

**FIGURE 2**

AGRICULTURAL EROSION CONTROL PLAN

NO. P14-00069-ECPA

**KONGSGAARD WINE LLC  
ATLAS PEAK**

**EROSION CONTROL PLAN  
ORIGINAL SUBMITTAL MARCH 2014  
REVISED JULY 2014**



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**KONGSGAARD WINE LLC  
ATLAS PEAK**

**EROSION CONTROL PLAN**

**ORIGINAL SUBMITTAL MARCH 2014  
REVISED JULY 2014**



**PREPARED BY:**

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*Revised July 2014*

**KONGSGAARD WINE LLC  
ATLAS PEAK**

**EROSION CONTROL PLAN**

**NARRATIVE**

**1. The nature and purpose of the land disturbing activity and the amount of grading involved.**

- a) This ECP addresses the development of approximately 17.3 net acres (24.3 gross acres) of proposed vineyard on the property located at 4375 Atlas Peak Road in Napa. The project is located on APN 032-540-042 which consists of approximately 148 acres per the Napa County Assessor's Office.
- b) Activities to be accomplished include removal of brush and trees within the proposed clearing limits, ripping, rock removal, cultivating the soil to prepare for planting, seeding cover crop, mulching, trenching for irrigation pipelines, installation of trellis system and deer fence, laying out the vine rows and installing erosion control measures.

**2. General description of existing site conditions, including topography, vegetation and soils.**

- a) The site is located in the Capell Creek - Upper Reach and Milliken Reservoir Watersheds.
- b) The elevations in the vineyard area range from approximately 1960 to 2450 feet above mean sea level per USGS Capell Valley and Yountville Quadrangle map. Ground slopes within the project boundary range between 7 and 26 percent. There are small pockets of areas with slope over 30% which total approximately 0.56 acres, please see Sheets 2 and 3 for the locations.
- c) Topographic mapping was provided by Michael W. Brooks & Associates, flown on January 18, 2001.
- d) Existing vegetation consists of grass, brush and trees. See Biological Resource Survey by Kjeldsen Biological Consulting dated August, 2013.
- e) Voluntary oak woodland preservation areas are shown on Sheets 2 and 3. These areas contain prime vineyard ground but are currently vegetated with oak woodland. In the spirit of compliance with the Napa County General Plan the owners have voluntarily removed them from the ECP rather than proposing they be converted to vineyard.
- f) There are structures on the property which include a residence, outbuildings and cave.

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- g) A portion of the property is currently deer fenced. Please see Figure 1 in Appendix E for the Proposed Deer Fence map.
  - h) Several site visits of the property were performed by Jim Bushey, Rachel LeRoy and Matt Bueno of PPI Engineering in 2012 & 2013 to evaluate the vineyard development area and to collect photographic documentation. Photographs of pre-project conditions can be found in Appendix A.
- 3. Natural and man-made features onsite including streams, lakes, reservoirs, roads, drainage, and other areas that may be affected by the proposed activity.**
- a) No natural or man-made features are expected to be adversely affected by this project. An unnamed blue-line stream is in the vicinity but will not be affected by the project.
- 4. Location and source of water for irrigation or other uses.**
- a) The proposed water source is an existing well. Please see the Vicinity Map for the location.
- 5. Soil types/soil series identified in the Soil Conservation Service (SCS) Napa County Soil Survey.**
- a) The USDA – SCS Napa County Soil Survey maps the soil within the project boundary as Aiken Loam with 2 to 15 percent slopes, Aiken Loam with 30 to 50 percent slopes, Hambright-Rock Outcrop with 2 to 30 percent slopes and Hambright-Rock Outcrop with 30 to 75 percent slopes.
  - b) Some rock is expected to be generated as a result of this project. A proposed rock disposal area is shown on Sheet 2 to the west of Block 4. In addition, some of the rock generated will be used to construct erosion control features such as rock aprons and rock berms. In many locations rock will be used for rock-filled avenues that will help retain sediment as well as disperse runoff from vineyard blocks. Rock-filled avenues shall be located as shown on Sheets 2 & 3 and at the downslope edge of vineyard blocks as determined by the Engineer in the field at the time of construction. The toe of the rock avenue fill slope shall not extend past the proposed clearing limits. Because of the nature of the rock-filled avenues, the proposed block boundary location is conceptual and not exact. Rock not used immediately will be stockpiled for future use inside the proposed clearing limits. Stockpiles are expected to be less than 20 feet in height. Rock staging areas shall be located inside of proposed clearing limits. Temporary rock stockpiles shall also be located inside of proposed clearing limits.

**6. Critical areas, if any, within the development site that have serious erosion potential or problems.**

- a) There is the potential for erosion to occur in several swales; see Section 8a and the Site Plan for details.

**7. Erosion calculations**

- a) Universal Soil Loss Equation (USLE) spreadsheets for this project are in Appendix B of this report.

**8. Proposed erosion control methods including:**

- 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.**

1. A variety of drainage systems will be utilized for erosion control in this project. In Block 2 pipelines and inlets will collect runoff and direct it to a rock apron. Existing pipes from the house area will be connected to the proposed system. In Block 3 diversion ditches will direct runoff to drop inlets, and drainage pipelines will be used to direct runoff to a sediment trap. In Block 5 rock berms will disperse water flowing on to the block from the slope above. Please see Sheets 2 & 3 for locations of the above erosion control measures. Please see Detail Sheets 4 & 5 and the Special Provisions for details on the erosion control items. Several different types of drop inlets will be used throughout the project as shown on the Plans and Detail sheets. The Project Engineer may substitute one type for another type during construction based on field conditions providing both types have the same capacity.
2. The final pass with disking equipment shall be performed across slopes to prevent channeling water downhill the first winter after development.
3. Straw wattles shall be installed the year of construction in the location shown on the Site Plan. Additional temporary erosion control measures shall be installed as needed.

- b) Proposed vegetative erosion control measures including location, type and quantity of seed, mulch, fertilizer and irrigation, timing and methods of planting, mulching and maintenance of plant material and slopes until a specified percentage of plant coverage is uniformly established.**

1. Disturbed areas shall be seeded as described below. Straw mulch shall be applied to all disturbed areas in Blocks 1, 2 & 3 at a rate of 3,000 lbs/acre prior to September 15 of the year of construction. Straw mulch shall be applied to all disturbed areas in



Blocks 4 & 5 at a rate of 3,000 lbs/acre prior to October 15 of the year of construction.

2. A permanent cover crop strategy will be utilized. The permanent cover crop will be generated the first year by seeding with the following mix: Vulpia Microstachys at 12 pounds per acre, Idaho Fescue at 10 pounds per acre, Poa Secunda at 10 pounds per acre and Crimson Clover at 6 pounds per acre. A pre-approved alternative seed mix may be allowed.

The permanent cover crop will be managed each year such that any areas which have less than 75% vegetative cover in Blocks 1, 3B, 3C, 3D & 4 and 80% vegetative cover in Blocks 2, 3A, 3E & 5 will be reseeded and mulched until adequate coverage is achieved. The permanent cover crop shall be mowed only and not disked.

3. The owner has the option of using a Dwarf Barley (or a pre-approved alternative) cover crop in the first 3 years to aid with vineyard establishment. If this option is used, seed shall be applied at a rate of 120 pounds per acre if broadcast seeded or at a rate of 60 pounds per acre if drilled. The cover crop within the vineyard may be disked each spring after April 1 for the first 3 years. An alternative cover crop seed mix may be used upon prior approval. Each year the owner chooses to disk, the area shall be straw mulched in Blocks 1, 2 & 3 at a rate of 3,000 lbs/acre prior to September 15 and shall be straw mulched in Blocks 4 & 5 at a rate of 3,000 lbs/acre prior to October 15. The permanent seed mix will be seeded prior to September 15 of the fourth (or earlier) year in Blocks 1, 2 & 3 and prior to October 15 of the fourth (or earlier) year in Blocks 4 & 5.
4. No pre-emergent herbicides will be strip sprayed in the vinerows each year for weed management. Contact or systemic herbicides may be applied in spring (no earlier than February 15<sup>th</sup> to ensure adequate vegetative cover in the spray strips for the remainder of the rainy season). The width of the spray strip shall be no wider than 1.5' in order to achieve 75% vegetative cover in Blocks 1, 3B, 3C, 3D & 4. The width of the spray strip shall be no wider than 1 foot in order to achieve 80% vegetative cover in Blocks 2, 3A, 3E & 5. If the owner chooses to farm without herbicide, an alternative will be to hand-hoe around the base of the vine only, or other methods that do not result in a continuous bare strip.
5. The vineyard avenues shall be mowed only and shall not be disked. Unless otherwise noted, all avenues shall conform to the natural grade. Vineyard avenues within Blocks 1, 2 & 3 shall be seeded and mulched prior to September 15 of the year of construction and in subsequent years in bare or disturbed areas. Vineyard avenues within Blocks 4 & 5 shall be seeded and mulched prior to October 15 of the year of construction and in subsequent years in bare or disturbed areas. The cover crop will be managed each year such that any avenues that have less than 75% vegetative cover in Blocks 1, 3B, 3C, 3D & 4 and 80% vegetative cover in Blocks 2, 3A, 3E & 5 will be reseeded and mulched until adequate coverage is achieved.



6. The proposed vine by row spacing is expected to be 3 feet by 7 feet, however in areas where cross-slope exceeds 15% the owner shall increase the row spacing as needed to ensure there is adequate room for equipment.
7. The owner has the freedom to further subdivide vineyard blocks within the footprint of the proposed vineyard blocks for irrigation and viticulture purposes. The proposed vinerow directions shall not be altered without the approval of Napa County or its agent.
8. Fertilizer shall be applied as necessary by vineyard management personnel for both the vineyard and to ensure specified percent vegetative cover crop is achieved.
9. Irrigation pipelines shall generally be located within roadways, vineyards and vineyard avenues. Where they are not located within these areas, disturbed ground shall be seeded and mulched in accordance with this ECP. Regardless of pipeline location, pipeline trenches located on ground slopes greater than 15% shall be backfilled using imported or select native granular material to a depth of 6 inches above the pipelines such that voids do not form below haunches of pipe. Backfill shall be wheel rolled or otherwise compacted to reduce settlement. Final grading over trenches shall be mounded and water-barred such that water is directed away from trenches. No trees larger than 5" DBH (diameter breast height) will be removed for installation of irrigation pipelines.
10. As stated in the Napa County Protocol for Re-Planting/Renewal of Approved Non-Tilled Vineyard Cover Crops dated March 23, 2004, when it becomes necessary, either by routine or emergency, to re-establish or renew vineyard cover crop the following measures should be followed:
  - Seek professional consultation, including soil nutrient analysis, to determine the reasons for the original cover crop's failure. Adjust soil fertility, irrigation and seed selection accordingly.
  - When tillage is necessary, alternate rows should be tilled, seeded, and straw-mulched to effectively accomplish the re-establishment/renewal process over a two-year period.
  - Tillage and re-seeding should be conducted in the following manner:
    - In year 1, till to prepare seed bed and sow desired cover crop in every other row ("the evens"), leaving the alternate rows ("the odds") untilled and mowed only.
    - Mulch all tilled rows having an up and down hill (perpendicular to contour) row direction with 3,000 lbs./acre of loose straw, or approved equivalent, after seeding.
    - Tilled rows with cross-slope (parallel to contour) row direction and slope gradients less than 15% may not require straw mulch.
    - In year 2, till to prepare seed bed and sow desired cover crop in "odd" rows.
    - In year 2, leave "even" rows untilled and mowed only.
    - Mulch rows till in year 2 as specified above.

- Put all re-establishment measures in place by September 1
- In year 3, return all rows to non-tilled culture.

**9. Stormwater stabilization measures, if the development of the site will result in increased peak rates of runoff that may cause flooding or channel degradation downstream.**

- a) No significant increase in quantity or rate of runoff is expected as a result of this project.

**10. An implementation schedule showing the following:**

**a) The proposed clearing, grading, and/or construction schedule.**

| <u>DATE</u>  | <u>DESCRIPTION</u>  |
|--------------|---|
| April 1      | Commence clearing and tillage operations.                     |
| September 1  | All tillage and erosion control completed in Blocks 1, 2 & 3. |
| September 15 | Seed and mulch all disturbed areas in Blocks 1, 2 & 3.        |
| October 1    | All tillage and erosion control completed in Blocks 4 & 5     |
| October 15   | Seed and mulch all disturbed areas in Blocks 4 & 5            |

**b) The proposed schedule for winterizing the site (generally by October 15 of each year the permit is in effect.)**

The site shall be winterized and all necessary erosion control measures described in the Erosion Control Plan shall be installed by September 15 in Blocks 1, 2 and 3, and by October 15 in Blocks 4 and 5.

**c) The proposed schedule of installation of all interim erosion and sediment control measures, including the stage of completion of such devices at the end of the grading season (generally October 15) of each year the permit will be in effect.**

See Item 10a).

- d) **The schedule for installation of permanent erosion and sediment control devices where required.**

See Item 10a).

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

Typical costs for installing erosion control measures as described in this plan range from \$500 to \$15,000 per acre.



**KONGSGAARD WINE LLC  
ATLAS PEAK**

**EROSION CONTROL PLAN**

**STANDARD PROVISIONS**

**SECTION 1 - SCOPE OF WORK**

These specifications cover the construction of the erosion control measures for approximately 17.3 acres of vineyard to be developed by Kongsgaard Wine LLC.

The drawing numbered 11212701B, and these Specifications describe in detail the construction of the complete erosion control system. Requests for further information or clarification of the work to be done can be made to Jim Bushey at the Napa office of PPI Engineering, phone (707) 253-1806.

All costs for the complete construction of the erosion control system must be included in the bid items, since no other payment will be made outside of the bid items. This includes all costs for moving onto and off of the job site, all equipment, tools, materials, labor, fuel, taxes, and incidentals for furnishing and installing the erosion control system.

Surveying adequate for construction will be provided by the Owner, at the Owner's expense. The Contractor will be responsible for preserving construction survey stakes and markers for the duration of their intended use. Any restaking costs or additional survey work requested by the Contractor shall be deducted from the final payment to the Contractor. The Owner does not guarantee that the project being bid will be awarded. The Owner also reserves the right to change the quantities of actual work performed as needed with payment made according to the new quantities at the unit price bid.

**SECTION 2 - AUTHORITY OF OWNER AND ENGINEER**

The property is owned by Kongsgaard Wine LLC. Kongsgaard Wine LLC or their appointed representative shall have the final say in the event of a dispute with the Contractor.

The Owner shall appoint PPI Engineering (PPI) as the Engineer to perform periodic review of the work. PPI Engineering shall report any unsatisfactory work to the Owner. The Contractor shall be responsible for any engineering fees or repair costs associated with bringing the unsatisfactory work into compliance with the Plans and Specifications.

### **SECTION 3 - CHANGES IN WORK**

Materials and the manner of performance of the work performed in this contract shall be according to the Plans and Specifications. Modifications to the Plans or Specifications shall be agreed upon in writing by the Contractor, Owner, and Engineer before the work in question is performed. Materials and construction methods shall be as specified on the Plans and Specifications. The burden of proof that a given material or method constitutes an equivalent to the one specified will rest with the Contractor.

### **SECTION 4 - UTILITIES**

At least two working days prior to beginning any excavation on the project, the Contractor shall contact Underground Service Alert (USA) at 1-800-642-2444 and request field location of all existing utilities.

Certain facilities at the site are existing. The Contractor shall be careful to avoid damaging existing facilities and shall notify the Owner immediately if any damage does occur. The cost of repairing any damage shall be the sole responsibility of the Contractor.

### **SECTION 5 - PROSECUTION OF THE WORK**

Unless otherwise provided, the contract time shall commence upon issuance of a Notice to Proceed by the Owner. The work shall start within ten days thereafter and be diligently prosecuted to completion within the time specified in the Contractor's bid. If weather conditions prevent completion of the project within the specified amount of time, the Owner may extend the completion date of the project.

### **SECTION 6 - RESPONSIBILITIES OF THE CONTRACTOR**

The Contractor agrees that in accordance with generally accepted construction practices, Contractor will be required to assume sole and complete responsibility for job site conditions during the course of construction of the project, including the safety of all persons and property. This requirement shall be made to apply continuously and not be limited to normal working hours. Contractor further agrees to defend, indemnify and hold design professional harmless from any and all liability, real or alleged, in connection with the performance of the work on this project, excepting liability arising from the sole negligence of design professional.

The Contractor shall be responsible for controlling dust and mud generated from construction activities. The Contractor shall not allow dust or mud to obstruct vehicular traffic on County roads or State Highways. The Contractor shall be responsible for cleaning all vehicles prior to leaving the site as required by the California Highway Patrol. The Contractor, at his own expense, shall provide adequate dust control and prevention of mud tracking on roads, and take other preventative measures as directed by the Owner.



The Contractor shall be responsible for following all safety laws that may be applicable. Of particular concern are the trench safety regulations issued by CAL-OSHA. The Contractor alone shall be responsible for the safety of his equipment and methods and for any damage or injury which may result from their failure, improper construction, maintenance, or operation.

The Contractor shall be responsible for installing necessary sediment retention measures to keep sediment from leaving the site if construction activities continue beyond October 1.

The Contractor shall keep the work site clean and free of rubbish and debris throughout the project. Materials and equipment shall be removed from the site as soon as they are no longer necessary or the project is completed.

The Contractor shall also be responsible for ensuring that all permits which are necessary for construction have been obtained and that copies of these permits are maintained onsite at all times.

The Contractor shall, at his own expense, furnish all necessary light, power, pumps, and water necessary for the work.

#### **SECTION 7 - MEASUREMENT AND PAYMENT**

Payment shall be made at the unit prices bid according to the actual quantities installed. Measurement of the final quantities shall be the responsibility of the Owner's Engineer.

The Engineer shall periodically observe the project during construction and upon completion of the project any unfinished or unacceptable work observed will be brought to the Contractor's attention verbally and in writing. Final payment will be made upon satisfactory completion of all work items required by these Plans and Specifications.

#### **SECTION 8 - GUARANTEE**

In addition to the guarantees from suppliers, the Contractor shall guarantee the work he performs for a period of two years. Any repairs needed to the system within two years of completion due to faulty workmanship or materials shall be promptly repaired at no expense to the Owner. Any costs incurred by the Owner and/or Engineer within two years of completion due to rubbish or debris placed in a trench or other excavation shall be paid by the Contractor.

Unless otherwise provided in writing, payment by the Owner to the Contractor for installation of this system shall constitute acceptance of all provisions in this document by the Contractor.

**KONGSGAARD WINE LLC  
ATLAS PEAK**

**EROSION CONTROL PLAN**

**SPECIAL PROVISIONS**

**SECTION 1 - SURFACE DRAINAGE PIPELINE**

**1.1 GENERAL:**

Surface drainage pipelines shall be installed to collect surface runoff at low points throughout the project area and transport it to protected outlets, as shown on Detail 1, Sheet 4.

**1.2 MATERIALS:**

Surface drainage pipelines shall be constructed of solid corrugated polyethylene pipe (CPP), either single-wall or dual-wall as shown on Sheets 2 and 3 of the Plans. Corrugated plastic pipe for use as surface drainage pipelines shall meet the standards of ASTM F667 and AASHTO M294, as applicable. Bent or damaged pipe shall not be used in the drainage system and shall be removed from the job site.

Pipe connections shall be made with fittings manufactured by the same manufacturer who made the pipe. All connections shall be securely fastened and the resulting connection shall not have gaps greater than 1/8 inch wide.

**1.3 INSTALLATION:**

The Contractor may use a trencher, or drainage plow with vertical soil displacement or backhoe/excavator for the excavation and placement of the surface drainage pipe as dictated by soil conditions. The operator shall be skillful in laying the tubing. Grade control may be established by visual control with grade stakes set no more than 100 feet apart or by laser control with grade stakes set no more than 200 feet apart.

Construction staking shall be provided by the Owner's Engineer. The slope, alignment, and depth of placement of the tubing shall be as shown on the Plans and as staked in the field. A minimum cover of 4.0 feet must be provided within vineyard areas, unless otherwise staked in the field by Engineer.

A gradual variation of no more than 0.1 foot from grade will be allowed where slopes are 2% or less. Where slopes are greater than 2%, a gradual variation of no more than 0.2 foot from grade will be allowed. No reverse grade will be allowed. A gradual variation of no more than 1 foot from design alignment is allowed.

Stretching of the tubing should be avoided during installation. No more than 10% stretch will be allowed.

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Cobbles and rocks may be present on the project site. The Contractor shall take necessary actions to work around the cobbles and rocks at his own expense.

#### 1.4 BEDDING AND BACKFILL:

Surface drainage piping may be backfilled with select native material. Pipelines shall be hand shaded. Backfill material within 6 inches of the pipeline shall be free of rocks and dirt clods larger than 2 inches in size and shall be hand-tamped as necessary to ensure no voids are present. The trench bottom shall be continuous, firm, relatively smooth, and free of rocks or other objects larger than 1 inch.

Cobbles and rocks may be present on the project site. The Contractor shall take necessary actions to work around the cobbles and rocks at his own expense.

Final backfill shall be placed and spread in approximately uniform layers to fill the trench completely. Rolling equipment or heavy tampers shall not be used to consolidate backfill.

Where pipe is installed under all-weather roads, backfill shall be Class II Aggregate Base compacted to 90% per ASTM D-1557. Road surface shall be regraded or paved as necessary to match original conditions.

### **SECTION 2 - SUBSURFACE DRAINAGE PIPELINE**

#### 2.1 GENERAL:

Perforated subsurface drainlines shall be installed in certain areas to reduce saturated conditions in the rootzone and to improve slope stability. Drainlines shall be installed as shown on Detail 2, Sheet 4 and as staked in the field.

#### 2.2 MATERIALS:

Corrugated plastic pipe for use as drain tubing shall meet the standards of SCS 606 Specifications. In addition, all four and six inch diameter tubing shall meet the standards of ASTM F405, and all tubing eight inches and larger shall meet the standards of ASTM F667. All perforations in the tubing shall be free of tag ends.

Bent or damaged tubing shall not be used in the drainage system and shall be removed from the job site.

Pipe connections shall be made with fittings manufactured by the same manufacturer who made the pipe. All connections shall be securely fastened and the resulting connection shall not have gaps greater than 1/4 inch wide.

## 2.3 GRAVEL ENVELOPE:

Two materials are permissible for use as an envelope material.

Gravel envelope material may be volcanic rock. It shall be free of organic matter, clay, or other material which could decrease its hydraulic conductivity with time. One hundred percent of the material must pass the 1-1/2" clear square openings. Ninety to one hundred percent must pass through the 3/4" clear square openings. At least 50% must pass through the 3/8" clear square openings. No more than 15% may pass the #20 U.S. Standard Sieve. At least 8% must pass the #60 U.S. Standard Sieve. No more than 3% may pass the #200 U.S. Standard Sieve.

Gravel envelope material may also be a blend of clean hard sand and gravel. It shall be free of organic matter, clay, or other material that would decrease its hydraulic conductivity with time. The material shall be well graded. The coefficient of uniformity ( $D_{60}/D_{10}$ ) must be greater than 4, and the coefficient of curvature ( $(D_{30})^2/(D_{10} \times D_{60})$ ) must be between 1 and 3. One hundred percent must pass the 1/2" clear square openings. No more than 5% may pass the #100 U.S. Standard Sieve. An example of this material would be 80% 3/8 crushed rock and 20% washed concrete sand.

For perforated drains, the envelope must be at least 3 inches thick on the sides and below the tubing and shall extend above the tubing to the depth specified in the detail. The loader operator shall avoid scooping up soil or other debris with the envelope material while loading the hopper on the trencher or plow and while placing the envelope material in trenches excavated by backhoe.

It will be the responsibility of the Contractor to remove and dispose of all envelope material not used on the project.

A sample of the proposed gravel envelope material shall be provided to the Engineer for approval. Any material moved onto the job site which is deemed unacceptable by the Engineer shall be promptly removed from the site at no cost to the owner.

## 2.4 TRENCHING AND TUBING PLACEMENT:

The Contractor may use a trencher, or drainage plow with vertical soil displacement, or backhoe/excavator for the placement of the tubing as dictated by soil conditions. The operator shall be skillful in laying the tubing. Grade control may be established by visual control with grade stakes set no more than 100 feet apart, or by laser control with grade stakes set no more than 200 feet apart.

Construction staking shall be provided by the Owner's Engineer. The slope, alignment, and depth of placement of the tubing shall be as shown on the Plans and as staked in the field.

A gradual variation of no more than 0.1 foot from grade will be allowed where slopes are 2% or less. Where slopes are greater than 2%, a gradual variation of no more than 0.2 foot from grade will be allowed. No reverse grade will be allowed. A gradual variation of no more than 1 foot from design alignment is allowed.



Rocks or clods shall not be allowed to fall upon or otherwise strike the tubing during any phase of construction.

Stretching of the tubing should be avoided during installation. No more than 10% stretch will be allowed.

### **SECTION 3 - CUTOFF COLLAR**

#### **3.1 GENERAL:**

Cutoff collars shall be installed on all solid pipelines with slopes greater than 5%, as shown in Detail 3, Sheet 4. Spacing between collars shall be as specified in the table below or as staked in the field by the Engineer.

| Ground Slope<br>(%) | Spacing<br>(Feet) |
|---------------------|-------------------|
| 0-5                 | None Required     |
| 6-15                | 200               |
| 16 and greater      | 100               |

#### **3.2 MATERIALS:**

Cutoff collars shall be constructed of Portland Cement Concrete, 3000-psi minimum compressive strength.

Gravel envelope shall be the same as specified in Section 2.3 Gravel Envelope of these provisions.

It will be the responsibility of the Contractor to remove and dispose of all envelope material not used on the project.

#### **3.3 INSTALLATION:**

Cutoff collars shall extend a minimum of 1.0 foot into native, undisturbed material on the sides and bottom of the trench and extend 1.0 feet above the top of the pipe. Cutoff collars shall be a minimum of 8 inches thick. A watertight seal shall be formed between the cutoff wall and the pipeline. The wall of the collar shall be poured against undisturbed soil. Backfill shall be placed around wall and hand compacted to ensure no voids are present.

The Contractor shall perforate the pipe with at least 30 1/8-inch diameter holes a minimum of 3 feet upstream of the cutoff collar to allow water to infiltrate back into the drainline. This perforated section shall be backfilled with approved envelope material. Gravel envelope shall be a minimum of 3 inches thick on all sides of the pipe.

The Contractor shall take precautions to ensure that concrete does not flow through perforations in amounts that would cause any reduction in flow capacity of pipe.

## **SECTION 4 – CONCRETE DROP INLETS**

### **4.1 GENERAL:**

Concrete drop inlets may be substituted for Standard Drop Inlets in high-traffic areas at the Owners discretion. In that case the inlet shall be installed at the location staked in the field by the Engineer. Concrete drop inlets shall be constructed as shown on Detail 4, Sheet 4.

### **4.2 MATERIALS:**

Concrete drop inlets shall be Central Precast product or equivalent. Inlets shall be constructed of a precast, reinforced concrete box with drive grate. Box and grate shall be H-20 traffic rated.

Drop inlets shall be placed on an aggregate base pad consisting of Cal Trans Class II Aggregate Base. Connector pipes shall be single-wall solid corrugated polyethylene pipe conforming to Section 1.2 of these specifications of the size specified on the detail.

Wire mesh for the debris shield shall be ¼" x ¼" galvanized hardware cloth or an Engineer-approved alternative.

### **4.3 INSTALLATION:**

Upon completion of the excavation for the drop inlet, a 2-inch thick pad of Class II Aggregate Base shall be placed on the bottom of the excavation. Aggregate base shall be compacted to 90% relative compaction. If approved by the Engineer, native material may be scarified, moisture conditioned as necessary, and compacted to 90% relative compaction.

The drop inlet shall be placed plumb and level and square with any adjacent fence or avenue. The lip of the inlet shall conform to the natural grade elevation or as directed in the field by the Engineer. Pipe connections and all other openings shall be grouted to form a watertight seal. Backfill around the inlet shall be water jetted or otherwise placed and compacted to prevent excess settlement of backfill. Earth berms around the drop inlets shall be moisture conditioned as necessary and compacted to 85% relative compaction.

A debris shield shall be constructed to help prevent loose debris and sediment from clogging the drop inlet grate. The shield shall be constructed as shown in Detail 4, Sheet 4. The shield shall be installed between the inlet grate and the concrete drop inlet frame. The wire mesh shall extend approximately 2 inches above the top of the inlet grate. This shield will not function after being driven over and is not intended for inlets in locations which receive traffic during the rainy season. It also should not be relied upon exclusively. Concrete drop inlets can be more susceptible to plugging than other types of inlets, especially with straw, and therefore require diligent maintenance.



## **SECTION 5 - DIVERSION DITCH**

### **5.1 GENERAL:**

Vineyard avenues along the uphill side of certain blocks will be constructed with a diversion ditch along the uphill side to collect upslope runoff and direct it to a stable outlet or drop inlet.

### **5.2 MATERIALS:**

Diversion ditches will be cut into native material. Rock for lining ditches will be native rock generated onsite, 4-inch to 8-inch diameter. Filter fabric shall be Mirafi 140N or equal.

### **5.3 INSTALLATION:**

Diversion ditches shall be cut into native material to the extent possible. Fill material, if necessary, shall be moisture conditioned and compacted to 90% relative compaction per ASTM D1557. Flowline slope shall be 4% minimum and side slopes of the ditches shall be 2:1 (Horizontal:Vertical) as shown on Detail 5, Sheet 4. The ditch shall be a minimum of 12 inches deep when complete and shall be lined with 4 to 8 inch diameter angular rock. A non-woven filter fabric shall be placed between the ground surface and the rock. The rocks shall be keyed into the sides of the ditch such that they do not obstruct or reduce the cross section of the channel. The ditch will outlet to a Drop Inlet. Flowline slopes less than 4% may be necessary on some diversion ditches but must be approved by the Project Engineer at time of construction.

## **SECTION 6 – ROCK-FILLED AVENUES**

### **6.1 GENERAL:**

Rock-filled avenues may be constructed as shown in Detail 6, Sheet 4 along the field edges from excess fieldstone as staked in the field by the Engineer and as shown on Sheet 2. Additional locations will be determined in the field by the Engineer during construction.

### **6.2 MATERIALS:**

Rock shall be clean, well-graded field rock generated onsite.

### **6.3 INSTALLATION:**

Field rock generated by ripping and/or blasting within the vineyard areas shall be used to construct outsloped avenues at the edges of certain vineyard areas. Vegetation shall be thoroughly incorporated and a bench cut as shown on the details. Rock shall be placed and shaped using a bulldozer, with smaller rock placed last (on top of the avenue) to the extent possible. The toe of the fill slope shall not extend past the clearing limits.

## **SECTION 7 - CMP SEDIMENT TRAP**

### **7.1 GENERAL:**

A Corrugated Metal Pipe (CMP) sediment trap shall be constructed in the location shown on Sheet 3 and as staked in the field by the Engineer. The sediment trap shall be constructed as shown on Detail 1, Sheet 5.

### **7.2 MATERIALS:**

The sediment trap shall be constructed of 6-foot diameter - 12 gauge galvanized CMP as shown on the Plans.

### **7.3 INSTALLATION:**

The bottom of the sediment trap shall be made by pouring concrete in the bottom 6 inches of the CMP pipe. A minimum of 30-1/2" diameter holes shall be drilled along the bottom of the CMP and above the concrete. CPP tees shall be attached to all pipelines that flow into the sediment trap to disrupt the flow of water and encourage the settling of sediment.

The top of the sediment trap shall be set a minimum of 1 foot above ground, not to exceed 2 feet above ground. A child-proof cover shall be constructed of either 3/16" thick steel or 1/4" Aluminum minimum. The cover shall be securely fastened and a locking viewport shall be provided to observe water flow.

## **SECTION 8 - STANDARD DROP INLETS**

### **8.1 GENERAL:**

Drop inlets shall be furnished and installed by the Contractor in the locations shown on the plans and as staked in the field by the Engineer, according to Detail 4, Sheet 5. The dimensions of the riser and connector pipeline shall be as shown on Sheet 3. A grate shall be installed over the top of each drop inlet.

### **8.2 MATERIALS:**

Drop inlet risers shall be galvanized, 14 gauge corrugated metal pipe (CMP) of the diameter shown on the Plans and Detail.

Grates shall be Agri Drain Bar Guard or equal.

Concrete for the bottom of the inlet shall be Portland Cement concrete, 2,000 psi minimum compressive strength.



### 8.3 INSTALLATION:

Standard Drop inlets shall be constructed as shown on the detail sheet and as staked in the field by the Engineer. Connector pipes shall be mortared in place to form a watertight seal. Grates shall be bolted or locked to drop inlet riser. Backfill around the inlet shall be compacted sufficiently by hand or water-jetted such that excessive settlement does not occur

## **SECTION 9 - ROCK APRON**

### 9.1 GENERAL:

Where pipelines will outlet into existing swales or channels, rock aprons will be constructed to minimize erosion down stream of the outlet. Rock aprons shall be installed where shown on the Plans and constructed as shown in Detail 5, Sheet 5.

### 9.2 MATERIALS:

Rock used in the construction of rock level spreaders shall be Cal Trans Class "Facing" as per Cal Trans Standard Specifications Section 72-2 or equivalent size field rock generated onsite.

### 9.3 INSTALLATION:

Rock aprons shall be constructed as shown on Detail 5, Sheet 5. All rock shall be placed on undisturbed native vegetation. The apron shall extend a minimum of 15 feet from the outlet of the pipe. The upstream end of the apron shall be a minimum of five feet wide. The downstream end shall be a minimum of ten feet wide.

## **SECTION 10 - TEMPORARY MEASURES**

### 10.1 GENERAL:

Temporary erosion control measures shall be constructed by the Owner. These measures can include water bars, straw wattles, straw mulching, straw bale dikes, and other practices as needed. The measures shall be constructed in conformance with the detail drawings and maintained in a functional condition throughout the rainy season.

## **SECTION 11 - MAINTENANCE**

### 11.1 GENERAL:

The erosion control measures described in these Specifications and shown on the Plans and Details require regular maintenance in order to function as intended. Vineyard management personnel shall assure that the erosion control measures are monitored throughout the rainy

season each year and necessary repairs and/or maintenance are performed immediately. Maintenance operations shall include, but not be limited to the following activities.

#### 11.2 DIVERSION DITCHES:

Ditches shall be monitored for over-topping and repaired as needed. Debris that could reduce the capacity of the ditch shall be removed during/after each storm event.

#### 11.3 STRAW WATTLES:

Straw wattles shall be monitored and repaired as needed to ensure water does not run under the wattle or between adjacent wattles. Should excessive erosion cause the wattle to fill with sediment, this material shall be removed to a protected location and the source of the sediment located and protected as needed.

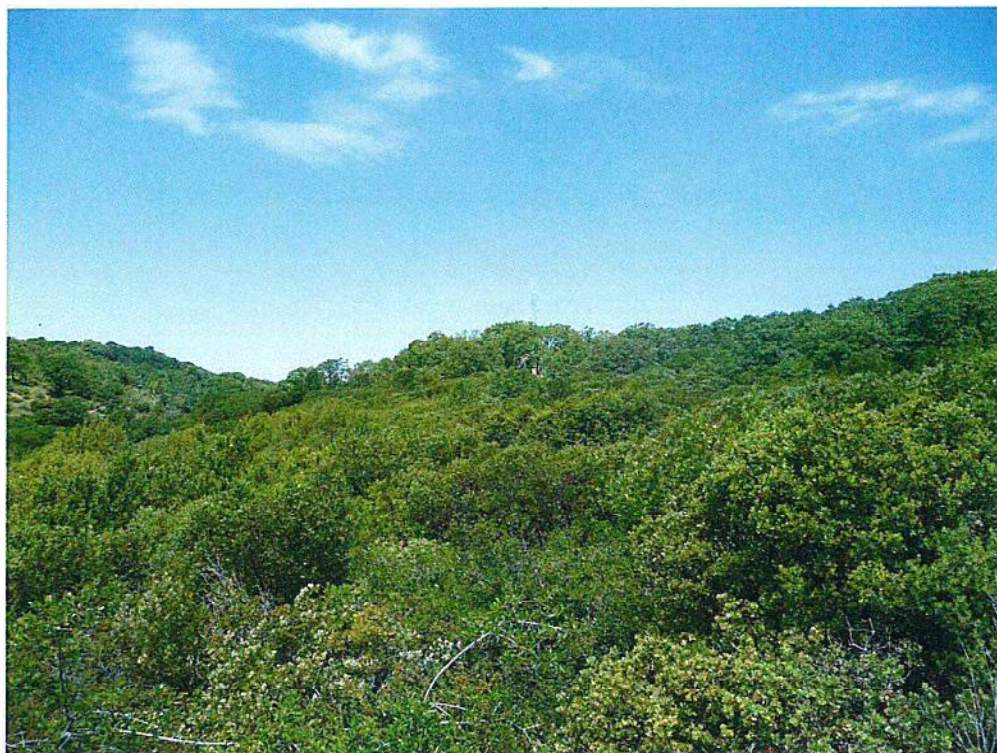
#### 11.4 DROP INLETS:

Drop inlets are designed with trash racks at the ground surface. Debris shall be removed from trash racks after each storm event or as necessary to assure a clear flow path for water entering the drop inlet. Damaged trash racks shall be repaired immediately in order to assure that unacceptable quantities of debris do not enter the storm drainage piping system.

## **APPENDIX A**

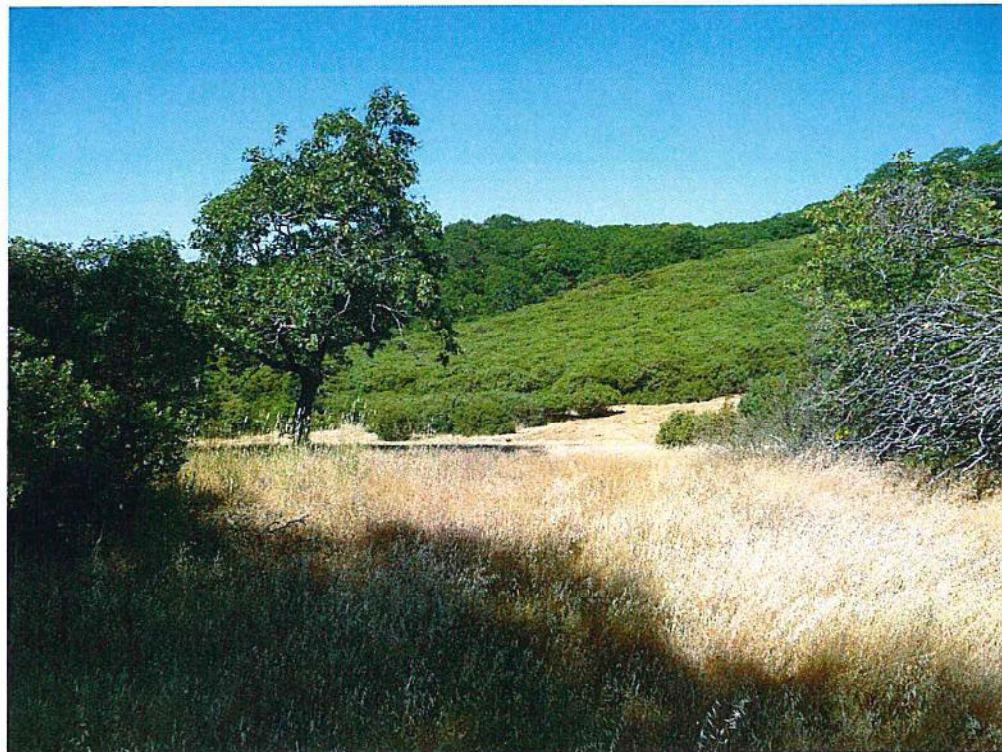
### **PHOTOGRAPHIC DOCUMENTATION**





5/8/2013

**Photo 1**



6/12/2013

**Photo 2**





5/8/2013

**Photo 3**



5/8/2013

**Photo 4**

## **APPENDIX B**

### **USLE CALCULATIONS**



**KONGSGAARD WINE LLC**  
**Percent Vegetative Cover and USLE "R" Value, by Block**

| Block | soil(s)   | USLE R value | % permanent vegetative cover crop |
|-------|---|--------------|-----------------------------------|
| 1     | 100: Aiken Loam, 2-15% slopes<br>102: Aiken Loam, 30-50% slopes<br>152: Hambright Rock-Outcrop Complex, 30-75% slopes | 90           | 75%                               |
| 2     | 100: Aiken Loam, 2-15% slopes   | 100          | 80%                               |
| 3A    | 100: Aiken Loam, 2-15% slopes<br>151: Hambright-Rock Outcrop Complex, 2-30% slopes                                    | 100          | 80%                               |
| 3B    | 151: Hambright-Rock Outcrop Complex, 2-30% slopes   | 100          | 75%                               |
| 3C    | 151: Hambright-Rock Outcrop Complex, 2-30% slopes   | 100          | 75%                               |
| 3D    | 100: Aiken Loam, 2-15% slopes<br>151: Hambright-Rock Outcrop Complex, 2-30% slopes                                    | 100          | 75%                               |
| 3E    | 151: Hambright-Rock Outcrop Complex, 2-30% slopes   | 100          | 80%                               |
| 4     | 100: Aiken Loam, 2-15% slopes<br>102: Aiken Loam, 30-50% slopes   | 90           | 75%                               |
| 5     | 100: Aiken Loam, 2-15% slopes<br>102: Aiken Loam, 30-50% slopes   | 90           | 80%                               |

PPI Engineering

Napa County  
Maximum Length of Slope  
for a soil loss of 5 tons per acre

NAME: Kongsgaard

DATE: 5/8/13

Cover Type: Permanent Cover Crop

Soil Unit No. (100-182)--- 100 & 102

Soil Name Aiken

-K= 0.28

-R= 90

-T= 3

| Percent Cover |    | 65%<br>Up & Down Hill | 70%<br>Up & Down Hill | 75%<br>Up & Down Hill | 80%<br>Up & Down Hill | 85%<br>Up & Down Hill | 90%<br>Up & Down Hill |
|---------------|----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|               |    | C= 0.058<br>P= 1.0    | C= 0.046<br>P= 1.0    | C= 0.034<br>P= 1.0    | C= 0.022<br>P= 1.0    | C= 0.015<br>P= 1.0    | C= 0.010<br>P= 1.0    |
| PERCENT SLOPE | 2  | 1,274,251             | 2,759,445             | 7,558,188             | 32,255,556            | 115,622,420           | 446,696,277           |
|               | 4  | 21,433                | 38,260                | 81,460                | 241,873               | 630,109               | 1,736,375             |
|               | 6  | 2,595                 | 4,125                 | 7,551                 | 18,034                | 38,793                | 87,285                |
|               | 8  | 1,195                 | 1,900                 | 3,477                 | 8,304                 | 17,864                | 40,194                |
|               | 10 | 637                   | 1,013                 | 1,855                 | 4,430                 | 9,530                 | 21,443                |
|               | 12 | 386                   | 613                   | 1,123                 | 2,681                 | 5,768                 | 12,977                |
|               | 14 | 253                   | 402                   | 736                   | 1,758                 | 3,782                 | 8,510                 |
|               | 16 | 176                   | 280                   | 512                   | 1,223                 | 2,632                 | 5,921                 |
|               | 18 | 128                   | 204                   | 373                   | 891                   | 1,916                 | 4,312                 |
|               | 20 | 97                    | 154                   | 282                   | 673                   | 1,447                 | 3,255                 |
|               | 22 | 75                    | 120                   | 219                   | 523                   | 1,125                 | 2,531                 |
|               | 24 | 60                    | 95                    | 174                   | 417                   | 896                   | 2,017                 |
|               | 26 | 49                    | 78                    | 142                   | 339                   | 729                   | 1,641                 |
|               | 28 | 40                    | 64                    | 118                   | 281                   | 604                   | 1,359                 |
|               | 30 | 34                    | 54                    | 99                    | 236                   | 508                   | 1,144                 |
|               | 32 | 29                    | 46                    | 84                    | 201                   | 433                   | 975                   |
|               | 34 | 25                    | 40                    | 73                    | 174                   | 374                   | 842                   |
|               | 36 | 22                    | 35                    | 64                    | 152                   | 326                   | 734                   |
|               | 38 | 19                    | 31                    | 56                    | 134                   | 288                   | 647                   |
|               | 40 | 17                    | 27                    | 50                    | 119                   | 256                   | 575                   |
|               | 42 | 15                    | 24                    | 45                    | 106                   | 229                   | 515                   |
|               | 44 | 14                    | 22                    | 40                    | 96                    | 207                   | 465                   |
|               | 46 | 13                    | 20                    | 37                    | 87                    | 188                   | 422                   |
|               | 48 | 11                    | 18                    | 33                    | 80                    | 172                   | 386                   |
|               | 50 | 11                    | 17                    | 31                    | 73                    | 158                   | 355                   |

NOTES:

C=Cover and Management Factor

P=Practice Factor

# PPI Engineering

Napa County  
Maximum Length of Slope  
for a soil loss of 5 tons per acre

NAME: Kongsgaard

DATE: 5/8/13

Cover Type: Permanent Cover Crop

Soil Unit No. (100-182)--- 100 & 102

Soil Name Aiken

-K= 0.28

-R= 100

-T= 3

| Percent Cover  |    | 65%<br>Up & Down Hill | 70%<br>Up & Down Hill | 75%<br>Up & Down Hill | 80%<br>Up & Down Hill | 85%<br>Up & Down Hill | 90%<br>Up & Down Hill |
|--|----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|  |    | C= 0.058<br>P= 1.0    | C= 0.046<br>P= 1.0    | C= 0.034<br>P= 1.0    | C= 0.022<br>P= 1.0    | C= 0.015<br>P= 1.0    | C= 0.010<br>P= 1.0    |
| P<br>E<br>R<br>C<br>E<br>N<br>T<br>S<br>L<br>O<br>P<br>E | 2  | 896,871               | 1,942,213             | 5,319,771             | 22,702,816            | 81,379,917            | 314,403,605           |
|  | 4  | 16,469                | 29,401                | 62,597                | 185,863               | 484,197               | 1,334,289             |
|  | 6  | 2,102                 | 3,341                 | 6,116                 | 14,608                | 31,423                | 70,701                |
|  | 8  | 968                   | 1,539                 | 2,816                 | 6,727                 | 14,470                | 32,557                |
|  | 10 | 516                   | 821                   | 1,503                 | 3,589                 | 7,720                 | 17,369                |
|  | 12 | 312                   | 497                   | 909                   | 2,172                 | 4,672                 | 10,511                |
|  | 14 | 205                   | 326                   | 596                   | 1,424                 | 3,064                 | 6,893                 |
|  | 16 | 143                   | 227                   | 415                   | 991                   | 2,132                 | 4,796                 |
|  | 18 | 104                   | 165                   | 302                   | 722                   | 1,552                 | 3,492                 |
|  | 20 | 78                    | 125                   | 228                   | 545                   | 1,172                 | 2,637                 |
|  | 22 | 61                    | 97                    | 177                   | 424                   | 911                   | 2,050                 |
|  | 24 | 49                    | 77                    | 141                   | 338                   | 726                   | 1,634                 |
|  | 26 | 40                    | 63                    | 115                   | 275                   | 591                   | 1,329                 |
|  | 28 | 33                    | 52                    | 95                    | 227                   | 489                   | 1,101                 |
|  | 30 | 28                    | 44                    | 80                    | 191                   | 412                   | 926                   |
|  | 32 | 23                    | 37                    | 68                    | 163                   | 351                   | 790                   |
|  | 34 | 20                    | 32                    | 59                    | 141                   | 303                   | 682                   |
|  | 36 | 18                    | 28                    | 51                    | 123                   | 264                   | 595                   |
|  | 38 | 16                    | 25                    | 45                    | 108                   | 233                   | 524                   |
|  | 40 | 14                    | 22                    | 40                    | 96                    | 207                   | 466                   |
|  | 42 | 12                    | 20                    | 36                    | 86                    | 185                   | 417                   |
|  | 44 | 11                    | 18                    | 33                    | 78                    | 167                   | 377                   |
|  | 46 | 10                    | 16                    | 30                    | 71                    | 152                   | 342                   |
|  | 48 | 9                     | 15                    | 27                    | 65                    | 139                   | 313                   |
|  | 50 | 9                     | 14                    | 25                    | 59                    | 128                   | 287                   |

## NOTES:

C=Cover and Management Factor

P=Practice Factor



# PPI Engineering

Napa County  
Maximum Length of Slope  
for a soil loss of 5 tons per acre

NAME: Kongsgaard

DATE: 5/8/13

Cover Type: Permanent Cover Crop

Soil Unit No. (100-182)--- 100 & 102

Soil Name Aiken

-K= 0.28

-R= 90

-T= 3

| Percent Cover  |    | 65%<br>Cross-Slope | 70%<br>Cross-Slope | 75%<br>Cross-Slope | 80%<br>Cross-Slope | 85%<br>Cross-Slope | 90%<br>Cross-Slope |
|--|----|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|  |    | C= 0.058<br>P= 0.6 | C= 0.046<br>P= 0.6 | C= 0.034<br>P= 0.6 | C= 0.022<br>P= 0.6 | C= 0.015<br>P= 0.6 | C= 0.010<br>P= 0.6 |
| P<br>E<br>R<br>M<br>A<br>N<br>E<br>N<br>T<br>C<br>O<br>V<br>E<br>R | 2  | 6,994,392          | 15,146,660         | 41,487,074         | 177,051,508        | 634,654,186        | 2,451,926,377      |
|  | 4  | 76,859             | 137,205            | 292,125            | 867,379            | 2,259,630          | 6,226,807          |
|  | 6  | 7,207              | 11,458             | 20,974             | 50,095             | 107,759            | 242,459            |
|  | 8  | 3,319              | 5,276              | 9,658              | 23,068             | 49,622             | 111,649            |
|  | 10 | 1,771              | 2,815              | 5,153              | 12,307             | 26,473             | 59,565             |
|  | 12 | 1,072              | 1,704              | 3,118              | 7,448              | 16,021             | 36,047             |
|  | 14 | 703                | 1,117              | 2,045              | 4,884              | 10,506             | 23,639             |
|  | 16 | 489                | 777                | 1,423              | 3,398              | 7,310              | 16,448             |
|  | 18 | 356                | 566                | 1,036              | 2,474              | 5,323              | 11,976             |
|  | 20 | 269                | 427                | 782                | 1,868              | 4,019              | 9,042              |
|  | 22 | 209                | 332                | 608                | 1,453              | 3,125              | 7,031              |
|  | 24 | 167                | 265                | 485                | 1,158              | 2,490              | 5,603              |
|  | 26 | 136                | 215                | 394                | 942                | 2,026              | 4,559              |
|  | 28 | 112                | 178                | 327                | 780                | 1,678              | 3,776              |
|  | 30 | 94                 | 150                | 275                | 656                | 1,412              | 3,177              |
|  | 32 | 81                 | 128                | 234                | 560                | 1,204              | 2,709              |
|  | 34 | 70                 | 111                | 202                | 483                | 1,039              | 2,338              |
|  | 36 | 61                 | 96                 | 176                | 422                | 907                | 2,040              |
|  | 38 | 53                 | 85                 | 155                | 371                | 799                | 1,798              |
|  | 40 | 47                 | 76                 | 138                | 330                | 710                | 1,598              |
| S<br>L<br>O<br>P<br>E  | 42 | 43                 | 68                 | 124                | 296                | 636                | 1,431              |
|  | 44 | 38                 | 61                 | 112                | 267                | 574                | 1,292              |
|  | 46 | 35                 | 55                 | 102                | 242                | 522                | 1,173              |
|  | 48 | 32                 | 51                 | 93                 | 222                | 477                | 1,072              |
|  | 50 | 29                 | 47                 | 85                 | 204                | 438                | 986                |

## NOTES:

C=Cover and Management Factor

P=Practice Factor

# PPI Engineering

Napa County  
Maximum Length of Slope  
for a soil loss of 5 tons per acre

NAME: Kongsgaard

DATE: 5/8/13

Cover Type: Permanent Cover Crop

Soil Unit No. (100-182)--- 100 & 102

Soil Name Aiken

-K= 0.28

-R= 100

-T= 3

| Percent Cover  |    | 65%<br>Cross-Slope<br>C= 0.058<br>P= 0.6 | 70%<br>Cross-Slope<br>C= 0.046<br>P= 0.6 | 75%<br>Cross-Slope<br>C= 0.034<br>P= 0.6 | 80%<br>Cross-Slope<br>C= 0.022<br>P= 0.6 | 85%<br>Cross-Slope<br>C= 0.015<br>P= 0.6 | 90%<br>Cross-Slope<br>C= 0.010<br>P= 0.6 |
|--|----|--|--|--|--|--|--|
| P<br>E<br>R<br>C<br>E<br>N<br>T<br>S<br>L<br>O<br>P<br>E | 2  | 4,922,947                                | 10,660,855                               | 29,200,346                               | 124,616,289                              | 446,696,277                              | 1,725,768,786                            |
|  | 4  | 59,061                                   | 105,433                                  | 224,478                                  | 666,523                                  | 1,736,375                                | 4,784,887                                |
|  | 6  | 5,838                                    | 9,281                                    | 16,989                                   | 40,577                                   | 87,285                                   | 196,392                                  |
|  | 8  | 2,688                                    | 4,274                                    | 7,823                                    | 18,685                                   | 40,194                                   | 90,436                                   |
|  | 10 | 1,434                                    | 2,280                                    | 4,174                                    | 9,968                                    | 21,443                                   | 48,247                                   |
|  | 12 | 868                                      | 1,380                                    | 2,526                                    | 6,033                                    | 12,977                                   | 29,198                                   |
|  | 14 | 569                                      | 905                                      | 1,656                                    | 3,956                                    | 8,510                                    | 19,148                                   |
|  | 16 | 396                                      | 630                                      | 1,152                                    | 2,753                                    | 5,921                                    | 13,322                                   |
|  | 18 | 288                                      | 458                                      | 839                                      | 2,004                                    | 4,312                                    | 9,701                                    |
|  | 20 | 218                                      | 346                                      | 634                                      | 1,513                                    | 3,255                                    | 7,324                                    |
|  | 22 | 169                                      | 269                                      | 493                                      | 1,177                                    | 2,531                                    | 5,695                                    |
|  | 24 | 135                                      | 214                                      | 393                                      | 938                                      | 2,017                                    | 4,538                                    |
|  | 26 | 110                                      | 175                                      | 319                                      | 763                                      | 1,641                                    | 3,692                                    |
|  | 28 | 91                                       | 145                                      | 265                                      | 632                                      | 1,359                                    | 3,058                                    |
|  | 30 | 76                                       | 122                                      | 223                                      | 532                                      | 1,144                                    | 2,573                                    |
|  | 32 | 65                                       | 104                                      | 190                                      | 453                                      | 975                                      | 2,194                                    |
|  | 34 | 56                                       | 90                                       | 164                                      | 391                                      | 842                                      | 1,894                                    |
|  | 36 | 49                                       | 78                                       | 143                                      | 341                                      | 734                                      | 1,653                                    |
|  | 38 | 43                                       | 69                                       | 126                                      | 301                                      | 647                                      | 1,456                                    |
|  | 40 | 38                                       | 61                                       | 112                                      | 267                                      | 575                                      | 1,294                                    |
|  | 42 | 34                                       | 55                                       | 100                                      | 240                                      | 515                                      | 1,159                                    |
|  | 44 | 31                                       | 49                                       | 91                                       | 216                                      | 465                                      | 1,046                                    |
|  | 46 | 28                                       | 45                                       | 82                                       | 196                                      | 422                                      | 950                                      |
|  | 48 | 26                                       | 41                                       | 75                                       | 179                                      | 386                                      | 869                                      |
|  | 50 | 24                                       | 38                                       | 69                                       | 165                                      | 355                                      | 799                                      |

## NOTES:

C=Cover and Management Factor

P=Practice Factor

PPI Engineering

Napa County  
Maximum Length of Slope  
for a soil loss of 3 tons per acre

NAME: Kongsgaard

DATE: 5/8/13

Cover Type: Permanent Cover Crop

Soil Unit No. (100-182)--- 151 & 152

Soil Name Hambright-Rock Outcrop

-K= 0.15

-R= 90

-T= 1

| Percent Cover  |    | 65%<br>Up & Down Hill | 70%<br>Up & Down Hill | 75%<br>Up & Down Hill | 80%<br>Up & Down Hill | 85%<br>Up & Down Hill | 90%<br>Up & Down Hill |
|--|----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|  |    | C= 0.058<br>P= 1.0    | C= 0.046<br>P= 1.0    | C= 0.034<br>P= 1.0    | C= 0.022<br>P= 1.0    | C= 0.015<br>P= 1.0    | C= 0.010<br>P= 1.0    |
| P<br>E<br>R<br>C<br>E<br>N<br>T<br>S<br>L<br>O<br>P<br>E | 2  | 1,859,152             | 4,026,073             | 11,027,514            | 47,061,357            | 168,694,906           | 651,736,801           |
|  | 4  | 28,452                | 50,792                | 108,141               | 321,094               | 836,489               | 2,305,094             |
|  | 6  | 3,255                 | 5,174                 | 9,472                 | 22,622                | 48,662                | 109,491               |
|  | 8  | 1,499                 | 2,383                 | 4,362                 | 10,417                | 22,408                | 50,419                |
|  | 10 | 800                   | 1,271                 | 2,327                 | 5,558                 | 11,955                | 26,898                |
|  | 12 | 484                   | 769                   | 1,408                 | 3,363                 | 7,235                 | 16,278                |
|  | 14 | 317                   | 504                   | 923                   | 2,206                 | 4,745                 | 10,675                |
|  | 16 | 221                   | 351                   | 643                   | 1,535                 | 3,301                 | 7,427                 |
|  | 18 | 161                   | 256                   | 468                   | 1,117                 | 2,404                 | 5,408                 |
|  | 20 | 121                   | 193                   | 353                   | 844                   | 1,815                 | 4,083                 |
|  | 22 | 94                    | 150                   | 275                   | 656                   | 1,411                 | 3,175                 |
|  | 24 | 75                    | 120                   | 219                   | 523                   | 1,124                 | 2,530                 |
|  | 26 | 61                    | 97                    | 178                   | 425                   | 915                   | 2,059                 |
|  | 28 | 51                    | 81                    | 148                   | 352                   | 758                   | 1,705                 |
|  | 30 | 43                    | 68                    | 124                   | 296                   | 638                   | 1,434                 |
|  | 32 | 36                    | 58                    | 106                   | 253                   | 544                   | 1,223                 |
|  | 34 | 31                    | 50                    | 91                    | 218                   | 469                   | 1,056                 |
|  | 36 | 27                    | 44                    | 80                    | 190                   | 409                   | 921                   |
|  | 38 | 24                    | 38                    | 70                    | 168                   | 361                   | 812                   |
|  | 40 | 21                    | 34                    | 62                    | 149                   | 321                   | 721                   |
|  | 42 | 19                    | 31                    | 56                    | 134                   | 287                   | 646                   |
|  | 44 | 17                    | 28                    | 50                    | 121                   | 259                   | 583                   |
|  | 46 | 16                    | 25                    | 46                    | 109                   | 236                   | 530                   |
|  | 48 | 14                    | 23                    | 42                    | 100                   | 215                   | 484                   |
|  | 50 | 13                    | 21                    | 39                    | 92                    | 198                   | 445                   |

NOTES:

C=Cover and Management Factor

P=Practice Factor



# PPI Engineering

Napa County  
Maximum Length of Slope  
for a soil loss of 3 tons per acre

NAME: Kongsgaard

DATE: 5/8/13

Cover Type: Permanent Cover Crop

Soil Unit No. (100-182)--- 151 & 152

Soil Name Hambright-Rock Outcrop

-K= 0.15

-R= 100

-T= 1

| Percent Cover  |    | 65%<br>Up & Down Hill | 70%<br>Up & Down Hill | 75%<br>Up & Down Hill | 80%<br>Up & Down Hill | 85%<br>Up & Down Hill | 90%<br>Up & Down Hill |
|--|----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|  |    | C= 0.058<br>P= 1.0    | C= 0.046<br>P= 1.0    | C= 0.034<br>P= 1.0    | C= 0.022<br>P= 1.0    | C= 0.015<br>P= 1.0    | C= 0.010<br>P= 1.0    |
| P<br>E<br>R<br>C<br>E<br>N<br>T<br>S<br>L<br>O<br>P<br>E | 2  | 1,308,549             | 2,833,720             | 7,761,628             | 33,123,760            | 118,734,561           | 458,719,739           |
|  | 4  | 21,864                | 39,030                | 83,099                | 246,739               | 642,786               | 1,771,311             |
|  | 6  | 2,636                 | 4,191                 | 7,672                 | 18,324                | 39,417                | 88,687                |
|  | 8  | 1,214                 | 1,930                 | 3,533                 | 8,438                 | 18,151                | 40,839                |
|  | 10 | 648                   | 1,030                 | 1,885                 | 4,502                 | 9,683                 | 21,788                |
|  | 12 | 392                   | 623                   | 1,141                 | 2,724                 | 5,860                 | 13,185                |
|  | 14 | 257                   | 409                   | 748                   | 1,787                 | 3,843                 | 8,647                 |
|  | 16 | 179                   | 284                   | 520                   | 1,243                 | 2,674                 | 6,016                 |
|  | 18 | 130                   | 207                   | 379                   | 905                   | 1,947                 | 4,381                 |
|  | 20 | 98                    | 156                   | 286                   | 683                   | 1,470                 | 3,307                 |
|  | 22 | 76                    | 122                   | 222                   | 531                   | 1,143                 | 2,572                 |
|  | 24 | 61                    | 97                    | 177                   | 423                   | 911                   | 2,049                 |
|  | 26 | 50                    | 79                    | 144                   | 345                   | 741                   | 1,667                 |
|  | 28 | 41                    | 65                    | 119                   | 285                   | 614                   | 1,381                 |
|  | 30 | 35                    | 55                    | 101                   | 240                   | 516                   | 1,162                 |
|  | 32 | 29                    | 47                    | 86                    | 205                   | 440                   | 991                   |
|  | 34 | 25                    | 40                    | 74                    | 177                   | 380                   | 855                   |
|  | 36 | 22                    | 35                    | 65                    | 154                   | 332                   | 746                   |
|  | 38 | 20                    | 31                    | 57                    | 136                   | 292                   | 658                   |
|  | 40 | 17                    | 28                    | 51                    | 121                   | 260                   | 584                   |
|  | 42 | 16                    | 25                    | 45                    | 108                   | 233                   | 524                   |
|  | 44 | 14                    | 22                    | 41                    | 98                    | 210                   | 472                   |
|  | 46 | 13                    | 20                    | 37                    | 89                    | 191                   | 429                   |
|  | 48 | 12                    | 19                    | 34                    | 81                    | 174                   | 392                   |
|  | 50 | 11                    | 17                    | 31                    | 75                    | 160                   | 361                   |

## NOTES:

C=Cover and Management Factor

P=Practice Factor

PPI Engineering

Napa County  
Maximum Length of Slope  
for a soil loss of 3 tons per acre

NAME: Kongsgaard

DATE: 5/8/13

Cover Type: Permanent Cover Crop

Soil Unit No. (100-182)--- 151 & 152

-K= 0.15

Soil Name Hambright-Rock Outcrop

-R= 90

-T= 1

| Percent Cover  |    | 65%<br>Cross-Slope<br>C= 0.058<br>P= 0.6 | 70%<br>Cross-Slope<br>C= 0.046<br>P= 0.6 | 75%<br>Cross-Slope<br>C= 0.034<br>P= 0.6 | 80%<br>Cross-Slope<br>C= 0.022<br>P= 0.6 | 85%<br>Cross-Slope<br>C= 0.015<br>P= 0.6 | 90%<br>Cross-Slope<br>C= 0.010<br>P= 0.6 |
|--|----|--|--|--|--|--|--|
| P<br>E<br>R<br>C<br>E<br>N<br>T<br>S<br>L<br>O<br>P<br>E | 2  | 10,204,927                               | 22,099,211                               | 60,530,285                               | 258,320,898                              | 925,970,307                              | 3,577,398,637                            |
|  | 4  | 102,033                                  | 182,144                                  | 387,805                                  | 1,151,473                                | 2,999,731                                | 8,266,287                                |
|  | 6  | 9,041                                    | 14,373                                   | 26,310                                   | 62,839                                   | 135,174                                  | 304,140                                  |
|  | 8  | 4,163                                    | 6,619                                    | 12,115                                   | 28,937                                   | 62,246                                   | 140,053                                  |
|  | 10 | 2,221                                    | 3,531                                    | 6,463                                    | 15,438                                   | 33,208                                   | 74,718                                   |
|  | 12 | 1,344                                    | 2,137                                    | 3,912                                    | 9,342                                    | 20,097                                   | 45,217                                   |
|  | 14 | 881                                      | 1,401                                    | 2,565                                    | 6,127                                    | 13,179                                   | 29,653                                   |
|  | 16 | 613                                      | 975                                      | 1,785                                    | 4,263                                    | 9,170                                    | 20,632                                   |
|  | 18 | 447                                      | 710                                      | 1,300                                    | 3,104                                    | 6,677                                    | 15,023                                   |
|  | 20 | 337                                      | 536                                      | 981                                      | 2,343                                    | 5,041                                    | 11,342                                   |
|  | 22 | 262                                      | 417                                      | 763                                      | 1,822                                    | 3,920                                    | 8,819                                    |
|  | 24 | 209                                      | 332                                      | 608                                      | 1,452                                    | 3,124                                    | 7,028                                    |
|  | 26 | 170                                      | 270                                      | 495                                      | 1,181                                    | 2,541                                    | 5,718                                    |
|  | 28 | 141                                      | 224                                      | 410                                      | 979                                      | 2,105                                    | 4,736                                    |
|  | 30 | 118                                      | 188                                      | 345                                      | 823                                      | 1,771                                    | 3,985                                    |
|  | 32 | 101                                      | 161                                      | 294                                      | 702                                      | 1,510                                    | 3,398                                    |
|  | 34 | 87                                       | 139                                      | 254                                      | 606                                      | 1,304                                    | 2,933                                    |
|  | 36 | 76                                       | 121                                      | 221                                      | 529                                      | 1,137                                    | 2,559                                    |
|  | 38 | 67                                       | 107                                      | 195                                      | 466                                      | 1,002                                    | 2,255                                    |
|  | 40 | 60                                       | 95                                       | 173                                      | 414                                      | 891                                      | 2,004                                    |
|  | 42 | 53                                       | 85                                       | 155                                      | 371                                      | 798                                      | 1,795                                    |
|  | 44 | 48                                       | 77                                       | 140                                      | 335                                      | 720                                      | 1,620                                    |
|  | 46 | 44                                       | 70                                       | 127                                      | 304                                      | 654                                      | 1,472                                    |
|  | 48 | 40                                       | 64                                       | 116                                      | 278                                      | 598                                      | 1,345                                    |
|  | 50 | 37                                       | 58                                       | 107                                      | 255                                      | 550                                      | 1,237                                    |

NOTES:

C=Cover and Management Factor

P=Practice Factor



# PPI Engineering

Napa County  
Maximum Length of Slope  
for a soil loss of 3 tons per acre

NAME: Kongsgaard

DATE: 5/8/13

Cover Type: Permanent Cover Crop

Soil Unit No. (100-182)--- 151 & 152

-K= 0.15

Soil Name Hambright-Rock Outcrop

-R= 100

-T= 1

| Percent Cover  |    | 65%<br>Cross-Slope | 70%<br>Cross-Slope | 75%<br>Cross-Slope | 80%<br>Cross-Slope | 85%<br>Cross-Slope | 90%<br>Cross-Slope |
|--|----|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|  |    | C= 0.058<br>P= 0.6 | C= 0.046<br>P= 0.6 | C= 0.034<br>P= 0.6 | C= 0.022<br>P= 0.6 | C= 0.015<br>P= 0.6 | C= 0.010<br>P= 0.6 |
| P<br>E<br>R<br>C<br>E<br>N<br>T<br>S<br>L<br>O<br>P<br>E | 2  | 7,182,656          | 15,554,353         | 42,603,757         | 181,817,100        | 651,736,801        | 2,517,923,442      |
|  | 4  | 78,406             | 139,966            | 298,002            | 884,830            | 2,305,094          | 6,352,092          |
|  | 6  | 7,323              | 11,642             | 21,311             | 50,900             | 109,491            | 246,354            |
|  | 8  | 3,372              | 5,361              | 9,813              | 23,439             | 50,419             | 113,443            |
|  | 10 | 1,799              | 2,860              | 5,235              | 12,504             | 26,898             | 60,522             |
|  | 12 | 1,089              | 1,731              | 3,168              | 7,567              | 16,278             | 36,626             |
|  | 14 | 714                | 1,135              | 2,078              | 4,963              | 10,675             | 24,019             |
|  | 16 | 497                | 790                | 1,446              | 3,453              | 7,427              | 16,712             |
|  | 18 | 362                | 575                | 1,053              | 2,514              | 5,408              | 12,169             |
|  | 20 | 273                | 434                | 795                | 1,898              | 4,083              | 9,187              |
|  | 22 | 212                | 338                | 618                | 1,476              | 3,175              | 7,144              |
|  | 24 | 169                | 269                | 492                | 1,176              | 2,530              | 5,693              |
|  | 26 | 138                | 219                | 401                | 957                | 2,059              | 4,632              |
|  | 28 | 114                | 181                | 332                | 793                | 1,705              | 3,837              |
|  | 30 | 96                 | 153                | 279                | 667                | 1,434              | 3,228              |
|  | 32 | 82                 | 130                | 238                | 569                | 1,223              | 2,752              |
|  | 34 | 71                 | 112                | 206                | 491                | 1,056              | 2,376              |
|  | 36 | 62                 | 98                 | 179                | 428                | 921                | 2,073              |
|  | 38 | 54                 | 86                 | 158                | 377                | 812                | 1,826              |
|  | 40 | 48                 | 77                 | 140                | 335                | 721                | 1,623              |
|  | 42 | 43                 | 69                 | 126                | 300                | 646                | 1,454              |
|  | 44 | 39                 | 62                 | 114                | 271                | 583                | 1,312              |
|  | 46 | 35                 | 56                 | 103                | 246                | 530                | 1,192              |
|  | 48 | 32                 | 51                 | 94                 | 225                | 484                | 1,090              |
|  | 50 | 30                 | 47                 | 87                 | 207                | 445                | 1,002              |

## NOTES:

C=Cover and Management Factor

P=Practice Factor

## **APPENDIX C**

### **VEGETATION RETENTION CALCULATIONS**

**KONGSGAARD WINE LLC**  
**VEGETATION RETENTION CALCULATIONS**  
**BASED ON 1993 PARCELS AND VEGETATION**

| 1993 APN    | Parcel Acres | Existing 1993 Tree Canopy Cover (Acres) | Existing 1993 Brush/Shrub/Open Cover (Acres) | Existing (post 1993) Vineyard Area (Acres) | Existing (post 1993) Residential Area (Acres) | Proposed Vineyard (Acres) | Proposed 1993 Tree Canopy Cover Removed; Residential and Existing & Proposed Vineyards (Acres) | Proposed 1993 Brush/Shrub/Open Cover Removed; Residential and Existing & Proposed Vineyards (Acres) | 1993 Tree Canopy Cover Retained (Percent) | 1993 Brush/Shrub/Open Cover Retained (Percent) |
|-------------|--------------|---|--|--|---|---------------------------|--|---|---|--|
| 032-540-042 | 145.4        | 79.2                                    | 66.2   | 6.1  | 0.1   | 24.3                      | 8.0  | 22.5  | 90%                                       | 66%  |



## **APPENDIX D**

### **SLOPE CALCULATIONS**

# Kongsgaard Wine LLC

## Average Slope Of Proposed Vineyard Blocks

| BLOCK | Gross Acres | Net Acres | SLOPE 1, % | SLOPE 2, % | AVERAGE SLOPE, % |
|-------|-------------|-----------|------------|------------|------------------|
| 1     | 5.5         | 4.1       | 7%         | 21%        | 14%              |
| 2     | 4.3         | 3.4       | 18%        | 18%        | 18%              |
| 3A    | 9.0         | 2.1       | 19%        |            | 19%              |
| 3B    |             | 2.3       | 11%        |            | 11%              |
| 3C    |             | 0.3       | 15%        | 16%        | 16%              |
| 3D    |             | 0.7       | 20%        |            | 20%              |
| 3E    |             | 1.0       | 19%        |            | 19%              |
| 4     | 2.7         | 2.0       | 11%        | 15%        | 13%              |
| 5     | 2.0         | 1.4       | 20%        | 26%        | 23%              |
| RD    | 0.8         |           |            |            |                  |
| Total | 24.3        | 17.3      |            |            | 17%              |