
MEMORANDUM

Date: February 10, 2012 **BKF No.:** 20110109-10

Deliver To: Douglas Atmore, HKS Hill Glazier Studio
Geoff Hebert, Bald Mountain Development

From: Tom Morse, BKF Engineers

Subject: Silver Rose - Calistoga
Preliminary Water and Wastewater Demand Study

INTRODUCTION:

Silver Rose Venture LLC proposes to redevelop 22.5 acres of land in southeast Calistoga. The triangular shaped parcel is bounded by Silverado Trail, Rosedale Road and an unimproved vineyard road. This preliminary water and wastewater demand study will provide an estimate of water and wastewater demands associated with the proposed development.

EXISTING CONDITION:

In its existing condition the site is developed with 20 one bedroom visitor accommodation units, spa facilities, meeting space, a 5,000 case winery with retail/tasting facilities, a 160-seat restaurant (permitted and constructed but currently unoccupied), a two bedroom on-site manager's residential unit, a four bedroom detached single-family dwelling unit and approximately 8 acres of vineyard. A pond, approximately one acre in size was installed on the site and is used for irrigation and frost protection. Currently all existing water demands for the site are provided by on-site water wells. Wastewater is disposed of on-site using a septic tank and in ground leach field.

PROPOSED CONDITION:

The proposed project will consist of 85 hotel rooms and 21 residences. The hotel will include a restaurant and bar, spa and fitness, meeting facilities, and typical back of house infrastructure. In addition to the hotel and residences, the existing winery operations will remain, including crush pad, production facility, barrel storage, and approximately 6 acres of vineyard. We anticipate that domestic water for the majority of the facility will be provided by the City of Calistoga from the existing 12 inch main in Silverado Trail.

The winery is an existing use on the site that will remain in its existing location with only minor modification. The winery is served by an existing on-site domestic water well which is permitted as Non Transient Non Community water system under Napa County permit. The winery production will expand to occupy the entire existing winery facility with an expected maximum yearly production of 10,000 cases. The winery tasting room will be relocated and connected to City service.

On-site irrigation demand for site landscaping and vineyard will be provided by on-site wells.

Sanitary sewer treatment for the majority of the on-site uses is expected to be provided by the City of Calistoga at the existing wastewater treatment facility. Conveyance to the wastewater treatment facility will require the extension of approximately 810 feet of 8 inch sewer main from the existing termination point approximately 208 feet east of MH #10, on the west side of Silverado Trail, to the project site.

The project is currently reviewing two options for disposal of winery process wastewater. The first option is pre-treatment to domestic waste strength and discharge to the City sanitary sewer system. The second option is a hold and haul system which includes storing winery process wastewater on site in a holding tank and then hauling it off-site to a municipal treatment plant for processing.

METHODOLOGY AND ANALYSIS:

The City of Calistoga has published unit water demand for various uses in their “Use Table for Resource Management System” (Use Table). We have calculated project domestic water demand based on city rates where applicable and have developed independent rates for the spa, laundry and winery facilities. The Use Table includes demands in both acre-ft per year and gallons per day. This analysis uses the acre-ft per year numbers and calculates gallons per day. Because of this the demands listed in gallons per day in this analysis may be slightly different than those included in the City’s Use Table.

Based on information provided by the Calistoga Chamber of Commerce, the average annual occupancy rate for all lodging in Calistoga for the fiscal year 2010/2011 was 56%, which is the highest occupancy rate of the last three years for which data was available. The annual occupancy rate for the Hotel & Resort subset for fiscal year 2010/2011 was approximately 60%. Based on the above historical data for Calistoga, study of comparable luxury resorts in Napa Valley, we believe the annual average occupancy rate will be 65% for the new hotel. We understand that the City Use Table was based on actual meter readings and may already approximately reflect this occupancy factor. Therefore, the analysis includes 100% occupancy for the hotel. The estimate of water demand and wastewater generation for laundry is for each occupied room, therefore this occupancy factor was applied to the estimate of laundry water and wastewater demands.

Based on a residential market analysis that was performed by a leading residential marketing consultant in the industry, it is believed that the residences will be purchased almost exclusively

as second homes. Owner use of the residences is expected to be approximately 6 weekends per year. The owners of the residences will have the option to place their home in the hotel rental pool. Based on discussions with hotel operators on historical participation rates for residential units in rental management programs, the project estimates 50% of the residential units will elect to participate in the rental pool. Those 11 residential units are expected to have annual average occupancies of 10% from hotel operations. Based on owner usage and anticipated occupancies of units in the rental program, the average annual residential occupancy is expected to be 11.5 percent. However, based on discussion with the City of Calistoga, this analysis includes the extreme condition of 100% occupancy of the residential units.

The project proposes that the winery production and commercial facilities would continue to be served by the on-site domestic water well. Because of this, these water demands are not included in tabulated water demands. The tasting room and deli will be included in the newly constructed building and will be served by domestic water from the City and are included in the water demand summary. Winery process wastewater is included in the tabulated wastewater generation in the event that discharge to the City sanitary sewer system is the selected winery discharge alternative.

CONCLUSION:

Evaluation of the proposed development indicates that the project will require 37.04 acre-ft per year (33,052 gpd average) of domestic water from the City. Winery operation will require 1.63 acre-ft per year (1,454 gpd average) from existing on-site domestic water wells.

Projected Domestic Water Demands Supplied by City of Calistoga

Land Use	Average Water Demand	
	Gallons per Day	Acre-Feet per Year
Hotel	27,632	30.96
Winery Tasting Room	880	0.99
Residences	4,540	5.09
Total	33,052	37.04

Evaluation of the proposed development indicates that the project will generate 40.65 acre-ft per year (36,274 gpd average) of wastewater that will be collected and treated by the City.

Projected Wastewater Generation Discharged to City of Calistoga

Land Use	Average Wastewater Generation	
	Gallons per Day	Acre-Feet per Year
Hotel	29,400	32.94
Winery Tasting Room	2,334	2.62
Residences	4,540	5.09
Total	36,274	40.65

Attachments:

- Resort Program
- Water Use and Wastewater Generation Calculations
- City of Calistoga Standardized Use Table
- Laundry Water Demands
- Spa and Fitness Water Consumption
- Pool Water Use and Sewage Discharge Estimates
- Resolution No. 99 – 65: Use Table for Resource Management System

Resort Program

Use Type	Monthly Discharge to City		
	Program Area	Design Contingency	Entitlement Area
Guestrooms	85 rooms	0%	85 rooms
Food & Beverage Outlets			
Restaurant	4,306 sf	5%	4,521 sf
Bar	1,580 sf	5%	1,659 sf
Food & Beverage BOH	5,980 sf	5%	6,279 sf
Pool Bar	2,025 sf	5%	2,126 sf
Banquet and Meeting Rooms	8,829 sf	5%	9,270 sf
Spa and Fitness	10,157 sf	5%	10,665 sf
Other Hotel Space			
Retail	- sf	5%	- sf
Business center	80 sf	5%	84 sf
Children's Activities	582 sf	5%	611 sf
Lobby	2,275 sf	5%	2,389 sf
Public Circulation	3,487 sf	5%	3,661 sf
Front Office	923 sf	5%	969 sf
Administration	1,623 sf	5%	1,704 sf
Accounting	1,833 sf	5%	1,925 sf
Truck Dock Area	1,268 sf	5%	1,331 sf
Housekeeping, Laundry	1,972 sf	5%	2,071 sf
Human Resources	330 sf	5%	347 sf
Security	132 sf	5%	139 sf
Staff Facilities	1,275 sf	5%	1,339 sf
Repairs & Maintenance	1,330 sf	5%	1,397 sf
Banquet & Meeting BOH	1,737 sf	5%	1,824 sf
Mechanical/Electrical	4,592 sf	5%	4,822 sf
BOH Circulation	5,620 sf	5%	5,901 sf
BOH, subtotal	29,059 sf		30,512 sf
Winery & Retail			
Winery Production	5,443 sf	5%	5,715 sf
Winery Storage	6,414 sf	5%	6,735 sf
Tasting Room	1,110 sf	5%	1,166 sf
Deli	1,370 sf	5%	1,439 sf
Winery & Retail, subtotal	14,337 sf		15,054 sf
Residences			
2 Bedroom	7 units	0%	7 units
3 Bedroom	10 units	0%	10 units
4 Bedroom	4 units	0%	4 units
Residences, subtotal	21 units		21 units

Areas include gross interior square feet.

WATER USE AND WASTEWATER GENERATION CALCULATIONS

Water Use	Qty	Monthly Discharge to City	Demand Factor	Units	Occupancy Factor	Annual Water Demand			Wastewater Generation			Data Source
						GPD	Gallons/Year	Acre-Feet/Year	% Return to Wastewater	GPD	Acre-Feet/Year	
Hotel:												
Guest Rooms	85	Rooms	134	gals/rm	100%	11,390	4,157,350	12.76	100%	11,390	12.76	S1
Meeting Space	9,270	sf	88	gal/day/ksf	100%	816	297,752	0.91	100%	816	0.91	S1
Other Hotel Space	30,512	sf	88	gal/day/ksf	100%	2,685	980,045	3.01	100%	2,685	3.01	S1
Restaurant	10,800	sf	468	gal/day/ksf	100%	5,054	1,844,856	5.66	100%	5,054	5.66	S1
Bar	1,659	sf	177	gal/day/ksf	100%	294	107,180	0.33	100%	294	0.33	S1
Pool Bar	2,126	sf	468	gal/day/ksf	100%	995	363,163	1.11	100%	995	1.11	S1
Spa & Fitness	10,665	sf	1,775	gal/day	100%	1,775	648,021	1.99	100%	1,775	1.99	S6
Laundry:												
Hotel	85	Rooms	60.0	gals/Room	65%	3,315	1,209,975	3.71	100%	3,315	3.71	S2
Spa & Fitness	654	pounds/day	2.0	gals/pound	100%	1,308	477,420	1.47	100%	1,308	1.47	S3
Pool make-up	3,367	gallons/day	-	days	100%	0	0	0.00		1,768	1.98	S4
Hotel, subtotal						27,632	10,085,763	30.96		29,400	32.94	
Winery:												
Winery Production	10,000	Cases	13.1	gal/case	100%	0	0	0.00	100%	358	0.40	S5
Winery Commercial	12,450	sf	88	gal/day/ksf	100%	0	0	0.00	100%	1,096	1.23	S5
Tasting Room	1,166	sf	177	gal/day/ksf	100%	206	75,329	0.23	100%	206	0.23	S1
Deli	1,439	sf	468	gal/day/ksf	100%	673	245,810	0.75	100%	673	0.75	S1
Winery, subtotal						880	321,139	0.99		2,334	2.62	
Residences:												
2BR	7	Units	200	gals/day/Unit	100.0%	1,400	511,000	1.57	100%	1,400	1.57	S1
3BR	10	Units	200	gals/day/Unit	100.0%	2,000	730,000	2.24	100%	2,000	2.24	S1
4BR	4	Units	285	gals/day/Unit	100.0%	1,140	416,100	1.28	100%	1,140	1.28	S1
Residences, subtotal						4,540	1,657,100	5.09		4,540	5.09	
Total Resort						33,052	12,064,002	37.04		36,274	40.65	

Data Sources:

- S1 City of Calistoga Use Table for Resource Management (excluding irrigation)
- S2 The Marshall Associates, Inc. See Laundry Sheet
- S3 Curry Spa Consulting. See laundry sheet.
- S4 Pool make-up to be sourced from on site wells.
- S5 Winery production water to be sourced by on site wells under current county permit.
Irrigation sourced from on site wells.
- S6 Curry Spa Consulting. See Spa Water Demans Sheet

CITY OF CALISTOGA STANDARDIZED USE TABLE

SUT Description	Resort Program Equivalent	Monthly Discharge to City		Wastewater Factors	
		Acre Ft /Yr	GPD	Acre Ft /Yr	GPD
Mobile Home Parks	NA for Resort program	0.149	133	0.125	112
Apartments, Condo, Townhouses, Granny Units	NA for Resort program	0.382	341	0.213	190
SFR: 1BR, 2BR, 3BR	Residences, 2BR, 3 BR	0.428	382	0.224	200
SFR: 4BR	Residences, 4 BR	0.539	481	0.319	285
Transient Lodging	Guest Rooms	0.170	152	0.150	134
Commercial	Multiple	0.110	98	0.099	88
Bar	Bar	0.220	196	0.198	177
Restaurants	Restaurant	0.580	518	0.524	468

Notes:

1. The difference between water use and wastewater demand is irrigation demand, which does not return to sanitary sewer.
2. Gallons per day shown vary slightly from the City Standard SUT Table. Demand in acre-feet per year was taken from the SUT and the demand in gallons per day was calculated.

Laundry Water Demands

	Monthly Discharge to City			Gals/Lb	Gallons	Gals/unit
Hotel laundry	Qty	Unit	Lbs/unit			
Hotel	85	rooms	30	2.0	5,100	60.0

Source: Steve Marshall and Associates, Laundry Consultant

Spa laundry	<u>Average</u> guests/day	Bath Mats	Bath Towels	Workout towels	Washcloth	Pool Towels	Bed Linens	Robes
Spa	66	66	198	-	66	132	66	66
Fitness	24	12	12	24	6	12	-	-
Subtotal	90	78	210	24	72	144	66	66
pounds/unit		0.25	0.75	0.50	0.25	1.50	1.00	2.50
Pounds, subtotal		20	158	12	18	216	66	165
Pounds/day, total	654							

Source: Curry Spa Consulting

Spa and Fitness

Water Consumption

	Average Demand			
	Qty	Uses/Day	Gal/Use	Gal/Day
Treatment Rooms	8			
Hand washing Sinks	6	3	1.50	27
Bathtubs	2	2	70.00	280
Showers	2	2	25.00	100
WC	2	2	1.60	6
Dispensary				
Residential Dishwasher	2	1	12.00	24
Residential Sink	1	1	25.00	25
Residential Icemaker	1	1	1.00	1
Residential Washer	1	1	42.00	42
Locker Rooms				
Showers	6	3	25.00	450
WC/Urinals	6	25	1.60	240
Sinks	4	25	1.50	150
Steam Rooms	2	1	60.00	120
Specialty Area				
Shower	1	10	25.00	250
Steam Room	1	1	60.00	60
Gallons/Day, total				1,775

Gals/treatment room: 222

Spa Area: 10,157

Gals/SF: 0.17

Data provided by Curry Spa Consulting

Excludes whirlpools/swimming pools/Spa laundry use. Modeled separately

POOL WATER USE AND SEWAGE DISCHARGE ESTIMATES

Anticipated Water demand. Pool make-up water proposed to be sourced by on site wells.

Pool Type	Total	Hotel Pool 1	Hotel Pool 2	Hotel Pool 3	Spa at Pool 1	Spa at Pool 3	Presid	Spa Pools
Water Surface Area (Sq Ft)	7,600.00	1,050	1,800	2,200	200	200	350	1,800
Average depth, feet		4.5	4.5	4.5	2.5	2.5	4.5	2.5
Volume, gallons		35,345	60,592	74,057	3,740	3,740	11,782	33,662

Water Demand

Make-up water

Evaporation, inches per year	57.75	77.00	inches/year pan evaporation at Berryessa	75%	pan rate factor, includes adjustment for precipitation
Splash Loss, inches per year	19.25	25%	as percent of evaporative loss		
Make-up water, inches per year/SF	77.00				
Cubic feet per year	48,767				
Gallons per year	364,800				
Acre-feet per year	1.12	29%			
per 1,000 sf of pool	0.15				

Deck Cleaning

Hours/day	0.50				
Flow rate, gpm	20				
Gallons/year	219,000				
Acre-feet/year	0.67	18%			

Back Wash Make-up

Gallons/year	110,435				
Acre-feet per year	0.34	9%			

Spa Drain down and refill

Gallons/year	534,857		4	week cycle	
Acre-feet per year	1.64	43%			

Pool and Spa Leakage

Gallons/year	8,322		3	gpd/1ksf	
Acre-feet per year	0.03	1%			

Water demand, total

Gallons/year	1,229,092				
Acre-feet/year	3.80	100%			
Gallons/day	3,367				
Gallons/day/SF	0.44				

Sewer Generation

Gallons/year	645,292				
Gallons/day	1,768				
Acre-feet/year	1.98	52%	Sewer as percent of water		

Backwash calculations

Backwash, filter maintenance

Turn, hours		6.0	6.0	6.0	0.5	0.5	6.0	3.0
Flow rate, GPM		98	168	206	125	125	33	187
Backwash cycle, minutes		4.5	4.5	4.5	4.5	4.5	4.5	4.5
gals/backflush.		442	757	926	561	561	147	842
Backflushes per year	14 day cycle	26	26	26	26	26	26	26
Backflush, gallons/year	110,435	11,519	19,747	24,135	14,627	14,627	3,840	21,941
Backwash, acre-feet/year	0.34							
Gallons/day	302.56							
Gallons/day/SF	0.04							

TRANSIENT LODGING

*Units
Yr*

Hotels, Motels, Resorts & Bed and Breakfasts per Living or Rental Unit

Water	.17 Acre Ft. Per Year	} Values include tests for irrigation use	154 gpd	75.1
Wastewater	.15 Acre Ft. Per Year		138 gpd	67.3

COMMERCIAL (Per 1000 Square Feet)

Offices, Retail Stores, Personal Services

Water	.11 Acre Ft. Per Year	}	98 gpd	47.8
Wastewater	.099 Acre Ft. Per Year		88 gpd	42.9

BAR (Per 1000 Square Feet)

Water	.22 Acre Ft. Per Year	193 gpd	94.2
Wastewater	.198 Acre Ft. Per Year	174 gpd	84.9

RESTAURANTS (Per 1000 Square Feet)

Water	.58 Acre Ft. Per Year	520 gpd	253.7
Wastewater	.524 Acre Ft. Per Year	468 gpd	228.4

1000 sqft = Gross Floor Area

* The adoption of this resolution amending the Standardized Use Table is not intended to affect the number of bedrooms purchased through the now defunct Leak Detection Program. All projects which purchased leak detection water shall only be vested for the original number of bedrooms purchased.

NOW THEREFORE, BE IT FURTHER RESOLVED that Resolution 91-42 is hereby rescinded in its entirety.

PASSED, APPROVED, AND ADOPTED by the City Council of the City of Calistoga at a regular meeting held this 5th day of October,