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## Water Availibility Analysis



C A R N E R O S

February 11, 2016

Shaveta Sharma  
Napa County PBES  
1195 Third Street, Second Floor  
Napa, CA 94559

RE: Mahoney Vineyards – 1134 Dealy Lane (APN049-090-007) – P14-00242

Dear Shaveta,

As we discussed in our meeting on January 28, I am submitting this information regarding water availability on my property located at 1134 Dealy Lane. This information was used by Taber Consulting to prepare the Water Availability Analysis dated June 23, 2015.

My wife Kathleen and I have worked and lived on Dealy Lane since 1972. In the course of living in Carneros, we have learned to appreciate water as a precious resource. Unlike some folks in Napa County, we have the benefit of decades of experience on this property. The following narrative is a declaration of our experience with our well at 1134 Dealy Lane.

### **Background and history**

In 1988, we purchased 45 acres of pasture property 300 feet to the east of our 1134 Dealy Lane property. These parcels are known as APNs 047-080-047 and 056. Our hope was to plant vineyard on the land provided we secured a water resource, and we hired a local geologist to investigate the potential of finding an agricultural water supply. His recommendation was to air-drill a well into the sandstone formations along the Carneros fault line that runs through our property. In 1988, we dug a new well at 1134 Dealy, which well tested at 150 gpm.<sup>1</sup> This was considered a very big well in Carneros. We set a 20 hp, 75 gpm pump at 294 feet. The 20hp pump was needed to lift the well water 500+ ft to the ridgeline properties. Static water was tested at 63 ft. This well became the primary source of water for our home, landscaping, house vineyard and the 42 acres vineyard on APNs 047-080-047 and 056. (See Exhibit B for detail of vineyard plantings and irrigation water used in vineyard from 1989 to 2015.)

### **Historic Well Water Levels**

The finding of such a large water source was totally unexpected, even with the geologist's report. We had been told by many farmers in the Carneros and government officials that good well production was very rare in the Carneros. We understood the potential irrigation demand on the new well, but we needed on going well data so they installed a ¼ " air tube alongside the pump pipe that would give us an exact measurement of the static water levels. This tube when pressurized with compressed air would give a pressure reading that we could convert to the static water level before and after each irrigation set, (an irrigation set is a timed water period for a block or multiple blocks of vines). Beginning in 1989, the well was checked constantly for static water levels before and after irrigation.

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<sup>1</sup> Water Well Driller's Report attached as Exhibit A.

Over 27 years, this well averaged a static water average of 62 feet, and post irrigation average of 114 feet for both spring and fall as well as water levels after irrigation. (See Exhibit C, Annual Water Log Of Static Water Levels). As the years went by, there has been little change in the static water levels and drawdown averaged 45 ft or 19% of the distance to depth of the pump set (294 ft). Typically, the well output exceeded the pump specification of 75gpm to produce 80 gpm because of high static water levels.

Beginning in 2001, the water levels reflected in Exhibit C were measured by third parties. Then Planning Commissioner David Graves organized a local well monitoring program that we joined. The idea was to have well measurements taken by other participants in the program so that a third party took the measurement. Since 2001, we have participated in this program and will continue to do so.

### **Historic Water Demand & Irrigation Practices**

Vineyard irrigation per vine would vary year-to-year depending on weather, cool summers vs. hot summers, wind and moisture content from the rainy season. Typically, the vineyards would require 8 (10 hour timed sets of irrigation) per vine. In other words, each vine received 1 gallon per hour for 10 hours 8 times a growing season or 80 gallons per growing season. Mahoney Vineyards drip irrigated annually 41,000 vines x 80 gals per vine = 10.052 acre feet over a total area of approximately 55 acres. There was never an issue with the well and it maintained static water levels even through the numerous drought periods from 1989 to 2015.

In the course of past 27 years, we have replanted our vineyards to respond to disease, changes in market demand, and old age. Young vineyards require many more water irrigation sets than mature vineyards. In all these replants, the well has not wavered in its ability to supply.

Apart from grape, we have been avid fruit and landscape tree planters on our property. The orchards supply summer and winter fruit, and the large selection of big trees provides beauty, shade and relief from afternoon winds. We have planted drought tolerant grass in and around their extensive landscape. Many of the trees are mature and need little water but as in all landscapes and orchards, trees die and new ones need to be replanted. The well has provided the water for all this beauty around our home and privacy cover from Dealy Lane for the existing agricultural buildings.

Our nearest neighbor Patrick Jude has not had any issues with his well; we have been neighbors for 33 years. When we first put in the well in 1988, we installed a water line at the edge of his property if there should ever be a problem. We have only used it once when his well electric controls failed. In 1999, Mr. Jude dug a new well to a depth of 320 feet, (same depth as the Mahoney well) for purpose of putting in a vineyard. This drilling was a community effort between the Mahoney's and Patrick Jude. Throughout the past 27 years, the Mahoney well has maintained its original flow rate. Based on our experience with this well over almost three decades, there is virtually no doubt that the addition of a 30,000 gal winery permit will have minimal effect on the well's output.

If it helps the Planning Commission to have the above information in the form of a declaration, I swear that the above is true. Please feel free to contact me with any questions. Thank you for your consideration.

Sincerely,



Francis Mahoney

TRIPPLICATE  
Owner's Copy

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

Do not fill in  
No. 291403

Notice of Intent No. \_\_\_\_\_  
Local Permit No. or Date 7-22-88

State Well No. \_\_\_\_\_  
Other Well No. \_\_\_\_\_

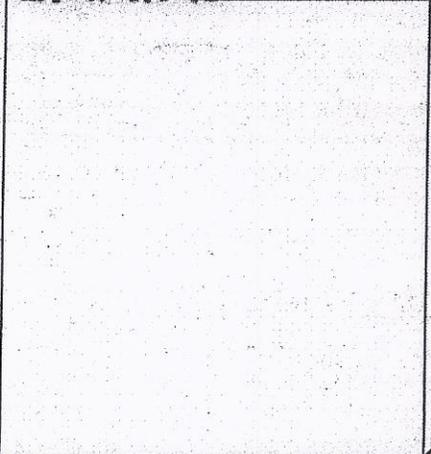
(1) OWNER: Name Francis Mahoney  
Address 1134 Dealey Lane  
City Napa ZIP \_\_\_\_\_

(12) WELL LOG: Total depth 320 ft Completed depth 320 ft  
from ft. to ft. Formation (Describe by color, character, size or material)

(2) LOCATION OF WELL (See instructions):  
County Napa Owner's Well Number \_\_\_\_\_  
Well address if different from above \_\_\_\_\_  
Township 5 N. Range 5 N. Section Rancho  
Distance from cities, roads, railroads, fences, etc. Carneros  
148<sup>+</sup> N. Dealey Lane

0-7 Top Soil  
7-20 Clay 10% Sandstone 90%  
20-25 Brown Sandstone  
25-65 Green Sandstone  
65-70 Brown Sandstone  
70-100 Green & Brown Sandstone  
100-160 Brown Sandstone  
160-200 Green & Gray Sandstone  
200-320 Light Green & Light Gray Sandstone

AP# 47-090-02



(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)

WELL LOCATION SKETCH

(5) EQUIPMENT:  
Rotary  Reverse   
Cable  Air   
Other  Bucket

(6) GRAVEL PACK:  
Yes  No  Size 3/8  
Diameter of bore 9"  
Packed from 22' to 320' 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
+1	320	6 5/8	188

From ft.	To ft.	Slot size
160	180	
200	220	1/8
240	260	
280	320	

(9) WELL SEAL:  
Was surface sanitary seal provided? Yes  No  If yes, to depth 21 ft  
Were strata sealed against pollution? Yes  No  Interval \_\_\_\_\_ ft  
Method of sealing cement

(10) WATER LEVELS:  
Depth of first water, if known 45' ft  
Standing level after well completion 30' ft

(11) WELL TESTS:  
Was well test made? Yes  No  If yes, by whom? Drillrig  
Type of test Pump  Bailor   
Depth to water at start of test 30' ft. At end of test 180' ft.  
Discharge 150 gal/min after 2 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

Work started 7-21-88 19\_\_\_\_ Completed 7-27 1988  
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 Lloyd Huckfeldt (Well Driller)  
NAME Huckfeldt Well Drilling (Person, firm, or corporation) (Typed or printed)  
Address 2110 Penny Lane  
City Napa CA ZIP 94558  
License No. 439 746 Date of this report 9-5-88

MAHONEY VINEYARDS Home and Vineyard Irrigation (YEARS 1989 to 2015)									
1134 Dealy Lane, Napa, CA 94559									
prepared July 6, 2015									
Current and Historic Water Uses of Project Well (at 1134 Dealy Ln)									
Project well tested at 150 gpm set a 20hp for 50% of tested output									
Project Well tested annually spring & fall -for static water levels									
75 gals/min 20hp 3phase									
<b>Parcels Drip Irrigated</b>									
APN 047-080-056 Carneros I Planted 1989	Acreage	Vine - acres	vines/ac	total vine	Avg Gal/vine	total gals	Ac feet	1 Acre Foot of water = 326,000 gal	
	18.98	16	1015	16240	80	1299200	3.99		
APN 047-080-047 Carneros II Planted 1990	22.5	18	1089	19602	80	1568160			
APN 047-090-007 House Project site Planted 1985	10.02	4.7	1089	5118	80	409440			
Total Vineyard Irrigation	<b>51.5</b>	38.7		40960		<b>3276800</b>	<b>10.052</b>		
Mahoney Home 1983	4125 sq ft	4 bedrooms				68450			
Landscaping 33 years	mature tree	Tall fescue	2.5 days/wk	36 weeks/yr		186400			
Home and Landscaping water use since 1983						<b>254850</b>	0.68		
Irrigation, landscaping and domestic Annual use since 1989						<b>3531650</b>	<b>10.73</b>	acre ft	
Projected additional water use for new winery permit						<b>75000</b>	0.23	acre feet	
TOTAL OF ALL WATER USED FROM PROJECT WELL WITH WINERY PERMIT						<b>3718050</b>	<b>11.405</b>	acre feet	
<b>MAHONEY'S BUILT A PERMITTED POND IN 1983 5 Acre feet</b>									
<b>Water Right permit State of California April 13, 1983 #18848</b>									
it has filled and spilled every year since 1984 to Jan 16, 2016									
Pond is filled only with rain run off - NO Well Water ever used									
5 ac/ft adds to recharge of project parcel									

EXHIBIT C

Mahoney Vineyards Irrigation well static water levels			
Main Well at 1134 Dealy Lane			
Pump designed to pump 75 - 85 Gallons per minute and lift water 520 feet at 25psi			
Well drilled in July 1988 to 320 feet set 20hp Pump at 294 feet			
A water level indicator tube installed at same time pump installed			
Irrigation of APN 047-080-047 19 acres of vineyard 20,691 vines		at 85gpm	
In 1991 at new vineyard added APN 047-080-056 - 16ac of vineyard 17,424 vines			
Record of static water levels		10 hrs 5 days	
check month	before irrigation season	after irrigation 10 days of vd	
Apr-89	64	Jun-89	97 to 107
Nov-89	74		
May-90	69	Jul-90	102 - 110
Oct-90	76		
May-91	71	Jun-91	103-114 new vd on 056 added to irrigation
Nov-91	75		
May-92	59	Aug-92	97-105
Nov-92	67		
May-93	62	Jul-93	104 -116
Nov-93	73		
May-94	70	Jul-94	106 - 113 Sep-94 108-120
Nov-94	74		
Apr-95	68	Aug-95	110 - 117
Nov-95	72		
May-96	74	Jul-96	109- 118
Oct-96	81		
May-97	53	Aug-97	101 -114
Nov-97	67		
May-98	59	Aug-98	106 - 119
Nov-98	65		
May-99	67	Sep-99	108 - 120
Nov-99	76		
May-00		Jul-00	111- 120
Nov-00	75		
May-01	70		
Nov-01	67		
May-02	74	Jun-02	109 - 118
Nov-02	63		
May-03	74	Jul-03	112 -121
Nov-03	77		
Apr-04	65	1-Jul	103 -116
Nov-04	71		
May-05	75		
Nov-05	78		
May-06	62	6-Jul	110 - 123
Nov-06	76		Joined the Carneros Water Well monitoring
Apr-07	73	Aug	107
Nov-07	79		
May-08	72	july	112 -118
Nov-08	68		
May-09	71	Aug	111 - 121
Nov-09	78		

Apr-10	73							
10-Nov	78							
May-11	69		July	105 - 121				
Nov-11	74							
Apr-12	70		Aug	109-120				
Nov-12	78							
May-13	59		Sept	104 - 123				
Nov-13	78							
May-14	74		Aug	106 -118				
Nov-14	71							
May-15	72		July	101- 116				
Nov-15	79							