

SANITARY SEWAGE WASTEWATER FEASIBILITY STUDY

FOR

GRGICH HILLS WINERY

Napa County, California
APN 027-470-005

Project No. 2008043



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September 2008



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GRGICH HILLS WINERY

Napa County, California

SANITARY SEWAGE WASTEWATER FEASIBILITY STUDY

SANITARY SEWAGE WASTEWATER MANAGEMENT DESCRIPTION

Project Description

Grgich Hills Winery is applying for a modification to the Use Permit for the existing winery located on 1829 St. Helena Highway (SR 29) near the town of Rutherford, Napa County California (APN 027-470-005). The proposed modification involves a lot line adjustment to include the existing residence and barn structure as part of the approved winery hospitality plan. No significant modifications to the existing winery is anticipated. The modifications to the Use Permit does not involve any increase in production capacity and hence no impact to the process wastewater generation.

Grgich Hills Winery proposes to modify and add to the existing residence and barn structures for dedicated hospitality event use. A new disposal system for sanitary sewage (SS) shall be constructed for the projected flows for the remodeled facility. After construction of the proposed disposal system, the existing residence's sanitary wastewater system will be abandoned as part of the project improvements.

The following two alternatives for SS wastewater disposal have been analyzed:

Option 1- Subsurface Drip

Option 2- Pressure Distribution

Following approval of the Use Permit, Grgich Hills Winery will have the option to select either a subsurface drip or a pressure distribution disposal system for design and installation in the designated areas. See Enclosure A for approved disposal areas. Adequate soils to accommodate disposal of all sanitary wastewater generated from employees and events from the proposed hospitality expansion were found onsite.

Site Description

The facility is located off State Highway 29 in Rutherford, surrounded by vineyards. The existing topography of the site is generally flat. Part of the property is located in the 100-year flood plain. The proposed SS disposal system, well location, and property lines are located on the Overall Site Plan in Enclosure A.

Sanitary Sewage Wastewater Conveyance, Treatment and Disposal

Wastewater disposal options are based on the acceptable soil depths assigned by the County and type of system that would be the least intrusive to the property and property uses. These include pretreatment followed by a subsurface drip or a pressure distribution disposal system.

The SS treatment and disposal system will consist of the following components:

- 1) Gravity Collection System
- 2) Grease Interceptor
- 3) Flow Measurement

- 4) Septic Tank with effluent filter
- 5) AdvanTex Pretreatment System
 - a. AdvanTex Textile Filter Pod(s)
 - b. Recirculation/blending Tank
- 6) Dosing Tank
- 7) Flow Measurement
- 8) Disposal
 - a. Option 1: Subsurface Drip System
 - b. Option 2: Pressure Distribution System

A discussion of each of these features is provided below. Refer to Enclosure B for flow schematics of the wastewater management systems.

- 1) Gravity Collection System – Designed to provide low maintenance and no infiltration or exfiltration. Piping will be compatible with SS wastewater per Uniform Plumbing Code (UPC) and local requirements.
- 2) Grease Interceptor – A precast concrete grease trap tank will be used for removing and retaining grease from wastewater in kitchen areas prior to discharge into the dosing tank. Such materials cause blockages in the system such as backups and overflows. The grease interceptor shall be sized using County and UPC guidelines.
- 3) Flow Measurement – An in-line magnetic flow measurement device will be provided to measure SS flows.
- 4) Septic Tank with effluent filter – A septic tank will provide solids removal and some treatment of raw SS waste. The minimum septic tank volume required would be 2,500 gallons. A septic tank capacity of this volume will provide approximately 1.5 days retention at peak flows. An effluent filter will be installed at the outlet of the septic tank to reduce solids passage to the disposal system.
- 5) AdvanTex Textile Filter Treatment System
 - a. AX-20 Textile Filter Pods – Orenco System's AdvanTex Treatment System is a packed bed filter that supports attached growth biological treatment. In addition to the packed bed filter, the treatment system will include a recirculating/blending tank, pumps, filtered pump vault, and valves. Controls will consist of a timer with float switch override, high water alarms, and a duplex pump control panel equipped with remote telemetry and a web based monitoring system.
 - b. Recirculation/Blending Tank – A recirculation blending tank is provided to allow for dilution and buffering of peak hydraulic and organic loads. A duplex pumping system is installed in the recirculation/blending tank to dose the AdvanTex filter pod(s).
- 6) Dosing Tank – A precast concrete pump tank will be provided for flow equalization and storage of the treated SS prior to pumping to the disposal system. The pump tank will incorporate duplex pump system. Tank sizing is dependent on the disposal option selected and County guidelines.

- 7) Flow Measurement – An in-line magnetic flow measurement device will be provided to measure SS flows to the disposal system.
- 8) Disposal – Final disposal of pretreated effluent is to be located to the east of the building between vineyard rows.

- a. Option 1: Subsurface Drip system

The subsurface drip system is sized for SS disposal and would require a total area of 2,760 square feet (for the primary disposal field). A Geoflow wastewater automatic headworks will be provided which is a pre-assembled unit including the filter, valves and pressure gauge in the box to be installed between the pump and the field.

- b. Option 2: Pressure Distribution system

The pressure distribution system is sized for SS disposal from the winery requiring 942 lineal feet (lf) based on a trench sidewall of 2.667 sf/lf and 12" of imported fill. This system would require a total area of 5,000 square feet (for the primary disposal field).

OTHER CONSIDERATIONS

Odor Control

There should be no obnoxious odors from a properly designed and operated treatment system of this type.

Ground Water Contamination

The nearest water well to any of the sanitary sewage treatment and disposal systems is a minimum of 100 feet. No disposal of SS will occur within 100 feet of any existing wells. Irrigation/disposal of treated effluent is considered a beneficial use and is considered an effective means to protect groundwater quality.

Protection

Exposed wastewater treatment facilities will be posted with appropriate warning signs. The above grade treatment area will be fenced, if necessary, to restrict public access.

Flood Level

The proposed disposal system is located in the 100 year FEMA floodplain. Based on Napa County guidelines, installation of subsurface disposal systems within this area is allowed. See the overall site plan in Enclosure A for the appropriate flood plane line.

WASTEWATER FEASIBILITY STUDYDESIGN CRITERIASite Evaluations

Site evaluations were performed by this office and Napa County Department of Environmental Management (NCEM) Registered Environmental Health Specialist (REHS) Kim Withrow on July 8, 2008 for the proposed SS disposal area.

A total of 9 test pits were excavated. All test pits—except for test pit #3—displayed sandy clay loam soil type at varying depths of 36 to 51 inches. Test pit #3 yielded stronger structures and higher clay content than other pits observed, and will be avoided for determination of feasibility. See Enclosure C for details on all test pit and horizon results.

Sanitary Sewage Design Flows

SS generated onsite will be from the employee restroom, event restroom use, and kitchen waste from meals prepared for onsite events. Peak SS flows are estimated as follows:

Hospitality Employees

$$10 \text{ employees per day} \times 15 \text{ gpcd} = 150 \text{ gpd}$$

Peak Day with Event (Conventional sit-down)

$$100 \text{ event visitors} \times 15 \text{ gpd} = 1,500 \text{ gpd}$$

Total SS Flows

$$\begin{array}{l} \text{Employees + Event (conventional sit-down)} \\ 150 \text{ gpd} + 1,500 \text{ gpd} \end{array} = 1,650 \text{ gpd}$$

Therefore, the peak flow of approximately 1,650 gpd is expected from employees and peak events. A peak design flow of **1,650 gpd** and average flow of 150 gpd will be used for calculations.

Sanitary Sewage Septic Tank(s)

The required septic tank size based on Napa County Environmental Management criteria is calculated from NCEM Table 13.44.020:

Flow, gal/d	Recommended Minimum Capacity, gal
600	1,200
900	1,500
1,200	2,000
1,500	2,500

Since the peak flow is above the values listed in the table, the Uniform Plumbing Code formula is utilized.

$$\text{Volume} = 1,125 + 0.75 \times \text{Flow rate}$$

$$\text{Volume} = 1,125 + 0.75 (1,650 \text{ gpd})$$

$$\text{Volume} = 2,362.5 \text{ gallons}$$

Use Total Volume = 2,500 gallons

A 2,500 gallon precast concrete septic tank will be installed. An effluent filter will be installed at the outlet of septic tank to reduce solids passage to the treatment system.

Kitchen SS Flows

For the events which provide a meal, a generation rate of 15 gallons of SS per event attendee is assumed. Of the 15 gallons, 10 gallons is assumed to be associated with food preparation and clean up and 5 gallons from attendee restroom use. Therefore, the maximum flow generated by the kitchen is calculated as follows:

$$100 \text{ event visitors} \times 10 \text{ gpd (onsite prepared meal)} = 1,000 \text{ gpd}$$

A SS flow of 1,000 gpd will be used to size the kitchen grease Interceptor.

Grease Interceptor Sizing

The maximum flow generated by the kitchen is projected to be 1,000 gpd. Therefore, the grease interceptor is sized as follows:

$$\begin{aligned} \text{Minimum Volume} &= \text{Number of meals} \times \text{WW Generation Rate} \times \text{Retention Time} \times \text{Storage Factor} \\ &= 100 \text{ meals peak/day} \times 10 \text{ gal/meal WW} \times 2.5 \text{ days} \times 1.0 \\ &= 2,500 \text{ gallons} \end{aligned}$$

A 2,500 gallon precast concrete grease interceptor is adequate to handle kitchen SS flows.

AdvanTex Textile Filter Treatment System

The Grgich Hills Winery AdvanTex filter treatment system component sizing is as follows:

AdvanTex units: 3 – AX20 Filter Pod
Recirculation/blending Tank: 1 – 3,000 gallon tank

AX20N Filter Pods

Three AdvanTex textile filter AX20 treatment systems in series are sufficient to treat the average flow of 150 gpd and peak flow of 1,650 gpd for commercial wastewater sources.

Recirculation/blending Tank

The recirculation/blending tank provided will allow for approximately 1.8 days retention at peak flows and 20 days at average flows. Orenco Systems Inc. recommends a minimum of 1 day retention in the recirculation/blending tank at peak flows. Therefore, the peak flow of 1,650 gpd is within the design parameters provided by the manufacturer. The controls for the recirculation/blending tank pump system will consist of a timer with float switch override high water alarm, and a duplex pump control panel equipped with remote telemetry and a web based monitoring system.

Dosing Tank

The dosing tank shall be sized per NCEM ASTS standards. That is, NCEM requires that the minimum pump tank size shall be approximately 1.5 times the design flow and also provide one day storage above the high water alarm for subsurface drip disposal. A duplex pump system shall be installed or additional tank volume shall be designed to accommodate the one day storage capacity requirement. The duplex pump system will provide redundancy such that if one pump fails, the second pump will allow continuous operation. The dosing tank used will be a minimum of 2,500 gallons.

Disposal Option 1: Subsurface Drip

Subsurface drip disposal system field sizing is based on the drip tubing manufacturer's recommendation as well as Table 10 of the Napa County ASTS guidelines. Table 10 class III soil type (clay loam), corresponding to 167 square feet of disposal field per 100 gallons per day of effluent discharged. Therefore, the disposal field size is calculated as follows:

$$1,650 \text{ gpd} \quad \times \quad \frac{167 \text{ ft}^2}{100 \text{ gpd effluent}} \quad = \quad \mathbf{2,760 \text{ ft}^2}$$

A field of 28' by 100' will be used and installed with 2 feet separation in between the existing vine rows. The subsurface drip lines will be buried at a depth of 12 inches minimum. An additional 200% reserve area will be provided as required by NCEM regulations. Therefore a minimum total area of 8,280 square feet (sf) must be provided for primary (2,760 sf) and reserve (5,520 sf) systems.

Disposal Option 2: Pressure Distribution (PD) Leachfield

Based on the soils found during the site evaluations, it is proposed to use a pressure distribution leachfield system with pretreatment for disposal of treated SS effluent. An average percolation rate of 0.5 inches per hour corresponds to an application rate of 0.657 gal/sf/day. A PD leachfield system would be proposed with 12 inches of imported fill and 16 inch deep trenches and a trench sidewall area of 2.667 square feet/lineal feet (sf/lf).

Leachfield Sizing

Required leachfield size is projected as follows:

$$\begin{aligned} \text{Leach line} &= \frac{1,650 \text{ gpd}}{2.667 \text{ sf/lf (0.657 gal/sf/day)}} \\ &= \underline{\underline{942 \text{ lf}}} \end{aligned}$$

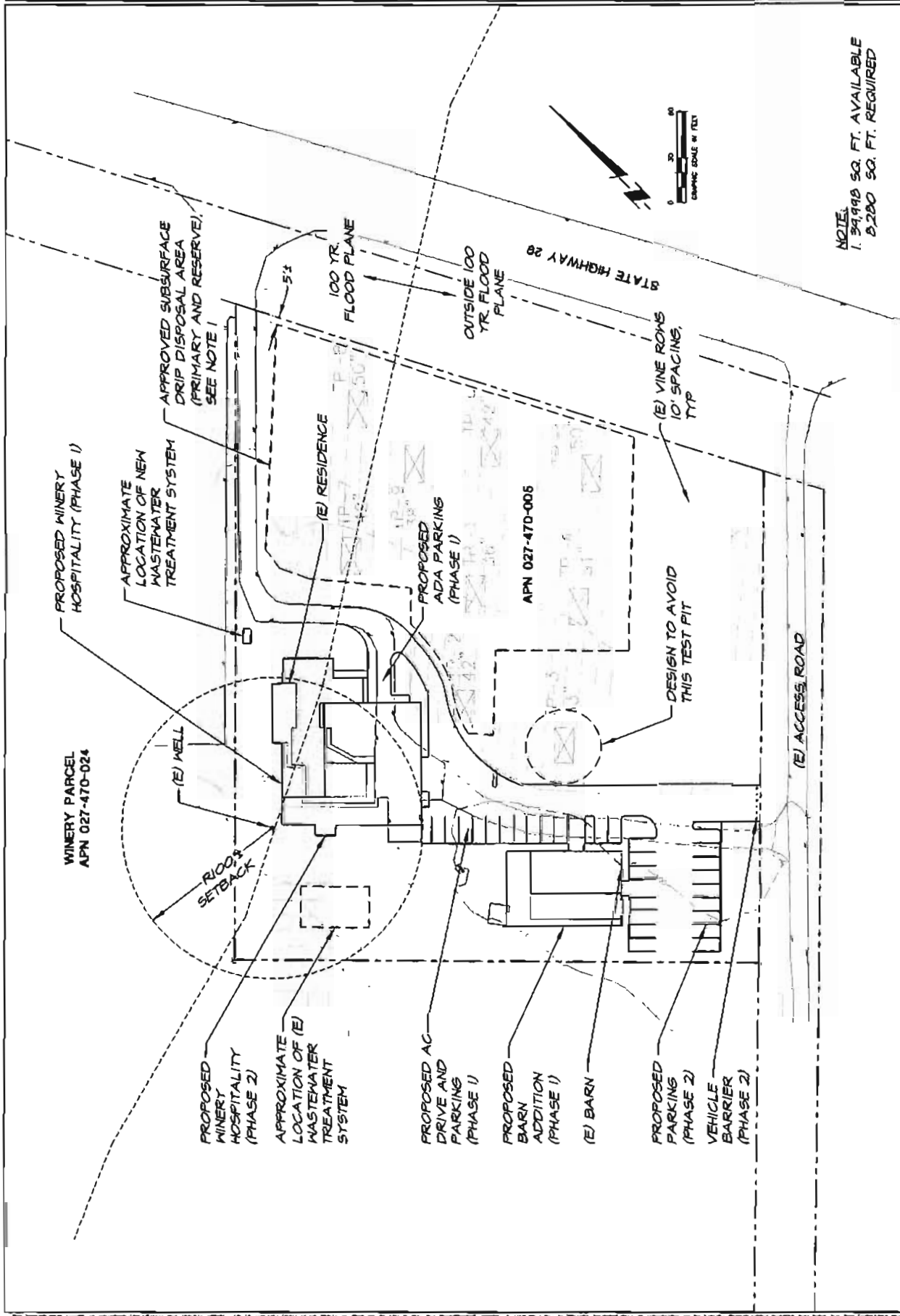
A 942 lf (10-100 lf leachlines) PD leachfield is proposed. The proposed leachfield trenches are to be spaced a minimum of 5 feet apart horizontally with two leachlines between vine rows and will follow the contour of the natural grade. 100% reserve area will be required. A total of 10,000 sf must be provided for primary (5,000 sf) and reserve (5,000 sf) systems.

GRGICH HILLS WINERY

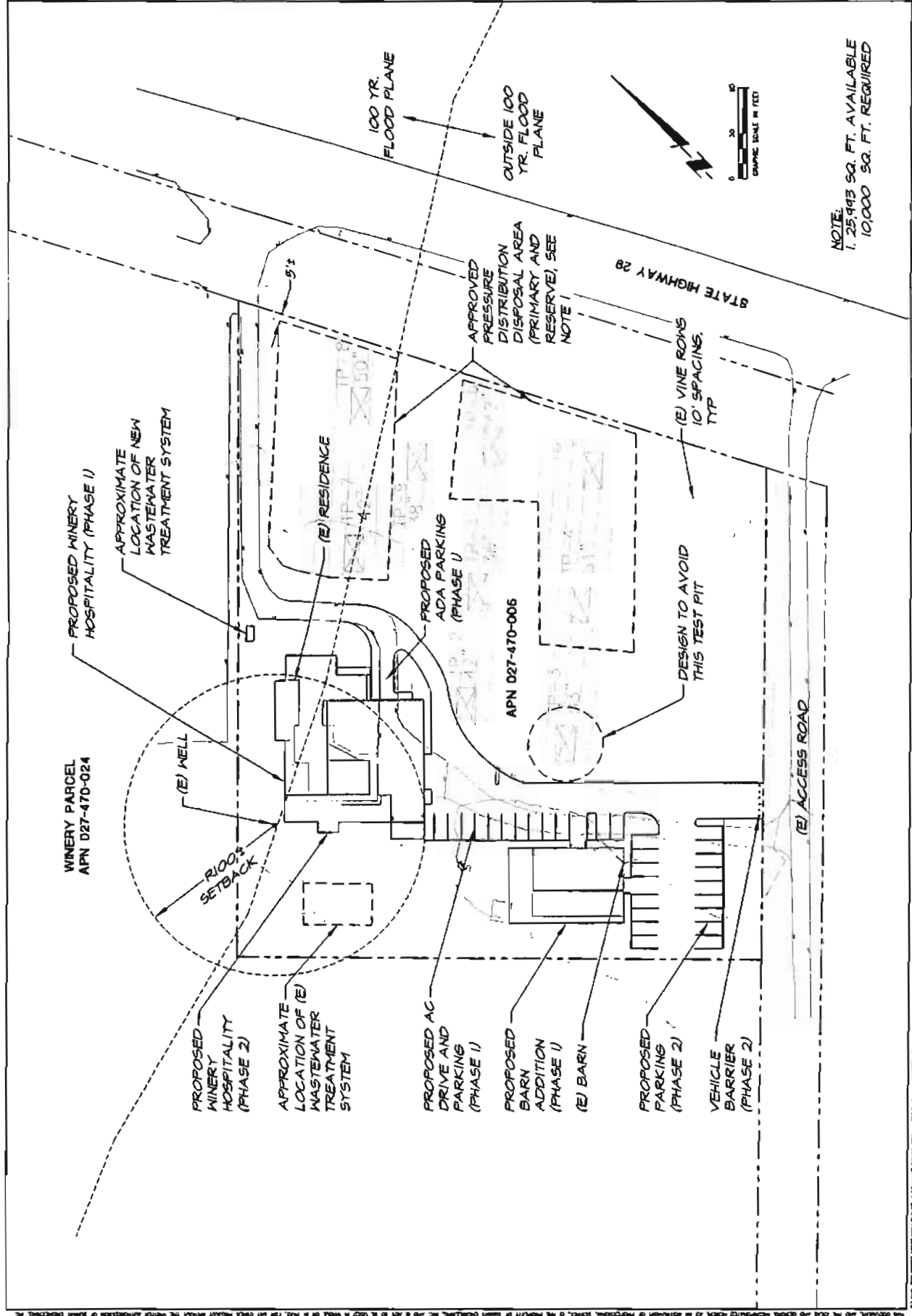
ENCLOSURE A

SUBSURFACE DRIP FIELD SITE PLAN

PRESSURE DISTRIBUTION SITE PLAN



NOTE:
1. 39,998 SQ. FT. AVAILABLE
2. 2,200 SQ. FT. REQUIRED



NOTE:
1. 25,943 SQ. FT. AVAILABLE
10,000 SQ. FT. REQUIRED

GRGICH HILLS WINERY

ENCLOSURE B

SS MANAGEMENT FLOW SCHEMATIC

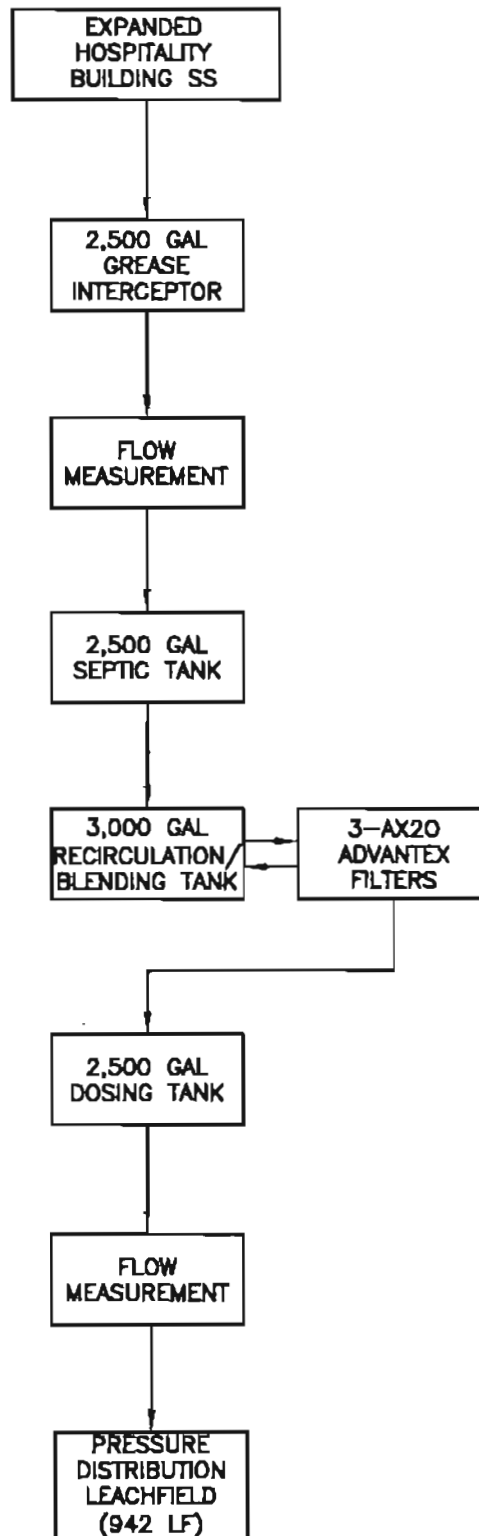
GRGICH HILLS WINERY
1829 ST. HELENA HWY.
RUTHERFORD, CALIFORNIA
APN 027-470-005



PRESSURE DISTRIBUTION DISPOSAL FLOW SCHEMATIC

PROJECT NO. 2008043
BY RC CHK SL

DATE 07/28/08
SHT NO. 2 OF 2



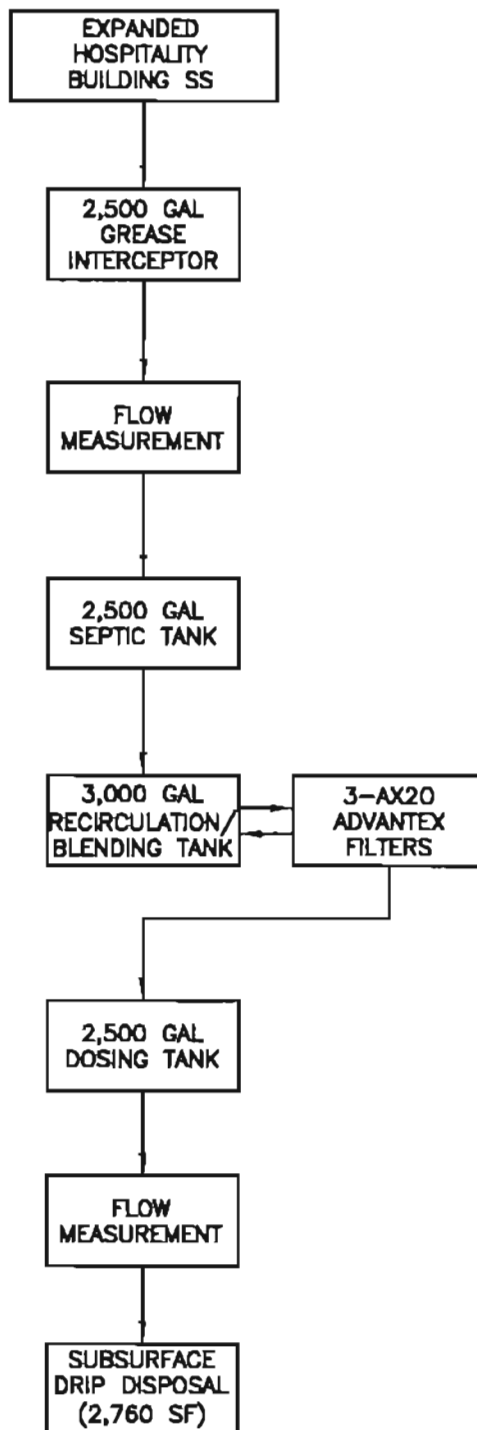
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GRGICH HILLS WINERY
1829 ST. HELENA HWY.
RUTHERFORD, CALIFORNIA
APN 027-470-005



SUBSURFACE DRIP DISPOSAL FLOW SCHEMATIC

PROJECT NO. 2008043 DATE 07/28/08
BY RC CHK SL SHT NO 1 OF 2



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SUMMIT ENGINEERING, INC.

Project 2008043

GRGICH HILLS WINERY

ENCLOSURE C

SITE EVALAUTION

GRGICH HILLS WINERY
1829 ST. HELENA HWY
RUTHERFORD, CALIFORNIA
APN 027-470-005

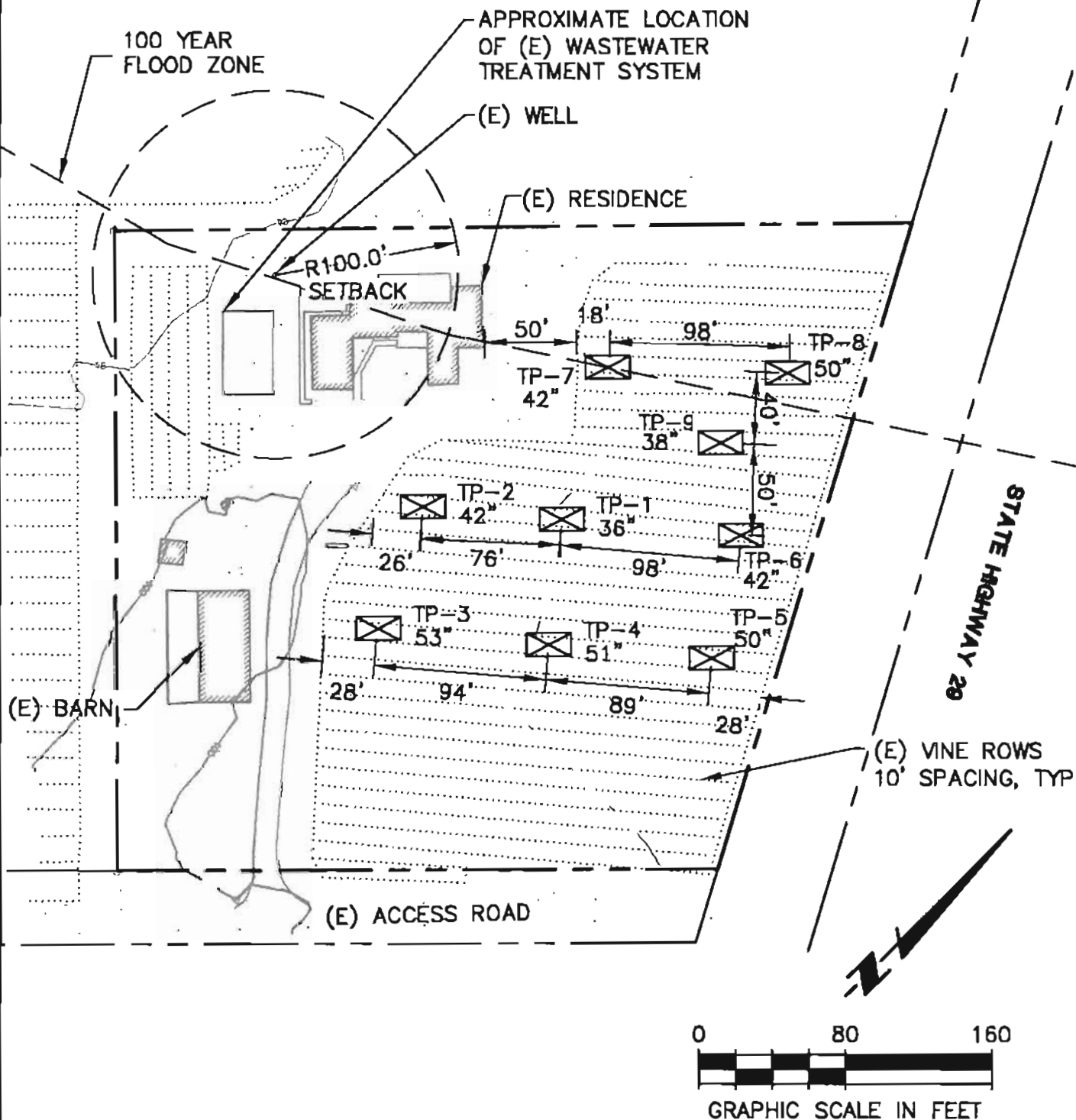


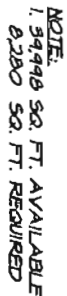
SITE EVALUATION MAP



PROJECT NO. 2008043
BY MS CHK RR

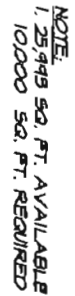
DATE 07-16-08
SHT NO 1 OF 1

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DATE 11-29-07 BY JERRY CHECKED BY JERRY APPROVED BY JERRY		WATER WASTEWATER FEASIBILITY STUDY	GRIGCH HILLS WINERY 1820 ST. HELENA HWY RUTHERFORD, CALIFORNIA APN 027-470-008	 SUMMIT ENGINEERING INC. 463 AVIATION BLVD., 82ND SANTA ROSA, CA 95403 Phone 707.537.0778 Fax 707.537.6212
SS1				



DATE JOB NO. SHEET NO. DRAWN CHECKED BY	11-05-81 104 46 JRM JRM	WATER WASTEWATER FEASIBILITY STUDY		GRGICH HILLS WINERY 1828 ST. HELENA HWY ST. HELENA, CALIFORNIA APN 027-470-005	 SUMMIT ENGINEERING INC. 483 AVIATION BLVD. #200 SANTA ROSA, CA 95403 Phone 707.527.5776 Fax 707.527.5212
		PRESSURE DISTRIBUTION SITE PLAN			

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 #: E08-00337

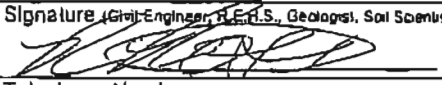
APN: 027-470-005

(County Use Only)

Reviewed by:

Date:

PLEASE PRINT OR TYPE ALL INFORMATION

Property Owner Violet Grgich		<input type="checkbox"/> New Construction <input type="checkbox"/> Addition <input checked="" type="checkbox"/> Remodel <input type="checkbox"/> Relocation <input type="checkbox"/> Other:	
Property Owner Mailing Address PO Box 450		<input type="checkbox"/> Residential - # of Bedrooms: Design Flow : gpd	
City Rutherford	State CA	Zip 94573	<input checked="" type="checkbox"/> Commercial - Type: Sanitary Waste: 1650 gpd Process Waste: 0 gpd
Site Address/Location 1829 St. Helena Hwy. Rutherford, CA 94573		<input type="checkbox"/> Other: Sanitary Waste: gpd Process Waste: gpd	
Evaluation Conducted By:			
Company Name Summit Engineering, Inc.		Evaluator's Name Richard Ross, E.I.T.	Signature (Civil Engineer, P.E., S., Geologist, Soil Scientist) 
Mailing Address: 463 Aviation Blvd. Suite 200		Telephone Number 707 - 527 - 0775	
City Santa Rosa	State CA	Zip 95403	Date Evaluation Conducted July 08, 2008

Primary Area	Expansion Area
Acceptable Soil Depth: 42 in. Test pit #'s: 7, 8	Acceptable Soil Depth: varies in. Test pit #'s: 1 - 9
Soil Application Rate (gal./sq. ft./day): 0.657 gal./sq.ft./ day (PD) 167 sq. ft./ 100 gpd (subsurface drip)	Soil Application Rate (gal./sq. ft./day): 0.657 gal./sq.ft./ day (PD) 167 sq. ft./ 100 gpd (subsurface drip)
System Type(s) Recommended: Subsurface Drip with Pretreatment	System Type(s) Recommended: Subsurface Drip with Pretreatment
Slope: 0-5 %. Distance to nearest water source: 190 ft.	Slope: 0-5 %. Distance to nearest water source: 190 ft.
Hydrometer test performed? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)	Hydrometer test performed? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)
Bulk Density test performed? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)	Bulk Density test performed? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)
Percolation test performed? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)	Percolation test performed? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)
Groundwater Monitoring Performed? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)	Groundwater Monitoring Performed? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)
Site constraints/Recommendations: Test Pit #3 exhibited stronger structure and higher clay content than other pits observed on-site. The texture of the soils in this pit was not verified and will be avoided for design purposes.	

Test Pit #

1

PLEASE PRINT OR TYPE ALL INFORMATION

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0 - 11	A	0 - 15	SCL	G	S	VFRB	NS	MF	CF	NONE
11 - 36	D	35 - 40	SCL	MSB	S	FRB	NS	CM	MF	F F/FT
36 +	--	50	LS	WSB	S	L	NS	FF	CF	F F FT

Test Pit #

2

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0 - 6	A	15 - 35	SCL	G	S	VFRB	NS	CF	CF	NONE
6 - 42	D	35	SCL	MSB	SH	FRB	NS	CM	MF	NONE
42 +	--	35 - 65	LS	WSB	SH	L	NS	FF	FF	NONE

Test Pit #

3

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0 - 6	A	0 - 15	--	G	S	VFRB	S	CF	CF	NONE
6 - 22	G	15 - 35	--	MSB	H	VF	S	FM	FM	NONE
22 - 53	D	0 - 15	--	SSB	H	VF	S	CF	FF	NONE
53 +	--	0 - 15	--	M	H	EXF	S	FF	--	NONE

Attach additional sheets as needed

4

Test Pil #

[illegible]

5

[illegible]

6

[illegible]

7

Test Pit #

[illegible]

8

[illegible]

9

[illegible]

GRGICH HILLS WINERY

APN 027-470-005, -024
Napa County, California

WATER MANAGEMENT SYSTEM FEASIBILITY REPORT

System Description

Water for winery process and domestic applications for the winery is to be supplied by the existing well near the winery. The modifications for the hospitality and barn buildings will be fed from an existing well near the hospitality building. See the Overall Site Plan (UP1) for a location of the well. The well is to be used for potable supply and fire protection/irrigation uses. If storage for fire protection is needed it will be located on the parcel.

There are currently no water treatment devices installed on the winery (027-470-024) or hospitality/barn property (027-470-005). Water quality will be analyzed prior to submittal for building permits.

As there is no change proposed for winery operations other than a slight increase in employees to accommodate the hospitality and barn upgrades, water feasibility is based on the hospitality parcel only. Based on the Napa County Department of Public Works' values for estimating water use, the one-year projected water demand for the hospitality parcel is approximately 1.39 ac-ft/yr. A conservative estimate of peak daily domestic water generated from the hospitality and barn buildings is 1,650 gpd will be adequately supplied by the existing well. If the well is not adequate, a new well will be drilled or the winery well evaluated and connected to meet the projected demands.

Management

The water supply system will be managed by the winery ownership. The cellar supervisor/operator will have direct responsibility for operation and maintenance of the system. Major maintenance and technical assistance will be contracted to a professional trained in such work.

Financial

The primary financial impact is the potential need for a water treatment system with an expected capital cost of \$5,000 - \$15,000, if it is found to be necessary in the future. Storage tanks, if needed may add an additional \$20,000 to the capital investment costs. The operating and maintenance costs on an annual basis are estimated to be less than \$2,500 per year.