CONSULTING CIVIL ENGINEERS
RIECHERS & SPENCE ASSOCIATES

WINERY WASTEWATER FEASIBILITY REPORT

SUMMERS ESTATE WINES
1171 TUBBS LANE
CALISTOGA, CALIFORNIA

APN 017-160-015

PROPERTY OWNER:

Summers Winery Realty LLC
1171 Tubbs Lane
Calistoga, CA 94515

Project# 4114023.0
June 27, 2014

1515 Fourth Street, Napa, CA 94559 www.rsacivil.com 707.252.3301.v 707.252.4966.f

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INTRODUCTION

The owner is applying to the County of Napa for a Winery Use Permit Modification. The modification will allow an increase in production to 100,000 gallons per year, and includes the addition of a new covered tank farm. The current Use Permit allows an 50,000 gallon per year winery on a 25.3 +/- acre parcel located at 1171 Tubbs Lane, Calistoga (APN 017-160-015). Access to the property is an existing driveway connecting to Tubbs Lane.

Most of the property is relatively level and is currently used for vineyards. The existing winery location is in the northeast corner of the property. Four wells exist on the site. Three are near the southern property line. The remaining well is located west of the office building near an existing water tank. The wells are all currently for winery use. Appendix 1 contains a Site Location Map and a USGS Site Map showing the parcel topography, features and boundary. Appendix 2 contains a reduced version of the proposed winery plan set.

This report will evaluate the disposal of wastewater consisting of winery process wastewater, and winery domestic wastewater.

EXISTING SEPTIC SYSTEM

Information from Napa County files for the parcel shows an existing septic system for the house consisting of a 1500 gallon septic tank, and 721 feet of distribution line.

The distribution lines are located southwest of the existing residence. This area will likely be impacted by the proposed winery improvements. It is proposed that the existing drain field be abandoned.

EXISTING PROCESS WASTEWATER SYSTEM

The property also has an existing process wastewater system that consists of four 1500 gallon septic tanks and an 800 gallon pump tank that supplies a pressure distribution system. The pressure distribution field consists of 34 lines.

The distribution lines are located south of the existing winery building. It is proposed that the existing drain field be abandoned due to insufficient soil depth for a pressure distribution system and to allow beneficial reuse of treated winery wastewater.

SITE EVALUATION

Riechers Spence & Associates conducted a site evaluation on the subject parcel on June 3, 2014. Appendix 4 contains a map of test pit locations and test pit logs for the site evaluation.

The site evaluation was conducted by Brett Frasier of Riechers Spence and Associates and observed by Maureen Shields Bown of Napa County Environmental Management.

Representative soil samples were collected during the site evaluation and analyzed by RGH Consultants Inc. The soil samples underwent a soil texture analysis by Bouyoucos Hydrometer Method. The soil sample results are shown in Appendix 4. Site evaluation test pit logs are shown in Appendix 4.

WINERY PROCESS WASTEWATER CHARACTERISTICS

The following is a summary of the winery wastewater characteristics:

Wine Production: 100,000 gallons of wine per year
2.38 gallons of wine per case
42,017 cases/year

Wastewater Production: 5 gallons of wastewater/gallon of wine
500,000 gallons/year

Peak Daily Waste Water Flow: Crush Period = 60 days
Annual wine production x 1.5 / 60
2,500 gallons/day

Average Daily Flow: 500,000/365 = 1,370 gallons/day

Monthly Wastewater Flows:

TABLE 1

	% By Month	Waste/Month	
Sep	15%	75,000	Gal/Month
Oct	15%	75,000	Gal/Month
Nov	11%	52,500	Gal/Month
Dec	8%	37,500	Gal/Month
Jan	4%	20,000	Gal/Month
Feb	6%	30,000	Gal/Month
Mar	6%	30,000	Gal/Month
Apr	5%	22,500	Gal/Month
May	6%	30,000	Gal/Month
Jun	7%	35,000	Gal/Month
Jul	9%	42,500	Gal/Month
Aug	10%	50,000	Gal/Month
Totals	100%	500,000	Gal/Year

DOMESTIC WASTEWATER CHARACTERISTICS

The winery domestic wastewater system has been sized to accommodate the unit values in Table 2 below. The number of visitors and employees is based on information provided by the owner. The projected flow is based on Napa County Environmental Management guidelines. The following is a summary of the estimated flows from the proposed winery.

Table 2

Use	Source	Number	Projected Flow (gpd)	Total Flow No Event Day (gpd)	Total Flow Event Day (gpd)
WINERY	Full-time employees	2	15	30	30
	Part-time employees	2	15	30	30
	Harvest employees	2	15	30	30
	Visitors	20	3	60	60
	Private Event w/ meals (catered)	30	10	0	300
	Event Staff	2	15	0	30
Winery Subtotals				150	480
Grand Total			**Total Peak Flow**	**150**	**480**

The number of visitors is based on a maximum expected daily visitor count. Any combination of events where the expected total guest count exceeds 50 persons in a single day will require the use of portable sanitation facilities.

WINERY PROCESS WASTEWATER - SURFACE DRIP IRRIGATION

According to Napa County Environmental Management Sewage Treatment System Design Guidelines, winery process wastewater must be treated prior to surface discharge. Based on our experience, winery wastewater characteristics are as follows:

Characteristics	Units	Average
pH		3.5
BOD5	mg/l	6000
TSS	mg/l	500
Nitrogen	mg/l	20
Phosphorus	mg/l	10

The treatment goal is 160 mg/l BOD and 80 mg/l TSS. To meet this treatment goal a treatment train including a septic tank, treatment tank with High Strength Membrane Bio-Reactor (HSMBR) unit, and pump tank are proposed. This treatment train may be modified for more desirable treatment processes prior to submitting construction plans. The following sections describe this process in more detail. This system is shown on Sheet UP3 contained in Appendix 2.

Septic Tank

The septic tank will serve to buffer peak flows and strengths from overwhelming the system and impairing treatment. The four existing 1,500 gallon winery septic tanks will be used subject to their condition being verified. Alternatively, a new tank will be provided. This tank will provide two days storage and will also serve to function as a primary settling basin. This tank will be 5,000 gallons.

Treatment Tank

The treatment tank will serve to treat wastewater flows using a High Strength Membrane Bio-Reactor (HSMBR) unit. This tank will be 30,000 gallons.

Pump Tank

The pump tank will serve to hold wastewater prior to distribution to the storage tank. This tank will house dual pumps. This tank will be 800 gallons.

Holding Tank and Dispersal Field

To provide a preliminary estimate of the amount of storage tanks required, we have prepared a monthly water balance, as shown in Appendix 5. Monthly wastewater production is based on a percentage of the total annual wastewater production. The amount of water allowed to be applied is estimated by the typical vine water demand. The irrigation will be applied to areas of vineyards outside well setback requirements. The area proposed for irrigation is shown in Appendix 5. An area of 5.27 acres of vineyard and 1.0 acres of cover crop has been used to calculate the storage capacity required. Based on monthly analysis 15,310 gallons of storage are required. Storage capacity of 20,000 gallons is provided for treated process wastewater generated during wet weather periods.

During the summer months all of the treated wastewater will be used for irrigation. During the wet winter months, a limited discharge will be consistent with landscape water demand and no discharge will occur within 48-hours of a forecasted rain event and also for 48-hours after a rain event. These irrigation scheduling constraints necessitate installing tanks to store excess water that cannot be discharged during the winter months. All stored water will then be used for irrigation during the summer months.

WINERY PROCESS WASTEWATER - HOLD & HAUL

Napa County Design Guidelines require a Hold and Haul volume equivalent to 7 days of peak process waste flow. This equates to 17,500 gallons of required storage for the proposed project at full production. Wastewater would be hauled to a facility permitted to accept winery process wastewater.

For this option pre-cast concrete holding tanks or equivalent capacity fiberglass tanks would be used. A high water alarm beacon, powered by the electrical system in the winery, will be located on an exterior panel.

DOMESTIC WASTEWATER - SUB SURFACE DRIP

The existing domestic wastewater system will be replaced by a new septic system and dispersal field for the proposed winery. A HOOT treatment system and a new dispersal field are proposed. The existing leach field and septic tank would be abandoned in accordance with Napa County Environmental Management requirements.

Domestic wastewater from the proposed tasting room will flow into a new HOOT H-600 tank. After pretreatment in the HOOT H-600, wastewater will be pumped to the proposed distribution field.

The existing connection for sanitary wastewater for the winery to the existing septic tank will be field verified for location and condition. A pump tank will be installed if required to pump sanitary wastewater from the winery to the proposed HOOT treatment system.

The subsurface drip field is sized to meet Napa County Environmental Management guidelines. The distribution field will be placed in the area of the site evaluation where the most limiting usable soil type was clay loam. The allowable application rate for clay loam is 0.6 gallons/square foot/day for pre-treated effluent. Peak daily domestic wastewater flow is 480 gallons/day.

$$Dispersal\ Field\ Area(primary) = \frac{480\ gpd}{0.6\ gpd/SF} = 800\ square\ feet$$

In addition to the primary dispersal area of 800 square feet, a 200% reserve area is required. The reserve area will be located adjacent to the primary field where the soil application rate is also 0.6 gallons/square foot/day.

$$Dispersal\ Field\ Area\ (reserve\ area) = \frac{480\ gpd}{0.6\ gpd/SF} = 800\ square\ feet$$

The total requirement for domestic wastewater reserve dispersal area is 1,600 square feet. Total combined area required for the primary and reserve is 2,400 square feet.

The system layout is shown on UP3 in Appendix 2.

STORMWATER DIVERSION

Operational areas including crush pad will be covered.

OPERATION AND MAINTENANCE

The winery process and domestic wastewater systems will be fully automated and will be designed so minimal input from winery staff is required. Per Napa County guidelines, a Registered Civil Engineer, Registered Environmental Health Specialist, or Licensed Contractor will provide semi-annual monitoring and evaluation of the system. The contract with the responsible party will be provided prior to the final inspection for the system installed.

CONCLUSION

This report demonstrates that enough dispersion area is available making a sub-surface drip system a feasible option for treating the Summers Estate Wines domestic wastewater. It has also been demonstrated that it is feasible to treat the winery process wastewater and distribute this to the vineyard using drip irrigation.

The above methodology results in a design that meets the Napa County Environmental Management Design standards for the treatment of winery and domestic wastewater.

APPENDIX 1

Vicinity Map & USGS Site Map

SUMMERS WINERY
VICINITY MAP
NAPA COUNTY CALIFORNIA

VICINITY MAP

SCALE: 1" = 2000'

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MAY 29, 2014

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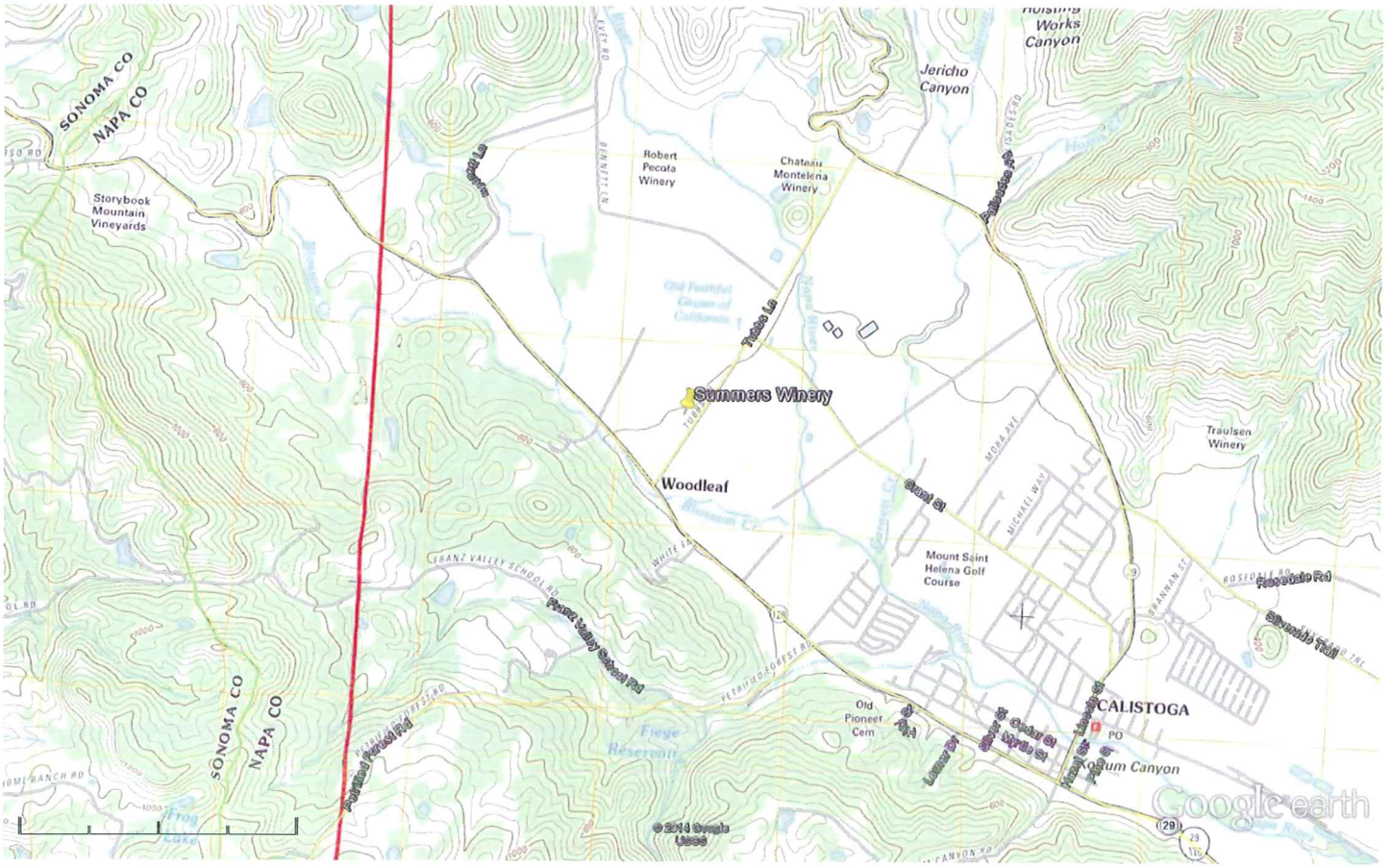


Google earth

miles 2
km 3

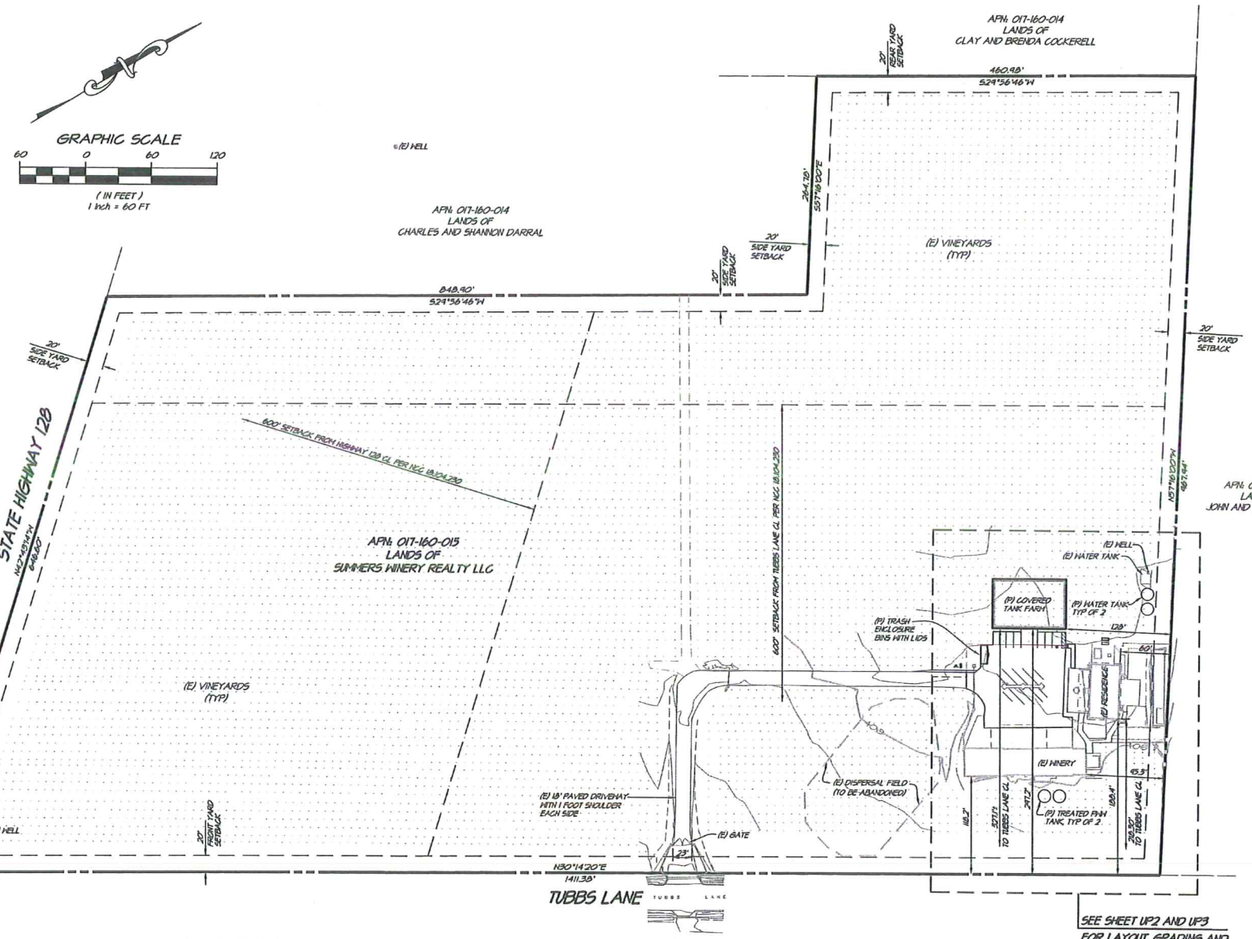
APPENDIX 2

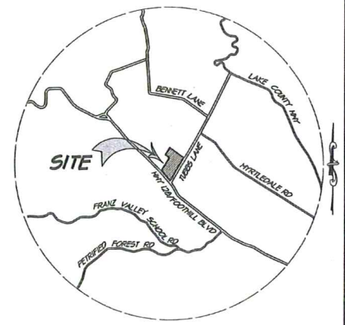
Reduced Use Permit Plan Set

SUMMERS ESTATE WINES

USE PERMIT MAJOR MODIFICATIONS

NAPA COUNTY CALIFORNIA





LOCATION MAP
NO SCALE

PROJECT INFORMATION

OWNER:	SUMMERS WINERY REALTY LLC
OWNER ADDRESS:	1171 TUBBS LANE CALISTOGA, CA 94515
SITE ADDRESS:	1171 TUBBS LANE CALISTOGA, CA 94515
CIVIL ENGINEER:	RIECHERS SPENCE & ASSOC. 1515 FOURTH STREET NAPA, CA 94559
CONTACT:	HUGH LINN TEL: 707-252-3301
APN:	017-160-015
PARCEL AREA:	25.3 ACRES±
EXISTING USE:	WINERY
PROPOSED USE:	WINERY
ZONING:	AP

BOUNDARY NOTES

THE BOUNDARIES SHOWN HEREIN ARE BASED UPON TOPOGRAPHIC MAP PREPARED BY RSA, MAY 2014.

BASIS OF BEARING

THE BEARINGS OF N 51°16'00" W BETWEEN FOUND MONUMENTS ON THE NORTHEAST LINE OF SUMMERS PER 24 RECORD OF SURVEYS 77. PROPERTY LINES ARE APPROXIMATE.

BENCHMARK

NAPA COUNTY M03-C, ELEVATION = 401.59 (NSVD 1988). PUBLISHED ELEVATION = 404.13' (NSVD 1929) ADJUSTMENT PER CORPSCON 6.1 +2.86'

SHEET INDEX

UP1	SITE AND WINERY LAYOUT PLAN
UP2	EXISTING RESIDENCE PLAN AND ELEVATION AND EXISTING WINERY ELEVATION
UP3	TANK FARM FLOOR PLAN AND ELEVATIONS
UP4	GRADING AND EROSION CONTROL PLAN
UP5	UTILITY PLAN LAYOUT AND FIRE TRUCK TURNING TEMPLATE

ABBREVIATIONS

AD	AREA DRAIN
AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
ARV	AIR RELEASE VALVE
BFP	BACK FLOW PREVENTER
BM	BENCHMARK
BO	BLOWOFF
BSW	BACK OF SIDEWALK
C&G	CURB AND GUTTER
CB	CATCH BASIN
℄	CENTERLINE
CIPP	CAST IN PLACE PIPE
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
CPP	CORRUGATED PLASTIC PIPE
CV	CHECK VALVE
DI	DROP INLET
DIP	DUCTILE IRON PIPE
DS	DOWNSPOUT
DCV	DOUBLE CHECK VALVE
DDCV	DOUBLE DETECTOR CHECK VALVE
EP	EDGE OF PAVEMENT
EX	EXISTING
F/C	FACE OF CURB
FDC	FIRE DEPT. CONNECTION
FF	FINISH FLOOR
FFG	FINISH FLOOR OF CAVE
FG	FINISH GRADE
FH	FIRE HYDRANT
FS	FIRE SERVICE
FL	FLOW LINE
FW	FIRE WATER LINE
GB	GRADE BREAK
HP	HIGH POINT
INV	INVERT
IP	IRON PIPE
JP	JOINT POLE
LF	LINEAL FEET/FOOT
LP	LOW POINT
MH	MANHOLE
OC	ON CENTER
OH	OVERHEAD
PCC	PORTLAND CONCRETE CEMENT
PG&E	PACIFIC GAS AND ELECTRIC
PIV	POST INDICATOR VALVE
PL	PROPERTY LINE
PRC	POINT OF REVERSE CURVE
PVC	POLYVINYL CHLORIDE
PW	PROCESS WASTE
R	RADIUS
RSA	RIECHERS SPENCE & ASSOCIATES
ROW	RIGHT OF WAY
RCP	REINFORCED CONCRETE PIPE
S	SLOPE (FEET/FOOT)
SD	STORM DRAIN
SS	SANITARY SEWER
STA	STATION
STD	STANDARD
STL	STEEL PIPE
TC	TOP OF CURB
TW	TOP OF WALL
VCP	VITRIFIED CLAY PIPE
W	DOMESTIC WATER LINE
WM	WATER METER
WV	WATER VALVE

SYMBOL LEGEND

EXISTING		PROPOSED	
EX SD	STORM DRAIN LINE	SD	STORM DRAIN LINE
		FIRE MAIN	FIRE MAIN
EXW	WATER LINE		PROPERTY LINE
	TREE TO REMAIN		DIRECTION OF EX. DRAINAGE
X X	FENCE		100-YEAR OVERLAND RELEASE PATH
235	CONTOUR LINE		
+231.5	SPOT ELEVATION		

REGISTERED PROFESSIONAL ENGINEER
HUGH ALEXANDER LINN
No. 52509
Exp. 12-31-14
CIVIL ENGINEER
STATE OF CALIFORNIA

PREPARED UNDER THE DIRECTION OF:
HUGH A. LINN RCE 52509 EXP 12-31-14

NO.	DATE	REVISIONS	BY	APP'D

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SUMMERS ESTATE WINES
SITE PLAN
NAPA COUNTY CALIFORNIA

DATE	06/30/2014	
DRAWN	ECB	KB
DESIGNED	ECB	KB
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JOB NO.	1114023.0	

SHEET NO.
UP1
OF 5 SHEETS

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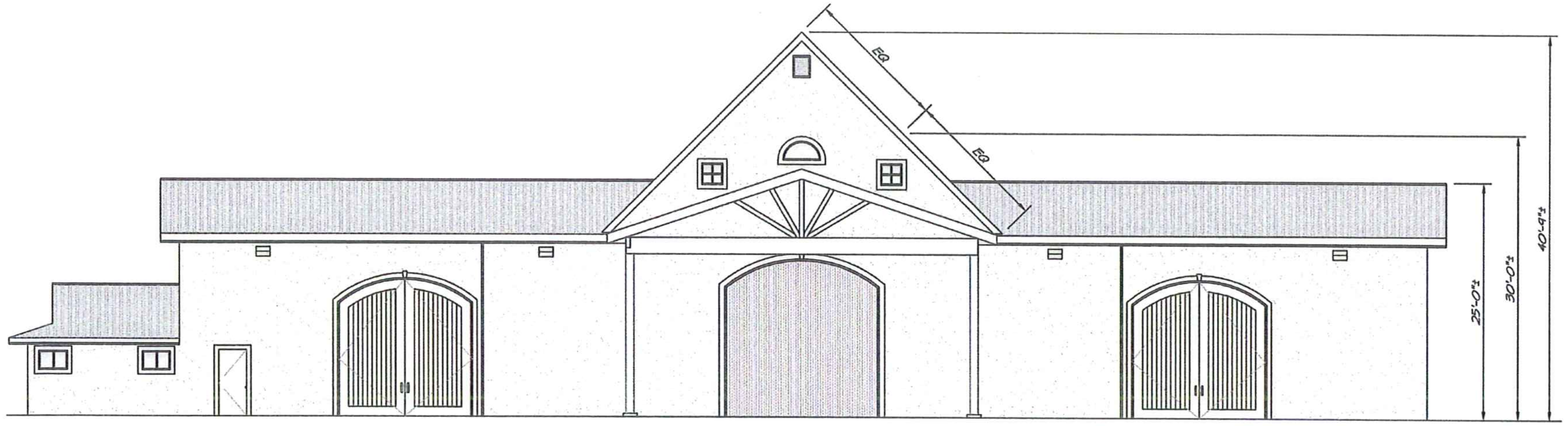
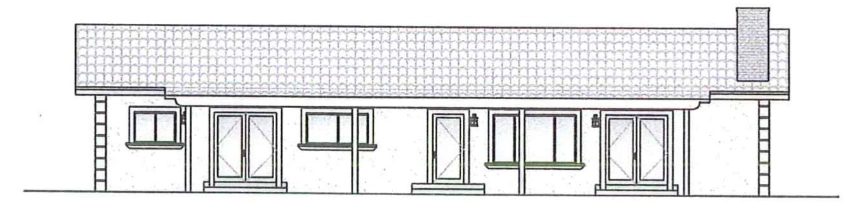


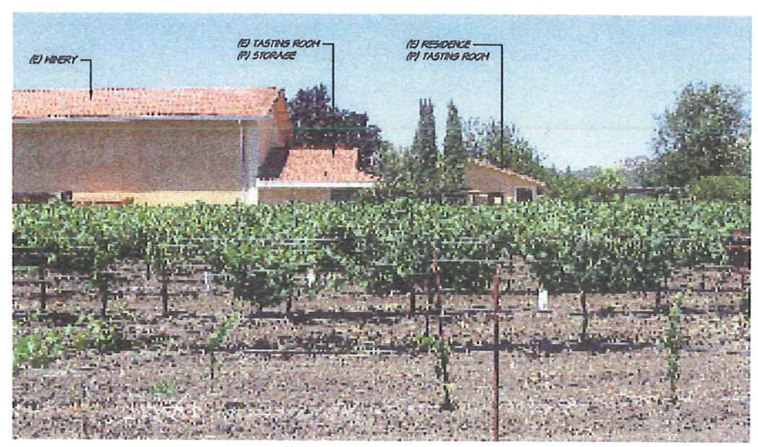
(3) EXISTING WINERY EAST ELEVATION
SCALE 1/8" = 1'-0"



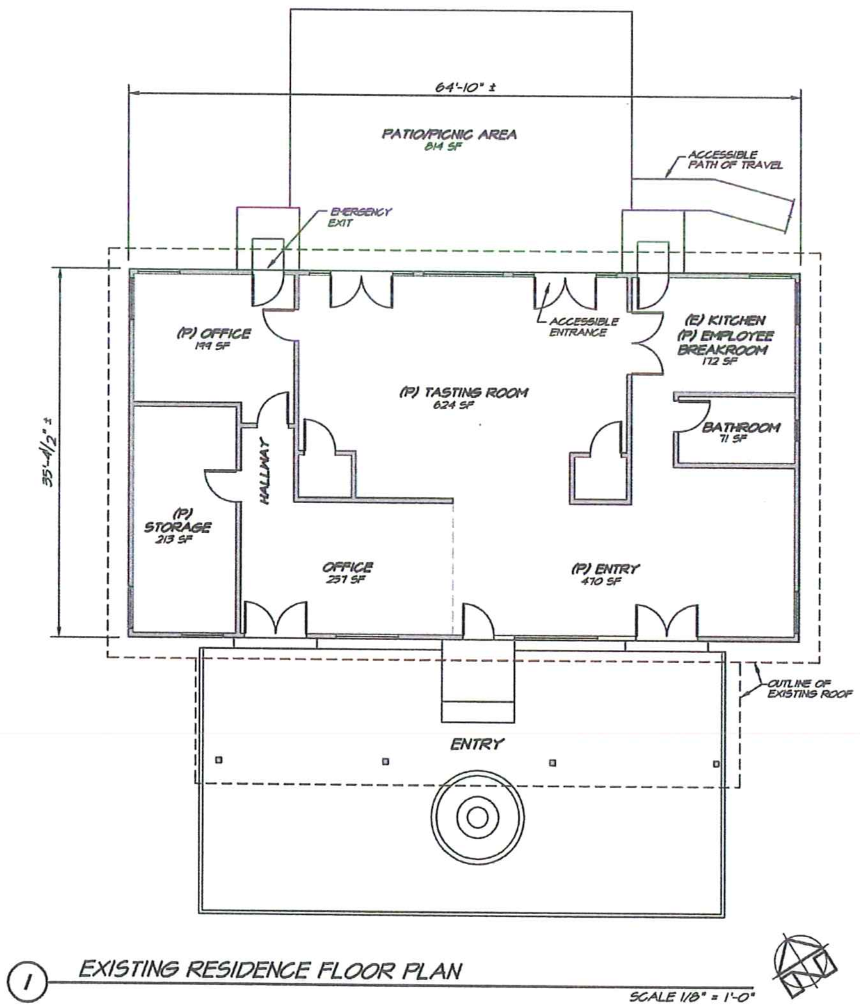
(2) EXISTING RESIDENCE NORTH ELEVATION
SCALE 1/8" = 1'-0"

(4) EXISTING WINERY EAST IMAGE
SCALE 1/8" = 1'-0"

(5) EXISTING WINERY - VIEW FROM TUBBS LANE
SCALE 1/8" = 1'-0"



(6) EXISTING WINERY - VIEW FROM TUBBS LANE
SCALE 1/8" = 1'-0"



(1) EXISTING RESIDENCE FLOOR PLAN
SCALE 1/8" = 1'-0"

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SUMMERS ESTATE WINES
EXISTING WINERY PLAN AND ELEVATIONS
NAPA COUNTY CALIFORNIA

DATE	06/30/2014
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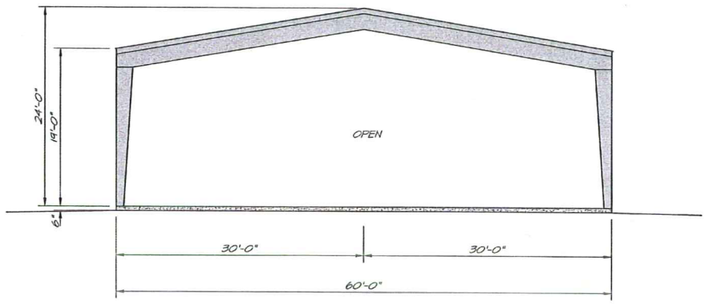
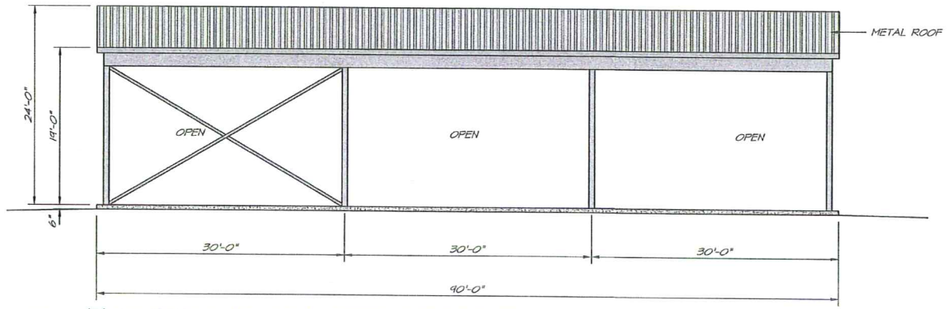


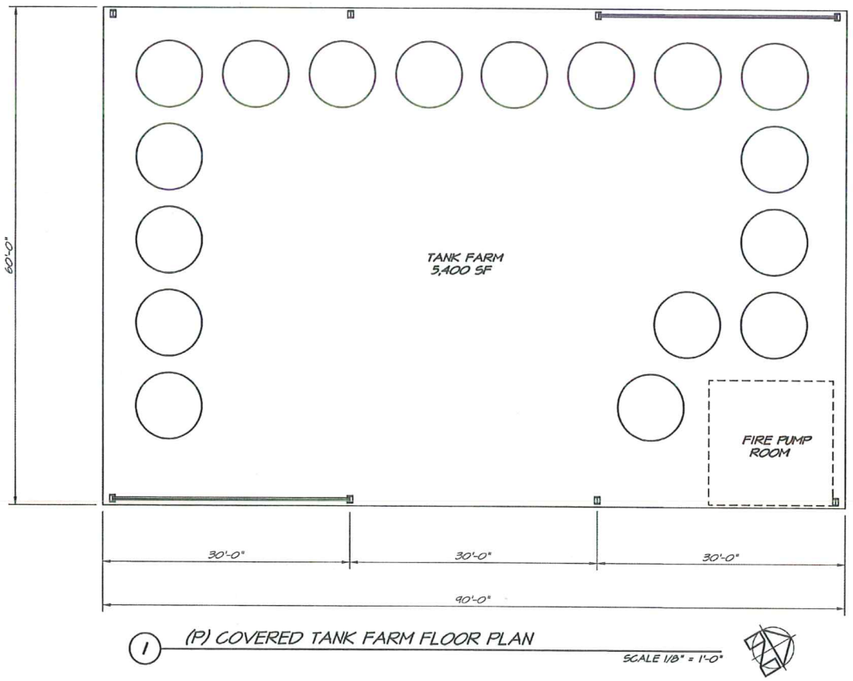
2 (P) COVERED TANK FARM - EAST AND WEST ELEVATION

SCALE 1/8" = 1'-0"



3 (P) COVERED TANK FARM - NORTH AND SOUTH ELEVATION

SCALE 1/8" = 1'-0"



1 (P) COVERED TANK FARM FLOOR PLAN

SCALE 1/8" = 1'-0"

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SUMMERS ESTATE WINES
TANK FARM FLOOR PLAN AND ELEVATIONS
NAPA COUNTY CALIFORNIA

DATE	06/30/2014	
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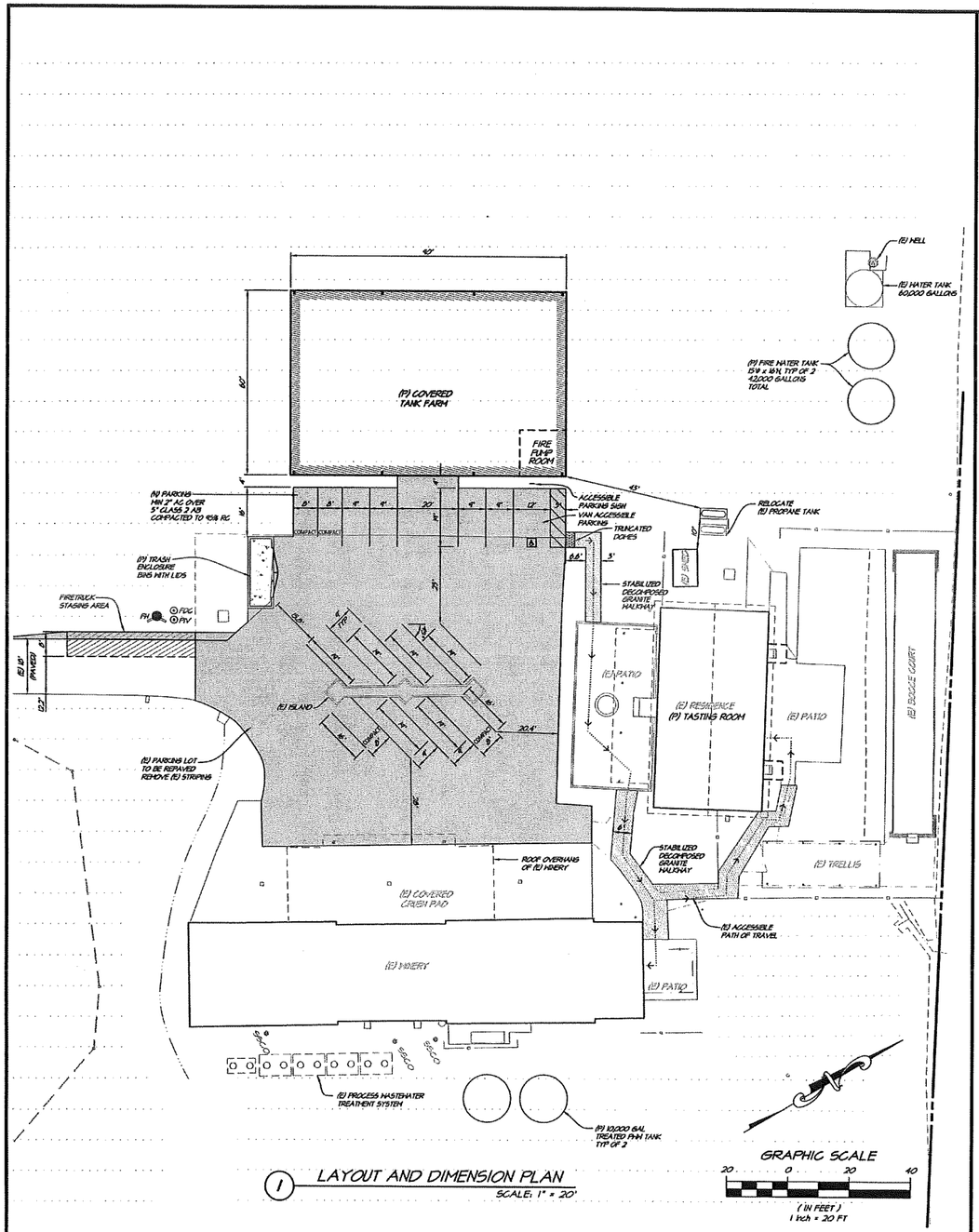
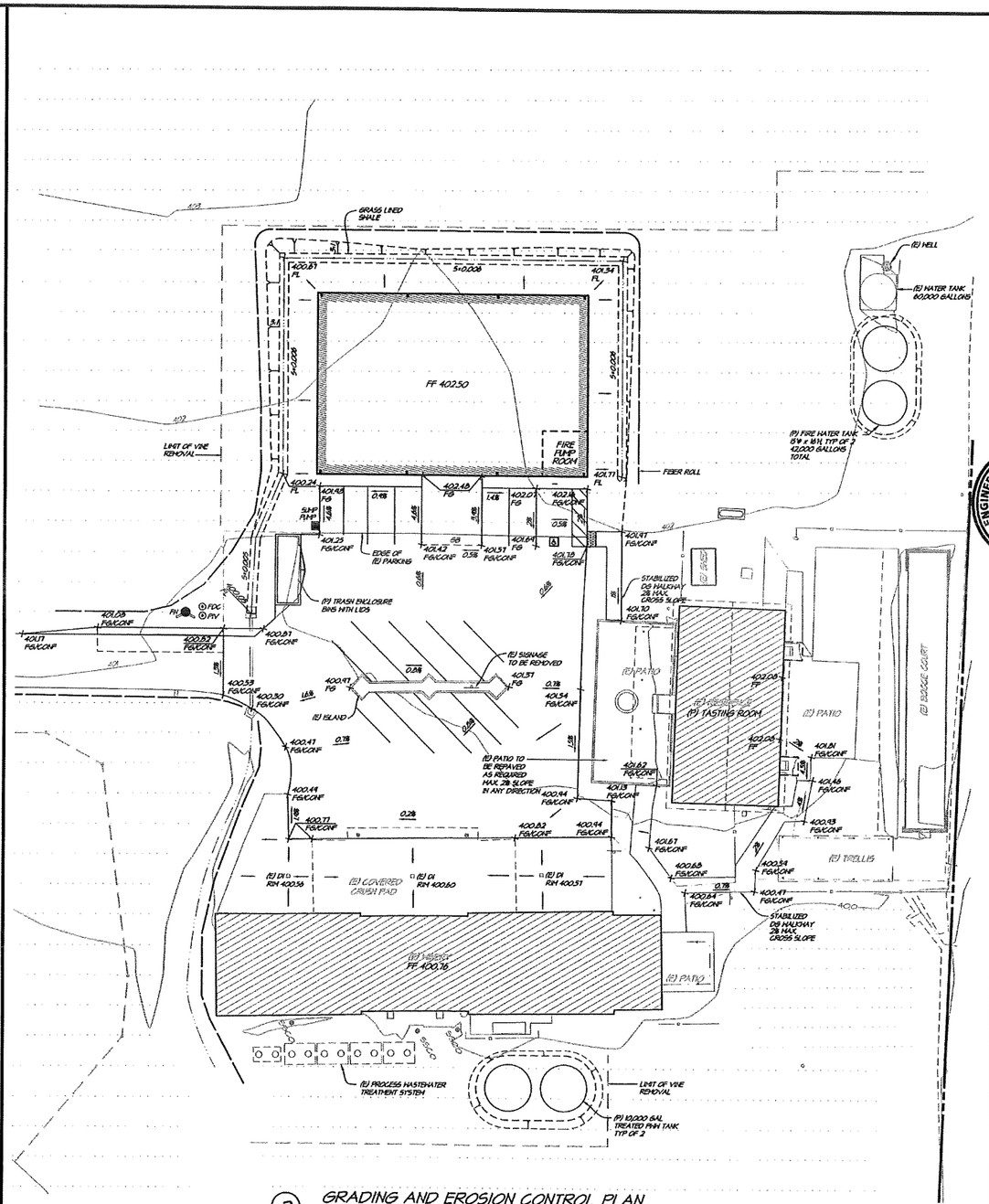


1 LAYOUT AND DIMENSION PLAN
SCALE: 1" = 20'

PARKING SUMMARY	
STANDARD (9'x19')	9 STALLS
COMPACT	4 STALLS
ACCESSIBLE (9'x18')	1 STALL
TOTAL	14 STALLS



2 GRADING AND EROSION CONTROL PLAN
SCALE: 1" = 20'

EARTHWORK ESTIMATES	
CUT	188 C.Y.
FILL	39 C.Y.
NET	149 C.Y. (SPOILS)

NOTE: SPOILS TO PLACED ON-SITE ON VINEYARD ROWS

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SUMMERS ESTATE WINES
LAYOUT, GRADING AND EROSION CONTROL PLAN
NAPA COUNTY CALIFORNIA

DATE	06/30/2014	
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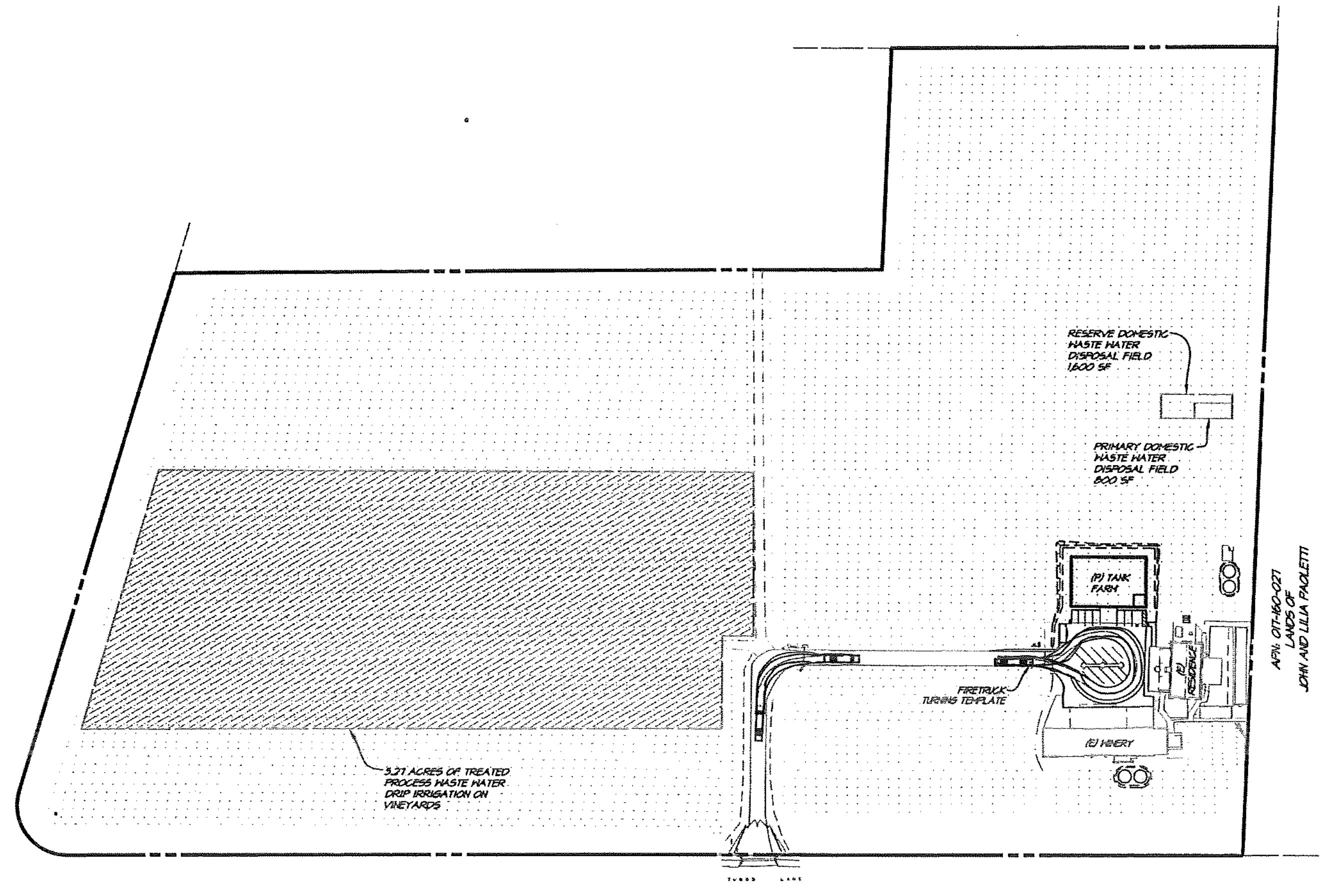
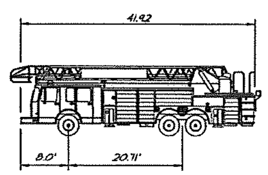


(1) FIRETRUCK ACCESS AND WASTEWASTE DISPERSAL FIELDS EXHIBIT

SCALE: 1" = 100'

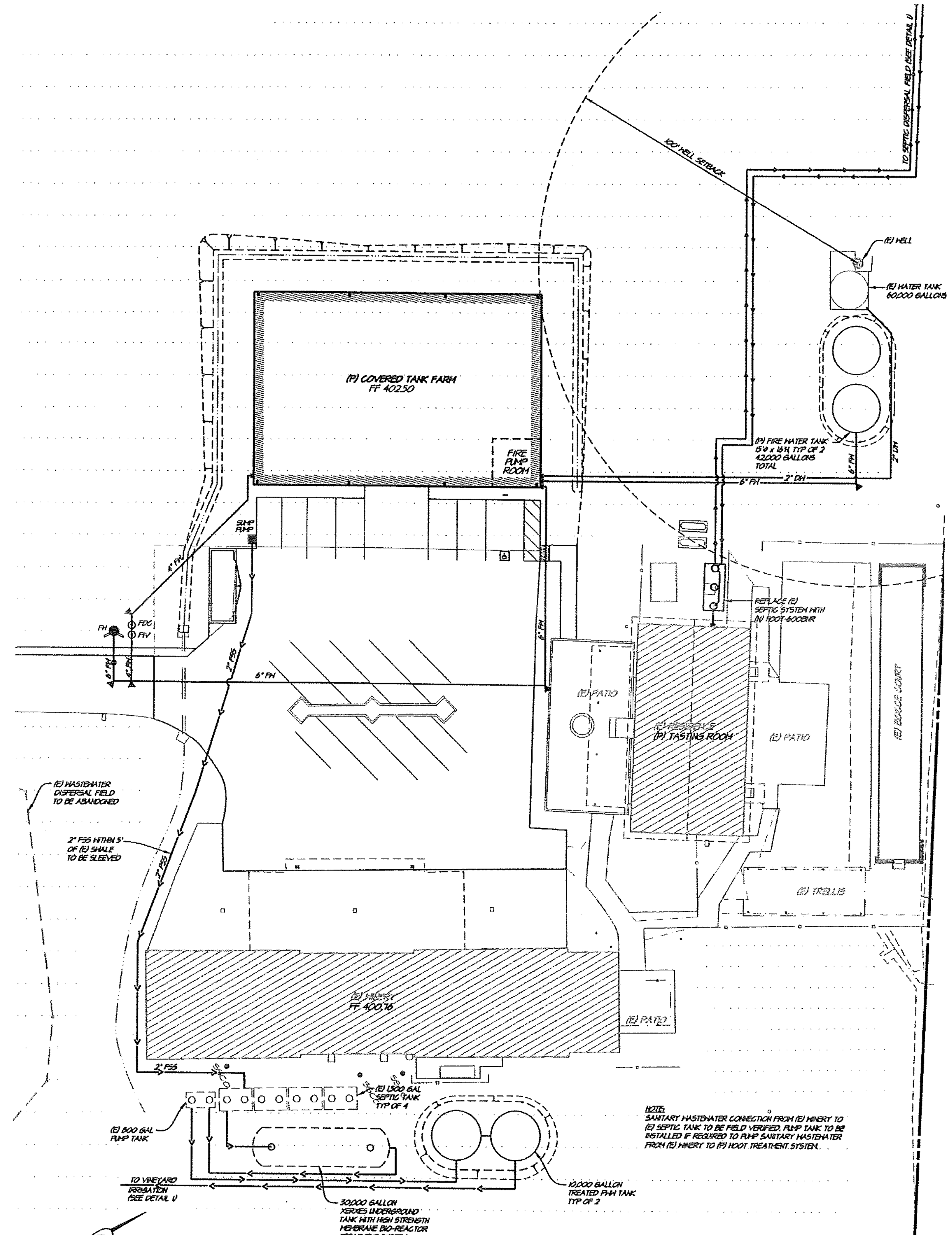


PIERCE 105' HEAVY DUTY FIRE TRUCK

DIMENSIONS	FEET
WIDTH	: 8.00
TRACK	: 8.00
LOCK TO LOCK TIME	: 6.00
STEERING ANGLE	: 45.00

NAPA COUNTY FIRE TRUCK DETAIL

NOT TO SCALE

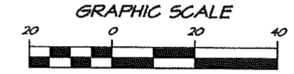


NOTE:
SANITARY WASTEWATER CONNECTION FROM (E) WINERY TO (E) SEPTIC TANK TO BE FIELD VERIFIED. PUMP TANK TO BE INSTALLED IF REQUIRED TO PUMP SANITARY WASTEWATER FROM (E) WINERY TO (P) 100T TREATMENT SYSTEM.

(2) UTILITY PLAN

SCALE: 1" = 20'

GRAPHIC SCALE



(IN FEET)
1 inch = 20 FT

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PREPARED UNDER THE DIRECTION OF:

HUGH A. LINN RCE 52509 EXP 12-31-14

NO.	DATE	REVISIONS	BY	APPD

RIECHERS SPENCE & ASSOCIATES
CONSULTING CIVIL ENGINEERS
1515 Fourth Street
Napa, California 94559
v 707.252.3301
f 707.252.4966

SUMMERS ESTATE WINES
UTILITY PLAN
NAPA COUNTY CALIFORNIA

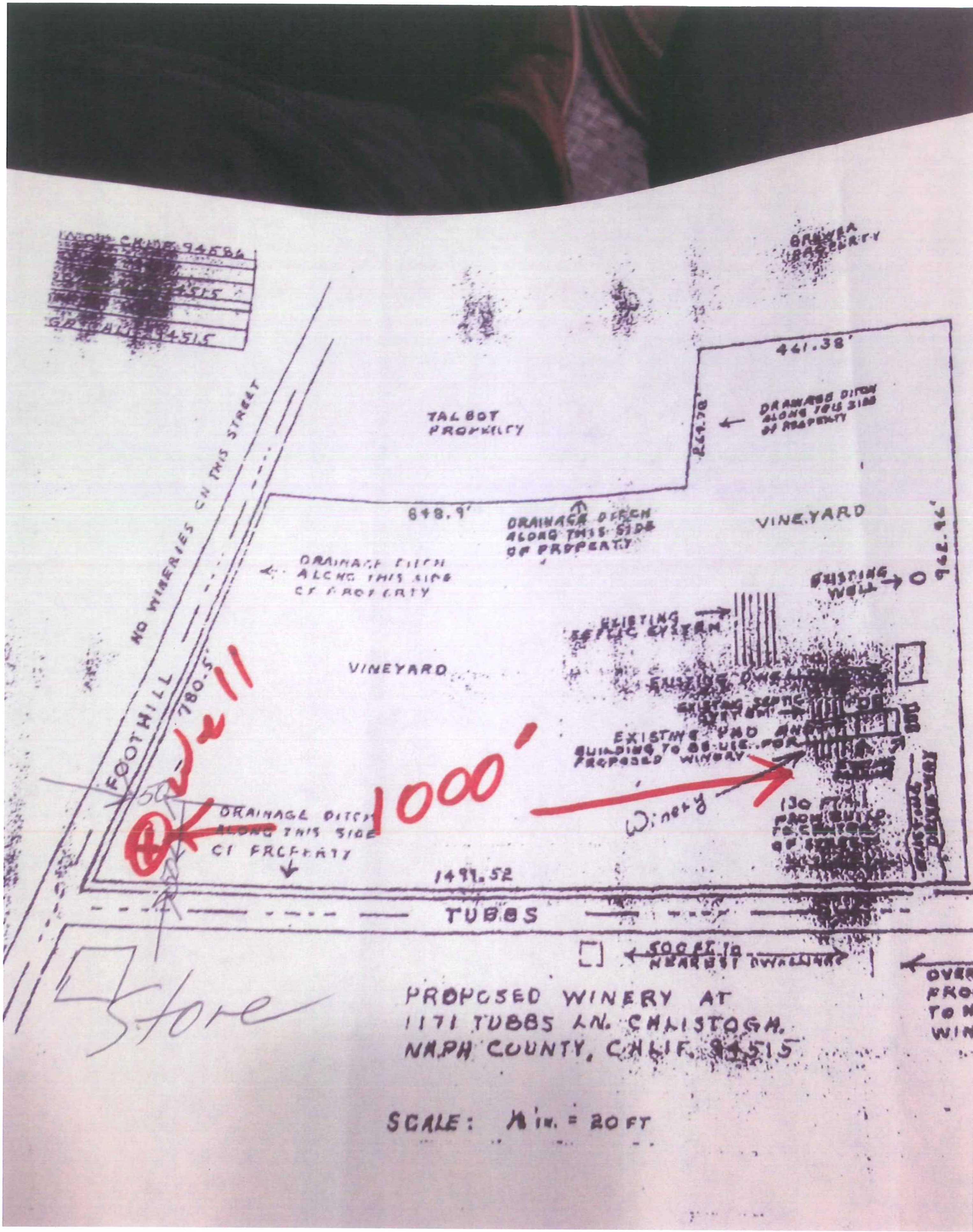
DATE	06/30/2014
DRAWN	ECB
DESIGNED	ECB
CHECKED	BWF
JOB NO.	4114023.0
SHEET NO.	UP5
	OF 5 SHEETS

COPYRIGHT Riechers Spence & Assoc.

PRELIMINARY NOT FOR CONSTRUCTION

APPENDIX 3

Existing Septic System Documentation

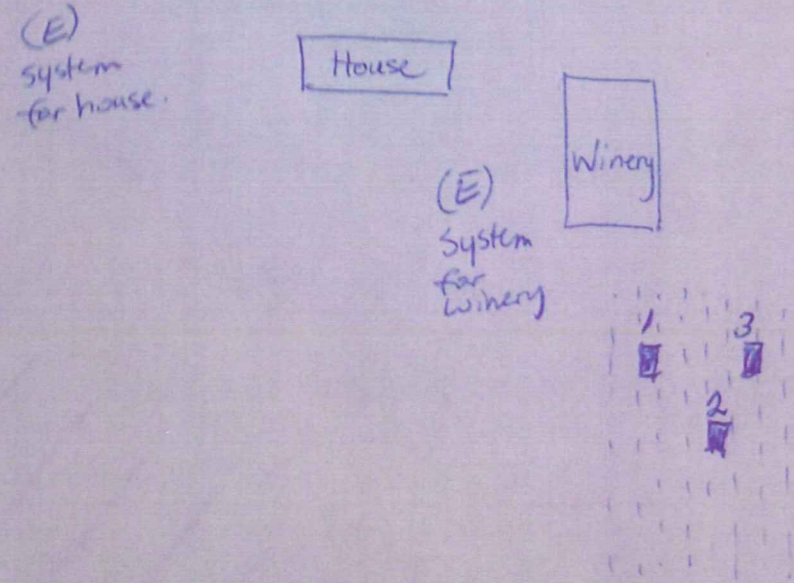

TALBOT PROPERTY
441.38'
DRAINAGE DITCH ALONG THIS SIDE OF PROPERTY
269.78'
NO WINERIES ON THIS STREET
648.9'
DRAINAGE DITCH ALONG THIS SIDE OF PROPERTY
VINEYARD
962.96'
DRAINAGE DITCH ALONG THIS SIDE OF PROPERTY
EXISTING WELL
EXISTING SEPTIC SYSTEM
VINEYARD
EXISTING DWELLING
EXISTING SEPTIC SYSTEM
EXISTING PAD AND BUILDING TO BE USE FOR PROPOSED WINERY
FOOTHILL
780.5'
Well
1000'
Winery
50
DRAINAGE DITCH ALONG THIS SIDE OF PROPERTY
130 FT FROM BUILD. TO CENTER OF STREET
1491.52
TUBBS
500 FT TO NEAREST DWELLING
Store
PROPOSED WINERY AT
1171 TUBBS LN. CALISTOGA.
NAPA COUNTY, CALIF. 94515
SCALE: 1/8 IN. = 20 FT

A.P.# 017-160

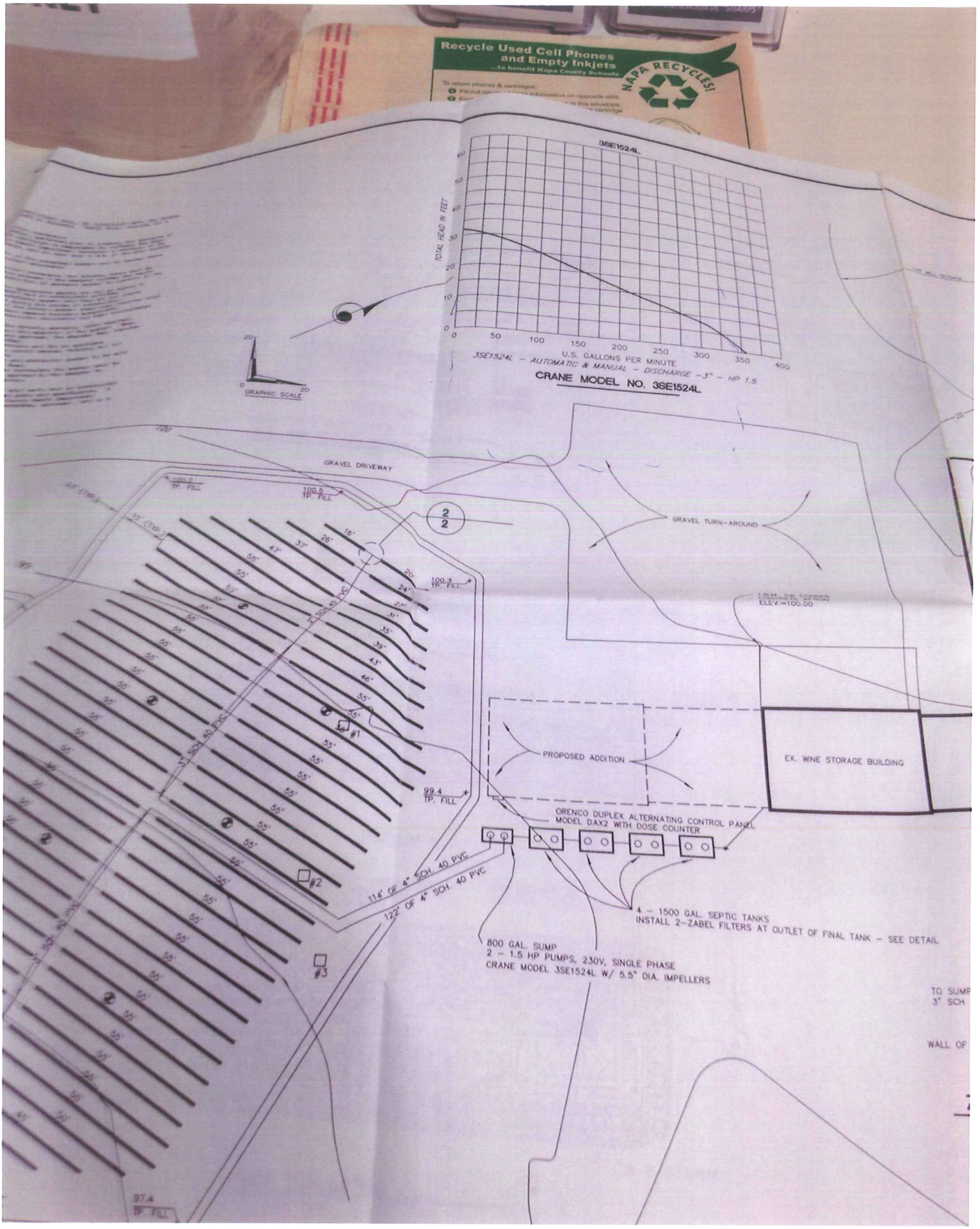
SUMMERS

Winery Expansion.

Owner wants to abandon the existing Winery system & start from scratch in the new area.



DOMESTIC WELL
200'
LEACH FIELD FOR WINERY
100'
100'
HOUSE
61'
50'
40'
1,200 GAL. SEPTIC TANK
WINERY
205'
130'
H FIELD FOR HOUSE
TO SCALE


Recycle Used Cell Phones and Empty Inkjets
...to benefit Napa County Schools
NAPA RECYCLES!
3SE1524L
TOTAL HEAD IN FEET
U.S. GALLONS PER MINUTE
3SE1524L – AUTOMATIC & MANUAL – DISCHARGE – 3" – HP 1.5
CRANE MODEL NO. 3SE1524L
GRAPHIC SCALE
GRAVEL DRIVEWAY
GRAVEL TURN-AROUND
100.2 TP. FILL
100.5 TP. FILL
100.3 TP. FILL
99.4 TP. FILL
97.4 TP. FILL
ELEV.=100.00
PROPOSED ADDITION
EX. WINE STORAGE BUILDING
ORENCO DUPLEX ALTERNATING CONTROL PANEL
MODEL DAX2 WITH DOSE COUNTER
3" SCH. 40 PVC
114' OF 4" SCH. 40 PVC
122' OF 4" SCH. 40 PVC
#1
#2
#3
4 – 1500 GAL. SEPTIC TANKS
INSTALL 2–ZABEL FILTERS AT OUTLET OF FINAL TANK – SEE DETAIL
800 GAL. SUMP
2 – 1.5 HP PUMPS, 230V, SINGLE PHASE
CRANE MODEL 3SE1524L W/ 5.5" DIA. IMPELLERS
TO SUMP
3" SCH
WALL OF

BY T. Cole

NAME Al & Norma Giordano (Owner) ADDRESS 1171 [illegible] Lane (Site Address)

NAME Montelli Construction (Contractor) MAILING ADDRESS SAME

TYPE OF WORK (X) INDIVIDUAL ( ) NEW CONSTRUCTION ( ) REPAIR (X) ADD ( ) ALTERATIONS
( ) SPECIAL DESIGN ______ ( ) PRIVATE SEWAGE DISPOSAL SYSTEM

PROPOSED USE (X) RESIDENTIAL UNITS 1 BDRMS 6 ( ) OTHER (Explain 3BDRMS + 3BDRM ADDITION)
( ) COMMERICAL/INDUSTRIAL GALS/DAY ______

WATER SUPPLY: ( ) Public (X) Individual
Distance from well to any part of nearest sewage disposal system 100 feet
Additional nearby wells 100'. (Sketch of site to accompany application).

County road setback 50+ feet from center line. ( ) Bldg. Dept. Form Received

WORKER'S COMPENSATION COVERAGE: (Check one of the following)
(X) A certificate of current Worker's Compensation Insurance on file with this office.
( ) A certificate of current Worker's Compensation Insurance is being filed with this application.
( ) I certify that in the performance of the work for which this permit is issued I shall not employ any person in any manner without complying with the Worker's Compensation laws in California.

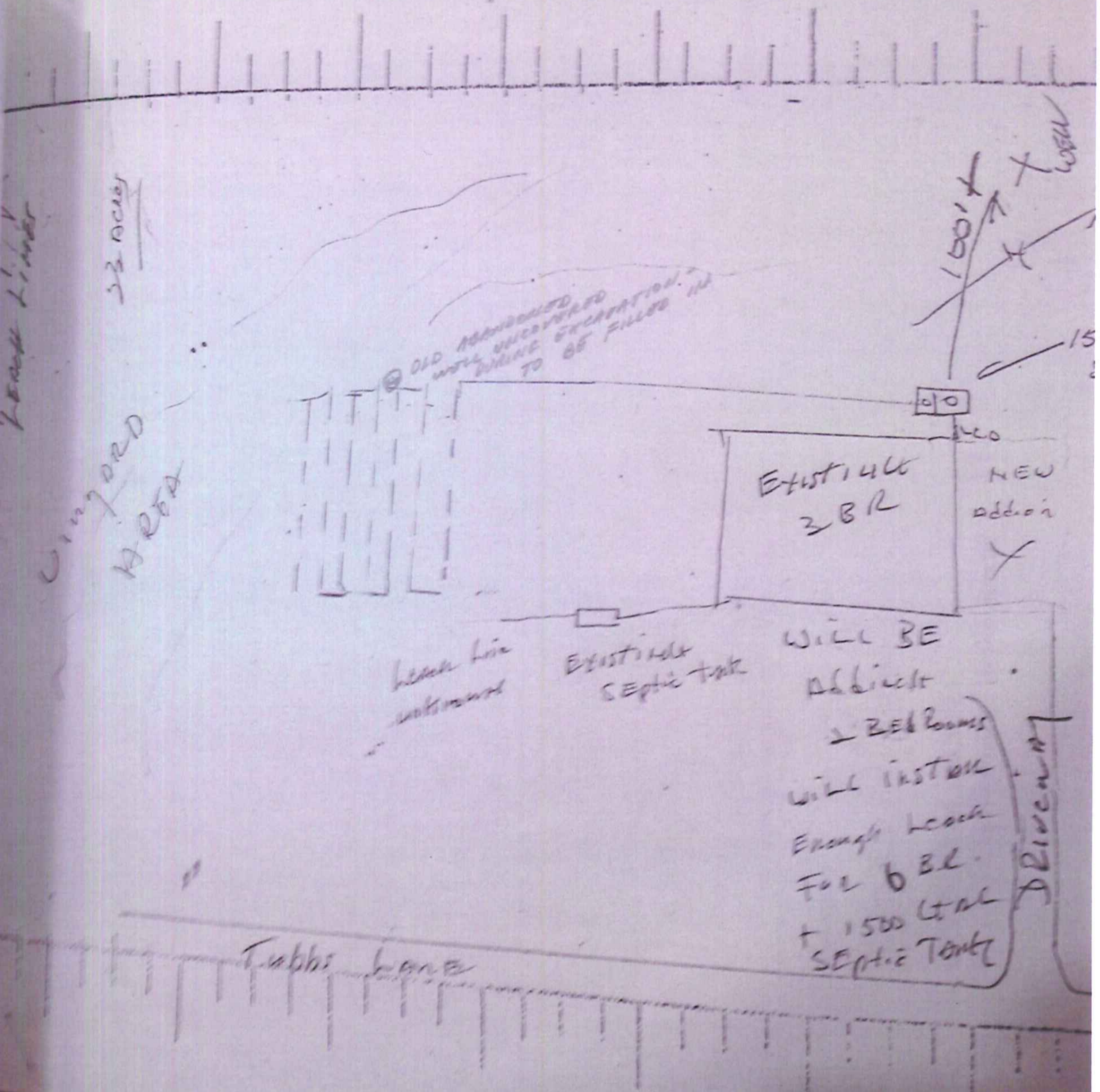
TERMS OF PERMIT

Applicant agrees that:
1. Sanitarian will be notified a minimum of 24 hours prior to requiring inspection(s).
2. Sanitarian and engineer's inspection, when indicated, will be obtained prior to covering the system.
3. The permit and a copy of the approved sewage disposal system design shall be available at the job site at all times.
4. Any deviation from approved plan and specifications without prior approval of this office will be cause for stopping work until the changes are fully justified and approved.
5. Prior to authorizing occupancy of any building with an engineered designed system a signed statement by the design engineer certifying that the system was installed in compliance with the approved plan must be submitted to the Public Health Officer.
6. This permit is subject to revocation if found to be in nonconformance with Napa County Code of Standards.
7. Before this office allows occupancy of a dwelling, an approved water source has to meet the quantity and storage specifications of the County Code.

IT IS UNDERSTOOD THAT THE ISSUANCE OF A PERMIT IN NO WAY INDICATES THAT A GUARANTEE OF PERFECT AND INDEFINITE OPERATION OF THIS SYSTEM IS MADE BY THE COUNTY OF NAPA PUBLIC HEALTH DEPARTMENT AND THAT THE OWNER IS REQUIRED TO MAKE ANY REPAIRS NECESSARY TO CONFINE SEWAGE AS REQUIRED BY COUNTY CODE.
I HEREBY ACKNOWLEDGE THAT I HAVE READ THIS APPLICATION AND STATE THAT THE ABOVE IS CORRECT AND AGREE TO COMPLY WITH ALL COUNTY ORDINANCES AND STATE LAWS REGULATING CONSTRUCTION OF SEWAGE DISPOSAL SYSTEMS. THIS PERMIT SHALL EXPIRE BY LIMITATION IF WORK AUTHORIZED IS NOT COMMENCED WITHIN 1 YEAR.

Owner or Authorized Agent X [signature]

[Spec]ifications: (X) Septic Tank 1500 Type Concrete Size (Gallons)
Drainline: 720' Total Length 42" Trench Depth 24" Rock under Til[e]
Sewer Line: ______ Type ______ Approximate Length ______ Depth
Sump Pump: ______ Tank Size ______ Alarm Type
See Special Design Plans Approved ______ (Date) Designer ______
See Private Sewer System Plans Approved ______ (Date) Designer ______


Leach Lines
Vineyard Area
Old abandoned well uncovered during excavation to be filled in
Existing 3 BR
New addition
Leach line unknown
Existing septic tank
Will be adding 2 Bedrooms
Will install enough leach for 6 BR + 1500 gal septic tank
Driveway
Tubbs Lane
100'+
Well

APPENDIX 4

Site Evaluation

Permit Number: E14-00309
APN 017-160-015
RSA Project Number: 4114023.0

Napa County Department of Environmental Management

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 #: E14-00309
APN: 017-160-015
(County Use Only) Reviewed by: Date:

PLEASE PRINT OR TYPE ALL INFORMATION

Property Owner Summers Winery Realty, LLC	☐ New Construction ☐ Addition ☐ Remodel ☐ Relocation ☐ Other:
Property Owner Mailing Address 1171 Tubbs Lane	☐ Residential - # of Bedrooms: Design Flow : gpd
City State Zip Calistoga CA 94515	☒ Commercial – Type: Winery Sanitary Waste: 555 gpd Process Waste:
Site Address/Location Same	☐ Other: Sanitary Waste: gpd Process Waste: gpd

Evaluation Conducted By:

Company Name Riechers Spence & Associates	Evaluator's Name Brett Frasier	Signature (Civil Engineer, R.E.H.S., Geologist, Soil Scientist)
Mailing Address: 1515 Fourth Street		Telephone Number 707-252-3301
City State Zip Napa CA 94559		Date Evaluation Conducted June 3, 2014

Primary Area

Acceptable Soil Depth: 24 in. Test pit #'s: 1,2,3,5-10

Soil Application Rate (gal. /sq. ft. /day): 0.6

System Type(s) Recommended: Geo-flow subsurface drip

Slope: 1.7% Distance to nearest water source: 161 ft

Hydrometer test performed? No ☐ Yes ☒ (attach results)

Bulk Density test performed? No ☒ Yes ☐ (attach results)

Percolation test performed? No ☒ Yes ☐ (attach results)

Groundwater Monitoring Performed? No ☒ Yes ☐ (attach results)

Expansion Area

Acceptable Soil Depth: 24 in. Test pit #'s: 1,2,3,5-10

Soil Application Rate (gal. /sq. ft. /day): 0.6

System Type(s) Recommended: Geo-flow subsurface drip

Slope: 1.7% Distance to nearest water source: 161 ft

Hydrometer test performed? No ☐ Yes ☒ (attach results)

Bulk Density test performed? No ☒ Yes ☐ (attach results)

Percolation test performed? No ☒ Yes ☐ (attach results)

Groundwater Monitoring Performed? No ☒ Yes ☐ (attach results)

Site constraints/Recommendations:

Test Pit # 1

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-24"	C	<15%	CL	M/SB	SH	VFRB	VS	M/F-M	F/F-M	N/A
X	24"-33"	Bottom		C							Yes

Notes:

Test Pit # 2

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-25"	G	<15%	CL	M/SB	SH	FRB	VS	M/F-M	F/F	N/A
X	25"-41"	Bottom		C							Yes

Notes:

Test Pit # 3

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-26"	C	<20%	CL	M/SB	SH	VFRB	S	M/F-M	C/F-M	N/A
X	26"-44"	Bottom	<30%								Yes

Notes:

Test Pit # 4

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-20"	C	<20%	CL	M/SB	SH	VRB	S	M/F-M	C/F-M	N/A
X	20"-46"	Bottom									Yes

Notes:

Test Pit # 5

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-32"	C	<15%	CL	M/SB	SH	FRB	S	M/F-M	M/F-C	N/A
X	32"-43"	Bottom	<40%								Yes

Notes: Sandy creek bed at 32"

Test Pit # 6

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-26"	C	<15%	CL	M/SB	SH	VFRB	S	C/F	C/F-M	N/A
X	26"-40"	Bottom									Yes

Notes: Signs of ground water and old stream sediment at bottom

Test Pit # 7

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-24"	C	<15%	CL	M/SB	SH	FRB	S	M/F-M	C/M-C	N/A
	24"-42"	Bottom	<35%	C	M/SB	SH	VFR B	VS	M/F-M	F/F	N/A

Notes:

Test Pit # 8

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-26"	C	<15%	CL	M/SB	SH	FRB	S	C/F-M	F/M	N/A
	26"-39"	Bottom									Yes

Notes:

Test Pit # 9

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-28"	G	<15%	CL	M/SB	H	FRB	S	C/F-M	F/F	N/A
X	28"-39"	Bottom									Yes

Notes:

Test Pit # 10

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-24"	C	<15%	CL	M/SB	SH	FRB	S	C/F-M	F/F	N/A
	24"-44"	Bottom									Yes

Notes:

Test Pit #

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			

Notes:

Test Pit #

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			

Notes:

RGH Soil Sample Index

Sample #1- This sample was taken from the first row of test pits. It is representative of the upper soil profiles (0-24").

Size/Density	Sample 1
+ #10 Sieve	5.6 %
Sand	30.2 %
Clay	38.8 %
Silt	31.0 %
Db g/cc	--

Sample #2 - This sample was taken from the first row of test pits. It is representative of the lower soil profiles (below 24").

Size/Density	Sample 2
+ #10 Sieve	9.7 %
Sand	29.0 %
Clay	43.8 %
Silt	27.2 %
Db g/cc	--

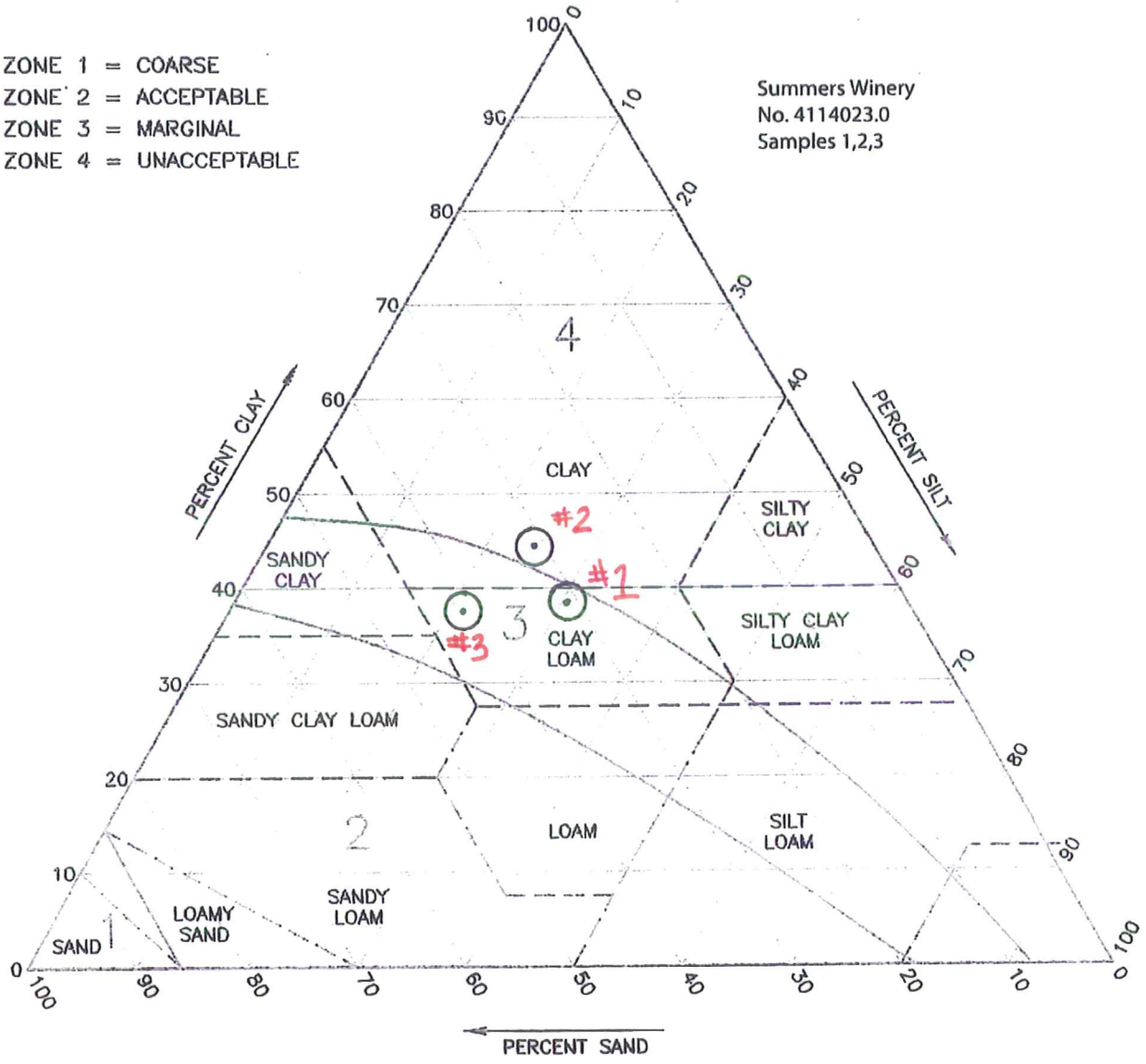
Sample #3 - This sample was taken from the second row of test pits. It is representative of the upper soil profiles (0-24").

Size/Density	Sample 3
+ #10 Sieve	7.1 %
Sand	40.2 %
Clay	37.8 %
Silt	22.0 %
Db g/cc	--

SOIL PERCOLATION SUITABILITY CHART

ZONE 1 = COARSE
ZONE 2 = ACCEPTABLE
ZONE 3 = MARGINAL
ZONE 4 = UNACCEPTABLE

Summers Winery
No. 4114023.0
Samples 1,2,3



Instructions:

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2% for each 10% (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the clay direction an additional 15% for soils having a bulk-density greater than 1.7 gm/cc.

Note:

For soils falling in sand, loamy sand or sandy loam classification bulk density analysis will generally not affect suitability and analysis not neccesary.

SUMMERS WINERY
VICINITY MAP
NAPA COUNTY CALIFORNIA

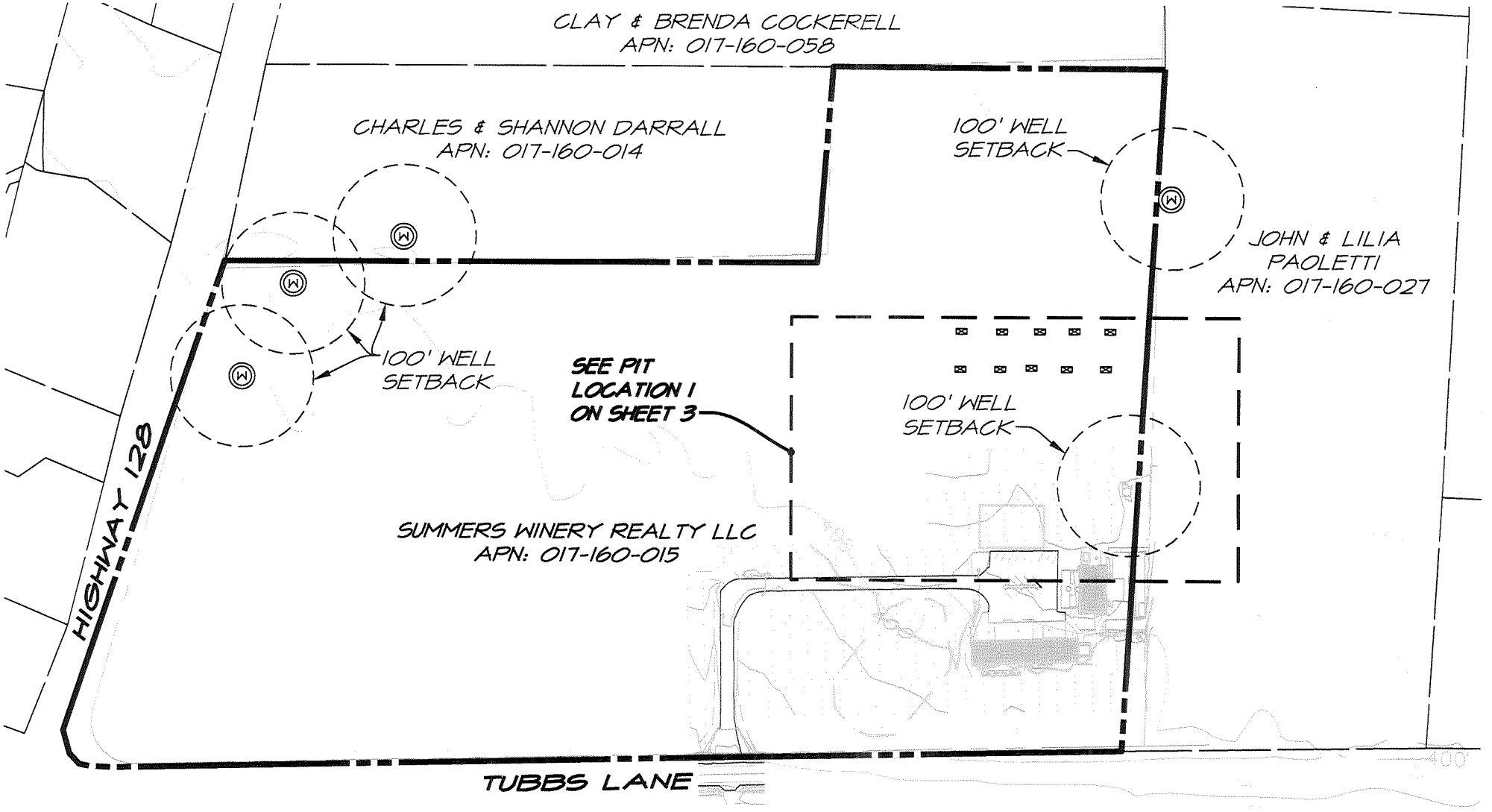
VICINITY MAP

SCALE: 1" = 2000'

CONSULTING CIVIL ENGINEERS
RIECHERS & SPENCE ASSOCIATES
1515 Fourth Street
Napa, Calif. 94559
v 707.252.3301
f 707.252.4966

JUNE 9, 2014

SUMMERS WINERY
PIT MAP



SITE EVALUATION DATE:	JUNE 4, 2014
APN:	017-160-015
ADDRESS:	1171 TUBBS LANE CALISTOGA, CA 94515
ENV. HEALTH INSPECTOR:	MAUREN SHIELDS BOWN

SCALE: 1" = 200'

LEGEND

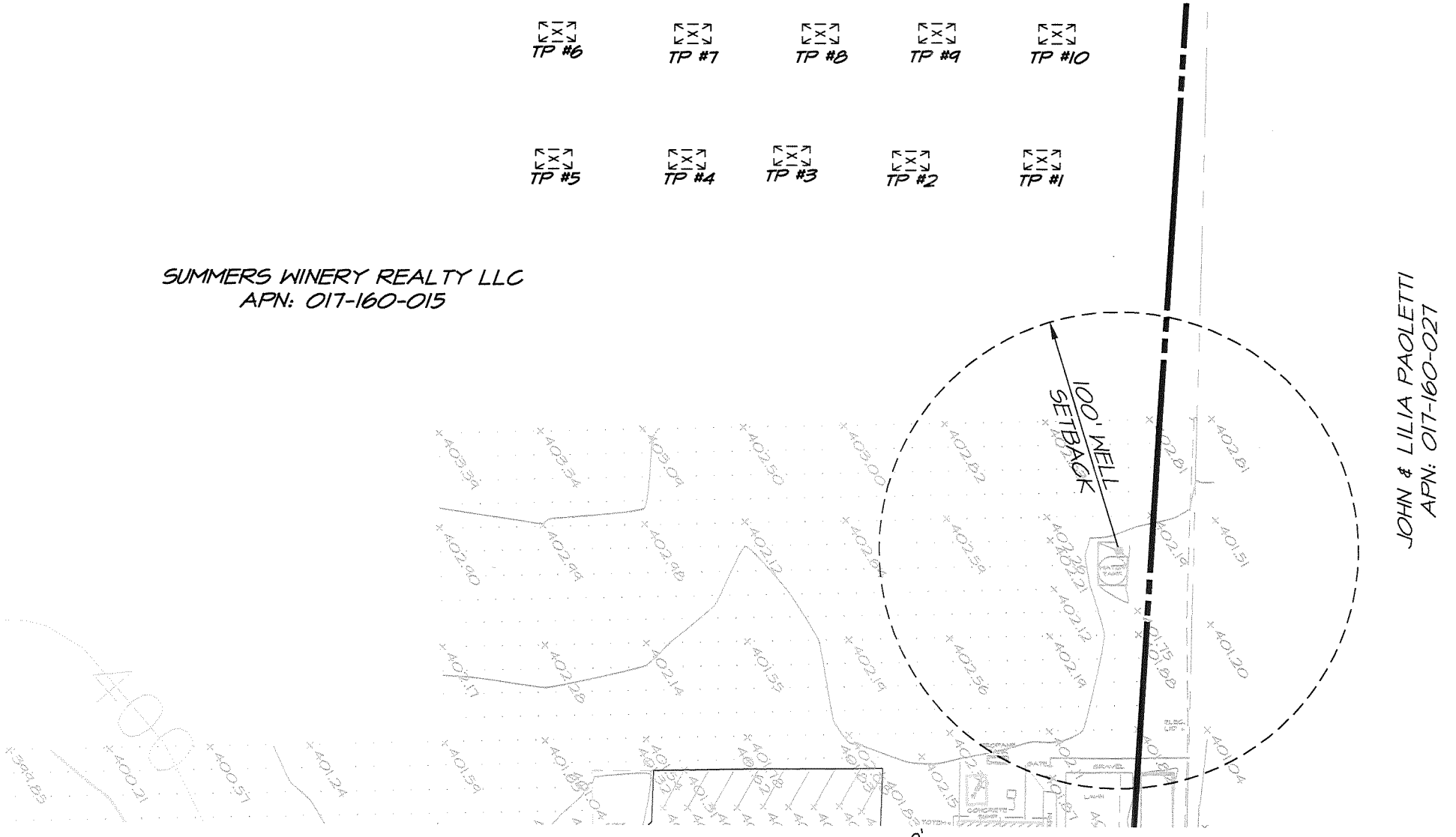
TP#1 TEST PIT

CONSULTING CIVIL ENGINEERS
RIECHERS SPENCE & ASSOCIATES
1515 Fourth Street
Napa, Calif. 94559
v 707.252.3301
f 707.252.4966

JUNE 9, 2014

4114023.0 Exh-Pitmap.dwg 3 OF 3

SUMMERS WINERY
PIT LOCATION 1



SITE EVALUATION DATE:	JUNE 4, 2014
APN:	017-160-015
ADDRESS:	1171 TUBBS LANE CALISTOGA, CA 94515
ENV. HEALTH INSPECTOR:	MAUREN SHIELDS BOWN

SCALE: 1" = 60'

LEGEND

TP#1 TEST PIT

CONSULTING CIVIL ENGINEERS
RIECHERS SPENCE & ASSOCIATES
1515 Fourth Street
Napa, Calif. 94559
v 707.252.3301
f 707.252.4966

JUNE 9, 2014

4114023.0 Exh-Pitmap.dwg 3 OF 3

APPENDIX 5

Water Balance for Irrigation and Storage
Irrigation Areas Exhibit

Reclaimed Process Wastewater
Water Balance for Irrigation and Storage

Project Description		Annual Process Waste Flow Volume		
Project Number:	4114023.0	Wine Production:	100,000	gal/year
Project Name:	Summers Winery			
Prepared By:	Brett Frasier	Annual Process Waste per Gallon Wine:	5	gal/year
Date:	May 19, 2014	Total Annual Process Waste Generated:	500,000	gal/year

Vineyard Irrigation Parameters		Landscape Irrigation Parameters		
Acres of irrigated vineyard:	5.27 acres	Crop type / name:	Native grass and trees	
Row spacing:	8.0 feet	Total irrigated acres of crop:	1.00 acres	
Vine spacing:	8.0 feet			
Total number of vines:	3,587 vines			
Water use per vine per month (peak):	26 gal			
Total peak monthly irrigation demand:	93,259 gal			

Monthly Process Wastewater Generation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly process wastewater generated as % of annual total:	4%	6%	6%	5%	6%	7%	9%	10%	14%	14%	11%	8%
Monthly process wastewater generated [gallons]:	20,000	30,000	30,000	25,000	30,000	35,000	45,000	50,000	70,000	70,000	55,000	40,000

Monthly Vineyard Irrigation Water Use

(Based on per-vine water use)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beginning of month reclaimed water in storage [gallons] (This number brought forward from end of previous month)	15,310	7,341	0	0	0	0	0	0	0	0	0	10,050
Vineyard irrigation as % of peak month irrigation demand:	6%	6%	10%	100%	100%	100%	100%	100%	100%	100%	10%	10%
Irrigation per month per vine (gallons):	2	2	3	26	26	26	26	26	26	26	3	3
Total vineyard irrigation demand [gallons]:	5,596	5,596	9,326	93,259	93,259	93,259	93,259	93,259	93,259	93,259	9,326	9,326
Will vineyard be irrigated with reclaimed water this month?	y	y	y	y	y	y	y	y	y	y	y	y
Process wastewater generated this month, reclaimed for vineyard irrigation [gallons]	5,596	5,596	9,326	25,000	30,000	35,000	45,000	50,000	70,000	70,000	9,326	9,326
Remaining vineyard irrigation demand after using this month's process water [gallons]	0	0	0	68,259	63,259	58,259	48,259	43,259	23,259	23,259	0	0
Drawdown from storage for remaining vineyard irrigation [gallons]	0	0	0	0	0	0	0	0	0	0	0	0
Well water required to satisfy remaining vineyard irrigation demand	0	0	0	68,259	63,259	58,259	48,259	43,259	23,259	23,259	0	0
Net storage after vineyard irrigation drawdown [gallons]	15,310	7,341	0	0	0	0	0	0	0	0	0	10,050
This month's process wastewater, remaining after vineyard irrigation, available for landscape irrigation[gallons]	14,404	24,404	20,674	0	0	0	0	0	0	0	45,674	30,674

Water balance continues on next page for cover crop irrigation.

Monthly Landscape Irrigation Water Use

(Based on evapotranspiration crop demand and irrigated area)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
This month's process wastewater, remaining after vineyard irrigation, available for landscape irrigation[gallons] *(From sheet 1)*	14,404	24,404	20,674	0	0	0	0	0	0	0	45,674	30,674
Reference ET (ETo) (in/month) (see note 1)	1.03	1.53	2.93	4.71	5.82	6.85	7.21	6.44	4.87	3.53	1.64	1.17
Crop Coefficient (k_c) (see note 2)	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Crop water demand per acre [inches]	0.82	1.22	2.34	3.77	4.66	5.48	5.77	5.15	3.90	2.82	1.31	0.94
Crop water demand per acre [gallons]	22,374	33,235	63,645	102,310	126,422	148,795	156,615	139,889	105,786	76,678	35,624	25,415
Total crop water demand for irrigated area [gallons]	22,374	33,235	63,645	102,310	126,422	148,795	156,615	139,889	105,786	76,678	35,624	25,415
Will landscape be irrigated with reclaimed water this month?	Y	Y	Y	N	N	N	N	N	N	Y	Y	Y
Process wastewater remaining after vineyard irrigation, reclaimed for landscape irrigation [gallons]	14,404	24,404	20,674	0	0	0	0	0	0	0	35,624	25,415
Landscape irrigation water required from storage or other source [gallons]	7,969	8,830	42,971	0	0	0	0	0	0	76,678	0	0
Drawdown from storage for landscape irrigation [gallons]	7,969	7,341	0	0	0	0	0	0	0	0	0	0
Process wastewater generated this month, unused for irrigation, to be reclaimed and stored [gallons]	0	0	0	0	0	0	0	0	0	0	10,050	5,259
Net end-of-month reclaimed water storage after all irrigation [gallons]	7,341	0	0	0	0	0	0	0	0	0	10,050	15,310

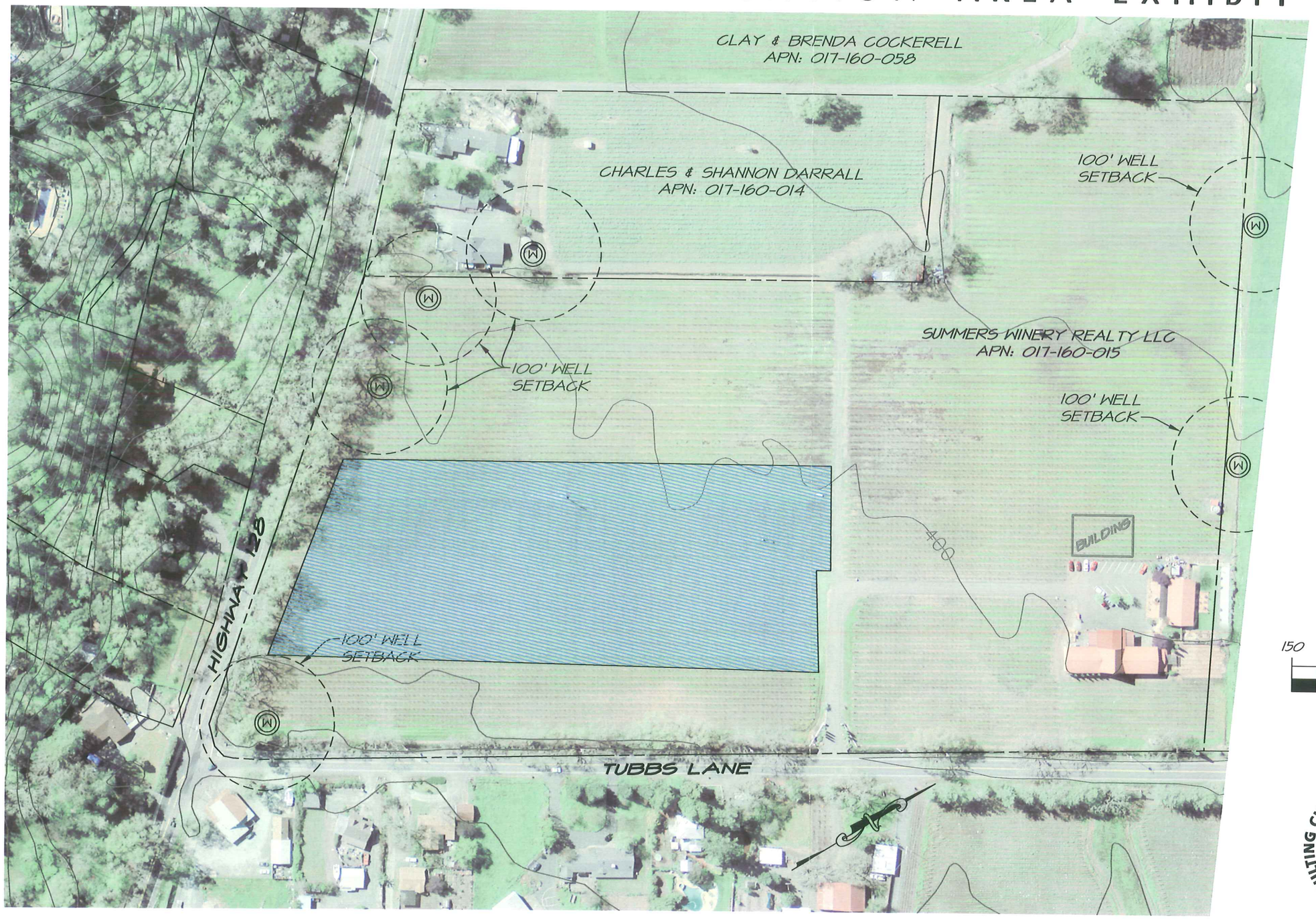
End of Water Balance

Peak Monthly Storage = 15,310 gallons

Notes:

1. Reference ETo from California Irrigation Management Information System
2. Crop Coefficient from Table 1 of "Estimating Irrigation Water Needs of Landscape Plantings in California", University of California Cooperative Extension, August 2000.

SUMMERS WINERY
VINEYARD IRRIGATION AREA EXHIBIT



Vineyard Area
= 5.27 ac

GRAPHIC SCALE

150 0 150 300

(IN FEET)
1 inch = 150 FT

CONSULTING CIVIL ENGINEERS
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APRIL 23, 2014
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