January 22, 2018
Project No. 17-1-060

Mr. Donald Barrella
Napa County Department of Planning, Building & Environmental Services
Engineering and Conservation Division
1195 Third St., #210
Napa, CA 94559

SUBJECT: Comments on Proposed Anthem Winery Draft Peer Review Response from Richard C. Slade & Associates, October 19, 2017

Dear Mr. Barrella:

This letter refers to the October 19, 2017 Draft Memorandum by Richard C. Slade & Associates (RCS), titled: *Response to Peer Review Letter Regarding Napa County Tier 1 Water Availability Analysis by RCS For Proposed Anthem Winery* (Draft Peer Review Response). The Draft Peer Review Response provides responses to nine recommendations and findings contained in the August 10, 2017 Memorandum by Luhdorff & Scalmanini, Consulting Engineers (LSCE), which provides a peer review of the April 10, 2017 *Draft Napa County Tier 1 Water Availability Analysis for the Proposed Anthem Winery* (Draft WAA) by RCS.

The following paragraphs provide our comments on the responses provided by RCS and identify remaining areas where additional data are needed to support the conclusions of the Draft WAA. Recommended Conditions of Approval for the Use Permit sought for the proposed Anthem Winery are also included below, based on the information provided to date.

Response to LSCE Recommendation 1

The response addresses the request for additional analysis of the effects of mutual well interference between Well 3 and Well 6 by presenting multiple scenarios for average and drought water year types. The various scenarios indicate how the total project daily groundwater demand for proposed additional uses of groundwater could be met by utilizing only Well 8 (in average water years only) or by utilizing Well 8 in combination with Wells 3 and/or Well 6 pumping at rates below flow rates tested during the aquifer testing at each well in 2016. All scenarios presented for drought water years rely on at least one of Wells 3 and 6 to meet the projected daily drought water year groundwater demand of 1,584 gallons. These scenarios would likely avoid significant mutual well interference, if implemented as described. However, the response does not include any additional data, such as flowmeter data and updated groundwater level hydrographs to demonstrate prior rates of groundwater production in prior years and groundwater level stability in the time since the Draft WAA was originally submitted. See the list of additional data needed to support the Draft WAA conclusions following the Response to LSCE Finding 9, below.

Recommended Conditions of Approval

The additional information provided in the Draft Peer Review Response indicates that under the proposed project, groundwater produced at Well 8 on Parcel 2 would be used to meet the demands of the residence on Parcel 1 in both average water years and drought water years (see **Appendix A, Table 9-Rev**).

A. It is recommended that the County condition the Anthem Winery Use Permit on recording the planned transfer of groundwater from Parcel 2 to supply existing residential uses on Parcel 1, as described in Appendix E of the Water Availability Analysis Guidance Document (Napa County, 2015).

Response to LSCE Recommendation 2

This response addresses the request for documentation and details relating to efforts made to identify wells on adjacent properties within 500 feet of proposed project wells. Well construction information for two additional wells are included with the Draft Peer Review Response. No additional data are needed, and no conditions of approval are recommended relative to Recommendation 2.

Response to LSCE Recommendation 3

The revised RSA+ Memo appended to the Draft Peer Review Response provides two additional pages detailing monthly water balances, including projected water storage needs, for average water years and drought water years. These two water balances detail water demands by type of use (including "vineyard", "residential", "winery domestic water", "winery process water", and "winery landscape irrigation") and sources of supply that will be used to meet the demands through a combination of current month water production and water stored from prior months. The monthly water balance calculations show the maximum monthly storage needs to be 130,732 gallons for reclaimed process water and 282,319 gallons for harvested rainwater. The maximum total storage required in any single month, according to the RSA+ water balance tables, would be 409,560 gallons in April of an average water year.

The monthly water balance calculations from RSA+ show that new water use for vineyard irrigation (0.73 acre-feet/year) will be supplied entirely by reclaimed winery process water. Apparently, the winery process water will be generated on Parcel 2, where the winery is located. Page 2 of 7 in the RSA+ Memo shows that new uses for vineyard irrigation will primarily occur on Parcel 1. This transfer between parcels was not clearly described in the April 10, 2017 Draft WAA and implies that the vineyard expansion on Parcel 1 could not occur until the winery is operational and generating reclaimed process water.

Consistent with the Draft WAA, the monthly water balance calculations show that winery process water use of 0.77 acre-feet/year will be recaptured and reused entirely, without losses. The proposed rate of winery process water use of 5 gallons of water per gallon of wine produced

is 29% less than the rate of 7 gallons of water per gallon of wine produced included in the Water Availability Analysis Guidance Document (Napa County, 2015).

The Draft Peer Review Response does not appear to include any additional information about the water tanks or other facilities that the applicant will use to store water, as indicated in the monthly water balances, or for other needs such as fire safety. The Draft WAA includes a figure showing eight 10,000 tanks to be located near the future winery building. The County previously provided LSCE with a figure from Backen Gillam Kroeger Architects depicting 400,000 gallons of "water tank-cave" storage in the winery cave, although these tanks and their planned use are not referenced in the Draft WAA. This response does not appear to include any new information that addresses the design of the recycled water and rainwater catchment systems nor the planned efficiency of those systems, and the potential for losses due to evaporation or other means that may impact the project's ability to achieve the projected supplies from these new sources. See the list of additional data needed to support the Draft WAA conclusions following the Response to LSCE Finding 9, below.

Recommended Conditions of Approval

The additional information provided in the Draft Peer Review Response indicate that under the proposed project, 85% of the reclaimed winery process water generated on Parcel 2 by future winery operations will be transferred to Parcel 1 to supply 2.56 acres of proposed additional vineyards (see **Appendix A, Table 9-Rev)**.[1]

B. It is recommended that the County condition the Anthem Winery Use Permit on recording the planned transfer of reclaimed winery process water from Parcel 2 to supply the proposed additional vineyard acreage on Parcel 1, as described in Appendix E of the Water Availability Analysis Guidance Document (Napa County, 2015).

C. It is recommended that the County condition the Anthem Winery Use Permit to ensure that the proposed vineyard expansion on Parcel 1 does not occur until the water source for that vineyard, the proposed winery and process water reclamation system, are operational.

D. It is recommended that the County condition the Anthem Winery Use Permit to require that the Applicant verify that they have, or will install, water storage capacity sufficient to meet the maximum monthly storage requirements (in addition to any storage required for

[1] The water balance tables provided in the RSA+ Appendix to the Peer Review Response show that the only source of supply for the additional proposed vineyards on both parcels will be 0.73 acre-feet/year to be generated by winery process water reclamation on Parcel 2. The table on Page 1 of 7 of the RSA+ Appendix shows that 0.62 acre-feet/year of the proposed additional vineyard irrigation use will occur on Parcel 1.

fire safety or other purposes) as demonstrated in the water balance information provided in the revised RSA+ Memo appended to the Draft Peer Review Response.

Response to LSCE Recommendation 4

As requested, the response provides an additional figure that is consistent with the summary of land surface slopes in the Draft WAA. No additional data are needed, and no conditions of approval are recommended relative to Recommendation 4.

Response to LSCE Recommendation 5

The response clarifies that all wells on the Anthem parcels were previously equipped with totalizing flowmeters, with the exceptions of Well 4 and Well 2, the latter being damaged and planned to be destroyed. The response states that the owner will provide a totalizing flowmeter for Well 4 in the future.

This response raises additional questions as to why no flowmeter data are presented in the Draft WAA to support estimates of existing water uses and well production capacities, particularly given the very low pumping capacities demonstrated by aquifer tests reported in the Draft WAA and the need to import water to the parcels to meet existing demands in 2013 and 2014. See the list of additional data needed to support the Draft WAA conclusions following the Response to LSCE Finding 9, below.

Recommended Conditions of Approval

E. It is recommended that the County condition the Anthem Winery Use Permit on reporting flowmeter data from all wells and other water sources used to supply the project water uses for a period of five years from the completion of vineyard expansion or start of winery production, whichever is later.

Response to LSCE Recommendation 6

The response indicates that the applicant intends to continue monitoring groundwater levels with pressure transducers at all six wells currently outfitted with that equipment. In addition, the applicant will begin monitoring groundwater levels in Well 4 quarterly.

Recommended Conditions of Approval

F. It is recommended that the County condition the Anthem Winery Use Permit in part on reporting groundwater level data from all wells on the property for a period of five years from the completion of vineyard expansion or start of winery production, whichever is later. Monitoring should be conducted at least quarterly by electronic sounder or pressure transducer.

Response to LSCE Recommendation 7

The response states an amount of water trucked to the property in 2013 and 2014 along with the beginning and ending dates of trucking for both years. Additional justification is provided for the need to truck water to the property in those years. No supporting documentation is provided to confirm the amounts of water and timing of delivery. See the list of additional data needed to support the Draft WAA conclusions following the Response to LSCE Finding 9, below.

Recommended Conditions of Approval

G. It is recommended that the County condition the Anthem Winery Use Permit in part on a requirement that water not be imported to the project parcels from sources not evaluated in the WAA.

Response to LSCE Recommendation 8

The response provides some additional detail regarding the sources of supply to Parcels 1 and 2 in 2015 and 2016, during continued drought conditions following two years when water was trucked to the property. The additional details focus largely on Well 8, constructed in 2015. The response clarifies that Well 8 "is not needed to meet the existing water demands on Parcel 1 or Parcel 2" (p. 6). Among the additional information provided is that "in early November 2016, Well 8 was connected to the water tank that serves Parcel 2 and was pumped occasionally in order to prevent its groundwater from becoming stagnant and contaminated" (p. 6). However, the hydrograph for Well 8 (Draft WAA, Figure 7G) appears to show that Well 8 was pumped frequently (i.e., several times per week) during April, May, and June 2016 and again from September 2016 through early February 2017. The pumping pattern shown in the hydrograph does not resemble the occasional pumping described in the Draft Peer Review Response Memo. See the list of additional data needed to support the Draft WAA conclusions following the Response to LSCE Finding 9, below.

Response to LSCE Finding 9

The response provides additional information, including geologic cross sections, demonstrating that Wells 3, 6, and 8 are unlikely to be hydraulically connected to Redwood Creek. No additional data are needed, and no conditions of approval are recommended relative to Finding 9.

Data Needed to Support Draft WAA Conclusions

1. Given the very low pumping capacities demonstrated by aquifer tests reported in the Draft WAA and the need to import water to the parcels to meet existing demands in both 2013 and 2014, the Applicant should present all available flowmeter data and updated groundwater hydrographs at all monitored wells to document the ability of both the project wells and non-project wells to meet existing demands, to demonstrate the feasibility of pumping scenarios presented in the Draft Peer Review Response, and to support the conclusions of the Draft WAA.

2. The Draft Peer Review Response and Draft WAA project a water demand for winery processes that is 29% below the rate referenced in the Water Availability Analysis Guidance Document (Napa County, 2015). The Applicant should provide a detailed rationale and documentation to support the proposed lower rate or recalculate the projected demand for winery process water use based on a rate of 7 gallons of water per gallon of wine produced.

3. The Draft Peer Review Response and Draft WAA project that all winery process water will be recaptured and reused without losses. The Applicant should provide a detailed rationale and documentation to support the projected 100% efficiency of winery process water reclamation or recalculate the available supply to account for losses.

4. The Applicant should provide supporting documentation to confirm the amounts of water and timing of delivery of water imported to the parcels in 2013 and 2014.

We appreciate the opportunity to provide this review. If you have any questions, or wish to discuss any of the above, we would be pleased to respond.

Sincerely,

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

Vicki Kretsinger Grabert
President/Senior Principal Hydrologist

Reid Bryson
Project Hydrologist

Enclosure: Appendix A

APPENDIX A

- Table 9-Rev (below) is a revision to the Table 9 previously prepared by LSCE and included in the August 10, 2017 Peer Review Memo. The table documents sources of supply and location of use, by project parcel.

- Information in the Table 9-Rev is revised compared to the version originally presented in August 10, 2017 LSCE Memo based on additional information provided in the Draft Peer Review Response by RCS. The revisions demonstrate how the proposed project will involve ongoing transfers of water between the two project parcels.

- As shown in the "Existing Project – Average Year" section, information provided to date indicate that the existing uses of water are all supplied by sources located on the same parcel.

- Additional information provided by RCS describe how the planned future groundwater production by Project Well 8 will be used. According to the pumping scenarios presented by RCS in the Draft Peer Review Response, in both average and drought water years, groundwater produced at Well 8 on Parcel 2 would be transferred to Parcel 1 to supply existing residential uses. As Table 9-Rev shows, the existing residential demand is currently met by Project Wells 3 and 6 (and Non-Project Well 4).

- The water balance tables provided in the RSA+ Appendix to the Draft Peer Review Response show that the only source of supply for the additional proposed vineyards on both parcels will be 0.73 acre-feet/year to be generated by winery process water reclamation on Parcel 2. The table on Page 1 of 7 of the RSA+ Appendix shows that 0.62 acre-feet/year of the proposed additional vineyard irrigation use will occur on Parcel 1.

- The table on Page 6 of 7 in the RSA+ Appendix to the Draft Peer Review Response indicates that a small percentage, 6.5%, of the roof area used to harvest rainwater for the proposed project is located on Parcel 1. However, the water balance tables provided by RSA+ also show that all harvested rainwater would be used for winery uses, which will occur on Parcel 2, per the table on Page 1 of 7 of the RSA+ Appendix.

Table 9-Rev. Applicant-Estimated Existing and Proposed Project Water Use by Source of Supply

Use by Parcel	Source of Supply (Acre-Feet/Year)							Parcel Use Total
	Groundwater (GW)					Reclaimed Process Wastewater (generated on **Parcel 2**)	Harvested Rainwater (generated on **Parcel 1** and **Parcel 2**)	
	Non-Project		Project		Total GW			
	Parcel 1 **Well 4**	Parcel 2 **Wells 1,5,7**	Parcel 1 **Wells 3,6**	Parcel 2 **Well 8**				
	Existing Project - Average Year							
Parcel 1 Uses	0.15	-	0.6	-	0.75	-	-	0.75
Parcel 2 Uses	-	3.64	-	-	3.64	-	-	3.64
Source Total	**0.15**	**3.64**	**0.6**	**0**	**4.39**	**0**	**0**	**4.39**
	Proposed Project - Average Year							
Parcel 1 Uses	0.15	-	0 – 0.27	0.33 – 0.6†	0.75	0.62§	0.00	1.37
Parcel 2 Uses	-	3.64	-	0.32	3.96	0.15	1.55*	5.66
Source Total	**0.15**	**3.64**	**0 – 0.27**	**0.65 – 0.92**	**4.71**	**0.77**	**1.55**	**7.03**
	Proposed Project - Dry Year							
Parcel 1 Uses	0.15	-	0.11 – 0.51	0.09 – 0.49†	0.75	0.62§	0.00	1.37
Parcel 2 Uses	-	3.64	-	1.12	4.76	0.15	0.75*	5.66
Source Total	**0.15**	**3.64**	**0.11 – 0.51**	**1.21 – 1.61**	**5.51**	**0.77**	**0.75**	**7.03**

† The Draft Peer Review Response (dated October 19, 2017) include a range of scenarios whereby all uses of groundwater not met by Wells 1, 4, 5, and 7 (estimated to be 0.92 AFY in average years and 1.72 AFY in drought years) could be met either entirely by Well 8 or primarily by Well 8 with lesser contributions from Wells 3 and 6. Under all scenarios, some groundwater would be transferred from Well 8 to Parcel 1 in every year.

§ The water balance tables provided in the RSA+ Appendix to the Draft Peer Review Response show that the only source of supply for the additional proposed vineyards on both parcels will be 0.73 acre-feet/year to be generated by winery process water reclamation on Parcel 2. The table on Page 1 of 7 of the RSA+ Appendix shows that 0.62 acre-feet/year of the proposed additional vineyard irrigation use will occur on Parcel 1.

* The table on Page 6 of 7 in the RSA+ Appendix to the Draft Peer Review Response indicates that a small percentage, 6.5%, of the roof area used to harvest rainwater for the proposed project is located on Parcel 1. However, the water balance tables provided by RSA+ also show that all harvested rainwater would be used for winery uses, which will occur on Parcel 2, per the table on Page 1 of 7 of the RSA+ Appendix.