“H”

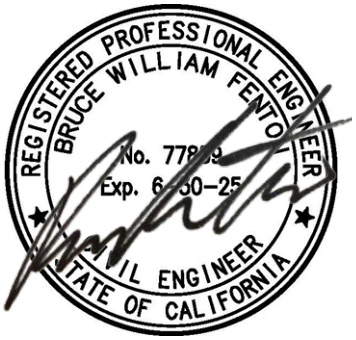
Wastewater Feasibility Study

Bremer Family Winery (P22-00086)
Planning Commission Hearing – July 1, 2026

WINERY WASTEWATER FEASIBILITY REPORT

BREMER FAMILY WINERY
975 DEER PARK ROAD
ST. HELENA, CA

APN 021-400-002 and 021-420-027



Prepared for:

John and Laura Bremer
975 Deer Park Road
St. Helena, CA 94574

Project # 4119005.0
July 12, 2024

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

TABLE OF CONTENTS

APPENDICES

I. INTRODUCTION

The Bremer Winery is applying for a Use Permit Modification to:

(1) Increase production from 15,000 gallons per year to 50,000 gallons per year;

(2) Increase the annual number of visitors from 3,600 persons to 12,500 persons, with no change to the daily maximum of 70 visitors;

(3) Increase marketing events to two (2) annual events with 100 guests, three (3) annual events with 50 guests, and two (2) annual events with 25 guests. Daily visitors on event days as below:

   i. On 100 guest event days, 25 daily visitors.

   ii. On 50 guest event days, 20 daily visitors.

   iii. On 25 guest event days, 45 daily visitors.

   iv. During production in the barrel room, there will be no visitation or events in the barrel room.

(4) Increase staff from four (4) full-time and two (2) part-time, to eight (8) full-time and two (2) part time employees.

(5) Allow on-site consumption pursuant to AB 2004

(6) i. To improve safety, an additional driveway connection and 9 new parking stalls

   ii. To utilize state-of-the-art environmental processes, replace existing conventional commingled wastewater system with separate and domestic wastewater treatment systems.

There are no other proposed modifications or construction.

This report demonstrates the feasibility of proposed winery process wastewater and domestic wastewater systems. Please refer to Appendix A for a Vicinity Map, USGS Map, and Soils Map.

II. EXISTING WASTEWATER SYSTEM

The existing wastewater system consists of two (2) 1,500-gallon tanks, and one (1) 1,200-gallon tank. Two tanks (1,500 gallon and 1,200 gallon) provide primary treatment for Process Wastewater and one tank (1,500 gallon) is the septic tank for domestic wastewater. From tanks wastewater gravity flows to the existing dispersal field. See Appendix B - Existing Wastewater System sizing by Drew Aspegren, and Permit E08-00452 documentation.

III. WINERY PROCESS WASTEWATER CHARACTERISTICS

The following is a summary of the winery wastewater characteristics:

Wine Production: 50,000 gallons of wine per year
2.38 gallons of wine per case
21,010 cases/year

Wastewater Production: 5 gallons of wastewater/gallon of wine
250,000 gallons/year

Peak Daily Waste Water Flow: Crush Period = 45 days
Annual wine production x 2.0 / 45
2,220 gallons/day

Average Daily Flow: 250,000/365 = 685 gallons/day

Monthly Wastewater Flows:

Table 1

Sep	14%	35,000	Gal/Month
Oct	14%	35,000	Gal/Month
Nov	11%	27,500	Gal/Month
Dec	8%	20,000	Gal/Month
Jan	4%	10,000	Gal/Month
Feb	6%	15,000	Gal/Month
Mar	6%	15,000	Gal/Month
Apr	5%	12,500	Gal/Month
May	6%	15,000	Gal/Month
Jun	7%	17,500	Gal/Month
Jul	9%	22,500	Gal/Month
Aug	10%	25,000	Gal/Month
Totals	100%	250,000	Gal/Year

IV. WINERY DOMESTIC WASTEWATER CHARACTERISTICS

The projected flows for domestic wastewater based on Napa County Environmental Health guidelines are shown below.

Use	Source	Number	Projected Flow (gpd)	Total Flow Typical Day (gpd)	Total Flow Small Event - 25 Guests Day - 45 visitors (gpd)	Total Flow Medium Event Day - 50 Guests - 20 visitors (gpd)	Total Flow Large Event Day - 100 guests - 25 visitors (gpd)
Winery	Total Employees	10	15	150	150	150	150
	Visitors	70	3	210	135	60	75
	Small Marketing Event	25	10	0	250	0	0
	Medium Marketing Event	50	10	0	0	500	0
	Large Marketing Event	100	10	0	0	0	1000
	Winery Subtotal			**360**	**535**	**710**	**1225**
Residence	Small Marketing Event	3	120	360	360	360	360
	Second Dwelling Unit	1	120	120	120	120	120
	Residence Subtotal			**480**	**480**	**480**	**480**
	Total Peak Flow			**840**	**1015**	**1190**	**1705**

An engineered domestic wastewater system is proposed and will be designed to treat flows up to 1,190 gallons per day which occur on Medium Event Days. On Large event days portable toilets will be used.

V. PROPOSED WINERY PROCESS WASTEWATER TREATMENT AND DISPOSAL SYSTEM

Bremer Family Winery proposes to separately treat and disperse winery process wastewater onsite with a BioFiltro system or equivalent. Treatment will meet the requirements of the State Water Resources Control Board General Waste Discharge Requirements for Winery Process Water with particular focus on Biological Oxygen Demand (BOD), Total Suspended Solids (TSS) and Total Nitrogen (TN).

It is likely that treatment will meet previously required County of Napa requirements of 160 mg/L for BOD and 80 mg/L for TSS. A conservative approach for calculating BOD loading was adopted by using the peak monthly generation (35,000 gallons from Table 1) of process wastewater generated in one month. Based on calculations in Appendix C, this treatment level will meet BOD loading limits given in Clause 35D of the State Water Resources Control Board General Waste Discharge Requirements for Winery Process Water.

Winery process wastewater will be treated prior to surface discharge. A treatment train including primary/pump tank, BioFiltro Control Module, and BioFiltro wiggle rooms are proposed. This treatment train may be modified for more optimal treatment process prior to submitting construction plans to Napa County for permitting. The following sections describe the treatment process in more detail.

Settling Tanks

The existing process wastewater tanks (1,500-gallon and 1,200-gallon) will be replaced in the same locations with traffic rated tanks. These tanks will be used as settling tanks and will provide approximately 1 day of settling.

Equalization Tank

Flow from the settling tank will drain to a 5,000-gallon equalization tank. This tank will serve to buffer peak flows and strengths from overwhelming the system and impairing treatment, as well as house the pump to convey flow to the BioFiltro treatment system.

Control Unit

The control unit will consist of a solid separator, an equalization tank, and a pH adjustment system. The influent into the control unit, will first flow through a solid separator before flowing into an equalization tank that will serve to buffer peak flows, monitor, and adjust pH to prevent surges from overwhelming the system and impairing treatment. Control unit design will be provided by BioFiltro.

Treatment System

The treatment system will be composed of two (2) BioFiltro Wiggle Room or equivalent. Each Wiggle Room contains media shavings, worms and a starter pack of microbes. The flow will be conveyed to the Wiggle Room via the initial pump/holding tank. After the first pass, the partially treated water will flow to a sump to be pumped into a second pass Wiggle Room. After the second pass, the water will flow to a sump to be pumped to irrigation storage tanks. BioFiltro Information can be found in Appendix D.

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 C. 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 and cover crop water demand. The irrigation will be applied to areas of vineyards outside of setback requirements. An area of 0.87 acres of vineyard and 0.83 acres of cover crop has been used to calculate the storage capacity required. Based on the monthly analysis, six thousand seven hundred and seventy-five (6,775) gallons of storage are required. To buffer peak flows and allow for wet weather periods without irrigation, four (4) 5,000-gallon tanks will be installed to store treated process wastewater prior to it being used for irrigation.

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 vineyard water demand, no discharge will occur within 24-hours of a forecasted rain event and also for 24-hours after a rain event. These irrigation scheduling constraints necessitate installing a tank to store excess water that cannot be discharged during the periods of rain. All stored water will then be used for irrigation during dry periods.

VI. SITE EVALUATION

RSA+ conducted a site evaluation on the parcel on August 29, 2023. Appendix B contains a copy of the Site Evaluation Report.

The site evaluation was conducted by Donal O'Briain of RSA+ and observed by Benjamin Hutter of Napa County Environmental Management.

VII. PROPOSED DOMESTIC WASTEWATER TREATMENT AND DISPOSAL SYSTEM

An Engineered septic system is proposed to treat and disperse domestic wastewater from the Winery, farmhouse and second dwelling unit.

The existing septic tank (1,500-gallons) will be replaced in the same location with a traffic rated tank. This tank will provide approximately 2 days of storage for a typical day.

Domestic wastewater will flow to the replaced 1,500-gallon septic tank where it will be pumped to a 1,500-gallon recirculation tank. Pumps in the recirculation tank will circulate wastewater to two AX-20 treatment pods. Treated wastewater will flow to a 3,000-gallon holding tank prior to dispersal to a Geoflow subsurface drip system.

The subsurface drip field is sized to meet Napa County Environmental Management guidelines. The distribution field will be placed where the most limiting soil type was sandy loam with a moderated subangular-blocky structure. The allowable application rate for this soil type is 0.9 gallons/square foot/day for pretreated effluent. Peak daily domestic wastewater flow is 1,190 gallons/day.

$$Winery\ Dispersal\ Field\ Area\ (primary) = \frac{1{,}190\ gpd}{0.9\ gpd/sf} = 1{,}322\ square\ feet$$

In addition to the primary dispersal area of 1,322 square feet, a 200% reserve area is required for the winery. The reserve area will be located in an area where the soil application rate is also 0.9 gallons/square foot/day.

$$Winery\ Dispersal\ Field\ Area\ (reserve) = 200\% \times \frac{1{,}190\ gpd}{0.9\ gpd/sf} = 2{,}644\ square\ feet$$

The total combined area required for the reserve field for the domestic winery wastewater is 3,966 square feet. These areas are shown on the sheet UP2.4 of the Use Permit Plans.

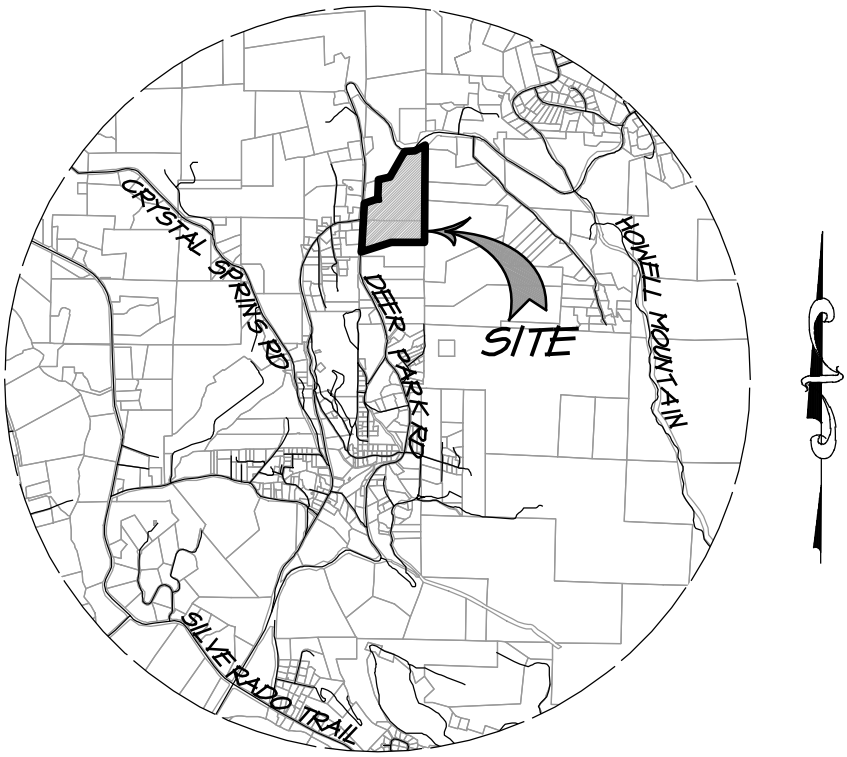
VIII. CONCLUSIONS

This report demonstrates that with the proposed production and visitors, the proposed winery process wastewater system can treat and disperse the projected flows of winery process wastewater. Similarly, the proposed sanitary wastewater can treat and disperse domestic wastewater generated on site.

Appendix A

Vicinity Map, USGS Map, Soils Map

BREMER FAMILY WINERY
VICINITY MAP
NAPA COUNTY CALIFORNIA



VICINITY MAP

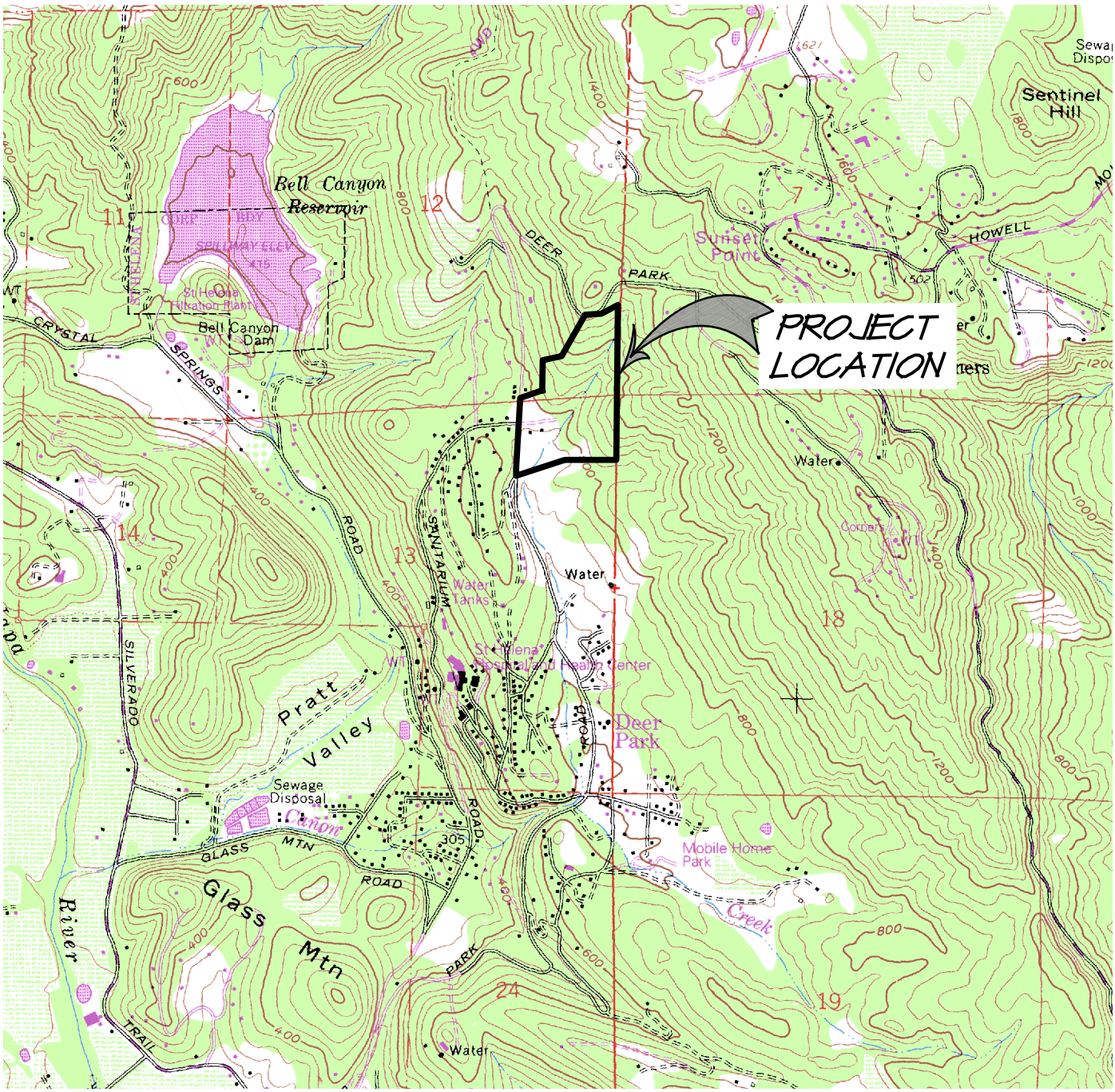
SCALE: 1" = 4000'

RSA+
1515 FOURTH STREET
NAPA, CALIF. 94559
OFFICE|707|252.3301
+ www.RSAcivil.com +

RSA+| CONSULTING CIVIL ENGINEERS + SURVEYORS + est. 1980

JUNE 15, 2021 4119005.0 Exh-Vic.dwg

BREMER FAMILY WINERY
USGS QUAD MAP
NAPA COUNTY CALIFORNIA



GRAPHIC SCALE

2000 0 2000 4000

(IN FEET)

1 inch = 2000 FT

RSA+

1515 FOURTH STREET
NAPA, CALIF. 94559
OFFICE|707|252.3301
+ www.RSAcivil.com +

RSA+| CONSULTING CIVIL ENGINEERS + SURVEYORS + est. 1980

JUNE 15, 2021 4119005.0 Exh-USGS.dwg

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Napa County, California

Bremer Family Winery

June 8, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Bremer Family Winery)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

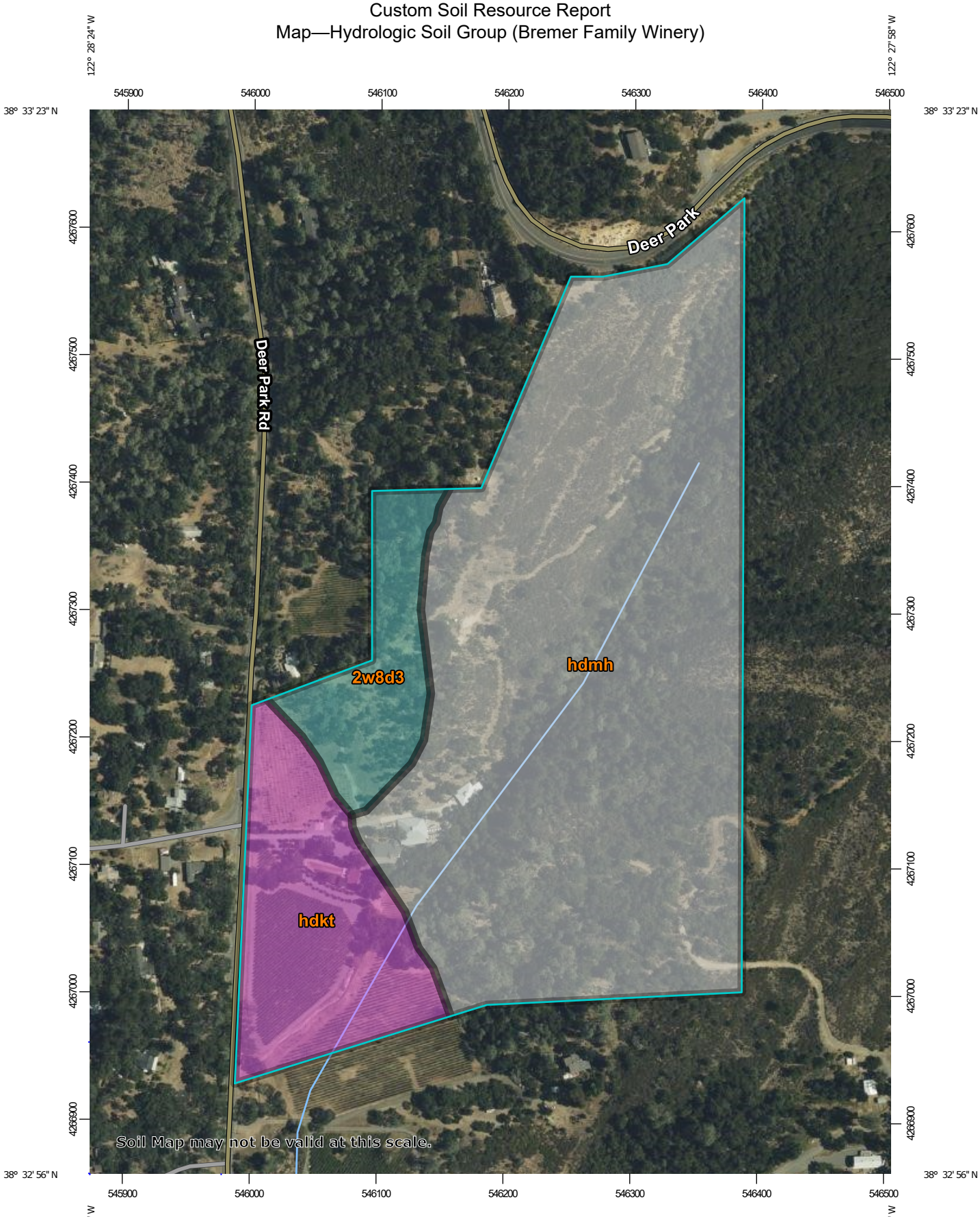
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group (Bremer Family Winery)



Map Scale: 1:4,070 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Napa County, California
Survey Area Data: Version 13, May 29, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 2, 2019—Jul 5, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group (Bremer Family Winery)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2w8d3	Boomer gravelly loam, volcanic bedrock, 14 to 60 percent slopes, MLRA 15	C	3.8	8.5%
hdkt	Cortina very stony loam, 0 to 5 percent slopes	A	7.2	16.1%
hdmh	Rock outcrop-Kidd complex, 50 to 75 percent slopes		33.6	75.4%
Totals for Area of Interest			**44.5**	**100.0%**

Rating Options—Hydrologic Soil Group (Bremer Family Winery)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix B

Existing Wastewater System and Site Evaluation

NAPA VALLEY VINEYARD ENGINEERING, INC.
176 MAIN STREET, SUITE B
ST. HELENA, NAPA VALLEY, CALIFORNIA 94574
(707) 963-4927 FAX (707) 963-1297 NapaVVE@aol.com

DREW L. ASPEGREN, P.E.
CIVIL ENGINEER

August 5, 2008

Mr. Sheldon Sapoznik
NAPA COUNTY DEPT OF ENVIRONMENTAL MANAGEMENT
1195 Third St.
Napa, CA. 94559-3092

Re: Bremer Family Winery
APN 021-400-002, 975 Deer Park Road
Proposed Leachfield

Dear Mr. Sapoznik:

Bremer Family Winery proposes to replace its leachfield. It is further proposed that the new leachfield be capable of supporting a 50,000 gallon winery. This is a voluntary over sizing of the system; Bremer Family Winery understands that this, in no way allows increased wine production above the 14,400 gallon currently permitted. Under current regulation, on a peak day, a 50,000 gallon winery would generate the following wastewater:

Description	Peak Day (gal/day)	
50 K gallon winery	1,667	$\left(\frac{50\text{ K gal}}{\text{yr}}\right)\left(\frac{1.5\text{ gal }H_2O}{\text{gal / wine}}\right)\left(\frac{\text{yr}}{45\text{ days}}\right)$
Max 10 workers	150	@ 15/gal/person/day
Large event (50 people)	150	@ 3 gal/person
Residence, 1 bedroom	150	
Total	2,117	

Bremer Family Winery proposes to use a chamber system (Infiltrator Systems, Inc. Equalizer 36). The leachfield area has been evaluated and has been rated at 0.33 gpd/sf of sidewall), so the following calculations are appropriate:

$$\left(\frac{2{,}117\ \text{gpd}}{}\right)\left(\frac{\text{SF sidewall}}{0.33\ \text{gpd}}\right) = 6{,}415\ \text{SF required}$$

$$\left(\frac{6{,}415\ \text{SF}}{}\right)\left(\frac{\text{LF}}{3\ \text{SF}}\right) = 2{,}138\ \text{LF chamber required}$$

Enclosed is the site evaluation by Sterk Engineering, and a site plan showing the existing septic tanks, the proposed leachfield, and a reserve area.

Sincerely,
NAPA VALLEY VINEYARD ENGINEERING, INC.

Drew L. Aspegren, P.E.
Civil Engineer #31418

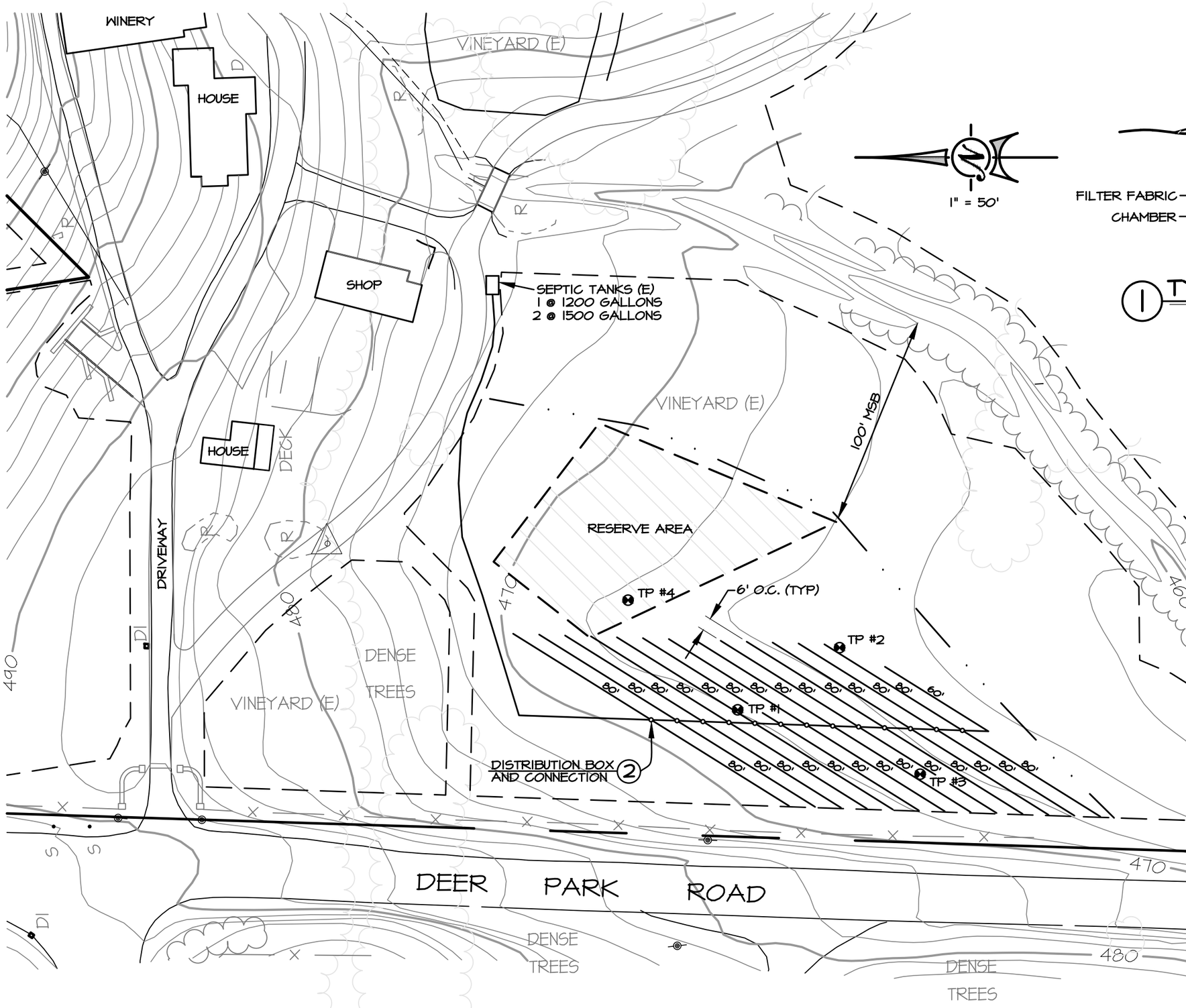
DLA:jw
encl.

cc: Laura Bremer

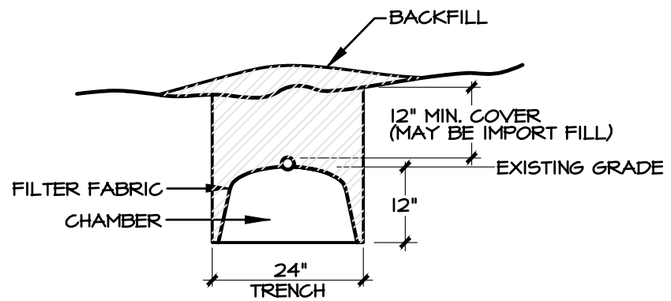
BREMER FAMILY WINERY

POTENTIAL SEPTIC SYSTEM

NVVE 10-14-08

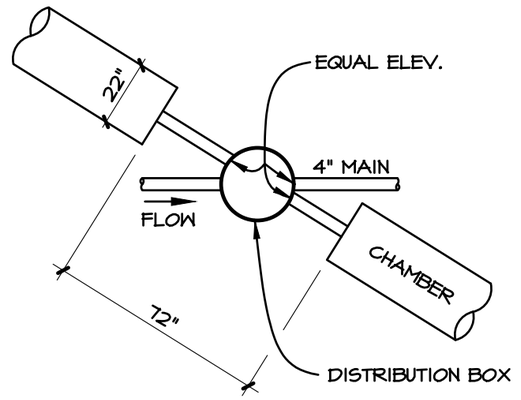


1" = 50'



1 TYPICAL INSTALLATION

NTS



2 TYPICAL CONNECTION

NTS

A Tradition of Stewardship
A Commitment to Service

Environmental Management

1195 Third Street, Suite 101
Napa, CA 94559
www.co.napa.ca.us

Main: (707) 253-4471
Fax: (707) 253-4545

Steven Lederer
Director

SEWAGE PERMIT

Application Type:	EM Permits-Sewage System-New Install Conventional		
Permit Number:	E08-00452	**Applied Date:**	08/12/2008
Parcel Number:	021-400-002-000	**Issued Date:**	10/24/2008
		Expiration Date:	10/24/2010

Site Address:	975 DEER PARK ST HELENA		
Owner:	BREMER JOHN ALEX ETAL TR	**Phone:**	
Address:	, , CA,		
Applicant:	LAURA BREMER	**Phone:**	
Business Name:	BREMER FAMILY WINERY		

Type of Project: New Install Conventional

Commercial UP#: U-697879

	Bedrooms				
	Existing	**Proposed**	**GPD**		**GPD**
Residence				**Sanitary Waste**	45
Second Dwelling	1		150	**Process Waste**	720
Guest House					

Water Supply: Well

Distance from closest water source to any part of sewage system: >100

Specifications

Designer:	Napa Valley Vyd Eng.	**Drainline:**	2140	**Sump Type:**	
Engineered Plan Date:		**Trench Depth (in):**	24	**A/V Alarm:**	
Conventional Plan Date:	10/24/2008	**Rock Under Pipe (in):**		**Remote Alarm:**	
Septic Tank:	existing	**Chamber Manu:**	Infiltrator	**Elec Self Cert:**	
Sewer Line:	existing	**Model Number:**	EQ 36		
Length (ft):		**DOC Backfill (in):**	12		
		DOC Fill (in):			

TO PERMITTEE:

Any work performed or operations conducted under the auspices of this permit constitutes acceptance of all conditions, inspections and comments contained in this permit, and the incorporation of all requirements as set forth in the permit application.

Staff Signature: _____ Date: 10/24/08

A Tradition of Stewardship
A Commitment to Service

Environmental Management

1195 Third Street, Suite 101
Napa, CA 94559
www.co.napa.ca.us

Main: (707) 253-4471
Fax: (707) 253-4545

Steven Lederer
Director

Sewage Permit
CONDITIONS/INSPECTIONS/COMMENTS

Application Type: New Install Conventional

Permit Number:	E08-00452	**Applied Date:**	08/12/2008
Parcel Number:	021-400-002-000	**Issued Date:**	10/24/2008
Applicant:	LAURA BREMER		
Owner:	BREMER JOHN ALEX ETAL TR		

Conditions:

Code		Condition
HIST		CODE VIOLATION#1 REDWOOD DECK, DECK PERMIT # B05-01249 (RESOLVED) 12/05/2005 GMB #2 BARN BLOCK & STONE WALL 8 TO 10 FEET TALL
EM-11		The applicant shall comply with the Department of Public Works "Conditions of Approval-National Polution Discharge Elimination System Requirements", a copy of which was provided at the time of permit issuance. Failure to comply with the NPDES requirements will result in a stop-work order.
EM-5	✓	An as-built drawing must be submitted prior to final.
Septic setback	✓	All parts of the septic system shall be located outside the 30 foot county road setback.
Distribution Box	N/A	Distribution boxes must be set on concrete pad and distribution of effluent to be serial distribution.

Inspections: Inspected By: Date: 10/24/2008

Inspection		
Leach Lines	PZ 6/24/09	All but 4 Lines Remain to Be Installed. Also Crossovers Remain PZ 7/6/09
Initial Layout and Site Prep	PZ	6/18/09 - Changing - taking out D-Boxes & using crossovers
Environmental Management Final	PZ 7/9/09	
~~D-Box~~	Lines changed - Not Needed PZ	

Comments:

Date	Comment
10/24/2008	Voluntary upgrade to existing septic system. This permit does not guarantee any increase in wastewater flow and/or wine production.
	Call 253-4135 at least 24 hours in advance during normal business hours to schedule inspection requests. Inspections are taken on a first-come-first-served basis so if you need a specific date and time be sure to call well in advance
	Environmental Management"s inspection must be obtained prior to covering any portion of the system.
10/24/2008	Any deviation from these permit specifications without prior approval from the Department of Environmental Management will be cause for stopping work until the changes are fully justified and approved.
	If a claim is to be submitted for a refund, per County Code, a 25% processing fee will be retained. Such claims must be made within one year of the date on the receipt.

STEVEN LEDERER
Director of Environmental Management

COUNTY of NAPA
ENVIRONMENTAL MANAGEMENT
1195Third Street, Suite 101, Napa CA 94559
Phone: 707/253-4471 Fax: 707/253-4545
www.co.napa.ca.us

APPLICATION
THIS IS NOT A PERMIT

Application Type:	EM Permits-Sewage System-New Install Conventional		
Permit Number:	E08-00452	**Parcel Number:**	021-400-002-000
Situs Address:	975 DEER PARK ST HELENA	**Applied Date:**	08/12/2008
Owner:	BREMER JOHN ALEX ETAL TR	**Phone:**	
Applicant:	LAURA BREMER	**Phone:**	

Worker's Compensation Coverage:
( ) A Certificate of current Worker's Comp Insurance Coverage is on file with this office (or filed with this application)
(X) I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Worker's Compensation laws of California.

By executing this application, the undersigned agrees to comply with all conditions, inspections and comments of the issued permit and all federal, state and county code requirements applicable to this permit. Furthermore, I understand that the Department of Environmental Management in no way guarantees trouble-free operation of the system, and that future repair may be necessary.

Owner or Authorized Agent Signature: _____ Date: 8/12/08

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 #: E23-00391
APN: 021-400-002
(County Use Only) Reviewed by: Date:

PLEASE PRINT OR TYPE ALL INFORMATION

Property Owner John Bremer	☐ New Construction ☐ Addition ☒ Remodel ☐ Relocation ☐ Other:
Property Owner Mailing Address 975 Deer Park Road	☒ Residential - # of Bedrooms: 4 Design Flow : 480 gpd.
City State Zip St. Helena, CA 94574	☒ Commercial – Type: Sanitary Waste: 710 gpd Process Waste: gpd
Site Address/Location 975 Deer Park Road St. Helena, CA 94574	☐ Other: Sanitary Waste: gpd Process Waste: gpd

Evaluation Conducted By:

Company Name RSA+	Evaluator's Name Donal O'Briain	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 August 29th, 2023

Primary Area	**Expansion Area**
Acceptable Soil Depth: 42 in Test pit #'s: 1, 2	Acceptable Soil Depth: 24 Test pit #'s: 3, 4, 6
Soil Application Rate (gal. /sq. ft. /day): 0.9 gpd/sf	Soil Application Rate (gal. /sq. ft. /day): 0.9 gpd/sf
System Type(s) Recommended: Subsurface Drip	System Type(s) Recommended: Subsurface Drip
Slope: 8 % Distance to nearest water source: <100	Slope: 2% Distance to nearest water source: >100ft
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:

Primary soil in test pits 1 and 2 was suitable to 42 inches. Test pit #5 was not suitable. 5 test pits suitable for subsurface drip with pretreatment.

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	20	SL	MSB	SH	FRB	SP	CM	FT	-
	24-42		30	SL	MSB	H	FRB	SP	FF	FF	-

Notes: Sidewall was harder below 24" horizon. Test pit suitable to 42". Bottom of excavation was limiting condition.

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			
	0-24	C	20	SL	MSB	SH	FRB	SP	CM	FT	-
	24-42	-	30	SL	MSB	SH	FRB	SP	FF	FF	-

Notes: Change in color from grey in upper horizon to brown in lower horizon. Pit suitable to 42". Bottom of excavation was limiting condition.

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			
	0-24	C	20	SL	MSB	SH	FRB	SP	CM	FF	
X	24-42	-	30	SL	MSB	VH	FRB	SP	FF	FF	

Notes: Tufa soil at 24" was limiting condition. Test pit suitable to 24".

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			
	0-30	C	30	SL	MSB	SH	FRB	SP	CM	FF	
X	30-50	-	30	SL	MSB	VH	FRB	SP	FF	FF	

Notes: Tufa pockets at 30" were limiting condition. Pit suitable to 30".

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			
	0-14	C	30	SL	MSB	SH	FRB	SP	CM	FF	
X	14-28	C	30	SL	MSB	VH	FRB	SP	FF	FF	
	28-40	C	30	SL	MSB	VH	FRB	SP	FF	FF	

Notes: Tufa layer at 14" was limiting condition. Pit not suitable.

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			
	0-36	-	30	SL	MSB	SH	FRB	SP	CM	FF	

Notes: Pit suitable to bottom of excavation at 36".

RGH CONSULTANTS
Experience is the difference

Santa Rosa Office
1305 North Dutton Ave.
Santa Rosa, CA 95401
P: 707-544-1072
F: 707-544-1082

Napa Office
1041 Jefferson St.
Napa, CA 94559
P: 707-252-8105
F: 707-544-1082

Middletown Office
P.O. Box 652
Middletown, CA 95461
P: 707-987-4602
F: 707-987-4603

Bouyoucos Hydrometer

Client:	**RSA+**	**Sampled:**	**8/11/2023**
Project:	**Bremer**	**Received:**	**8/15/2023**
Project #:	**9187.27**	**Reported:**	**8/22/2023**
Client Project #:	**Not Stated**		

Sample Number	TP-2	TP-5						
Depth	Not Stated	Not Stated						
A. Oven Dry Wt.	50.0	50.0						
B. Starting Time (hr:min)	1:06	1:08						
C. Temp. @ 40 sec. (F)	70.6	70.4						
D. Hydro Reading @ 40 sec.	28.0	27.5						
E. Composite Correction	-4.2	-4.2						
F. True Density @ 40 sec. (D-E)	23.8	23.3						
G. Temp. @ 2 hrs. (F)	69.7	69.7						
H. Hydro Reading @ 2 hrs.	9.0	11.0						
I. Composite Correction	-4.4	-4.4						
J. True Density @ 2 hrs. (H-I)	4.6	6.6						
K. % Sand=100-((F/A) x 100)	**52.4**	**53.4**						
L. % Clay= ((J/A) x 100)	**9.2**	**13.2**						
M. % Silt= 100-(K+L)	**38.4**	**33.4**						
N. % Retained #10=	**22.9**	**28.5**						
Dry Wt. Before Wash + Tare	830.0	1009.7						
Dry Wt. After Wash + Tare	431.6	512.7						
Dry Wt. Passing #10	398.4	497.0						
Tare Weight	313.1	314.3						
Dry Wt. Before Wash	516.9	695.4						
% Passing #10	77.1	71.5						
% Retained #10	22.9	28.5						

RGH CONSULTANTS
Experience is the difference

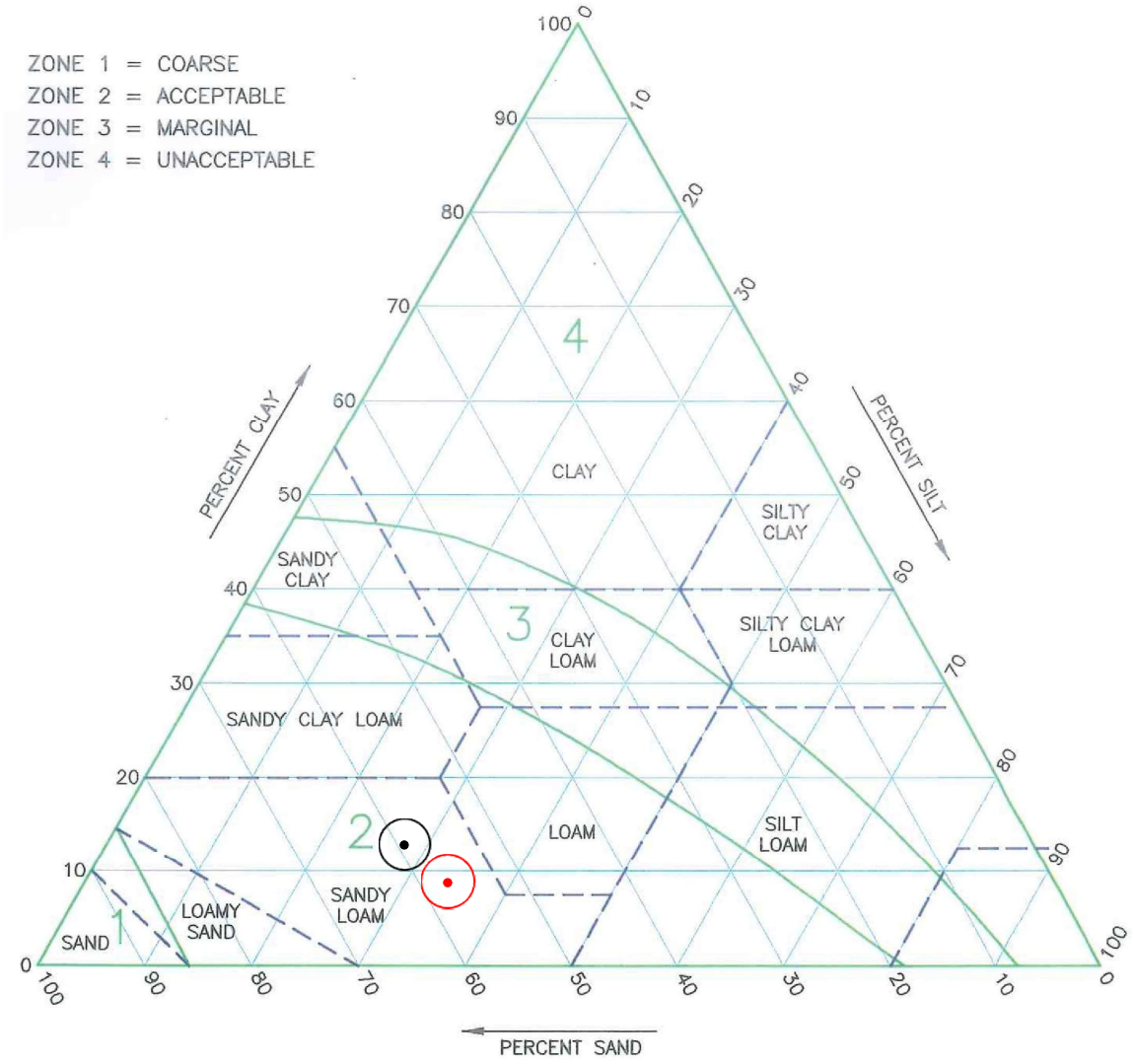
Santa Rosa Office
1305 North Dutton Ave.
Santa Rosa, CA 95401
P: 707-544-1072
F: 707-544-1082

Napa Office
1041 Jefferson St.
Napa, CA 94559
P: 707-252-8105
F: 707-544-1082

Middletown Office
P.O. Box 652
Middletown, CA 95461
P: 707-987-4602
F: 707-987-4603

Bouyoucos Hydrometer

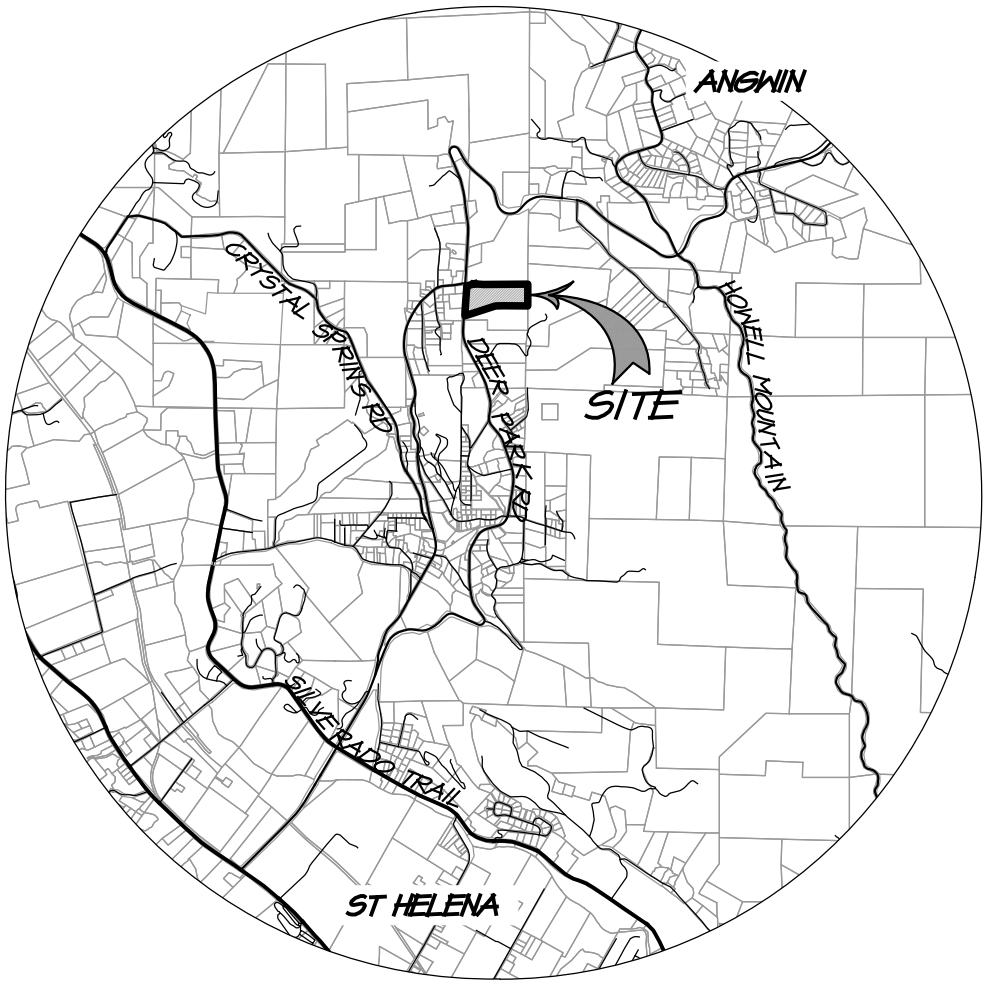
Client:	**RSA+**	**Sampled:**	**8/11/2023**
Project:	**Bremer**	**Received:**	**8/15/2023**
Project #:	**9187.27**	**Reported:**	**8/22/2023**
Client Project #:	**Not Stated**		



Legend

TP-2 @ Not Stated	TP-5 @ Not Stated

BREMER FAMILY WINERY
VICINITY MAP
ST HELENA CALIFORNIA



LOCATION MAP
SCALE: 1" = 4,000'

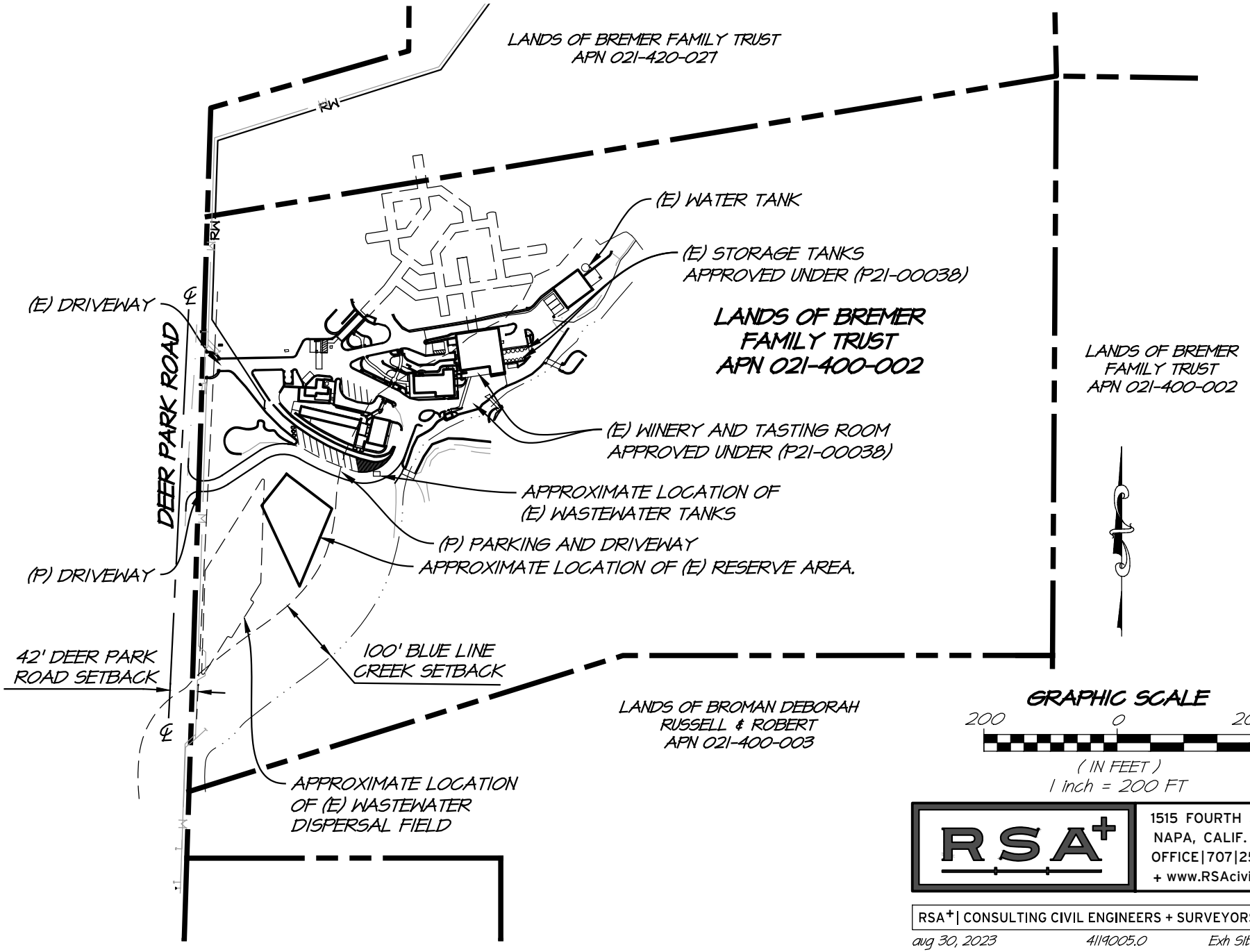
RSA+
1515 FOURTH STREET
NAPA, CALIF. 94559
OFFICE|707|252.3301
+ www.RSAcivil.com +

RSA+| CONSULTING CIVIL ENGINEERS + SURVEYORS + est. 1980

AUG 30, 2023 4119033.0 Exh-Vic-Map.dwg

R:\2019\4119005.0_Bremer_Winery_Use_Permit_Modification\DESIGN (DESIGN 3D)\Exhibits\Exh-Vic-Map.dwg 09/01/2023

BREMER FAMILY WINERY
SITE MAP
ST HELENA CALIFORNIA



GRAPHIC SCALE
200 0 200
(IN FEET)
1 inch = 200 FT

RSA+
1515 FOURTH STREET
NAPA, CALIF. 94559
OFFICE|707|252.3301
+ www.RSAcivil.com +

RSA+| CONSULTING CIVIL ENGINEERS + SURVEYORS + est. 1980

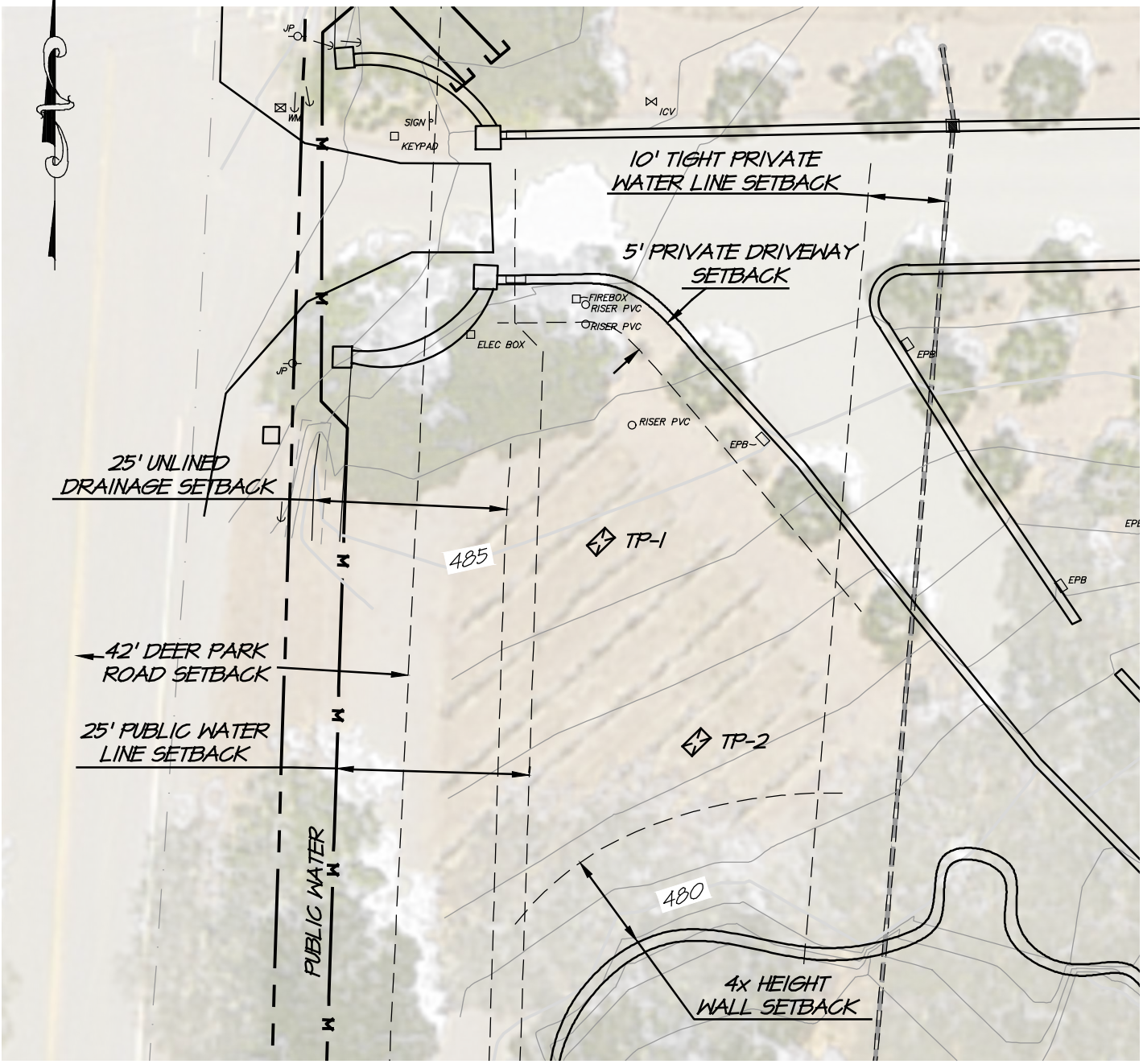
aug 30, 2023 4119005.0 Exh Site Map.dwg

R:\2019\4119005.0_Bremer_Winery_Use_Permit_Modification\DESIGN (DESIGN 3D)\Exhibits\Exh-Site Map.dwg 09/01/2023

BREMER FAMILY WINERY

TEST PIT MAP 1

ST HELENA CALIFORNIA



GRAPHIC SCALE

20' 0 20'

(IN FEET)

1 INCH = 20 FT

LEGEND

TP-1 TEST PIT

TP-4 TEST PIT NOT GOOD

ADDRESS: 975 DEER PARK RD
ST HELENA, CA 94574

SITE EVALUATION DATE: AUG 29, 2023

APN: 021-400-002

ENVIRONMENTAL HEALTH INSPECTOR: BENJAMIN HUTTER

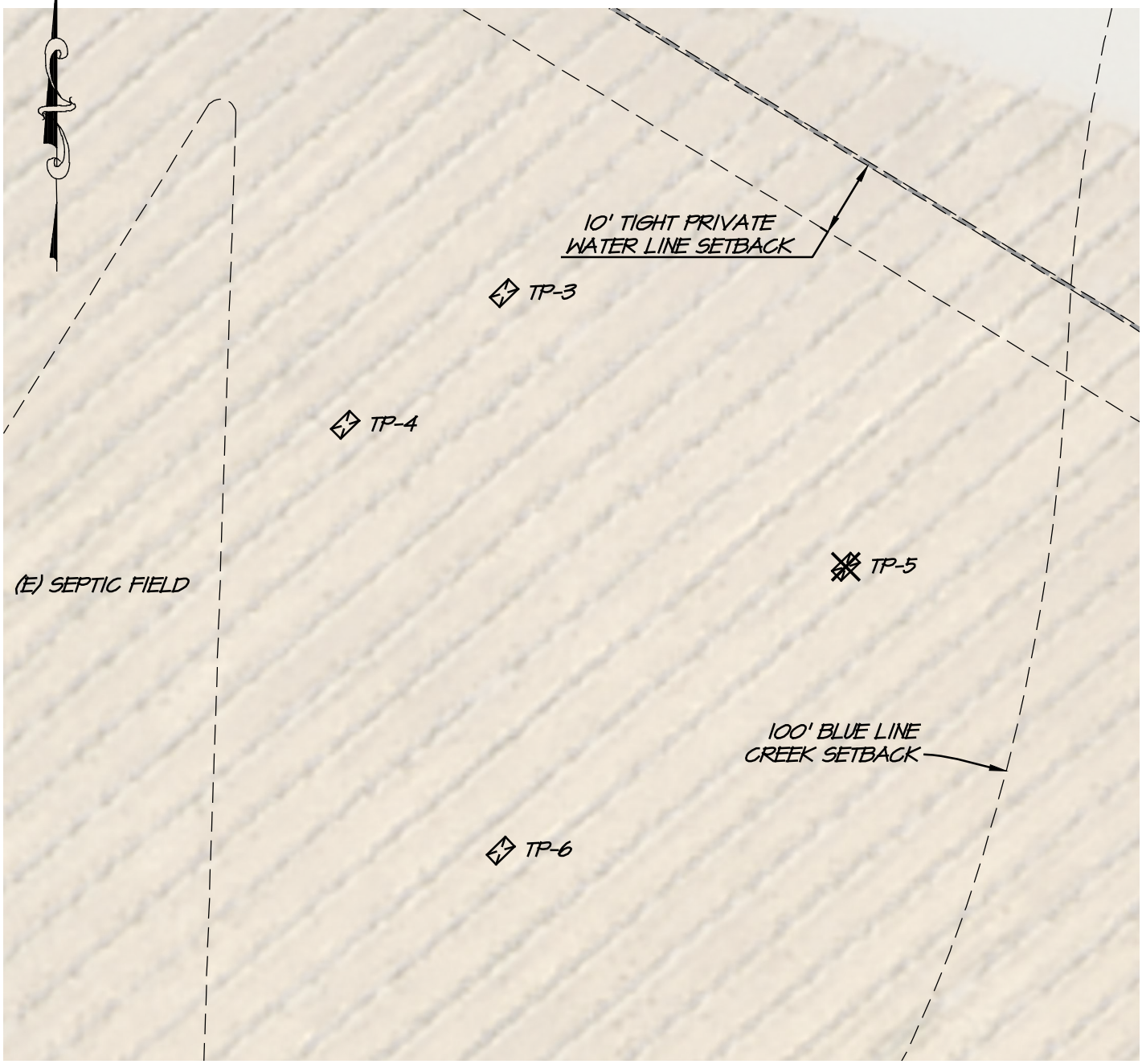
RSA+

1515 FOURTH STREET
NAPA, CALIF. 94559
OFFICE|707|252.3301
+ www.RSAcivil.com +

RSA+| CONSULTING CIVIL ENGINEERS + SURVEYORS + est. 1980

R:\2019\4119005.0_Bremer_Winery_Use_Permit_Modification\DESIGN (DESIGN 3D)\Exhibits\Pit Map 1.dwg 09/01/2023

BREMER FAMILY WINERY
TEST PIT MAP 2
ST HELENA CALIFORNIA



GRAPHIC SCALE
20' 0 20'
(IN FEET)
1 INCH = 20 FT

LEGEND

TP-1 TEST PIT

TP-5 TEST PIT NOT GOOD

ADDRESS: 975 DEER PARK ROAD
ST HELENA, CA 94574
SITE EVALUATION DATE: AUG 29, 2023
APN: 021-400-002
ENVIRONMENTAL HEALTH INSPECTOR: BENJAMIN HUTTER

RSA+
1515 FOURTH STREET
NAPA, CALIF. 94559
OFFICE|707|252.3301
+ www.RSAcivil.com +

RSA+| CONSULTING CIVIL ENGINEERS + SURVEYORS + est. 1980

Appendix C

Irrigation Water Balance, BOD Loading Limit Calculation and Irrigation Exhibit

Reclaimed Process Wastewater
Water Balance for Irrigation and Storage

Project Description		Annual Process Waste Flow Volume		
Project Number:	4119005.0	Wine Production:	50,000	gal/year
Project Name:	Bremer Family Winery			
Prepared By:	BWF	Annual Process Waste per Gallon Wine:	5	gal/year
Date:	May 12, 2023	Total Annual Process Waste Generated:	250,000	gal/year

Vineyard Irrigation Parameters		Landscape Irrigation Parameters		
Acres of irrigated vineyard:	0.87 acres	Crop type / name:	Cover Crop	
Row spacing:	6.0 feet	Total irrigated acres of crop:	0.83 acres	
Vine spacing:	4.0 feet			
Total number of vines:	1,579 vines			
Water use per vine per month (peak):	26 gal			
Total peak monthly irrigation demand:	41,055 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]:	10,000	15,000	15,000	12,500	15,000	17,500	22,500	25,000	35,000	35,000	27,500	20,000

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)	6,775	0	0	0	0	0	0	0	0	0	0	4,114
Vineyard irrigation as % of peak month irrigation demand:	0%	0%	0%	0%	100%	100%	100%	100%	100%	0%	0%	0%
Irrigation per month per vine (gallons):	0.0	0.0	0.0	0.0	26.0	26.0	26.0	26.0	26.0	0.0	0.0	0.0
Total vineyard irrigation demand [gallons]:	0	0	0	0	41,055	41,055	41,055	41,055	41,055	0	0	0
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]	0	0	0	0	15,000	17,500	22,500	25,000	35,000	0	0	0
Remaining vineyard irrigation demand after using this month's process water [gallons]	0	0	0	0	26,055	23,555	18,555	16,055	6,055	0	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	0	26,055	23,555	18,555	16,055	6,055	0	0	0
Net storage after vineyard irrigation drawdown [gallons]	6,775	0	0	0	0	0	0	0	0	0	0	4,114
This month's process wastewater, remaining after vineyard irrigation, available for landscape irrigation[gallons]	10,000	15,000	15,000	12,500	0	0	0	0	0	35,000	27,500	20,000

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)*	10,000	15,000	15,000	12,500	0	0	0	0	0	35,000	27,500	20,000
Reference ET (ETo) (in/month) (see note 1)	1.32	1.8	3.32	4.78	6.11	6.84	7.07	6.3	4.9	3.45	1.74	1.29
Crop Coefficient (k_c) (see note 2)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Crop water demand per acre [inches]	0.79	1.08	1.99	2.87	3.67	4.10	4.24	3.78	2.94	2.07	1.04	0.77
Crop water demand per acre [gallons]	21,505	29,325	54,088	77,873	99,541	111,433	115,180	102,636	79,828	56,205	28,347	21,016
Total crop water demand for irrigated area [gallons]	17,741	24,193	44,622	64,245	82,121	91,933	95,024	84,675	65,858	46,370	23,386	17,338
Will landscape be irrigated with reclaimed water this month?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Process wastewater remaining after vineyard irrigation, reclaimed for landscape irrigation [gallons]	10,000	15,000	15,000	12,500	0	0	0	0	0	35,000	23,386	17,338
Landscape irrigation water required from storage or other source [gallons]	7,741	9,193	29,622	51,745	82,121	91,933	95,024	84,675	65,858	11,370	0	0
Drawdown from storage for landscape irrigation [gallons]	6,775	0	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	4,114	2,662
Net end-of-month reclaimed water storage after all irrigation [gallons]	0	0	0	0	0	0	0	0	0	0	4,114	6,775

End of Water Balance

Peak Monthly Storage = **6,775 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.

Bremer Family Winery - BOD Loading Calculation

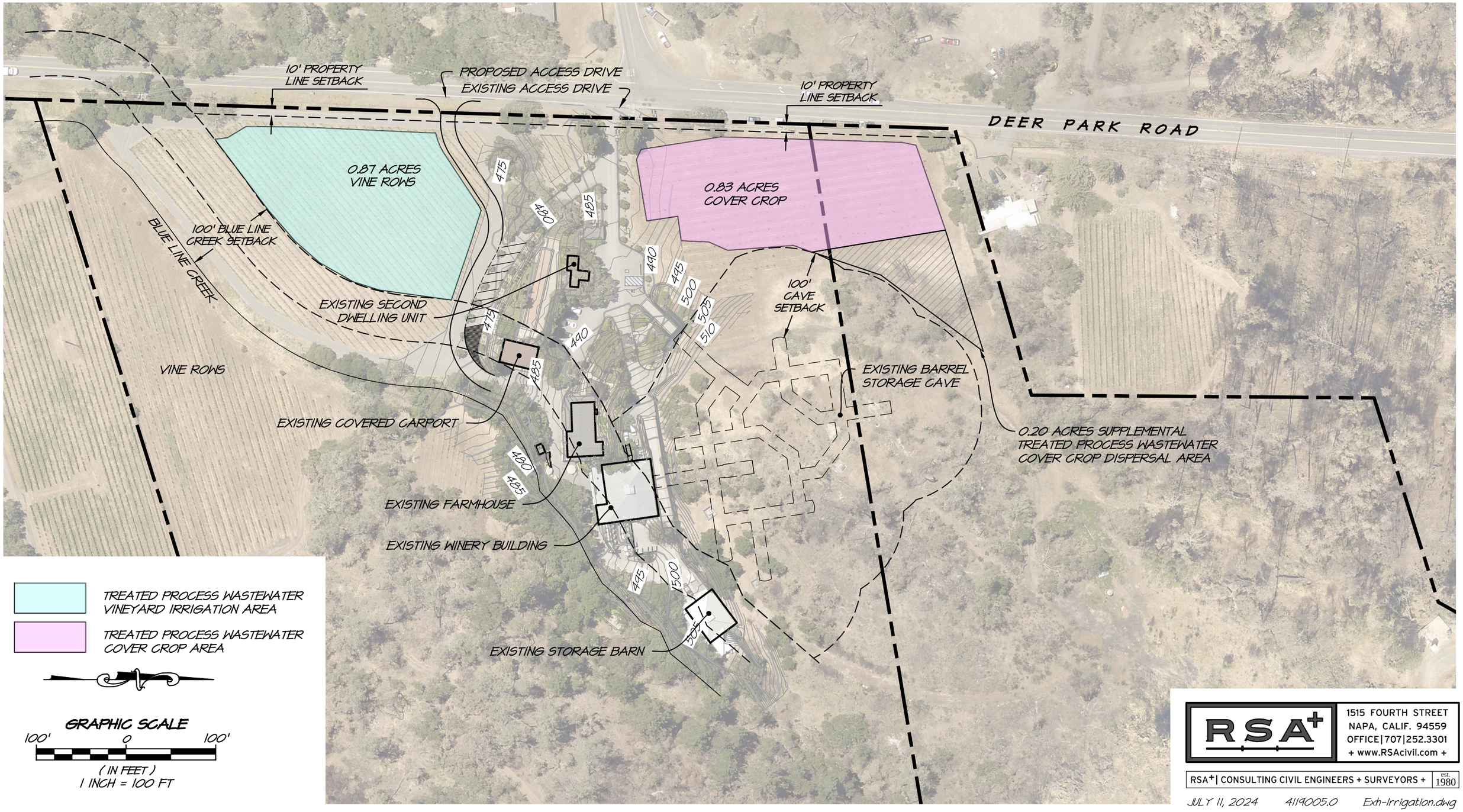
Input Criteria		
Land Application Area	0.83	Acres
Post Treatment BOD (County of Napa)	160	mg/L
* Loading Limit (Target)	100	lbs/acre/day
Peak Process Wastewater month, Sept.	35000	Gallons/month
Calculations		
Process Wastewater Generation per week (4 weeks / month)	8750	Gallons/week
Process Wastewater Generation per week (1 gallon / 3.78541 Liters)	33122	Liters/week
BOD Generation per week (160 mg/L Post Treatment Loading)	5299574	mg/week
BOD Generation per week (453,592 mg/lb)	12	lbs/week
BOD loading per acre	14	lbs/acre/day **
Conclusion		
BOD Loading per acre less than loading limit	14 < 100	lbs/acre/day **

* State Water Board General Waste Discharge Requirements For Winery Process Water, Section 35-D

** Assumes irrigation once per week with a 7-day irrigation cycle

BREMER FAMILY WINERY
TREATED PROCESS WASTEWATER VINEYARD IRRIGATION AREAS

NAPA COUNTY CALIFORNIA



TREATED PROCESS WASTEWATER VINEYARD IRRIGATION AREA

TREATED PROCESS WASTEWATER COVER CROP AREA

GRAPHIC SCALE

100' 0 100'

(IN FEET)

1 INCH = 100 FT

RSA+

1515 FOURTH STREET
NAPA, CALIF. 94559
OFFICE|707|252.3301
+ www.RSAcivil.com +

RSA+| CONSULTING CIVIL ENGINEERS + SURVEYORS + est. 1980

JULY 11, 2024 4119005.0 Exh-Irrigation.dwg

Appendix D

BioFiltro System Information

BIOFILTRO
worm powered wastewater solutions

2 BIDA® Modular System Quote

Prepared for:
Bremer Family Winery, 975 Deer Park Rd, St Helena, CA 94574

Prepared by:
Sarah Haupt at BioFiltro, 1949 5th Street, Suite 101, Davis, CA 95616

The proposal is valid for 30 days

1. INTRODUCTION

1.1 Background Information

Bruce Fenton of RSA+ has solicited a proposal for the process water treatment at Bremer Family Winery located in St Helena, CA. The existing winery is increasing its use permit from 15,000 to 50,000 gallons of wine production. As there is no existing water quality or flow data, RSA+ estimates that the winery should have a peak harvest discharge of 2,200 gallons per day (GPD).

Annual Wine Production in Gallons	Absolute Peak Daily Discharge (GPD)
50,000	2,200

1.2 Project Description

BioFiltro proposes one (1) Control Unit and two (2) M2 Wiggle Rooms to treat a maximum discharge of 1,500 GPD of winery process wastewater. Each M2 Wiggle Room consists of two stories of BIDA technology for a total of four BIDA beds. The first three BIDA beds shall be designed and plumbed to receive the first pass of process water, and the fourth BIDA bed will function as a second pass to deliver higher effluent quality.

1.3 Influent Parameters

Influent parameters for BioFiltro's system require pH to range between 6.0 - 9.0. As there is currently no existing pH adjustment system at the winery, BioFiltro includes one in this proposal. No existing water quality data was provided. BioFiltro assumes typical winery process water levels and influent temperatures of 30 degrees Celsius or less. BioFiltro has targeted the following design parameters:

Constituent	Influent	Effluent	Unit
Estimated Process Water Flows	2,200	2,200	GPD
BioFiltro Design Flow*	1,500	1,500	GPD
pH	3-9	6-9	S.U.
Maximum BOD5	6,000	<160	mg/l
Maximum TSS	1,000	<80	mg/l

With this design, the BioFiltro system shall deliver high water quality effluent that can be reused for dripline irrigation with a reduced risk of fouling the lines due to nutrient build-up.

*Bruce Fenton of RSA+ is designing additional upstream process water capacity for volumes in excess of BioFiltro's treatment capacity and to allow for lees settling. Such storage/settling tanks upstream of BioFiltro's control unit are beyond BioFiltro's scope of work.

1.4 Overall Treatment Method/Technology

The BioFiltro BIDA® System could be classified as a trickling filter, where the filtering media is made of wood chips and shavings. Wastewater is spray irrigated over the media, and organic constituents in water are retained and

digested by the microbiological community that grows in the media (biofilm). Additionally, the media is inhabited by worms (*eisenia andrei*) as an improvement to biological treatment by providing natural aeration, proliferating the biofilm, mixing, and further reducing biological solids.

2. PACKAGE OFFERING

2.1 Package Offering

Units	Item	Dimensions
2	Wiggle Room – Two-Story Worm Bed	20’ L x 8’ W x 11’ 6” H
	Includes all system media (wood shavings, geotextiles, irrigation system, drainage cells	
	Includes starter of worms and microbes	
1	Control Module (which shall contain the following equipment)	10’ L x 8’ W x 8’ H
1	Rosedale LCO Bag Filter	
1	pH Adjustment System	
1	1,000 Gallon Storage Tank	
1	Mazzei Venturi Injector	
2	3/4 HP Pumps	
1	Lot of pH, Temperature, pressure, and ultrasonic level influent and effluent sensors and probes	
1	Pressure Relief Valve	
1	Programmable Logic Controller	
1	Flow Meter	
1	Overhead Light and Ventilation Fan	
	Additional Equipment Provided	
2	¾ HP Sump Pumps for Double Pass	

2.2 Installation Requirements Not Included in Scope of Work

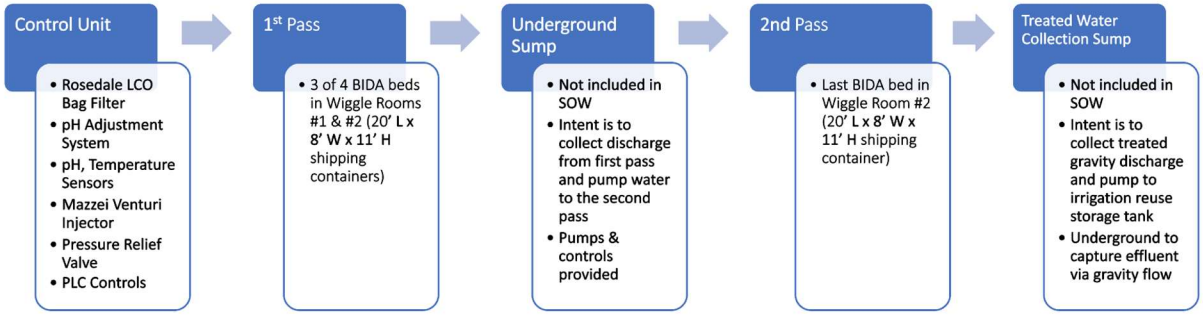
BioFiltro will provide a General Arrangement drawing and piping and instrumentation diagram to facilitate the planning and layout of the project site, but all permit and construction drawings for site infrastructure will be by others.

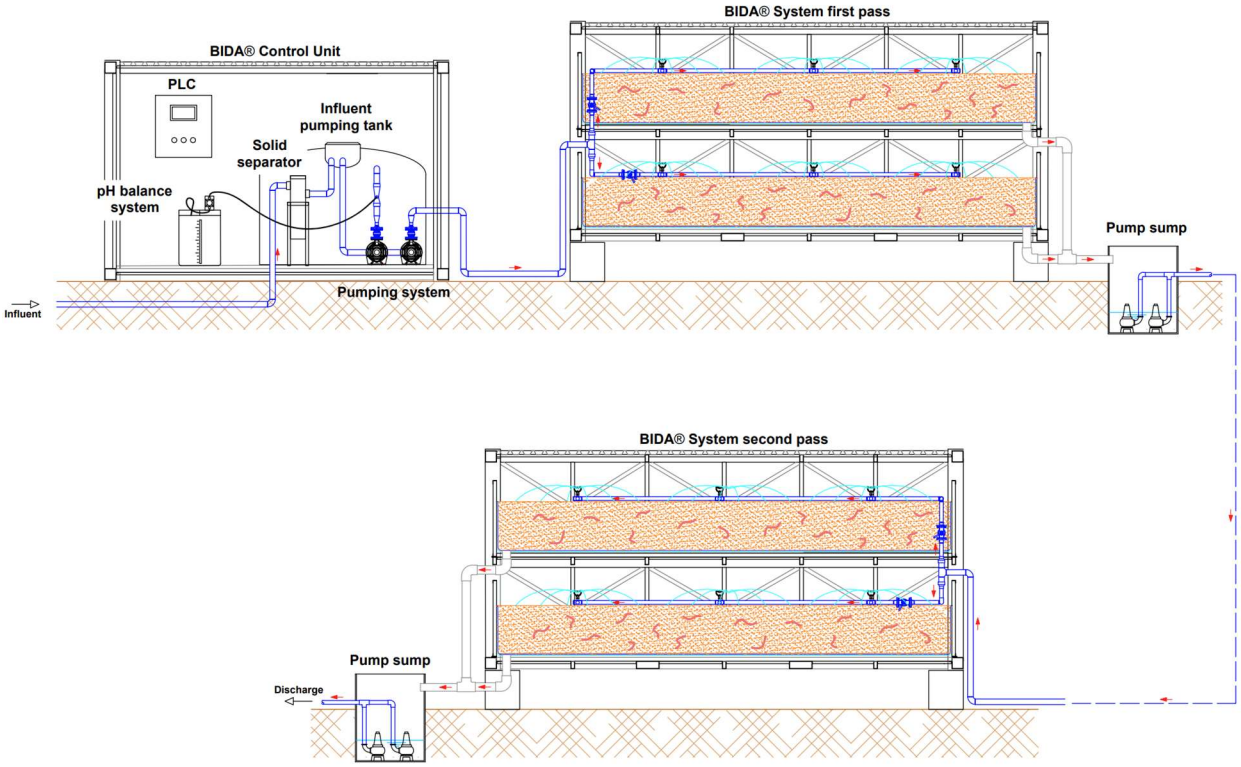
It is assumed that the client provides the following items:

- Availability at the project site of 240V three phase with 40 amps or 480 V three phase with 20 Amps available capacity (15 kVA total estimated) and any underground conduit.
- Site preparation of a 4" gravel or concrete pad with 90% compaction and concrete footings, if required, for the M2 Wiggle Rooms or as otherwise directed by a Geotechnical Engineer.
- Any underground sumps, storage, and piping which may be needed to deliver wastewater under pressure into the Control Unit, from the first pass to the second pass, and/or collect treated water from the M2 module and pump to irrigation reuse/storage. BioFiltro can provide recommendations on the capacity and routing of these utilities, but stamped drawings, if required, will be done by others.
- That the site is plumbed with access to influent and effluent piping.
- Access to 1 ½" pipe with fresh water for general maintenance items.

2.3 Anticipated Process Flow

This quotation assumes that the influent shall consist solely of winery process water. The scope of this proposal assumes that water arrives pressurized (minimum 20 PSI) into the Control Unit, where it shall first pass through a solid separator consisting of a bag filter before it flows into the 1,000-gallon equalization tank. While in this tank, probes shall monitor the water for temperature and pH. Should the pH of the process water be below 6, the probe shall trigger the need for the pH adjustment system to dose adjustment chemicals. A Mazzei Venturi injector will provide aeration during recirculation pumping within the tank. Once every half hour, or when otherwise triggered by the ultrasonic level sensor, a timer shall trigger the pump station, which shall consist of two 3/4 HP pumps, to irrigate the module. From here, the standard operating procedure will be to have 100% of the daily volume be pumped to the first Wiggle Room, where it shall percolate down through a layer of wood shavings, which shall be rich in microbes and earthworm activity, geotextiles, and drain out along the lined floor down into a sump basin. Here, the second pass pump sump shall deliver all the water to the second Wiggle Room, where it shall pass through another layer of wood shavings, microbes, earthworms, and geotextiles before gravity feeding into a treated water pump sump, which will send water to the winery's preferred irrigation storage location.





2.4 Operational Considerations

The winery should expect the system to consume approximately 0.0014 kWh/gallon treated for double pass operation and 0.0007 kWh/gallon treated for single pass operation.

Consumption of pH adjustment chemicals will depend on processes upstream in the winery, but with BioFiltro's on-demand pH adjustment system design, the overall usage should range between $80 – 400 per year. While BioFiltro technicians shall alert the winery when chemicals are needed, only the winery shall be responsible for sourcing and replenishing the chemical.

The Sustainable Choice

Thank you for considering BioFiltro for your wastewater treatment needs. We are a carbon-neutral company with a mission to provide climate-smart regenerative solutions that enable companies and communities to treat water, build soil health, and offset their carbon footprint. In doing so, we use business as a force for good to cultivate a harmonious relationship between people, the planet, and profit.

By harnessing the natural digestive power of worms, BioFiltro is a non-combustion technology that demands up to 85% less energy than traditional wastewater systems while still delivering the same, if not better, water quality. By improving water quality, BioFiltro enables its customers to reduce their environmental footprint and land application area, thereby freeing up land for more beneficial uses.

BioFiltro is also a nature-based solution that does not generate sludge, a byproduct of wastewater treatment often hauled to landfills. Instead, BioFiltro generates vermicompost, a beneficial soil amendment rich in nutrients and microbial activity that can be used to improve water retention, root structure, and soil diversity and health. BioFiltro is currently participating in the California Department of Food and Agriculture's Healthy Soils Program to see if the application and use of our vermicompost on croplands helps sequester carbon. In 2021, BioFiltro generated more than 45,000 cubic yards of vermicompost in the United States, enough to amend ~450,000 acres.

BioFiltro's systems have also been validated and verified to prevent the formation of greenhouse gases from forming. In one case study, one of our dairy systems prevents the formation of 42,000 metric tons of CO2 equivalent yearly. Carbon credit generation varies and depends on upstream practices, existing wastewater treatment infrastructure, and pre-existing water quality.

BIOFILTRO
worm powered wastewater solutions

A Can of Worms for Climate Smart Winemaking

Control Unit

Wiggle Room

By pairing our Control Unit with the Wiggle Room, BioFiltro delivers the ultimate can of worms. Our pre-packaged system includes a solid separator, pH adjustment system, flow meter, equalization tank, pumps, PLC & HMI and a two-story BIDA® System, our patented worm powered wastewater treatment process. Units are built in the US and clients are able to choose the the color(s) of the unit(s).

Discharge from the winery enters the Control Unit through its included solid separator before arriving to the equalization tank. Here, probes and sensors monitor water quality before it is dispersed evenly across the two floors of the Wiggle Room(s) where it percolates down through layers of wood media where worms and microbes capture and digest contaminants. Once treated, water gravity feeds out of the system through exit pipes and is ready for reuse in irrigation in as little as four hours.

Blend our earthy tones with your sustainability forward wines and choose worms for not only the cost-effective but also climate smart wastewater solution for your winery.

Circular and Regenerative

- ✓ Energy Efficient
- ✓ Modular and Scalable
- ✓ Minimal Odors & Noise
- ✓ Nature Based Technology
- ✓ Worm Castings Byproduct
- ✓ Sludge Free
- ✓ Automated

MADE IN USA

BIOFILTRO
worm powered wastewater solutions

Take Control of Your Wastewater

Each Control Unit comes with a control panel that is built in house and listed under UL508A; an HMI, and Intelligence of Worms (IoW); BioFiltro's very own control system and monitoring software. Accessible from both mobile and desktop devices, IoW provides verified users with historians and the ability to monitor the system, equipment, and water levels in real time. IoW can push alerts and troubleshooting guidance to assigned operators to facilitate. Through IoW, the system's operations are automated and remotely accessible.

Technical Specifications	
Treatment Capacity	≤1,200 GPD for average winery (~10,000 cases), per Wiggle Room*
Nutrient Removal	Up to 99% removal of BOD5, TSS, TKN, Ammonia, and Phosphorus
Treatment Time	Continuous process 4-hour treatment time when operating in parallel 8-hour treatment time when operating in series
Treatment Media	~50 cubic yards of wood media per Wiggle Room ~1/2-2" Douglas Fir shavings or equivalent with minimal sawdust
Operating Dimensions & Weight	Wiggle Room 20' L x 8'W x 11'H & ≤ 22,000 lbs Control Unit 8'L x 8'W x 9'H & ≤ 12,500 lbs At least three sides of the Wiggle Room need to be accessible
Client Site Prep Requirements	90% compaction & gravel or concrete pad Concrete footings ≤50A, 240 or 480 V, 3PH
Electrical Demand	0.0007 kWh/gallon treated when operating in parallel 0.0014 kWh/gallon treated when operating in series
Optional Equipment	Solar Panels for off-grid operations Climate control equipment and insulation

1949 5th Street, Suite 101, Davis, CA 95616
Tel: 530 564 4260 | info@biofiltro.com
www.biofiltro.com

*Can vary by influent/effluent characteristics

Revised January 2023