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Water Availability Analysis
February 20, 2024 - Second Addendum



SECOND ADDENDUM MEMORANDUM

February 20, 2024

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Job No. 669-NPA02

From: Anthony Hicke, CHG
Edward Linden, GIT
Richard C. Slade & Associates LLC



Re: Updated Calculation of Groundwater Recharge Estimate in Response to
Updated County Water Availability Analysis (WAA) Requirements
Vida Valiente Winery
407 Crystal Springs Road, Vicinity St. Helena
Napa County, California

This Second Addendum Memorandum was prepared at the request of the property owner in response to changes by Napa County in WAA requirements (Napa County, 2015) that occurred after the publication of the WAA for the project. RCS prepared two documents for the Vida Valiente project: "Results of Napa County Tier 1 and Tier 2 Water Availability Analyses" (RCS, 2021) and "Addendum to Tier 1 and Tier 2 Water Availability Analyses" (RCS, 2022). In those documents, RCS used a 30-year PRISM precipitation dataset to determine the average rainfall at the subject property, and to estimate the average annual volume of groundwater recharge thereon. Since those documents were published and accepted by Napa County, the County changed its requirements and now requires that estimates of rainfall recharge be calculated using a 10-year PRISM precipitation dataset (Napa County, 2022). Herein, RCS has revised its original groundwater calculation and has now recalculated groundwater recharge for the for the Vida Valiente property using the County-required 10-year average.



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Also note that prior work by RCS (2021 & 2022) included a “prolonged drought analysis” for the project. RCS understands that a “prolonged drought analysis” is no longer required for WAA preparation due to the required use of the 10-year annual rainfall average (Napa County, 2022).

Groundwater Recharge Calculations

Original WAA Calculation (RCS, 2021)

The originally submitted WAA (RCS, 2021) presented a groundwater recharge estimate for the subject property of 5.4 acre-feet per year (AFY). That recharge estimate was based on:

- Conservative estimates of the long-term (30-year) average annual rainfall at the property (38.3 inches per year).
- The assumption that deep percolation of rainfall occurs only into portions of the subject property that have ground surface slopes that are inclined at angles of less than 30 degrees (i.e., groundwater recharge was assumed to occur on only 10.5 acres of the 16.9-acre property).
- The estimated percentage of rainfall (~16%) that could be available to deep percolate into the pore spaces and/or fractures and joints in the Sonoma Volcanics that underlie the subject property. This estimated percentage is based on data from LSCE&MBK (2013), and is calculated on Table 3 of the WAA (RCS, 2021).

The proposed (future) average annual groundwater demand for the subject property is estimated to be 3.0 AFY (RCS, 2021). Thus, the estimated groundwater recharge of 5.4 AFY is greater than the groundwater demand of 3.0 AFY estimated to be required on an average annual basis in the future from the subject property.

Subject 2024 Revised Calculation

A revised estimate of groundwater recharge is calculated herein using a County-provided, 10-year GIS dataset representing average water year (WY) precipitation from WY 2011-12 to WY 2020-21 (Napa County, 2022). The description of this dataset states: “*The 10-year average for precipitation in Napa County was determined with monthly precipitation data from PRISM Climate Group. Annual totals were calculated on a water year basis (October through September). Precipitation values are in inches/year.*”. This County-provided dataset was apparently derived from a monthly timestep PRISM precipitation dataset, but neither a specific reference to the original dataset, nor a description of the methodology for the derivation were distributed with the County files. The gridded polygon cells in the County-provided dataset are slightly variable in dimension, measuring roughly 210 meters wide (longitudinally [i.e., in a roughly west to east direction]) by 268 meters tall (latitudinally [i.e., in a roughly north to south direction]).

Using the County-provided 10-year average data set, RCS now calculates the area-weighted mean (average) precipitation for the entire subject property to be approximately 32.3 inches (2.7 ft); this new value is 16% lower than the 38.3-inch total presented in the RCS WAA (2021). To calculate the updated groundwater recharge value for the subject property, the previously used 30-year average precipitation estimate of 38.3 inches is replaced with the 10-year average precipitation estimate of 32.3 inches. The other values used in the original groundwater recharge calculation remain unchanged (i.e., ~16% rainfall deep percolation rate, recharge only occurs on 10.5 acres of the subject property). This updated calculation results in a revised groundwater



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recharge estimate of 4.5 AFY, which is 0.9 AFY lower than the 5.4 AFY groundwater recharge estimate presented in the RCS WAA (2021).

The updated calculation of the groundwater recharge estimate of 4.5 AFY is greater than the 3.0 AFY demand estimated to be required on an average annual basis in the future from the subject property. Hence, when using the 10-year average rainfall totals required by the County, the project still meets Tier 1 WAA requirements (Napa County, 2015).

Closure/Disclaimer

No other project details or RCS WAA calculations are changed as part of this Second Addendum Memorandum. For all other project details, please refer to the original WAA (RCS, 2021) and Addendum (RCS, 2022).

This Addendum regarding RCS's WAA for the Vida Valiente Winery project located at 407 Crystal Springs Road, Vicinity St. Helena, in Napa County, California has been prepared for Mr. Hayes Drumwright and applies only to the evaluation of the subject property for the requirements discussed herein. This report has been prepared in accordance with the care and skill generally exercised by reputable professionals, under similar circumstances, and in this or similar localities. No other warranty, either express or implied, is made to the calculations, conclusions, or professional advice presented herein.



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References

- Luhdorff & Scalmanini Consulting Engineers and MBK Engineers (LSCE&MBK), January 2013. Updated Hydrogeologic Conceptualization and Characterization of Conditions, Prepared for Napa County.
- Napa County, 2015. Water Availability Analysis (WAA) – Guidance Document. Napa County Board of Supervisors, Adopted May 12, 2015.
- , 2022. MeanPrecip_WY_2012_2021_PRISM. Feature Service polygon layer. Credits: <https://prism.oregonstate.edu/recent/> (data modified by LSCE and Napa Co. PBES). Geographic coordinate system: NAD 1983. Last updated: 10/20/2022. <https://napacounty.maps.arcgis.com/home/item.html?id=985a11dfb2ab45518254354036c93aa2>
- , 2024. Interim Napa County Well Permit Standards and WAA Requirements - January 2024. . <https://www.countyofnapa.org/DocumentCenter/View/25905/Well-Permit-Standards-and-WAA-Requirements--January-10-2024?bid>.
- Richard C. Slade & Associates LLC (RCS), 2021. “Results of Napa County Tier 1 and Tier 2 Water Availability Analyses”, Vida Valiente Winery, 407 Crystal Spring Road, Vicinity St. Helena, Napa County, California. March 5, 2021.
- , 2022. “Addendum to Tier 1 and Tier 2 Water Availability Analyses”, Vida Valiente Winery, 407 Crystal Spring Road, Vicinity St. Helena, Napa County, California. October 4, 2022.