

Harcross Winery

Vineyard Development Erosion Control Plan

Erosion Control Plan Narrative

- 1. The nature and purpose of all/any land clearing, grading or earthmoving activity, the amount of cut & fill, the location of spoils storage and disposal areas, the total number of acres of grading involved including but not limited to roads, vineyards, avenues, trenching for irrigation or pipes, reservoirs, wells, water tanks, septic systems, etc. Indicate the acres of land clearing, grading or earthmoving activity that will occur on 30% or greater slopes. (Note: slopes shall be calculated in whole percent)*

The project site is located northwest of the Town of Yountville on the north side of Dry Creek Road in an unincorporated portion of Napa County, California (Napa County APN 027-530-006). Access to the project area is via an existing residential driveway entrance that provides access to the property from Dry Creek Road.

The purpose of the proposed land clearing, grading and earthmoving is to prepare the project area for planting with new vineyard. Following is a list of planned land preparation activities:

- Clearing and grubbing of existing vegetation
- Re-contouring and land smoothing to promote sheet flow
- Ripping and rock breaking as needed to fracture subsoils and rock to a depth of approximately 24 to 48 inches to prepare soil for planting and to incorporate soil amendments within the vineyard footprint area
- Mechanical and hand rock raking to remove loose rocks from the ground surface
- Discing and harrowing to prepare seedbed for vegetative erosion control measures
- Installation of erosion control features
- Installation of vineyard irrigation and trellis systems

Grading within the project area will be the minimum amount needed to smooth out the existing ground surface and create smooth slopes to promote sheet flow and to install the proposed runoff and erosion control measures. Cuts and fills will be minor and are expected to average from 0 to 12 inches. The estimated quantity of grading is approximately 500 cubic yards of cut and 500 cubic yards of fill. An earthwork balance will be achieved onsite. Import and/or export of soil material is not planned however, soil amendments will be imported and incorporated into the project area as needed to improve soil tilth and thereby support vine and cover crop growth.

All temporary debris, vegetation, soil and soil amendment stockpiles and storage areas, if needed, will be located within the proposed vineyard project area. No long-term stockpiles of rock or soil are anticipated.

No new roads are required to access the proposed vineyard development area. Access is via the existing residential driveway that provides access to the house that is currently under construction and via a future driveway that will service a winery (use permit under review).

The total disturbed area for the vineyard development project is $3.0 \pm$ acres. The total disturbed area includes the area to be planted with vines and the area used for perimeter avenues and connecting avenues that provide access to the vineyard blocks for farming equipment and incidental disturbance for installation of erosion control features. Including the winery project that is under concurrent review the total disturbed area is $4.0 \pm$ acres. The total area to be planted with vines $2.5 \pm$ acres.

Stream and drainage course setbacks will be provided in accordance with the Napa County Conservation Regulations. Stream setbacks are shown on the erosion control plan.

The proposed vineyard development consists of three adjacent vineyard blocks. The blocks are all adjacent and are only separated by the proposed winery access road. The block will have a row spacing of 6 feet and vine spacing along the row of 4 feet for an average vine density of 1,815 vines per acre and a total of approximately 4,538 vines (subject to change pending future viticultural assessments).

The details of the proposed vineyard development are shown on the Harcross Winery Vineyard Development Erosion Control Plan prepared by Applied Civil Engineering Incorporated.

- 2. Comprehensive description of existing site conditions, including topography, vegetation (including under-story and canopy cover), and soils. Provide extent of tree canopy covered and shrub and brush without a tree canopy covered areas in acres for each parcel. Identify and indicate the project boundaries in watersheds, including municipal watersheds, and in the water deficient area. The plan preparer is required to visit the site and the narrative must include the date, purpose, and persons making each site visit. The description shall verify the source or validity of the topographic map. Wide angle or panoramic photographs documenting existing site conditions shall be provided. A photo location map indicating the date of the site visit and by whom it was made shall accompany such documentation.*

Topography:

The project area is located on a moderately sloping hillside in Napa County northwest of the Town of Yountville (Latitude = 38.4097° N & Longitude = 122.4585° W). Topography on the property varies and is characterized by gentle to steep slopes ranging from less than 5% to in excess of 30%.

Average slopes within the proposed vineyard development area are moderate and range from 11% to 19% with an overall average slope of 16%. Slopes were determined using topographic data obtained from the Napa County Geographic Information System database and the slope transect method in several representative locations in the proposed development area.

Isolated areas within the project area, totaling approximately 0.15 acres, have slopes slightly in excess of 30%. Most of these areas are steeper than 30% due to previous grading.

Vegetation:

The Calveg designations for the subject parcel were obtained from the Napa County GIS database and are as follows:

- DF – Pacific Douglas-Fir
- HG – Annual Grass/Forbs
- NX – Mixed Hardwoods

Our visual observation of onsite vegetation in the vicinity of the project area is consistent with the Calveg designations.

A detailed assessment of vegetation within the parcel and subject project area was prepared by Kjeldsen Biological Consulting. According to the report by Kjeldsen Biological Consulting there are no sensitive plant species that will be affected by the proposed project. Please refer to the report prepared by Kjeldsen Biological Consulting for additional information.

Kjeldsen Biological Consulting has estimated the following land use / coverage statistics for the entire property:

Developed & Improved	4.2 ± acres
Tree Canopy Cover (Woodland)	41.2 ± acres
Grass Cover	5.4 ± acres
Total Parcel Size	51 ± acres

In total, approximately 0.5 acres of tree canopy cover (woodland) and approximately 3.5 acres that was classified as grass cover will be converted to new vineyard and winery improvements. The calculated tree canopy cover and grass cover retention percentages for the entire parcel are as follows:

Tree Canopy Retention	99%
Grass Retention	35%

Watershed:

The project site is located in the Mayacamas range along the west side of the Napa Valley. Rainfall runoff from the entire parcel and project area flows northerly via sheet and shallow concentrated flow and thence concentrates in the onsite drainage courses that continue northerly and easterly into Dry Creek. Dry Creek flows easterly and southerly ultimately entering the Napa River.

No changes in runoff patterns are proposed as part of this project. All existing drainage patterns will be maintained.

The subject parcel is not located within a municipal drinking water supply watershed.

The subject parcel is not located within the Milliken-Sarco-Tulocay groundwater deficient area.

Site Visits & Photograph Documentation:

Representatives from Applied Civil Engineering Incorporated have visited the site several times. The purpose of the site visits was to review existing site conditions and to verify the general validity of the topographic mapping for this project that was obtained from the Napa County GIS database. Isometric photographs of the project area were obtained from Google Earth and are presented in the Photographic Documentation of Existing Site Conditions for the Harcross Winery Vineyard Development Erosion Control Plan.

- 3. All natural and man-made features on-site including but not limited to, streams, watercourses (drainage, channels, etc.), wetlands, riparian habitat, lakes, reservoirs, roads, water tanks, septic systems, reservoirs, ponds, etc. Indicate which ones may be affected by the proposed activity. For blue line and County-definitional streams indicate top, toe, and slope of bank, channel depth, and existing and proposed setback conditions. The entire length of blue line streams & 41 County-named streams on the parcel(s) shall be included in photo documentation (a recent aerial may be included). Provide the name and distance of the nearest blue line and/or County-definitional stream(s) to the project site.*

Existing manmade improvements on the subject parcel include a residence that is under construction, another existing residential structure, fences, driveways, two wells and the related access and utility infrastructure typical of this type of residential development. None of the existing manmade improvements will be affected by the proposed project.

There are no blue-line streams located on the subject property. The nearest blue-line stream is Dry Creek which is located near the northern tip of the parcel, approximately 270 feet northeasterly of the project area at its closest point.

There are smaller drainage courses located nearer to the development area including ephemeral streams and one County Definition Stream. All stream classifications have been confirmed by Kjeldsen Biological Consulting and the appropriate setbacks are identified on the erosion control plans.

- 4. Location and source of water for irrigation or other uses. Provide copies of all necessary permits.*

The irrigation source for the proposed vineyard development will be the existing onsite well. No other new wells or other water sources are planned at this time.

Please refer to the Water Availability Analysis prepared by O'Connor Environmental for additional information regarding estimated water use and estimated aquifer recharge rates.

5. *Soil types/soil series identified in the Soil Conservation Service (SCS) Napa County Soil Survey, or, if prepared, a site-specific soils report.*

The United States Department of Agriculture Soil Conservation Service Soils Map for Napa County shows several soil types mapped on the subject property including:

136	Felton gravelly loam, 30 to 50 percent slopes
139	Forward gravelly loam, 2 to 30% slopes
168	Perkins gravelly loam, 2 to 5 percent slopes
178	Sobrante loam, 5 to 30 percent slopes

Most of the proposed development occurs in areas mapped as Sobrante loam except for a small portion along the eastern edge of Block B that is mapped as Felton gravelly loam. The approximate soil type boundaries based on data obtained from the Napa County Geographic Information System database are illustrated on Sheet C1 of the Harcross Winery Vineyard Development Erosion Control Plan.

6. *Critical areas of erosion and slope instability such as gullies, landslides, etc. within or potentially affecting the “development site” (i.e., the area disturbed by the project) or potentially affected by the work to be undertaken within the development site. In the case of landslides a report indicating the probable effects of the planned work on slope stability and erosion levels shall be prepared and submitted by a registered geologist.*

Potential landslides are noted on the Napa County GIS database.

Furthermore, RGH Consultants confirms the area is part of an ancient landslide that is not currently active. RGH Consultants prepared a geotechnical report for both the onsite residence and the proposed winery and found the soils to be stable for development. RGH will continue to be consulted to verify stability of the vineyard areas and any remedial grading needed within the planned vineyard development area will be per the recommendations of RGH Consultants.

Furthermore, representatives from Applied Civil Engineering Incorporated have visited the site several times since 2019 to review the project area and have not observed any signs of gullies, landslides, slope instability or excessive erosion within the project area or in close proximity to the project area that would affect, or be affected by, the proposed project.

7. *Any erosion calculations prepared.*

The Universal Soil Loss Equation (USLE) was used to model pre-project and post-project conditions and estimate soil loss rates from the project area due to sheet erosion. The Soil Loss Analysis prepared by Dave Steiner, CPESC, CPSWC is included as an attachment to this document.

The USLE calculations predict that net soil loss rates will decrease slightly relative to existing conditions after implementation of the proposed vineyard erosion control plan and will be less than the prescribed soil loss tolerance (T) for the soil type.

8. *Any/all proposed erosion control methods including, but not limited to:*

a. *All drainage systems and facilities, walls, cribbing or other erosion protection devices to be constructed with, or as a part of the proposed work.*

The following measures will be implemented to minimize the potential for erosion on the project site during development and following completion of the vineyard development program:

- Sediment Barriers – Temporary silt fence and/or straw wattle type sediment barriers will be installed throughout the development area. The planned locations and installation details are provided on the erosion control plan. Additional sediment barriers will be installed as deemed necessary throughout the course of construction. The sediment barriers are intended to provide temporary sediment control during development and until the cover crop is established.
- Erosion Control Blankets – Erosion control blankets will be installed over seed on all cut and fill slopes that are steeper than 3:1 (Horizontal : Vertical). Erosion control blankets will provide additional protection from rainfall impact on exposed soils while the cover crop is getting established. The erosion control blanket locations, specifications and installation details are provided on the erosion control plan.
- Energy Dissipators – Rock rip-rap energy dissipators will be constructed at the outlet of all water bars that direct flow outside of the vineyard area to dissipate runoff energy and minimize the potential for erosion.
- Water Bars/ Rolling Dips – Temporary water bars or permanent rolling dips will be installed on vineyard avenues to divert runoff from the avenues to prevent rutting along the avenues. Water bar and rolling dip locations and installation details are shown on the erosion control plan.
- Storm Drain Pipe - A permanent storm drain pipe will be installed where indicated on the Erosion Control Plan. The storm drain pipe will collect runoff that might otherwise concentrate and cause erosion within the development area. The storm drain pipe will outlet to a level spreader or infiltration trench as indicated on the plans in order to dissipate runoff energy, return the water to sheet flow conditions, slow down the runoff and promote infiltration.
- Drainage Ditches – Existing drainage ditches that intercept water flowing toward the project area will be maintained.

- Straw Mulch – Weed free agricultural straw derived from wheat, rice, barley, or native grass shall be used. Straw mulch can be applied by hand and can be adhered to slopes by roughening the soil surface before the mulch is applied, spreading the straw in a manner that promotes formation of an interwoven matrix, then crimping the straw into the soil. Straw mulch shall be applied at a rate of 3,000 pounds per acre over disturbed areas.
 - Cross Slope Diversions – Permanent cross slope diversion ditches will be installed in various locations throughout the project area where indicated on the Erosion Control Plan. The purpose of the cross slope diversions is to limit the effective slope length within the vineyard block. This minimizes the chance for the runoff regimes transitioning from sheet flow to concentrated flow which would lead to increased runoff velocities and an increased potential for excessive erosion. Furthermore, cross slope diversions will be constructed with a mild longitudinal slope to minimize the potential for erosion within the diversion, promote infiltration and mitigate any potential for increasing the rate at which runoff reaches receiving waters. Cross slope diversion locations and installation details are shown on the erosion control plan.
- b. *Proposed vegetative erosion control measures including maintenance of plant material and slopes until a specified percentage of plant coverage is uniformly established.*

Minimum coverage has been calculated for each block in order to maintain soil loss rates at or below existing conditions and also below the soil loss tolerance “T” for each soil type. Minimum coverage rates for each development area are as follows:

VINEYARD BLOCK COVER CROP SPECIFICATION TABLE	
Block ID	Required Cover %
A	80%
B	80%
C	80%

The seed, fertilizer and mulch specifications are provided on the erosion control plan.

This temporary cover crop will be cultivated in the spring and replanted in the fall for the first three years of the vineyard establishment period. Straw mulch will also be applied each fall during the vineyard established period. In the Fall, following the vineyard establishment period all vineyard blocks will be planted with a permanent cover crop seed mix and farming practices will transition to a permanent cover, no-till, farming regime. The permanent cover crop will be mowed in the Spring. Spring mowing will be timed to allow maturation of seeds and promote natural stand regeneration. All permanent cover crop areas will be reseeded every two to three years or more frequently as needed to maintain at least 80% cover. Straw mulching will also be implemented as needed to achieve the 80% coverage requirement.

Weed control under the vine rows will be primarily via mechanical means such as string trimmers and minimal herbicide usage. Herbicide used to control weeds within the vineyard block will be limited to spraying of post-emergent herbicide in a narrow 18 inch maximum width strip spray, if necessary to control weeds at the bases of the vines. The post emergent herbicide will be applied in the late winter or early spring to ensure that the spray area has vegetative protection through the rainy season. If the spray areas are not achieving adequate cover, they must be mulched with straw and reseeded each year to provide the required cover.

The cover crop should be irrigated prior to the onset of the rainy season for at least the first Fall following development to establish a dense cover prior to the onset of heavy winter rains.

- c. *Proposed erosion control measures for vineyard avenues to accommodate farm or vineyard equipment and materials storage locations.*

A permanent cover crop will be planted in the vineyard avenues the first Fall following land preparation activities and it will be maintained as permanent cover throughout the life of the vineyard. No tilling will occur in the vineyard avenues. The permanent cover crop will be mowed in the Spring. Mowing will be timed to allow maturation of seeds and promote natural cover crop regeneration. All permanent cover crop areas will be reseeded every two to three years or more frequently as needed to maintain at least the coverage specified for each vineyard block. Straw mulching and / or pre-irrigation of the cover crop will also be implemented as needed to achieve the 80% coverage requirement. No herbicides will be used in the vineyard avenues.

Alternatively, vineyard avenues may be lined with crushed rock to limit their susceptibility to erosion and provide all weather access.

Water bars and / or straw wattles will be installed across the sloping vineyard avenues to force runoff to adjacent stable areas so that runoff does not concentrate on the vineyard avenues and cause erosion. Locations are shown on the erosion control plans.

9. *Storm water stabilization measures to handle any increased peak rates of runoff from the development of the site that would result in flooding or channel degradation downstream. Include calculations of estimated increased runoff and/or an explanation of why an increase is/is not expected.*

Detailed calculations of predicted runoff rates within the project area for both pre- and post-project conditions utilizing the United States Department of Agriculture Technical Release 55 (USDA TR-55) methodologies are presented in the Hydrologic Analysis prepared by David Steiner, CPESC, CPSWQ. These calculations indicate that post-project conditions, including built in project design parameters, will result in runoff rates that are not greater than current conditions for the 2, 5, 10, 25, 50 and 100 year design storm events.

Since the project has been designed to maintain existing drainage patterns and since there will be no increase in peak runoff rates, the proposed project will not result in any significant

change to local or regional hydrology / runoff patterns that could result in downstream flooding or channel degradation.

10. An implementation schedule indicating:

- a. The proposed vegetation clearing, earth moving/grading, and construction/planting schedule.
- b. The proposed schedule for winterizing the site (by October 15th of each year the permit is in effect except in a municipal watershed where it is by September 1st).
- c. The proposed schedule for installation of all interim erosion and sediment control measures (including vegetative measures) and the state of completion of such devices/measures at the end of the grading season (i.e., on October 15th [except in 5 designated municipal watersheds where it is September 1st] of each year the permit will be in effect).
- d. The proposed schedule for installation of any permanent erosion and sediment control devices required.

Vineyard Development Schedule

The schedule below is an estimate and is subject to change. Implementation of winterization and erosion control measure must be adjusted to accommodate any changes in development and planning under consultation with the Engineer. All land preparation, planting and erosion control work is to be performed by the property owner or by their contractor / vineyard manager.

April 2024	Commence Vineyard Development Program Begin clearing and grubbing of existing vegetation. Complete land preparation for vineyard planting including: ripping, discing, rock removal and processing, recontouring and incorporation of soil amendments. Install waterbars and rock energy dissipators. Install irrigation and trellis systems.
Prior to October 1, 2024	Complete all drainage system improvements including cross slope diversions, drainage pipes and outfalls.
Prior to October 15, 2024	Complete all earth disturbing activities. Winterize Site Seed vineyard with temporary cover crop seed mix Seed vineyard avenues with permanent cover crop seed mix Place fertilizer, straw mulch and erosion control blankets Install sediment barriers Install water bars

Pre-irrigate cover crop to establish cover prior to rainy season.

Establish reserve of erosion control measures to be maintained onsite throughout the rainy season to facilitate rapid deployment. Materials shall include silt fence, straw wattle, straw, erosion control seed mix, erosion control blanket and plastic sheeting.

October 15, 2024 - April 2025

Inspect and maintain vegetative cover and erosion control devices at least once per week, prior to each anticipated rainfall event, at least once every 24 hours during extended rainfall events and following each rainfall event. Reseed and mulch any erosion damaged areas or areas with less than the specified cover percentage and repair or replace erosion control devices as necessary.

Spring 2025

Cultivate temporary cover crop within vineyard block footprint area and perform fine site grading to repair any storm damaged areas. No tilling of vineyard avenues is to be performed.

Plant rootstock.

Prior to October 15, 2025

Complete all earth disturbing activities

Winterize Site

Seed vineyard with temporary cover crop seed mix
Seed vineyard avenues with permanent cover crop seed mix

Place fertilizer, straw mulch and erosion control blankets

Install sediment barriers

Install water bars

October 15, 2025 - April 2026

Inspect and maintain vegetative cover and erosion control devices at least once per week, prior to each anticipated rainfall event, at least once every 24 hours during extended rainfall events and following each rainfall event. Reseed and mulch any erosion damaged areas or areas with less than the specified cover percentage and repair or replace erosion control devices as necessary.

Spring 2026 Cultivate temporary cover crop and perform fine site grading to repair any storm damaged areas.

Prior to October 15, 2026 Complete all earth disturbing activities

Winterize Site

Seed vineyard with temporary cover crop seed mix
Seed vineyard avenues with permanent cover crop seed mix

Place fertilizer, straw mulch and erosion control blankets

Install sediment barriers

Install water bars

October 15, 2026 - April 2027

Inspect and maintain vegetative cover and erosion control devices at least once per week, prior to each anticipated rainfall event, at least once every 24 hours during extended rainfall events and following each rainfall event. Reseed and mulch any erosion damaged areas or areas with less than the specified cover percentage and repair or replace erosion control devices as necessary.

Spring 2027

Cultivate temporary cover crop and perform fine site grading to repair any storm damaged areas.

Prior to October 15, 2027

Complete all earth disturbing activities

Winterize Site

Seed vineyard rows with permanent cover crop seed mix

Seed vineyard avenues with permanent cover crop seed mix

Place fertilizer, straw mulch and erosion control blankets

Install sediment barriers

Install water bars

October 15, 2027 - April 2028

Inspect and maintain vegetative cover and erosion control devices at least once per week, prior to each anticipated rainfall event, at least once every 24 hours during extended rainfall events and following each rainfall event. Reseed and mulch any erosion damaged areas or areas with less than the specified cover percentage and repair or replace erosion control devices as necessary.

Spring 2028 & Beyond See Annual Maintenance Schedule

Annual Maintenance Schedule

Spring Mow permanent cover crop in vineyard and vineyard avenues and perform fine site grading to repair any storm damaged areas.

Prior to October 15 Winterize Site

Repair any damage to vineyard and vineyard avenues that has occurred during the farming season. Place seed and straw on all vineyard avenues as needed to achieve the specified cover percentage. Install water bars.

Place erosion control seed, fertilizer, straw mulch, erosion control blankets and sediment barriers as necessary to stabilize any erosion prone areas outside and adjacent to the vineyard areas.

October 15 - April 1 Inspect and maintain vegetative cover and erosion control devices at least once per week, prior to each anticipated rainfall event, at least once every 24 hours during extended rainfall events and following each rainfall event. Reseed and mulch any erosion damaged areas or areas with less than the specified percentage cover and repair or replace erosion control devices as necessary.

11. The estimated cost of implementation of the erosion and sediment control measures.

Implementation of erosion and sediment control measures for this project is anticipated to cost approximately \$5,000 per acre for installation and maintenance. This estimate includes only the erosion and sediment control portions of the project, not the entire cost of permitting, engineering, land preparation, development, irrigation systems, trellis systems, and plants.