DELTA CONSULTING & ENGINEERING
OF ST. HELENA

February 09, 2015

John McDowell
Deputy Planning Director
County of Napa
1195 Third Street, 2nd Floor
Napa, CA 94559

RE: Melka winery project at 2900 Silverado Trail, St. Helena

John,

As requested during our conference call on February 05, 2015, with yourself, Shaveta Sharma (Napa County Planner), Andrew Simpson (Principal Engineer, Delta Consulting & Engineering), and myself, this letter is intended to provide a comparative analysis between the proposed water use and the available water capacity on the subject property at 2900 Silverado Trail in St. Helena (unincorporated Napa County).

Philippe and Cherie Melka are applying to Napa County to request approval for a 10,000 gallon per year winery on their 10.68 acre parcel. As part of the project, the owners are proposing to construct a new 2,675 square foot winery production building with a covered crush pad, and convert an existing barn to a winery/hospitality building. The requested marketing plan is as follows:

- Production Capacity: 10,000 Gallons Wine / Year
- Employees: 1 full-time, 1 part time
- Daily Visitors (By Appointment): 7 / day Weekends, 5 / day Weekdays
- Marketing Events: 2 / year with 30 Guests
- Wine Auction Related Events: 1 / year with 100 guests

The property also has an existing two-bedroom main residence, a 450 square foot pool, a two-bedroom guest house, a one-bedroom second unit, and 1.5 acres of vineyards. The following sections address the estimated water usage on the property derived from a summary of the existing and proposed water use on the subject parcel.

Proposed Water Usage

With the approval of the Winery Use Permit, the parcel will utilize water through the following means:

Residential Water Usage
Pool Water Usage
Vineyard Irrigation
Winery Domestic Water Use
Winery Process Water Use
Landscape Irrigation

Each of these categories is analyzed as follows:

Residential: Residence Water Usage

As noted above, the parcel has a main residence, a guest unit, and a second dwelling, culminating in a total of 5

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bedrooms on the parcel. Assuming the master bedroom in the main residence hosts two persons, while each additional bedroom hosts a single person, the theoretical number of occupants on the property is six persons. Using the City of St. Helena water use guidelines, the water usage is estimated as follows:

Residential Daily and Annual Water Usage

	Average Flow	Duration	Daily Use	Occupants	Total Daily Water Use	Total Annual Water Use	Total Annual Water Use
Toilet	1.6 gal		3	6	28.8 gal	10,512 gal	0.03 af
Lavatory Faucet	1.5 gpm	0.25 min	3	6	6.75 gal	2,463.75 gal	0.01 af
Kitchen Faucet	2.0 gpm	4 min	1	6	48.0 gal	17,520 gal	0.05 af
Shower Head	2.0 gpm	8 min	1	6	96 gal	35,040 gal	0.11 af
Bath	22 gal		0.1	6	13.2 gal	4,818 gal	0.01 af
Clothes Washer	12 gal per load		0.37	6	26.64 gal	9,723.6 gal	0.03 af
Dish Washer	4 gal per cycle		0.5	6	12 gal	4,380 gal	0.01 af
Total					231 gal	84,457 gal	0.26 af

The residential water usage for the property is 231 gallons per day, or 0.26 acre-feet annually.

Residential: Pool Water Usage

The parcel has a pool on the property located between the main residence and guest house. The surface area of the pool is approximately 450 square feet. Based on historical local climate and evaporation data, the pools estimated water losses due to evaporation is identified in the table below:

Pool Water Usage

	Pool Area (sf)	Annual Evaporation (ft)	Annual Precipitation (ft)	Total Annual Water Loss (cf)	Total Annual Water Loss (gal)	Total Daily Water Loss (gal)	Total Annual Loss (acre-ft)
Existing Pool	450	5.14	2.92	1,003	7,501	20.55	0.02
Total	450	5.14	2.92	1,003	7,501	20.55	0.02

Additional detail on the derivation of these values can be found in Appendix A of this letter. Based on the evaporation losses of the pool, it is estimated the pool's water usage is 21 gallons per day, or 0.02 acre feet per year.

Vineyard Irrigation Water Usage

The vineyard on the property covers approximately 1.5 acres of land. Per irrigation data recorded by Silverado Farming Inc., the vineyard management company for the property, the water usage for vineyard irrigation is as follows:

Vineyard Irrigation Water Usage

	Vineyard Irrigation Totals		
	Gallons Per Day	Gallons Per Year	Acre-Feet Per Year
2013	163	59,675	0.183
2014	209	76,384	0.234
Average	**186**	**68,030**	**0.209**

Based on actual irrigation data, the average water usage for vineyard irrigation is 186 gallons per day, or 0.209 acre-feet per year.

Winery: Domestic Water Usage

The estimated winery domestic water usage is determined from the number of daily employees, visitors, and event guests. Using Napa County Environmental Management's Table 4 from 'Regulations for Design, Construction, and Installation of Alternative Sewage Treatment Systems', daily and annual water usage for visitors, employees, and event guests is estimated as:

Winery Domestic Water Usage Estimation

Use Type	Maximum Quantity (persons)	Water Demand (GPP)*	Days Contributed	Gallons per Day	Annual Water Generated (gallons)	
Weekend Guests per Day	7	3	104	21	2,184	
Weekday Guests per Day	5	3	261	15	3,915	
Staff per Day	1	15	365	15	5,475	
Marketing Events	30	15	2	450	900	
Wine-Auction Related Events	100	15	1	1,500	1,500	
		Total Estimated Water Usage =			13,974	**Gallons per year**
				Average Daily Water Usage=	38	gpd

**GPP = gallons per person; Values From Napa County Department of Environmental Management*

The annual estimated winery domestic water usage is 38 gallons per day, or 0.043 acre-feet per year.

Winery: Process Water Usage

The winery proposes to produce a maximum of 10,000 gallons of wine per year. Based on industry standard information, a typical winery uses between 4-10 gallons of water per gallon of wine produced. For the purpose of this analysis, an estimation of 8 gallons water required per gallon wine produced will be used. Therefore, it is estimated that the winery production process will consume approximately 80,000 gallons of water per year. This equates to 219 gallons per day, or 0.25 acre-feet per year

Winery: Landscape Irrigation Water Usage

The landscaping on the property is limited to plants and shrubs requiring drip-irrigation only. Wasteful and inefficient spray-irrigation typical of lawns and grasses are not used on the parcel. In addition, the residential landscaping is currently equipped with smart yard sensors to limit irrigation water use.

It is unknown the exact extent of landscaping proposed with the winery at this time, but for the purpose of this letter a conservative assumption of 22,000 square feet, or 0.5 acres, will be planted with drip-irrigation planting.

On an annual basis, this report assumes the landscaping is watered seven days per week from June through September, two days per week in October and from March through May, and receives no irrigation from November through February. This analysis assumes the typical emitter flowrate is 0.5 gallon per hour, emitter spacing 3 feet, and the system is turned 'on' for 30 minutes per day on watering days. Based on a detailed analysis which can be viewed in Appendix B of this letter, the estimated water usage for landscape irrigation is approximately 313 gallons per day, or 0.35 acre feet water per year.

Total Parcel Water Usage

Accounting for all of the water uses on the parcel, the estimated proposed daily and annual water usage is noted in the table below:

Total Proposed Water Usage

	Water Use	
	Gallons Per Day	Acre-Feet Per Year
Residential Water Usage	231	0.259
Pool Water Usage	21	0.024
Vineyard Irrigation	186	0.209
Winery Domestic Water Usage	38	0.043
Winery Process Water Usage	219	0.245
Landscape Irrgation	313	0.351
Total	1,008	1.130

The total proposed water demand for the property, including the winery, is estimated to be 1,008 gallons per day or 1.130 acre-feet per year. This equates to the daily water demand to be 0.7 gallons per minute from the well.

Available Water Capacity

The parcel's water is sourced from an existing well. The well location, along with the well's proximity to neighboring wells, is included as Appendix C of this letter.

The water availability is based on the capacity of this individual well. A well-yield test for this well was completed in August of 2012; a dry month at the onset of the drought. The well yield test determined a stabilized water yield of 75 gallons per minute with a drawdown of 132 feet. See Appendix D of this letter for a copy of this well yield report. The water demand for the proposed property uses is less than 1% of the available water capacity from the on-site well. In order for the well to meet the daily water demand, the pump would need to be 'on' for less than 15 minutes per day.

Drought Year Water Conservation

With regard to the past, current, and any future drought year(s), the owners will practice sustainable winegrowing techniques in the existing vineyard to reduce water demand, and the winery landscape plan includes a water efficient landscape portfolio, reducing the landscape irrigation requirements especially as plants mature. In a very severe drought, landscaping irrigation would be reduced the minimum amount needed to keep the plants alive.

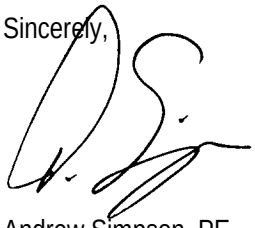
Water Quality Standards

The quality of the water for the vines will continue as is, while the water for the winery will be treated to meet any applicable water standards.

Conclusion

In closing, while the water use for the residence, residential landscaping, and the vineyard are not a part of the winery use permit application, their estimated annual water demand is included in this brief to highlight the fact that the total water demand for the parcel's uses, including the winery, is less than 1% of the available water.

Sincerely,



Andrew Simpson, PE
Principal

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APPENDIX A

Pool Water Useage

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Melka Use Permit
Proposed Water Usage Analysis

Water Usage Due to Evaporation

	Information Source	Location
Rainfall	California Department of Water Resources	St. Helena
Pan Evaporation	Western Regional Climate Center	Warm Springs Dam, CA
Temperatures	California Department of Water Resources	Healdsburg, CA

	Precipitation		Evaporation		Average Temperatures		
Month	Avg Rainfall (in)	10-Year Rainfall[a] (in)	PAN Evaporation (in)	Lake Evaporation[b] (In)	High (ºF)	Low (ºF)	Month
Jan	7.48	10.47	1.17	0.90	58.0	37.8	Jan
Feb	6.46	9.04	1.83	1.41	62.5	40.3	Feb
Mar	4.59	6.43	3.23	2.49	66.3	41.8	Mar
Apr	2.14	3.00	5.37	4.13	73.0	44.2	Apr
May	0.84	1.18	7.83	6.03	79.2	48.0	May
Jun	0.23	0.32	9.33	7.18	85.5	52.1	Jun
Jul	0.03	0.04	10.04	7.73	89.3	53.9	Jul
Aug	0.08	0.11	8.49	6.54	88.3	53.6	Aug
Sep	0.27	0.38	6.58	5.07	85.6	51.6	Sep
Oct	1.87	2.62	4.59	3.53	77.7	47.2	Oct
Nov	4.06	5.68	2.10	1.62	65.1	41.6	Nov
Dec	6.94	9.72	1.17	0.90	58.4	36.7	Dec
	34.99	48.99	61.73	47.53	89.3	36.7	<---Max/Min Temp (ºF)
					Jul	Dec	<---Max/Min Month

Residential Pool Water Usage: 450 sf

Pool Water Usage

	Pool Area (sf)	Annual Evaporation	Annual Precipitation	Total Annual Water Loss (cf)	Total Annual Water Loss	Total Daily Water Loss	Total Annual Loss (acre-ft)
Existing Pool	450	5.14	2.92	1,003	7,501	20.55	0.02
Total	450	5.14	2.92	1,003	7,501	20.55	0.02

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APPENDIX B

Landscape Water Useage

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Appendix B
Proposed Water Usage Analysis

PROPOSED WATER USAGE ANALYSIS

Landscaping Watering Requirements

	Jun - Sep	Mar - May, Oct	Nov - Feb	
Irrigation Days/Wk	7	2	0	
Hours/Irrigation Day	0.5	0.5	0.5	
Irrigation hours/month	15	4	0	
Irrigation hours (annual total)	78	hrs		
Emitter Spacing	3	ft		
Emmitter Lateral Influence	2.5	ft		
Area per Emitter	7.5	sf		
Emitter Flow Rate (gph)	0.5	gph		

Calculations - Landscaping Areas

	Area (sf)	Area with Drip Irrigation (sf)	Number of Drip Emmiters	Irrigation Hours (annual	Total Daily Flow (gpd)	Total Annual Flow (gal)
Parcel Landscaping	22,000	22,000	2933	78.0	313.4	114,391
					Acre-ft--->	0.35

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APPENDIX C:

Well Location Exhibit

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Appendix C: Source Well Location

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APPENDIX D

Well Yield Results

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IMBODEN PUMP
SINCE 1946
1030 PUEBLO AVENUE • NAPA, CALIFORNIA 94558
(707) 252-6493 • LIC. # 404594
FAX (707) 226-1580

WELL TEST & REPORT

DATE: 08/28/12

OWNER: MELKA PROPERTY

ADDRESS: SILVERADO TRAIL

WELL DEPTH: 392 **DIAMETER: 5"** **CASING: PVC**

PUMP SETTING: 357' **PUMP HP: 10** **DROP PIPE: 2"GALV.**

POWER & VOLTAGE: 460, 3 PH **DROP CABLE: 10-4 FJ**

PUMP MODEL:

TANK SIZE & MODEL:

WATER LEVEL AT START OF TEST: 32' **GPM: 111**

WATER LEVEL AT END OF TEST: 164' **GPM: 75**

LENGTH OF TEST: 2 HOUR, 40 MINUTES

****THIS TEST IS BASED ON THE WELL PRODUCTION AS OF THE DAY OF THE TEST ONLY. THE WELL MAY PRODUCE MORE OR LESS WATER THROUGHOUT THE YEAR.****

RESPECTFULLY,
IMBODEN PUMP

DATE: 08/28/12

OWNER: MELKA PROPERTY

ADDRESS: SILVERADO TRAIL

TIME	WATER LEVEL	BACK PRESSURE	WATER COLOR	SAND	GPM
1:20pm	32'	0	CLOUDY	?	111
1:25pm	150'	0	CLOUDY	?	100
1:30pm	165'	0	CLOUDY	?	100
1:40pm	172'	0	CLOUDY	YES	100
1:50pm	177'	0	CLOUDY	YES	100
2:00pm	181'	0	CLOUDY	YES	100
2:10pm	183.5'	0	CLOUDY	YES	100
2:25pm	187'	0	LT/CLOUDY	NO	96.5
2:40pm	189'	0	LT/CLOUDY	NO	96.5
2:50pm	190.5'	0	CLEAR	NO	96.5
2:52pm	190.5'	50	CLEAR	NO	75
3:00pm	168'	55	LT/CLOUDY	NO	75
3:10pm	164'	55	CLEAR	NO	75
3:20pm	164'	55	CLEAR	NO	75
3:30pm	164'	55	CLEAR	NO	75
3:40pm	164'	55	CLEAR	NO	75
3:50pm	164'	55	CLEAR	NO	75
4:00pm	164'	55	CLEAR	NO	75

TIME	WATER LEVEL	BACK PRESSURE	WATER COLOR	SAND	GPM
4:03pm	75'				
4:10pm	60'				
4:15pm	54'				