

8G: Hydrology Report – Haas Vineyard

December 8, 2023

BACKGROUND

The subject site is located on Glass Mountain, APN 021-352-036, in the St Helena USGS Quad. The property is situated on the Napa River watershed. Elevations within the proposed vineyard blocks range 570ft to 295ft asl. Mapped bedrock units in the area are Sonoma Volcanics [3].

Vineyard blocks are within the Boomer Series (109) and Forward-Kidd Complex (141). The Napa County Soil Survey [4] describes site soils as follows:

- The Boomer series consists of well drained soils on uplands. Slope is 2 to 50 percent. These soils formed in material weathered from mixed igneous rocks.
- The Forward-Kidd complex consists of very steep soils on uplands. This complex is about 60 percent Forward soils, about 20 percent Kidd soils, and about 20 percent Aiken, Boomer, and Sobrante soils and areas of rock outcrop.

Soil data (K and T factors) were not listed in the NRCS web soil survey, however it was referenced for Hydraulic Soil Group (HSG) [2]. The NRCS web soil survey notes that map data may not be valid the map scale for this project. The soils map was created at a scale of 1:24,000 or 1 in = 2,000 ft. Enlarged maps can cause misunderstandings of the accuracy of soil line placement. The USLE Special Applications for Napa County [7] was used as reference for K and T factors. The following soil properties were used for this project:

Soil Type	Soils description	K [7]	T [7]	HSG [2]
109	Boomer Gravelly Loam 14 - 60 percent slopes	0.20	3	C
141	Forward-Kidd Complex 11 - 60 percent slopes	0.17	2	C

Average slope across vineyard blocks ranges from 5% to 24% with an average of about 15%.

ANALYSIS

The project parcel is situated on the east side of Napa Valley on the western flank of Glass Mountain within elevations ranging from about 585 ft to about 300 ft asl. The project development area is situated on the higher slopes ranging from about 575 ft to 425 ft asl.

The majority of run-off from the proposed project area sheets to the west/north-west and flows into a drainage ditch along the property owner’s driveway that joins a drainage ditch along Swanston Rd. The Swanston Rd drainage ditch traverses the adjacent parcel (APN 021-352-028, 4 Swanston Rd), crosses underneath Swanston Rd twice, then runs along the east side of Bournemouth Dr and joins a ditch north of Silverado Trail that crosses under the road and connects to the dashed blue line on the south side of Silverado Trail. The ditch also continues along the east side of Silverado Trail and crosses under the driveway of 2974 Silverado Trail and terminates in a widened section of ditch lined with cobbles.

Existing cover conditions were evaluated in the field on June 14, 2023 and effort was made to interpret pre-fire conditions for “existing cover”. Please refer to Application Section 7: Photos for visual documentation of (post-fire) existing cover crop in each block. Pre-fire (i.e. “current”) groundcover is comprised primarily of douglas fir and developed areas. Post-cover conditions will establish a 75% cover crop throughout, which qualifies as “good” hydrologic condition per the NRCS Engineering Field Handbook.

No drainage improvements are proposed and ground contours will remain unchanged, therefore post-development conditions are expected to follow the same flow patterns. No cut/fill is required for avenue construction. As such, there is no opportunity for change in time of concentration (Tc) across the site as a result of development and an analysis of a comparison of cover conditions (Cn values) was conducted.

RESULTS

A Cn analysis is presented in Table 1 that compares land cover properties before and after development. The proposed vineyard development will result in no change to the area-weighted average Cn.

Table 1 Cn Analysis for vineyard development

Cn description	HSG	Condition	Cn	PRE (acres)	Δ (acres)	POST (acres)
Farmstead	C		82	4.7	-0.1	4.6
Grassland	C	fair	79	1.8	-0.3	1.5
Woods	C	fair	73	24.4	-4.7	19.7
Woods-Grass Combo	C	fair	76	13.3	-0.5	12.8
Vineyard	C	good	74	0	5.6	5.6
Total acres:				44.2		44.2
Weighted Average Cn:				75	-	75

The Napa County General Plan (June 23, 2009), Policy CON-50.c dictates that peak flows shall not increase above pre-development conditions. Since there is no change in average Cn across the watershed, there is no potential for an increase in peak flow across the site.

CONCLUSIONS

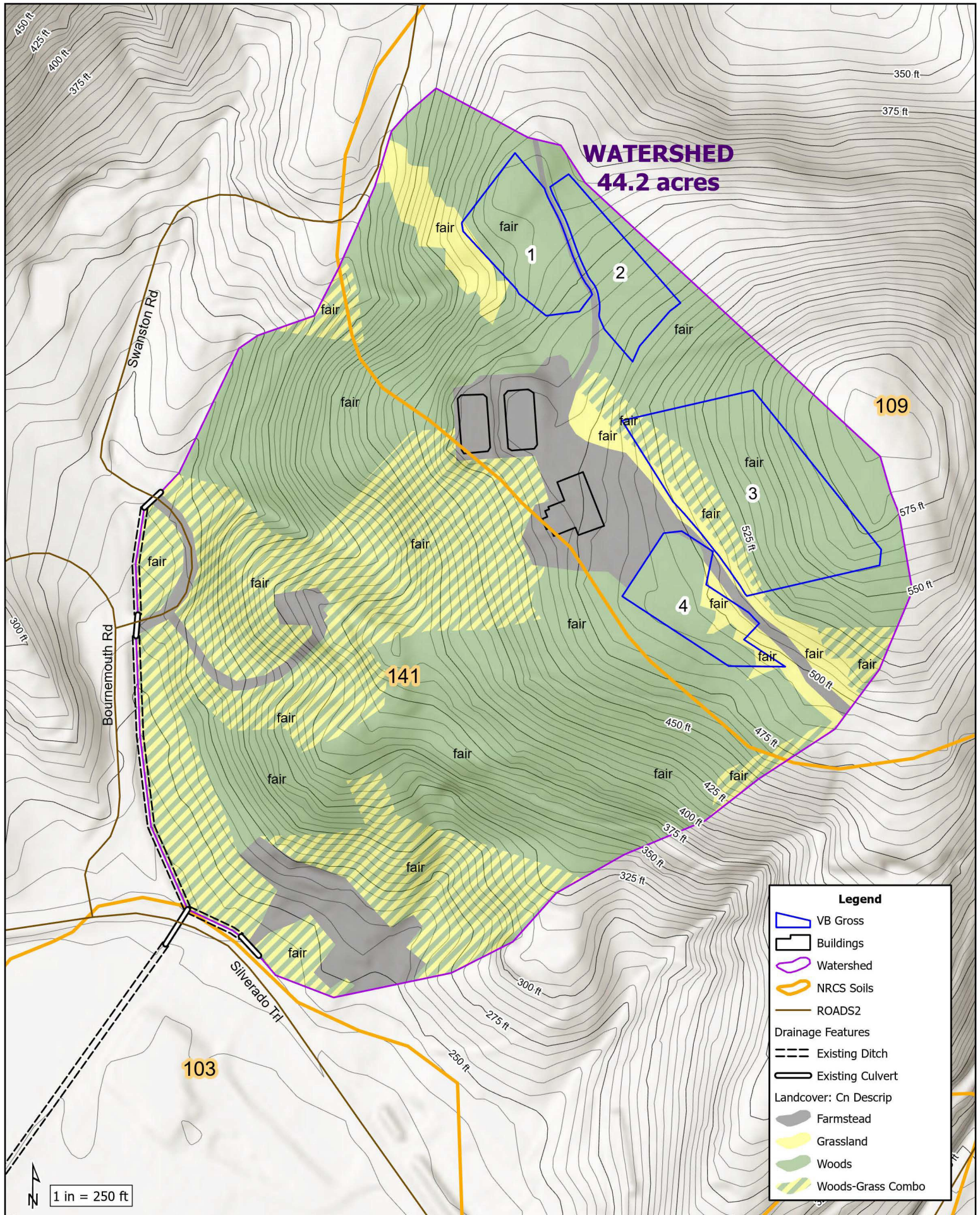
Vineyard development will have no change to run-off potential from the project area. The vineyard development will result in no change to the weighted average Cn in the watershed and no change in peak flows across the site.

References

1. Attachments B&C, *Biological Resources Reconnaissance Survey, 2 Swanston Road*, prepared by WRA, December 2023
2. *Custom Soil Resource Report for Napa County, California*, from USDA NRCS Web Soil Survey, May 2023
3. *HydroCAD® Stormwater Modeling System, Version 10, Owner's Manual*, HydroCAD Software Solutions LLC, rev. 7/27/2011
4. Lambert, G., et al., *Soil Survey of Napa County, California*, USDA in cooperation with UC Agricultural Experiment Station, August 1978
5. *Napa County General Plan: Conservation Element*, Napa County Department of Conservation, Development & Planning, June 23, 2009
6. *SCS Part 650 Engineering Field Handbook, Chapter 2 – Estimating Runoff*, Amend. 48, January 2012, Table 2-3b
7. *The Universal Soil Loss Equation, Special Applications for Napa County, CA* USDA Natural Resources Conservation Service, May 1994

Attachments

1. *Haas: Landcover Map*



WATERSHED
44.2 acres

Legend	
	VB Gross
	Buildings
	Watershed
	NRCS Soils
	ROADS2
Drainage Features	
	Existing Ditch
	Existing Culvert
Landcover: Cn Descrip	
	Farmstead
	Grassland
	Woods
	Woods-Grass Combo

1 in = 250 ft

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Date: 11/17/23

Haas Landcover Map

