Napa De Oro
1228 Hagen Road
USLE - Analysis

Prepared by Napa Valley Vineyard Engineering, Inc
September 2, 2021; Rev. 1 November 22, 2021

INTRODUCTION

Napa De Oro seeks approval of approximately 1.25 gross acres of proposed vineyard. The project lies within APN 049-200-003, a parcel totaling about 6.10 acres, located at 1228 Hagen Road, Napa.

This analysis is to predict the affect the proposed vineyard development project will have on local soil erosion. Modeling of existing and proposed conditions was performed using the Universal Soil Loss Equation (USLE). Following is a summary of the data used and the results of the analysis.

RAINFALL DATA

The 2 year, 6 hour rainfall depth is used to determine the “R” value in the USLE. The rainfall depth for the project site was 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 a site to interpolate rainfall depths between data points. The latitude and longitude of the Napa De Oro project are estimated to be, 38.3259° N, -122.2612° W, based on information obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Precipitation Frequency Data. The 2 year, 6 hour rainfall depth at the project site ranges from 1.34-inches to 1.71-inches. This analysis conservatively uses the high end of the range (1.71-inches), which equals an “R” value of 53.02. “R” is constant in the pre-project and post-project models.

SOIL EROSIVENESS

Each soil type listed in the United States Department of Agriculture, Soil Conservation Service (SCS), Napa County Soil Survey has an erodibility factor (“K”). The SCS soil maps indicate that soils on the project site as:

SCS# 123, Coombs gravely loam - K value of 0.37

“K” is constant in the pre-project and post-project models.

SLOPE LENGTH and STEEPNESS

Terra Firma Surveys Inc. September 21, 2020 contour mapping was used to determine slope steepness on the project site. The Slope lengths were selected to analyze the soil loss from the longest and steepest slopes in the blocks for the project area, as shown on the map included in the Appendix. The slope lengths and gradients for the blocks from the pre-project to the post-project models do not change and are identified on the map and in the USLE worksheets included in the Appendix.

VEGETATIVE COVER

Cover factors ("C") for pre-project and post-project conditions were determined using the guidelines provided in the SCS pamphlet entitled "The Universal Soil Loss Equation: Special Applications for Napa County, California (guide).

Pre Project

The existing site conditions used for Blocks A2 will be conditions of the block prior to planting of the existing vineyard. Historically both proposed block areas were farmed. Historic aerial photos show dirt covering both areas with visible tracks left from farming equipment throughout the year. With the presents of rain both areas can grow enough grass to cover about 70-75% of the area, but until the presents of rain both areas remain bare soil (bare soil conditions were present upon September 2020 field visit). Existing conditions for the Blocks are as follows:

The existing site conditions for Block A2 consists of approximately 15% tree canopy with grass. The ground cover for this block is approximately 60% grass-like herbaceous plants (grassy) and 40% broadleaf herbaceous plants (woody), and covers approximately 75% of the area.

The existing site conditions for transect B1 of Block B consists of approximately 10% tree canopy with grass. The ground cover for this block is approximately 70% grass-like herbaceous plants (grassy) and 30% broadleaf herbaceous plants (woody), and covers approximately 75% of the area.

The existing site conditions for transect B2 of Block B consists of approximately 25% tree canopy with grass. The ground cover for this block is approximately 70% grass-like herbaceous plants (grassy) and 30% broadleaf herbaceous plants (woody), and covers approximately 75% of the area.

Post Project

The project proposes a “no till cover crop with spot spray cultivation scheme” (refer to ECP narrative). Using the table in the guide, “USLE ‘C’ Factors for Vineyards”, the post-project C factor for a no till cover crop with spot spray assuming 80% ground cover (0.022).

PRACTICE FACTOR

The accepted practice factor for the existing conditions is 1.0. Using the table in the guide, “P (“Practice”) Factors for USLE in Napa Valley Vineyards, the practice factor for vineyard rows running up and downhill is 1.0. Practice factor of 1.0 was used for Blocks A2 and B.

RESULTS, CONCLUSION

The pre-project and post-project modeling is presented with Appendix. A comparison of pre-project and post-project modeling shown:

Blocks	Soil Loss (tons/ac.)	
	Pre Project	Post Project
A2	0.69	0.45
B1	1.04	0.76
B2	0.73	0.53

The analysis shows, in each case, that the estimated post-project soil loss is less than or equal to the pre-project condition, and that the proposed vineyard project will not result in increased soil loss.