Exhibit F



Hydrologic Analysis, revised
Proposed NewVineyard
Meka Vineyard
4473 Atlas Peak Road
Napa, CA 94558
032-540-034
February 29, 2029

The following analysis evaluates a vineyard planting proposal, to determine the project's potential to increase peak flow or runoff from the various parts of the site. The project proposes development of approximately 23.8 acres of new vineyard on the referenced 91-acre parcel, north of the City of Napa. The parcel lies just to the east of the prominent Atlas Peak (elevation 2663 feet) with the modeled Watersheds 1 and 2 draining south to the Napa River via Milliken Creek; and Watershed 3, draining southeast to Capell and Putah Creeks.

This analysis, prepared by David Steiner, CPESC, CPSWQ, at the request of and in consultation with Mike Muelrath of Applied Civil Engineering, relies on the basic methodology of USDA Technical Release 55, as modeled in Version 1.00.10 of WinTR-55 "Small Watershed Hydrology", a Windows-based application. The watersheds' Times of Concentration (Tc) were determined by plotting flowpaths from the hydrologically most remote points to designated outlets, or points of interest. Each flowpath component's data are entered into the model as slope length, gradient, and Manning's "N" roughness factor.

Each watershed is modeled to compare predicted peak flows, under pre- and post-project conditions, of 24-hour storms of 2, 10, 50, and 100-year return intervals, as published online in NOAA Atlas 14. Mapping Units (soil types) and their corresponding Hydrologic Soil Groups were determined with reference to the USDA Web Soil Survey. Printouts from these respective website authorities accompany this submittal.

The watersheds' land uses include existing vineyards with agricultural outbuildings, rural residential development, mixed hardwood and conifer woodland, chaparral or brushland, and grazed and ungrazed grassland. Access to these uses is via asphalt and gravel driveways. Pre- and post-project runoff curve numbers (**CN**) are assigned based on hydrologic soil group (**HSG**), land use, and hydrologic condition. Estimates of land use, cover, and hydrologic condition are based on evaluations made during field visits on June 14 and July 5, 2022, and examinations of aerial photographic images on Google Earth and the OnX GIS application.

As vineyards are not included among WinTR-55's land use alternatives, the application's "custom CN" field is used to enter selections from a California-specific table found in the NRCS Engineering Field Handbook.[1] This table's guidance calls for vineyard Curve Numbers equivalent to those of "annual grass." Data for all proposed vineyards are entered into the post-project modeling to indicate "good" hydrologic condition, to reflect the specifications of the Erosion Control Plan (non-tilled cover management, with winterization measures to provide a minimum 75-80% cover). CN printouts have been edited as pdf documents, where necessary to reflect the actual land uses.

[1]Engineering Field Handbook, Part 650, Chapter 2, Supplement 1, USDA/NRCS, Oct 2008.

Summary of the Results of WinTR-55 Analysis: (Please see accompanying WinTR-55 printouts and electronic files for complete reports.)

• Watershed 1:	Pre-project 2-year peak flow:	1.69	cfs
	Post-project 2-year peak flow:	1.69	cfs
	Increase/<Decrease>:	0	
• Watershed 1:	Pre-project 10-year peak flow:	3.31	cfs
	Post-project 10-year peak flow:	3.31	cfs
	Increase/<Decrease>:	0	cfs
• Watershed 1:	Pre-project 50-year peak flow:	5.05	cfs
	Post-project 50-year peak flow:	5.05	cfs
	Increase/<Decrease>:	0	cfs
• Watershed 1:	Pre-project 100-year peak flow:	5.79	cfs
	Post-project 100-year peak flow:	5.79	cfs
	Increase/<Decrease>:	0	cfs
• Watershed 2:	Pre-project 2-year peak flow:	2.20	cfs
	Post-project 2-year peak flow:	2.20	cfs
	Increase/<Decrease>:	0	cfs
• Watershed 2:	Pre-project 10-year peak flow:	4.06	cfs
	Post-project 10-year peak flow:	4.06	cfs
	Increase/<Decrease>:	0	cfs
• Watershed 2:	Pre-project 50-year peak flow:	6.00	cfs
	Post-project 50-year peak flow:	6.00	cfs
	Increase/<Decrease>:	0	cfs
• Watershed 2:	Pre-project 100-year peak flow:	6.82	cfs
	Post-project 100-year peak flow:	6.82	cfs
	Increase/<Decrease>:	0	cfs
• Watershed 3:	Pre-project 2-year peak flow:	29.35	cfs
	Post-project 2-year peak flow:	29.35	cfs
	Increase/<Decrease>:	0	cfs
• Watershed 3:	Pre-project 10-year peak flow:	60.78	cfs
	Post-project 10-year peak flow:	60.78	cfs
	Increase/<Decrease>:	0	cfs

- Watershed 3: Pre-project 50-year peak flow: 95.13 cfs
  Post-project 50-year peak flow: 95.13 cfs
  Increase/<Decrease>: 0 cfs

- Watershed 3: Pre-project 100-year peak flow: 110.02 cfs
  Post-project 100-year peak flow: 110.02 cfs
  Increase/<Decrease>: 0 cfs

Conclusion: Assuming maintenance of the ECP's specified cover, the proposal will result in no increase in runoff or peak flow.

DAS

Meka WS 1
Pre-Project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS								
main	1.69	12.12	3.31	12.12	5.05	12.12	5.79	12.12
REACHES								
OUTLET	1.69		3.31		5.05		5.79	

Meka WS 1
Pre-Project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	10-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)
4.19	6.27	8.39	9.29	.0	.0	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Meka WS 1
Pre-Project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
main							
SHEET	100	0.1630	0.150				0.062
SHALLOW	920	0.2510	0.050				0.032
					Time of Concentration		0.1

DAS

Meka WS 1
Pre-Project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
main	Residential districts (1/4 acre)	B	5.3	75
	Total Area / Weighted Curve Number		5.3	75

Meka WS 1
Pre-Project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
main	Broadleaf Chaparral (fair)	C	5.3	75
	Total Area / Weighted Curve Number		5.3	75

DAS

Meka WS 1
post-Project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS								
main	1.69	12.12	3.31	12.12	5.05	12.12	5.79	12.12
REACHES								
OUTLET	1.69		3.31		5.05		5.79	

Meka WS 1
post-Project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	10-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)
4.19	6.27	8.39	9.29	.0	.0	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Meka WS 1
post-Project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
main							
SHEET	100	0.1630	0.150				0.062
SHALLOW	920	0.2510	0.050				0.032
						Time of Concentration	0.1

Meka WS 1
post-Project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
main	Residential districts (1/4 acre)	B	4.6	75
	User defined urban (Click button or	C	.7	75
	Total Area / Weighted Curve Number		5.3	75

DAS

Meka WS 1
post-Project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
main	Broadleaf Chaparral	(fair)	C	4.6	75
	Vineyard (annual grass)	(good)	C	.7	75
	Total Area / Weighted Curve Number			5.3	75

DAS

Meka WS 2
Pre-Project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS								
main	2.20	12.13	4.06	12.13	6.00	12.13	6.82	12.13
REACHES								
OUTLET	2.20		4.06		6.00		6.82	

DAS

Meka WS 2
Pre-Project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	10-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)
4.19	6.27	8.39	9.29	.0	.0	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Meka WS 2
Pre-Project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
main							
SHEET	100	0.0590	0.150				0.093
SHALLOW	897	0.1660	0.050				0.038
					Time of Concentration		.131

DAS

Meka WS 2
Pre-Project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
main	Residential districts (1/4 acre)		B	2.1	75
	Residential districts (1/3 acre)		C	3.5	81
	Woods	(good)	D	.4	77
	Total Area / Weighted Curve Number			6	79
				=	==

DAS

Meka WS 2
Pre-Project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
main	Broadleaf Chaparral	(fair)	C	2.1	75
	Broadleaf Chaparral	(fair)	D	3.5	81
	Woods	(good)	D	.4	77
	Total Area / Weighted Curve Number			6	79
				=	==

DAS

Meka WS 2
Post-Project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS								
main	2.20	12.13	4.06	12.13	6.00	12.13	6.82	12.13
REACHES								
OUTLET	2.20		4.06		6.00		6.82	

Meka WS 2
Post-Project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	10-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)
4.19	6.27	8.39	9.29	.0	.0	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Meka WS 2
Post-Project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
main							
SHEET	100	0.0590	0.150				0.093
SHALLOW	897	0.1660	0.050				0.038
					Time of Concentration		.131

Meka WS 2
Post-Project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
main	Residential districts (1/4 acre)		B	1.3	75
	Residential districts (1/3 acre)		C	3.5	81
	User defined urban (Click button or		C	.8	75
	Woods	(good)	D	.4	77
	Total Area / Weighted Curve Number			6	79
				=	==

Meka WS 2
Post-Project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
main	Broadleaf Chaparral	(fair)	C	1.3	75
	Broadleaf Chaparral	(fair)	D	3.5	81
	Vineyard (annual grass)	(good)	C	.8	75
	Woods	(good)	D	.4	77
	Total Area / Weighted Curve Number			6	79
				=	==

DAS

Meka WS 3
Pre-Project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS								
main	29.35	12.19	60.78	12.18	95.13	12.18	110.02	12.18
REACHES								
OUTLET	29.35		60.78		95.13		110.02	

Meka WS 3
Pre-Project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	10-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)
4.19	6.27	8.39	9.29	.0	.0	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Meka WS 3
Pre-Project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
main							
SHEET	100	0.2860	0.150				0.049
SHALLOW	1960	0.2420	0.050				0.069
SHALLOW	1485	0.0590	0.050				0.105
						Time of Concentration	.223

DAS

Meka WS 3
Pre-Project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
main	Paved parking lots, roofs, driveways		C	.7	98
	Gravel (w/ right-of-way)		C	.5	89
	Residential districts (1/4 acre)		B	13.1	75
	Residential districts (1/3 acre)		C	.3	81
	User defined urban (Click button or		C	2.1	75
	User defined urban (Click button or		D	.1	81
	Legume/Rot. Meadow Straight row	(good)	C	.6	81
	Legume/Rot. Meadow Contoured	(poor)	B	19.5	75
	Woods	(good)	C	77.1	70
	Woods	(good)	D	2	77
	Farmsteads		C	1.7	82
	Total Area / Weighted Curve Number			117.7	72

DAS

Meka WS 3
Pre-Project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
main	Paved parking lots, roofs, driveways		C	.7	98
	Gravel (w/ right-of-way)		C	.5	89
	Broadleaf Chaparral	(fair)	C	13.1	75
	Broadleaf Chaparral	(fair)	D	.3	81
	Vineyard (annual grass)	(good)	C	2.1	75
	Vineyard (annual grass)	(good)	D	.1	81
	Annual grass	(good)	D	.6	81
	Annual grass	(good)	C	19.5	75
	Woods	(good)	C	77.1	70
	Woods	(good)	D	2	77
	Farmsteads		C	1.7	82
	Total Area / Weighted Curve Number			117.7	72

DAS

Meka WS 3
Post-Project, rev
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS								
main	29.35	12.19	60.78	12.18	95.13	12.18	110.02	12.18
REACHES								
OUTLET	29.35		60.78		95.13		110.02	

Meka WS 3
Post-Project, rev
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	10-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)
4.19	6.27	8.39	9.29	.0	.0	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Meka WS 3
Post-Project, rev
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
main							
SHEET	100	0.2860	0.150				0.049
SHALLOW	1960	0.2420	0.050				0.069
SHALLOW	1485	0.0590	0.050				0.105
						Time of Concentration	.223

Meka WS 3
Post-Project, rev
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
main	Paved parking lots, roofs, driveways		C	.7	98
	Gravel (w/ right-of-way)		C	.5	89
	Residential districts (1/4 acre)		B	8.6	75
	Residential districts (1/3 acre)		C	.3	81
	User defined urban (Click button or		C	24.4	75
	User defined urban (Click button or		D	.1	81
	Legume/Rot. Meadow Contoured	(poor)	B	5.3	75
	Woods	(good)	C	74.4	70
	Woods	(good)	D	2	77
	Farmsteads		C	1.4	82
	Total Area / Weighted Curve Number			117.7	72
				=====	==

Meka WS 3
Post-Project, rev
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
main	Paved parking lots, roofs, driveways		C	.7	98
	Gravel (w/ right-of-way)		C	.5	89
	Broadleaf Chaparral	(fair)	C	8.6	75
	Broadleaf Chaparral	(fair)	D	.3	81
	Vineyard (annual grass)	(good)	C	24.4	75
	Vineyard (annual grass)	(good)	D	.1	81
	Annual grass	(good)	B	5.3	75
	Woods	(good)	C	74.4	70
	Woods	(good)	D	2	77
	Farmsteads		C	1.4	82
	Total Area / Weighted Curve Number			117.7	72

www.nws.noaa.gov

NOAA's National Weather Service
Hydrometeorological Design Studies Center
Precipitation Frequency Data Server (PFDS)

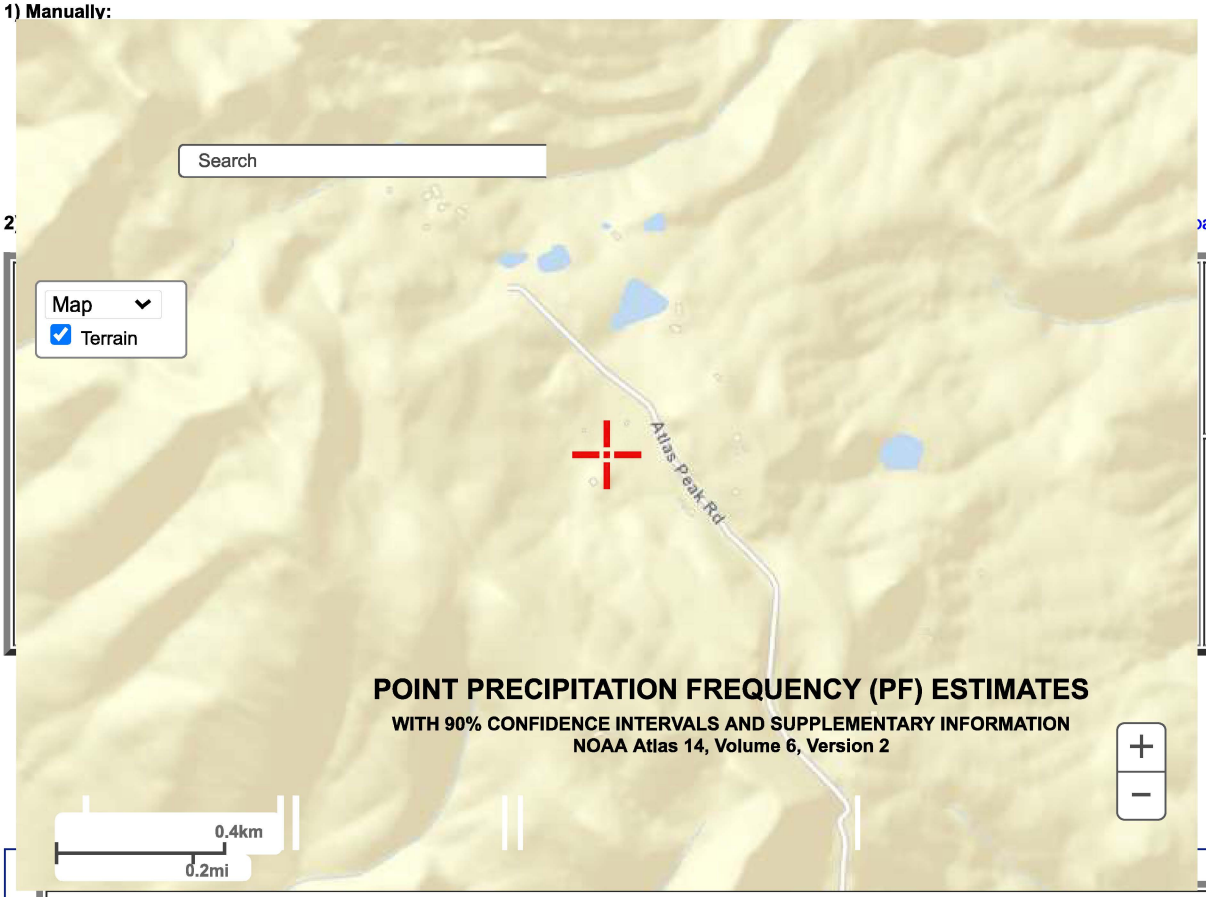
NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CA

Data description

Data type: Precipitation depth **Units:** English **Time series type:** Partial duration

Select location

1) Manually:



a) Select location
Move crosshair or double click

b) Click on station icon
☐ Show stations on map

Location information:
Name: Napa, California, USA*
Latitude: 38.4430°
Longitude: -122.2500°
Elevation: 2086.77 ft **
* Source: ESRI Maps
** Source: USGS

Print page

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.146** (0.130-0.166)	**0.182** (0.162-0.207)	**0.229** (0.203-0.261)	**0.268** (0.235-0.308)	**0.321** (0.271-0.383)	**0.362** (0.299-0.444)	**0.405** (0.325-0.510)	**0.450** (0.350-0.585)	**0.513** (0.381-0.699)	**0.564** (0.402-0.799)

10-min	**0.210** (0.187-0.238)	**0.261** (0.232-0.296)	**0.328** (0.291-0.374)	**0.384** (0.337-0.442)	**0.460** (0.389-0.550)	**0.519** (0.428-0.636)	**0.581** (0.466-0.731)	**0.645** (0.501-0.839)	**0.736** (0.545-1.00)	**0.809** (0.577-1.15)
15-min	**0.253** (0.226-0.288)	**0.316** (0.281-0.358)	**0.397** (0.352-0.452)	**0.464** (0.408-0.534)	**0.556** (0.470-0.665)	**0.628** (0.518-0.769)	**0.702** (0.563-0.884)	**0.780** (0.606-1.01)	**0.890** (0.660-1.21)	**0.978** (0.697-1.39)
30-min	**0.364** (0.324-0.413)	**0.453** (0.403-0.515)	**0.570** (0.505-0.650)	**0.667** (0.585-0.767)	**0.799** (0.675-0.955)	**0.902** (0.744-1.10)	**1.01** (0.809-1.27)	**1.12** (0.871-1.46)	**1.28** (0.947-1.74)	**1.40** (1.00-1.99)
60-min	**0.532** (0.474-0.604)	**0.663** (0.589-0.753)	**0.834** (0.739-0.950)	**0.975** (0.856-1.12)	**1.17** (0.987-1.40)	**1.32** (1.09-1.61)	**1.47** (1.18-1.86)	**1.64** (1.27-2.13)	**1.87** (1.39-2.55)	**2.05** (1.47-2.91)
2-hr	**0.808** (0.719-0.916)	**1.01** (0.895-1.14)	**1.27** (1.12-1.44)	**1.48** (1.30-1.70)	**1.77** (1.49-2.11)	**1.99** (1.64-2.44)	**2.22** (1.78-2.79)	**2.45** (1.91-3.19)	**2.78** (2.06-3.78)	**3.03** (2.16-4.29)
3-hr	**1.03** (0.921-1.17)	**1.29** (1.15-1.46)	**1.62** (1.44-1.85)	**1.89** (1.66-2.17)	**2.26** (1.91-2.70)	**2.54** (2.09-3.11)	**2.82** (2.26-3.55)	**3.12** (2.42-4.05)	**3.52** (2.61-4.79)	**3.83** (2.73-5.43)
6-hr	**1.58** (1.41-1.79)	**1.97** (1.76-2.24)	**2.49** (2.20-2.83)	**2.90** (2.54-3.33)	**3.45** (2.91-4.12)	**3.87** (3.19-4.74)	**4.29** (3.44-5.40)	**4.72** (3.67-6.14)	**5.31** (3.94-7.23)	**5.76** (4.11-8.16)
12-hr	**2.27** (2.02-2.58)	**2.87** (2.55-3.26)	**3.63** (3.22-4.14)	**4.24** (3.72-4.88)	**5.05** (4.26-6.03)	**5.66** (4.67-6.92)	**6.26** (5.02-7.88)	**6.88** (5.34-8.94)	**7.70** (5.71-10.5)	**8.32** (5.94-11.8)
24-hr	**3.28** (2.95-3.72)	**4.19** (3.77-4.76)	**5.35** (4.80-6.09)	**6.27** (5.59-7.18)	**7.48** (6.49-8.81)	**8.39** (7.15-10.0)	**9.29** (7.76-11.4)	**10.2** (8.32-12.8)	**11.4** (8.98-14.8)	**12.3** (9.43-16.4)
2-day	**4.36** (3.92-4.95)	**5.59** (5.02-6.34)	**7.14** (6.41-8.13)	**8.38** (7.47-9.60)	**10.0** (8.69-11.8)	**11.3** (9.59-13.5)	**12.5** (10.4-15.3)	**13.7** (11.2-17.2)	**15.4** (12.1-19.9)	**16.7** (12.8-22.2)
3-day	**5.20** (4.67-5.89)	**6.66** (5.98-7.56)	**8.51** (7.64-9.69)	**10.00** (8.91-11.5)	**12.0** (10.4-14.1)	**13.5** (11.5-16.1)	**15.0** (12.5-18.3)	**16.5** (13.4-20.6)	**18.5** (14.6-24.0)	**20.1** (15.3-26.7)
4-day	**5.77** (5.19-6.54)	**7.40** (6.65-8.40)	**9.47** (8.49-10.8)	**11.1** (9.90-12.7)	**13.3** (11.5-15.7)	**14.9** (12.7-17.9)	**16.6** (13.9-20.3)	**18.3** (14.9-22.8)	**20.5** (16.1-26.5)	**22.2** (17.0-29.6)
7-day	**7.14** (6.43-8.10)	**9.19** (8.26-10.4)	**11.7** (10.5-13.4)	**13.8** (12.3-15.8)	**16.4** (14.2-19.3)	**18.3** (15.6-22.0)	**20.3** (16.9-24.8)	**22.2** (18.1-27.8)	**24.8** (19.5-32.1)	**26.8** (20.5-35.7)
10-day	**7.91** (7.12-8.97)	**10.2** (9.16-11.6)	**13.0** (11.7-14.8)	**15.2** (13.6-17.4)	**18.1** (15.7-21.3)	**20.2** (17.2-24.1)	**22.2** (18.6-27.1)	**24.3** (19.8-30.4)	**26.9** (21.2-34.9)	**29.0** (22.2-38.6)
20-day	**10.3** (9.30-11.7)	**13.3** (12.0-15.1)	**17.0** (15.2-19.3)	**19.8** (17.6-22.6)	**23.2** (20.2-27.4)	**25.8** (21.9-30.8)	**28.2** (23.5-34.4)	**30.5** (24.9-38.2)	**33.6** (26.5-43.5)	**35.8** (27.4-47.8)
30-day	**12.7** (11.4-14.4)	**16.3** (14.7-18.5)	**20.7** (18.5-23.5)	**23.9** (21.3-27.4)	**28.0** (24.3-32.9)	**30.8** (26.3-36.9)	**33.6** (28.0-41.0)	**36.2** (29.5-45.3)	**39.6** (31.2-51.2)	**42.0** (32.2-56.1)
45-day	**15.3** (13.7-17.3)	**19.5** (17.5-22.2)	**24.5** (22.0-27.9)	**28.2** (25.2-32.4)	**32.8** (28.4-38.6)	**35.9** (30.6-43.0)	**38.9** (32.5-47.5)	**41.7** (34.0-52.2)	**45.3** (35.7-58.6)	**47.8** (36.6-63.8)
60-day	**18.4** (16.5-20.8)	**23.3** (20.9-26.4)	**29.0** (26.0-33.0)	**33.2** (29.5-38.0)	**38.2** (33.1-45.0)	**41.7** (35.5-49.9)	**44.9** (37.5-54.9)	**48.0** (39.1-60.0)	**51.7** (40.8-67.0)	**54.5** (41.7-72.6)

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

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

Please refer to NOAA Atlas 14 document for more information.

Estimates from the table in CSV format: Precipitation frequency estimates Submit

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US Department of Commerce
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National Weather Service
Office of Water Prediction (OWP)
1325 East West Highway
Silver Spring, MD 20910
Page Author: HDSC webmaster
Page last modified: April 21, 2017

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  - Wind Erodibility Index
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- Soil Physical Properties
- **Soil Qualities and Features**
  - AASHTO Group Classification (Surface)
  - AASHTO Group Index
  - Depth to a Selected Soil Restrictive Layer
  - Depth to Any Soil Restrictive Layer
  - Depth to Bedrock
  - Drainage Class
  - Frost Action
  - Frost-Free Days
  - Hydrologic Soil Group

View Description | View Rating

View Options

Map ☑

Table ☑

Description of Rating ☑

Rating Options ☑

Detailed Description ☐

Advanced Options

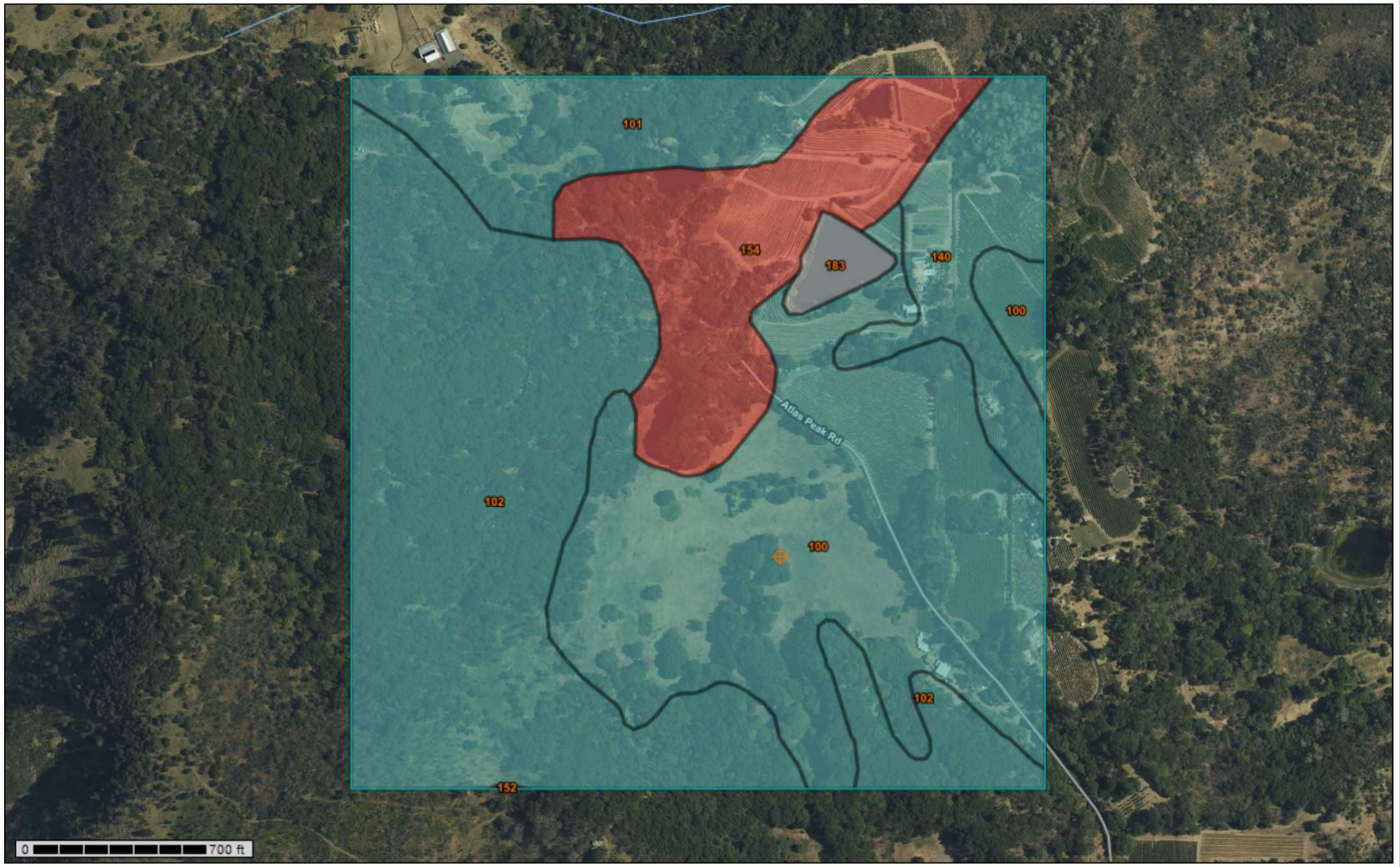
Aggregation Method: Dominant Condition

Component Percent Cutoff:

Tie-break Rule: ○ Lower ◉ Higher

Map — Hydrologic Soil Group

Scale (not to scale)



Warning: Soil Ratings Map may not be valid at this scale.

You have zoomed in beyond the scale at which the soil map for this area is intended to be used. Mapping of soils is done at a particular scale. The soil surveys that comprise your AOI were mapped at 1:24,000. The design of map units and the level of detail shown in the resulting soil map are dependent on that map scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Tables — Hydrologic Soil Group — Summary By Map Unit

Summary by Map Unit — Napa County, California (CA055)

Summary by Map Unit — Napa County, California (CA055)

View Description | View Rating

- Map Unit Name
- Parent Material Name
- Representative Slope
- Soil Slippage Potential
- Subsidence, Initial
- Subsidence, Total
- Unified Soil Classification (Surface)

Water Features

Summary by Map Unit — Napa County, California (CA055)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
100	Aiken loam, 2 to 15 percent slopes	C	60.3	32.6%
101	Aiken loam, 15 to 30 percent slopes	C	16.9	9.1%
102	Aiken loam, 30 to 50 percent slopes	C	67.9	36.7%
140	Forward silt loam, 12 to 57 percent slopes, MLRA 15	C	13.6	7.3%
152	Hambright rock-Outcrop complex, 30 to 75 percent slopes	D	0.0	0.0%
154	Henneke gravelly loam, 30 to 75 percent slopes	D	24.1	13.0%
183	Water		2.3	1.2%
Totals for Area of Interest			**185.2**	**100.0%**

Description — Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options — Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

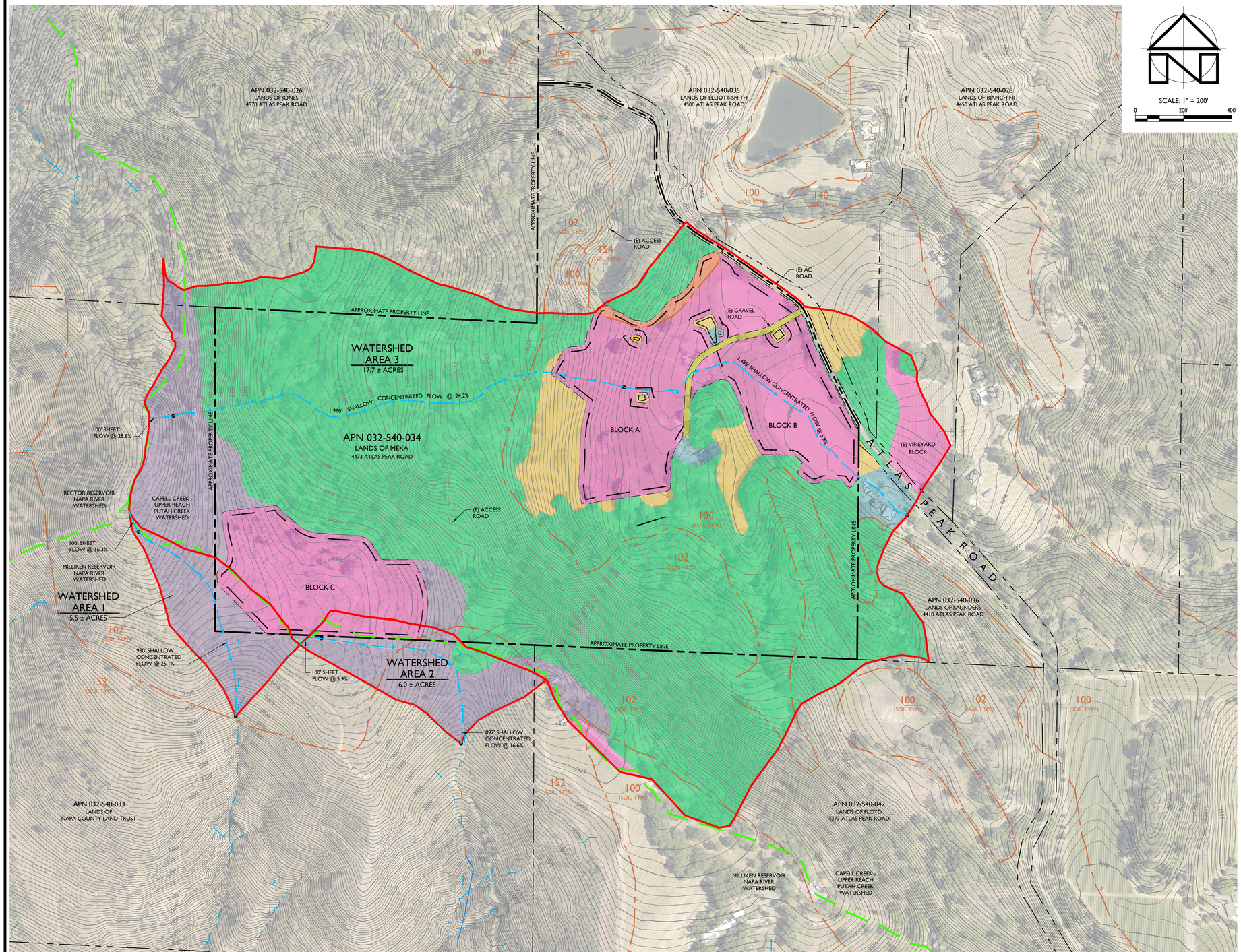
Tie-break Rule: Higher

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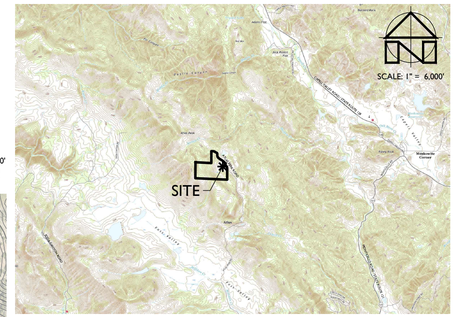
WATERSHED EXHIBITS



WATERSHED EXHIBIT KEY MAP

SCALE: 1" = 200'

SCALE: 1" = 200'
0 200' 400'



LOCATION MAP

SCALE: 1" = 6,000'

PROJECT INFORMATION:

PROPERTY OWNER & APPLICANT:
MUKTHESWARA RAO MEKA
4473 ATLAS PEAK ROAD
NAPA, CA 94558

SITE ADDRESS:
4473 ATLAS PEAK ROAD
NAPA, CA 94558

ASSESSOR'S PARCEL NUMBER:
032-540-034

PARCEL SIZE:
96.6 ± ACRES

PROJECT SIZE:
26 ± ACRES DISTURBED AREA
19.8 ± ACRES PLANTED

ZONING:
AGRICULTURAL WATERSHED (AW)

SHEET INDEX:

1 WATERSHED EXHIBIT KEY MAP
2 WATERSHED AREAS A & B - EXISTING CONDITIONS
3 WATERSHED AREAS A & B - PROPOSED CONDITIONS

LEGEND:

- APPROXIMATE PROPERTY LINE
- SOIL TYPE BOUNDARY
- COUNTY DEFINED WATERSHED BOUNDARY
- BLUELINE STREAM
- WATER BOARD STREAM LAYER
- EXISTING VINEYARD BLOCK
- PROPOSED VINEYARD AVENUE
- PROPOSED VINEYARD BLOCK
- WATERSHED AREA
- TIME OF CONCENTRATION FLOW PATH

NOTES:

1. FADED BACKGROUND REPRESENTS EXISTING TOPOGRAPHIC FEATURES. TOPOGRAPHIC INFORMATION WAS TAKEN FROM THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM DATABASE. APPLIED CIVIL ENGINEERING INCORPORATED ASSUMES NO LIABILITY REGARDING THE ACCURACY OR COMPLETENESS OF THE TOPOGRAPHIC INFORMATION.
2. AERIAL PHOTOGRAPHS ARE NADIR IMAGES CAPTURED BY PICTOMETRY INTERNATIONAL DATED JULY 15, 2021 AND MAY NOT REPRESENT CURRENT CONDITIONS.
3. CONTOUR INTERVAL: FIVE (5) FEET, HIGHLIGHTED EVERY TWENTY FIVE (25) FEET.
4. BENCHMARK: NAVD 88
5. THE PROPERTY LINES SHOWN ON THESE PLANS DO NOT REPRESENT A BOUNDARY SURVEY. THEY ARE APPROXIMATE AND ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

SOIL TYPE LEGEND:

TYPE	HSG	DESCRIPTION
100	C	AIKEN LOAM, 2 TO 15 PERCENT SLOPES
101	C	AIKEN LOAM, 15 TO 30 PERCENT SLOPES
102	C	AIKEN LOAM, 30 TO 50 PERCENT SLOPES
140	C	FORWARD GRAVELLY LOAM, 30 TO 75 PERCENT SLOPES
152	D	HAMBRIGHT ROCK-OUTCROP COMPLEX, 30 TO 75 PERCENT SLOPES
154	D	HENNEKE GRAVELLY LOAM, 30 TO 75 PERCENT SLOPES

SOIL TYPE BOUNDARIES SHOWN ON THIS MAP ARE BASED ON THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM DATA AND SHOULD BE CONSIDERED APPROXIMATE.

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Napa, CA 94559
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WATERSHED EXHIBITS
WATERSHED EXHIBIT KEY MAP

PREPARED UNDER THE DIRECTION OF:

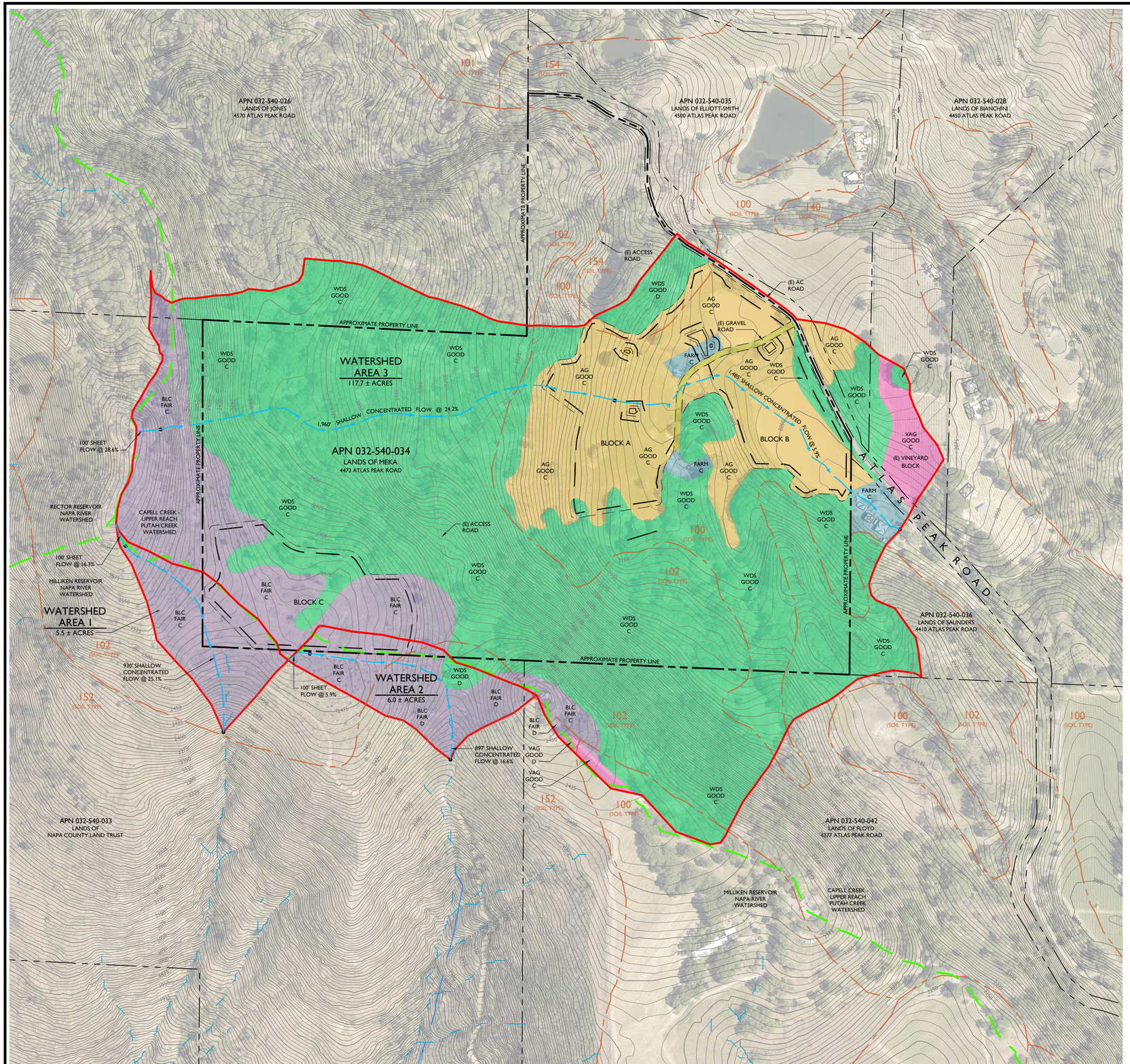
REGISTERED PROFESSIONAL ENGINEER
MICHAEL R. MUETZNER
MRM
NO. 67435
Exp. 12/31/2024
2/15/2024
CIVIL
STATE OF CALIFORNIA

DRAWN BY: PowerCAD LLC
CHECKED BY: MRM
DATE: FEBRUARY 15, 2024

REVISIONS:	BY:
2/15/2024 PERMIT SUBMITTAL	NJH

JOB NUMBER: 21-115
FILE: 21-115EXH-WTRSHD.DWG
ORIGINAL SIZE: 24" X 36"
SHEET NUMBER: 1 OF 3

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WATERSHED AREAS A, B & C - EXISTING CONDITIONS

SCALE: 1" = 200'

SCALE: 1" = 200'

0 200' 400'

WATERSHED AREA "1" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
BLC-FAIR-C	BROADLEAF CHAPARRAL	FAIR	C	75	5.3 ± AC	0.7± AC	4.6 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	0.7 ± AC
				TOTALS	5.3 ± AC	0.7 ± AC	5.3 ± AC

WATERSHED AREA "2" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
BLC-FAIR-C	BROADLEAF CHAPARRAL	FAIR	C	75	2.1 ± AC	0.8 ± AC	1.3 ± AC
BLC-FAIR-D	BROADLEAF CHAPARRAL	FAIR	D	81	3.5 ± AC	0	3.5 ± AC
WDS-GOOD-D	WOODS	GOOD	D	77	0.4 ± AC	0	0.4 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	0.8 ± AC
				TOTALS	6.0 ± AC	0.8 ± AC	6.0 ± AC

WATERSHED AREA "3" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
RD-PVD-C	ROADS - PAVED	N/A	C	98	0.7 ± AC	0	0.7 ± AC
RD-GRVL-C	GRAVEL ROAD	N/A	C	89	0.5 ± AC	0	0.5 ± AC
FARM-C	FARMSTEAD	N/A	C	82	1.7 ± AC	0.3 ± AC	1.4 ± AC
BLC-FAIR-C	BROADLEAF CHAPARRAL	FAIR	C	75	13.1 ± AC	4.5 ± AC	8.6 ± AC
BLC-FAIR-D	BROADLEAF CHAPARRAL	FAIR	D	81	0.3 ± AC	0	0.3 ± AC
WDS-GOOD-C	WOODS	GOOD	C	70	77.1 ± AC	2.7 ± AC	74.4 ± AC
WDS-GOOD-D	WOODS	GOOD	D	77	2.0 ± AC	0	2.0 ± AC
AG-GOOD-C	ANNUAL GRASS	GOOD	C	75	19.5 ± AC	14.2 ± AC	5.3 ± AC
AG-GOOD-D	ANNUAL GRASS	GOOD	D	81	0.6 ± AC	0.6 ± AC	0
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (PRE)	GOOD	C	75	2.1 ± AC	0	2.1 ± AC
VAG-GOOD-D	VINEYARD - ANNUAL GRASS (PRE)	GOOD	D	81	0.1 ± AC	0	0.1 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	22.3 ± AC
				TOTALS	117.7 ± AC	22.3 ± AC	117.7 ± AC

SOIL TYPE LEGEND:

TYPE	HSG	DESCRIPTION
100	C	AIKEN LOAM, 2 TO 15 PERCENT SLOPES
101	C	AIKEN LOAM, 15 TO 30 PERCENT SLOPES
102	C	AIKEN LOAM, 30 TO 50 PERCENT SLOPES
140	C	FORWARD GRAVELLY LOAM, 30 TO 75 PERCENT SLOPES
152	D	HAMBRIGHT ROCK-OUTCROP COMPLEX, 30 TO 75 PERCENT SLOPES
154	D	HENNEKE GRAVELLY LOAM, 30 TO 75 PERCENT SLOPES

SOIL TYPE BOUNDARIES SHOWN ON THIS MAP ARE BASED ON THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM DATA AND SHOULD BE CONSIDERED APPROXIMATE.

LEGEND:

- APPROXIMATE PROPERTY LINE
- SOIL TYPE BOUNDARY
- COUNTY DEFINED WATERSHED BOUNDARY
- BLUELINE STREAM
- WATER BOARD STREAM LAYER
- EXISTING VINEYARD BLOCK
- PROPOSED VINEYARD AVENUE
- PROPOSED VINEYARD BLOCK
- WATERSHED AREA
- TIME OF CONCENTRATION FLOW PATH

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MEKA VINEYARD

WATERSHED EXHIBITS

WATERSHED AREAS A, B & C - EXISTING CONDITIONS

PREPARED UNDER THE DIRECTION OF:

REGISTERED PROFESSIONAL ENGINEER
MICHAEL R. MUELRATH
MRM
NO. 67435
Exp. 12/31/2024
2/15/2024
CIVIL
STATE OF CALIFORNIA

DRAWN BY: PowerCAD LLC

CHECKED BY: MRM

DATE: FEBRUARY 15, 2024

REVISIONS:	BY:
2/15/2024 PERMIT SUBMITTAL	NJH

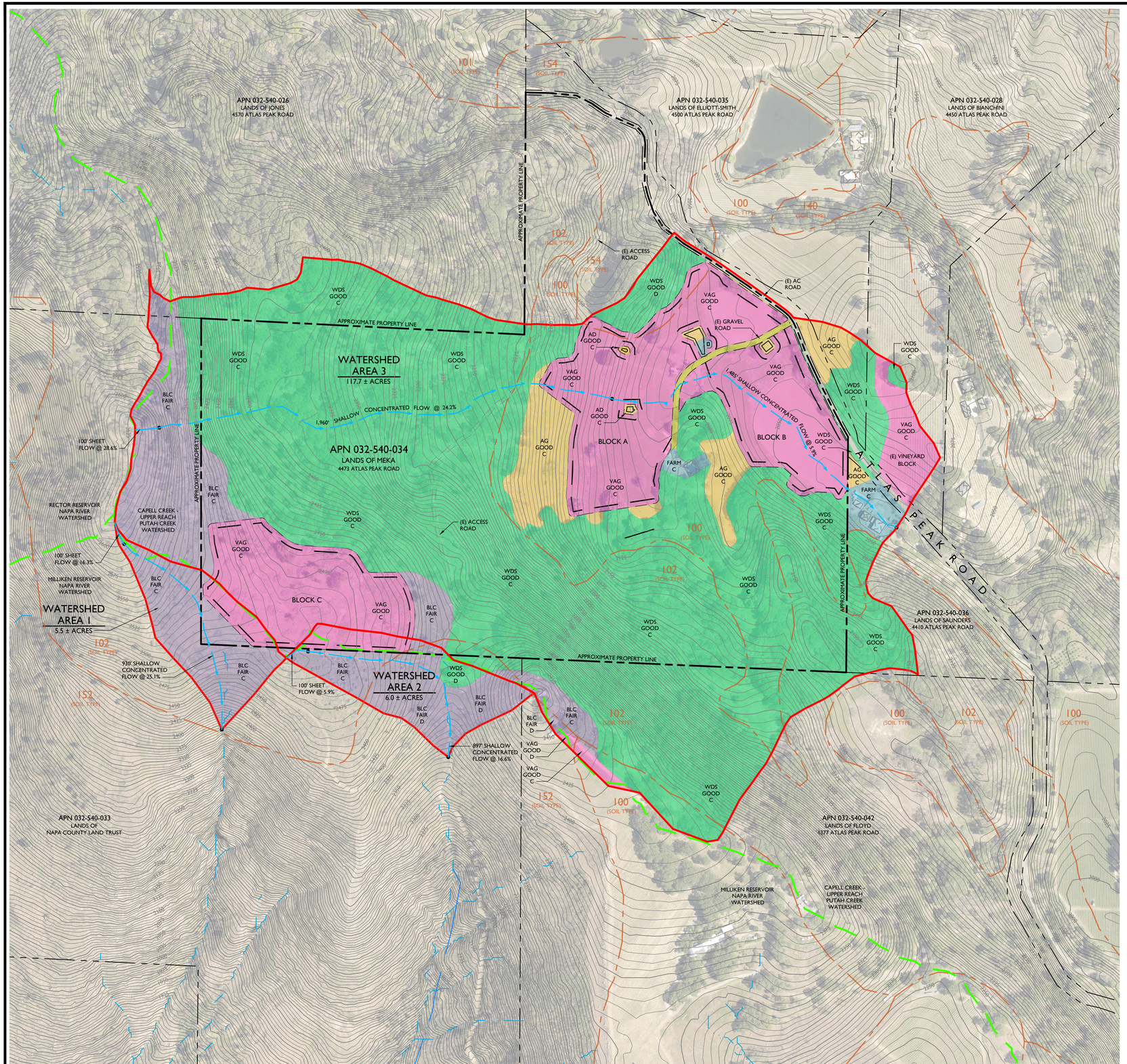
JOB NUMBER: 21-115

FILE: 21-115EXH-WTRSHD.DWG

ORIGINAL SIZE: 24" X 36"

SHEET NUMBER: 2 OF 3

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WATERSHED AREAS A, B & C - PROPOSED CONDITIONS

SCALE: 1" = 200'

SCALE: 1" = 200'

0 200' 400'

WATERSHED AREA "1" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
BLC-FAIR-C	BROADLEAF CHAPARRAL	FAIR	C	75	5.3 ± AC	0.7± AC	4.6 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	0.7 ± AC
				TOTALS	5.3 ± AC	0.7 ± AC	5.3 ± AC

WATERSHED AREA "2" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
BLC-FAIR-C	BROADLEAF CHAPARRAL	FAIR	C	75	2.1 ± AC	0.8 ± AC	1.3 ± AC
BLC-FAIR-D	BROADLEAF CHAPARRAL	FAIR	D	81	3.5 ± AC	0	3.5 ± AC
WDS-GOOD-D	WOODS	GOOD	D	77	0.4 ± AC	0	0.4 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	0.8 ± AC
				TOTALS	6.0 ± AC	0.8 ± AC	6.0 ± AC

WATERSHED AREA "3" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
RD-PVD-C	ROADS - PAVED	N/A	C	98	0.7 ± AC	0	0.7 ± AC
RD-GRVL-C	GRAVEL ROAD	N/A	C	89	0.5 ± AC	0	0.5 ± AC
FARM-C	FARMSTEAD	N/A	C	82	1.7 ± AC	0.3 ± AC	1.4 ± AC
BLC-FAIR-C	BROADLEAF CHAPARRAL	FAIR	C	75	13.1 ± AC	4.5 ± AC	8.6 ± AC
BLC-FAIR-D	BROADLEAF CHAPARRAL	FAIR	D	81	0.3 ± AC	0	0.3 ± AC
WDS-GOOD-C	WOODS	GOOD	C	70	77.1 ± AC	2.7 ± AC	74.4 ± AC
WDS-GOOD-D	WOODS	GOOD	D	77	2.0 ± AC	0	2.0 ± AC
AG-GOOD-C	ANNUAL GRASS	GOOD	C	75	19.5 ± AC	14.2 ± AC	5.3 ± AC
AG-GOOD-D	ANNUAL GRASS	GOOD	D	81	0.6 ± AC	0.6 ± AC	0
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (PRE)	GOOD	C	75	2.1 ± AC	0	2.1 ± AC
VAG-GOOD-D	VINEYARD - ANNUAL GRASS (PRE)	GOOD	D	81	0.1 ± AC	0	0.1 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	22.3 ± AC
				TOTALS	117.7 ± AC	22.3 ± AC	117.7 ± AC

SOIL TYPE LEGEND:

TYPE	HSG	DESCRIPTION
100	C	AIKEN LOAM, 2 TO 15 PERCENT SLOPES
101	C	AIKEN LOAM, 15 TO 30 PERCENT SLOPES
102	C	AIKEN LOAM, 30 TO 50 PERCENT SLOPES
140	C	FORWARD GRAVELLY LOAM, 30 TO 75 PERCENT SLOPES
152	D	HAMBRIGHT ROCK-OUTCROP COMPLEX, 30 TO 75 PERCENT SLOPES
154	D	HENNEKE GRAVELLY LOAM, 30 TO 75 PERCENT SLOPES

SOIL TYPE BOUNDARIES SHOWN ON THIS MAP ARE BASED ON THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM DATA AND SHOULD BE CONSIDERED APPROXIMATE.

LEGEND:

- APPROXIMATE PROPERTY LINE
- SOIL TYPE BOUNDARY
- COUNTY DEFINED WATERSHED BOUNDARY
- BLUELINE STREAM
- WATER BOARD STREAM LAYER
- EXISTING VINEYARD BLOCK
- PROPOSED VINEYARD AVENUE
- PROPOSED VINEYARD BLOCK
- WATERSHED AREA
- TIME OF CONCENTRATION FLOW PATH

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MEKA VINEYARD

WATERSHED EXHIBITS

WATERSHED AREAS A, B & C - PROPOSED CONDITIONS

PREPARED UNDER THE DIRECTION OF:

REGISTERED PROFESSIONAL ENGINEER
MICHAEL R. MUELRATH
MRM
NO. 67435
Exp. 12/31/2024
2/15/2024
CIVIL
STATE OF CALIFORNIA

DRAWN BY: PowerCAD LLC

CHECKED BY: MRM

DATE: FEBRUARY 15, 2024

REVISIONS:	BY:
2/15/2024 PERMIT SUBMITTAL	NJH

JOB NUMBER: 21-115

FILE: 21-115EXH-WTRSHD.DWG

ORIGINAL SIZE: 24" X 36"

SHEET NUMBER: 3 OF 3