RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

MEMORANDUM

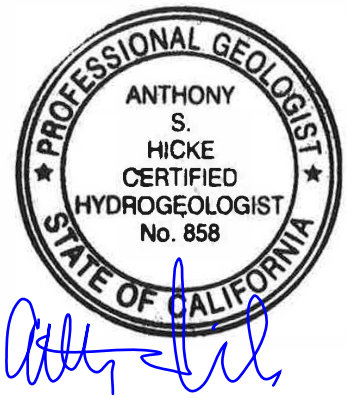
February 15, 2024

Job No. 818-NPA01

To: Josh Hannah
Infinite Leisure LLC
c/o Mr. Michael Muelrath, P.E.
Applied Civil Engineering Inc. (ACE)
Sent via email: mike@appliedcivil.com

From: Anthony Hicke and Edward Linden
Richard C. Slade & Associates LLC (RCS)

Re: Results of Napa County Tier 1 Water Availability Analysis
For a Proposed New Residential Development Project
And a Proposed New Water Well Adjacent to
1200 Grandview Drive, Napa, CA 94558



Introduction

This Memorandum presents the key findings, conclusions, and preliminary recommendations regarding this Water Availability Analysis (WAA) prepared by RCS for a proposed new residential development project adjacent to 1200 Grandview Drive (the subject property) in Napa, California. RCS understands the proposed project is to construct three residential structures on the subject property. In addition, a new, optional well has been proposed for the property. Currently, onsite irrigation demands are met solely via surface water collected onsite in reservoir storage. This WAA also includes analysis of a new, optional, backup irrigation well for the property that may not actually be necessary, but may be desirable to the owner for operational flexibility. If constructed, Well 2 could be used for domestic and irrigation supply, as needed.

This document was prepared on behalf of the property owner, Infinite Leisure LLC, to provide hydrogeologic analyses pertaining to the proposed new residential development project and the proposed optional new backup well (referred to as optional "Well 2" herein) in conformance with the Napa County WAA Guidelines (2015) and recent updates to those Guidelines by Napa County (2022a, 2024a, 2024b). A summary of the WAA Tiers and their applicability to the proposed developments is as follows:

- A "Tier 1" WAA ("Groundwater Use for Napa County") consists of calculating an estimate of the annual groundwater recharge that occurs at the subject property (including certain County-mandated assumptions) and comparing that estimate to the estimated future groundwater extractions at the property. A Tier 1 WAA is applicable to the subject property for the proposed new residential development and proposed optional backup Well 2 only when assuming that groundwater must be used to meet vineyard demands in lieu of the existing surface water supply (Napa County, 2024b). A Tier 1 WAA is not applicable to the proposed new residential development itself because all groundwater demand would be strictly for domestic supply and groundwater extractions would total less than 2 acre-feet, thus exempting the residential development from Tier 1 WAA requirements (Napa County, 2024b). For this WAA, the more stringent assumption that groundwater will be used for both domestic demands and vineyard irrigation demands has been assumed.

- No active offsite wells are known to exist within 500 feet of either Well 1 (the existing domestic well) or proposed Well 2 (the proposed optional backup well), and no springs used for water supply purposes are known to exist within 1,500 feet of either of these well locations. Therefore, a "Tier 2" WAA ("Well & Spring Interference") is not required for County-approval of the proposed project or for County-issuance of a drilling permit for the proposed optional backup well (proposed Well 2) per County requirements (Napa County, 2015 & 2024b).
- A "Tier 3" WAA ("Groundwater / Surface Water Interaction") is not required for the proposed residential development project (Napa County, 2024b) or for County-issuance of a drilling permit for the proposed optional backup well (proposed Well 2) because neither the proposed project well nor the proposed optional backup well are located within 1,500 feet of a County-defined "Significant Stream" (PBES & LSCE, 2023a & 2023b).

This Memorandum has been prepared by RCS to satisfy the WAA requirements for the proposed residential project and the drilling of the proposed, optional, backup Well 2 drilling permit application, and this WAA also addresses the owner's desire to have flexibility to use groundwater to irrigate the existing onsite vineyards.

Site Conditions and Project Description

The subject property consists of a single parcel that was recently formed through a lot line adjustment, from portions of the former parcels that were identified by County Assessor's Parcel Numbers (APNs) 043-061-019 and 043-061-020, located in the hills of the Carneros area along the eastern edge of Congress Valley, in Napa County, California. The approximate realigned boundary of the subject property provided by the project engineer, Applied Civil Engineering, Inc. (ACE) is shown on Figure 1, "Regional Map". The area of the subject property is 42.16 acres[1], and it is located adjacent to a second parcel under common ownership, but that adjacent parcel is not a part of the proposed residential development. Also shown in relation to the subject property on Figure 1 are several other relevant data including: the County's Significant Streams (PBES & LSCE, 2023a) and Significant Streams 1,500-foot buffer areas (PBES & LSCE, 2023b); and the local groundwater basins (DWR, 2021). A majority of the subject property is within a County-designated 1,500-foot buffer area around an unnamed Significant Stream, but the entire property is outside of the local groundwater basins, known as the Napa-Sonoma Lowlands Subbasin of the Napa-Sonoma Valley Groundwater Basin and the Napa Valley Subbasin of the Napa-Sonoma Valley Groundwater Basin (DWR, 2021). No portion of the subject property is within any of the subwatersheds of LSCE & MBK (2013), which consists of subwatersheds within and tributary to the Napa Valley.

Figure 2, "Property Map", and Figure 3, "Geologic Map", show several of the same data that are shown on Figure 1, but, depending on the Figure, add additional data, including: the locations of existing "Well 1" (the proposed "project well"); the location for "Well 2" (the proposed optional backup well); the location of an offsite well under common ownership, the approximate locations of several offsite water sources that are either known to exist or may possibly exist; the owner-reported locations of onsite and nearby septic system components; and Tier 2 WAA setback distances (500 feet and 1,500 feet) around the locations of existing Well 1 and proposed Well 2.

[1] Calculated in California State Plane Coordinate System Zone 2 (NAD 1983)

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The locations of the known and possible offsite wells were approximated by RCS based on records retrieved from the County's Electronic Document Retrieval website (PBES, 2024), on records retrieved from the California Department of Water Resources (DWR) Well Completion Report Database (DWR, 2024), on internal RCS records, and on data collected during a site visit to the property by an RCS groundwater geologist. The records retrieved from Napa County consisted of various types of documents including State Well Completion Reports (WCRs, also known as "driller's logs") and drilling permits for wells that may have been drilled in the area; the records retrieved from DWR consisted of WCRs only. No clear evidence of springs used for water supply purposes located near the subject property was discovered amongst the PBES or DWR records reviewed. The locations of known and possible offsite wells shown on Figures 2 and 3 should not be considered an exhaustive representation of all nearby wells; others wells and springs used for water supply purposes may also exist in the area for which records were not available, or were not directly observed from the subject property.

From communications with and review of data provided by the project engineer (Mr. Michael Muelrath of ACE) and from a February 13, 2024, field reconnaissance visit by an RCS geologist to the subject property, the following key items were noted and/or observed (refer to Figure 2):

- The subject property has reportedly been developed with 16.45 acres of vineyards; no other significant onsite developments with associated water demands are known to exist.
- Two surface water reservoirs exist onsite.
- One water-supply well is known to exist at the subject property, existing Well 1; Well 1 is not currently in active use, and it is not currently equipped with a pump.
- Existing onsite water demands consist solely of vineyard irrigation and are reportedly met via onsite reservoir storage. Onsite reservoir storage is fed by a surface water diversion right described in and in accordance with the County-filed "Tsiplakos Vineyard Erosion Control Plan #04-0230-ECPA" and the 1959-dated DWR Permit # 12096.
- The applicant intends to develop three residential structures on the subject property. These structures will consist of a main residence, a guest cottage, and a second dwelling unit with little to no associated landscaping. No changes to the existing onsite vineyard areas are proposed as part of the subject development project.
- In addition to the proposed new residential development, the applicant may drill and construct a proposed new backup water supply well on the subject property, referred to herein as optional "Well 2". Optional Well 2 is proposed to provide redundancy to existing Well 1.
- Development on offsite areas surrounding the subject property consists of vineyards, various buildings, and forested areas.
- During the February 2024 site visit, the RCS geologist traveled along roads in the immediate vicinity of the subject property with the goal of identifying possible nearby, offsite wells. RCS refers to such work as a "windshield survey." During this survey, the RCS geologist attempted to identify the locations of possible offsite wells by observing typical well-house enclosures, pressure tanks, storage tanks, power lines, or by making direct observations of wellheads.

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Local Geologic Conditions

Figure 3, "Geologic Map," depicts the types, lateral extents, and boundaries between the various earth materials mapped at ground surface in the region by others; this map was adapted from work by the California Geological Survey (Wagner & Gutierrez, 2017). The earth materials mapped by others at ground surface at and proximal to the subject property include the following, from geologically youngest to oldest:

Recent Sedimentary Deposits (map symbols Qhc, Qha, Qht, Qa, Qc, and Qoa)

These deposits consist of sediments that have been deposited since the Pleistocene geological epoch (since ~2.58 million years ago [mya]). The depositional environments of these sediments have been various terrestrial settings that included stream channels, alluvial fans, and sloped areas; they are generally comprised by unconsolidated to poorly consolidated layers and lenses of sand, gravel, silt, and clay.

The only recent sedimentary deposits shown in Wagner & Gutierrez (2017) at ground surface within the boundary of the subject property are undivided older alluvial deposits (Qoa), found in the lower-elevation areas of the subject property, underlying the reservoir in the southwestern corner. The actual thickness (depth below ground surface) of these deposits, and that of any possible underlying sediments, is not known. However, based on the map patterns shown on Figure 3, it is likely that these sediments are of limited thickness beneath the subject property, where present.

Sonoma Volcanics (map symbol Tsvt)

The earth materials belonging to the Sonoma Volcanics that are exposed at ground surface within the view of Figure 3 were deposited or emplaced ~5.4 to 3.4 mya (Miocene to Pliocene), per Wagner & Gutierrez (2017). The Sonoma Volcanics are known to include many varied types of volcanic materials. The specific ground surface exposure of the Sonoma Volcanics within the boundary of the subject property, as mapped by others, are Tuff and Sediments of the Eastern Sonoma Volcanics (Tsvt).

Earth materials belonging to the Sonoma Volcanics tend to produce more groundwater where they are hard and highly fractured, where they are deeply weathered, or where the individual grains (clasts) are relatively large and the pore spaces between the grains are uncemented and well connected (in sedimentary and deeply weathered materials). Where such zones occur, these earth materials are considered the main water-bearing units in the region. In contrast, volcanic ash flows and deeply weathered volcanic tuffs tend to be fine-grained, clay-rich, and often have limited permeability; these fine-grained materials tend to only yield groundwater to wells at limited flow rates.

The maximum thickness of the Sonoma Volcanics beneath the subject property cannot be determined with certainty using data reported on the WCR for Well 1, but the driller's descriptions of the earth materials encountered in the borehole described on that WCR suggest a minimum thickness of 418 feet, the total drilling depth of the borehole. More specifically, the driller's descriptions suggest that essentially from ground surface down to a depth of 418 feet, the earth materials of the Sonoma Volcanics were observed in the borehole cuttings. The Sonoma Volcanics materials may also extend below the 418-foot bottom-depth of the borehole of Well 1.

During the February 13, 2024, visit to the subject property by an RCS groundwater geologist, an outcrop of possible tuffaceous material was observed by the geologist near the proposed location for optional Well 2, which confirms the presence of Tsvt on the subject property.

Older Sedimentary Rocks (map symbol Ed)

Within the view of Figure 3, an older sedimentary unit known as the Domengine Sandstone (Ed) was mapped by others at ground surface to the north and west of the subject property, on either side of Congress Valley (but not within the boundaries of the subject property). This sedimentary unit is comprised by quartzose sandstone and was deposited under shallow marine conditions during the Eocene geologic epoch (56 to 33.9 mya). The Domengine Sandstone is not expected to play a direct role in the availability of groundwater at the subject property, based on the Figure 3 map patterns and on the driller's descriptions of earth materials encountered in the borehole described on the WCR for Well 1.

Great Valley Sequence (map symbol Kgv)

At great depth below the ground surface of the subject property, underlying the Sonoma Volcanics, geologically ancient (at least several tens of millions of years old) sedimentary, metasedimentary, and metaigneous rocks that comprise the regional bedrock are known to be present. These rocks belong to complex assemblages of earth materials that include the Great Valley Sequence and the Franciscan Complex. These regional bedrock materials are generally considered to be non-water bearing, but they are not expected to play a direct role in the availability of groundwater at the subject property based on driller's descriptions of earth materials encountered in the borehole described on the WCR for Well 1. Within the view of Figure 3, Wagner & Gutierrez (2017) shows a ground surface exposure of undivided Great Valley Sequence sedimentary rocks (Kgv), but this exposure is approximately 1,400 feet southwest of the southwestern corner of the subject property.

Geologic Structure

Within the view of Figure 3, numerous faults[2] are shown to exist in the vicinity of the subject property (Wagner & Gutierrez, 2017), including one that passes through the eastern portion of the property along a north-south trend. Most of the fault traces within the view of Figure 3 follow a generally north-south trend on Figure 3, and most are associated with the West Napa fault (USGS, 2020a). It is not known if any of the geologic structures (faults, folds, etc.) that are reported to exist, or that may exist, in the vicinity of the subject property have any influence on groundwater flow (e.g., act as groundwater flow barriers).

A single measurement by others of the orientation of sedimentary bedding is shown within the view of Figure 3, along the western side of the map view, where the Ed geologic material is shown as dipping at an angle of 45 degrees to the west. No other structural features are present in the geologic mapping by others that is shown on Figure 3 (Wagner & Gutierrez, 2017).

[2] Hydrogeologic work by RCS presented herein does not include any efforts to define or determine local seismicity; to define or determine the potential activity of any faults in the region; or to define or determine the potential for onsite fault rupture.

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Local Hydrogeologic Conditions

The earth materials described above can generally be separated into two basic categories, based on their relative capacity to store and transmit groundwater to wells. These two general categories are:

Potentially Water-Bearing Materials

The Sonoma Volcanics, including some of the sedimentary deposits thereof, are considered by RCS to be the principal water-bearing materials beneath the subject property and its immediate environs. Based on the work of Wagner & Gutierrez (2017), the geologic unit belonging to the Sonoma Volcanics beneath the subject property are undifferentiated tuff and sediments (Tsvt), whereas the overlying, geologically younger sedimentary materials, where present, are undivided alluvial deposits that consist primarily of unconsolidated to poorly consolidated gravel, sand, silt, and clay. These interpretations are based primarily on RCS's interpretation of the driller's descriptions of earth materials on the WCR for existing Well 1, and review of the descriptions and map patterns of the earth materials mapped in the vicinity of the subject property in Wagner & Gutierrez (2017).

In harder volcanic materials like some portions of the Sonoma Volcanics, the occurrence and movement of groundwater tends to be controlled by the frequency, openness, and interconnectedness of the randomly occurring network of subsurface fractures that often exists in these rocks. Tuff deposits can exist as relatively hard, competent deposits (described as "welded"), or as softer, more friable deposits. Deeply weathered volcanic tuffs tend to be fine-grained, clay-rich, and often have limited permeability; thus, these fine-grained tuffaceous materials are typically only capable of yielding groundwater to wells at limited flow rates. Based on review of Wagner & Gutierrez (2017), it is not apparent if the sedimentary materials within Tsvt that underlie the subject property are particularly water-bearing. However, in general, the occurrence and movement of groundwater in unconsolidated to poorly consolidated sedimentary deposits tends to be controlled by the intergranular porosity of the materials; the size and angularity of the individual grains; the degree of consolidation and cementation; and potentially numerous other factors.

From our long-term experience with these materials and based on our numerous water well construction projects in Napa County, RCS has experienced that pumping capacities of wells that draw groundwater from the earth materials of the Sonoma Volcanics can range widely, from rates as low as a few gallons per minute (gpm) to rates in excess of several hundred gpm.

Potentially Nonwater-Bearing Rocks

Within the boundary of the subject property, this category includes the geologically ancient regional basement rocks, including the Great Valley Sequence, known to be present below the Sonoma Volcanics in the vicinity of the subject property. These diverse and geologically old rocks are well-cemented, well-lithified, and tend to exhibit very low permeability. Occasionally, localized conditions can allow for small volumes of groundwater to exist in these bedrock materials where they are sufficiently fractured, or where they are relatively more coarse-grained. However, even in areas with potentially favorable conditions, well yields are often no more than a few gpm in these bedrock materials, and the water quality can be marginal to poor in terms of various naturally occurring groundwater constituents.

Local Groundwater Basin

Groundwater basin boundaries in California have been defined and designated by the State Department of Water Resources (DWR) in their Bulletin 118, "California's Groundwater" (2021), and were used to define groundwater basin boundaries for the purposes of Groundwater Sustainability Plan (GSP) preparation (LSCE, 2022). Figure 1 shows the boundaries of the local groundwater basins (the Napa-Sonoma Lowlands Subbasin of the Napa-Sonoma Valley Groundwater Basin and the Napa Valley Subbasin of the Napa-Sonoma Valley Groundwater Basin) in DWR Bulletin 118, relative to the boundary of the subject property. As shown on that Figure, the entire subject property is located outside of the local groundwater basins.

Key Construction and Testing Data for Existing Onsite Well

One well currently exists on the subject property, at the location shown on Figures 2 and 3; this well is referred to as "Well 1" for the purposes of this Memorandum. RCS was able to obtain a DWR Well Completion Report (WCR, or "driller's log") for the well, a County permit for this well from Napa County records (PBES, 2024), and another copy of the same WCR for the well from DWR (2024); the County-sourced documents are included in the Appendix to this report. A well inspection by Ray's Well Testing Service (RWTS), of Sebastopol, CA was performed on this well on August 12, 2021, referred to thereon as "Upper Well". Included in that inspection procedure was a 5.5-hour period of pumping of the well, via a temporarily installed test pump.

Well 1 Construction Data

The data on WCR 819471 include the following details on the construction of Well 1:

- Constructed between August 14 and September 2 of 1999.
- Well casing depth of 406 ft below ground surface (bgs).
- Constructed with polyvinyl chloride (PVC) composition casing, with a casing diameter of 6 inches.
- Sanitary seal depth of 20 ft bgs.
- Constructed with 186 feet of 0.032" slot aperture perforated casing, between the depths of 150 to 250 ft bgs and 320 to 406 ft bgs.

Summary of Key "Test" Data for Well 1

The WCR for Well 1 provides the depth to the original post-construction static water level (SWL) in the well, along with the original airlift "test" rate. These data include:

- The initial SWL depth in Well 1 following completion of well construction was reportedly 150 ft below reference point (brp), but the reference point height above ground surface was not reported.
- The reported "test" rate for initial post-construction airlifting[3] operations in Well 1 was estimated by the well driller to be 20 gpm for a period of 20 hours, at the end of well construction.

[3] As a rule of thumb, RCS geologists estimate that normal operational pumping rates for a new well equipped with a permanent pump are typically on the order of only about one-half or less of the airlifting rate reported on a driller's log.

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Summary of Onsite Well Data Collected by RCS Geologist During Site Visit

During the February 13, 2024, site visit, the RCS groundwater geologist measured a SWL in Well 1 at a depth of 140.1 ft bgs. The wellhead reference point from which that SWL was measured was approximately 1.5 ft above ground surface (ags). The RCS geologist also obtained a current well depth measurement, of approximately 400.5 ft bgs.

Summary of Onsite Well Inspection Report Pumping Information

On August 12, 2021, RWTS performed a 5.5-hour test of Well 1 using a temporarily installed test pump. The water level depth measurements by RWTS are assumed to have been made relative to the 1.5-ft ags wellhead reference point measured during the RCS site visit. Selected measurements reported by RWTS are as follows:

- The casing of the well was observed to be 6-inch diameter PVC.
- The depth of the well was measured to be 376 ft brp (31.5 ft above the 406-ft bgs depth of the well reported on the associated WCR, and 25.5 ft shallower than the 400.5-ft bgs well depth measured by the RCS geologist).
- The intake of the temporarily installed well pump was set at a depth of 360 ft brp.
- The pre-test SWL depth was 141 ft brp (139.5 ft bgs).
- The total continuous pumping period was 5.5 hours.
- The initial flow rate was 14.9 gpm, but the flow rate continuously dropped for the first 2 hours of pumping, at which time it stabilized for a period of 1.5 hours at a flow rate of 6.8 gpm. Following the 1.5-hour period of 6.8 gpm discharge, the flow rate was decreased to 5.5 gpm for the remaining 2.5 hours of the test.
- The final pumping water level (PWL) was 360 ft brp (358.5 ft bgs).
- The water level drawdown at the end of the 5.5-hour pumping period was 219 ft.

Based on the data reported by RWTS for the end of the pumping test, the specific capacity of the well at the time of testing was 0.025 gpm per foot of water level drawdown (gpm/ft ddn).

The actual location of Well 1 does not closely match the location shown on the permit map associated with the WCR (No. 819471) assumed to represent this well. Also, the bottom-depth of the well measured and tested by RWTS was reported to be 376 ft brp, more than 30 feet shallower than the bottom depth of the casing reported on the WCR (reported to be 406 ft bgs). The current bottom depth of Well 1 was measured to be approximately 400.5 ft bgs by the RCS geologist during their February 13, 2024, site visit; a difference of only 5.5 ft in depth in comparison with the depth reported on WCR 819471. Based on these data, it is the opinion of RCS that: Well 1 is represented by WCR 819471; that the actual location at which the well was drilled was different than shown on the permit map; and that the well may have experienced some minor infilling over time. RCS also contacted RWTS and confirmed that the well that was tested was indeed onsite Well 1. RCS is not able to determine or explain why such a large discrepancy exists between the RWTS well depth measurement (376 ft brp) and the RCS well depth measurement (400.5 ft bgs), but RCS regards the recent well depth measurement by the RCS geologist as accurate.

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Proposed Construction for Optional Well 2

The proposed location of Optional Well 2 is shown on Figures 2 and 3. Key construction details of Optional Well 2 are proposed to be as follows:

- Well casing depth on the order of 400-500 ft bgs.
- Nominal well casing diameter of 5 or 6 inches.
- Sanitary seal depth of at least 50 ft bgs, beginning at ground surface.
- Casing perforations interspersed between the approximate depths of 200 ft bgs and 480 ft bgs, but the specific layout and depths of perforations would be determined based on borehole geology, the hydrogeologic conditions encountered during drilling, and the SWL observed during drilling operations.

Water Demands

Existing Water Demands

Existing onsite water demands solely consist of irrigation of 16.45 acres of vineyard; no other water demands were reported to exist at the property. Water use estimates for the onsite vineyard are presented in the "Tsiplakos Vineyard Erosion Control Plan #04-0230-ECPA" document (Napa County, 2006) are assumed by RCS to be reflective of current onsite conditions. Note that that ECP was prepared for the original APN 043-061-019 (before the LLA), which comprised a smaller land surface area than the recently aligned parcel boundary of the subject property. Despite the LLA, existing water demands of the subject property are not expected to be different than if the LLA had not occurred, because no additional vineyard areas (or other known water-using developments) are present on the areas added to the subject property, and all the vineyard areas that were on APN 043-061-019 prior to the LLA have remained on the subject property. According to that ECP, vineyard irrigation demands for the then-proposed 16.4-acre[4] (net vine acres) vineyard were estimated to total approximately 5.1 acre-feet per year (AFY). This equates to a unit irrigation rate of 0.31 AFY/acre of vines. This unit irrigation rate is well within the standard range (0.2 - 0.5 AFY/acre) of vineyard irrigation rates presented in the 2015 WAA Guidance Document (Napa County), and according to Mr. Muelrath of ACE, is reasonable for a vineyard maintained in the relatively mild conditions present in the Carneros area of Napa County.

Thus, current onsite water demands are estimated to total 5.1 AFY. As described in the above-referenced 2004 ECP, all onsite vineyard demands are met by onsite reservoir storage; groundwater is not used to meet the existing onsite irrigation demands.

[4] It is not immediately clear why a small discrepancy exists in vineyard area between the 16.4 acres reported in the 2004 ECP, and the 16.45 acres that reportedly currently exist onsite. However, for both reported vineyard areas, a total water use of 5.1 AFY results in a unit irrigation rate of 0.31 AFY/acre, after numerical rounding. Thus, RCS regards this small difference in reported vineyard areas as insignificant for the purposes of water use estimates.

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Possible Future Water Demands

Following construction of the proposed new residential development project, future onsite water demands would consist of the following, based on communications with Mr. Muelrath of ACE, on Napa County's 2015 WAA Guidance Document, and on "Tsiplakos Vineyard Erosion Control Plan #04-0230-ECPA" document (Napa County, 2006):

- Total water demand for subject property = 6.2 AFY, consisting of:
  - Proposed New Residences = 1.1 AFY
    - Primary residence without significant landscaping = 0.5 AFY
    - Secondary residence without significant landscaping = 0.4 AFY
    - Guest cottage without significant landscaping = 0.2 AFY
  - Vineyard Irrigation = 5.1 AFY
    - Assumes 16.45 acres of vines on the subject property.
    - Also assumes heat suppression will not be required for the vineyard, any frost protection that might be necessary for the vineyard would not be accomplished through use of groundwater, and that vineyard water use is not expected to vary significantly during drought years.

Thus, assuming the conservative scenario in which all irrigation is derived from groundwater, groundwater demand at the property would increase to 6.2 AFY (from 0 AFY). If surface water use continues as it currently does for vineyard irrigation, groundwater demand would only increase from 0 AFY to 1.1 AFY.

Proposed Pumping Rates

To estimate the pumping rate that would be required to meet 6.2 AFY of groundwater demand (conservatively assuming surface water is not used), it is assumed that groundwater pumped from Well 1 and proposed backup Well 2 (if constructed) will be directed to the onsite reservoir storage for later distribution to the onsite vineyard for irrigation use when required (i.e., during the irrigation season); the remaining 1.1 AFY of groundwater required to meet domestic demands would be directed to the residences (and not onsite reservoir storage). Note that the calculations below are conservative because they do not account for direct rainfall that accumulates in the onsite reservoirs. In actuality, rainfall will accumulate in the onsite reservoirs and reduce the amount of groundwater actually needed for vineyard irrigation.

To meet the 1.1 AFY residential demand, Well 1 would need to pump at a rate of about 1.5 gpm, assuming the well operates on a 50% operational basis (12 hours per day, every day of the year), calculated as follows:

Residential Demand Only, from Well 1:

$$\text{Required Pumping Rate from Well 1} = 1.1 \text{ AFY} \times \frac{325{,}851 \text{ gallons}}{\text{AF}} \times \frac{\text{year}}{365 \text{ days}} \times \frac{\text{day}}{720 \text{ minutes}} \approx 1.5 \text{ gpm}$$

The estimated pumping rates necessary to meet the onsite irrigation demand demands are as follows:

- If Well 2 is drilled and constructed, and assuming that Well 2 will be capable of producing at a similar rate to Well 1 (5.5 gpm), pumping of Well 1 and Well 2 could occur roughly 5 days/week throughout the year (243 days/year), for 12 hours per day (720 minutes/day), at an average combined flow rate of 9.5 gpm, calculated as follows:

$$\text{Irrigation Demand Only, Assuming Well 1 \& Proposed Well 2:}$$
$$\text{Required Combined Pumping Rate from Well 1 \& Well 2}$$
$$= 5.1\ \text{AFY} \times \frac{325{,}851\ \text{gallons}}{\text{AF}} \times \frac{\text{year}}{243\ \text{days}} \times \frac{\text{day}}{720\ \text{minutes}} \approx 9.5\ \text{gpm}$$

- If Well 2 is NOT drilled and constructed, pumping of Well 1 for irrigation purposes would need to occur nearly 7 days/week throughout the year (347 days/year), for 20 hours per day (1,200 minutes/day), at an average flow rate of 4.0 gpm, calculated as follows:

$$\text{Irrigation Demand Only, Assuming Well 1 Only:}$$
$$\text{Required Pumping Rate from Well 1}$$
$$= 5.1\ \text{AFY} \times \frac{325{,}851\ \text{gallons}}{\text{AF}} \times \frac{\text{year}}{347\ \text{days}} \times \frac{\text{day}}{1{,}200\ \text{minutes}} \approx 4.0\ \text{gpm}$$

Combing the residential and irrigation demands described above, it is feasible that all onsite demands could be met using groundwater by either:

- Pumping Well 1 only at a rate of 5.5 gpm for most of the year.

Pumping Well 1 and Proposed Well 2 at a combined rate of 11 gpm for 243 days per year, and at a much lower combined rate of 1.5 gpm for the remainder of the year.

As described above, the property owner is applying for a new well drilling permit with the County for possible drilling and construction of Well 2. Based the pumping rate determined by RWTS for Well 1, data for several offsite wells in the area, pumping data for an offsite well under common control, and on RCS's experience in the area, it is reasonable to expect an operational pumping rate on the order of 5 to 10 gpm, and perhaps even higher, from a properly designed and developed well that is constructed at the proposed Well 2 site shown on Figure 2. As demonstrated by the calculations above, Well 1 is capable of meeting the proposed onsite demands within the parameters described above, without any additional contributions from other water sources. With the possible addition of the water supply derived from a future Well 2, the onsite demands are anticipated to be met by these current and possible optional future onsite wells (conservatively assuming surface water is not used).

WAA Tier 1: "Groundwater Use for Napa County"

Napa County promulgated additional guidelines[5] for WAA preparation with respect to groundwater recharge calculations in response to the Governor's Executive Order N-7-22 (Napa County, 2022a & 2024b) and the drought in the State at that time. For projects that require a WAA and are located outside of the Napa Valley Subbasin of the Napa-Sonoma Valley Groundwater Basin (DWR, 2021), the County requires that a calculation of parcel-specific groundwater recharge be performed to determine allowable groundwater usage (referred to herein as "property"-specific, because an APN is not yet available for the post-LLA parcel). Napa

[5] A "prolonged drought analysis" is no longer required for WAA preparation due to the required use of the 10-year annual rainfall average or the unit groundwater use of 0.3 AFY/ac (Napa County, 2022b).

County also requires that property-specific groundwater recharge estimates used in WAAs for projects outside of the Napa Valley Subbasin consider "average rainfall" to be the average annual rainfall that has occurred in the last 10 water years, such as defined in the County's 10-year average precipitation dataset (PBES & LSCE, 2022). As described above, the subject property is located entirely outside of the Napa Valley Subbasin of the Napa-Sonoma Valley Groundwater Basin, so a property-specific groundwater recharge estimate is appropriate for the subject Tier 1 WAA.

Property-Specific Precipitation

Spatial analysis of the County's 10-year average rainfall data set (PBES & LSCE, 2022) determined that the area-weighted average rainfall for the 10-water-year period of 2012 to 2021 within the post-LLA subject property boundary shown on the Figures herein is 1.85 ft (22.17 inches). Multiplying this rainfall average by the 42.16-acre post-LLA area of the subject property results in a total of 78.0 AFY. This value is the average volume of rainfall that the subject property receives each water year, per the County's current 10-year (Water Years 2012 to 2021) average methodology. However, it does not consider the deep percolation rate (groundwater recharge rate) at the subject property.

Property-Specific Groundwater Recharge

Groundwater recharge on a long-term average annual basis at the subject property can be estimated as a percentage of average rainfall that falls on the property and subsequently undergoes deep percolation, ultimately entering the local aquifer system beneath the property. The actual percentage of rainfall that undergoes deep percolation is a function of numerous local and regional conditions, including ground surface slopes; soil types; ground cover; evapotranspiration; and the frequency, intensity, and duration of rainfall, among other possible factors.

Estimates of groundwater recharge as a percentage of rainfall were presented for several watersheds that are tributary to the Napa River in LSCE & MBK (2013), which is commonly used to establish recharge rates for the purposes of WAAs prepared for properties within and proximal to the Napa Valley. However, the location of the subject property is in Congress Valley, in an area not covered by the data of LSCE & MBK. Rather than attempting to develop a novel groundwater recharge percentage, another data source was considered to establish a reasonable and conservative groundwater recharge rate for the subject property. That other data source, a WAA prepared for another vineyard property in the Carneros area (LSCE, 2015), considered groundwater recharge to be 10% of precipitation.

Multiplication of the 10% groundwater recharge rate in LSCE (2015) with the average volume of rainfall that the subject property receives each water year (78.0 AFY) results in a property-specific average groundwater recharge rate of 7.80 AFY by the County's current 10-year precipitation average methodology. However, this calculation still does not directly consider the possible effect of the ground surface slope on the potential for deep percolation at the property.

Effect of Slope on Groundwater Recharge Potential

To provide a more conservative and site-specific estimate of the potential effects of ground slope on groundwater recharge at the subject property, the slope-based assumption made by LSCE (2015) was also applied to this analysis. The slope-based assumption by LSCE was that groundwater recharge does not occur on slopes that exceed 25%.

MEMORANDUM

Spatial analysis of a U.S. Geological Survey (USGS) digital elevation model (2020b) determined that approximately 20% of the ground surface at the subject property (8.41 acres of the 42.16 acre-subject property) is sloped in excess of 25%. Under the assumption that groundwater recharge does not occur on the portions of the property in excess of 25% slope, the recharge area for the subject property is considered to be 33.75 acres. Multiplying the rainfall average (1.85 ft/year) by the recharge area (33.75 acres) and the 10% groundwater recharge rate in LSCE (2015) results in an estimated recharge rate of 6.24 AFY for the subject property.

In accordance with current Napa County guidelines (2015 & 2024b) and based on the conservative analyses presented above, average annual groundwater recharge at the subject property, and thus allowable groundwater extractions from the subject property, is 6.24 AFY. This estimate of groundwater recharge and allowable groundwater extractions is much higher than the 1.1 AFY of onsite groundwater extractions proposed for the domestic demands at the property, and roughly the same as the 6.2 AFY of onsite groundwater extractions proposed for the project if use of surface water from reservoir storage does not occur. Because the total proposed onsite groundwater extractions do not exceed the estimated average annual groundwater recharge at the property (calculated using County-required assumptions), the Tier 1 WAA conditions are satisfied for the proposed project and the proposed optional backup well (Well 2).

Tier 2 WAA – Review of Possible "Well & Spring Interference"

RCS reviewed publicly available records for evidence of offsite wells (PBES, 2024; DWR, 2024) and springs (PBES, 2024; USGS, 2023) near the subject property. This review did not result in discovery of any known or possible offsite wells or offsite springs that are used for water supply purposes within 500 feet or 1,500 feet, respectively, of the location of Well 1 or the proposed location of optional Well 2 (see Figure 2). Therefore, the Tier 2 WAA requirements for the proposed residential development project and the proposed optional well (Well 2) are presumptively met, and a Tier 2 WAA is not required to gain County approval of a drilling permit for proposed optional Well 2 (Napa County, 2015 & 2024b).

Tier 3 WAA – Review of Possible "Groundwater/Surface Water Interaction"

Napa County has published information defining which rivers, streams, and creeks within the County are considered "significant" for the purposes of Tier 3 WAA review. These "Significant Streams" are defined in GIS data available from a County GIS data source, where they are referred to as "Significant_Streams" and "Significant_Streams_1500ft_Buffer" (PBES & LSCE, 2023a & b). According to the County's updates to WAA requirements (Napa County, 2024a & 2024b), a Tier 3 WAA is required if a project well is located within 1,500 feet of a Significant Stream.

Figures 1 and 2 show the spatial relationship between the subject property and the nearby Significant Streams 1,500-foot buffer areas, demonstrating that most of the subject property is within a Significant Streams 1,500-foot buffer area. However, the location of the existing project well (Well 1) and the location for the proposed optional well (Well 2) are both outside of the County's Significant Streams 1,500-foot buffer areas. The Tier 3 requirements are therefore presumptively met, and a Tier 3 WAA is not necessary for County-approval of the proposed residential development project, or for County-approval of a drilling permit for the proposed optional well, Well 2 (Napa County, 2015, 2024a, 2024b).

MEMORANDUM

Key Conclusions and Recommendations

1. The proposed project consists of developing three new residential structures (main residence, second dwelling, and guest cottage) on the subject property, and possibly of drilling a new water supply well onsite that would help meet the water demands of the proposed new residences and/or the existing vineyards.
2. No groundwater is currently used at or extracted from the subject property, but the existing onsite vineyards are estimated to use 5.1 AFY of surface water. All irrigation demands of the onsite vineyards are currently met by surface-water-fed onsite reservoir pumpage, assumed to be in accordance with an existing ECP. No other onsite water use is known to currently take place.
3. Two future scenarios have been evaluated at the request of the owner. Under both scenarios, all residential water supply (1.1 AFY) would be met by groundwater extracted from the onsite well(s), and no change to the area of or annual volume of water use by the existing onsite vineyards is proposed. Under the first scenario, all water used vineyard irrigation would continue to be provided from onsite reservoir storage, as is currently practiced. The second scenario, which was included to facilitate the owner's desire for operational flexibility, assumes that in addition to the domestic demand, vineyard irrigation demands (5.1 AFY) would also be met by groundwater produced from existing Well 1 and/or by proposed optional backup Well 2, should the owner choose to drill and construct an additional onsite well. Groundwater demand from onsite sources under this second scenario would total 6.2 AFY. To be conservative, the later condition with the higher groundwater demand was evaluated for this WAA.
4. Estimated property-specific average annual groundwater recharge at the is 6.24 AFY. This conservatively estimated average annual recharge volume is greater than the total future groundwater extractions proposed for the property, of 1.1 AFY (residential use only) and 6.2 AFY (residential and vineyard irrigation). Therefore, because proposed groundwater use does not exceed parcel-specific groundwater recharge, even in the more conservative scenario, the proposed project and the proposed optional new well are compliant with Napa County's Tier 1 WAA requirements (Napa County, 2015 & 2024b).
5. The existing onsite well, Well 1, which was shown to pump at a rate of 5.5 gpm, can feasibly meet the onsite water demands estimated for the subject property.
6. If constructed, proposed optional backup Well 2 would only need to operate at a pumping rate of 5.5 gpm to meet the estimated groundwater demands that it would provide. Based on the results of pumping tests of Well 1 and an offsite well under common ownership; offsite well data research; and RCS's experience in the region, it is reasonable to expect proposed optional backup Well 2 to be capable of providing an operational pumping rate on the order of 5 to 10 gpm once it is successfully constructed and developed.
7. A Tier 2 WAA is not necessary for either the existing onsite well (Well 1), or the proposed optional backup well (Well 2), because:
    a. The proposed project well (Well 1) is located greater than 500 feet from the known and possible locations of offsite wells owned by others, and greater than 1,500 feet from the locations of known and possible offsite springs that are used for water supply purposes and are owned by others.
    b. The proposed optional backup well (Well 2), if constructed, would be located greater than 500 feet from the known and possible locations of offsite wells, and greater than 1,500 feet

from the locations of known and possible offsite springs that are used for water supply purposes and are owned by others.

8. A Tier 3 WAA is not necessary for either the existing onsite well (Well 1) or the proposed residential development or the proposed optional backup well (Well 2), because the proposed project well (Well 1) and the proposed optional backup well (Well 2) are both located outside of the County-defined Significant Streams 1,500 buffer areas.
9. RCS recommends initiation of groundwater monitoring at the subject property, in all existing and future onsite wells. This should include the frequent and ongoing monitoring of static and pumping water levels in all onsite wells, and the monitoring of instantaneous flow rates and cumulative pumped volumes from all active onsite pumping wells.

Closure/Disclaimer

This Memorandum regarding RCS's WAA for a proposed residential development project and drilling permit for a proposed optional new well at a newly formed parcel adjacent to 1200 Grandview Drive, in Napa, CA, has been prepared for Infinite Leisure LLC and applies only to the evaluation of the subject property for the requirements discussed herein. This WAA 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 conclusions or professional advice presented herein.

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Napa Valley Subbasin of the Napa-Sonoma Valley Groundwater Basin

Napa-Sonoma Lowlands Subbasin of the Napa-Sonoma Valley Groundwater Basin

N

0 2,000 Feet

Subject Property (ACE)

Property Under Common Ownership (ACE)

Significant Streams (PBES & LSCE, 2023a)

Significant Streams 1,500-foot Buffer (PBES & LSCE, 2023b)

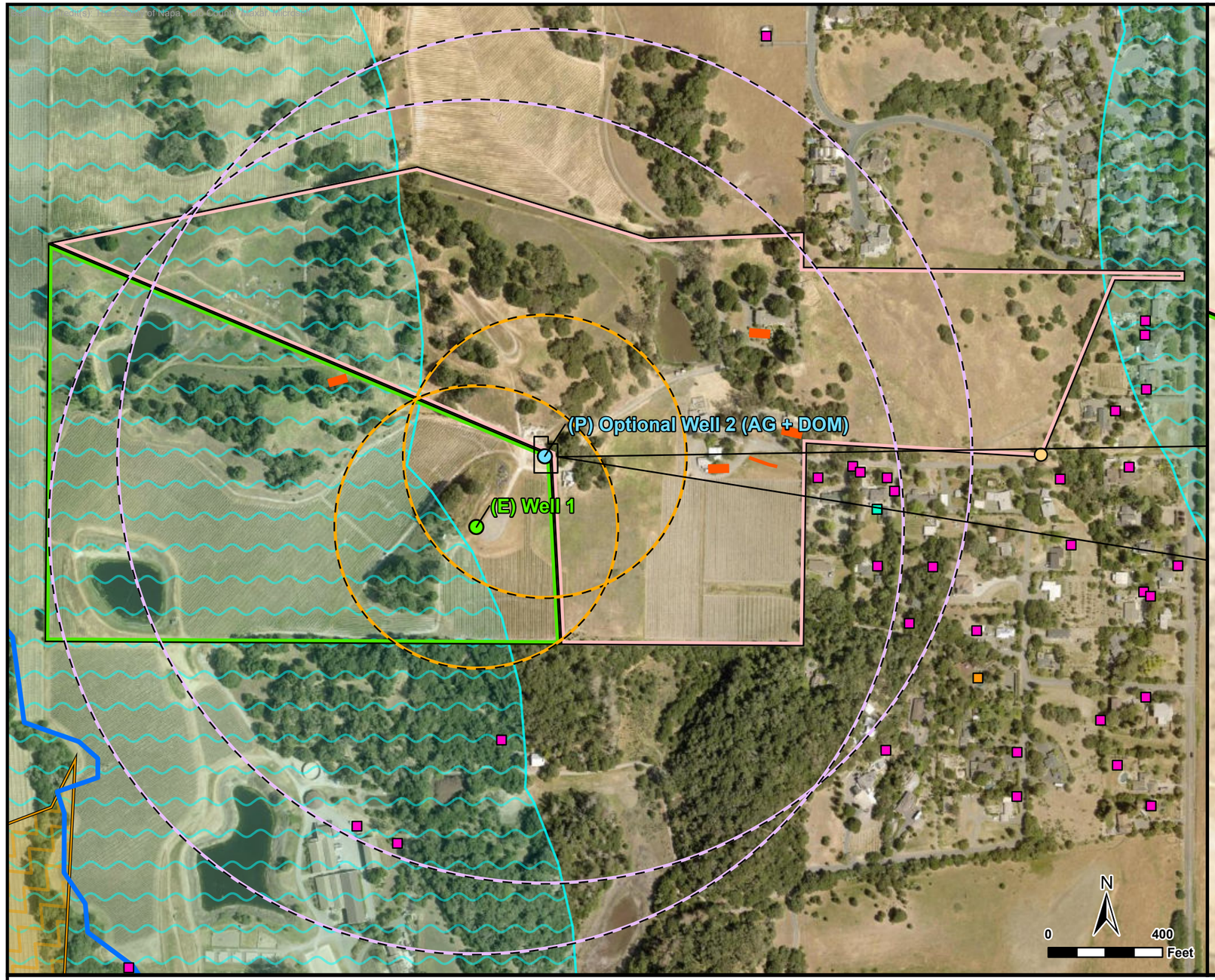
Groundwater Basin Boundary (DWR, 2021)

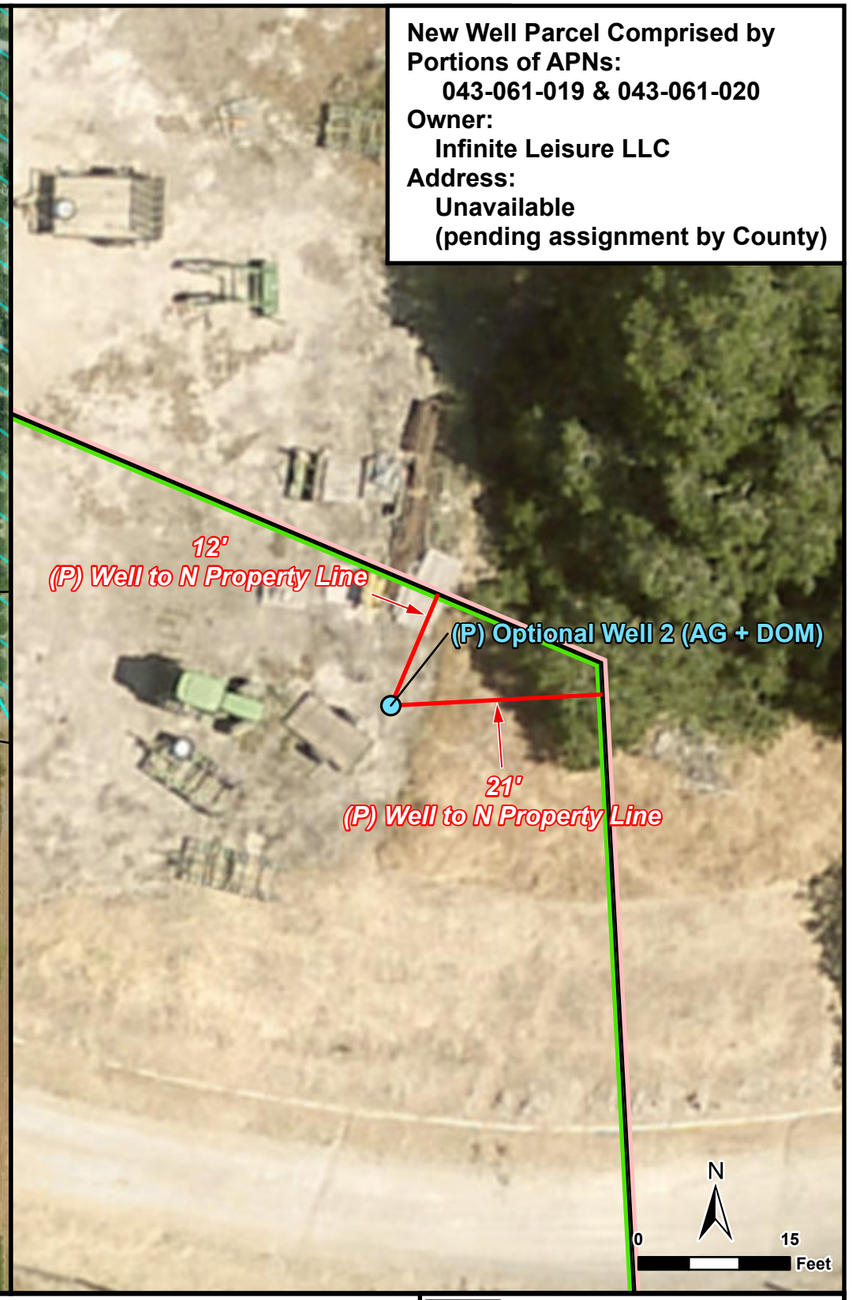
RCS

Figure 1
Regional Map

RCS Job No. 818-NPA01 **February 2024**

Cartographic Presentation by E. Linden. Spatial Reference Name: NAD 1983 StatePlane California II FIPS 0402 Feet.





New Well Parcel Comprised by Portions of APNs:
043-061-019 & 043-061-020
Owner:
Infinite Leisure LLC
Address:
Unavailable
(pending assignment by County)

- Subject Property (ACE)
- Property Under Common Ownership (ACE)
- Proposed (P) Optional Well 2
- Existing (E) Onsite Well 1
- Known Offsite Well Under Common Ownership
- Known or Possible Offsite Well
- Possible Offsite Well - Center of Parcel
- Possible Offsite Well - Possibly Destroyed
- 500-foot Buffer Around Existing or Proposed Onsite Well
- 1,500-foot Buffer Around Existing or Proposed Onsite Well
- Significant Streams (PBES & LSCE, 2023a)
- Significant Streams 1,500-foot Buffer (PBES & LSCE, 2023b)
- Groundwater Basin Boundary (DWR, 2021)
- Current or Proposed Septic System Component (ACE)

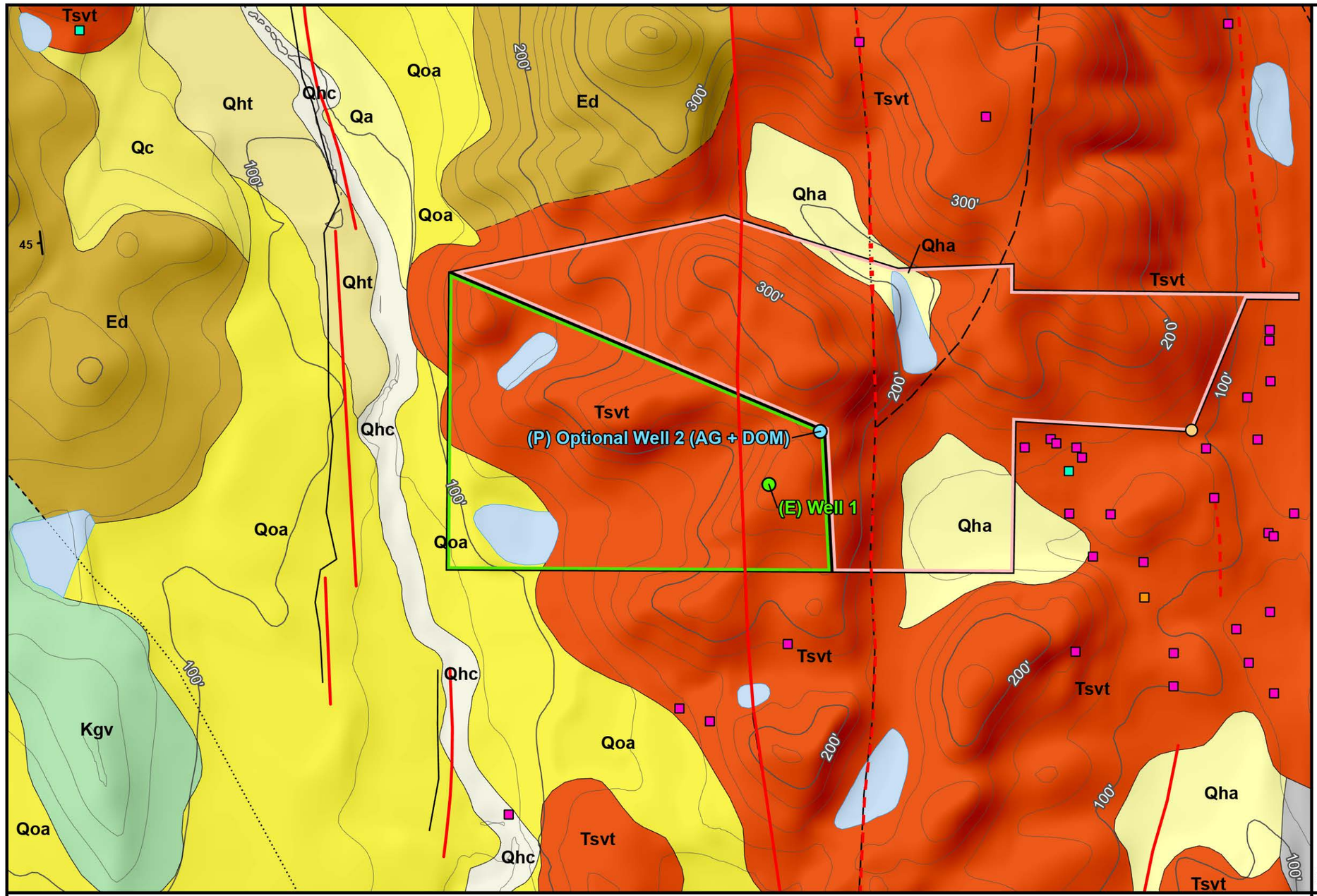
Note: All locations shown are approximate.

RCS

Figure 2
Property Map

RCS Job No. 818-NPA01 **February 2024**

Cartographic Presentation by E. Linden. Spatial Reference Name: NAD 1983 StatePlane California II FIPS 0402 Feet.



Geologic Legend

Recent Sedimentary Deposits

- **Qhc** — Stream channel deposits (modern <150 years to late Holocene)
- **Qha** — Alluvium, undivided (Holocene)
- **Qht** — Stream terrace deposits (Holocene, 10,000 years)
- **Qa** — Alluvium, undivided (Holocene to latest Pleistocene)
- **Qc** — Colluvium (Holocene to latest Pleistocene)
- **Qoa** — Alluvial deposits, undivided (late to early Pleistocene)

Sonoma Volcanics

- **Tsvt** — Tuff and sediments (Miocene to Pliocene)

Older Sedimentary Rocks

- **Ed** — Domengine Sandstone (Eocene)

Great Valley Sequence

- **Kgv** — Undivided sedimentary rocks (Cretaceous)

- Geologic contact, approximately located
- Geologic contact, certain
- Geologic contact, concealed
- Fault, approximately located
- Fault, certain
- Fault, concealed
- Fault, inferred
- 45 Bedding orientation, showing dip angle

Quaternary Faults (USGS, 2020a)

- Inferred location
- Moderately constrained location
- Well constrained location

Geologic map adapted from: Wagner, D.L., and Gutierrez, C.I. (2017). Preliminary Geologic Map of the Napa and Bodega Bay 30' x 60' Quadrangles, California. California Geological Survey.

LEGEND

- Existing (E) Onsite Well 1
- Proposed (P) Optional Well 2
- Offsite Well Under Common Ownership
- Subject Property (ACE)
- Property Under Common Ownership (ACE)

Possible Offsite Water Sources

- Known or Possible Offsite Well
- Well - Center of Parcel
- Well - Possibly Destroyed

Elevation Contours (Derived from USGS DEM, 2020b)

- 100-foot Contour (NAVD 88)
- 20-foot Contour (NAVD 88)

N

0 500 Feet

Note: All locations shown are approximate. Hillshade basemap derived from USGS DEM (2020b).

RCS

Figure 3
Geologic Map

RCS Job No. 818-NPA01 **February 2024**

Cartographic Presentation by E. Linden. Spatial Reference Name: NAD 1983 StatePlane California II FIPS 0402 Feet.

MEMORANDUM

APPENDIX

STATE WELL COMPLETION REPORT,

COUNTY WELL PERMIT,

&

WELL INSPECTION REPORT WITH PUMPING TEST

FOR

ONSITE WELL 1

Environmental

Cover Sheet

APN	043-061-019-000
Permit #	
Program	WELL
DocType	WL
Street #	1200
Street Name	Grandview
Year	1999

QUADRUPLICATE
For Local Requirements

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 819471

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Page ___ of ___
Owner's Well No. 1
Date Work Began 8-14-99 , Ended 9-2-99
Local Permit Agency NAPA COUNTY
Permit No. 96-11221 Permit Date 8-9-99

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID MUD

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	3	TOP SOIL
3	180	BROWN VOLCANIC
180	256	BLACK VOLCANIC
256	360	VERY HARD BASALT
360	418	HARD BLACK VOLCANIC

RECEIVED
DEC 22 1999
DEPT OF
ENVIRONMENTAL MANAGEMENT

TOTAL DEPTH OF BORING 418 (Feet)
TOTAL DEPTH OF COMPLETED WELL 406 (Feet)

WELL OWNER

Name [redacted]
Mailing Address [redacted]
CITY [redacted] STATE [redacted] ZIP

WELL LOCATION

Address 1200 GRANDVIEW DRIVE
City NAPA
County NAPA
APN Book 43 Page 061 Parcel 19
Township ___ Range ___ Section ___
Latitude ___ DEG. ___ MIN. ___ SEC. NORTH
Longitude ___ DEG ___ MIN. ___ SEC. WEST

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

*Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USES (✓)

WATER SUPPLY
X Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ___
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 150 (Ft.) & DATE MEASURED ___
ESTIMATED YIELD * 20 (GPM) & TEST TYPE AIRLIFT
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
** May not be representative of a well's long-term yield.*

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	CASING (S) TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	150	9	X				PVC	6	200	
150	250	9		X			PVC	6	200	.032
250	320	9	X				PVC	6	200	
320	406	9		X			PVC	6	200	.032

DEPTH FROM SURFACE Ft.	to Ft.	ANNULAR MATERIAL TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	20	X			
20	406			X	GRAVEL

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME A & K DRILLING, INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

P.O. BOX 750143 PETALUMA CA 94975
ADDRESS CITY STATE ZIP

Signed ___ 12-7-99 720534
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Environmental

Cover Sheet

APN	043-061-019-000
Permit #	
Program	WEH
DocType	PMT
Street #	1200
Street Name	Grandview
Year	1999

13

DATE 8-11-99
FEE 119.00
RECEIPT NO. 10359
BY V. Cardoza

A.P.# 43-061-19
RECORD # 96-11244

NAPA COUNTY
DEPT. OF ENVIRONMENTAL MANAGEMENT
APPLICATION & PERMIT TO CONSTRUCT A WATER WELL

NAME NICK TSIPLAKOS (Owner) ADDRESS 1200 GRANDVIEW DRIVE, NAPA (Job Location)
PHONE # 707 585-1045
NAME A & K DRILLING, INC. (Well Driller) ADDRESS P.O. BOX 750143, PETALUMA 94975

TYPE OF WORK
New Class I PERMIT X Test Hole Date Called In
New Class II PERMIT U.S.G.S. Map Received
Well Reconstruction Well Deepening Horizontal Well
Well Destruction High Hazard Low Hazard Hand Dug

PROPOSED USE
DOMESTIC X IRRIGATION X INDUSTRIAL MUNICIPAL
TEST WELL HOT WATER (D.O.G. Clearance) OTHER

Sewage Disposal System (existing or proposed) Public Individual X Private
Distance from well to any part of nearest sewage disposal system 250 feet.
Septic System Location Determined By:
Plot plan of well location received County road setback ft. from centerline.

WORKER'S COMPENSATION COVERAGE: (Check one of the following)
X A certificate of current Worker's Compensation Insurance coverage is presently on file with this office.
___ A certificate of current Worker's Compensation Insurance is being filed with this application.
___ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Worker's Compensation laws in California.

****

TERMS OF PERMIT

1) Call at least 24 hours in advance to schedule an inspection.
2) Prior to receiving a Final Clearance on the well, a copy of the Department of Water Resources "Water Well Drillers Report" (DWR-188) must be returned to our Department.

Old Wells to be Destroyed:
Other Remarks:

Signature of Applicant — Date 13 Aug 99

****

FOR OFFICE USE ONLY

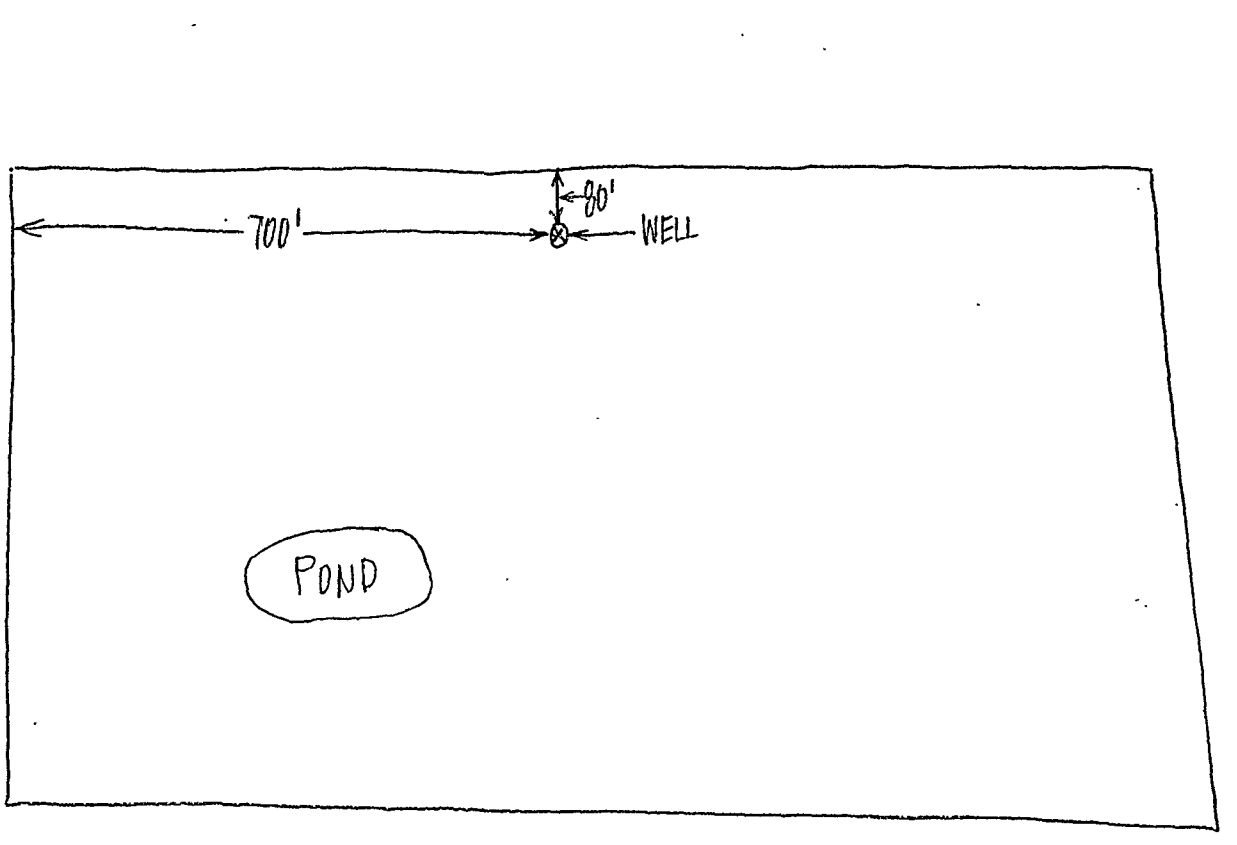
	Date	By	Remarks
City Clearance			
Pub. Works Clearance			
Pre-Inspection			
Class II Approval			
Permit Issued	8/13/99	LK	
Const. Insp.			
Well Log Rec.			
Final Insp.			

White-Office Yellow-Owner Pink-Contractor
EHM Form Letter#6 / 12-14-88

HUCKFELDT
WELL DRILLING

NICK TSIPLAKOS
1200 GRANDVIEW DRIVE
NAPA CA 94558
AP # 43-061-19

RECEIVED
AUG 13 1999
DEPT. OF
ENVIRONMENTAL MANAGEMENT



2110 PENNY LANE • NAPA, CALIFORNIA 94559 • 707-255-7923 • FAX 252-4651

C9

DATE 9 Aug 99
FEE 119
RECEIPT NO. 10216
BY DLP
Ck #864

A.P.# 43-061-[illegible]
RECORD # 96-1121

NAPA COUNTY
DEPT. OF ENVIRONMENTAL MANAGEMENT
APPLICATION & PERMIT TO CONSTRUCT A WATER WELL

NAME Nick Esipka Kos (Owner) ADDRESS 1200 Grandview Drive Napa (Job Location)

PHONE # 707-762-5269

NAME AEK Drilling (Well Driller) ADDRESS PO Box 750143 Petaluma Ca 94975

TYPE OF WORK
New Class I PERMIT ✓ Test Hole Date Called In _____
New Class II PERMIT _____ U.S.G.S. Map Received _____
Well Reconstruction _____ Well Deepening _____ Horizontal Well _____
Well Destruction _____ High Hazard _____ Low Hazard _____ Hand Dug _____

PROPOSED USE
DOMESTIC X IRRIGATION _____ INDUSTRIAL _____ MUNICIPAL _____
TEST WELL _____ HOT WATER _____ (D.O.G. Clearance _____) OTHER _____

Sewage Disposal System (existing or proposed) Public _____ Individual X Private _____
Distance from well to any part of nearest sewage disposal system 250 feet.
Septic System Location Determined By: Owner
Plot plan of well location received Yes County road setback _____ ft. from centerline.

WORKER'S COMPENSATION COVERAGE: (Check one of the following)
___ A certificate of current Worker's Compensation Insurance coverage is presently on file with this office.
___ A certificate of current Worker's Compensation Insurance is being filed with this application.
___ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Worker's Compensation laws in California.

****

TERMS OF PERMIT

1) Call at least 24 hours in advance to schedule an inspection.
2) Prior to receiving a Final Clearance on the well, a copy of the Department of Water Resources "Water Well Drillers Report" (DWR-188) must be returned to our Department.

Old Wells to be Destroyed: _____
Other Remarks: _____

Signature of Applicant — 9 Aug 99 Date

****

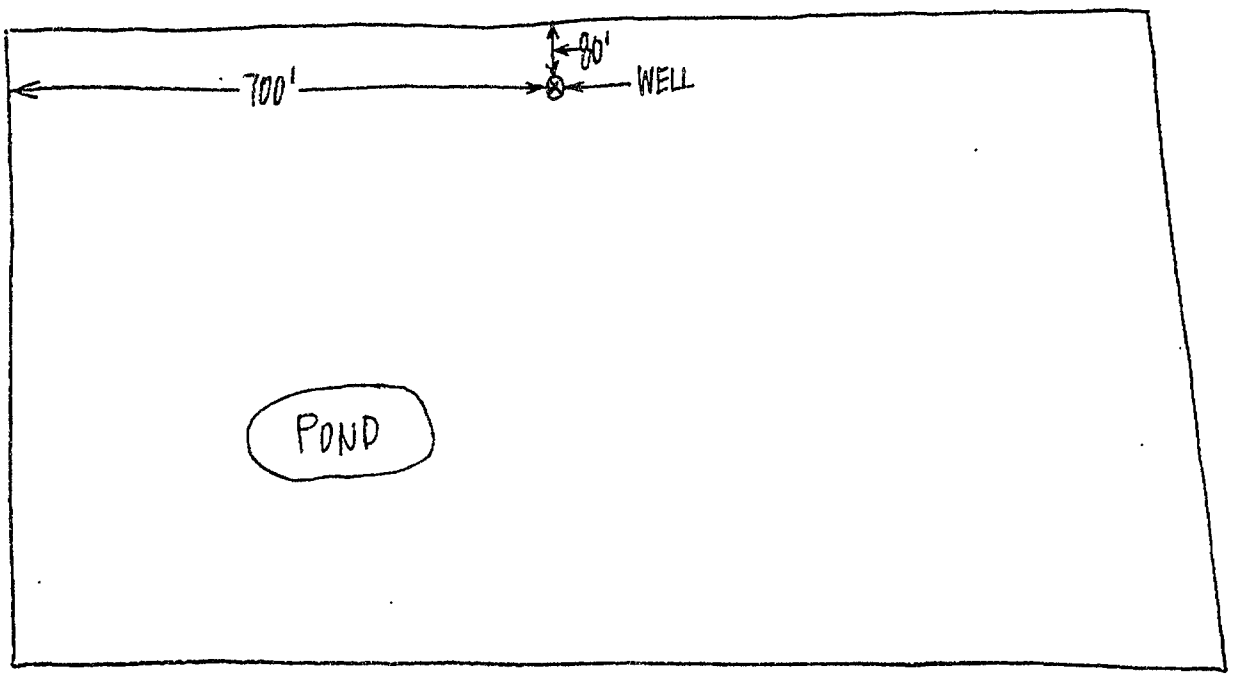
FOR OFFICE USE ONLY

	Date	By	Remarks
City Clearance			
Pub. Works Clearance			
Pre-Inspection			
Class II Approval			
Permit Issued	8/9/99	GK	
Const. Insp.			
Well Log Rec.	12/30/99	KW	
Final Insp.			

White-Office Yellow-Owner Pink-Contractor
EHM Form Letter#6 / 12-14-88

A & K DRILLING
LIC. NO. ~~387890~~ 720531
P.O. BOX 750143
PETALUMA, CALIFORNIA 94975
(707) 762-5264 (707) 585-1045

NICK TSIPLAKOS
1200 GRANDVIEW DRIVE
NAPA CA 94558
AP # 43-061-19



DATE 9 Aug 99
FEE 119
RECEIPT NO 10216
BY DLP
CK #864

Well #1

A.P.# 43-061-19
RECORD # 96-1121

NAPA COUNTY
DEPT. OF ENVIRONMENTAL MANAGEMENT
APPLICATION & PERMIT TO CONSTRUCT A WATER WELL

NAME Nick Tsipka Kos (Owner) ADDRESS 1200 Grandview Drive Napa (Job Location)

NAME AEK Drilling (Well Driller) PHONE # 707-762-5269
ADDRESS PO Box 750143 Petaluma Ca 94975

TYPE OF WORK
New Class I PERMIT ✓ Test Hole Date Called In _____
New Class II PERMIT _____ U.S.G.S. Map Received _____
Well Reconstruction _____ Well Deepening _____ Horizontal Well _____
Well Destruction _____ High Hazard _____ Low Hazard _____ Hand Dug _____

PROPOSED USE
DOMESTIC X IRRIGATION _____ INDUSTRIAL _____ MUNICIPAL _____
TEST WELL _____ HOT WATER _____ (D.O.G. Clearance _____) OTHER _____

Sewage Disposal System (existing or proposed) Public _____ Individual X Private _____
Distance from well to any part of nearest sewage disposal system 250 feet.
Septic System Location Determined By: Owner
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Old Wells to be Destroyed: _____
Other Remarks: _____

Signature of Applicant — 9 Aug 99 Date

****

FOR OFFICE USE ONLY

	Date	By	Remarks
City Clearance			
Pub. Works Clearance			
Pre-Inspection			
Class II Approval			
Permit Issued	8/9/99		
Const. Insp.	9/10/99		21' seal, 10" borehole, 5" casing
Well Log Rec.			
Final Insp.			

White-Office Yellow-Owner Pink-Contractor

Groundwater Ordinance, Revised 7/27/99
ADOPTED 8/2/99, EFFECTIVE 9/2/99

AN ORDINANCE OF THE BOARD OF SUPERVISORS OF THE COUNTY OF NAPA AMENDING THE NAPA COUNTY CODE TO ESTABLISH FINDINGS AND PERMIT REQUIREMENTS FOR THE EXTRACTION AND USE OF PUMPED GROUNDWATER AS A WATER SOURCE ON AFFECTED PROPERTIES.

Chapter 13.15 GROUNDWATER CONSERVATION

Sections:

13.15.010 Title. This chapter implements the Napa County Groundwater Conservation Ordinance.

13.15.015 Groundwater Permit Required. No applications filed pursuant to division I of title 13 of this code for development of a new water system or improvement of an existing water system within Napa County that may use groundwater as a water source on the affected property shall be approved by any employee, department or body of Napa County until the applicant has obtained a groundwater permit if required by this chapter. Prior to the issuance of a building permit pursuant to chapter 15.08.040, or any other permit or administrative approval facilitating the development or use of any lot that may utilize a groundwater supply, this chapter must first be satisfied. Prior to the final approval of a subdivision a groundwater permit must be secured if an existing, new or improved water system will provide groundwater to the subdivision.

13.15.030. Classification of Applications. Applications described in section 13.15.020 shall be classified as follows for the purpose of determining whether a groundwater permit is required under this Chapter:

A. **Applications exempt from groundwater permit requirement.**

1. In the case of uses permitted without a use permit under any provision of this Code, applications to develop or improve an on-parcel water source, or an off-parcel water source serving a single contiguous parcel, are exempt from the requirement that a groundwater permit must be secured under this chapter, unless the water source :

Phone: 707 823 3191 **Fax:** 707 317 0057 **Email:** rayswelltesting@gmail.com **Lic#**:903708
Address: 4853 Vine Hill Rd, Sebastopol Ca 95472

Date: 08/12/21
Report #: 12838
Report By: Cody Monday

Subject Property Address: 1200 Grandview Dr, Napa CA 94558
Customer Name: George Tsiplakos

WELL DATA:

Location/Description of well:	Upper Well
Type of Well:	Drilled
Depth of Well:	Measured 376 Feet
Diameter of Well Casing:	6” PVC
Sanitary Seal (plate seal at top of well):	Capped
Annular Well Seal (in ground seal of bore hole):	20 Feet Cement

PUMP DATA:

Pump HP and Type:	Test Pump
Depth of Pump Suction:	Test Pump Set 360'.
Size of Tee at Well Head:	Test Pump
Submersible Cable Size:	Test Pump
Water Level Control:	Test Pump
Backpressure Test:	Test Pump

WELL PRODUCTION SUMMARY (see next page for pumping log):

Length of Test:	5 Hour 30 Minutes
Type of Test:	Drawdown and constant pumping level

Static Water Level:	141 Feet	**Starting Flow**	14.9 GPM
Water Level Drawdown:	219 Feet		
Final Pumping Level:	360 Feet	**Final Flow**	5.5 GPM

WELL PRODUCTION DATA & PUMPING LOG:

Date	Time	Interval	Water Level	Appearance	Sulfur Odor	Sand	GPM
08/12/21	09:35 AM	0 Minutes	141	Yellow Tint	No	No	14.9
08/12/21	09:50 AM	15 Minutes	215	Yellow Tint	No	No	14
08/12/21	10:05 AM	15 Minutes	249.8	Grey	No	2 Cups Fine Grey	11.9
08/12/21	10:20 AM	15 Minutes	275.8	Grey	No	Trace Fine Grey	10.5
08/12/21	10:35 AM	15 Minutes	294.5	Grey	No	Trace Fine Grey	10
08/12/21	11:05 AM	30 Minutes	343	Light Grey	No	No	12
08/12/21	11:35 AM	30 Minutes	360	Slight Yellow Tint	No	No	6.8
08/12/21	12:05 PM	30 Minutes	360	Slight Yellow Tint	No	No	6.8
08/12/21	12:35 PM	30 Minutes	360	Slight Yellow Tint	No	No	6.8
08/12/21	01:05 PM	30 Minutes	360	Slight Yellow Tint	No	No	5.5
08/12/21	01:35 PM	30 Minutes	360	Slight Yellow Tint	No	No	5.5
08/12/21	02:05 PM	30 Minutes	360	Slight Yellow Tint	No	No	5.5
08/12/21	02:35 PM	30 Minutes	360	Slight Yellow Tint	No	No	5.5
08/12/21	03:05 PM	30 Minutes	360	Slight Yellow Tint	No	No	5.5

Final Pumping Level: 360 Feet
Final Flow Rate: 5.5 GPM

Water levels and well depth are measured as feet below top of well casing unless otherwise noted.

DISCLAIMER:
Results of well production are accurate only at time of test. We cannot predict future production or water yield.

WATER QUALITY: (The following samples are being analyzed, please refer to follow up report)
Analysis Choice: Basic Residential/Irrigation **Turnaround:** Standard