“E”

Revised Water Availability Analysis

Benjamin Ranch Winery, Use Permit Application No. P13-00371-UP
Planning Commission Hearing, May 19, 2021

BARTELT ENGINEERING

WATER AVAILABILITY ANALYSIS FOR THE BENJAMIN RANCH WINERY 8895 CONN CREEK ROAD, NAPA COUNTY, CA APN 030-120-016

As required by Napa County Planning, Building & Environmental Services (PBES), this study outlines availability of groundwater for a potential winery located at 8895 Conn Creek Road, Napa County, CA.

PROJECT DESCRIPTION

The project proposes the installation of a Visitors Center, commercial kitchen, and full crush winery on a 54.64± acre parcel with the intent of the facility having the capability of producing 475,000 gallons of wine per year. The parcel is currently developed with a vineyard manager's office, 47.5± acres of vineyard, miscellaneous structures associated with vineyard operations and access roads. The project also proposes a Lot Line Adjustment increasing the parcel size to 63.97± acres. Refer to the attached Use Permit drawings for the existing and proposed development.

Along with the proposed wine production at the site, the project proposes a moderate staffing and marketing plan which includes the following for the proposed winery: 30 year around full-time employees, 5 seasonal dayshift (harvest) employees and 5 seasonal swing shift (harvest) employees and the following for the proposed Visitors Center: 15 year around full-time employees and 5 part-time employees. 1 additional year around full-time employee is added to account for the onsite Vineyard Manager. The project proposes to offer private tours and tastings for a maximum number of 150 guests per day Monday through Wednesday and 300 guests per day Thursday through Sunday. The project also proposed to offer Large Events for a maximum of 150 guests that may occur Monday through Sunday up to an annual maximum of 8 events – no more than 2 large events may occur in a given month – no more than 1 large event may occur on any given day. The winery may also hold an event related to the Auction Napa Valley. In no case shall the daily combined tours and tastings and marketing event visitation exceed 300 guests. All marketing events will serve food provided by an offsite caterer.

EXHIBITS

The associated USGS "Topographic Site Location Map" shows the project site, the locations of the existing "Project well", the "Replacement Project well", as well as the approximate property line locations. Information regarding the location of existing wells and structures are shown on the associated Use Permit Drawings prepared by Bartelt Engineering.

GROUNDWATER OVERVIEW

According to the Napa County Watershed Information & Conservation Council (WICC), the parcel is primarily located in the St. Helena Groundwater Subarea of Napa County. The Napa County Groundwater Monitoring Program tested wells in this area in 2014 and 2015. The observed groundwater depth in these wells ranged from 44 feet to 240 feet below ground surface. Ground elevations range from 90 feet to 150 feet, mean sea level.

The groundwater availability in this subarea is reported to be stable and as the well for this project is on the valley floor, a recharge analysis will not be conducted at this time.

Water Use Criteria

TABLE 1: SCREENING CRITERIA	
Parcel Zoning	Agricultural Preserve (AP)
Project Parcel Location	Napa Valley Floor
Parcel Size (Existing)	54.64± acres
Parcel Size (Proposed)	63.97± acres
Water Use Criteria	1 acre-feet per acre per year
Well and Spring Interference	None Anticipated
Groundwater/Surface Water Interaction	No
Screening Tier	Tier 1

The subject parcel is located within the Agricultural Preserve (AP) Zoning District sub-watershed area of the Mouth of Napa River watershed. Per the PBES Water Availability Analysis (WAA)-Guidance Document dated May 12, 2015 the water use criteria for a parcel located in the Napa Valley Floor and not designated as a groundwater deficient area without any well or spring interference must follow Tier 1 requirements.

WATER DEMAND

The total water demand for the existing and proposed uses for the project is calculated below based on the Guidelines for Estimating Residential and Non-residential Water Use from the WAA Guidance Document (2015):

TABLE 2A: EXISTING WATER DEMAND	
Description	**Estimated Water Usage (acre-feet/year)**
Vineyard Manager's Office	0.01
Vineyard (47.5± acres)	
Irrigation	14.25
Heat and Frost Protection	23.75
Total Existing Water Demand =	38.01

TABLE 2B: PROPOSED WATER DEMAND	
Description	**Estimated Water Usage (acre-feet/year)**
Winery (475,000 gallons per year)	
Process Water	10.21
Employees	0.55
Landscaping Water[1]	1.32
Visitors Center	
Employees and Kitchen	0.55
Landscaping Water[1]	0.85
Vineyard Manager's Office	0.01
Vineyard (45.7± acres)	
Irrigation	13.71
Heat and Frost Protection	22.85
Tours and Tastings (150 guests per day; M, T, W)	0.13
Tours and Tastings (300 guests per day; Th, F, Sa, Su)	0.34
Large Events plus Auction Napa Valley (9 events per year; 150 guests per event and 10 event staff)	0.02
Subtotal =	50.54
Vineyard Irrigation Credit for Treated Wastewater Reuse	-8.75
Total Proposed Water Demand =	41.79

As shown in Table 2A and Table 2B, the water demand is estimated to increase from 38.01 to 50.54 acre feet per year as part of the proposed improvements. Treated winery process wastewater is proposed to be beneficially reused as a source for vineyard irrigation. Reusing treated process wastewater for vineyard irrigation will reduce the proposed water demand by 8.75 acre-feet/year to 41.79 acre feet per year. Refer to the Onsite Wastewater Dispersal Feasibility Study prepared by Bartelt Engineering for further information regarding the proposed reuse of treated winery process wastewater for vineyard irrigation.

ALLOWABLE WATER ALLOTMENT[2]

The following calculation is based on the fact that the entire parcel lies in an area designated as "Valley Floor".

1.0 acre-feet/acre of water is allotted for parcels located on the Valley Floor.

[1] Landscape irrigation estimates provided by CBH Design, Inc.
[2] Calculation based on the Napa County Policy for water usage.

EXISTING PARCEL CONFIGURATION

Allowable water allotment = 54.64± acres x 1.0 acre-feet/year = 54.64± acre-feet/year

PROPOSED PARCEL "1" CONFIGURATION

Allowable water allotment = 63.97± acres x 1.0 acre-feet/year = 63.97± acre-feet/year

The above analysis shows that the projected water usage will be more than the current water usage and less than the allowable water allotment for the subject parcel.

SOURCE WATER INFORMATION

The parcel currently sources water from a number of existing onsite wells. The "Project well" is located northwest of the proposed winery facility in the proximity of the existing irrigation wells. The project proposes to use the "Project well" as the water source for the proposed project which must be capable of meeting the water demand shown in Table 2B. If it is determined that a new well will need to be drilled for the project, the "Replacement Project well" would be located southwest of the proposed winery facility.

According to the Property Owner, the wells serving this parcel are capable of producing flow rates in excess of 100 gallons per minute (gpm). Well water will be used to satisfy irrigation, domestic, production, and fire protection requirements. Groundwater will be pumped from the "Project well" or "Replacement Project well" into onsite storage tanks for use.

Prior to use, domestic water is proposed to be stored in a 40,000± gallon storage tank. Treated Process Wastewater used for irrigation is proposed to be stored in a 126,000 gallon storage tank and fire protection water is also proposed to be stored in a separate 126,000 gallon storage tank.

Well Description

At the time this study was prepared, it was not determined if any of the existing on-site wells were constructed with a minimum 50-foot seal. It will be necessary to verify the construction of the "Project well" prior to construction of the proposed winery and Visitors Center. If the existing "Project well" was not constructed with a 50-foot minimum annular seal, it will most likely be necessary to drill a "Replacement Project well" to comply with the annular seal depth requirement and satisfy domestic and production demands. If the construction of a new "Replacement Project well" is required, the proposed project will use the existing well(s) to pump groundwater to proposed onsite vineyard irrigation pond, irrigation tank(s) and fire protection storage tank and the new constructed well will be used to pump groundwater to proposed domestic storage tank(s).

Under proposed conditions, groundwater will be pumped from the "Project well" or "Replacement Project well" into onsite storage tanks and then supplied to the Visitors Center and production facility. The tank(s) will allow stored water to be distributed as appropriate.

Yield Test

Yield tests were performed on 2 of the existing wells that are believed to have been constructed with the required 50-foot minimum seal at the time of drilling. Prior to the start of the yield test, static water level was recorded at 40 feet below surface. A sustained yield of over 100 gallons per minute (gpm) was recorded after 6 and 4 hours of continuous pumping.

Water System Classification

A Non-Transient – Non-Community Water System (NTNCWS) is identified as a water system that has less than 5 connections, serves less than 25 yearlong residents[3], serves 25 people per day at least 60 days per year and serves 25 or more of the same people at least 6 months out of the year. The 10 seasonal employees are not considered yearlong residents. Although the proposed project serves less than 5 connections and serves less than 25 yearlong residents; it does serve 25 or more of the same people per day at least 60 days per year and a commercial kitchen is proposed. Therefore, under PBES guidelines, the Benjamin Ranch Winery may be required to operate and maintain a regulated non-transient-non-community water system (NTNCWS) as a result of the proposed Use Permit Application. Refer to the Technical, Managerial and Financial (TMF) Capacity Worksheet included with the Use Permit Application for further information.

Neighboring Water Source(s)

Based on review of neighboring property records at Napa County PBES and discussions with PBES staff, there appears to be 1 adjacent well and 1 neighboring well located within 500 feet of the location of the "Project well" all of which are also owned by the applicant and are used for irrigation. The proposed location of the "Replacement Project well" is located such that none of the existing wells fall within 500 feet of its location. Refer to the associated Use Permit Drawings prepared by Bartelt Engineering for location of the existing onsite wells, neighboring wells, "Replacement Project well", and nearby creek.

Water Quality

Water quality results were not available for the "Project well" prior to completion of this WAA.

SUMMARY

The groundwater demand generated as a result of the proposed development is estimated to increase from 38.01 acre-feet per year (see Table 2A) to 41.79 acre-feet per year and is well below the allowable of 63.97± acre-feet per year for the proposed parcel configuration (see Table 2B). The "Project well" has a reported yield rate of 100 gpm which is more than capable of meeting the proposed water demand and the "Replacement Project well" is anticipated to have a similar yield rate.

[3] Yearlong resident is considered an individual served by the water system for 183 or more days annually and does not include seasonal employees.

CONCLUSION

The estimated water demand for the parcel associated with the proposed Benjamin Ranch Winery Use Permit Application is projected to be less than the allowable water allotment in accordance with the Napa County Water Availability Policy.

The above analysis shows that the groundwater demand for the proposed project can feasibly be sourced by the existing "Project well" or "Replacement Project well". Furthermore, the estimated available water for the subject parcel satisfies the Tier 1 Water Use Criterion of the Napa County Water Availability Analysis.

ATTACHMENTS

Appendix A – Water Budget Worksheet, Benjamin Ranch – Winery Building

Appendix B – Water Efficient Landscape Worksheet, Benjamin Ranch – Winery Building

Appendix A – Water Budget Worksheet – Benjamin Ranch Winery Visitors Center

Appendix B – Water Efficient Landscape Worksheet – Benjamin Ranch Winery Visitors Center

USGS "Topographic Site Location Map"

Well Completion Reports (5)

REFERENCES

Napa County 2015, May 12. Water Availability (WAA) - Design, Construction and Guidance Document.

Napa County Watershed Information & Conservation Council (WICC). (n.d.). Retrieved from www.napawatershed.org

APPENDIX A
WATER BUDGET WORKSHEET
BENJAMIN RANCH WINERY - WINERY BUILDING

The following calculations will help you determine your site-specific water budget and establish a planting mix that will allow you to meet your water budget. **Your Estimated Total Water Use must be less than your Maximum Applied Water Allowance.**

ENTER DATA IN LAVENDER-SHADED CELLS ONLY. CALCULATIONS ARE AUTOMATIC.

1.) **Maximum Applied Water Allowance (MAWA)**

MAWA = (ETo) (0.62) [(0.6x LA) + (0.4 x SLA)]

Where:
ETo = Annual Net Reference Evapotranspiration (inches)
0.62 = Conversion factor (to gallons)
0.6 = ET Adjustment Factor
LA = Landscape Area including SLA (square feet)
SLA = Portion of the landscape area identified as Special Landscape Area (square feet)
0.4 = the additional ET adjustment factor for Special Landscape Area (1.0 - 0.6 = 0.4)

A.) Net Evapotranspiration Calculation

44.1 (Annual ETo)				
24.00 (Annual Rainfall)	x	.25	=	6.00 (Effective Rainfall)

Annual Net Reference Evapotranspiration = Annual ETo - Effective Rainfall = 38.10

B.) Adjusted Landscape Area Calculation

44478 (Landscape Area, including SLA)	x 0.6 (Adjustment Factor)	=	26687
0 (Special Landscape Area)	x 0.4 (Adjustment Factor)	=	0
	Sum of Adjusted Landscape Area	=	26687

MAWA = 38.10 x 0.62 x 26687 = 630396.00 gallons

2.) **Estimated Total Water Use (ETWU)**

A.) Net Evapotranspiration Calculation

Annual Net Reference Evapotranspiration = Annual ETo - Effective Rainfall = 38.10

B.) Adjusted Landscape Area Calculation, excluding SLA

44478 (Low Water Use Area, sq.ft.)	x 0.3 (Plant Factor)	=	13,343.40
0 (Moderate Water Use Area, sq.ft.)	x 0.6 (Plant Factor)	=	0
0 (High Water Use Area, sq.ft.)	x 1.0 (Plant Factor)	=	0
	Sum of Adjusted Landscape Area	=	13,343

C.) Special Landscape Area (SLA), sq.ft. = 0

ETWU = 38.10 x 0.62 x (13,343 / 0.85 + 0) = 370821 gallons

Irrigation Efficiency Factor	
% of total landscape area irrigated with Drip	
0-25%	0.71
26-50%	0.75
51-75%	0.80
76-100%	0.85

Appendix B – Sample Water Efficient Landscape Worksheet

BENJAMIN RANCH WINERY - Winery Building

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the project applicant and it is a required element of the Landscape Documentation Package.

Reference Evapotranspiration (ETo) 44.1

Hydrozone # / Planting Description[a]	Plant Factor (PF)	Irrigation Method[b]	Irrigation Efficiency (IE)[c]	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF x Area	Estimated Total Water Use (ETWU)[e]	
Regular Landscape Areas								
ZONES								
#1	0.3	DRIP	0.85	0.35	546	192.7	5,269	
#2	0.3	DRIP	0.85	0.35	4075	1438.2	39,324	V - .1
#3	0.3	DRIP	0.85	0.35	2832	999.5	27,329	L - .3
#4	0.3	DRIP	0.85	0.35	4131	1458.0	39,865	M - .6
#5	0.3	DRIP	0.85	0.35	4200	1482.4	40,530	H - 1.0
#6	0.3	DRIP	0.85	0.35	70	24.7	676	
#7	0.3	DRIP	0.85	0.35	1205	425.3	11,628	
#8	0.3	DRIP	0.85	0.35	615	217.1	5,935	
#9	0.3	DRIP	0.85	0.35	2191	773.3	21,143	
#10	0.3	DRIP	0.85	0.35	486	171.5	4,690	
#11	0.3	DRIP	0.85	0.35	5213	1839.9	50,306	
#12	0.3	DRIP	0.85	0.35	4889	1725.5	47,179	
#13	0.3	DRIP	0.85	0.35	5724	2020.2	55,237	
#14	0.3	DRIP	0.85	0.35	3187	1124.8	30,755	
#15	0.3	DRIP	0.85	0.35	4527	1597.8	43,686	
#16	0.3	DRIP	0.85	0.35	587	207.2	5,665	
				Totals	44,478	15,698	**429,218**	
Special Landscape Areas								
NONE				1	0	0		
				1	0	0		
				1	0	0		
				Totals		0	**0**	
						ETWU Total	**429,218**	
						Maximum Allowed Water Allowance (MAWA)[e]	**630,396**	

[a]Hydrozone #/Planting Description
E.g
1.) front lawn
2.) low water use plantings
3.) medium water use planting

[b]Irrigation Method
overhead spray or drip

[c]Irrigation Efficiency
0.75 for spray head
0.81 for drip

***[d]ETWU* (Annual Gallons Required) =** *Eto x 0.62 x ETAF x Area*
where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year.

[e]MAWA (Annual Gallons Allowed)
= (Eto) (0.62) [(ETAF x LA) + ((1-ETAF) x SLA)]
where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year, LA is the total landscape area in square feet, SLA is the total special landscape area in square feet,
and **ETAF is .55 for residential areas and 0.45 for non-residential areas.**

ETAF Calculations

Regular Landscape Areas

Total ETAF x Area	(B)	15,698
Total Area	(A)	44,478
Average ETAF	**B ÷ A**	**0.35**

Average ETAF for Regular Landscape Areas must be:
0.55 or below for residential areas
0.45 or below for non-residential areas.

All Landscape Areas

Total ETAF x Area	(B+D)	15,698
Total Area	(A+C)	44,478
Sitewide ETAF	**(B+D) ÷ (A+C)**	**0.35**

APPENDIX A
WATER BUDGET WORKSHEET
BENJAMIN RANCH WINERY - Visitor's Center

The following calculations will help you determine your site-specific water budget and establish a planting mix that will allow you to meet your water budget. **Your Estimated Total Water Use must be less than your Maximum Applied Water Allowance.**

ENTER DATA IN LAVENDER-SHADED CELLS ONLY. CALCULATIONS ARE AUTOMATIC.

1.) **Maximum Applied Water Allowance (MAWA)**

MAWA = (ETo) (0.62) [(0.6x LA) + (0.4 x SLA)]

Where:
ETo = Annual Net Reference Evapotranspiration (inches)
0.62 = Conversion factor (to gallons)
0.6 = ET Adjustment Factor
LA = Landscape Area including SLA (square feet)
SLA = Portion of the landscape area identified as Special Landscape Area (square feet)
0.4 = the additional ET adjustment factor for Special Landscape Area (1.0 - 0.6 = 0.4)

A.) Net Evapotranspiration Calculation

44.10 *(Annual ETo)*

24.00 *(Annual Rainfall)* x .25 = 6.00 *(Effective Rainfall)*

Annual Net Reference Evapotranspiration = Annual ETo - Effective Rainfall = 38.10

B.) Adjusted Landscape Area Calculation

31987 *(Landscape Area, including SLA)* x 0.6 *Adjustment Factor* = 19192

0 *(Special Landscape Area)* x 0.4 *Adjustment Factor* = 0

Sum of Adjusted Landscape Area = 19192

MAWA = 38.10 x 0.62 x 19192 = 453358.00 gallons

2.) **Estimated Total Water Use (ETWU)**

A.) Net Evapotranspiration Calculation

Annual Net Reference Evapotranspiration = Annual ETo - Effective Rainfall = 38.10

B.) Adjusted Landscape Area Calculation, excluding SLA

31987 *(Low Water Use Area, sq.ft.)* x 0.3 *Plant Factor* = 9596

0 *(Moderate Water Use Area, sq.ft.)* x 0.6 *Plant Factor* = 0

0 *(High Water Use Area, sq.ft.)* x 1.0 *Plant Factor* = 0

Sum of Adjusted Landscape Area = 9,596

C.) Special Landscape Area (SLA), sq.ft. = 0

ETWU = 38.10 x 0.62 x (9,596 / 0.85 + 0) = 266681 gallons

Irrigation Efficiency Factor	
% of total landscape area irrigated with Drip	
0-25%	0.71
26-50%	0.75
51-75%	0.80
76-100%	0.85

Appendix B – Sample Water Efficient Landscape Worksheet

BENJAMIN RANCH WINERY - Vistor's Center

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the project applicant and it is a required element of the Landscape Documentation Package.

Reference Evapotranspiration (ETo) 44.1

Hydrozone # / Planting Description[a]	Plant Factor (PF)	Irrigation Method[b]	Irrigation Efficiency (IE)[c]	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF x Area	Estimated Total Water Use (ETWU)[e]
Regular Landscape Areas							
ZONES							
#1	0.3	DRIP	0.85	0.35	1155	407.6	11,146
#2	0.3	DRIP	0.85	0.35	890	314.1	8,589
#3	0.3	DRIP	0.85	0.35	1665	587.6	16,067
#4	0.3	DRIP	0.85	0.35	1995	704.1	19,252
#5	0.3	DRIP	0.85	0.35	1394	492.0	13,452
#6	0.3	DRIP	0.85	0.35	3060	1080.0	29,529
#7	0.3	DRIP	0.85	0.35	5220	1842.4	50,374
#8	0.3	DRIP	0.85	0.35	1980	698.8	19,107
#9	0.3	DRIP	0.85	0.35	1218	429.9	11,754
#10	0.3	DRIP	0.85	0.35	1073	378.7	10,355
#11	0.3	DRIP	0.85	0.35	1026	362.1	9,901
#12	0.3	DRIP	0.85	0.35	1512	533.6	14,591
#13	0.3	DRIP	0.85	0.35	1297	457.8	12,516
#14	0.3	DRIP	0.85	0.35	1080	381.2	10,422
#15	0.3	DRIP	0.85	0.35	212	74.8	2,046
#16	0.3	DRIP	0.85	0.35	2346	828.0	22,639
#17	0.1	DRIP	0.85	0.12	2775	326.5	8,926
#18	0.1	DRIP	0.85	0.12	2089	245.8	6,720
				Totals	31,987	10,145	**277,386**
Special Landscape Areas							
NONE				1		0	
				1	0	0	
				1	0	0	
				Totals		0	**0**
						ETWU Total	**277,386**
						Maximum Allowed Water Allowance (MAWA)[e]	**516,424**

[a]Hydrozone #/Planting Description
E.g
1.) front lawn
2.) low water use plantings
3.) medium water use planting

[b]Irrigation Method
overhead spray or drip

[c]Irrigation Efficiency
0.75 for spray head
0.81 for drip

***[d]ETWU* (Annual Gallons Required) =** *Eto x 0.62 x ETAF x Area*
where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year.

[e]MAWA (Annual Gallons Allowed)
= *(Eto) (0.62) [(ETAF x LA) + ((1-ETAF) x SLA)]*
where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year, LA is the total landscape area in square feet, SLA is the total special landscape area in square feet,
and **ETAF is .55 for residential areas and 0.45 for non-residential areas.**

ETAF Calculations

Regular Landscape Areas

Total ETAF x Area	(B)	10,145
Total Area	(A)	31,987
Average ETAF	**B ÷ A**	**0.32**

All Landscape Areas

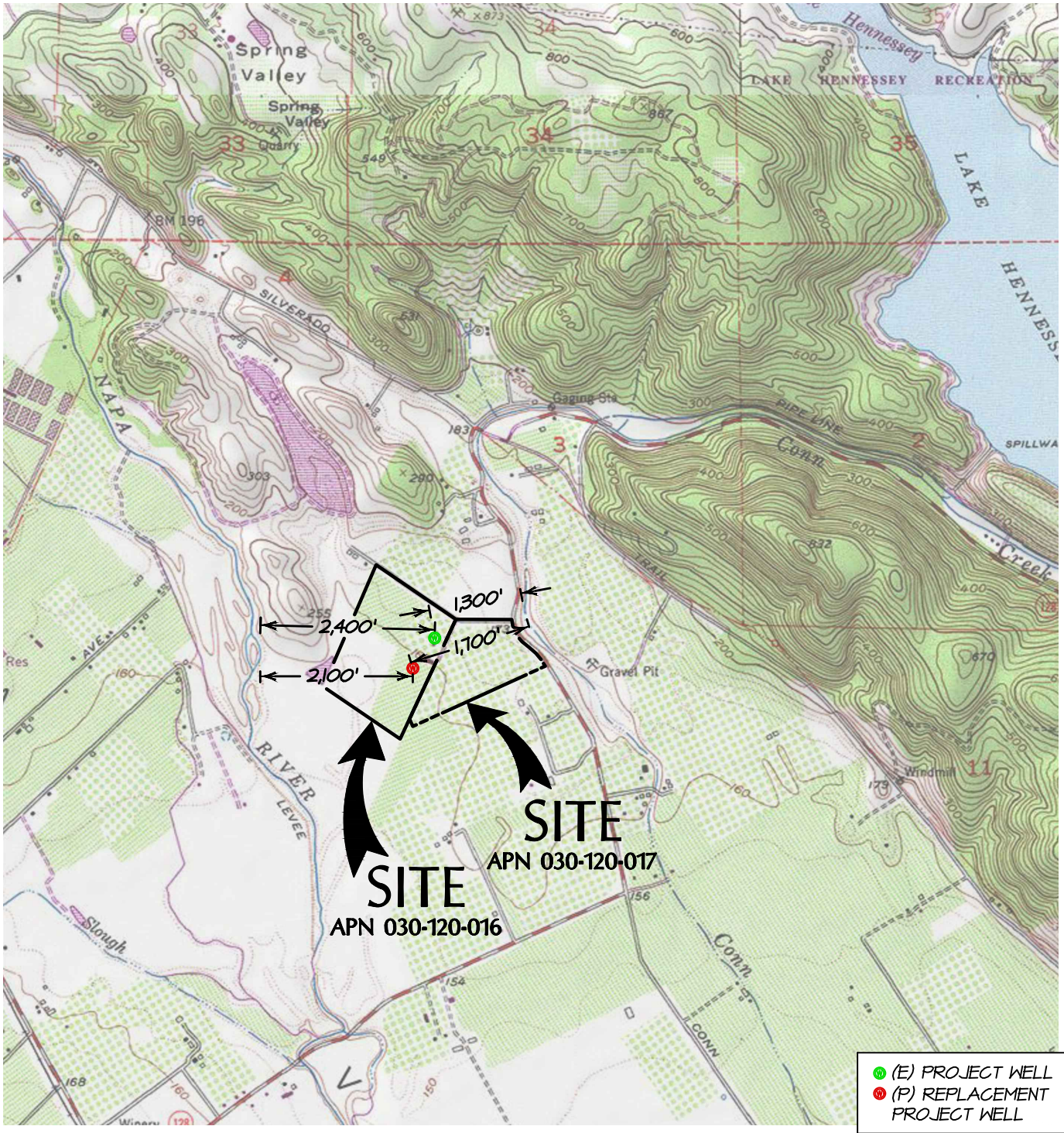
Total ETAF x Area	(B+D)	10,145
Total Area	(A+C)	31,987
Sitewide ETAF	**(B+D) ÷ (A+C)**	**0.32**

Average ETAF for Regular Landscape Areas must be:
0.55 or below for residential areas
0.45 or below for non-residential areas.

TOPOGRAPHIC SITE LOCATION INFORMATION

USGS 7.5 MINUTE QUADRANGLE "RUTHERFORD"

Scale: 1" = 2000'



BARTELT ENGINEERING
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· Telephone: 707-258-1301 ·

Benjamin Ranch Winery
8895 Conn Creek Road (SR 128)
St. Helena, CA
APN 030-120-016 & -017
Job No. 12-17

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0132502

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude / Longitude

APN/TRS/Other

Page _____ of _____

Owner's Well Number _____

Date Work Began 05/28/2011 Date Work Ended 6/7/2011

Local Permit Agency Napa County

Permit Number E11-00183 Permit Date 5/23/11

Geologic Log

Orientation ◉ Vertical ○ Horizontal ○ Angle Specify _____

Drilling Method ROT Air Rev Drilling Fluid Water / Rotary

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0	60	Brown Clay
60	200	River Gravels
200	222	Brown Clay
222	300	River Gravels
300	345	Brown Clay
345	391	Green Clay
391	410	Green Fractured Volcanic Rock
410	452	Brown & Green Volcanic Rock
452	470	Brown Clay

RECEIVED
SEP 06 2011
DEPT. OF ENVIRONMENTAL MANAGEMENT

Total Depth of Boring 470 Feet

Total Depth of Completed Well 464 Feet

Well Owner

Name [redacted]

Mailing Address [redacted]

City [redacted] State [redacted] Zip _____

Well Location

Address 8901 Conn Creek Rd.

City St. Helena County Napa

Latitude _____ Deg. _____ Min. _____ Sec. N Longitude _____ Deg. _____ Min. _____ Sec. W

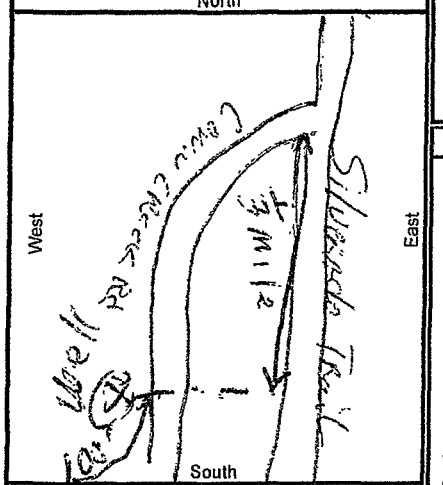
Datum _____ Decimal Lat. _____ Decimal Long. _____

APN Book 030 Page 120 Parcel 017-000

Township _____ Range _____ Section _____

Location Sketch

(Sketch must be drawn by hand after form is printed.)



Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

◉ New Well
○ Modification/Repair
○ Deepen
○ Other _____
○ Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

◉ Water Supply
☐ Domestic ☐ Public
☑ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other _____

Water Level and Yield of Completed Well

Depth to first water 55 (Feet below surface)

Depth to Static Water Level 40 (Feet) Date Measured 06/07/2011

Estimated Yield * 120 (GPM) Test Type Air Lift

Test Length 6.0 (Hours) Total Drawdown 400 (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	60	14.5	Blank	PVC Sch. 80	F480-21	8		
60	108	14.5	Blank	PVC Sch. 80	F480-21	8		
108	464	14.5	Screen	PVC Sch. 80	F480-21	8	Milled Slots	0.032

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	56	Cement	Vol Clay
56	464	Filter Pack	

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 Pulliam Well Exploration Inc.
Person, Firm or Corporation

4371 Cantelow Rd. Address Vacaville City CA State 95688 Zip

Signed _____ C-57 Licensed Water Well Contractor

06/23/2011 Date Signed

808-508 C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

QUADRUPLICATE
For Local Requirements

Page ___ of ___

Owner's Well No. ___

Date Work Began 02/15/05, Ended 02/23/05

Local Permit Agency Napa

Permit No. E05-0037 Permit Date 01/26/05

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 0918515

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Rotary FLUID Mud

DEPTH FROM SURFACE Ft. to Ft.		DESCRIPTION Describe material, grain size, color, etc.
0	8	Brown Clay
8	16	Gravel with Brown Clay
16	95	Brown Clay with Small Gravel
95	240	Gravel
240	255	Gravel and Brown Ash
255	305	Gravel
304	340	Hard Brown Caly
340	370	Brown Sands and Gravel
370	395	Green and Blue Gravel
395	445	Hard Brown Clay
445	470	Compressd Brown,Red, Green Gravels
		Well Test
		400 Gpm at 260 Feet
		600 Gpm at 400 Feet

TOTAL DEPTH OF BORING 470 (Feet)

TOTAL DEPTH OF COMPLETED WELL 463 (Feet)

RECEIVED APR 28 2005 DEPT. OF ENVIRONMENTAL MANAGEMENT

WELL OWNER

Name [redacted]

Mailing Address [redacted]

CITY [redacted] STATE [redacted]

WELL LOCATION

Address 8899 Con Creek

City Saint Helena, CAS

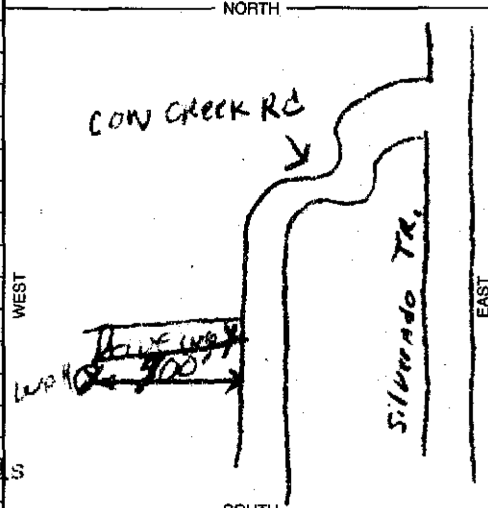
County Napa CA

APN Book 30-120-017 Page ___ Parcel ___

Township ___ Range ___ Section ___

Lat ___ DEG. MIN. SEC. N Long ___ DEG. MIN. SEC. W

LOCATION SKETCH



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 (✓)

✓ NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY (*Describe Procedures and Materials Under "GEOLOGIC LOG"*)

USES (✓)

WATER SUPPLY
___ 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 UK (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 40 (Ft.) & DATE MEASURED 2-23-05

ESTIMATED YIELD * 600 (GPM) & TEST TYPE Air lift

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN 360 (Ft.)

* *May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	65	14	✓				Plastic	8	200	
65	123	12¼	✓				"	"	"	
123	463	12¼		✓			"	"	"	Factory 1/32

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	65	✓			and Vol Clay
65	463				Well Pack

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 Pulliam Well Exploration
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

5100 Highway 128, Napa CA 94558
ADDRESS CITY STATE ZIP

Signed Tom Pulliam
C-57 LICENSED WATER WELL CONTRACTOR

03/06/2005 DATE SIGNED

808508 C-57 LICENSE NUMBER

DWR 188 REV. 05-03

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

QUADRUPLICATE
For Local Requirements

Page ___ of ___
Owner's Well No. 2-26-01 (?)
Date Work Began 2-20-01 (?), Ended 2-26-01
Local Permit Agency Napa County
Permit No. 16231 (?) Permit Date 1-16-01

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 710251

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

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD rotary FLUID mud

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION Describe material, grain size, color, etc.
0 25	brown clay
25 30	gravel
30 105	brown clay with gravel
105 110	hard brown clay
110 160	brown clay with gravel
160 220	gravel
220 365	green, black, brown ash
365 375	hard brown clay
375 385	green & brown ash
385 410	hard brown clay

RECEIVED
MAY 16 2001
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

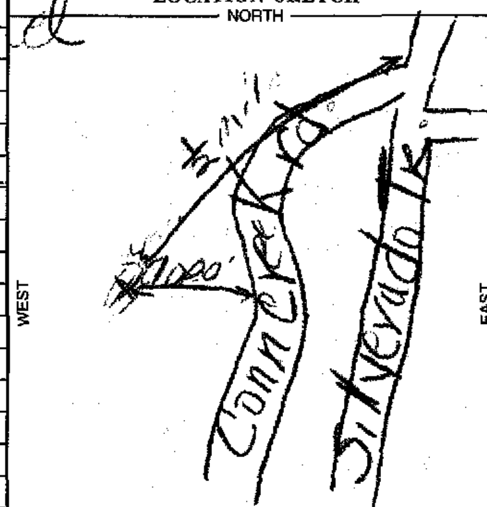
TOTAL DEPTH OF BORING 412 (Feet)
TOTAL DEPTH OF COMPLETED WELL 410 (Feet)

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

WELL LOCATION

Address Same
City Same
County Napa
APN Book ___ Page ___ Parcel 030-170-017
Township ___ Range ___ Section ___
Latitude ___ NORTH DEG. MIN. SEC. Longitude ___ WEST DEG. MIN. SEC.

LOCATION SKETCH



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

PLANNED USES (✓)
WATER SUPPLY
✓ 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 unk (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 25 (Ft.) & DATE MEASURED 2-26-01
ESTIMATED YIELD* 180 (GPM) & TEST TYPE Air lift
TEST LENGTH 3 (Hrs.) TOTAL DRAWDOWN 375 (Ft.)
** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0 150	12¼	✓				Plastic	8	200	
150 410	12¼		✓			"	"	"	Factory

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0 24	✓			
24 410				Pea 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 Pulliam Well Drilling
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
2877 Piedmont Napa Ca. 94558
ADDRESS CITY STATE ZIP
Signed [signature] 3-21-01 248677
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

Parcel 030-120-017-000 10/25/90 #2529

QUADRUPLICATE
Use to comply with local requirements

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

Do not fill in

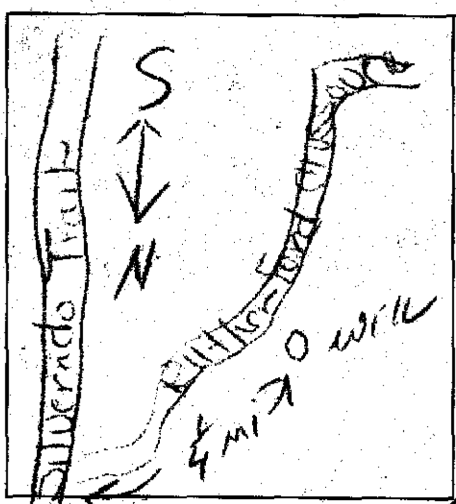
No. 284988

Notice of Intent No. ______
Local Permit No. or Date 026192

State Well No. ______
Other Well No. ______

(1) OWNER: Name [redacted]
Address [redacted]
City [redacted] ZIP ______

(2) LOCATION OF WELL (See instructions):
County 23 Owner's Well Number ______
Well address if different from above Rutherford Crossouck
Township 030 Range 120 Section 017-000
Distance from cities, roads, railroads, fences, etc. 4 West of Silverado Tr. on Rutherford Crossouck



WELL LOCATION SKETCH

(3) TYPE OF WORK:
New Well ☐ Deepening ☒
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:
Domestic ☐
Irrigation ☒
Industrial ☐
Test Well ☐
Municipal ☐
Other ☐
(Describe)

(5) EQUIPMENT:
Rotary ☒ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK:
Yes ☒ No ☐ Size pea
Diameter of bore 10
Packed from 30 to 345 ft.

(7) CASING INSTALLED:
Steel ☐ Plastic ☒ Concrete ☐

(8) PERFORATIONS:
Type of perforation or size of screen

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	345	6	160	40	345	1/8 x 3

(9) WELL SEAL:
Was surface sanitary seal provided? Yes ☐ No ☒ If yes, to depth ______ ft.
Were strata sealed against pollution? Yes ☐ No ☐ Interval ______ ft.
Method of sealing ______

(10) WATER LEVELS:
Depth of first water, if known ______ ft.
Standing level after well completion 20' ft.

(11) WELL TESTS:
Was well test made? Yes ☒ No ☐ If yes, by whom? Pullam
Type of test Pump ☐ Bailer ☐ Air lift ☒
Depth to water at start of test 20 ft. At end of test 50 ft.
Discharge 70 gal/min after 4 hours Water temperature ______
Chemical analysis made? Yes ☐ No ☒ If yes, by whom? ______
Was electric log made Yes ☐ No ☒ If yes, attach copy to this report

(12) WELL LOG: Total depth 345 ft. Completed depth 345 ft.
from ft. to ft. Formation (Describe by color, character, size or material)

112 - 330' broken up ash boulders & gravel streaks of clay
330 - 345' clay

Work started 11-11- 1990 Completed 11-24- 1990

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Signed [signature] (Well Driller)
NAME Pullam Well Drilling (Person, firm or corporation) (Typed or printed)
Address 3877 Piedmont Ave
City N.P. ZIP 94558
License No. 312677 Date of this report 5-1-90

CONFIDENTIAL
NOT FOR PUBLIC USE
WATER CODE SEC. 13752

RECEIVED OCT 25 1990
DEPT. OF ENVIRONMENTAL MANAGEMENT

DWR 188 (REV. 12-86)
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM
88 92355

QUADRUPLICATE
For Local Requirements

Page ___ of ___

Owner's Well No. ___

Date Work Began 1-25-99 Ended 2-1-99

Local Permit Agency Napa County

Permit No. 2-18-99 Permit Date 96-10757

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 528411

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION — Describe material, grain size, color, etc.
0	25	brown clay
25	45	gravel
45	95	brown clay & gravel
95	110	gravel
110	165	gravel & brown clay
165	170	black & green ash
170		gravel
200	250	black & green ash
250	315	gravel with boulders
315	360	black & green ash
360	380	brown clay & gravel
380	400	black rock
400	450	brown clay
		Well test:
		2 x 0 ft 180 GPM
		3 x 0 ft 280 GPM

TOTAL DEPTH OF BORING 450 (Feet)

TOTAL DEPTH OF COMPLETED WELL 395 (Feet)

WELL OWNER

Name [redacted]

Mailing Address [redacted]

CITY STATE ZIP

WELL LOCATION

Address Same

City St Helena

County Napa

APN Book ___ Page ___ Parcel [redacted]

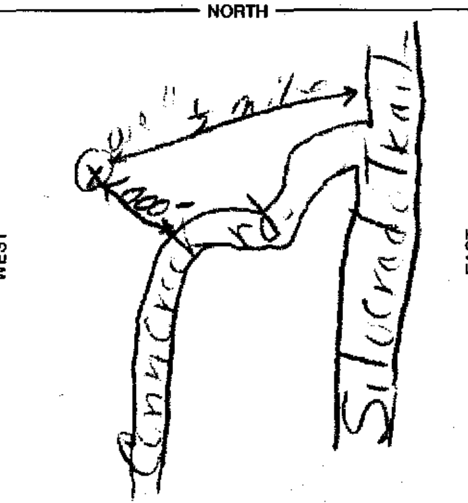
or Township ___ Range ___ Section ___

or Latitude ___ NORTH Longitude ___ WEST
DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH

NORTH

WEST



EAST

SOUTH

Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USE(S) (✓)

___ MONITORING

WATER SUPPLY
✓ Domestic
___ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD Mud Rotary FLUID Mud

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 25 (Ft.) & DATE MEASURED 2-1-99

ESTIMATED YIELD* 280 (GPM) & TEST TYPE Air lift

TEST LENGTH 5 (Hrs.) TOTAL DRAWDOWN 360 (Ft.)

* *May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL/GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	135	12¼	✓				Plastic	8	200	
135	395	"		✓			Plastic	8	200	Factory 1/32

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	24	✓			
24	395				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 Pulliam Well Drilling
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

2377 Piedmont Ave Napa Ca 94558
ADDRESS CITY STATE ZIP

Signed Tom Pulliam 2-16-99 248677
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM