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Wastewater Feasibility Study

Saddleback Cellars #P16-00266-MOD and #P16-00267-VAR
Planning Commission Hearing Date August 16, 2017

DUAL SEPTIC SYSTEM DESIGN

For

Saddleback Cellars

7802 Money Road
Oakville, CA

April 5, 2016

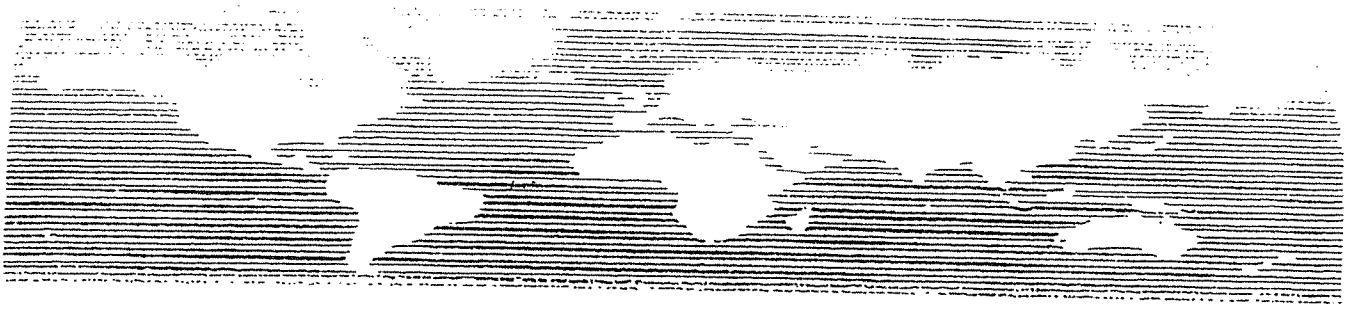
Prepared For:

Rick Wehman
Saddleback Cellars
7802 Money Road
Oakville, Ca

Prepared By:

Robert A. Karn & Associates, Inc.
707 Beck Avenue
Fairfield, CA 94533
(707) 435-9999

Project #A15055



F&R Soil Testing

Ruben Oropeza R.E.H.S 7 Griggs Lane Napa, California 94558
Phone (707) 363-2306

REGISTERED ENVIRONMENTAL SPECIALIST RUBEN I. OROPEZA No. 5116 exp. 12/31/16 R. E. H. S. STATE OF CALIFORNIA

Advantex / PD System
For Saddleback Cellars
7802 Money Rd. Oakville Ca.
A.P.N. 031 -040-002

Introduction:

The subject 16.96 acre parcel is currently developed with a small winery served by a private water well and a conventional septic system. The property is located between Oakville and Silverado Trail, on the West side of the Napa River. The facility is currently operating under Use Permit U-428384 and has been issued a notice of violation by Napa County. In an effort to comply with Napa County requirements regarding the disposal of both domestic and winery waste generated by the facility, soil testing was conducted and a new septic system is proposed. Four (4) soil profiles (Test pits) were dug with a backhoe on 01/28/16 and two (2) soil hydrometry tests were conducted on 02/03/16. The top soils appear to be in the Cole series and were identified as silty clay loam/ clay loams of strong to moderate sub-angular blocky structure, with light mottles noted at 48"-52" (see soil testing data enclosed). Based on the soil testing conducted a Pressure Distribution (PD) with treatment is proposed for the existing operation using a soil infiltration rate of .5 gal./sq.ft./day. The Advantex / PD system is proposed using 18"– 24" wide, 26" deep trenches with 16" of rock under the pipe and 12" of soil cover. The 16inches of ¾" – 11/2" lava rock under the pipe, will allow for 2.7 sq.ft. of side wall per lineal foot of trench. This will also provide a 2ft. separation to the levels where soil mottling was observed. The

PD lines will be placed between existing vine rows with a spacing of 8ft. - 9ft. (see site plan attached). The septic system is proposed in the area of TP-3 & TP-4
A 100% reserve area will also be designated.

Design Flows

The wastewater system will be designed to accommodate a 24,000 gallon per year winery with 7 employees and 15 visitors per day.

Winery

Employees(full time) = 5 @ 20gals./day =		100 gals.
Employess(part time) = 2 @ 7 gals/day =		14 gals
Visitors = 15 @ 5 gals/day =		75 gals
Winery waste = 600 gals/day		600 gals
	Total waste	**789 gals/day**

Pressure Distribution Design

The proposed trench depth of 26" (18"-24" wide) with 16" of lava rock (¾" – 1 ½") under the pipe, 12"-14" over the pipe. The 16" of rock under the pressure lines will allow for 2.7 ft. of side-wall per lineal foot of trench.

Design Flow

Required length of trench = (789 gpd / .5 gals. / ft. sq. / day) (1 ft. / 2.7 ft. sq. of side-wall) = 584.4 lineal ft.
432 lineal ft. of leach line is proposed.
The Pressure Distribution System will consist of eight(8) 75 ft. lines(1 ¼" sch. 40 pvc laterals) with 1/8" holes spaced three feet apart (25 holes per lateral). The leach field will consist of four sub-fields with two 75ft. lines in each sub-field.

System Dosing

Volume 1 ¼" pipe = 0.64 gals. / ft. of pipe length.
Length dose volume = (150ft. x 0.64 gals. = 96 gals.)
50 gals. per dose will be used
Dose rate = 789 gpd / 50 gals. = 15.78 or sixteen (16) doses per day.
24hrs. / 16 doses = 1.5hrs. 50gals. will be dosed every 90 min.

Pump Requirements

Using a residual head of 5' and an Orifice diameter of 1/8", the discharge rate = .41gpm.
Discharge rate of 1/8" per orifice = .41gpm / orifice
Discharge rate / lateral = (.41gpm / orifice)(25 orifices / lateral) = 10.25gpm / lateral.
Total discharge = (10.25gpm / lateral)(2 laterals)= 20.50gpm
Use a pump rate of 30gpm.

Friction Loss

Fittings	Quantity	Equiv. Length	Total Length
90 deg. Ell	4	5.2	20.8
45 deg. ELL	2	2.8	5.6
check valve	1	23.3	23.3
connect bushings	3	8.9	26.7
2 inch gate valve	1	2.2	2.2
reducing bushing	1	8.9	8.9
increasing bushing	1	2.8	2.8
2" straight tee	1	3.5	3.5
2" sch 40 pvc	50	1.0	50

Total Equiv. Feet = 143.8

1 ¼ inch sch 40 fittings

Fittings	Quantity	Equiv. Length	Total Length
1 ¼" ball valve	2	1.5	3.0
1 ¼" lateral	2	75	150

Total Equiv. Feet = 153

Summary of friction loss

Friction loss per 100 ft. 2 inch diameter sch 40 pvc at 30 gpm = 2.9
Total friction loss for 2 inch pipe = (2.9 ft. / 100 ft.) (143.8) = 4.2

Total friction loss for 1 ¼ inch sch 40 pvc pipe at 30.0 gpm = 6.4
Total friction loss for 1 ¼ inch pipe =(6.4 / 100 ft.) (153 ft.) = 9.2
TDH loss = 4.2+ 9.2 + 5.0 (head at end of laterals) + 5 (elevation of pump) + 12.0 (dist. valve)= 35.4
Use a pump at 30 gpm. with 40 ft. of head.

System Layout

Winery waste from the crush pad will gravity flow to a new 1500 gal. septic tank(settling). The wastewater will then gravity flow to a second 1500 gal. aeration tank. Aerated waste water will gravity flow to a third 1500 gal.(clarifying) tank before it gravity flows to a 2000 gal.(re-circulation) tank. Domestic waste from the winery will continue to be collected in the existing septic tank before it gravity flows to a new 1500 gal. septic tank. The domestic waste water will the gravity flow the 2000 gal. re-circulation tank where it will mix with the winery waste. The combined waste will the be pumped an treated by a new Orenco AX-100 Advantex treatment unit. treated effluent will gravity flow to a new 1500 gal. sump tank that will distribute the treated waste water to the PD leach field via an Orenco 4-way distribution valve. A meter is also proposed to measure the quantity of waste water that is pumped to the PD lines. An Orenco Vericom panel will be provided to operate the system. Six monitoring wells will also be provided as per plan.

General notes:

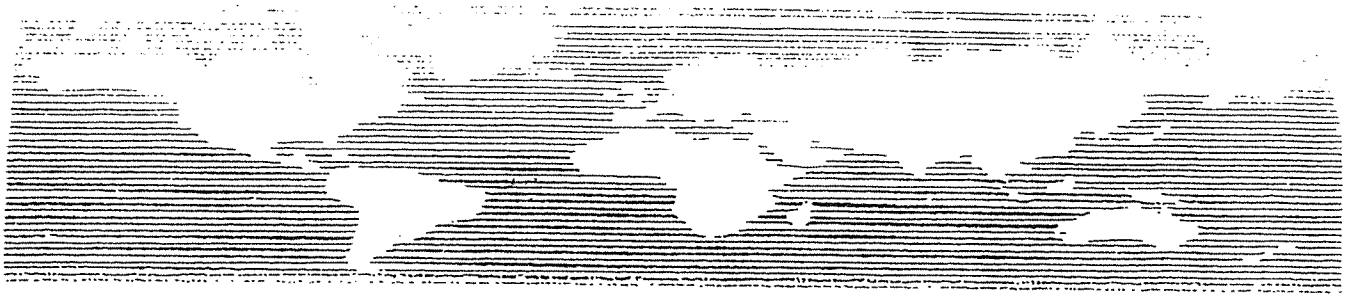
1. Septic tanks must be tested for water tightness by filling the tanks 2" into the risers checking for leaks or seepage for a minimum of 24 hours.
2. The P.D. pump & Advantex pump will be connected to an Orenco control panel, containg a dose counter time dose unit and audio and visual alarms.
3. The dosing tank will be set to allow for a minimum 24 hour storage capacity in case of pump failure.
4. The P.D field will have sweeps at the end of the lines for flushing and cleaning. The sweeps to be provided with caps with a 11/8" hole for testing pressure at each lateral.
5. Six monitoring wells (with concrete seal) will be placed for monitoring the disposal field as shown on the site plan.
6. Advantex unit must be installed by a certified Orenco installer.

Construction notes:

1. All laterals to be dug so as to maintain level trench bottoms.
2. 24" of ¾" – 1 ½" washed river rock to be added to each trench.
3. Manifold and laterals to be placed with holes facing up.
4. Squirt test to be conducted and witnessed by Napa Co. before Orenco caps are placed over each orifice.
5. ¾" – 1 ½" washed river rock to be placed a min. of 2" above laterals. 140 N marifi cloth to be placed above rock before the final 12" of soil cover is added.
6. Concrete septic tanks to be IAPMO approved with Orenco fiberglass risers and lids.

Project Inspection by schedule

A. Pre-construction conference with owner and contractor
B. Inspection of septic tanks & water tight test
C. Inspections of sewer lines and pump lines
D. Inspection of P.D trenches and materials
E. Inspection of the Advantex unit
F. Squirt test inspection for P.D system
G. Inspection of final cover to P.D system & monitoring wells.



F&R Soil Testing

Ruben Oropeza R.E.H.S 7 Griggs Lane Napa, California 94558
Phone (707) 363-2306

Advantex Sizing Calculations

Date:	**3/22/16**
Project:	**Saddleback Cellars**
Location:	**7802 Money Rd. Oakville Ca.**
Designer:	**R. Oropeza R.E.H.S.**

Inputs

Qmax – Design/Peak Flow	785 gpd
Qa – Average Daily Flow	500 gpd
Proposed Influent # BOD, Peak	5.3 BOD
Proposed Influent # BOD Average	3.32 BOD

Hydrollic Loading Calculations

Sizing Calcs. Using Design/Peak Flow	16 sq.ft. of textile required
Sizing Calcs. Using Average Daily Flow	20 sq.ft. of textile required

Organic Loading Calculations

Sizing Calcs. Using Design/Peak #BOD value	66 sq.ft. of textile required
Sizing Calcs. Using Average Daily #BOD value	83 sq.ft. of textile required

Saddleback Cellars – Project Description
Designer: R. Oropeza R.E.H.S.

Winery Waste:
Because winery wastewater has high BOD's (estimated raw BOD values of 5,000mg./L), Aeration is proposed since winery waste is highly soluble. The objective is to reduce the BOD values to less than 1,000mg/L by using simple aeration **(Terator device/Mazzei injectors)** before the wastewater is introduced to the Advantex treatment unit. Winery waste also has a low PH. To compensate for this, the domestic waste from the winery operation will be mixed with the winery waste. This will raise the PH in the wastewater and will create more favorable living conditions for the bacteria. Both winery waste and domestic waste will be provided with primary treatment before they are mixed.

Process Wastewater Pre-Treatment:
Basic settling followed aeration and clarifying will be provided for the winery waste

a. Settling: 2 – 3 day retention
b. Aeration: 2 day retention
c. Clarifying: 1 –2 retention

The 600 gpd waste flows will be processed in a 1500gal septic tank. The settling should provide a 25% BOD reduction. The 1,500gal aeration/clarifying tank (1,000gal first compartment with a terator nozzle, 500gal second compartment for clarifying), will be provided with a 1.5" Mazzei injector dosed with a PF500512 Orenco pump located in the pump vault unit in the clarifying chamber with a pipe over to the inlet of the aeration chamber (time dosed). The aeration and clarifying stage should lower the BOD to less than 1,000mg/L.

The processed waste will then flow into a 1,500gal combination pre-anoxic and surge tank. The tank is proposed to run with a normal liquid level of 600gal. using a Simplex time dosing pump package unit that will pump 300gal to the treatment system per day.

Domestic Waste Primary Treatment:
A 1,500gal tank with an Orenco effluent filter will be provided. The 3-6 day retention time should lower the effluent BOD to 200mg/L or less.

Combination Secondary Treatment: (Advatex/Ax100 unit)
The winery waste will be mixed with domestic waste before it is treated by the Advantex System (see calculations Attached). Based on the calculations, it is estimated that the mixed wastewater flow of 785gal per day (peak flow) and 500gal per day (average flow) is expected to have an influent BOD of 5.3# of BOD at peak and 3.32# of BOD at peak average. The Advantex sizing calculations show that approximately 83sq.ft. of textile is required to properly treat the proposed waste flows. A single AX100 pod (100sq.ft.of textile media) is proposed.

A 2,000gal. septic tank will be provided for re-circulation. An Orenco TCOM panel will be provided to operate the system.

High-Strength Sizing Calculation Worksheet

Project Name: Saddleback Winery

Inputs = RED
Calculation = GREEN

Domestic Waste Calculations

Design/Peak

Inputs		
Design/Peak Flow		185 gpd
Peak BOD		500 mg/L
Effluent Limit		200 mg/L
AdvanTex Sizing Calcs - Hydraulic Loading		
Square Feet of Textile Required (50gpd/sq.ft. loading)		3.7 sq.ft.
Organic Calcs (Input)		
Peak Organic Loading		0.77 #bod
Reduction Needed to meet Effluent Limit		0.46 #bod
Tank Sizing Recommendation Calculations		
Grease Tank Volume	0.00	gal
Primary Settling Tank Volume	8.11	1500 gal
Aeration Tank Volume	0.00	gal
Clarifier Tank Volume	0.00	gal
Anoxic/Surge Tank Volume	0.00	gal
Primary Tank Reduction Calcs		
Reduction through Primary Tankage		50%
Reduction through Pre-Anoxic Stage, Return Line		10%
Total #BOD reduced by Tankage		0.46 #bod
Total #BOD remaining in system		0.31 #bod
Estimated BOD remaining after this step		200 mg/L
Incoming to AdvanTex Treatment System		200 mg/L
		0.31 mg/L

Average

Inputs		
Average Daily Flow		100 gpd
Average BOD		500 mg/L
Effluent Limit		200 mg/L
AdvanTex Sizing Calcs - Hydraulic Loading		
Square Feet of Textile Required (25gpd/sq.ft. loading)		4 sq.ft.
Average Organic Loading		0.42 #bod
Reduction Needed to meet Effluent Limit		0.25 #bod
Tank Sizing Recommendation Calculations		
Grease Tank Volume	0.00	gal
Primary Settling Tank Volume	15.00	1500 gal
Aeration Tank Volume	0.00	gal
Clarifier Tank Volume	0.00	gal
Anoxic/Surge Tank Volume	0.00	gal
Primary Tank Reduction Calcs		
Reduction through Primary Tankage		50%
Reduction through Pre-Anoxic Stage, Return Line		10%
Total #BOD reduced by Primary Tankage		0.25 #bod
Total #BOD remaining in system		0.17 #bod
Estimated BOD remaining after this step		200 mg/L
Incoming to AdvanTex Treatment System		200 mg/L
		0.17 mg/L

High-Strength Sizing Calculation Worksheet

Project Name: Saddleback Winery

Inputs = RED
Calculation = GREEN

Process Waste Calculations

Design/Peak

Inputs

Design/Peak Flow	600	gpd
Peak BOD	5000	mg/L
Effluent Limit	500	mg/L

Organic Calcs (input)

Peak Organic Loading	25.02	#bod
Reduction Needed to meet Effluent Limit	22.52	#bod

Tank Sizing Recommendation Calculations

Grease Tank Volume	0.00	gal
Primary Settling Tank Volume	2.50	1500 gal
Aeration Tank Volume	1.67	1000 gal
Clarifier Tank Volume	0.83	500 gal
Anoxic/Surge Tank Volume	0.30	1500 gal
Recirculation Tank Volume	3.38	2000 gal

Primary Tank Reduction Calcs

Reduction through Primary Tankage	25%	
Reduction through Pre-Anoxic Stage, Return Line	10%	
Total #BOD reduced by Tankage	8.76	#bod
Total #BOD remaining in system	16.26	#bod
Estimated BOD remaining after this step	3250	mg/L

Pretreatment/Aeration Sizing and Reduction Calcs

	# of units	#bod red	% run
T1 Terator		0.00	
T15 Terator	1	11.28	0.55
T20 Terator		0.00	

Using a 18% efficiency rate per Orenco

Total #BOD reduced by Aeration Step	11.28	#bod
Total #BOD remaining in system	4.99	#bod
Estimated BOD remaining after two above steps	997	mg/L

****NOTE*** The goal is reduce to 1,000mg/L BOD before mixing with domestic waste, before going into the AdvanTex Treatment stage*

Incoming to AdvanTex Treatment System	997	mg/L
	4.99	mg/L

Average

Inputs

Average Daily Flow	400	gpd
Average BOD	5000	mg/L
Effluent Limit	500	mg/L

Average Organic Loading	16.68	#bod
Reduction Needed to meet Effluent Limit	15.01	#bod

Tank Sizing Recommendation Calculations

Grease Tank Volume	0.00	gal
Primary Settling Tank Volume	1.75	1500 gal
Aeration Tank Volume	2.50	1000 gal
Clarifier Tank Volume	1.25	500 gal
Anoxic/Surge Tank Volume	0.30	1500 gal
Recirculation Tank Volume	5.00	2000 ga

Primary Tank Reduction Calcs

Reduction through Primary Tankage	25%	
Reduction through Pre-Anoxic Stage, Return Line	10%	
Total #BOD reduced by Primary Tankage	5.84	#bod
Total #BOD remaining in system	10.84	#bod
Estimated BOD remaining after this step	3250	mg/L

Pretreatment/Aeration Sizing and Reduction Calcs

	# of units	#bod red	% run
T1 Terator		0.00	
T15 Terator	1	7.69	0.25
T20 Terator		0.00	

Using a 12% efficiency rate per Orenco

Total #BOD reduced by Aeration Step	7.69	#bod
Total #BOD remaining in system	3.15	#bod
Estimated BOD remaining after two above steps	946	mg/L

****NOTE*** The goal is reduce to 1,000mg/L BOD before mixing with domestic waste, before going into the AdvanTex Treatment stage*

Incoming to AdvanTex Treatment System	946	mg/L
	3.15	mg/L

Oakley Laboratory & Field Services
1645 Chapman Way • Santa Rosa , CA 95403 • Telephone 707-575-1075

February 5, 2016
Job No. 16-125.126

Ruben Oropeza R.E.H.S.
7 Griggs Lane
Napa, California 94558

Attention: Mr. Ruben Oropeza

Re: Results of Soil Texture Analysis
By Bouyoucos Hydrometry Method

Client: Saddle Back Cellars, APN 031-040-002

Client address: 7802 Money Lane

The results of the soil texture analysis on samples received on February 3, 2016 are as follows:

Sample Location	TP-3, Top Soil @ 20"-24"
% Plus No. 10 (WT)	0.3
% Sand	27.0
% Clay	32.2
% Silt	40.8
Db g/cc	--

We are pleased to provide laboratory services for you and look forward to your continued work. If you have any questions, please call.

Oakley Laboratory and Field Services

By: _____
Wayne G. Oakley
Laboratory Director

Owners Name Saddleback Cellars

A.P.N. 031-040-002 7802 Money Rd Oakville

Soil Hydrometry test conducted on 2/3/16

Name of Laboratory Oakley Lab & Field

Test Results

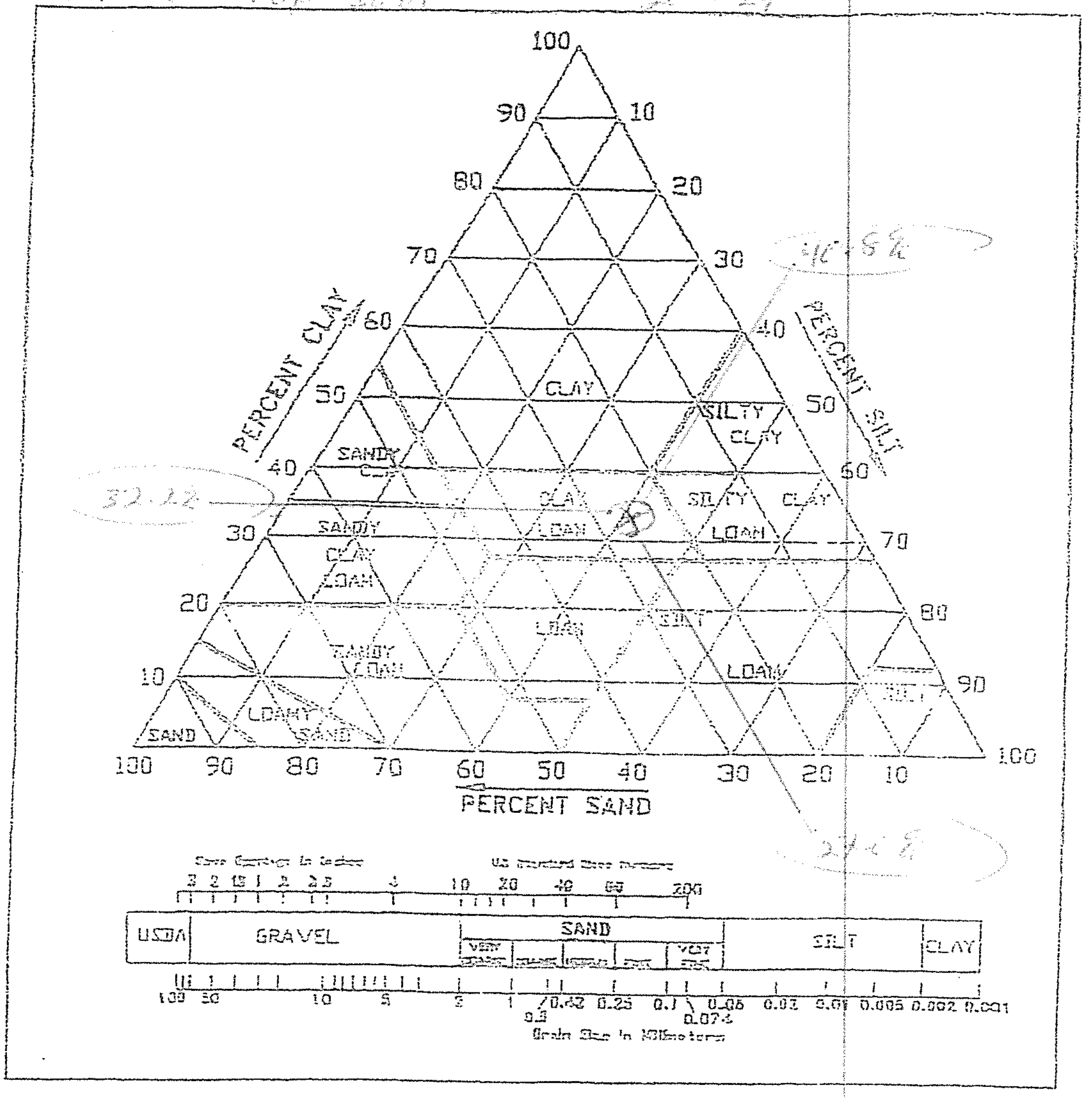
Sand 27.0 %

Clay 32.2 %

Silt 40.8 %

Figure 1: USDA Soil Textural Triangle

TP-3 Top soil 20"-24"



Oakley Laboratory & Field Services
1645 Chapman Way • Santa Rosa , CA 95403 • Telephone 707-575-1075

February 5, 2016
Job No. 16-125.126

Ruben Oropeza R.E.H.S.
7 Griggs Lane
Napa, California 94558

Attention: Mr. Ruben Oropeza

Re: Results of Soil Texture Analysis
By Bouyoucos Hydrometry Method

Client: Saddle Back Cellars, APN 031-040-002

Client address: 7802 Money Lane

The results of the soil texture analysis on samples received on February 3, 2016 are as follows:

Sample Location	TP-4, Sub Soil @ 36"-40"
% Plus No. 10 (WT)	0.0
% Sand	13.0
% Clay	42.2
% Silt	44.8
Db g/cc	--

We are pleased to provide laboratory services for you and look forward to your continued work. If you have any questions, please call.

Oakley Laboratory and Field Services

By: _____
Wayne G. Oakley
Laboratory Director

Owners Name Saddleback Cellars

A.P.N. 031-090-002 7802 Money Rd. Oakville

Soil Hydrometry test conducted on 2/3/16

Name of Laboratory Oakley Lab & Field

Test Results

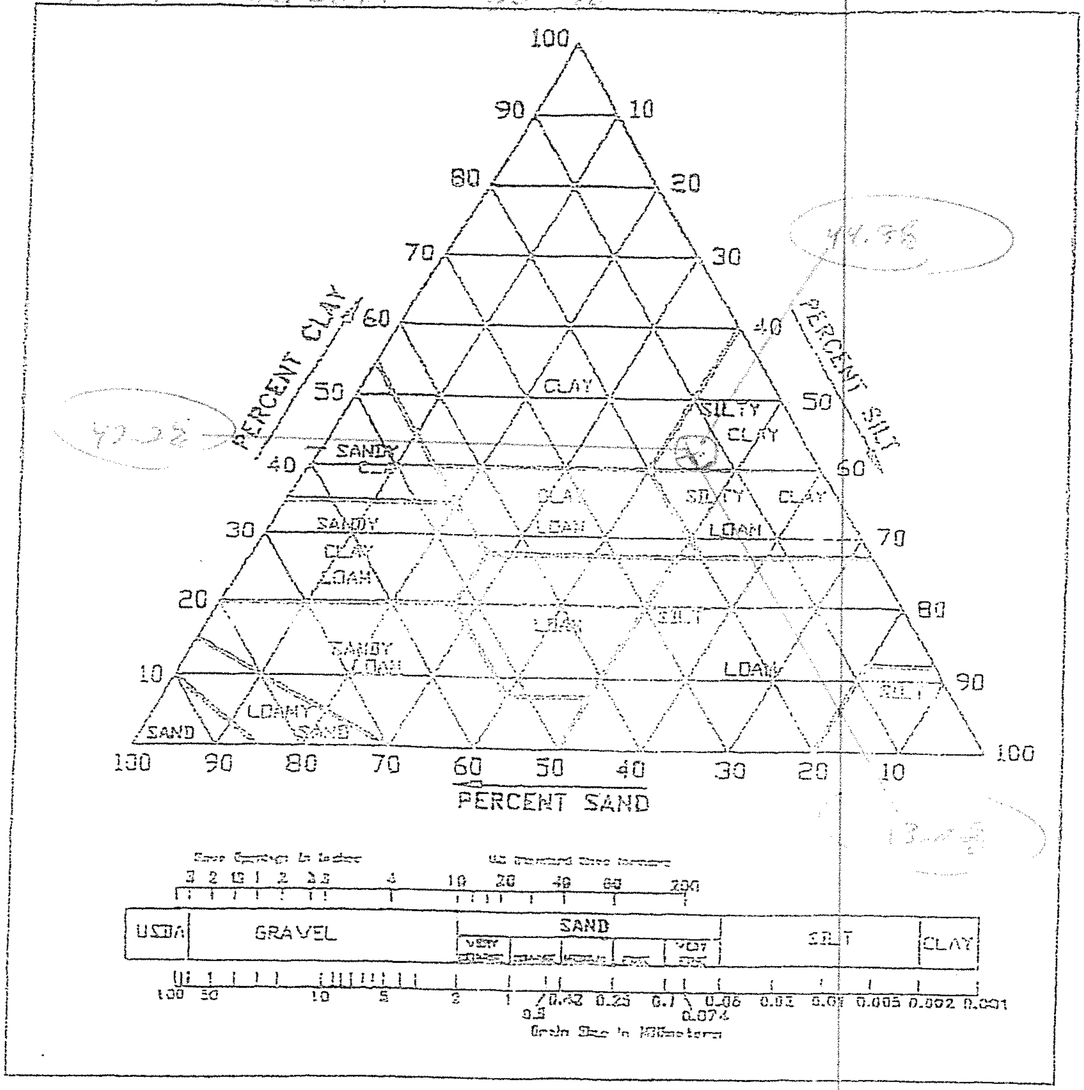
Sand 13.0 %

Clay 42.2 %

Silt 44.8 %

Figure 1: USDA Soil Textural Triangle

TP-4 Subsoil 36"-48"



Napa County Division of Environmental Health

SITE EVALUATION REPORT

Please attach an 8.5" x 11" plot map showing the locations of all test pits triangulated from permanent landmarks or known property corners. The map must be drawn to scale and include a North arrow, surrounding geographic and topographic features, direction and % slope, distance to drainages, water bodies, potential areas for flooding, unstable landforms, existing or proposed roads, structures, utilities, domestic water supplies, wells, ponds, existing wastewater treatment systems and facilities.

Permit #:	E16-00014
APN:	031-040-002
(County Use Only) Reviewed by:	Date:

PLEASE PRINT OR TYPE ALL INFORMATION

Property Owner: VENGENILS TR ETAL	☐ New Construction ☐ Addition ☐ Remodel ☐ Relocation ☐ Other:
Property Owner Mailing Address: 7802 Money Rd	☐ Residential - # of Bedrooms: Design Flow: gpd
City: Oakville State: CA Zip:	☒ Commercial – Type: winery & Domestic waste
Site Address/Location: 7802 Money Rd. Napa	Sanitary Waste: 189 gpd Process Waste: 600 gpd
	☐ Other: Sanitary Waste: gpd Process Waste: gpd

Evaluation Conducted By:

Company Name: FR Soil Testing	Evaluator's Name: R. Oropeza	Signature (Civil Engineer, R.E.H.S., Geologist, Soil Scientist): R. Oropeza
Mailing Address: 219 N. College St.		Telephone Number: (707) 363-2306
City: Woodland State: CA Zip: 95695		Date Evaluation Conducted: Jan. 28, 2016

Primary Area	Expansion Area
Acceptable Soil Depth: 52 in. Test pit #'s: TP-3 & TP-4	Acceptable Soil Depth: 48 in. Test pit #'s: TP-2
Soil Application Rate (gal. /sq. ft. /day): .5 – .6	Soil Application Rate (gal. /sq. ft. /day): .5 – .6
System Type(s) Recommended: shallow PD w/ Treatment	System Type(s) Recommended: shallow PD w/ Treatment
Slope: 1 %. Distance to nearest water source: 150 ft. +	Slope: %. Distance to nearest water source: ft.
Hydrometer test performed? No ☐ Yes ☒ (attach results)	Hydrometer test performed? No ☐ Yes ☐ (attach results)
Bulk Density test performed? No ☒ Yes ☐ (attach results)	Bulk Density test performed? No ☐ Yes ☐ (attach results)
Percolation test performed? No ☒ Yes ☐ (attach results)	Percolation test performed? No ☐ Yes ☐ (attach results)
Groundwater Monitoring Performed? No ☒ Yes ☐ (attach results)	Groundwater Monitoring Performed? No ☐ Yes ☐ (attach results)

Site constraints/Recommendations:
Maintain 100' + to blue line creek (swail) as well as other property line & building set-backs.

Test Pit # TP-1

PLEASE PRINT OR TYPE ALL INFORMATION

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-24"	gradual	0-1%	SCL/CL	mod-strong sub blk 3	Hard	Friable	slightly S/P	c/f	cc	—
24"-60"	gradual	0-1%	CL	mod. sub blk 3	Hard	Friable	S/P	c/f	ff	light at 45-50"
60"-64"	gradual	0-1%	CL	mod. sub blk 3	Hard	Friable	S/P	f/f	ff	red

Test Pit # TP-2

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-26"	gradual	0-1%	SCL/CL	mod-strong sub blk 3	H	Friable	slightly S/P	c/f	cc	—
26-36"	gradual	0-1%	CL	mod. sub blk 3	H	Friable	S/P	c/f	fc	—
36"-48"	gradual	0-1%	CL	mod. sub blk 3	H	Friable	S/P	f/f	ff	light at 45-50"

Test Pit # TP-3

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-24"	gradual	0-1%	SCL/CL	mod.-strong sub blk 3	H	Friable	slightly S/P	c/f	cc	—
24"-36"	gradual	0-1%	CL	mod. sub blk 3	H	Friable	S/P	c/f	fc	—
36"-72"	gradual	0-1%	CL	mod. sub blk 3	H	Friable	S/P	f/f	ff	light at 50"

Test Pit # TP-4

PLEASE PRINT OR TYPE ALL INFORMATION

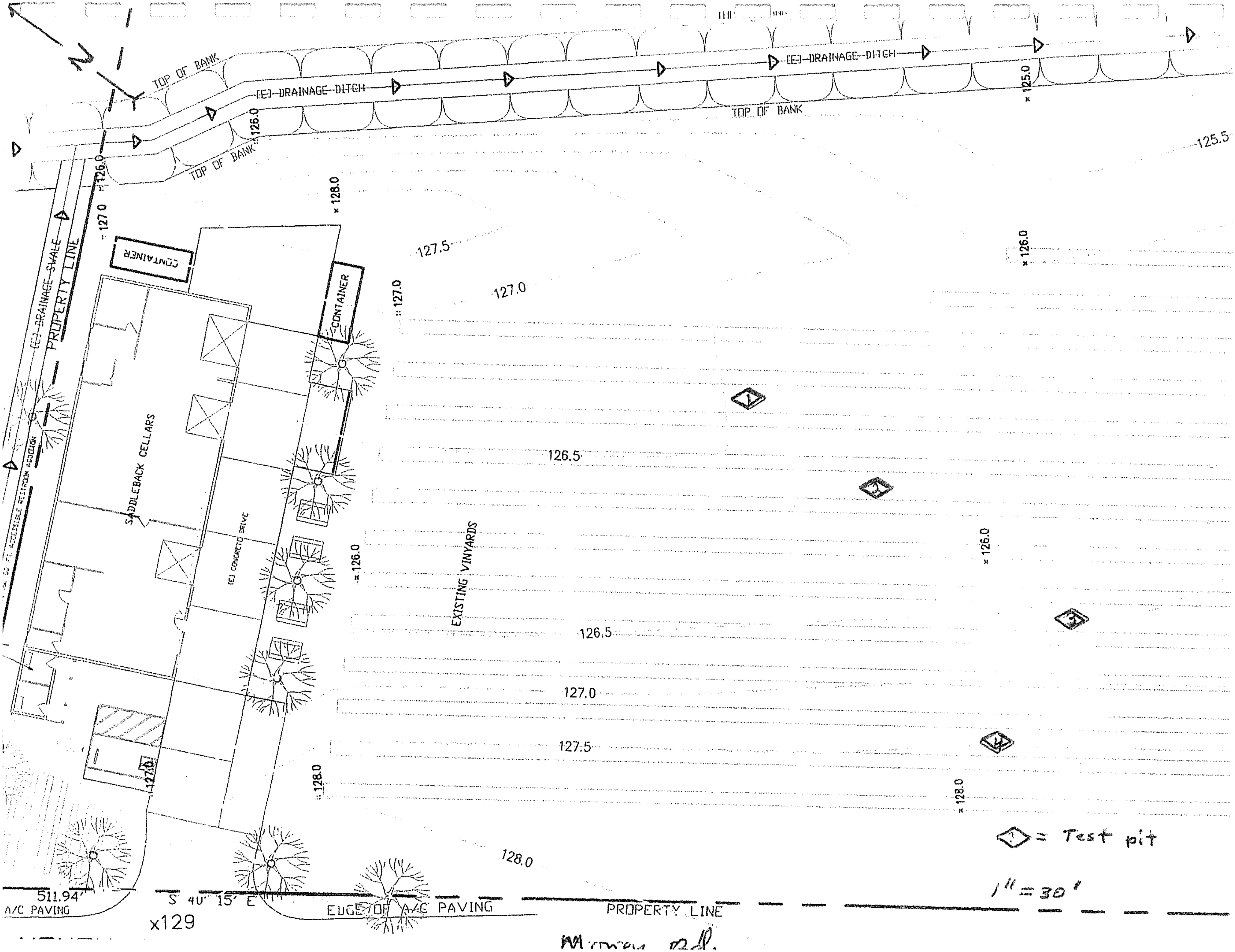
Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-22"	gradual	0-1%	SCL	med-strong subang	slightly H	friable	slightly SP	C/P	C/C	—
22"-50"	gradual	0-1%	CL	med subang	H	friable	SP	C/P	F/C	—
50"-66"	gradual	0-1%	CL	med subang	H	friable	SP	F/P	F/F	light at 52"

Test Pit #

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			

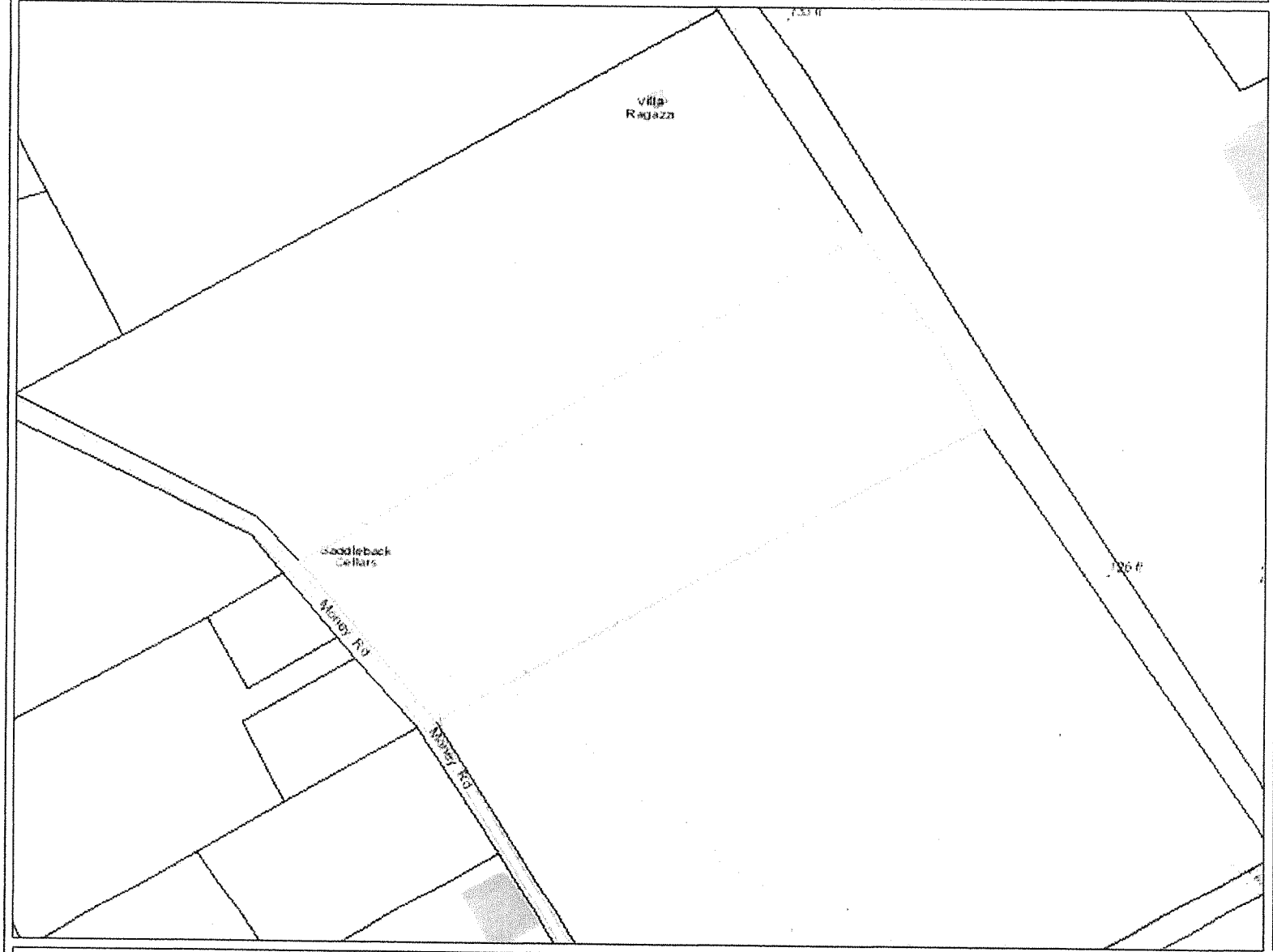
Test Pit #

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			


N
TOP OF BANK
(E) DRAINAGE DITCH
(E) DRAINAGE DITCH
TOP OF BANK
TOP OF BANK
125.0
125.5
126.0
127.0
128.0
(E) DRAINAGE SWALE
PROPERTY LINE
CONTAINER
CONTAINER
127.5
127.0
126.0
SADDLEBACK CELLARS
(E) CONCRETE DRIVE
EXISTING VINYARDS
126.5
126.5
126.0
127.0
127.5
127.0
128.0
128.0
128.0
= Test pit
1" = 30'
511.94'
A/C PAVING
S 40° 15' E
x129
EDGE OF A/C PAVING
PROPERTY LINE


1 890 000 FEET
122°22'30"
1 895 000 FEET
R. 5 W. | R. 4 W.
NAPA VALLEY
YOUNTVILLE HILLS
CAYMUS
Oakville
Napa River
Conn Creek
Rector Creek
Reservoir
SOUTHERN PACIFIC
ROAD
GRADE
QUARRY
SILVERADO
29

County of Napa GIS



Legend

- Waterlines - City of Calistoga
- Parcels
- County Boundary

920.9 0 460.43 920.9 Feet

Disclaimer: This map was prepared for informational purposes only.
No liability is assumed for the accuracy of the data delineated hereon.

This map was printed on 2/4/2016

Notes