

MEMORANDUM

Date: April 13, 2020
To: Daniel Basore, Napa County Planning, Building, and Environmental Services
From: James R. Bushey, P.E.



Cc: John McDowell, Napa County Planning, Building, and Environmental Services
Re: G1 Financial Corporation Track I ECP
APN 039-150-091
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 the watershed containing the proposed development area. 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.

One (1) watershed was delineated for the hydrologic modeling. The watershed drains into an unnamed stream which runs south off of the property. Please see the attached figures for the location of the watershed.

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

- Boomer-Forward-Felta Complex, 30-50% slopes (Map Unit Symbol 110)
- Coombs Gravelly Loam, 2-5% slopes (Map Unit Symbol 123)
- Kidd Loam, 15-30% slopes (Map Unit Symbol 155)
- Rock Outcrop (Map Unit Symbol 175)
- Sobrante Loam, 30-50% slopes (Map Unit Symbol 179)

The Boomer-Forward-Felta complex soil group is classified as Hydrologic Soil Group (HSG) B. The Coombs Gravelly Loam and Sobrante Loam soil groups are classified as HSG C. The Rock Outcrop and Kidd Loam soil groups are classified as HSG D. Please see the attached figures for soil type delineations within the vicinity of each watershed.

Land use areas were initially delineated based on Napa County orthophotos and both PPI and Napa County contours. A site visit was then conducted on September 4, 2019 by Cody Corsetti and Rachel Rosasco of PPI Engineering to ground truth the orthophotos and determine the existing land use conditions. 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 the watershed was determined using both American Aerial Inc. two-foot and Napa County five-foot contours. The flow path was drafted from the hydrologically most distant point (longest travel time) in the watershed to the watershed outlet per NRCS standards. The flow path for the watershed did not change from pre-project to post-project conditions. 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 model are summarized in Table 1. Runoff was calculated for the 2-, 10-, 50-, and 100-year storms respectively.

Table 1. Hydrologic Analysis Summary

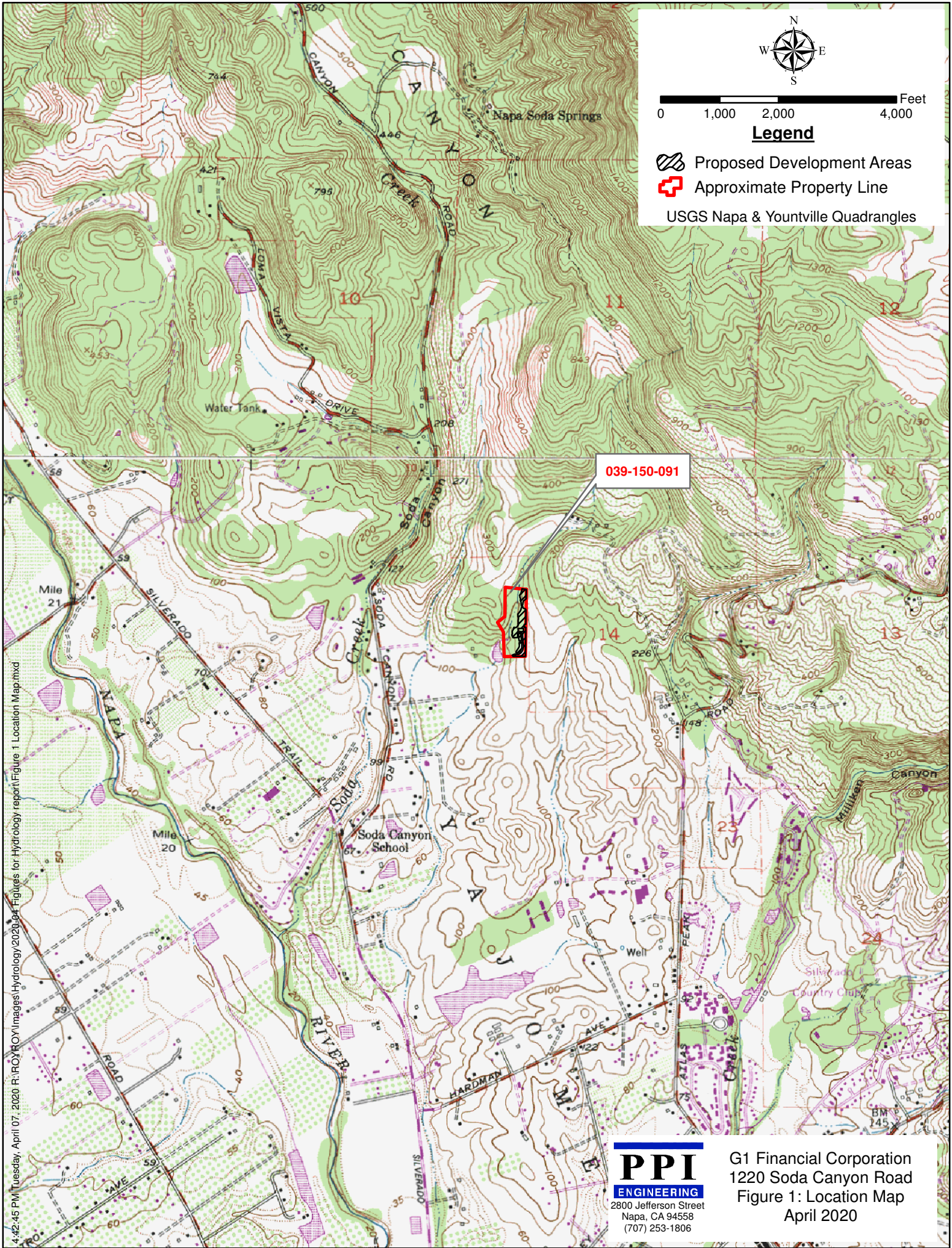
	Runoff (cfs)		
	Watershed 1		
	Pre-Project	Post-Project	Increase/Decrease
2-Year Storm	13.26	13.26	0.00
10-Year Storm	28.92	28.92	0.00
50-Year Storm	45.77	45.77	0.00
100-Year Storm	53.15	53.15	0.00

The HydroCAD model predicts no net change in runoff from pre- to post-project conditions for all storm events. This is due to the fact that neither the curve number (CN) nor the time of concentration (Tc) changed for the post-project conditions within the watershed. 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



0 1,000 2,000 4,000 Feet

Legend

-  Proposed Development Areas
-  Approximate Property Line

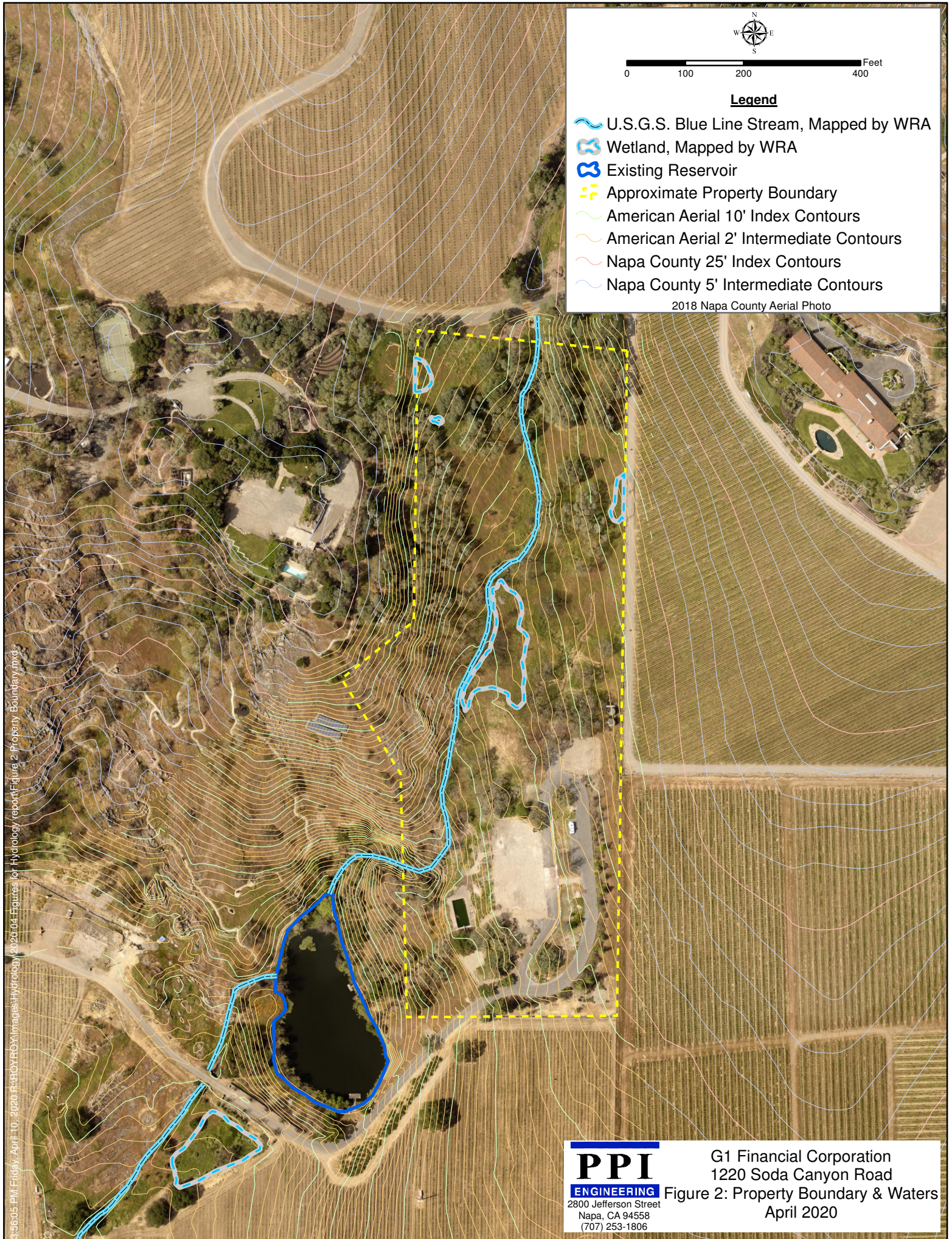
USGS Napa & Yountville Quadrangles

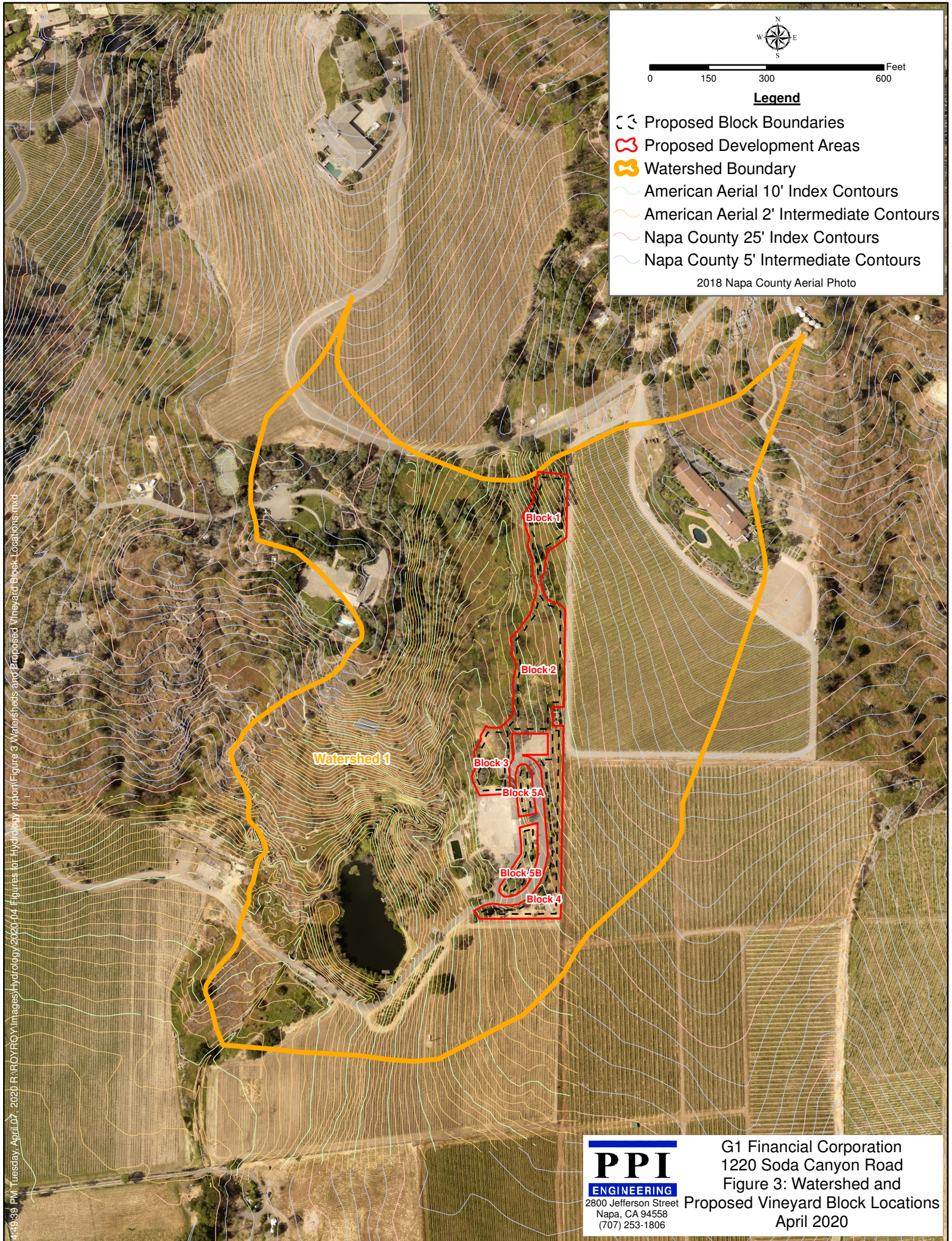
039-150-091

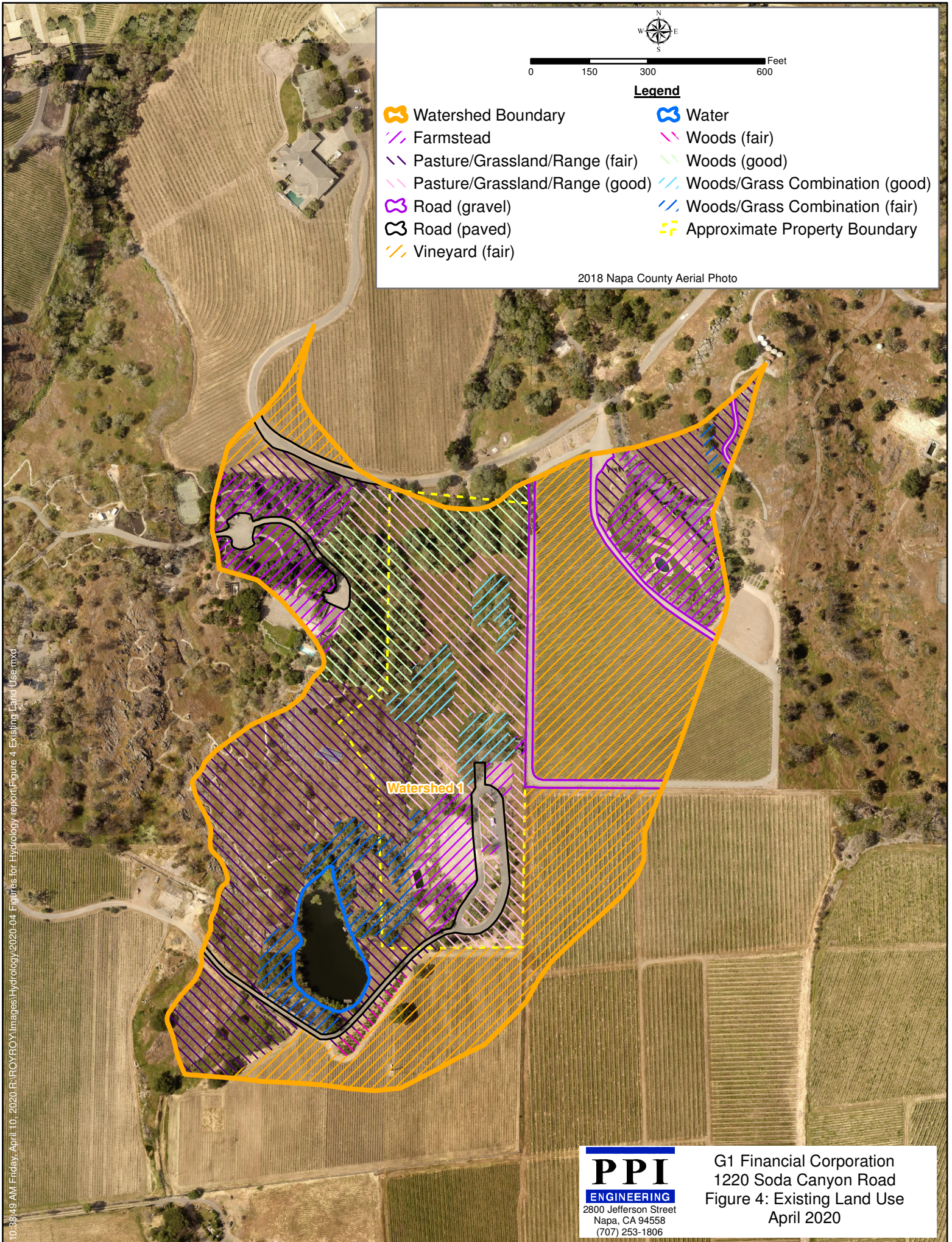
4:42:45 PM Tuesday, April 07, 2020 R:\PROJECTS\Hydrology\2020\039-150-091\Figures for Hydrology report\Figure 1 Location Map.mxd

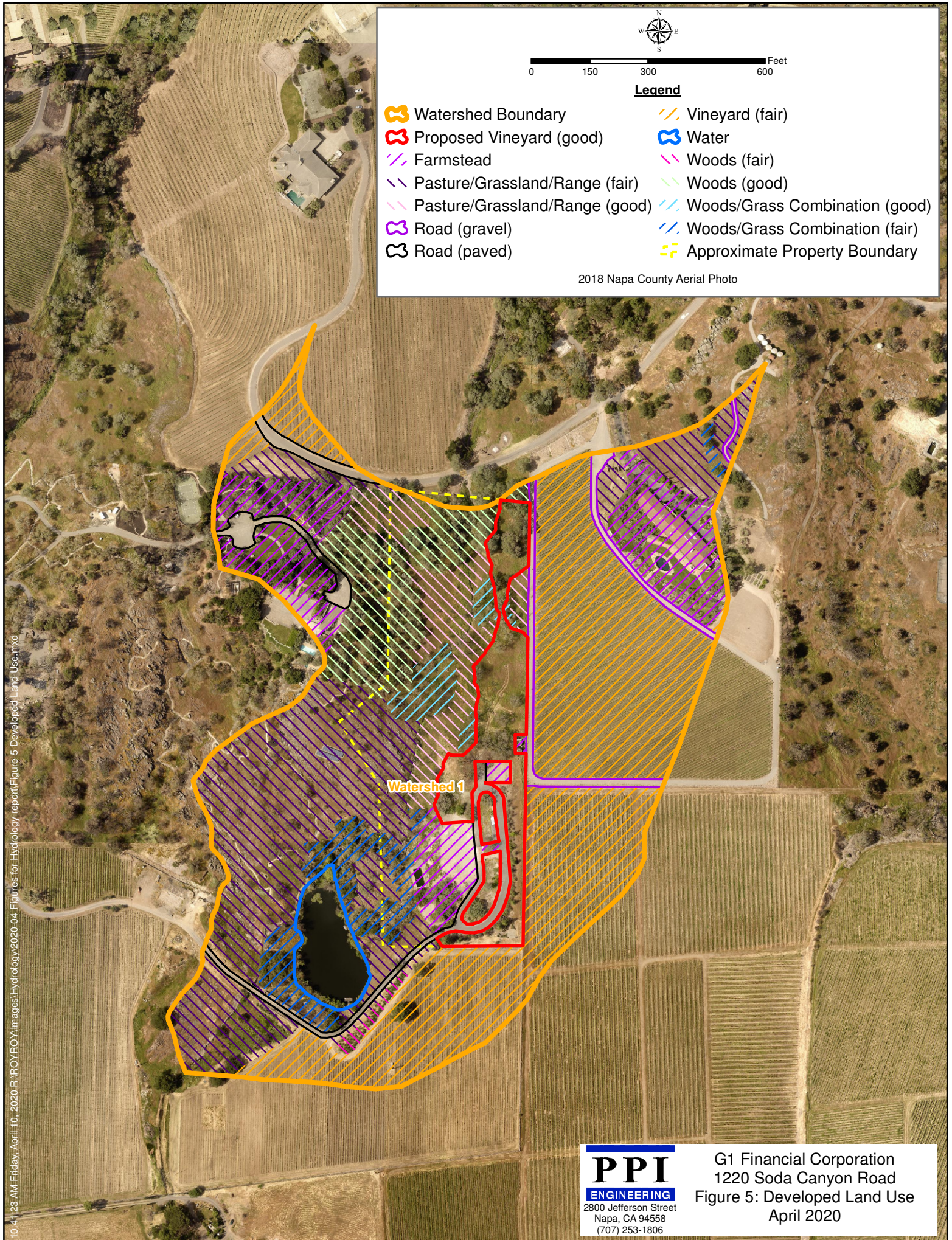
PPI
ENGINEERING
2800 Jefferson Street
Napa, CA 94558
(707) 253-1806

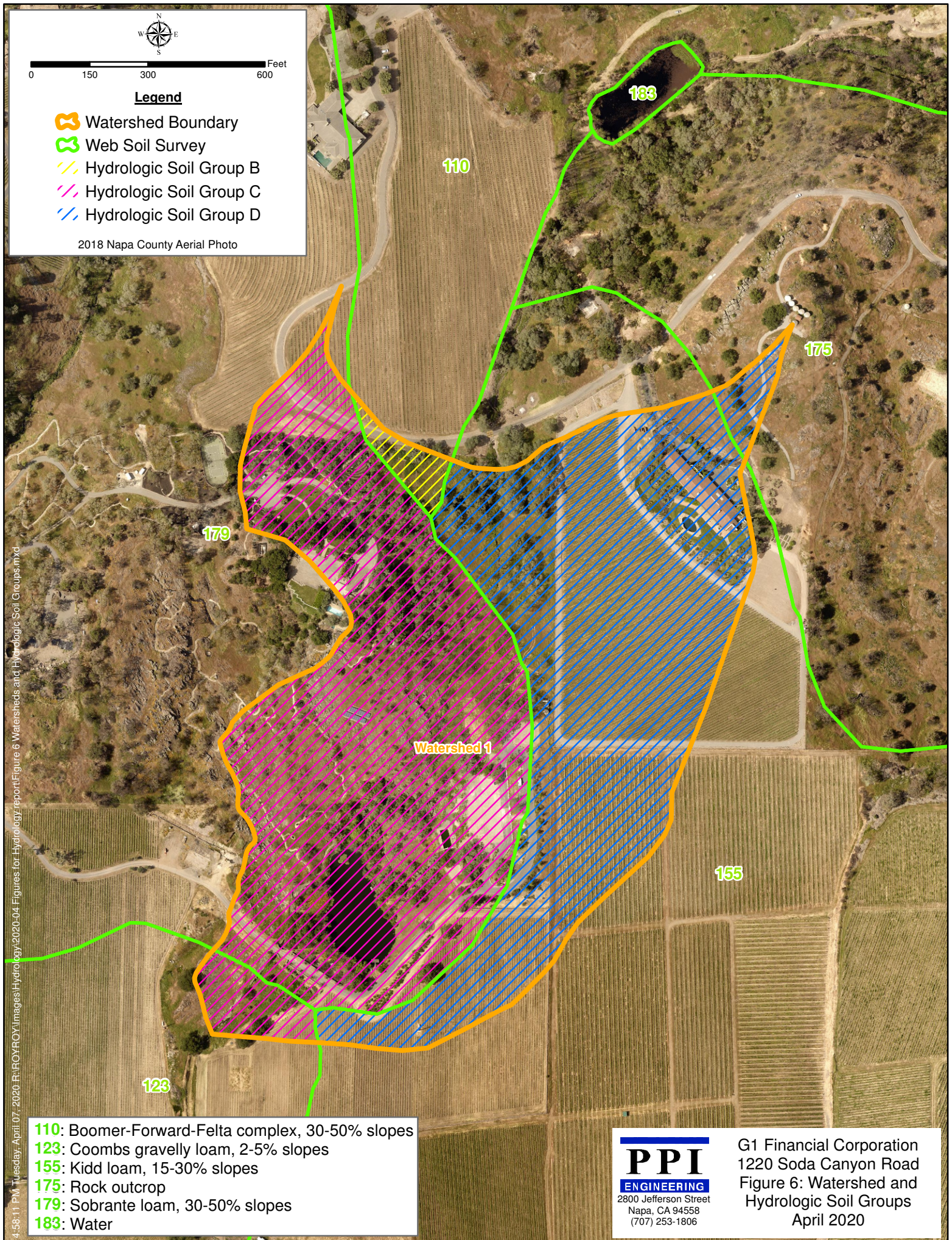
G1 Financial Corporation
1220 Soda Canyon Road
Figure 1: Location Map
April 2020

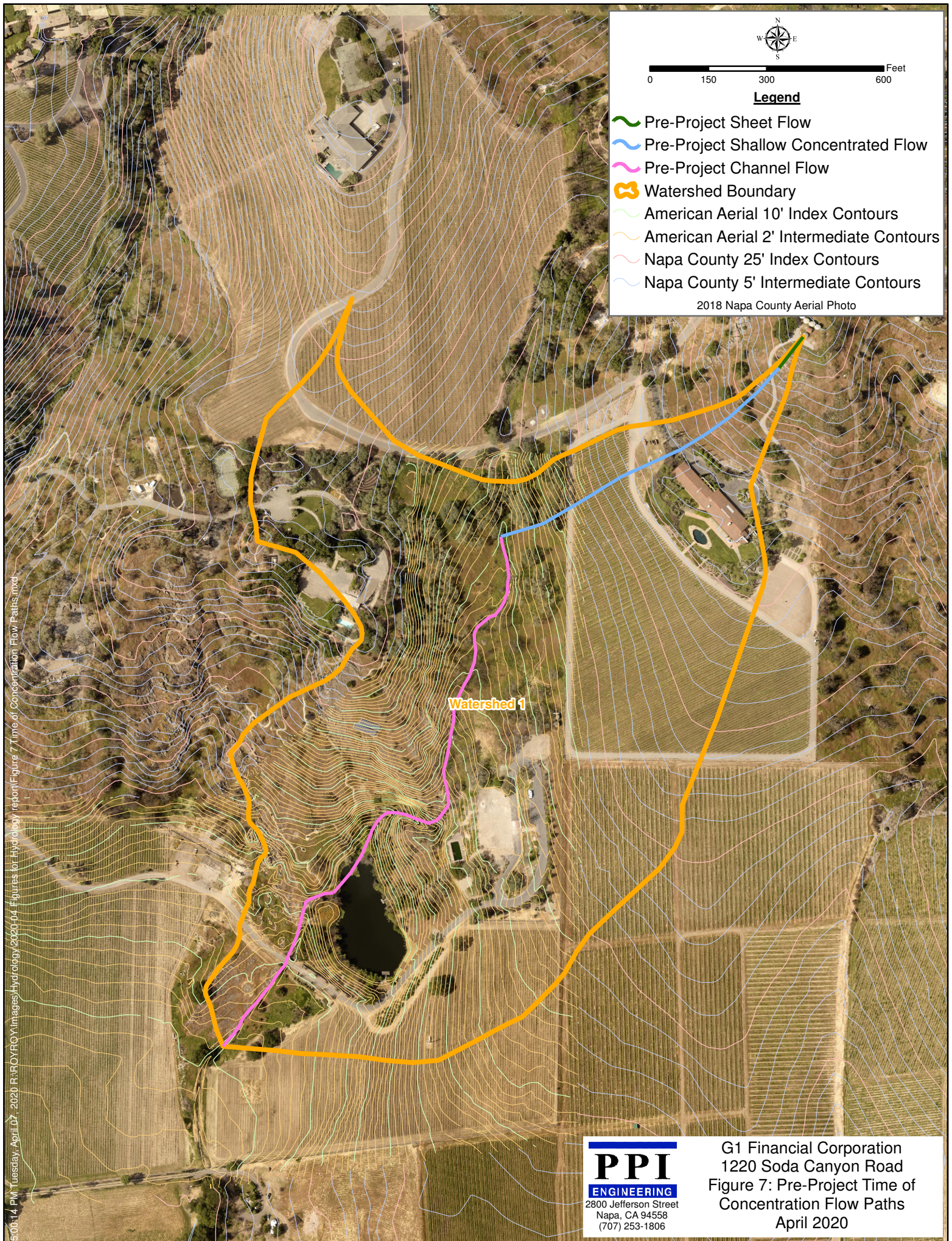


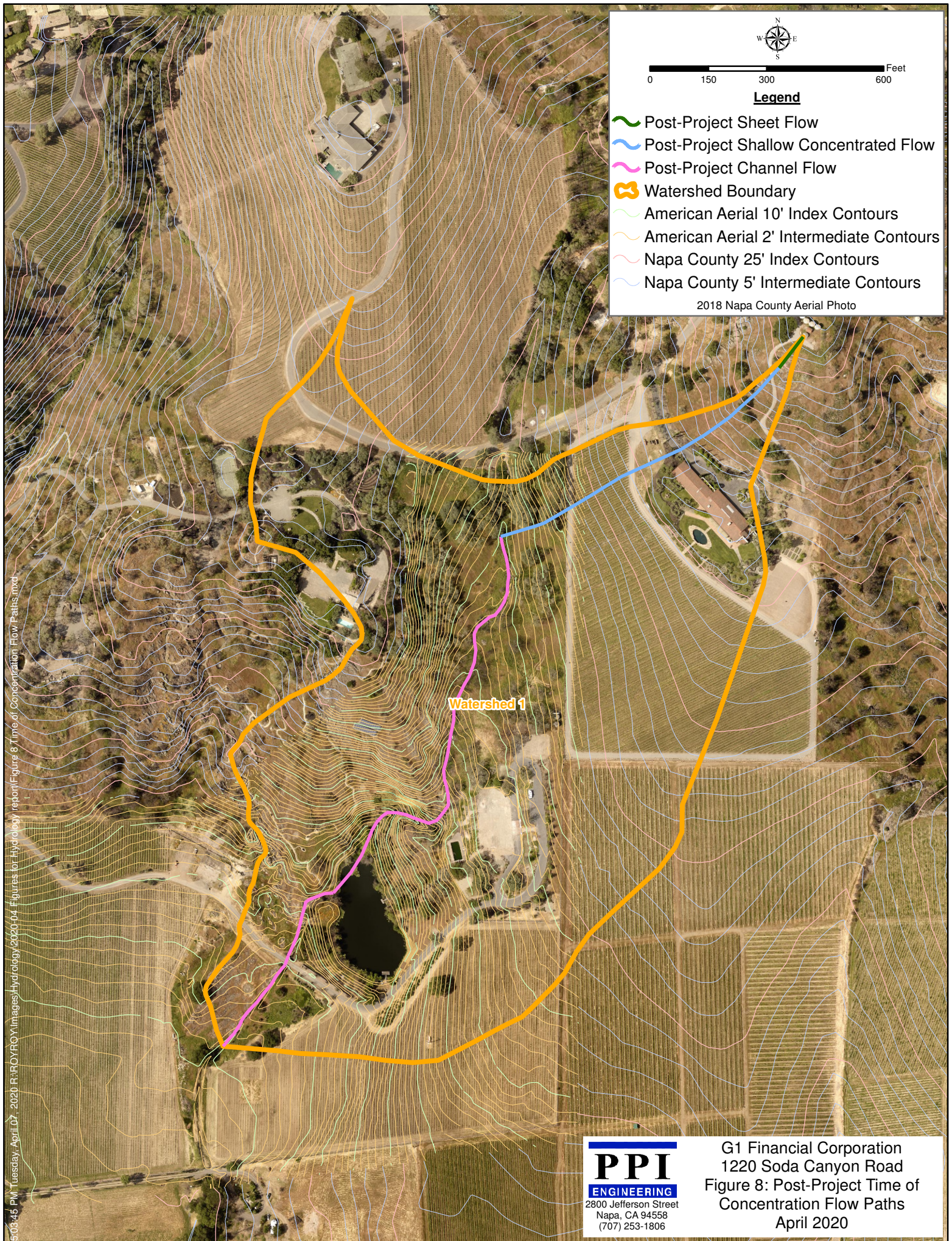






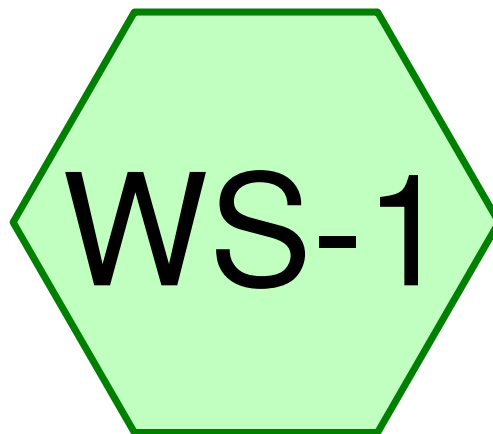




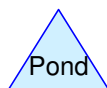
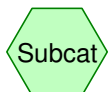


ATTACHMENT B

HYDROCAD ANALYSES



WS-1



G1 Hydrology Pre-Project

Prepared by PPI Engineering

HydroCAD® 10.00-24 s/n 09429 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr 2 Year Rainfall=3.23"

Printed 4/10/2020

Page 2

Summary for Subcatchment WS-1: WS-1

Runoff = 13.26 cfs @ 8.04 hrs, Volume= 4.929 af, Depth= 1.49"

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=3.23"

Area (ac)	CN	Description
0.005	74	Farmsteads, HSG B
3.165	82	Farmsteads, HSG C
1.969	86	Farmsteads, HSG D
0.723	91	Gravel Roads, HSG D
0.051	69	Pasture/grassland/range, Fair, HSG B
8.033	79	Pasture/grassland/range, Fair, HSG C
1.017	84	Pasture/grassland/range, Fair, HSG D
0.376	61	Pasture/grassland/range, Good, HSG B
1.602	74	Pasture/grassland/range, Good, HSG C
2.097	80	Pasture/grassland/range, Good, HSG D
0.064	98	Paved roads w/curbs & sewers, HSG B
1.019	98	Paved roads w/curbs & sewers, HSG C
0.152	98	Paved roads w/curbs & sewers, HSG D
0.051	69	Vineyard, Fair, HSG B
1.421	79	Vineyard, Fair, HSG C
10.643	84	Vineyard, Fair, HSG D
1.072	98	Water Surface, HSG C
0.154	73	Woods, Fair, HSG C
0.004	79	Woods, Fair, HSG D
0.039	55	Woods, Good, HSG B
1.867	70	Woods, Good, HSG C
0.993	77	Woods, Good, HSG D
1.715	76	Woods/grass comb., Fair, HSG C
0.119	82	Woods/grass comb., Fair, HSG D
0.876	72	Woods/grass comb., Good, HSG C
0.395	79	Woods/grass comb., Good, HSG D
39.622	81	Weighted Average
37.315		94.18% Pervious Area
2.307		5.82% Impervious Area

G1 Hydrology Pre-Project

Prepared by PPI Engineering

HydroCAD® 10.00-24 s/n 09429 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr 2 Year Rainfall=3.23"

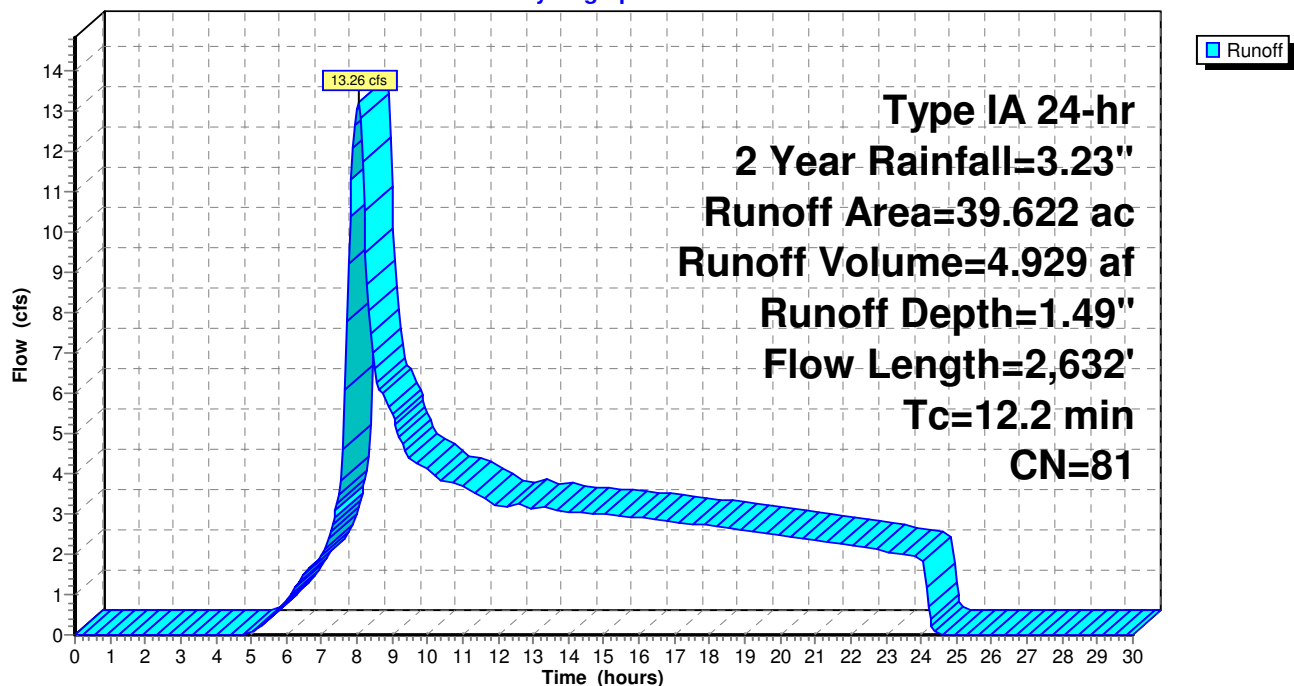
Printed 4/10/2020

Page 3

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.1500	0.26		Sheet Flow, Sheet Grass: Dense n= 0.240 P2= 3.23"
2.1	845	0.1700	6.64		Shallow Concentrated Flow, Shallow Unpaved Kv= 16.1 fps
2.6	1,177	0.0600	7.55	30.18	Trap/Vee/Rect Channel Flow, Stream Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
0.5	221	0.0700	8.15	32.60	Trap/Vee/Rect Channel Flow, Stream - Reservoir Outlet Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
0.0	26	0.0200	11.02	311.44	Pipe Channel, 6' CMP Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.025 Corrugated metal
0.7	263	0.0400	6.16	24.64	Trap/Vee/Rect Channel Flow, Stream - Post Culvert Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
12.2	2,632	Total			

Subcatchment WS-1: WS-1

Hydrograph



G1 Hydrology Pre-Project

Prepared by PPI Engineering

HydroCAD® 10.00-24 s/n 09429 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr 10 Year Rainfall=4.98"

Printed 4/10/2020

Page 4

Summary for Subcatchment WS-1: WS-1

Runoff = 28.92 cfs @ 8.03 hrs, Volume= 9.799 af, Depth= 2.97"

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=4.98"

Area (ac)	CN	Description
0.005	74	Farmsteads, HSG B
3.165	82	Farmsteads, HSG C
1.969	86	Farmsteads, HSG D
0.723	91	Gravel Roads, HSG D
0.051	69	Pasture/grassland/range, Fair, HSG B
8.033	79	Pasture/grassland/range, Fair, HSG C
1.017	84	Pasture/grassland/range, Fair, HSG D
0.376	61	Pasture/grassland/range, Good, HSG B
1.602	74	Pasture/grassland/range, Good, HSG C
2.097	80	Pasture/grassland/range, Good, HSG D
0.064	98	Paved roads w/curbs & sewers, HSG B
1.019	98	Paved roads w/curbs & sewers, HSG C
0.152	98	Paved roads w/curbs & sewers, HSG D
0.051	69	Vineyard, Fair, HSG B
1.421	79	Vineyard, Fair, HSG C
10.643	84	Vineyard, Fair, HSG D
1.072	98	Water Surface, HSG C
0.154	73	Woods, Fair, HSG C
0.004	79	Woods, Fair, HSG D
0.039	55	Woods, Good, HSG B
1.867	70	Woods, Good, HSG C
0.993	77	Woods, Good, HSG D
1.715	76	Woods/grass comb., Fair, HSG C
0.119	82	Woods/grass comb., Fair, HSG D
0.876	72	Woods/grass comb., Good, HSG C
0.395	79	Woods/grass comb., Good, HSG D
39.622	81	Weighted Average
37.315		94.18% Pervious Area
2.307		5.82% Impervious Area

G1 Hydrology Pre-Project

Prepared by PPI Engineering

HydroCAD® 10.00-24 s/n 09429 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr 10 Year Rainfall=4.98"

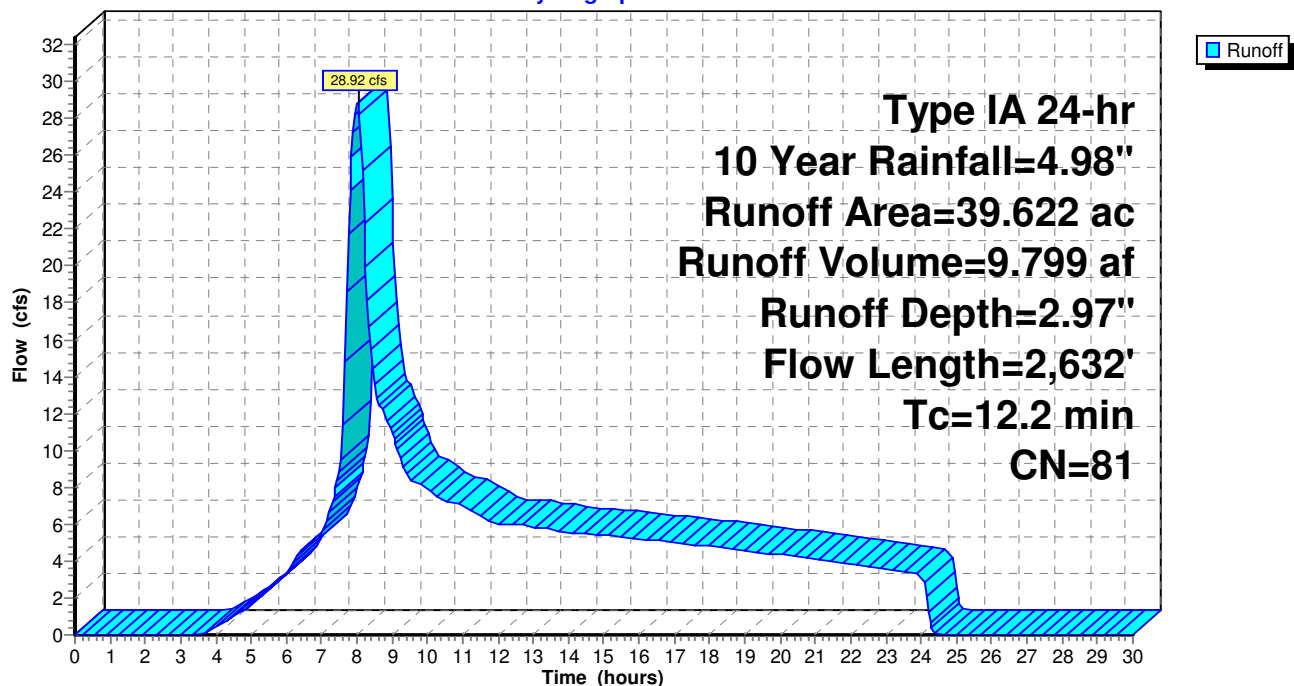
Printed 4/10/2020

Page 5

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.1500	0.26		Sheet Flow, Sheet Grass: Dense n= 0.240 P2= 3.23"
2.1	845	0.1700	6.64		Shallow Concentrated Flow, Shallow Unpaved Kv= 16.1 fps
2.6	1,177	0.0600	7.55	30.18	Trap/Vee/Rect Channel Flow, Stream Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
0.5	221	0.0700	8.15	32.60	Trap/Vee/Rect Channel Flow, Stream - Reservoir Outlet Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
0.0	26	0.0200	11.02	311.44	Pipe Channel, 6' CMP Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.025 Corrugated metal
0.7	263	0.0400	6.16	24.64	Trap/Vee/Rect Channel Flow, Stream - Post Culvert Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
12.2	2,632	Total			

Subcatchment WS-1: WS-1

Hydrograph



G1 Hydrology Pre-Project

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Type IA 24-hr 50 Year Rainfall=6.74"

Printed 4/10/2020

Page 6

Summary for Subcatchment WS-1: WS-1

Runoff = 45.77 cfs @ 8.01 hrs, Volume= 15.069 af, Depth= 4.56"

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=6.74"

Area (ac)	CN	Description
0.005	74	Farmsteads, HSG B
3.165	82	Farmsteads, HSG C
1.969	86	Farmsteads, HSG D
0.723	91	Gravel Roads, HSG D
0.051	69	Pasture/grassland/range, Fair, HSG B
8.033	79	Pasture/grassland/range, Fair, HSG C
1.017	84	Pasture/grassland/range, Fair, HSG D
0.376	61	Pasture/grassland/range, Good, HSG B
1.602	74	Pasture/grassland/range, Good, HSG C
2.097	80	Pasture/grassland/range, Good, HSG D
0.064	98	Paved roads w/curbs & sewers, HSG B
1.019	98	Paved roads w/curbs & sewers, HSG C
0.152	98	Paved roads w/curbs & sewers, HSG D
0.051	69	Vineyard, Fair, HSG B
1.421	79	Vineyard, Fair, HSG C
10.643	84	Vineyard, Fair, HSG D
1.072	98	Water Surface, HSG C
0.154	73	Woods, Fair, HSG C
0.004	79	Woods, Fair, HSG D
0.039	55	Woods, Good, HSG B
1.867	70	Woods, Good, HSG C
0.993	77	Woods, Good, HSG D
1.715	76	Woods/grass comb., Fair, HSG C
0.119	82	Woods/grass comb., Fair, HSG D
0.876	72	Woods/grass comb., Good, HSG C
0.395	79	Woods/grass comb., Good, HSG D
39.622	81	Weighted Average
37.315		94.18% Pervious Area
2.307		5.82% Impervious Area

G1 Hydrology Pre-Project

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Type IA 24-hr 50 Year Rainfall=6.74"

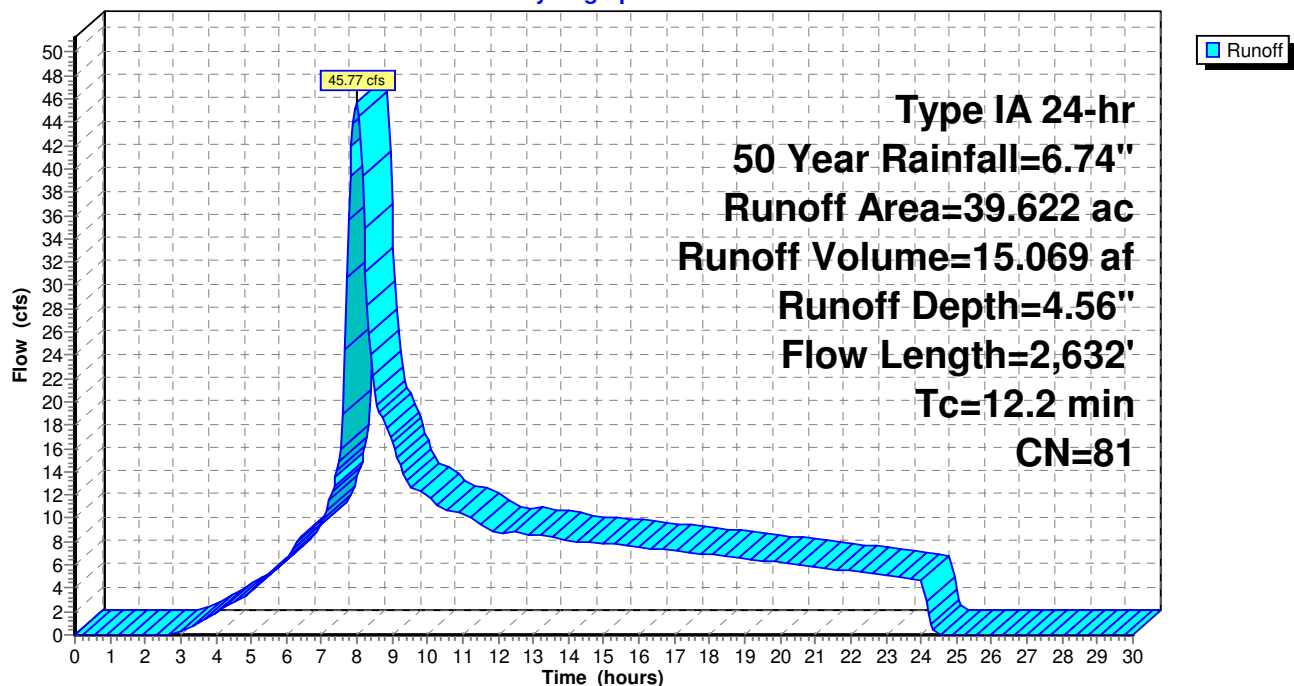
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Page 7

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.1500	0.26		Sheet Flow, Sheet Grass: Dense n= 0.240 P2= 3.23"
2.1	845	0.1700	6.64		Shallow Concentrated Flow, Shallow Unpaved Kv= 16.1 fps
2.6	1,177	0.0600	7.55	30.18	Trap/Vee/Rect Channel Flow, Stream Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
0.5	221	0.0700	8.15	32.60	Trap/Vee/Rect Channel Flow, Stream - Reservoir Outlet Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
0.0	26	0.0200	11.02	311.44	Pipe Channel, 6' CMP Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.025 Corrugated metal
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12.2	2,632	Total			

Subcatchment WS-1: WS-1

Hydrograph



G1 Hydrology Pre-Project

Prepared by PPI Engineering

HydroCAD® 10.00-24 s/n 09429 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr 100 Year Rainfall=7.49"

Printed 4/10/2020

Page 8

Summary for Subcatchment WS-1: WS-1

Runoff = 53.15 cfs @ 8.01 hrs, Volume= 17.376 af, Depth= 5.26"

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=7.49"

Area (ac)	CN	Description
0.005	74	Farmsteads, HSG B
3.165	82	Farmsteads, HSG C
1.969	86	Farmsteads, HSG D
0.723	91	Gravel Roads, HSG D
0.051	69	Pasture/grassland/range, Fair, HSG B
8.033	79	Pasture/grassland/range, Fair, HSG C
1.017	84	Pasture/grassland/range, Fair, HSG D
0.376	61	Pasture/grassland/range, Good, HSG B
1.602	74	Pasture/grassland/range, Good, HSG C
2.097	80	Pasture/grassland/range, Good, HSG D
0.064	98	Paved roads w/curbs & sewers, HSG B
1.019	98	Paved roads w/curbs & sewers, HSG C
0.152	98	Paved roads w/curbs & sewers, HSG D
0.051	69	Vineyard, Fair, HSG B
1.421	79	Vineyard, Fair, HSG C
10.643	84	Vineyard, Fair, HSG D
1.072	98	Water Surface, HSG C
0.154	73	Woods, Fair, HSG C
0.004	79	Woods, Fair, HSG D
0.039	55	Woods, Good, HSG B
1.867	70	Woods, Good, HSG C
0.993	77	Woods, Good, HSG D
1.715	76	Woods/grass comb., Fair, HSG C
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37.315		94.18% Pervious Area
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G1 Hydrology Pre-Project

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HydroCAD® 10.00-24 s/n 09429 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr 100 Year Rainfall=7.49"

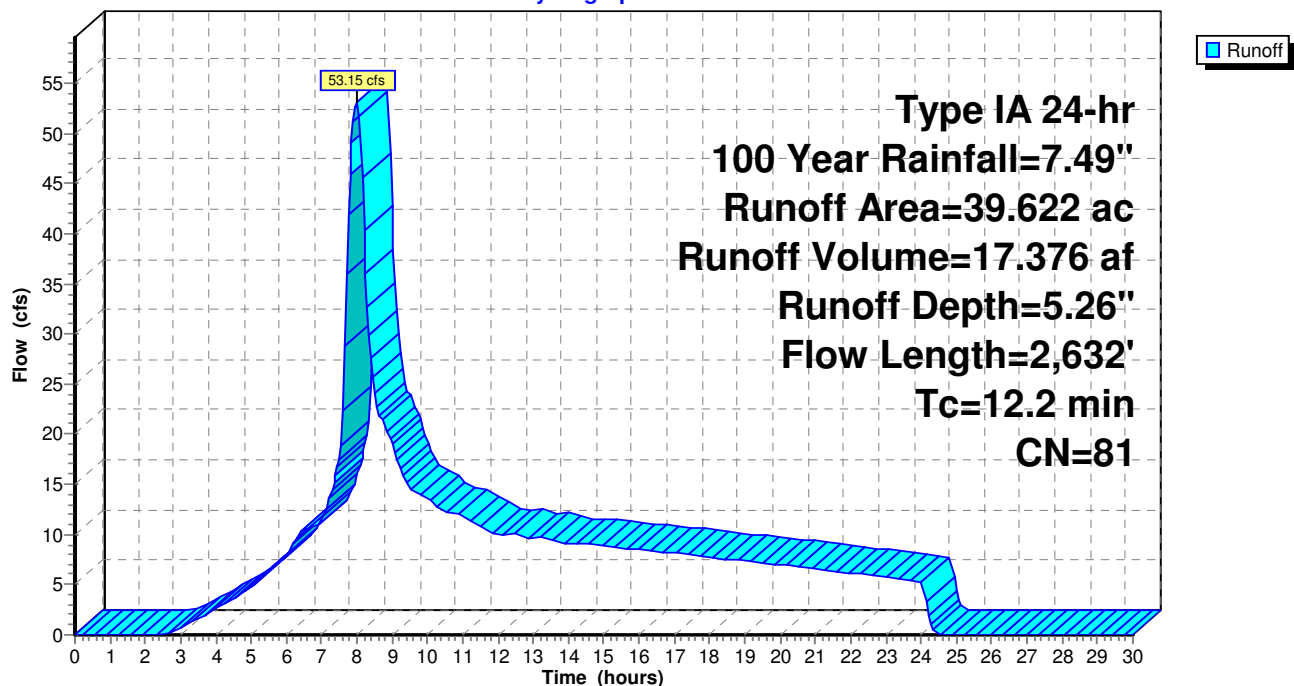
Printed 4/10/2020

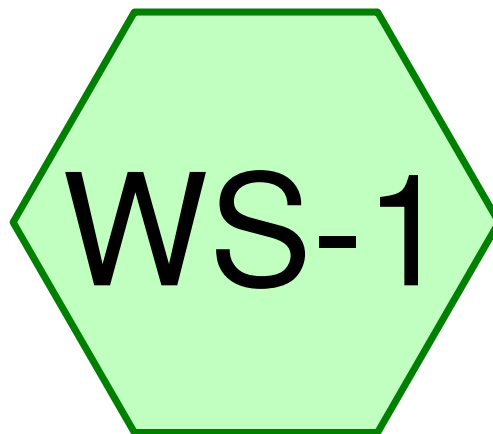
Page 9

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
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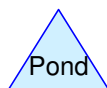
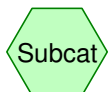
Subcatchment WS-1: WS-1

Hydrograph





WS-1



G1 Hydrology Post-Project

Prepared by PPI Engineering

HydroCAD® 10.00-24 s/n 09429 © 2018 HydroCAD Software Solutions LLC

Type IA 24-hr 2 Year Rainfall=3.23"

Printed 4/10/2020

Page 11

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1.019	98	Paved roads w/curbs & sewers, HSG C
0.152	98	Paved roads w/curbs & sewers, HSG D
0.051	69	Vineyard, Fair, HSG B
1.421	79	Vineyard, Fair, HSG C
10.643	84	Vineyard, Fair, HSG D
1.019	75	Vineyard, Good, HSG C
1.788	81	Vineyard, Good, HSG D
1.072	98	Water Surface, HSG C
0.154	73	Woods, Fair, HSG C
0.004	79	Woods, Fair, HSG D
0.039	55	Woods, Good, HSG B
1.865	70	Woods, Good, HSG C
0.696	77	Woods, Good, HSG D
1.715	76	Woods/grass comb., Fair, HSG C
0.119	82	Woods/grass comb., Fair, HSG D
0.586	72	Woods/grass comb., Good, HSG C
0.184	79	Woods/grass comb., Good, HSG D
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G1 Hydrology Post-Project

Prepared by PPI Engineering

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Type IA 24-hr 2 Year Rainfall=3.23"

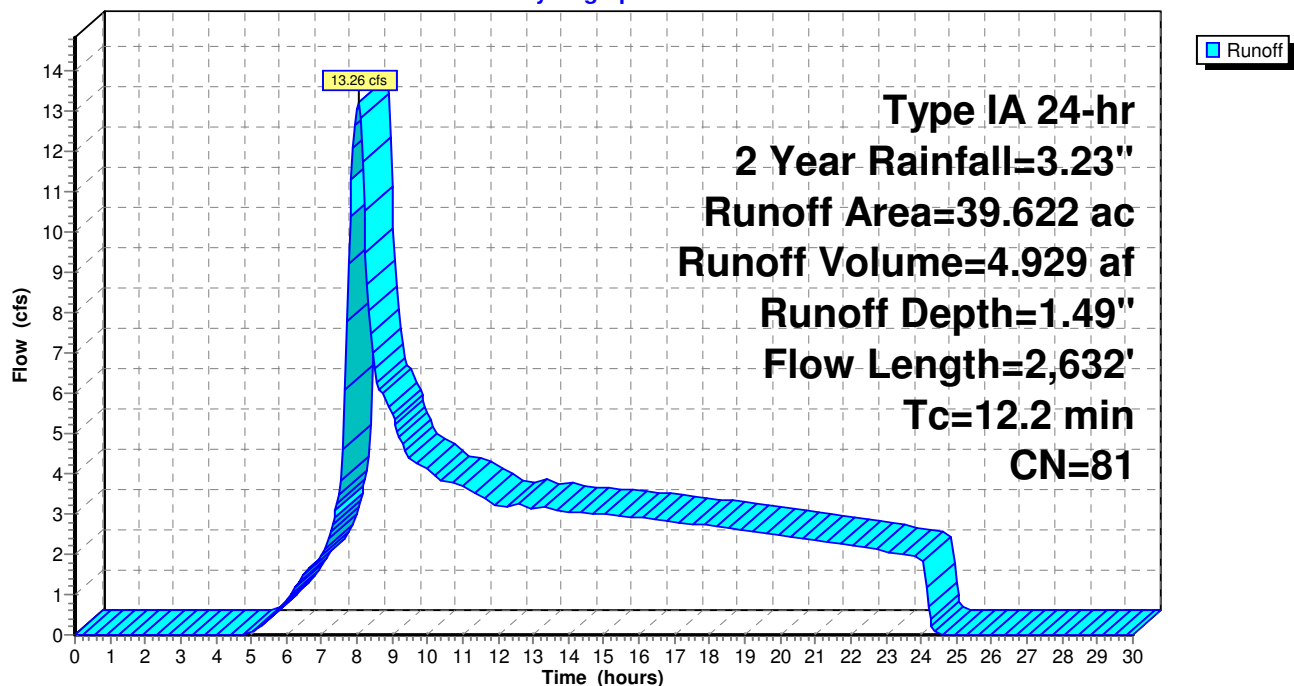
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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.1500	0.26		Sheet Flow, Sheet Grass: Dense n= 0.240 P2= 3.23"
2.1	845	0.1700	6.64		Shallow Concentrated Flow, Shallow Unpaved Kv= 16.1 fps
2.6	1,177	0.0600	7.55	30.18	Trap/Vee/Rect Channel Flow, Stream Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
0.5	221	0.0700	8.15	32.60	Trap/Vee/Rect Channel Flow, Stream - Post Reservoir Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
0.0	26	0.0200	11.02	311.44	Pipe Channel, 6' CMP Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.025 Corrugated metal
0.7	263	0.0400	6.16	24.64	Trap/Vee/Rect Channel Flow, Stream - Post Culvert Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
12.2	2,632	Total			

Subcatchment WS-1: WS-1

Hydrograph



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Type IA 24-hr 10 Year Rainfall=4.98"

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Summary for Subcatchment WS-1: WS-1

Runoff = 28.92 cfs @ 8.03 hrs, Volume= 9.799 af, Depth= 2.97"

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=4.98"

Area (ac)	CN	Description
0.005	74	Farmsteads, HSG B
2.986	82	Farmsteads, HSG C
1.942	86	Farmsteads, HSG D
0.723	91	Gravel Roads, HSG D
0.051	69	Pasture/grassland/range, Fair, HSG B
8.033	79	Pasture/grassland/range, Fair, HSG C
1.017	84	Pasture/grassland/range, Fair, HSG D
0.376	61	Pasture/grassland/range, Good, HSG B
1.054	74	Pasture/grassland/range, Good, HSG C
0.844	80	Pasture/grassland/range, Good, HSG D
0.064	98	Paved roads w/curbs & sewers, HSG B
1.019	98	Paved roads w/curbs & sewers, HSG C
0.152	98	Paved roads w/curbs & sewers, HSG D
0.051	69	Vineyard, Fair, HSG B
1.421	79	Vineyard, Fair, HSG C
10.643	84	Vineyard, Fair, HSG D
1.019	75	Vineyard, Good, HSG C
1.788	81	Vineyard, Good, HSG D
1.072	98	Water Surface, HSG C
0.154	73	Woods, Fair, HSG C
0.004	79	Woods, Fair, HSG D
0.039	55	Woods, Good, HSG B
1.865	70	Woods, Good, HSG C
0.696	77	Woods, Good, HSG D
1.715	76	Woods/grass comb., Fair, HSG C
0.119	82	Woods/grass comb., Fair, HSG D
0.586	72	Woods/grass comb., Good, HSG C
0.184	79	Woods/grass comb., Good, HSG D
39.622	81	Weighted Average
37.315		94.18% Pervious Area
2.307		5.82% Impervious Area

G1 Hydrology Post-Project

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Type IA 24-hr 10 Year Rainfall=4.98"

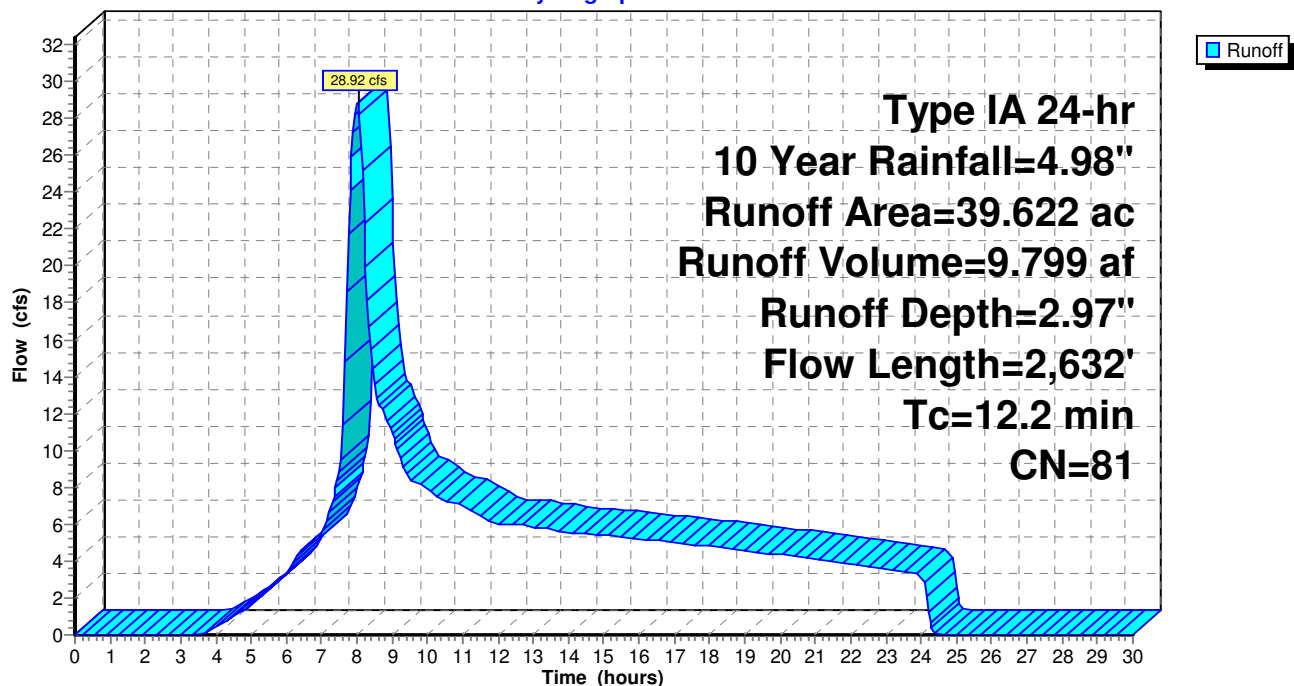
Printed 4/10/2020

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.1500	0.26		Sheet Flow, Sheet Grass: Dense n= 0.240 P2= 3.23"
2.1	845	0.1700	6.64		Shallow Concentrated Flow, Shallow Unpaved Kv= 16.1 fps
2.6	1,177	0.0600	7.55	30.18	Trap/Vee/Rect Channel Flow, Stream Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
0.5	221	0.0700	8.15	32.60	Trap/Vee/Rect Channel Flow, Stream - Post Reservoir Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
0.0	26	0.0200	11.02	311.44	Pipe Channel, 6' CMP Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.025 Corrugated metal
0.7	263	0.0400	6.16	24.64	Trap/Vee/Rect Channel Flow, Stream - Post Culvert Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
12.2	2,632	Total			

Subcatchment WS-1: WS-1

Hydrograph



G1 Hydrology Post-Project

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Type IA 24-hr 50 Year Rainfall=6.74"

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Summary for Subcatchment WS-1: WS-1

Runoff = 45.77 cfs @ 8.01 hrs, Volume= 15.069 af, Depth= 4.56"

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=6.74"

Area (ac)	CN	Description
0.005	74	Farmsteads, HSG B
2.986	82	Farmsteads, HSG C
1.942	86	Farmsteads, HSG D
0.723	91	Gravel Roads, HSG D
0.051	69	Pasture/grassland/range, Fair, HSG B
8.033	79	Pasture/grassland/range, Fair, HSG C
1.017	84	Pasture/grassland/range, Fair, HSG D
0.376	61	Pasture/grassland/range, Good, HSG B
1.054	74	Pasture/grassland/range, Good, HSG C
0.844	80	Pasture/grassland/range, Good, HSG D
0.064	98	Paved roads w/curbs & sewers, HSG B
1.019	98	Paved roads w/curbs & sewers, HSG C
0.152	98	Paved roads w/curbs & sewers, HSG D
0.051	69	Vineyard, Fair, HSG B
1.421	79	Vineyard, Fair, HSG C
10.643	84	Vineyard, Fair, HSG D
1.019	75	Vineyard, Good, HSG C
1.788	81	Vineyard, Good, HSG D
1.072	98	Water Surface, HSG C
0.154	73	Woods, Fair, HSG C
0.004	79	Woods, Fair, HSG D
0.039	55	Woods, Good, HSG B
1.865	70	Woods, Good, HSG C
0.696	77	Woods, Good, HSG D
1.715	76	Woods/grass comb., Fair, HSG C
0.119	82	Woods/grass comb., Fair, HSG D
0.586	72	Woods/grass comb., Good, HSG C
0.184	79	Woods/grass comb., Good, HSG D
39.622	81	Weighted Average
37.315		94.18% Pervious Area
2.307		5.82% Impervious Area

G1 Hydrology Post-Project

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Type IA 24-hr 50 Year Rainfall=6.74"

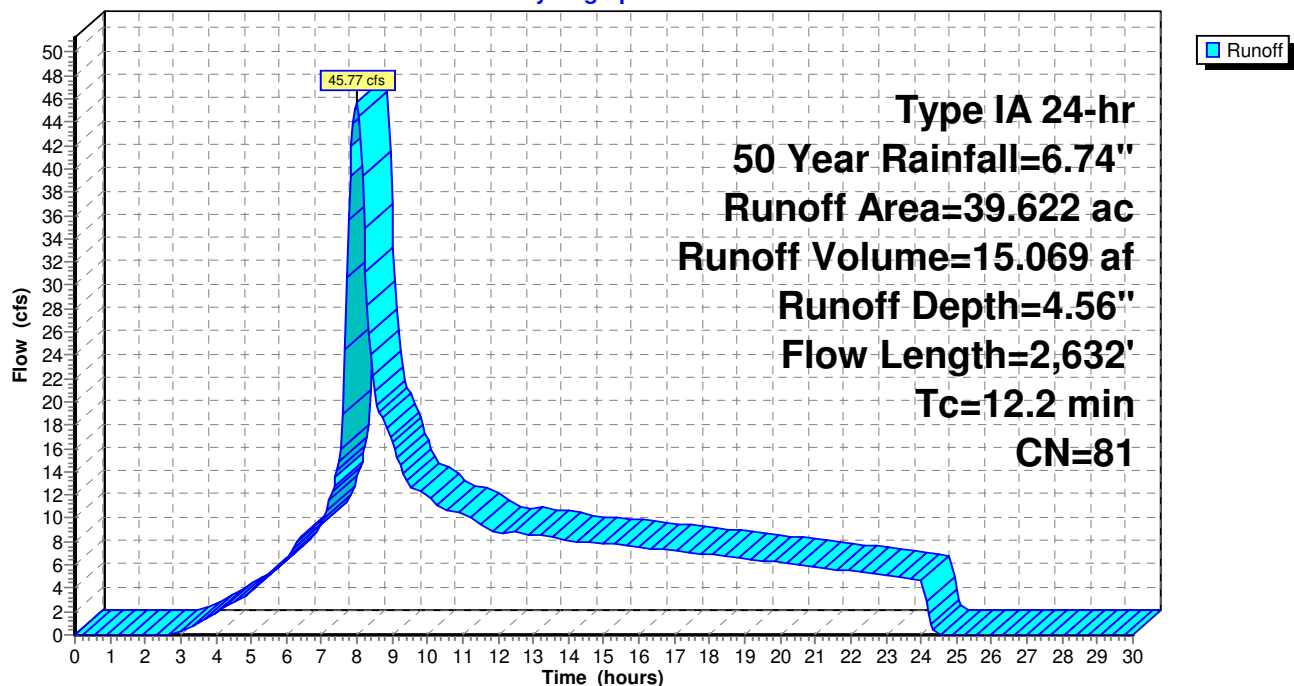
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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.1500	0.26		Sheet Flow, Sheet Grass: Dense n= 0.240 P2= 3.23"
2.1	845	0.1700	6.64		Shallow Concentrated Flow, Shallow Unpaved Kv= 16.1 fps
2.6	1,177	0.0600	7.55	30.18	Trap/Vee/Rect Channel Flow, Stream Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
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0.7	263	0.0400	6.16	24.64	Trap/Vee/Rect Channel Flow, Stream - Post Culvert Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
12.2	2,632	Total			

Subcatchment WS-1: WS-1

Hydrograph



G1 Hydrology Post-Project

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Type IA 24-hr 100 Year Rainfall=7.49"

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Summary for Subcatchment WS-1: WS-1

Runoff = 53.15 cfs @ 8.01 hrs, Volume= 17.376 af, Depth= 5.26"

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=7.49"

Area (ac)	CN	Description
0.005	74	Farmsteads, HSG B
2.986	82	Farmsteads, HSG C
1.942	86	Farmsteads, HSG D
0.723	91	Gravel Roads, HSG D
0.051	69	Pasture/grassland/range, Fair, HSG B
8.033	79	Pasture/grassland/range, Fair, HSG C
1.017	84	Pasture/grassland/range, Fair, HSG D
0.376	61	Pasture/grassland/range, Good, HSG B
1.054	74	Pasture/grassland/range, Good, HSG C
0.844	80	Pasture/grassland/range, Good, HSG D
0.064	98	Paved roads w/curbs & sewers, HSG B
1.019	98	Paved roads w/curbs & sewers, HSG C
0.152	98	Paved roads w/curbs & sewers, HSG D
0.051	69	Vineyard, Fair, HSG B
1.421	79	Vineyard, Fair, HSG C
10.643	84	Vineyard, Fair, HSG D
1.019	75	Vineyard, Good, HSG C
1.788	81	Vineyard, Good, HSG D
1.072	98	Water Surface, HSG C
0.154	73	Woods, Fair, HSG C
0.004	79	Woods, Fair, HSG D
0.039	55	Woods, Good, HSG B
1.865	70	Woods, Good, HSG C
0.696	77	Woods, Good, HSG D
1.715	76	Woods/grass comb., Fair, HSG C
0.119	82	Woods/grass comb., Fair, HSG D
0.586	72	Woods/grass comb., Good, HSG C
0.184	79	Woods/grass comb., Good, HSG D
39.622	81	Weighted Average
37.315		94.18% Pervious Area
2.307		5.82% Impervious Area

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Type IA 24-hr 100 Year Rainfall=7.49"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.1500	0.26		Sheet Flow, Sheet Grass: Dense n= 0.240 P2= 3.23"
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0.7	263	0.0400	6.16	24.64	Trap/Vee/Rect Channel Flow, Stream - Post Culvert Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.035
12.2	2,632	Total			

Subcatchment WS-1: WS-1**Hydrograph**