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Water Availability Analysis

Benjamin Ranch Winery, Use Permit Application No. P13-00371-UP
Planning Commission Hearing, September 16, 2020

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 Visitor 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: thirty (30) year around full-time employees, five (5) seasonal dayshift (harvest) employees and five (5) seasonal swing shift (harvest employees and the following for the proposed Visitor Center: fifteen (15) year around full-time employees and five (5) part-time employees. One (1) additional year around full-time employee is added to account for the Vineyard Manager. The project proposes to offer private tours and tastings for a maximum number of 400 guests per day. The project also proposed to offer the following marketing events: Dinnertime Wine Marketing Events for a maximum of 24 guests that may occur on Friday and Saturday nights, plus up to 4 events monthly occurring on days other than Friday and Saturday – no more than 1 dinnertime wine marketing event may occur on any given day, food may be prepared on-site; Lunchtime Wine Marketing Events for a maximum of 16 guests that may occur Monday through Sunday up to a monthly maximum of 15 lunchtime events - no more than 1 lunchtime wine marketing event may occur on any given day, food may be prepared on-site; Large Events for a maximum of 150 guests that may occur Monday through Sunday up to an annual maximum of 8 large 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, food to be catered; and participation in the Auction Napa Valley. In no case shall the daily combined tours and tastings and marketing visitation exceed 400 guests.

EXHIBITS

The associated USGS "Topographic Site Location Map" shows the project site and 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 subject 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	potentially
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

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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
Visitor Center	
Employees	0.34
Landscaping Water[1]	0.85
Vineyard Manager's Office	0.01
Vineyard (42.7± acres)	
Irrigation	12.81
Heat and Frost Protection	21.35
Tours and Tastings (400 guests per day; 3 gallons per guest)	1.32[2]
Lunch and Dinner Events (29 events per month; 16 guests per lunch event; 24 guests per dinner event; 15 gallons per guest)	0.32
Large Events (9 events per year; 150 guests per event; 15 gallons per guest)	0.01
Subtotal =	49.27
Vineyard Irrigation Credit for Treated Wastewater Reuse	-8.75
Total Proposed Water Demand =	40.52

As shown in Table 2A and Table 2B, the water demand is estimated to increase from 38.01 to 40.71 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 would reduce the proposed water demand by 8.75 acre-feet/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[3]

The following calculation assumes 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.

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[1] Landscape irrigation estimates provided by CBH Design, Inc.
[2] Annual estimated water usage for tours and tastings is adjusted to account for lunch, dinner, and large events without exceeding a maximum of 400 guests per day.
[3] 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 subject parcel currently sources water from the existing onsite "project" well which is located northwest of the proposed winery facility and currently supplies irrigation water. The project proposes to use the existing "project" well as the water source for the proposed project which must be capable of meeting the water demand shown in Table 2B.

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. Ground water is pumped from the existing wells into onsite storage tanks and an irrigation pond on an adjacent parcel. A proposed lot line adjustment will allow the irrigation pond to be located on the proposed winery parcel.

Prior to use, domestic water is proposed to be stored in one (1) 40,000± gallon storage tank. Treated Process Wastewater used for irrigation is proposed to be stored in one (1) 126,000 gallon storage tank and fire protection water is also proposed to be stored in one (1) 126,000 gallon storage tank.

Well Description

At the time this study was prepared, it was not determined if the proposed "project" well was 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 Visitor Center. If the proposed "project" well was not constructed with a 50-foot minimum annular seal, it will most likely be necessary to drill a new well to comply with the annular seal depth requirement and satisfy domestic and production demands. If the construction of a new well is required, the proposed project will use the existing well(s) to pump ground water to proposed onsite vineyard irrigation tank(s) and fire protection storage tank and the new constructed well will be used to pump ground water to proposed domestic storage tank(s). Well Completion Reports are attached for additional information.

Under proposed conditions, ground water will be pumped from the existing "project" well into onsite storage tanks and then supplied to the vineyard, Visitor Center, and production facility. The tanks will allow stored water to be distributed as appropriate.

Yield Test

Yield tests were performed on the two (2) wells 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 six (6) and four (4) hours of continuous pumping, respectively. Refer to attached Well Completion Reports for addition information.

Water System Classification

A Non-Transient – Non-Community Water System (NTNCWS) is identified as a water system that has less than five (5) connections, serves less than 25 yearlong residents[4], serves 25 people per day at least 60 days per year and serves 25 or more of the same people at least six (6) months out of the year. The ten (10) seasonal employees are not considered yearlong residents. Although the proposed project serves less than five (5) connections, 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 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 one (1) neighboring well located within 500 feet of the proposed "project" well which is also owned by the applicant and is used for irrigation. Refer to the associated Use Permit Drawings prepared by Bartelt Engineering for location of the existing onsite wells, neighboring wells, 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 40.52 acre-feet per year (see Table 2B). The groundwater project well is proposed to be sourced from the existing onsite "project" well. The "project" well has a reported yield rate of 100 gpm which is more than capable of meeting the proposed water demand.

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. Furthermore, the estimated available water for the subject parcel satisfies the Tier 1 Water Use Criterion of the Napa County Water Availability Analysis.

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

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 Visitor's Center

Appendix B – Water Efficient Landscape Worksheet – Benjamin Ranch Winery Visitor's Center

Neighboring Well Location Map

NRCS Custom Soils Report

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

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

B.) Adjusted Landscape Area Calculation

44478	x 0.6	=	26687
(Landscape Area, including SLA)	Adjustment Factor		

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

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	x 0.3	=	13,343.40
(Low Water Use Area, sq.ft.)	Plant Factor		

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

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

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	=	370821 gallons
						+			
						0			

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

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

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

B.) Adjusted Landscape Area Calculation

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

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

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

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

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

                                         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   =   266681 gallons
                                                                    +
                                                                    0

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**

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