



Summary for Subcatchment WS7: WS7

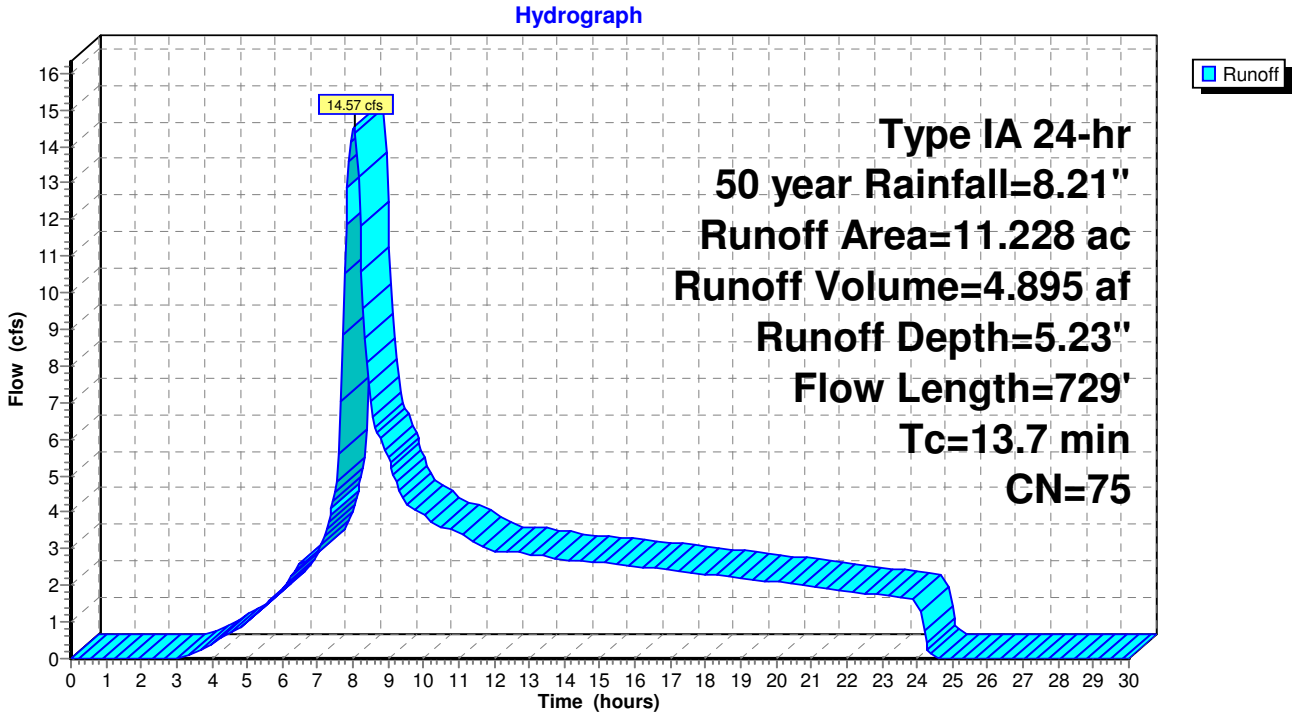
Runoff = 14.57 cfs @ 8.03 hrs, Volume= 4.895 af, Depth= 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
3.471	75	Annual Grass, Good, HSG C
7.470	75	Vineyard, Good, HSG C
0.286	70	Woods, Good, HSG C
11.228	75	Weighted Average
11.228		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	59	0.0200	0.12		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.6	670	0.0800	1.98		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.7	729	Total			

Subcatchment WS7: WS7



Summary for Subcatchment WS7: WS7

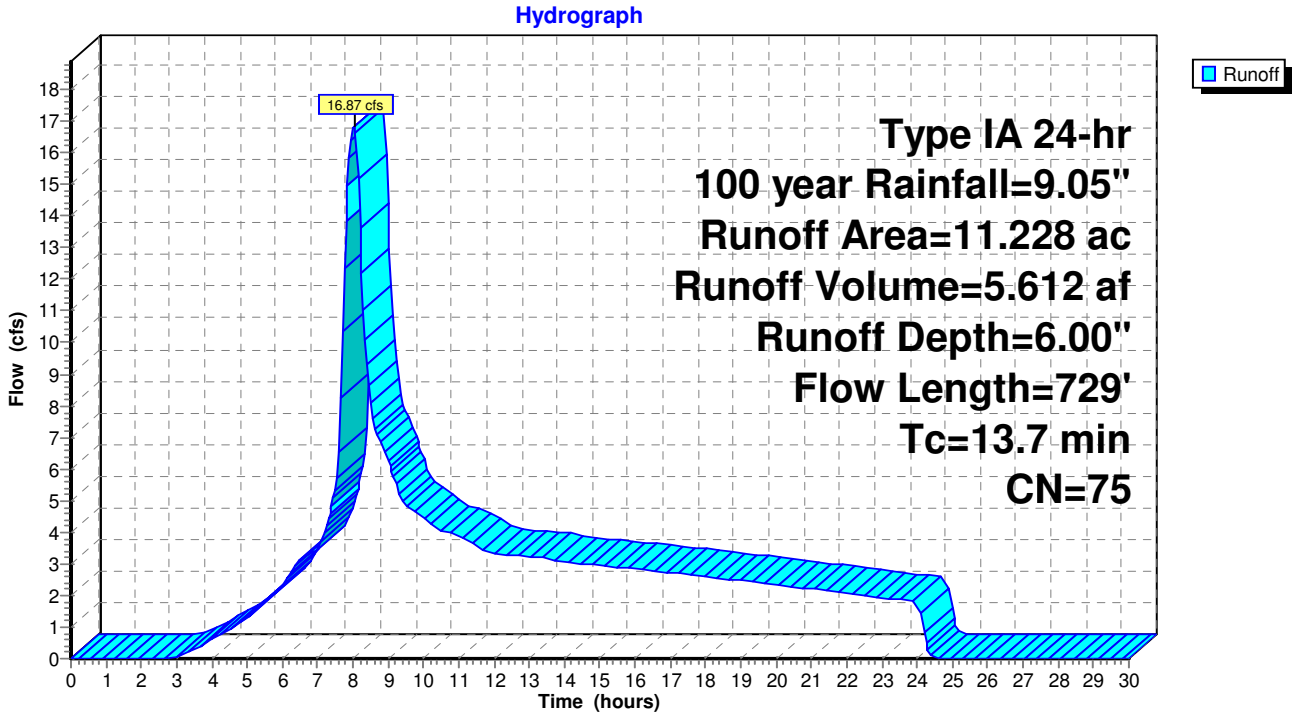
Runoff = 16.87 cfs @ 8.03 hrs, Volume= 5.612 af, Depth= 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
3.471	75	Annual Grass, Good, HSG C
7.470	75	Vineyard, Good, HSG C
0.286	70	Woods, Good, HSG C
11.228	75	Weighted Average
11.228		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	59	0.0200	0.12		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.6	670	0.0800	1.98		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.7	729	Total			

Subcatchment WS7: WS7



WS8

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Pre-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS8: WS8

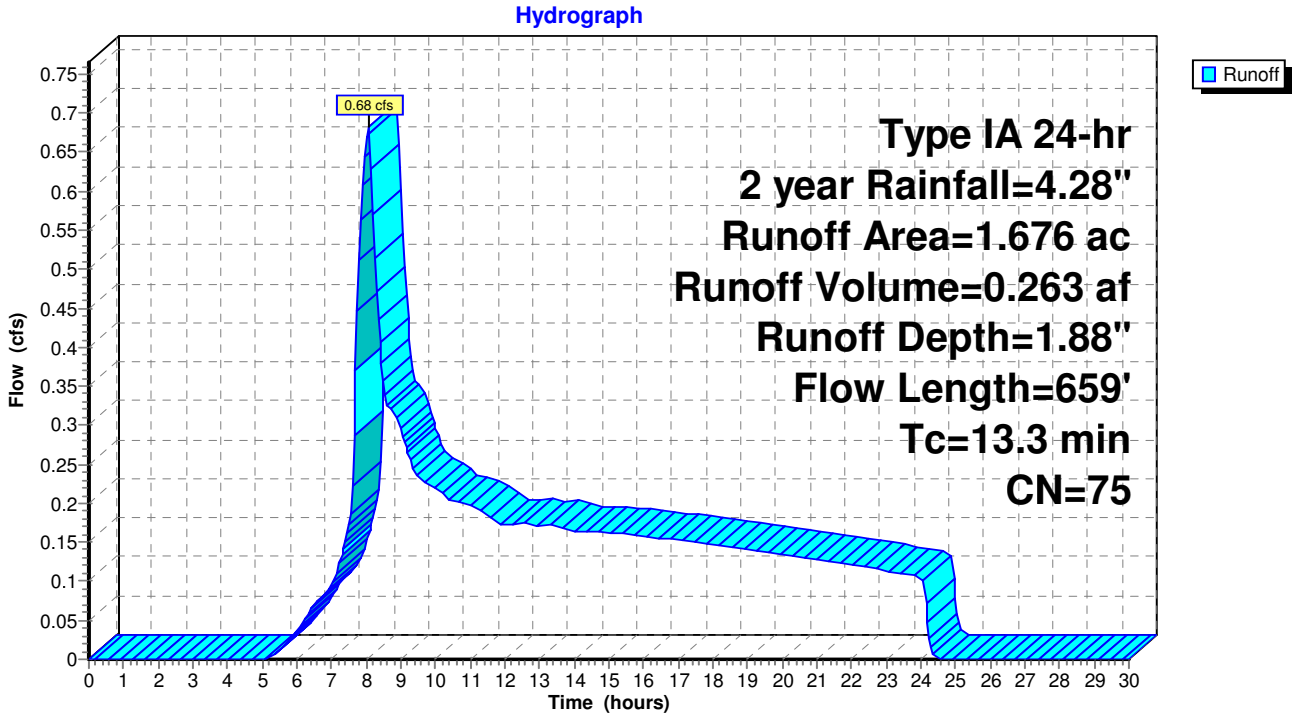
Runoff = 0.68 cfs @ 8.05 hrs, Volume= 0.263 af, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
1.676	75	Annual Grass, Good, HSG C
1.676		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	83	0.0400	0.17		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.2	576	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.3	659	Total			

Subcatchment WS8: WS8



Summary for Subcatchment WS8: WS8

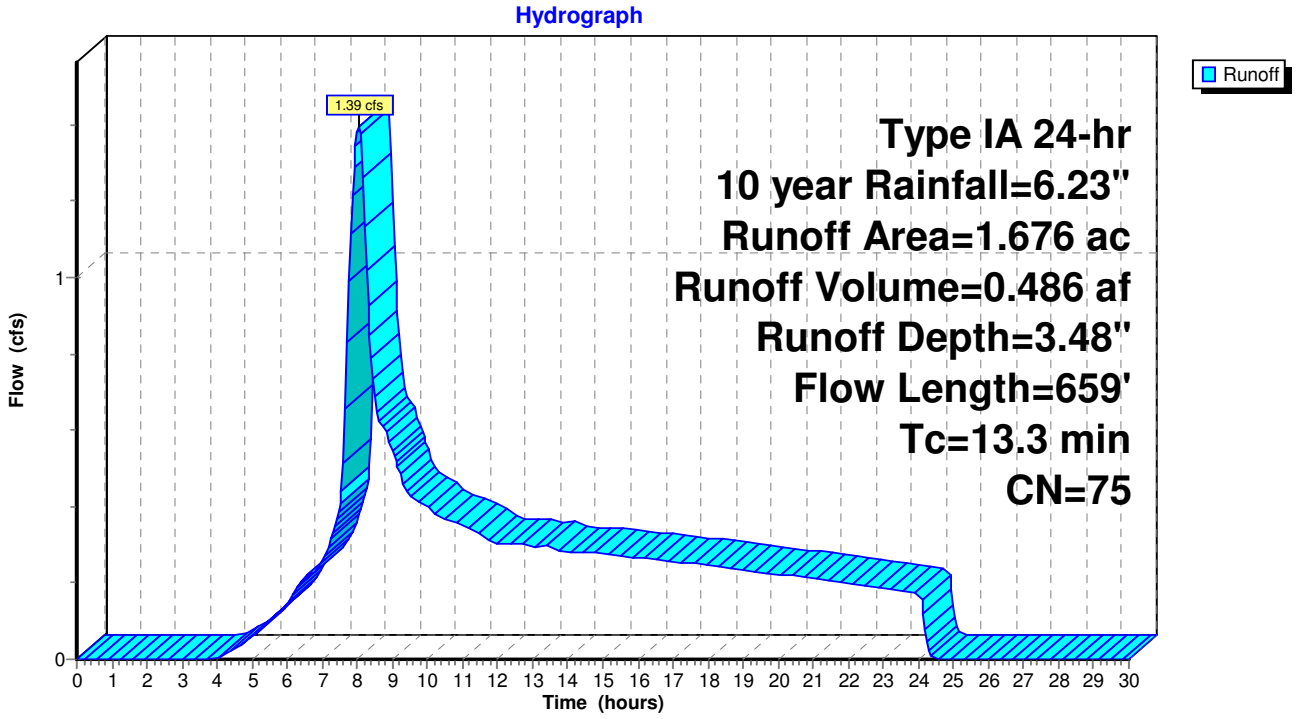
Runoff = 1.39 cfs @ 8.04 hrs, Volume= 0.486 af, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
1.676	75	Annual Grass, Good, HSG C
1.676		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	83	0.0400	0.17		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.2	576	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.3	659	Total			

Subcatchment WS8: WS8



Summary for Subcatchment WS8: WS8

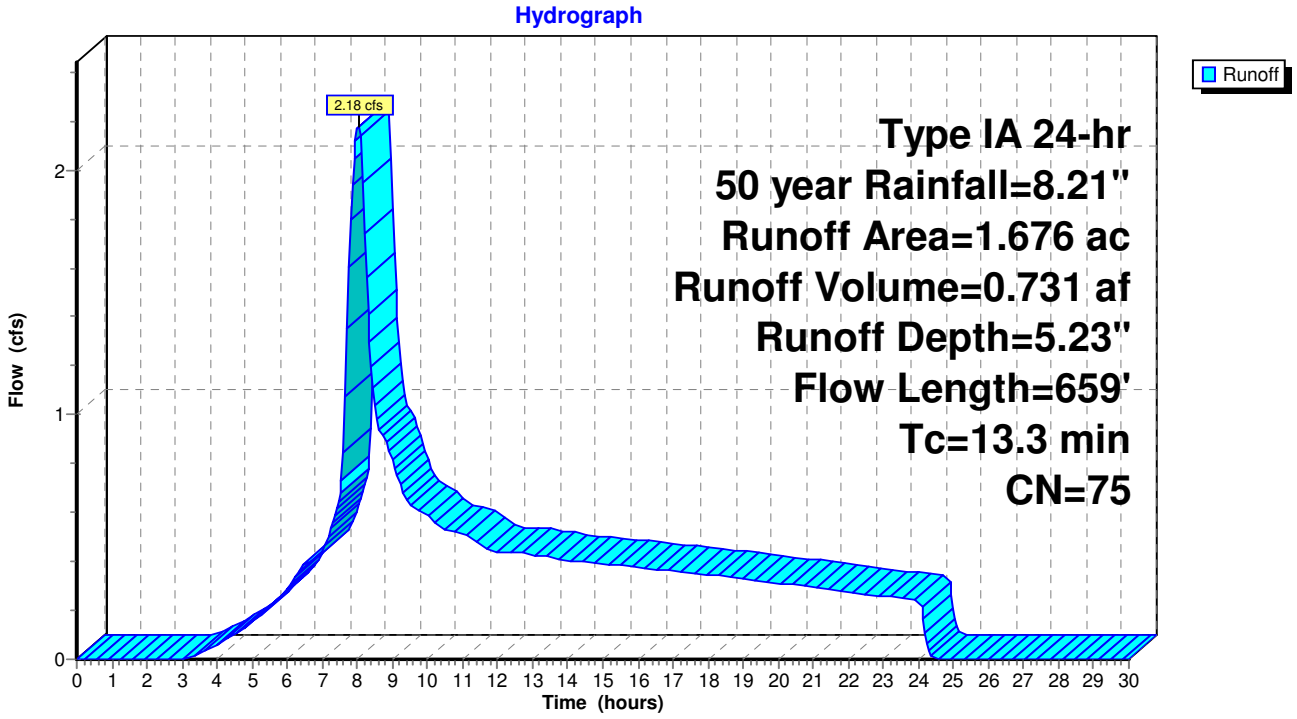
Runoff = 2.18 cfs @ 8.03 hrs, Volume= 0.731 af, Depth= 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
1.676	75	Annual Grass, Good, HSG C
1.676		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	83	0.0400	0.17		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.2	576	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.3	659	Total			

Subcatchment WS8: WS8



Summary for Subcatchment WS8: WS8

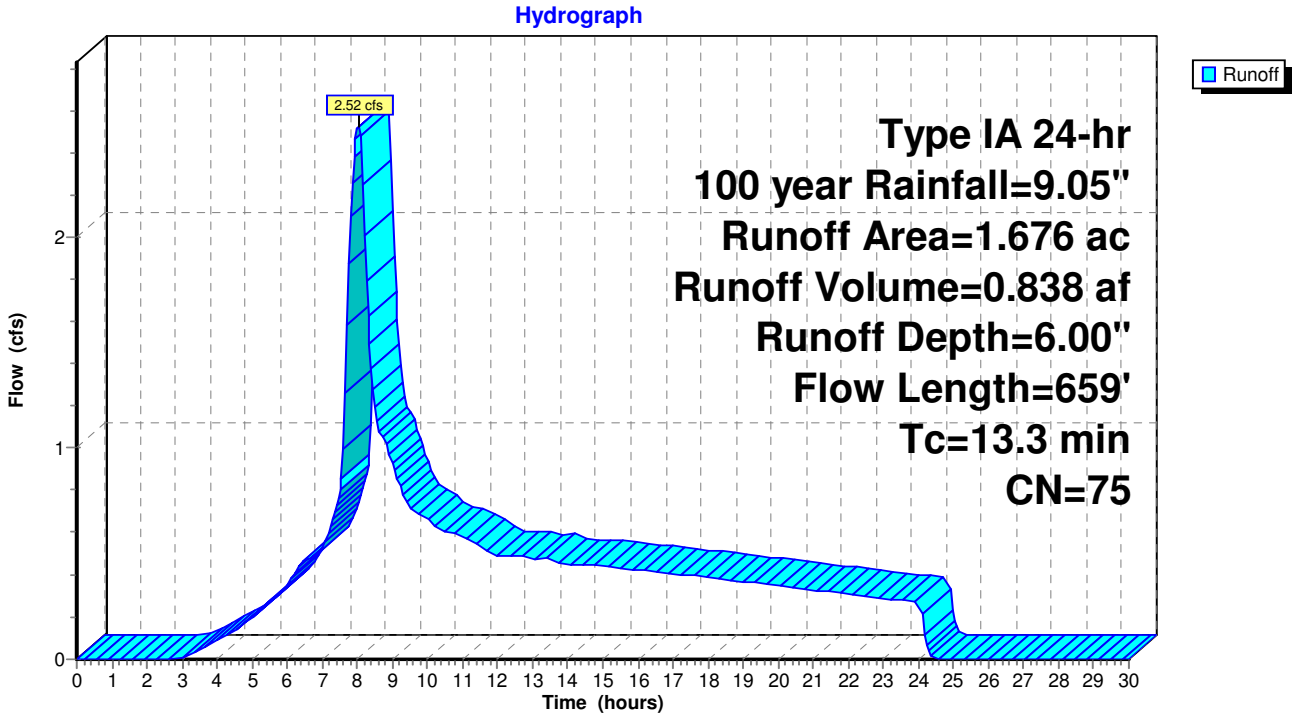
Runoff = 2.52 cfs @ 8.03 hrs, Volume= 0.838 af, Depth= 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
1.676	75	Annual Grass, Good, HSG C
1.676		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	83	0.0400	0.17		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.2	576	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.3	659	Total			

Subcatchment WS8: WS8



WS8

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Post-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS8: WS8

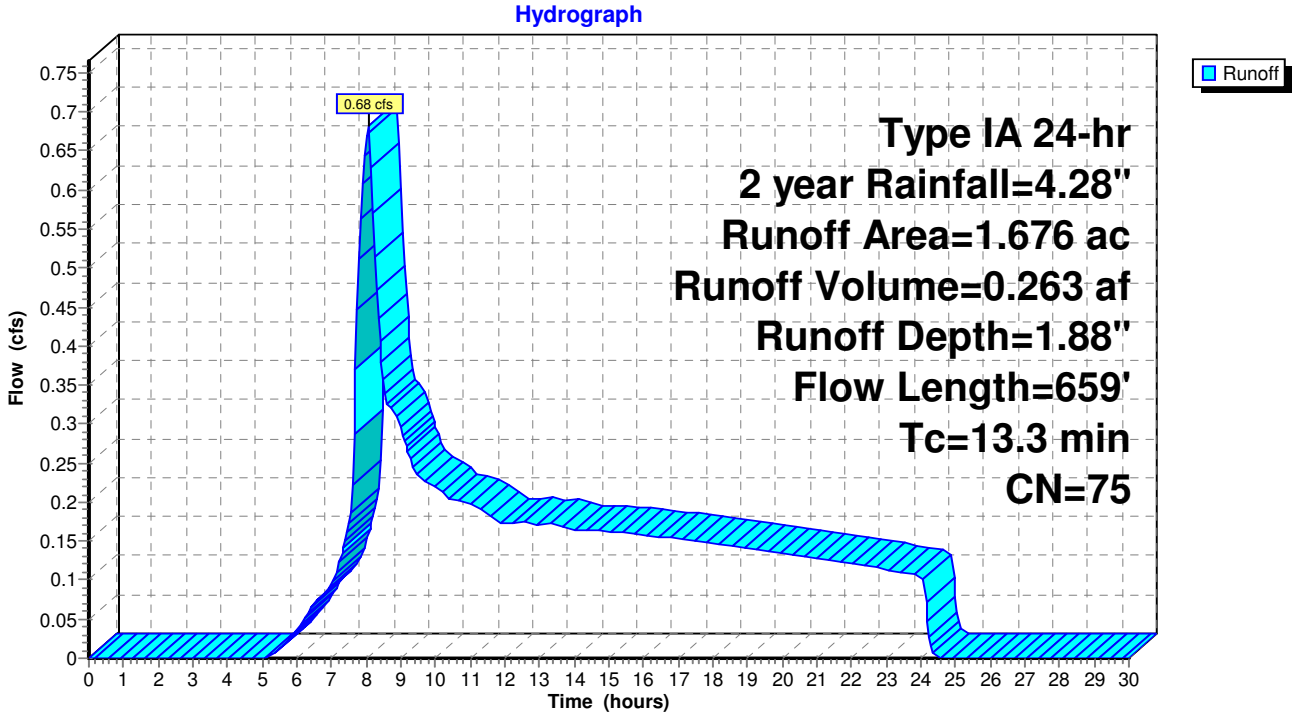
Runoff = 0.68 cfs @ 8.05 hrs, Volume= 0.263 af, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
0.105	75	Annual Grass, Good, HSG C
1.571	75	Vineyard, Good, HSG C
1.676	75	Weighted Average
1.676		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	83	0.0400	0.17		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.2	576	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.3	659	Total			

Subcatchment WS8: WS8



Summary for Subcatchment WS8: WS8

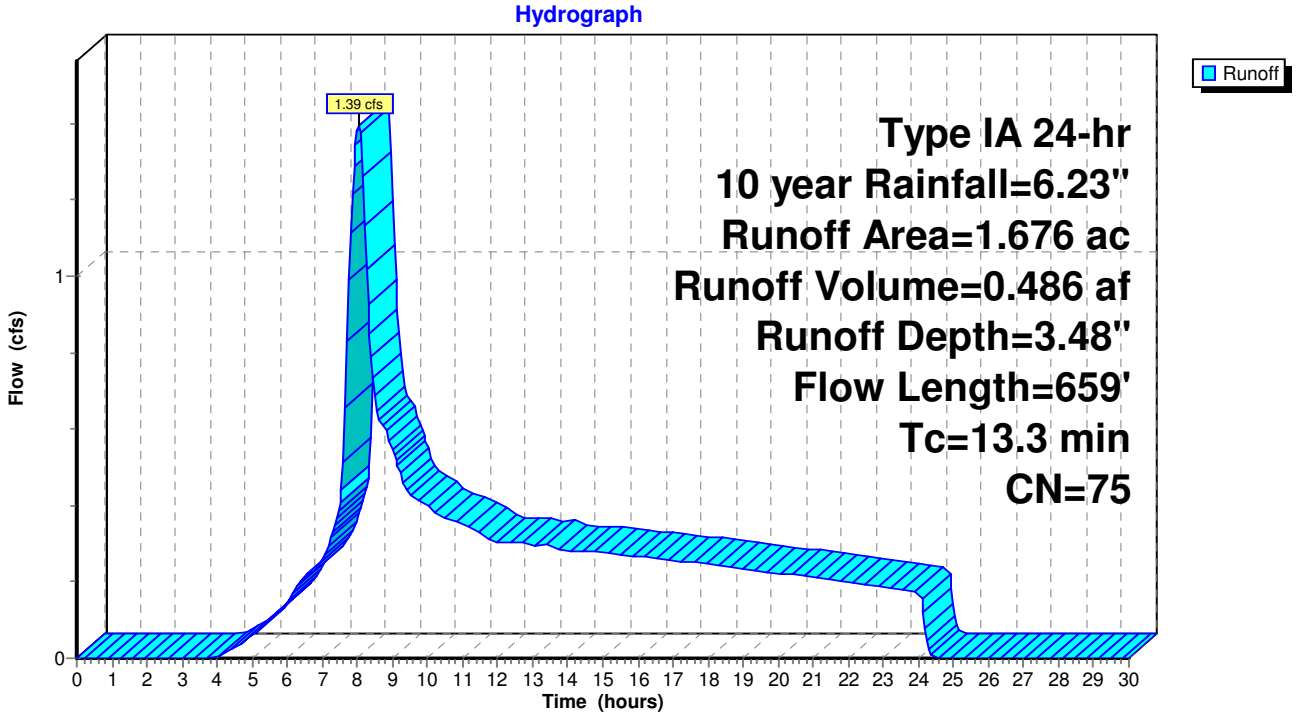
Runoff = 1.39 cfs @ 8.04 hrs, Volume= 0.486 af, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
0.105	75	Annual Grass, Good, HSG C
1.571	75	Vineyard, Good, HSG C
1.676	75	Weighted Average
1.676		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	83	0.0400	0.17		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.2	576	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.3	659	Total			

Subcatchment WS8: WS8



Summary for Subcatchment WS8: WS8

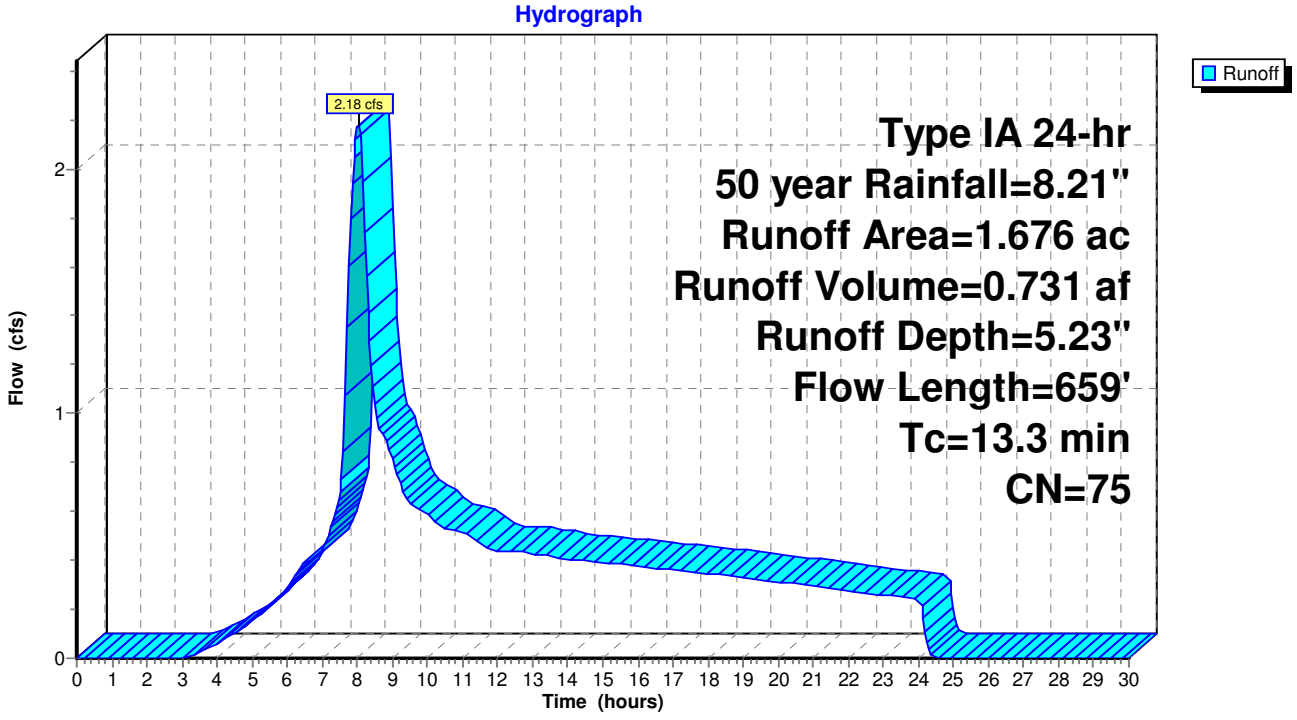
Runoff = 2.18 cfs @ 8.03 hrs, Volume= 0.731 af, Depth= 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
0.105	75	Annual Grass, Good, HSG C
1.571	75	Vineyard, Good, HSG C
1.676	75	Weighted Average
1.676		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	83	0.0400	0.17		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.2	576	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.3	659	Total			

Subcatchment WS8: WS8



Summary for Subcatchment WS8: WS8

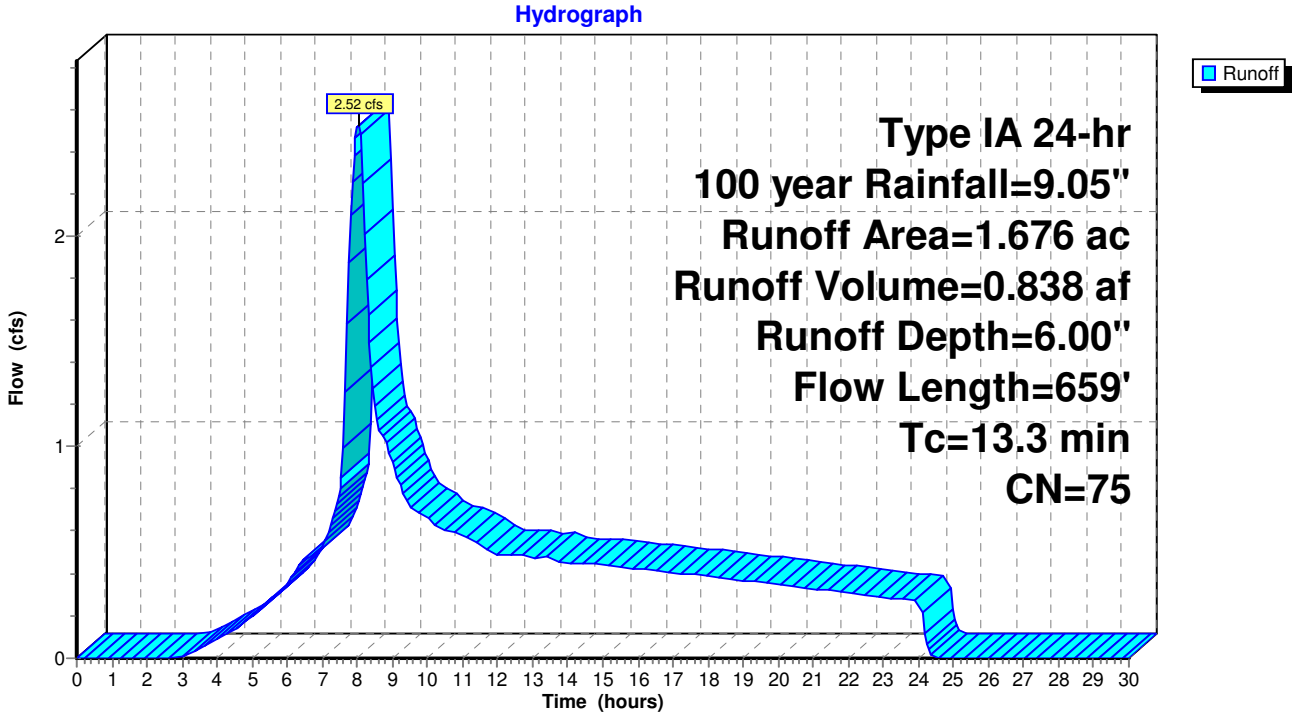
Runoff = 2.52 cfs @ 8.03 hrs, Volume= 0.838 af, Depth= 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
0.105	75	Annual Grass, Good, HSG C
1.571	75	Vineyard, Good, HSG C
1.676	75	Weighted Average
1.676		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	83	0.0400	0.17		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
5.2	576	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
13.3	659	Total			

Subcatchment WS8: WS8



WS9

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Pre-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS9: WS9

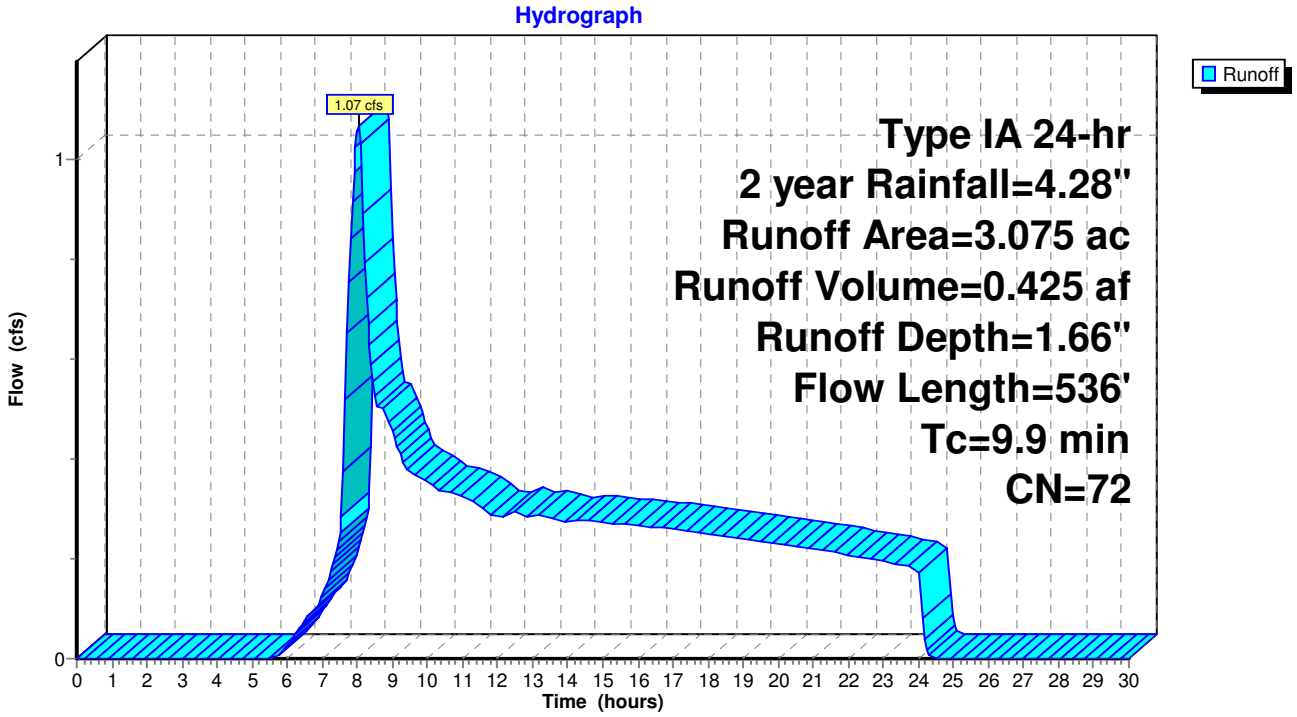
Runoff = 1.07 cfs @ 8.03 hrs, Volume= 0.425 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
0.791	75	Annual Grass, Good, HSG C
0.196	87	Dirt roads, HSG C
2.087	70	Woods, Good, HSG C
3.075	72	Weighted Average
3.075		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0800	0.24		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.8	436	0.2700	2.60		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
9.9	536	Total			

Subcatchment WS9: WS9



Summary for Subcatchment WS9: WS9

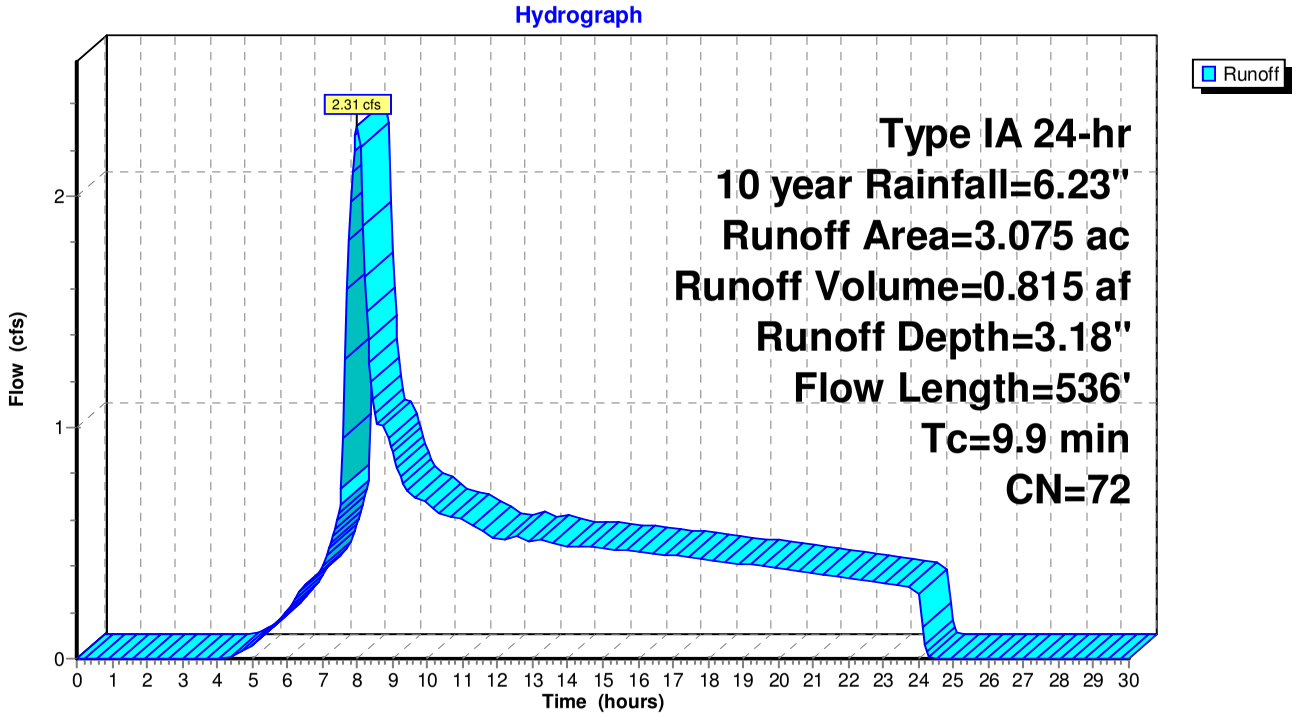
Runoff = 2.31 cfs @ 8.01 hrs, Volume= 0.815 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
0.791	75	Annual Grass, Good, HSG C
0.196	87	Dirt roads, HSG C
2.087	70	Woods, Good, HSG C
3.075	72	Weighted Average
3.075		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0800	0.24		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.8	436	0.2700	2.60		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
9.9	536	Total			

Subcatchment WS9: WS9



Summary for Subcatchment WS9: WS9

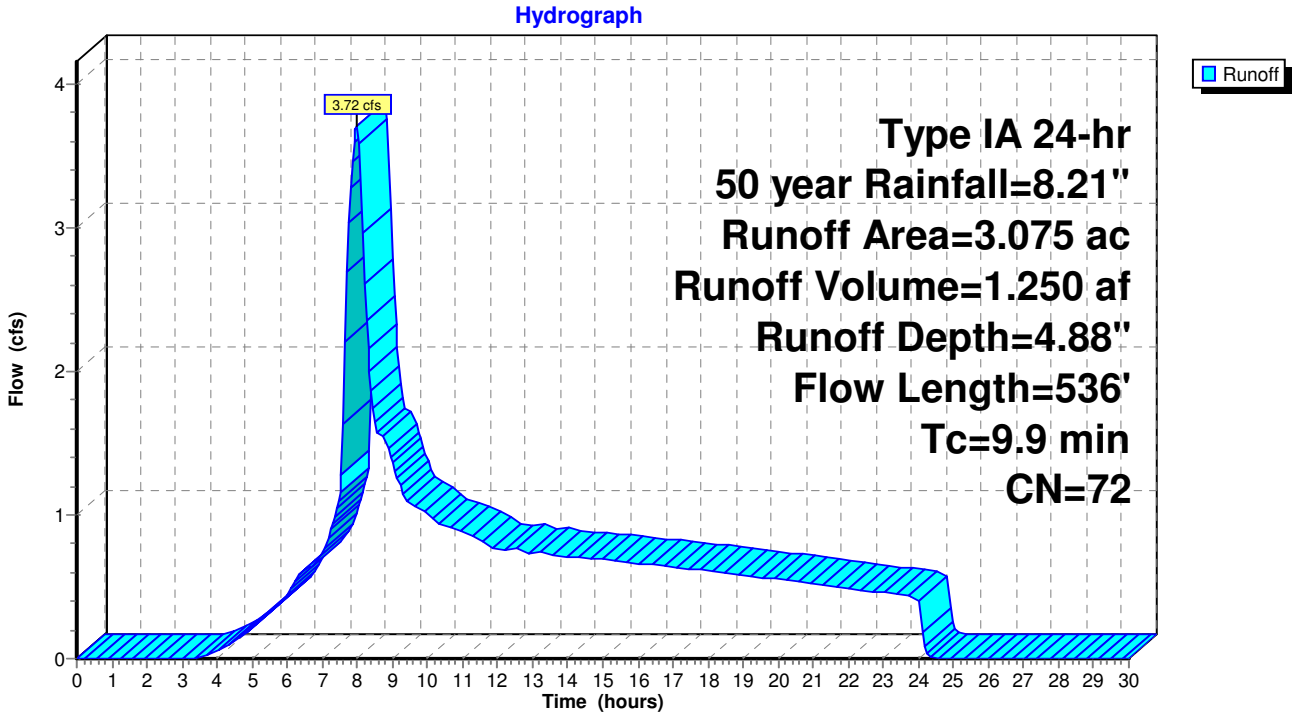
Runoff = 3.72 cfs @ 7.99 hrs, Volume= 1.250 af, Depth= 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
0.791	75	Annual Grass, Good, HSG C
0.196	87	Dirt roads, HSG C
2.087	70	Woods, Good, HSG C
3.075	72	Weighted Average
3.075		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0800	0.24		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.8	436	0.2700	2.60		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
9.9	536	Total			

Subcatchment WS9: WS9



Summary for Subcatchment WS9: WS9

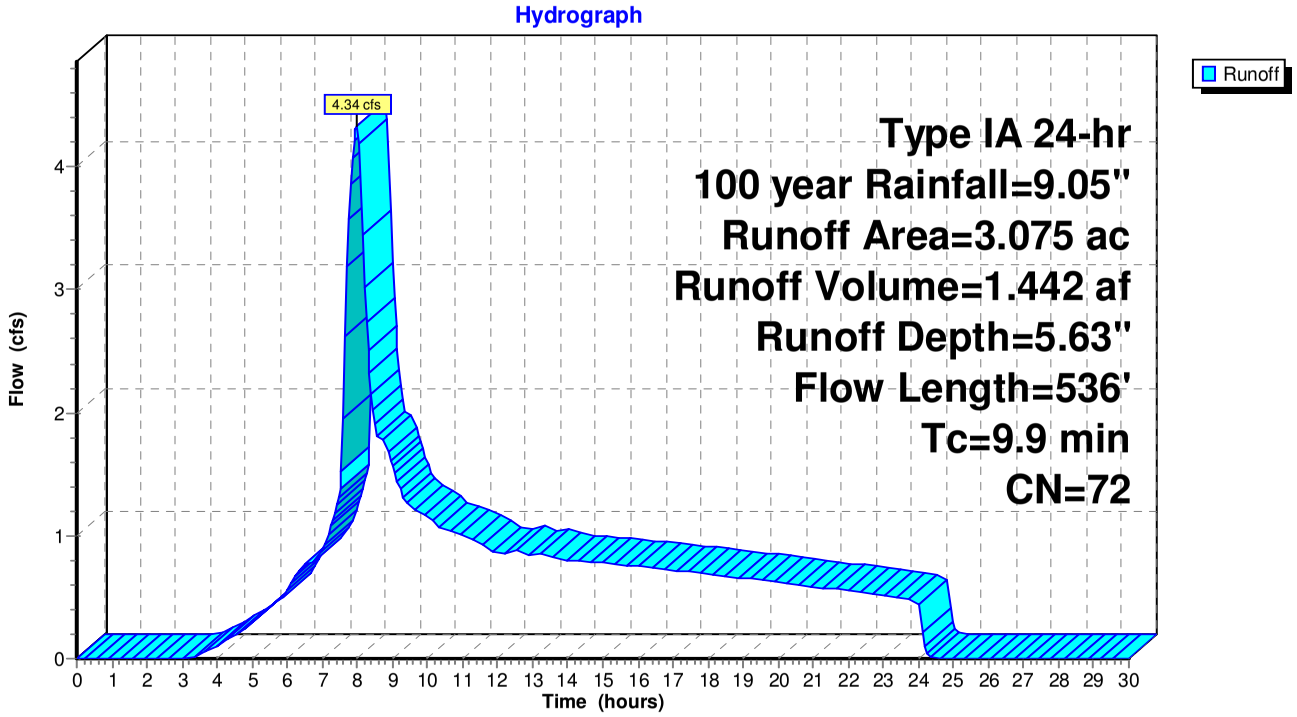
Runoff = 4.34 cfs @ 7.99 hrs, Volume= 1.442 af, Depth= 5.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
0.791	75	Annual Grass, Good, HSG C
0.196	87	Dirt roads, HSG C
2.087	70	Woods, Good, HSG C
3.075	72	Weighted Average
3.075		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0800	0.24		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.8	436	0.2700	2.60		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
9.9	536	Total			

Subcatchment WS9: WS9



WS9

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Post-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS9: WS9

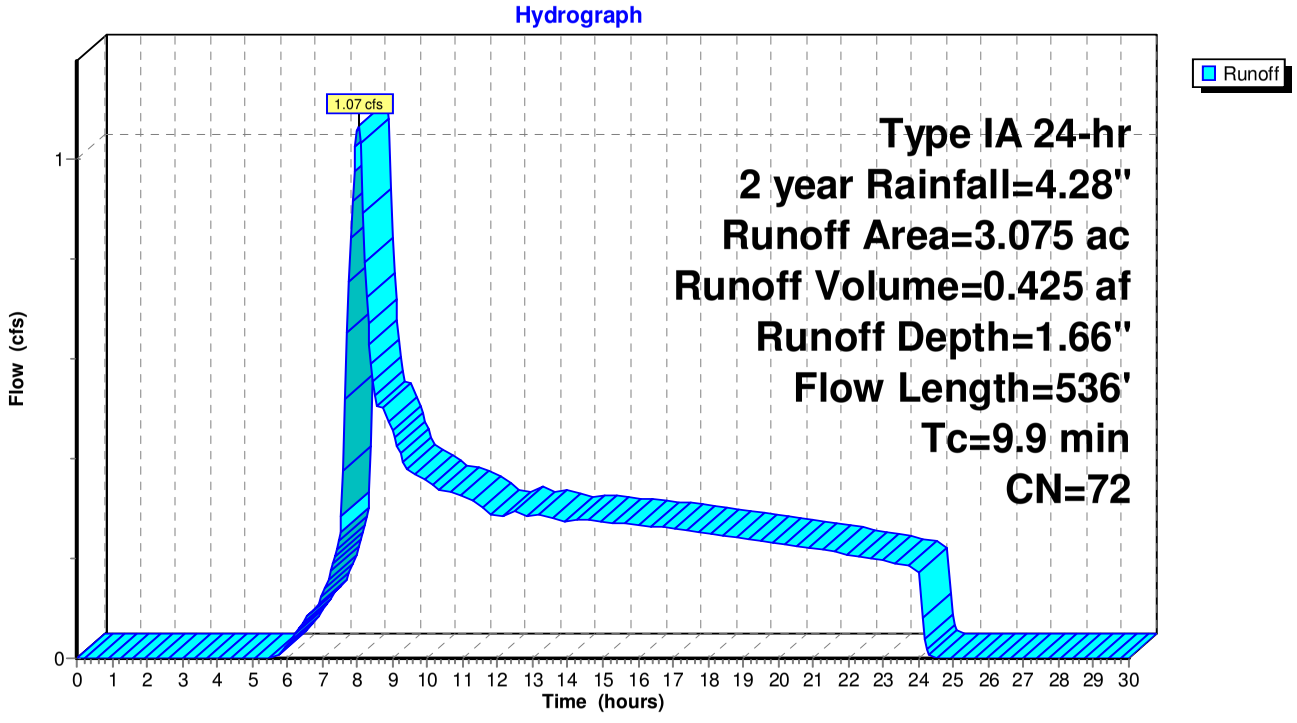
Runoff = 1.07 cfs @ 8.03 hrs, Volume= 0.425 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
0.258	75	Annual Grass, Good, HSG C
0.196	87	Dirt roads, HSG C
0.533	75	Vineyard, Good, HSG C
2.087	70	Woods, Good, HSG C
3.075	72	Weighted Average
3.075		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0800	0.24		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.8	436	0.2700	2.60		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
9.9	536	Total			

Subcatchment WS9: WS9



Summary for Subcatchment WS9: WS9

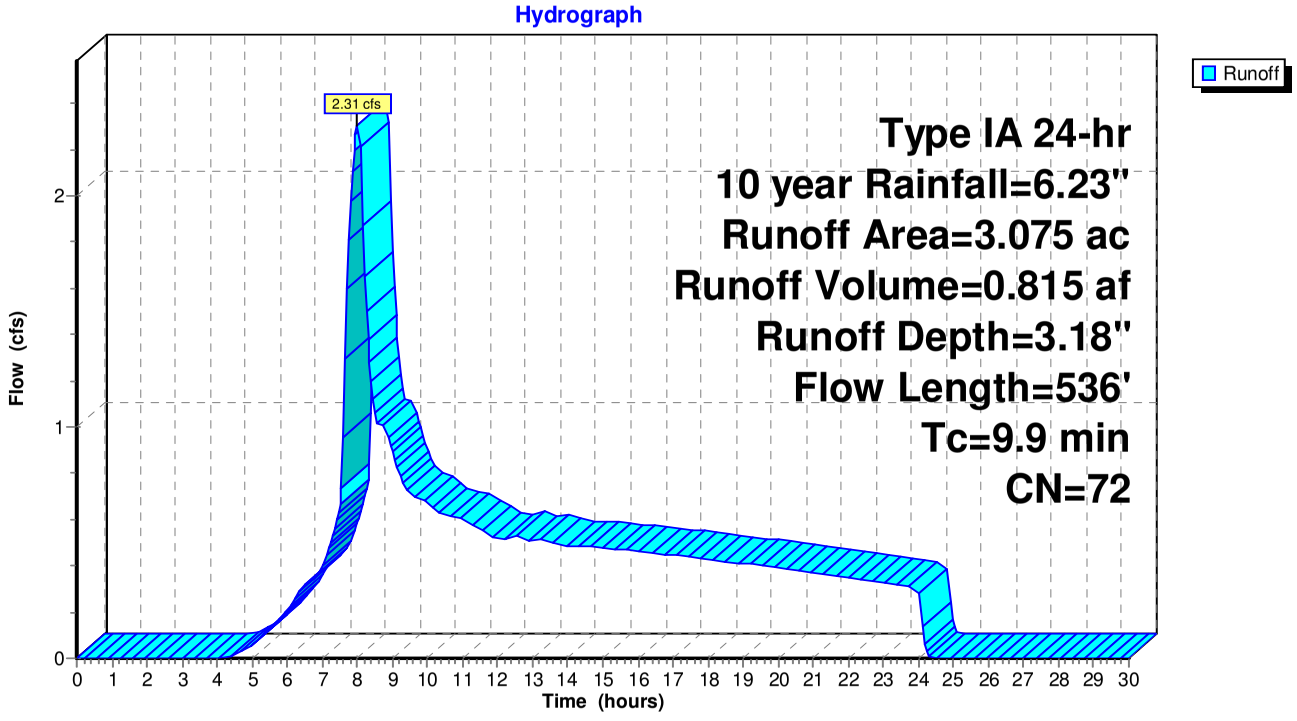
Runoff = 2.31 cfs @ 8.01 hrs, Volume= 0.815 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
0.258	75	Annual Grass, Good, HSG C
0.196	87	Dirt roads, HSG C
0.533	75	Vineyard, Good, HSG C
2.087	70	Woods, Good, HSG C
3.075	72	Weighted Average
3.075		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0800	0.24		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.8	436	0.2700	2.60		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
9.9	536	Total			

Subcatchment WS9: WS9



Summary for Subcatchment WS9: WS9

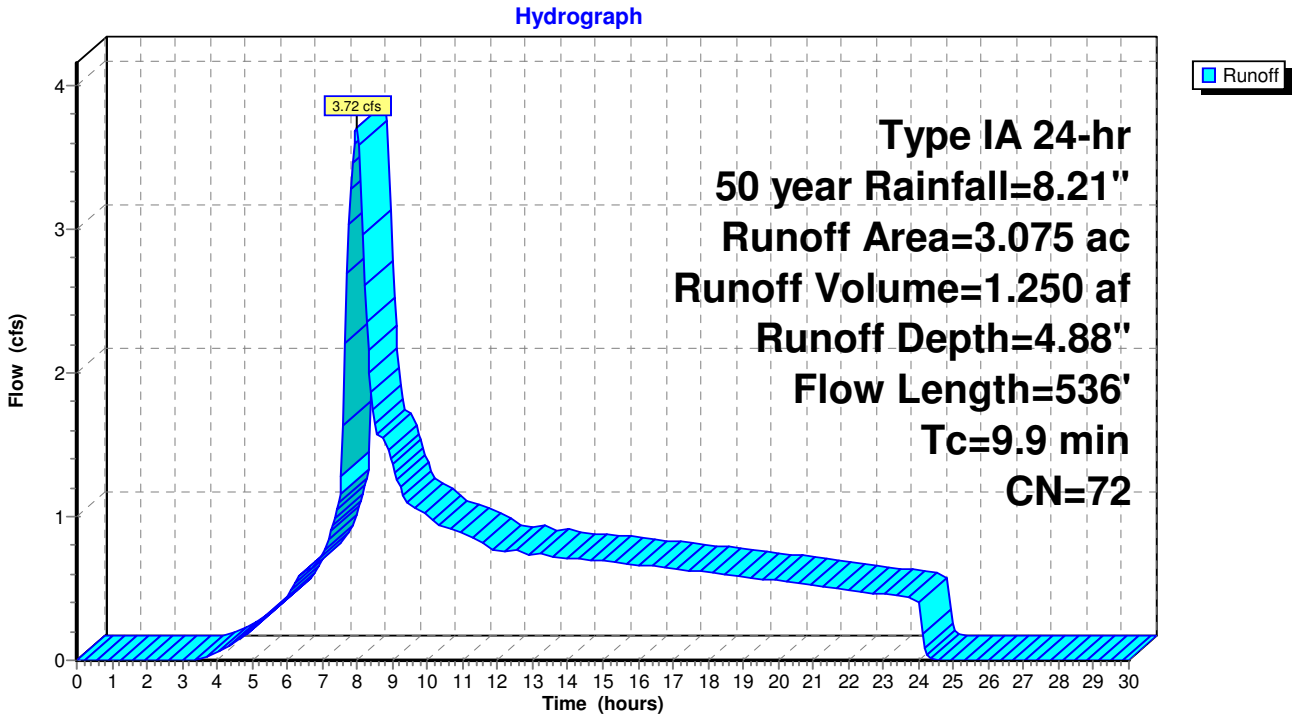
Runoff = 3.72 cfs @ 7.99 hrs, Volume= 1.250 af, Depth= 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
0.258	75	Annual Grass, Good, HSG C
0.196	87	Dirt roads, HSG C
0.533	75	Vineyard, Good, HSG C
2.087	70	Woods, Good, HSG C
3.075	72	Weighted Average
3.075		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0800	0.24		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.8	436	0.2700	2.60		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
9.9	536	Total			

Subcatchment WS9: WS9



Summary for Subcatchment WS9: WS9

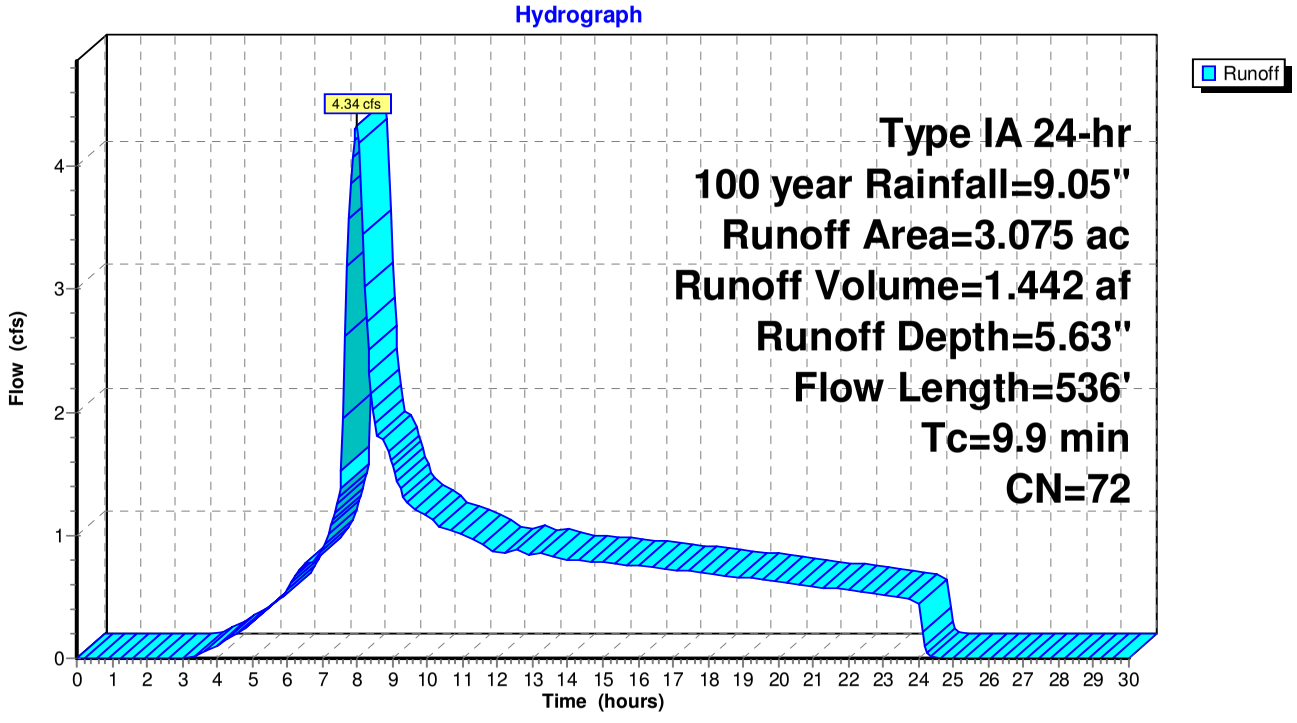
Runoff = 4.34 cfs @ 7.99 hrs, Volume= 1.442 af, Depth= 5.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
0.258	75	Annual Grass, Good, HSG C
0.196	87	Dirt roads, HSG C
0.533	75	Vineyard, Good, HSG C
2.087	70	Woods, Good, HSG C
3.075	72	Weighted Average
3.075		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0800	0.24		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.8	436	0.2700	2.60		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
9.9	536	Total			

Subcatchment WS9: WS9



WS10

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Pre-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS10: WS10

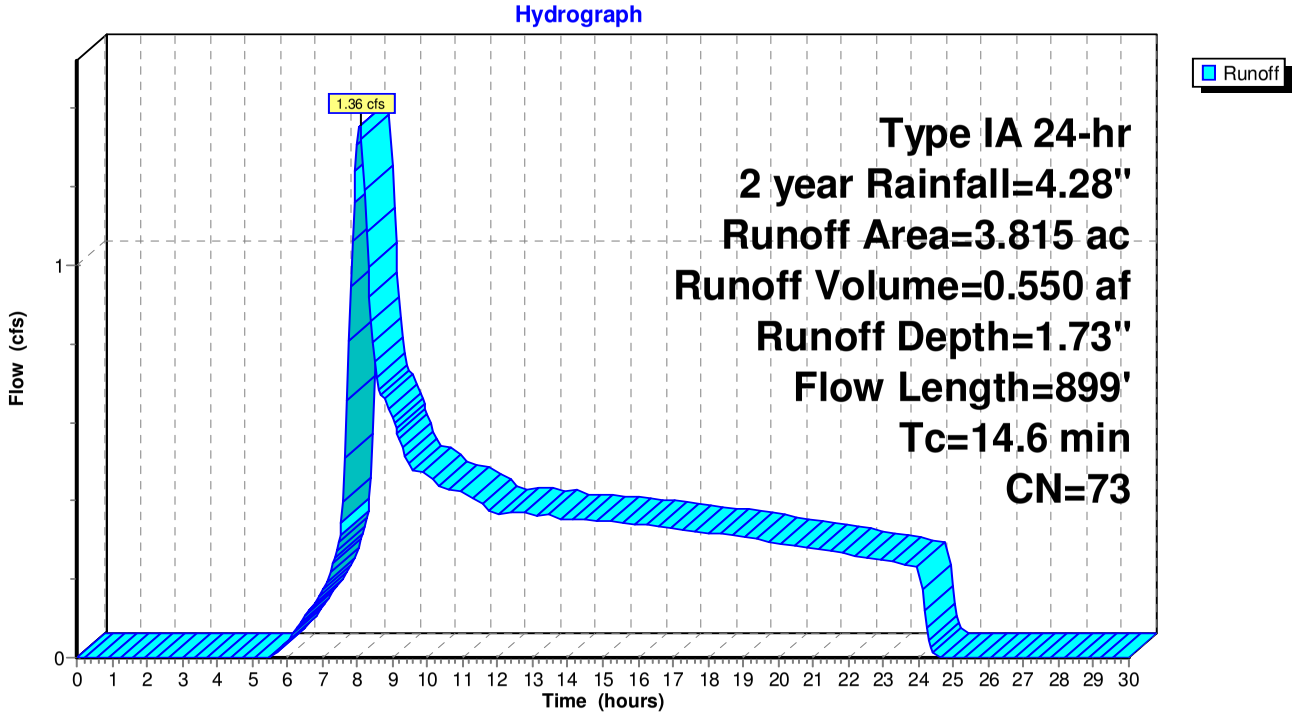
Runoff = 1.36 cfs @ 8.08 hrs, Volume= 0.550 af, Depth= 1.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
1.774	75	Annual Grass, Good, HSG C
0.075	87	Dirt roads, HSG C
1.967	70	Woods, Good, HSG C
3.815	73	Weighted Average
3.815		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.1	333	0.2900	2.69		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
5.0	466	0.0500	1.57		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
14.6	899	Total			

Subcatchment WS10: WS10



Summary for Subcatchment WS10: WS10

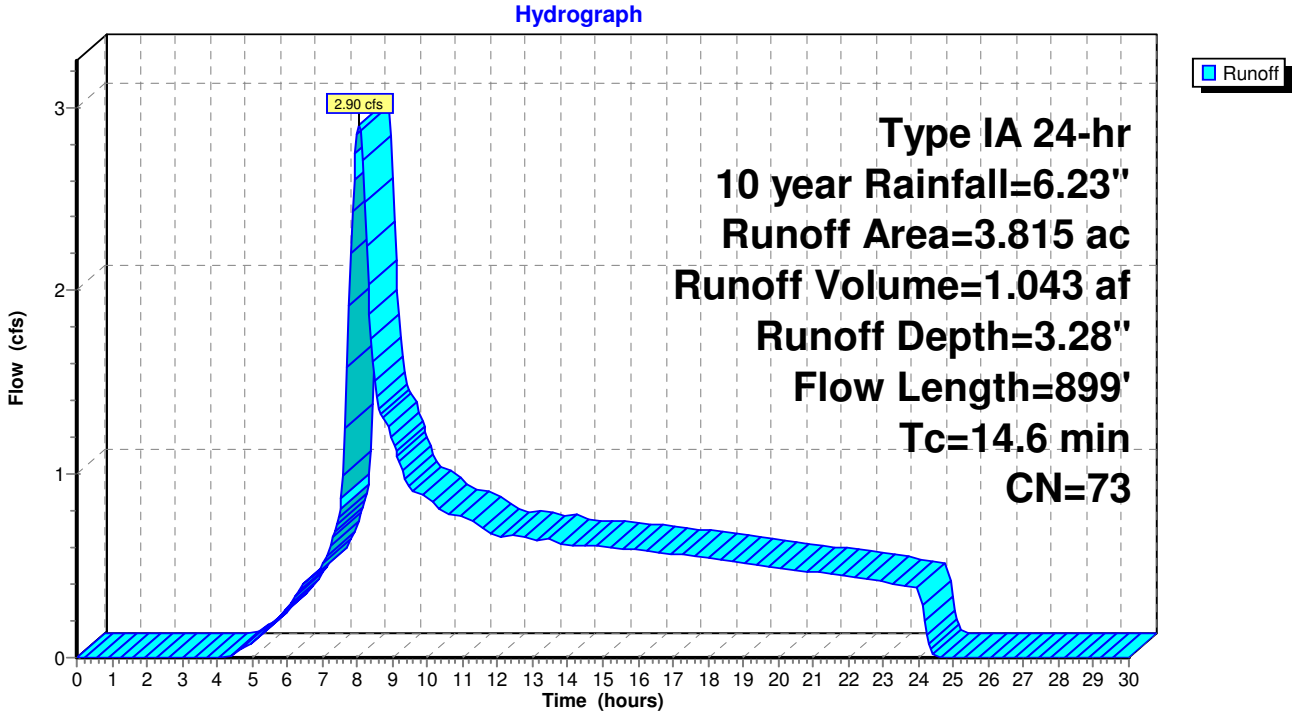
Runoff = 2.90 cfs @ 8.06 hrs, Volume= 1.043 af, Depth= 3.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
1.774	75	Annual Grass, Good, HSG C
0.075	87	Dirt roads, HSG C
1.967	70	Woods, Good, HSG C
3.815	73	Weighted Average
3.815		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.1	333	0.2900	2.69		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
5.0	466	0.0500	1.57		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
14.6	899	Total			

Subcatchment WS10: WS10



Summary for Subcatchment WS10: WS10

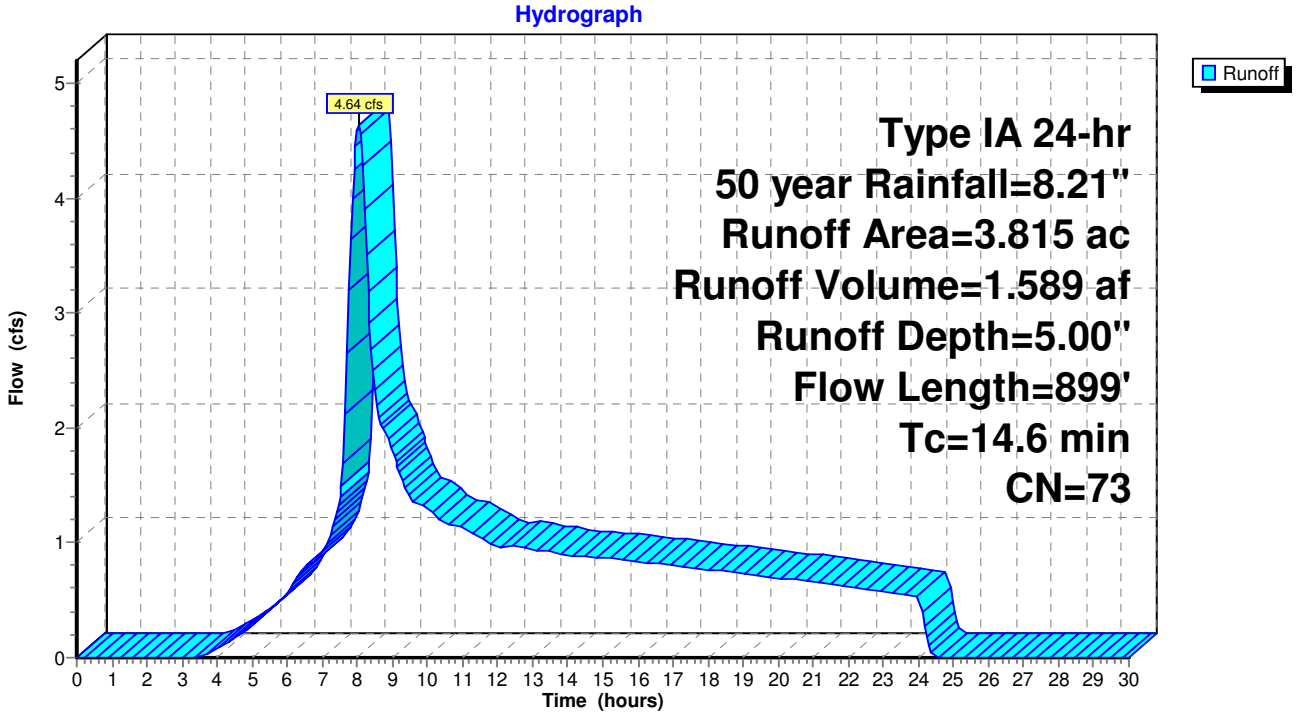
Runoff = 4.64 cfs @ 8.05 hrs, Volume= 1.589 af, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
1.774	75	Annual Grass, Good, HSG C
0.075	87	Dirt roads, HSG C
1.967	70	Woods, Good, HSG C
3.815	73	Weighted Average
3.815		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.1	333	0.2900	2.69		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
5.0	466	0.0500	1.57		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
14.6	899	Total			

Subcatchment WS10: WS10



Summary for Subcatchment WS10: WS10

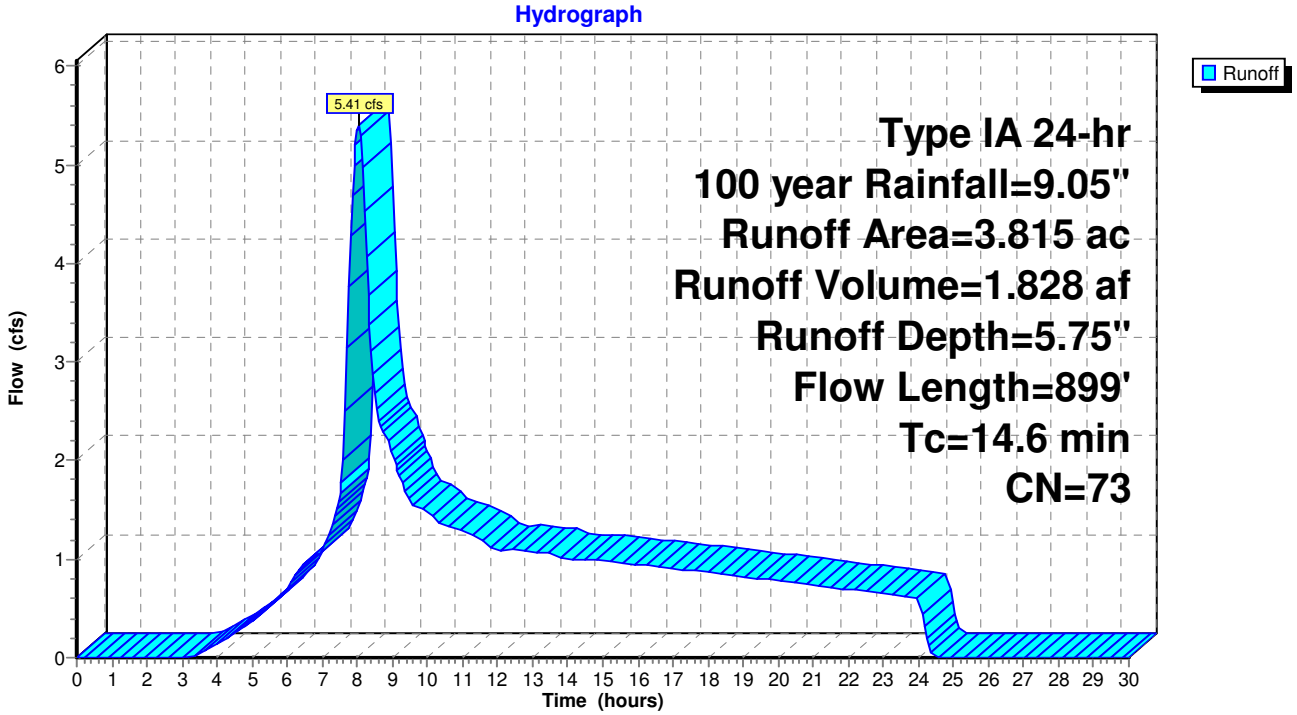
Runoff = 5.41 cfs @ 8.04 hrs, Volume= 1.828 af, Depth= 5.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
1.774	75	Annual Grass, Good, HSG C
0.075	87	Dirt roads, HSG C
1.967	70	Woods, Good, HSG C
3.815	73	Weighted Average
3.815		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.1	333	0.2900	2.69		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
5.0	466	0.0500	1.57		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
14.6	899	Total			

Subcatchment WS10: WS10



WS10

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Post-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS10: WS10

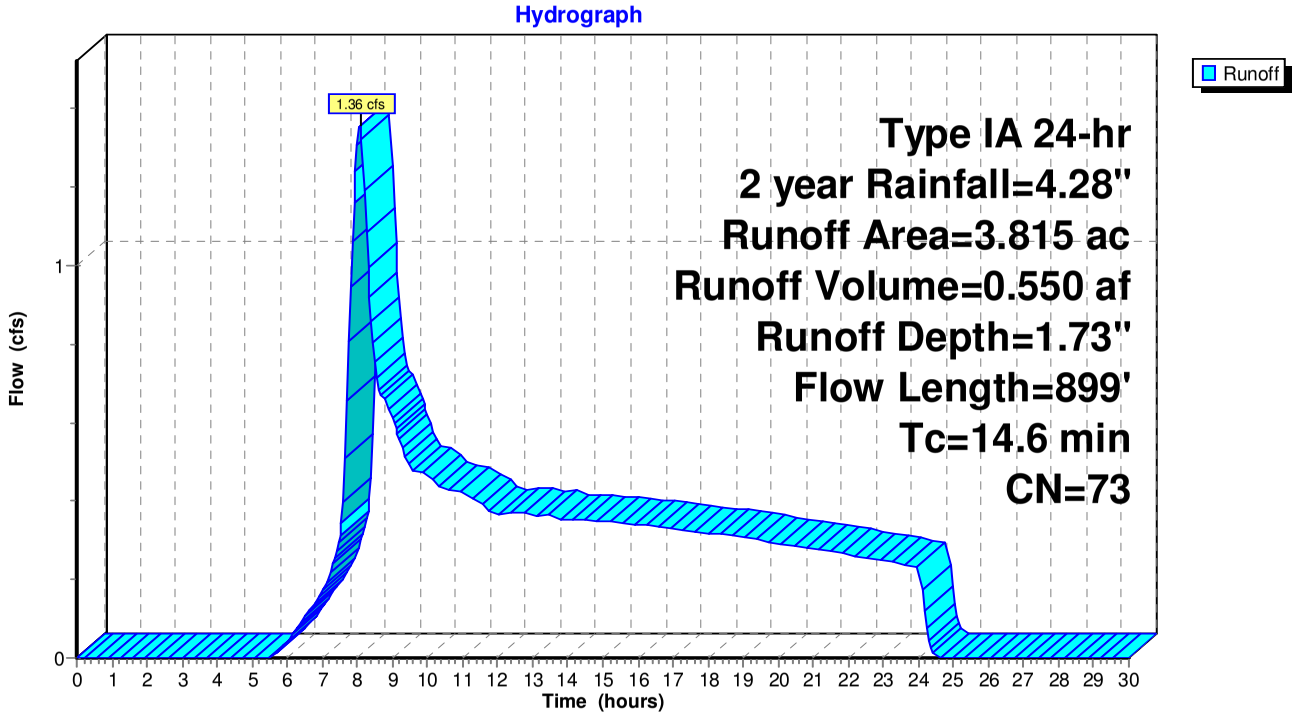
Runoff = 1.36 cfs @ 8.08 hrs, Volume= 0.550 af, Depth= 1.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
1.727	75	Annual Grass, Good, HSG C
0.075	87	Dirt roads, HSG C
0.046	75	Vineyard, Good, HSG C
1.967	70	Woods, Good, HSG C
3.815	73	Weighted Average
3.815		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.1	333	0.2900	2.69		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
5.0	466	0.0500	1.57		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
14.6	899	Total			

Subcatchment WS10: WS10



Summary for Subcatchment WS10: WS10

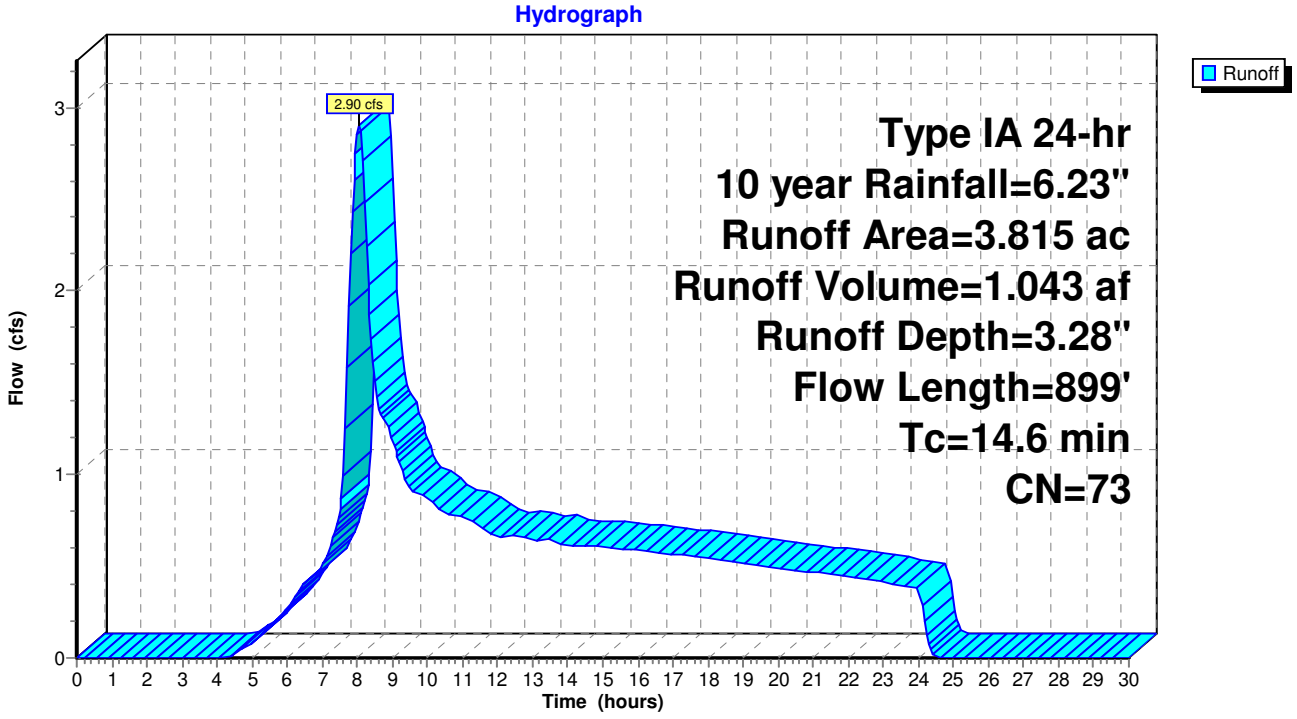
Runoff = 2.90 cfs @ 8.06 hrs, Volume= 1.043 af, Depth= 3.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
1.727	75	Annual Grass, Good, HSG C
0.075	87	Dirt roads, HSG C
0.046	75	Vineyard, Good, HSG C
1.967	70	Woods, Good, HSG C
3.815	73	Weighted Average
3.815		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.1	333	0.2900	2.69		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
5.0	466	0.0500	1.57		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
14.6	899	Total			

Subcatchment WS10: WS10



Summary for Subcatchment WS10: WS10

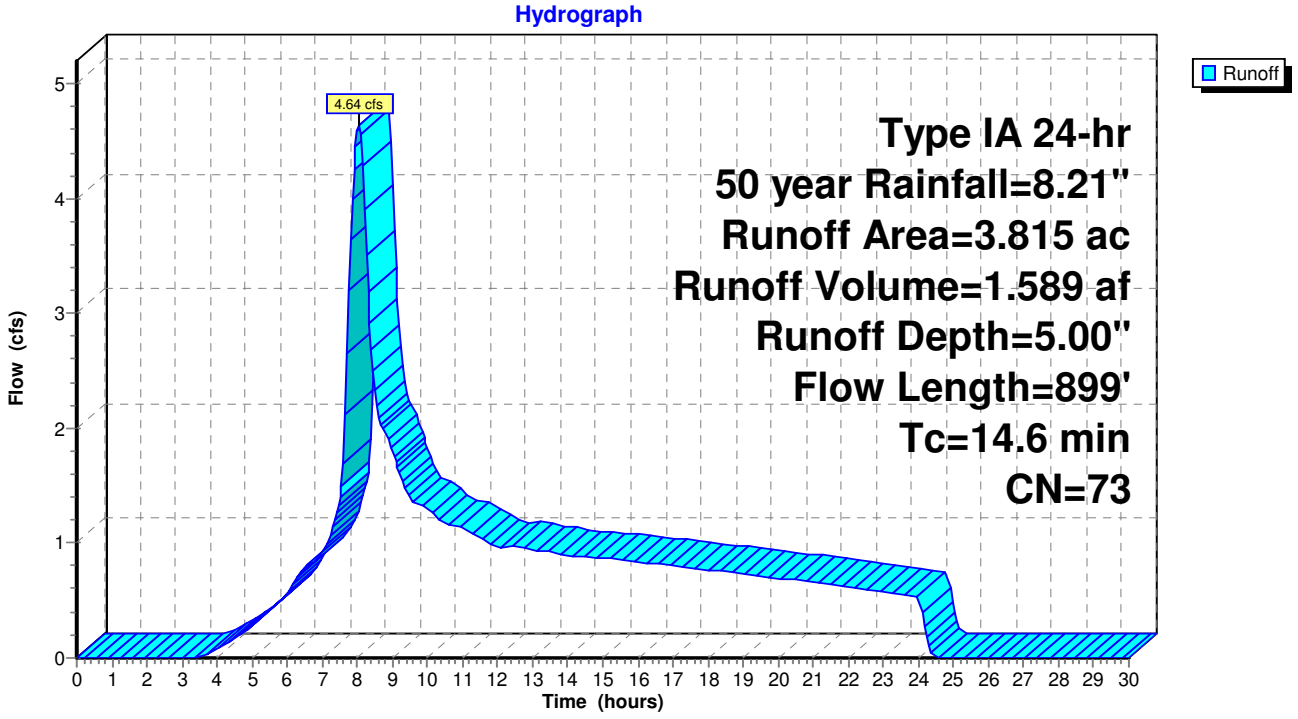
Runoff = 4.64 cfs @ 8.05 hrs, Volume= 1.589 af, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
1.727	75	Annual Grass, Good, HSG C
0.075	87	Dirt roads, HSG C
0.046	75	Vineyard, Good, HSG C
1.967	70	Woods, Good, HSG C
3.815	73	Weighted Average
3.815		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.1	333	0.2900	2.69		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
5.0	466	0.0500	1.57		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
14.6	899	Total			

Subcatchment WS10: WS10



Summary for Subcatchment WS10: WS10

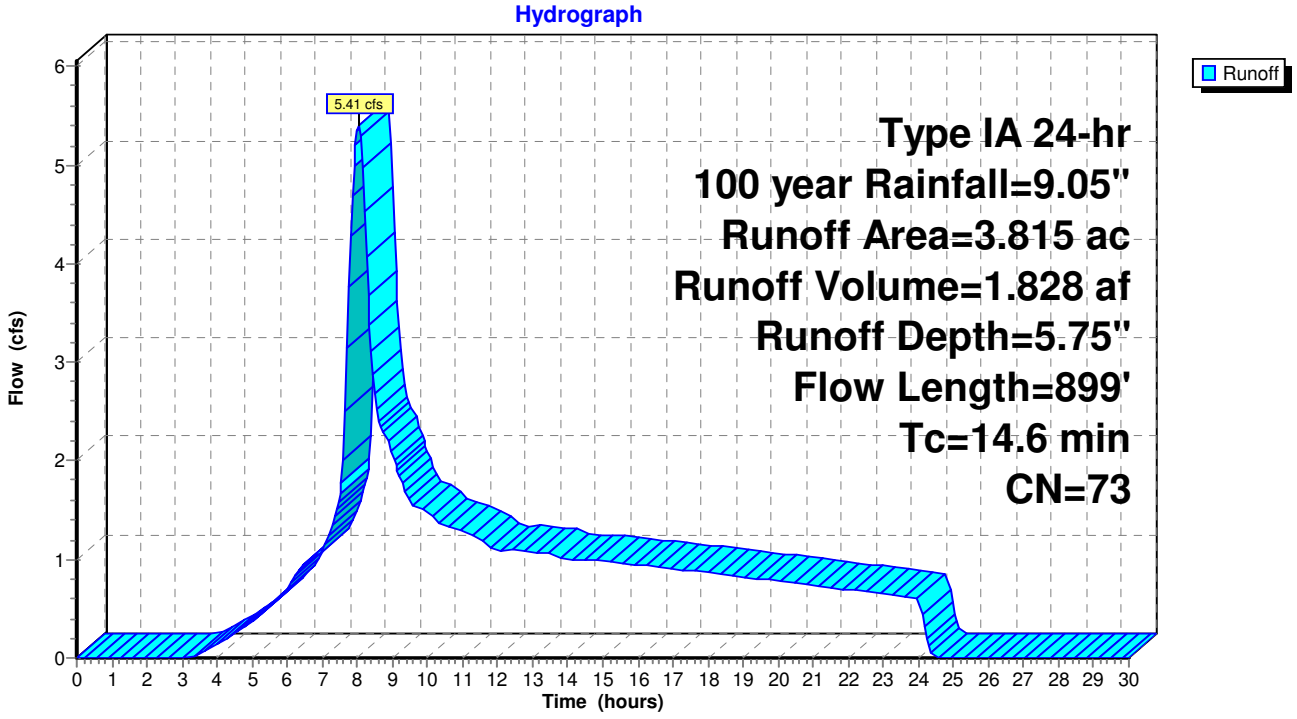
Runoff = 5.41 cfs @ 8.04 hrs, Volume= 1.828 af, Depth= 5.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
1.727	75	Annual Grass, Good, HSG C
0.075	87	Dirt roads, HSG C
0.046	75	Vineyard, Good, HSG C
1.967	70	Woods, Good, HSG C
3.815	73	Weighted Average
3.815		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0700	0.22		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.1	333	0.2900	2.69		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
5.0	466	0.0500	1.57		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
14.6	899	Total			

Subcatchment WS10: WS10



WS11

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Pre-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS11: WS11

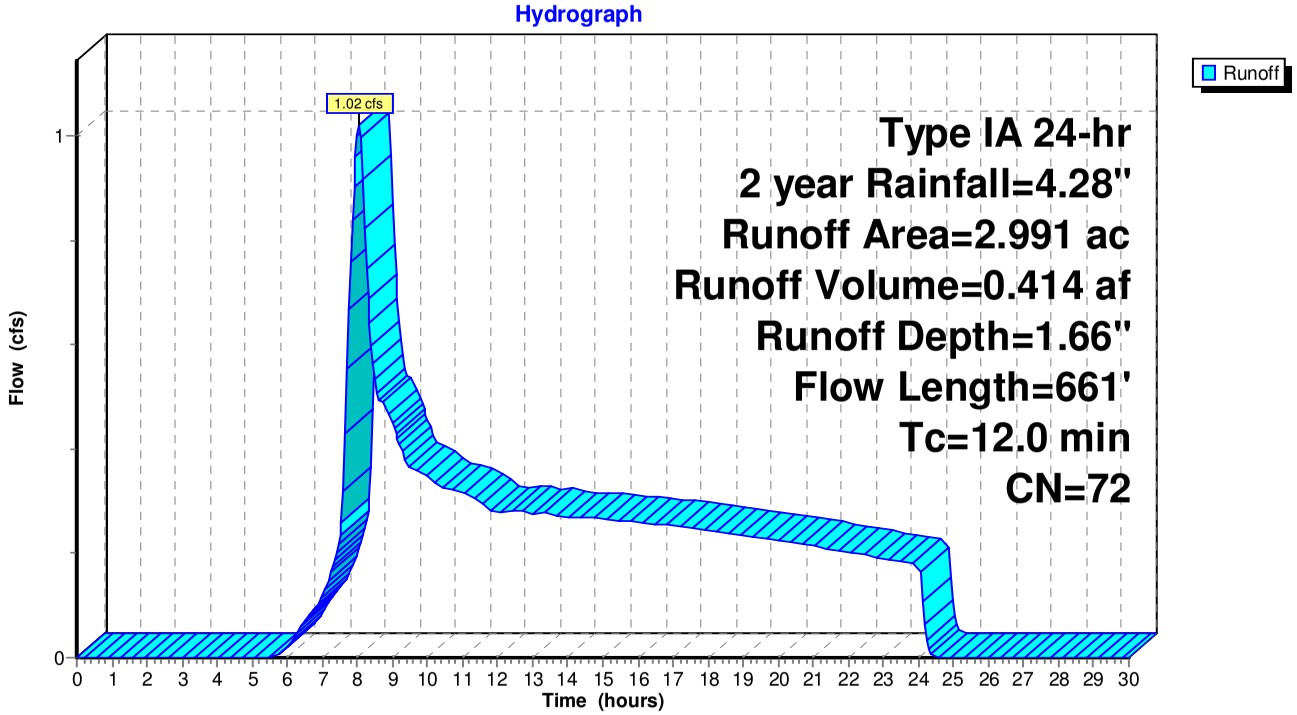
Runoff = 1.02 cfs @ 8.05 hrs, Volume= 0.414 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
0.735	75	Annual Grass, Good, HSG C
0.117	87	Dirt roads, HSG C
2.139	70	Woods, Good, HSG C
2.991	72	Weighted Average
2.991		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.0600	0.21		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.2	361	0.3000	2.74		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.8	200	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
12.0	661	Total			

Subcatchment WS11: WS11



Summary for Subcatchment WS11: WS11

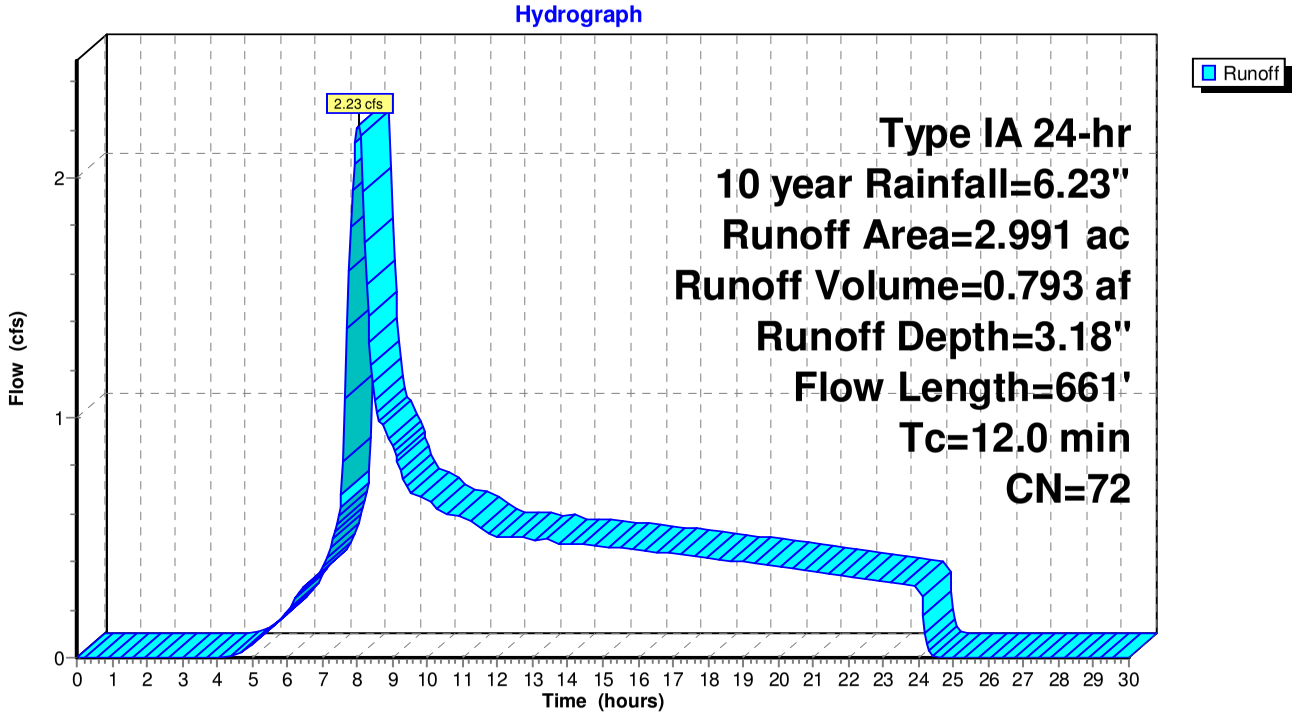
Runoff = 2.23 cfs @ 8.03 hrs, Volume= 0.793 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
0.735	75	Annual Grass, Good, HSG C
0.117	87	Dirt roads, HSG C
2.139	70	Woods, Good, HSG C
2.991	72	Weighted Average
2.991		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.0600	0.21		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.2	361	0.3000	2.74		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.8	200	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
12.0	661	Total			

Subcatchment WS11: WS11



Summary for Subcatchment WS11: WS11

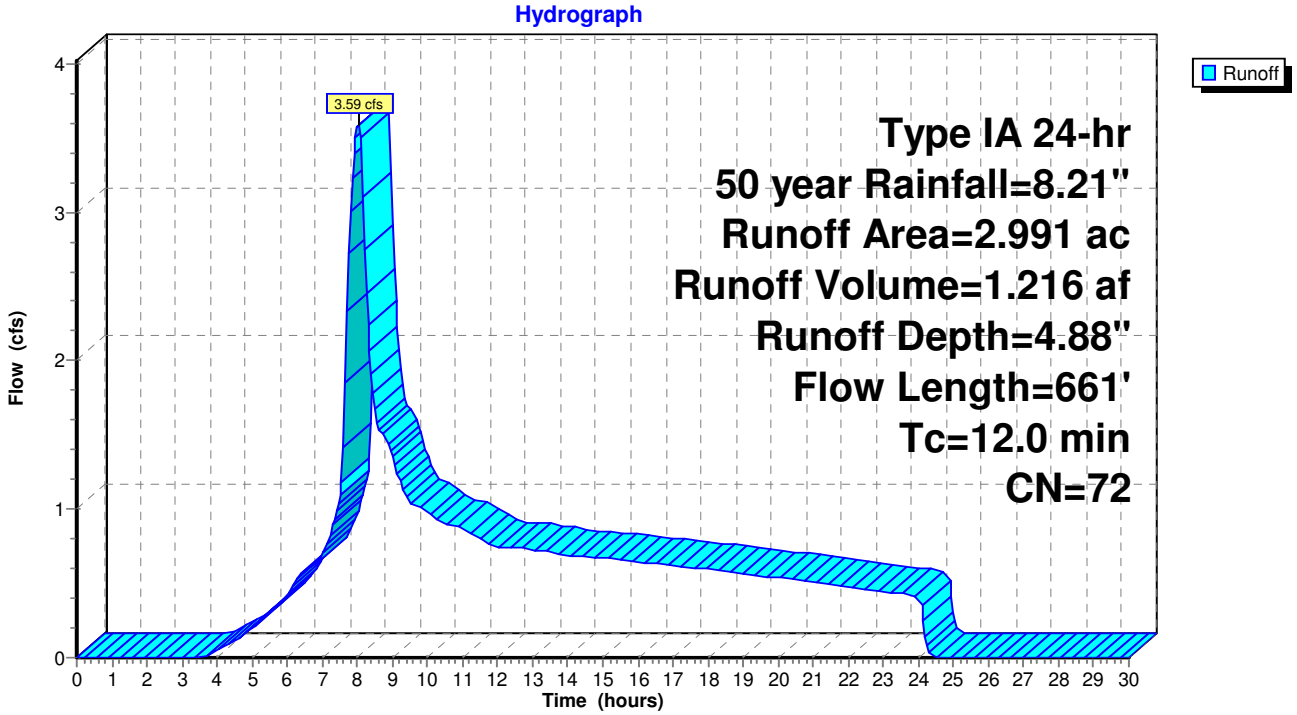
Runoff = 3.59 cfs @ 8.03 hrs, Volume= 1.216 af, Depth= 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
0.735	75	Annual Grass, Good, HSG C
0.117	87	Dirt roads, HSG C
2.139	70	Woods, Good, HSG C
2.991	72	Weighted Average
2.991		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.0600	0.21		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.2	361	0.3000	2.74		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.8	200	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
12.0	661	Total			

Subcatchment WS11: WS11



Summary for Subcatchment WS11: WS11

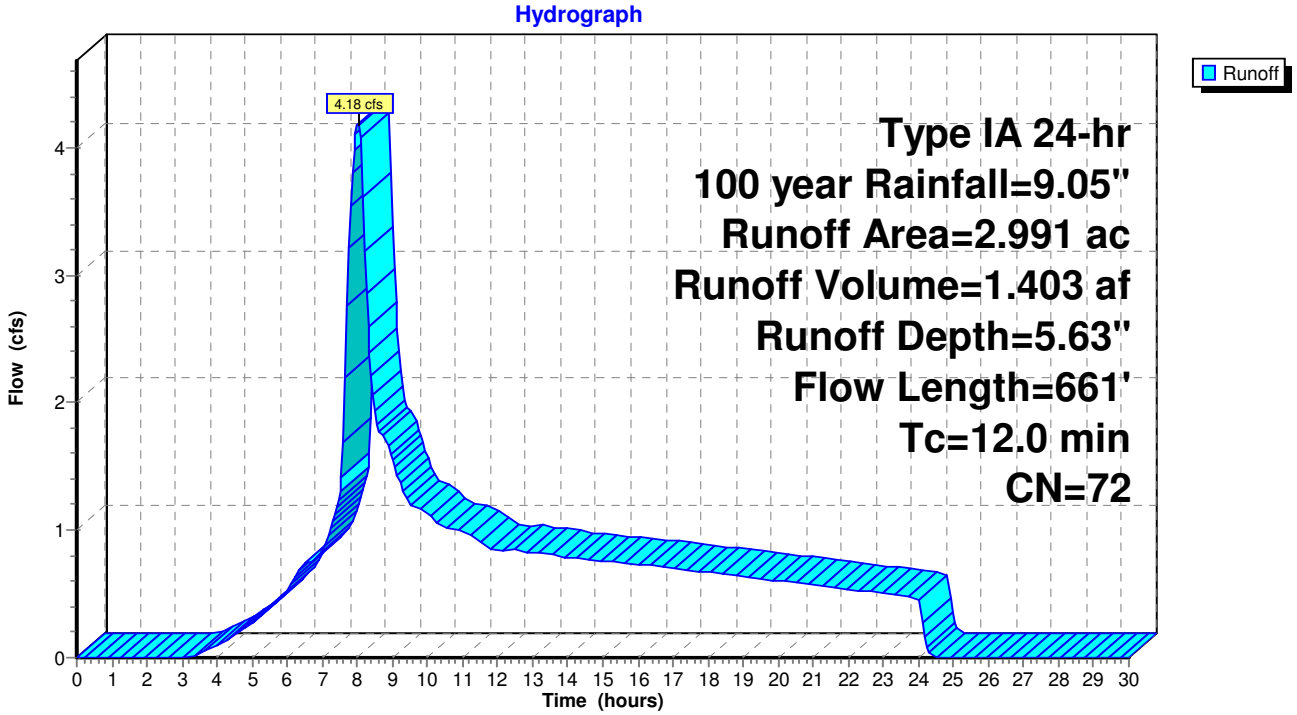
Runoff = 4.18 cfs @ 8.02 hrs, Volume= 1.403 af, Depth= 5.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
0.735	75	Annual Grass, Good, HSG C
0.117	87	Dirt roads, HSG C
2.139	70	Woods, Good, HSG C
2.991	72	Weighted Average
2.991		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.0600	0.21		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.2	361	0.3000	2.74		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.8	200	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
12.0	661	Total			

Subcatchment WS11: WS11



WS11

Subcat Reach Pond Link

Routing Diagram for Project Pioneer Post-Project Hydrologic Analysis
Prepared by PPI Engineering, Revised Sept. 2020, Printed 11/18/2020

Summary for Subcatchment WS11: WS11

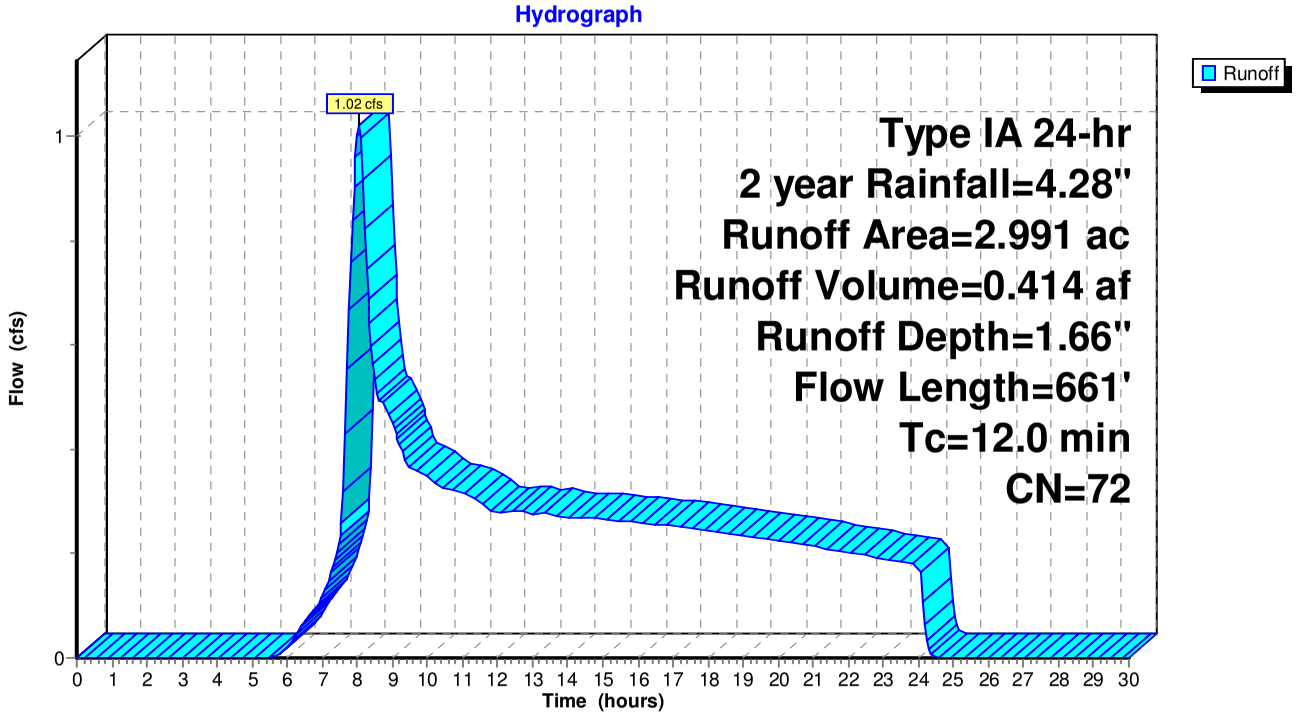
Runoff = 1.02 cfs @ 8.05 hrs, Volume= 0.414 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=4.28"

Area (ac)	CN	Description
0.463	75	Annual Grass, Good, HSG C
0.117	87	Dirt roads, HSG C
0.272	75	Vineyard, Good, HSG C
2.139	70	Woods, Good, HSG C
2.991	72	Weighted Average
2.991		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.0600	0.21		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.2	361	0.3000	2.74		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.8	200	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
12.0	661	Total			

Subcatchment WS11: WS11



Summary for Subcatchment WS11: WS11

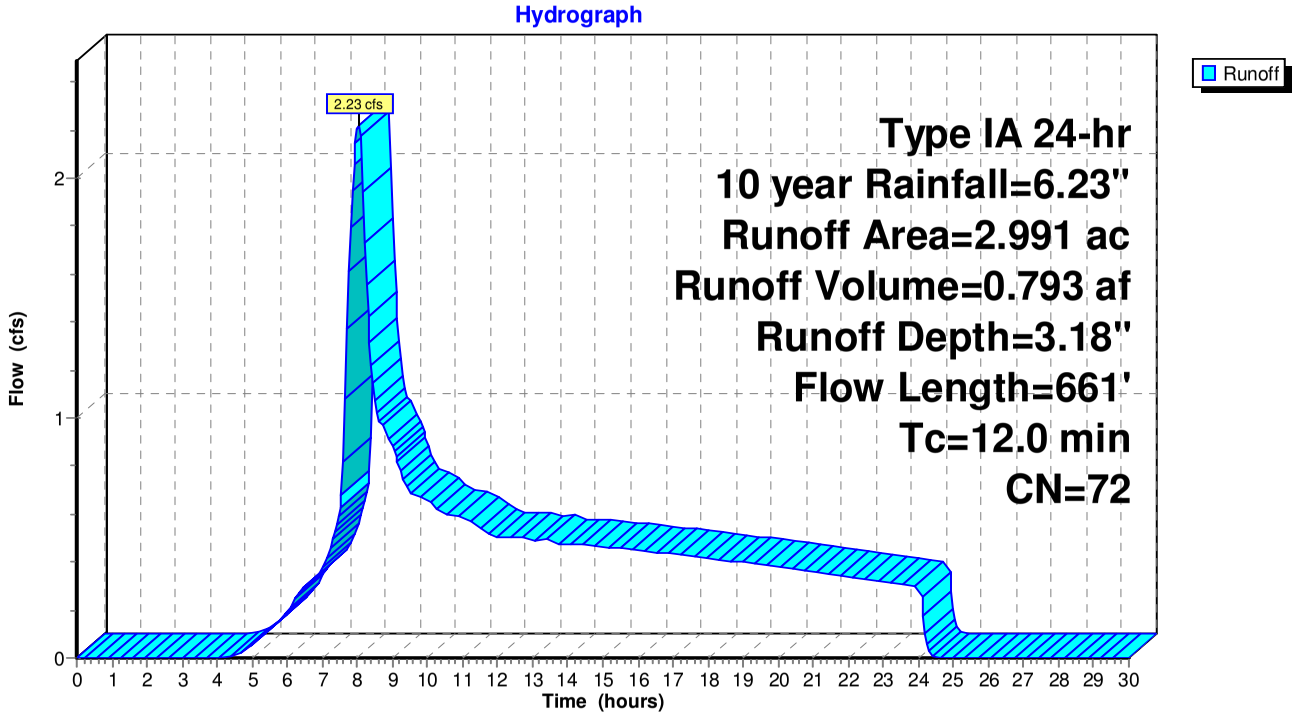
Runoff = 2.23 cfs @ 8.03 hrs, Volume= 0.793 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=6.23"

Area (ac)	CN	Description
0.463	75	Annual Grass, Good, HSG C
0.117	87	Dirt roads, HSG C
0.272	75	Vineyard, Good, HSG C
2.139	70	Woods, Good, HSG C
2.991	72	Weighted Average
2.991		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.0600	0.21		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.2	361	0.3000	2.74		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.8	200	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
12.0	661	Total			

Subcatchment WS11: WS11



Summary for Subcatchment WS11: WS11

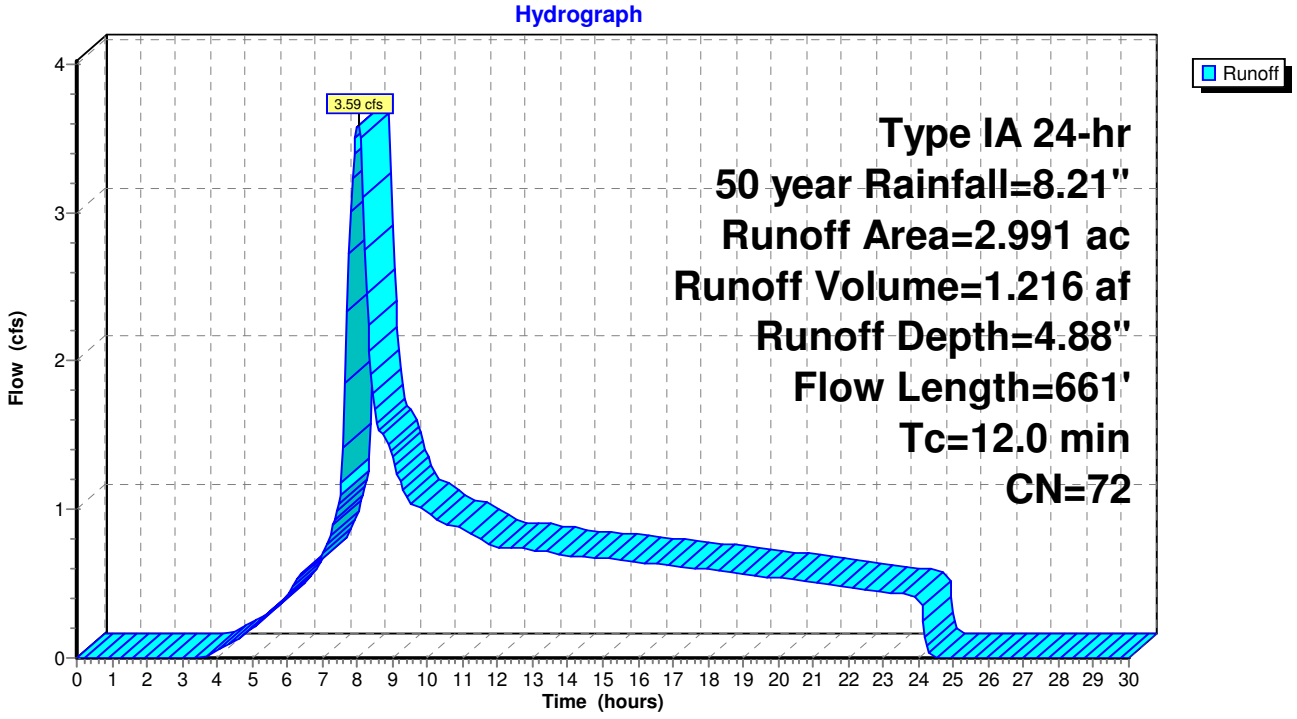
Runoff = 3.59 cfs @ 8.03 hrs, Volume= 1.216 af, Depth= 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50 year Rainfall=8.21"

Area (ac)	CN	Description
0.463	75	Annual Grass, Good, HSG C
0.117	87	Dirt roads, HSG C
0.272	75	Vineyard, Good, HSG C
2.139	70	Woods, Good, HSG C
2.991	72	Weighted Average
2.991		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.0600	0.21		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.2	361	0.3000	2.74		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.8	200	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
12.0	661	Total			

Subcatchment WS11: WS11



Summary for Subcatchment WS11: WS11

Runoff = 4.18 cfs @ 8.02 hrs, Volume= 1.403 af, Depth= 5.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=9.05"

Area (ac)	CN	Description
0.463	75	Annual Grass, Good, HSG C
0.117	87	Dirt roads, HSG C
0.272	75	Vineyard, Good, HSG C
2.139	70	Woods, Good, HSG C
2.991	72	Weighted Average
2.991		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.0600	0.21		**Sheet Flow, Sheet-1** Grass: Dense n= 0.240 P2= 4.28"
2.2	361	0.3000	2.74		**Shallow Concentrated Flow, Shallow - Woodland** Woodland Kv= 5.0 fps
1.8	200	0.0700	1.85		**Shallow Concentrated Flow, Shallow - Short Grass** Short Grass Pasture Kv= 7.0 fps
12.0	661	Total			

Subcatchment WS11: WS11