DRAFT

September 13, 2016

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Subject: Review of Draft EIR for General Waste Discharge Requirements for Vineyard Dischargers in the Napa River and Sonoma Creek Watersheds.

Dear Tom:

I have reviewed the DEIR dated July 15, 2016 for the General Waste Discharge Requirements for Vineyard Properties located in the Napa River and Sonoma Creek Watersheds and have the following comments.

1. Inadequate Performance Standards

I don't believe the DEIR or Draft Order present complete or reliable methods that evaluate Performance Standards for Farm Plan BMPs installed and maintained to control runoff and erosion at vineyard properties. The Performance Standards are presented in Attachment A of the Draft Order, while the monitoring and reporting requirements for vineyard Farm Plans at achieving Performance Standards are presented in Attachment E of the Draft Order. The following subsections present the Performance Standard followed by my comments.

a) Soil erosion in the Farm Area: soil loss rate ≤ tolerable soil loss rate. The tolerable soil loss rate is as defined by the USDA Soil Conservation Service (1994).

The 1994 USDA Soil Conservation Service report cited in this Performance Standard reports that the tolerable soil loss rate for most Napa County hillside soils ranges from 2 to 4 tons of tolerable soil loss per acre-year. Nowhere in the DEIR or Draft Order is there an explanation on how the Farm Area "soil loss rate" will be quantified for comparison to the USDA tolerable soil loss rates. Standard methods for quantifying soil loss include monitoring and modeling, however neither of these approaches are presented in the DEIR or Draft Order. Thus, I see no feasible way this Performance Standard can be evaluated or applied given the lack of guidance in the Draft Order.

b) Sediment delivery from existing unpaved roads: a) culvert inlets have a low plug potential; b) critical dips shall be installed at culverted crossings that have a diversion potential; and c) ≤ 25 percent of the total length of unpaved roads are hydrologically connected.

The Performance Standards associated with erosion and sediment transport for existing unpaved roads are qualitative in nature and don't actually evaluate the performance of any independent road BMP. As indicated in Attachment E of the Draft Order, the monitoring of this Performance Standard is referred to as "BMP Implementation Monitoring" for all (Tier 1-3) Dischargers. BMP Implementation Monitoring consists of establishing and monitoring Photo-points, "to document winter readiness, demonstrate annual maintenance practices and BMP implementation, and to document habitat and water quality conditions in receiving waters at and/or near points of discharge from the vineyard" (page 23 Attachment E, Draft Order). Photo-point records and field notes are to be appended to the Farm Plan. This type of monitoring can verify that a BMP measure was installed, but it does not evaluate if the BMP is functioning as intended and reducing sediment loads sourced from the unpaved roads. In short, this Performance Standard assumes that if the BMP is installed, it is functioning to provide the desired erosion control benefits – there is no requirement or guidance in the Monitoring Plan or Performance Standard to actually verify that the BMP is reducing erosion. Even if we assume the monitor makes a qualitative assessment on how the BMP is functioning, this is an unguided subjective opinion made by a "Qualified Professional" hired by the vineyard owner. Clear and more precise success criteria based on site specific monitoring is required in this Performance Standard to make consistent and reproducible determinations amongst different "Qualified Professionals".

c) Sediment delivery from new roads: all new roads (unpaved and/or paved) shall be storm-proofed roads.

See comments for item b) above.

d) Storm Runoff from an existing Hillslope Vineyard: shall not cause or contribute to downstream increases in bed and/or bank erosion.

To evaluate this storm runoff Performance Standard, Tier 1 Discharges need only comply with the BMP Implementation (Photo-point) Monitoring described above. Pursuant to this level of qualitative monitoring, only a subjective conclusion, at best, can be made about storm runoff effects on receiving channels for Tier 1 Dischargers.

In addition to the BMP Implementation (Photo-point) Monitoring described above, the Monitoring Plans for Tier 2 and 3 Dischargers include requirements for BMP

Effectiveness Monitoring. The BMP Effectiveness Monitoring approach for Tier 2 and 3 dischargers as described in Attachment E (pg. 25-26) of the Order does not acknowledge the presence of engineered drainage features and may incorrectly assume erosion control measures are achieved. This effectiveness monitoring approach defines a field method to characterize hillslope vineyard soil infiltration capacity and assumes that once post-project infiltration capacity values are statistically similar or greater than values at paired sites under natural vegetation cover (i.e., representative of pre-project conditions), the performance standards for Hillslope Vineyard storm runoff shall be considered achieved. We have demonstrated on the Walt Ranch project (and as described in detail on pages 245-246 of DEIR) that the presence of engineered drainage features can contribute significant increases in storm runoff and erosion potential. As presented in Section 2.0 of my comment letter on the Walt Ranch Erosion Control Plan dated August 26, 2016 (see Attachment A), integrating engineered drainage elements into storm runoff modeling of a new vineyard block reveals storm runoff rates significantly higher than those modeled solely with altered runoff curve numbers. The integration of engineered drainage features in this example resulted in vineyard runoff rates higher than the pre-project rates. Any analysis of runoff rates and BMP effectiveness that does not factor in the effect of engineered drainages or is based solely on an estimation of soil infiltration capacity of the vineyard does not consider all variables at play in characterizing runoff magnitude and erosion potential. Thus, this BMP Effectiveness monitoring approach should not be considered adequate at evaluating the impacts of runoff rates based on a single (of many) parameters affecting that rate.

The field method for the BMP Effectiveness Monitoring described in Attachment E of the Draft Order that outlines a method to estimate pre- and post-project soil infiltration capacities is highly subjective and easily manipulated to provide biased outcomes. As someone who could be hired as a "Qualified Professional", I am confident that through preferred soil-testing site selection and/or elimination of "anomalous results" and retesting, I could easily bias results to provide a desired outcome. Therefore, I believe the BMP Effectiveness Monitoring protocol requires refinement or agency field supervision to eliminate what I see as an easily manipulable analysis.

e) **Storm runoff from a new Hillslope Vineyard: a) peak storm runoff in 2-, 10-, 50-, and 100-year (24-hour duration) rainfall events following vineyard development shall not be greater than pre-development peak storm runoff; and b) shall not cause or contribute to downstream increases in bed and/or bank erosion.**

The storm runoff Performance Criteria for new Hillslope Vineyards is expanded over that for existing vineyards to include quantification of peak storm runoff for rainfall events of selected recurrence intervals. I agree that this model-based quantification is a good approach towards identifying, quantifying and guiding mitigation for potential increases in storm runoff. However, in order to avoid the opportunity to manipulate the outcome, the Performance Standard needs to provide further guidance and direction on how to incorporate engineered drainage elements and clarify what drainage areas need to be modeled.

Based on my experience described above, not incorporating engineered drainage elements into the rainfall-runoff modeling can significantly underestimate peak runoff rates. In order to capture the effects of engineered drainage elements, it is important to model runoff from the pre- and post-project watershed area above each proposed vineyard drainage outfall, whether the outfalls discharge on- or off-site. This scale of modeling avoids masking the effects of engineered drainage elements by modeling a larger project drainage, where vineyards do not lie within the primary modeled flow path. This scale of modeling also provides the required level of detail to effectively design runoff and erosion control BMPs.

An example on the importance in selecting representative model areas is provided in Section 10 of my comment letter on the Walt Ranch Project DEIR, dated November 20, 2014 and included as Attachment B. Although this example pertains to soil loss modeling, the concept of masking potential significant impacts through inappropriate sizing of model area is applicable to all types of numerical modeling including storm runoff modeling. The Walt Ranch DEIR conclusions regarding project-induced changes in erosion potential are based on summing vineyard block soil loss subtotals within the Milliken and Capell Creek watersheds and presenting the total (net) change for each watershed (Milliken and Capell). The net results indicate that there are 44- and 13-percent reductions in potential soil loss from the Milliken and Capell Creek watersheds, respectively. However, this type of lumping of results masks localized impacts, which when considered alone, could be considered a significant impact. A more thorough review of changes in modeled soil loss results indicates localized increases in erosion potential from multiple vineyard blocks that contribute drainage and sediment to onsite Corps designated waters and wetlands located downstream of the proposed vineyards. These downstream creek, riparian and wetland areas host potentially sensitive biological resources, which would be potentially adversely impacted by increases in water and sediment runoff.

f) f) Pesticide management: An integrated pest management program shall be developed and implemented for the vineyard (UC Statewide IPM Program, 2015), and effective practices shall be implemented to avoid mixing, storage, or

application of pesticides near wells and surface waters, or in ways that could contribute to receiving water toxicity.

The development and implementation of an integrated pest management program (IPMP) does not guarantee the elimination of agrochemical and pesticide loadings to surface waters. This Performance Standard lacks any means (e.g., monitoring) to evaluate if the IPMP is actually working.

g) Stream-Riparian Habitat Protection and Enhancement Actions

A required element of the Farm Plan includes (item 4e. page 5 of Attachment A, Draft Order), "Conservation practices to protect and/or enhance stream-riparian habitat complexity and connectivity." This element is addressed on page 7 (Attachment A, Draft Order) under the heading, "Stream-Riparian Habitat Protection and Enhancement Actions" and includes a list of channel conditions that need to be delineated and "assessed." It is not clear to me how this inventory of channel conditions is supposed to be assessed and translated into "conservation practices" or "habitat protection and enhancement actions." Nor does the Draft Order or DEIR provide Performance Standards with respect to the "actions" directed under this Farm Plan element.

2. Inappropriate Application of Performance Standards to Groundwater Recharge Assessment (DEIR Impact 8.2)

The assumption, presented in discussion of DEIR Impact 8.2, that meeting Performance Standards to reduce storm runoff result in increased infiltration and groundwater recharge is oversimplified and not entirely valid. BMPs such as gravel berms and basins that detain runoff during storm events can lead to increases in infiltration and groundwater recharge. However, these BMPs are commonly installed in response to other vineyard elements such as engineered drainage systems that collect and accelerate runoff through vineyards during all rain events. Engineered drainage systems reduce the residence time and opportunity for infiltration and groundwater recharge. To what degree these competing vineyard drainage enhancements and runoff/erosion BMP elements effect the net increase or reduction in infiltration requires more detailed analysis before making blanket assumptions on the effectiveness of runoff performance standards.

Other professionals reporting on the linkage of hydrologic processes between runoff and infiltration have also called into question the assumption that increased infiltration leads to reduced runoff and increased groundwater recharge. In his January 26, 2013 comment letter on Napa River Sediment TMDL Vineyard Waiver and ISMND (included as Attachment C), Dennis Jackson (hydrologist) provides considerable background and hydrologic explanation on accepted principals of surface and subsurface storm runoff. Mr. Jackson presents several examples of subsurface pipe flow contained in hydrologic research literature that demonstrates infiltrated water does not uniformly reduce surface runoff rates, nor does all infiltrated water go to groundwater recharge.

In page 29 of their 2013 Hydrology Report[1] completed on behalf of the Walt Ranch vineyard expansion project EIR, RiverSmith Engineering reports on the fate of additional infiltration gains associated with vineyard development in the Milliken Creek watershed. They state the following.

> *The modeling results show a consistent pattern of a modest reduction in rainfall runoff within the Milliken watershed of Walt Ranch for the proposed vineyard blocks and the associated vineyard development practices. This is consistent for all modeled storm frequencies, 2-yr through the 100-yr event as shown in Tables 5, 6, 7 and 8.*
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> *The reduction in the runoff peaks and associated runoff volumes is due to an increase in soil infiltration rates, primarily associated with the deep ripping practice. However, credit for the increased rate was only taken in the rocky soil groups where the ripping practice effectively changes the soil classification from Hydrologic Group D to Group C (higher infiltration rate).*
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> *However, it is believed that much of this additional infiltration volume will return over time as "quick return flow" leading into the local drainages following the storm event. Also see discussion in Section 5.0 regarding rainfall infiltration into the rocky soil groups (Slade, 2013). Based on their estimate that 7% of the rainfall deep percolates into the underlying aquifer, about 90% of the additional infiltration due to ripping is likely to resurface as "quick return flow".*

Although the GWDR Draft Order stipulates that deep ripping of soils cannot be credited for a reduction in peak runoff, the process and fate of subsurface "pipe" or "quick return flow" is what is important here. Similar to the processes reported by Jackson, the RiverSmith findings indicate that significant volumes of infiltrated water thought lost to runoff, actually resurfaces shortly thereafter contributing to surface runoff. These

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[1] RiverSmith Engineering, 2013, Hydrologic analysis of proposed vineyard blocks within the Walt Ranch Property, Napa County, California. Prepared for: PPI Engineering, March, 130p.

examples demonstrate that the assumption that increased infiltration rates reduce runoff is unjustified and certainly should not serve as the sole Performance Standard associated with the GWDR Order runoff BMP Effectiveness Monitoring.

Please feel free to contact me with any questions regarding the material and conclusions contained in this letter report.

Sincerely,

Greg Kamman, PG, CHG
Principal Hydrologist