

Miller Vineyard
30 Lupine Hill Road - Hydrology Study
Prepared by Napa Valley Vineyard Engineering, Inc
October 22, 2024
Revision 1, February 18, 2025

INTRODUCTION

Miller Vineyard seek approval of approximately 4.52 net acres of new vineyard. The project lies within APN 052-170-054, a 10.47 acre parcel located at 30 Lupine Hill Road, Napa.

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

RAINFALL DATA

Rainfall depths for the project site were obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6, Version 2, Precipitation Frequency Data for California, which uses the latitude and longitude of the Miller Vineyard project is estimated to be 38.3123 N, -122.2532 W, based on information obtained from (NOAA) Atlas 14 site.

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

2 year, 24 hour	3.33 inches
100 year, 24 hour	8.91 inches

Rainfall data for the interim storm events were interpolated as:

5 year, 24 hour	4.49 inches
10 year, 24 hour	5.43 inches
25 year, 24 hour	6.80 inches
50 year, 24 hour	7.83 inches

WATERSHED AREAS

The project site drains toward unnamed stream thence Spencer Creek and lies within the Hagen Creek sub-watershed. The points of interest for this analysis is point along a stream just outside of the project area. The watershed for Area A is approximately 21.10 acres and was delineated based on topographic data from the Napa County GIS Data Base website.

The maps included in Appendix A, depict the watershed, the existing land uses, and the proposed vineyard project.

PRE-PROJECT WATERSHED CONDITIONS

Soil Types

The Natural Resource Conservation Service, used Web Soil Survey Mapping for Napa County, at project site location, maps the following soil types within the watershed:

SCS #152, Hambright rock-Outcrop complex 30 to 75% slopes
(Hydrologic Soil Group (HSG) D)

SCS #178, Sobrante loam 5 to 30% slopes
(Hydrologic Soil Group (HSG) C)

Land Use

Land use within the subject watersheds was analyzed based on the 2021 aerial photograph obtained from the Napa County GIS website. Area A consists of 20.111 acres of Woods and grasslands mixed, 0.159 acres of existing vineyard, 0.816 acres of existing developed area and 0.007 acres of landscaping. The grasslands and woods areas are considered to be in a "fair" condition, due to animal grazing within the watershed area. A detailed breakdown of land use by area and hydrologic soil group is included in the HydroCad Reports, Appendix A.

Time of Concentration

The time of concentration represents the time it takes for rainfall in the most hydraulically remote portion of the watershed to reach the point of interest. The time of concentration was estimated assuming sheet flow for 100 feet in the uppermost reach of the watershed. A shallow concentrated flow regime and Parabolic Channel was used to model the runoff down to the point of interest. Mannings coefficients were selected to represent the respective surface conditions. A detailed breakdown of the time of concentration parameters is included in the HydroCad Reports, Appendix A and are shown on the Drainage Area Map.

POST PROJECT WATERSHED CONDITIONS

Soil Types

The proposed vineyard development occurs within the areas mapped as

SCS #152, Hambright rock-Outcrop complex 30 to 75% slopes ((HSG) D)

SCS #178, Sobrante loam 5 to 30% slopes ((HSG) C)

Land Use

The proposed project will convert 5.51 acres pasture grasses with no trees being removed. Some development areas with-in the proposed vineyard areas will be relocated by avenues around the vineyard areas. The project proposes a no-till cover crop with strip spray only, which is considered a "good" hydrologic condition. Vineyard avenues/turnspaces will be maintained in a no-till cover and are modeled as part of the vineyard. All other areas within the watershed are assumed to remain unchanged. A detailed breakdown of land uses by area and hydrologic soil group is included in the HydroCad Reports, Appendix A.

Time of Concentration

Time of concentration under post-project conditions will not increase in the watersheds The erosion control measures provided within the project area include. The time of concentration is estimated assuming sheet flow for 100 feet in the uppermost reach of the watershed area, and shallow concentrated flow regime and Parabolic Channel was used to model the runoff down to the point of interest. A detailed breakdown of the time of concentration parameters is included in the HydroCad Report.

CALCULATED RUNOFF RATE

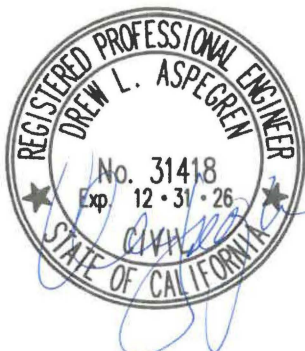
Using the rainfall data, watershed area, land use and time of concentration parameters described above and included in Appendix A, the following runoff rates were calculated:

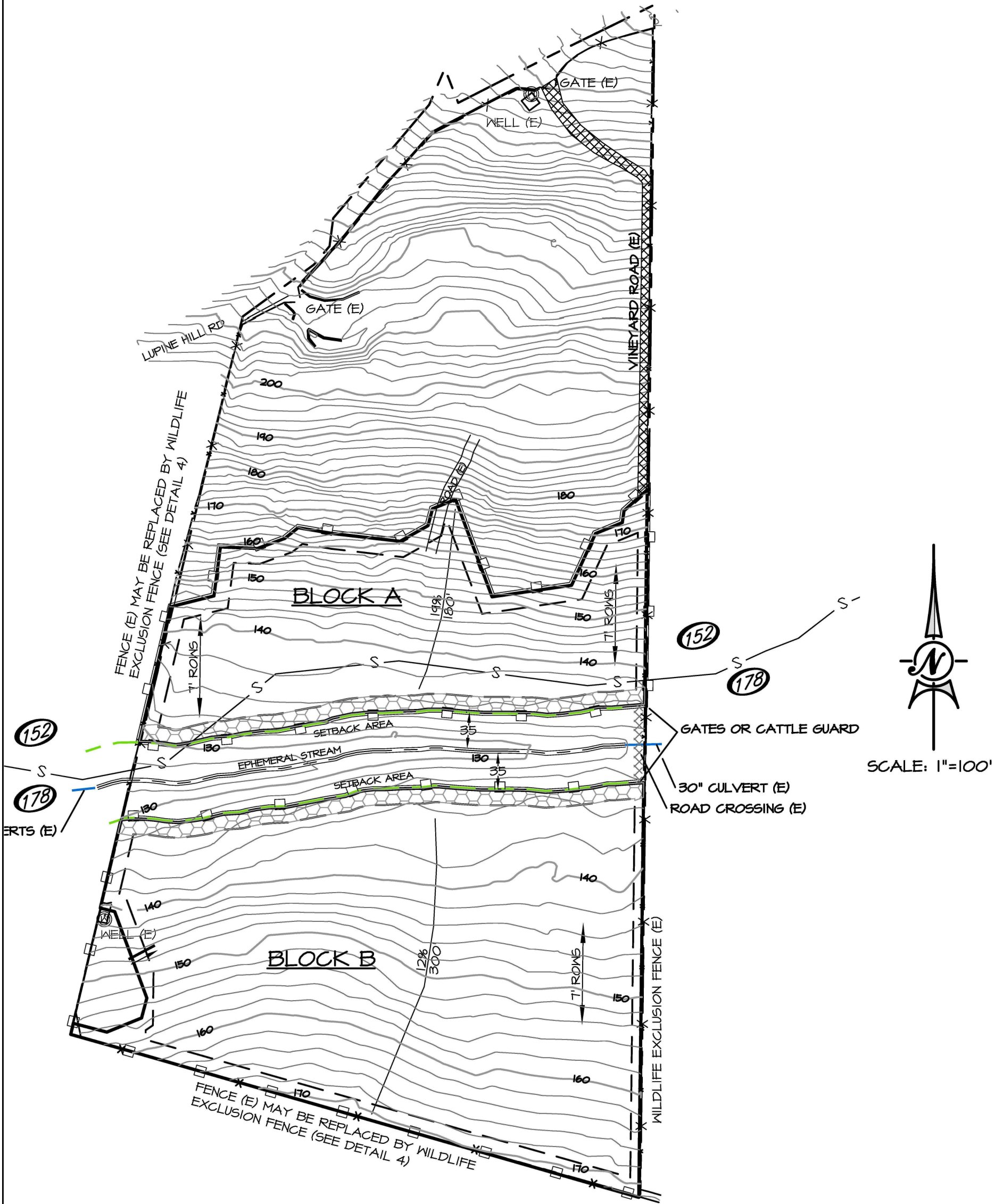
HydroCad Calculated Peak Runoff Rate (cfs)

24 hr. storm event	2 yr.		5 yr.		10 yr.		25 yr.		50 yr.		100 yr.	
Project Condition	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post
Watershed A	4.24	4.24	7.10	7.10	9.52	9.52	13.12	13.12	15.86	15.86	18.73	18.73

CONCLUSION

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





MILLER VINEYARD
30 LUPINE HILL ROAD
USLE PRE AND POST MAP

EROSION CONTROL PLAN
TRACK 1

NYVE 3-4-25 REVISION 1