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## Wastewater Feasibility Study

# SEPTIC FEASIBILITY REPORT

FOR

## SIGNORELLO WINERY MAJOR MODIFICATION

4500 SILVERADO TRAIL

NAPA, CA 94558

APN 039-400-080

SEPTEMBER 2019

Prepared by BKF Engineers

FOR

**Napa County Environmental Health Division**

1195 Third Street

Napa, CA 94558



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Project Engineer  
September 9, 2019

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## **I. Project Data**

The applicant is applying to the County of Napa for a Use Permit Major Modification to their winery facility. This report has been prepared to evaluate the effects that increasing wine production and the marketing plan will have on the existing system.

According to use permit U-587879 and modification 02353-MOD, the winery is currently permitted to produce 20,000 gallons of wine per year out of a fermentation building and have 4 full time employees and 20 daily visitors a day for private wine tasting. The winery marketing plan also includes special events with a maximum of 20 guests, food prepared on site and 2 release events per year.

The applicant proposes to increase production to 50,000 gallons of wine per year and implement the following marketing plan:

- 20 Employees
  - 16 Full Time
  - 4 Seasonal / Harvest
- 60 visitors per day - private tours/ tasting with food prepared onsite
- Monthly Events
  - Small Event - maximum 20 people with food prepared onsite
  - Large Event - maximum 40 people with food prepared onsite
- Wine Release Events - maximum 75 people with catered food
- 3 Auction Events - maximum 125 people with catered food and portable toilets

The waste generated from the proposed grease interceptor will be combined, treated and disposed of in the subsurface drip field with the process waste from the winery.

There is also a 3 bedroom residence on the property constructed under building permit B18-01473. The domestic waste from the winery and residence is currently combined, treated, and disposed of in the existing ETI bed.

### **I.A. Site Evaluation**

A site evaluation was completed on March 8, 2018 (E18-00156, attached in **Appendix A**) and 13 pits were excavated. Test pits 5 and 11 were determined to be Sandy Clay while pits 12 and 13 were determined to be Sandy Clay Loam according to the Napa County approved feel method. The acceptable soil depth ranged from 28 to 36 inches before reaching a limiting layer of either rock content greater than 50% or standing water. The test pits are suitable for sub-surface drip system with pre-treatment with an application rate of 0.3 gal/sf/day for the Sandy Clay soil and 0.6 gal/sf/day for the Sandy Clay Loam soil.

## **II. ETI Bed Design Flow and Disposal**

### **II.A. Existing Wastewater System and Capacity**

The domestic wastewater from the residence and the winery are combined and currently disposed of in a sub-surface disposal system utilizing evapo-transpiration (ETI) methods. The system was originally designed to dispose of 900 gallons per day according to a letter from Mahoney and Associates to the Napa County Environmental Health Department dated February 19, 2003 (attached in **Appendix B**). The system consists of primary treatment via a 1,500 gallon septic tank and disposal through a 6,000 square foot ETI bed.

## **II.B. Domestic Wastewater Flows**

The domestic wastewater system has a design capacity of the existing wastewater flows from the 3 bedroom residence the proposed winery domestic flows from the increased marketing plan.

### **II.B.1. Existing Residential Wastewater Flows**

Using the Napa County method for determining the daily domestic effluent from a 3 bedroom residence, the flow is estimated to be:

$$\text{Residential Wastewater Flow} = (120 \text{ gpd/bedroom}) \times (3 \text{ bedrooms}) = 360 \text{ gpd.}$$

The peak wastewater flow for the residence is anticipated to be **360 gallons per day**.

### **II.B.2. Winery Domestic Wastewater Flows**

As noted in section I of this report, the waste generated from the proposed grease interceptor will be combined, treated and disposed of with the process waste from the winery. The peak daily domestic flows will occur during harvest when the peak number of wine club members attend an event (75) with peak number of employees (20). The peak daily winery domestic demand was determined to be **525 gallons per day** in accordance with the following calculations:

$$\begin{aligned} (75 \text{ guests / wine club event}) \times (3 \text{ gallons / guest}) &= 225 \text{ gpd} \\ (20 \text{ employees}) \times (15 \text{ gallons/ employee}) &= 300 \text{ gpd} \end{aligned}$$

## **II.C. Total Domestic Flow and Disposal**

The anticipated total domestic wastewater demand from the winery and the residence is **885 gallons per day**. Given that the existing ETI bed has a capacity of 900 gallons per day, there are no changes proposed to the domestic wastewater system.

## **III. Subsurface Drip Field Design Flow and Dispersal**

The existing subsurface drip field is currently designed to disperse process waste generated from 20,000 gallons of wine per year. The project proposes to expand the subsurface drip field to accommodate the flows generated from the commercial kitchen and the increased winery production.

### **III.A. Existing Subsurface Drip Field Capacity**

The process subsurface drip system was constructed under a separate permit and consists of primary treatment via a 5,000 gallon septic tank and secondary treatment via a Cloacina Package Treatment unit before being disposed of through a pump tank to a 2,256 sf subsurface drip field. The system is constructed in an area with soil classified as Sandy Clay with an approximate 5% slope toward Silverado Trail. According to these parameters, the subsurface drip field has a capacity of 677 gpd.

### **III.B. Proposed Subsurface Drip Field Design Flows**

Peak process wastewater demand is based on combining the wine production volume of 50,000 gallons per year with the peak onsite food generating event described in the marketing plan. Using the Napa county method for determining the peak process waste demand from production, the peak flow is estimated to be:

$$[(50,000 \text{ gallons wine/ year}) (1.5)] / (60 \text{ day crush}) = 1,250 \text{ gpd}$$

Food will be prepared onsite for wine tasting and lunch event guests. This report assumes the kitchen will generate an additional 12 gallons of waste per visitor being served food. The peak food preparation event will occur on a day with peak wine tasting visitors (60). This event will add an additional 720 gallons per day demand to the system according to the following calculation:

$$(60 \text{ visitors/ day}) \times (12 \text{ gallons / visitor}) = 720 \text{ gpd}$$

The process wastewater and commercial kitchen wastewater flows combine for a total design flow of **1,970 gallons per day**.

### **III.C. Proposed Subsurface Drip Field Sizing Parameters**

The subsurface drip field is located in an area with soil classified as Sandy Clay and Sandy Clay Loam, with infiltration rates of 0.3 gal/sf/day and 0.6 gal/sf/day. An infiltration rate of 0.3 gal/sf/day will be used to determine the necessary field size. The existing area has an approximate 5% slope towards Silverado trail, requiring a 2' o.c lateral spacing. According to these parameters, a subsurface drip field will require the following area to have a design capacity of 1,970 gpd:

$$(1,970 \text{ gpd}) / (0.3 \text{ gal/sf/day}) = 6,567 \text{ sf.}$$

The existing field is 2,256 sf and comprised of 12 rows of 94 ft. long leach lines. The project proposes to add an additional 23 rows of 94 ft. long leach lines to create a 70 ft. x 94 ft. or 6,580 sf field.

### **IV. Domestic and Process Wastewater Reserve Area**

The proposed reserve area shall be subsurface drip disposal reserve area. According to Napa County alternative sewage treatment manual, a 200% reserve area is required for sub-surface drip fields. The combined process and domestic design demand 2,855 gpd leading to a required reserve area capacity of 5,710 gpd.

The reserve capacity will be split between two areas on the site. The first area will be comprised of Sandy Clay Loam found in test pits 12 and 13 and have a design capacity of 4,872 gpd and the second area will be comprised of Sandy Clay at test pit 5 and have a design capacity of 838 gpd. The reserve area square footage are calculated below:

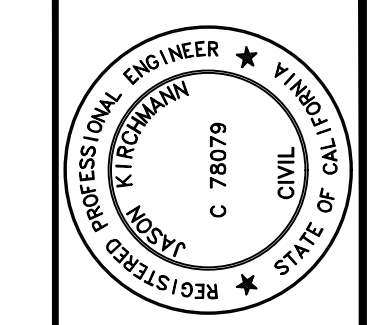
$$\text{Reserve Area 1} = (4,872 \text{ gpd}) / (0.6 \text{ gal/sf/day}) = 8,120 \text{ sf}$$

$$\text{Reserve Area 2} = (838 \text{ gpd}) / (0.3 \text{ gal/sf/day}) = 2,794 \text{ sf}$$

Please refer to the utility plan prepared by BKF Engineers attached in **Appendix C** for the layout of the reserve areas.

### **V. Project Wastewater Feasibility Conclusions**

Based on the previous narrative and calculations, Signorello Winery is able to handle the wastewater flows proposed in the major modification. Detailed calculations and construction plans, if required, will be submitted to the Napa County Environmental Health Division for permit approval prior to the construction of the final disposal system modifications.



**PRELIMINARY**  
NOT FOR CONSTRUCTION  
DATE: 04/27/2020  
JASON KIRCHMANN C78079



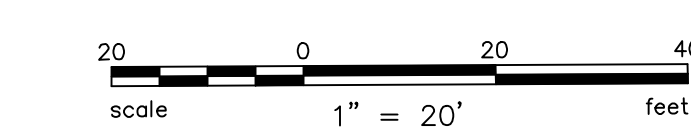
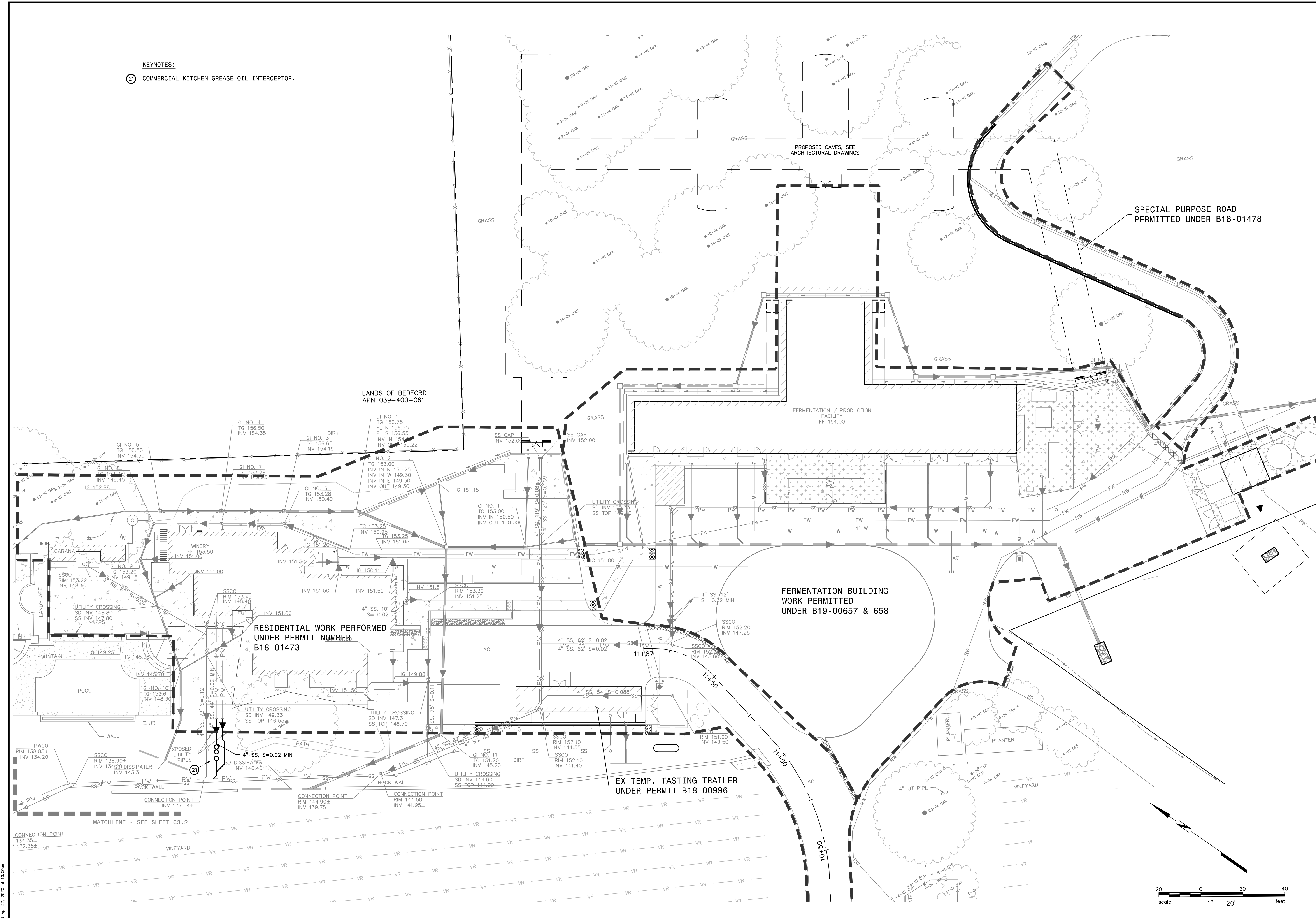
**SIGNORELLO WINERY - MAJOR MODIFICATION**  
APN 039-400-080  
4500 SILVERADO TRAIL, NAPA, CA 94558  
**UTILITY PLAN**

No.	Revisions

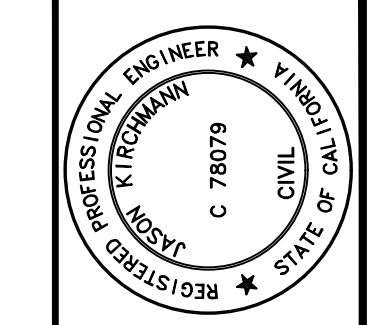
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Design: JEP  
Drawn: MKK  
Approved: JAK  
Job No: 20179199

Drawing Number:  
**C3.1**

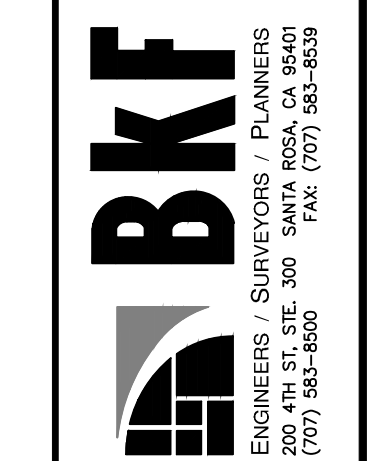
**KEYNOTES:**  
② COMMERCIAL KITCHEN GREASE OIL INTERCEPTOR.



Plot: Apr 27, 2020 at 10:50am



**PRELIMINARY**  
NOT FOR CONSTRUCTION  
DATE: 04/27/2020  
JASON KIRCHMANN C78079



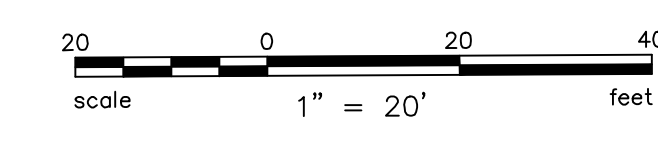
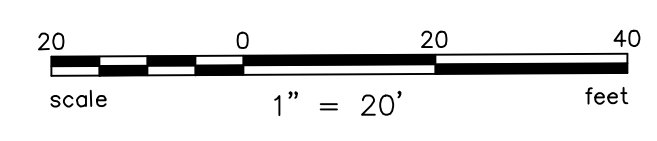
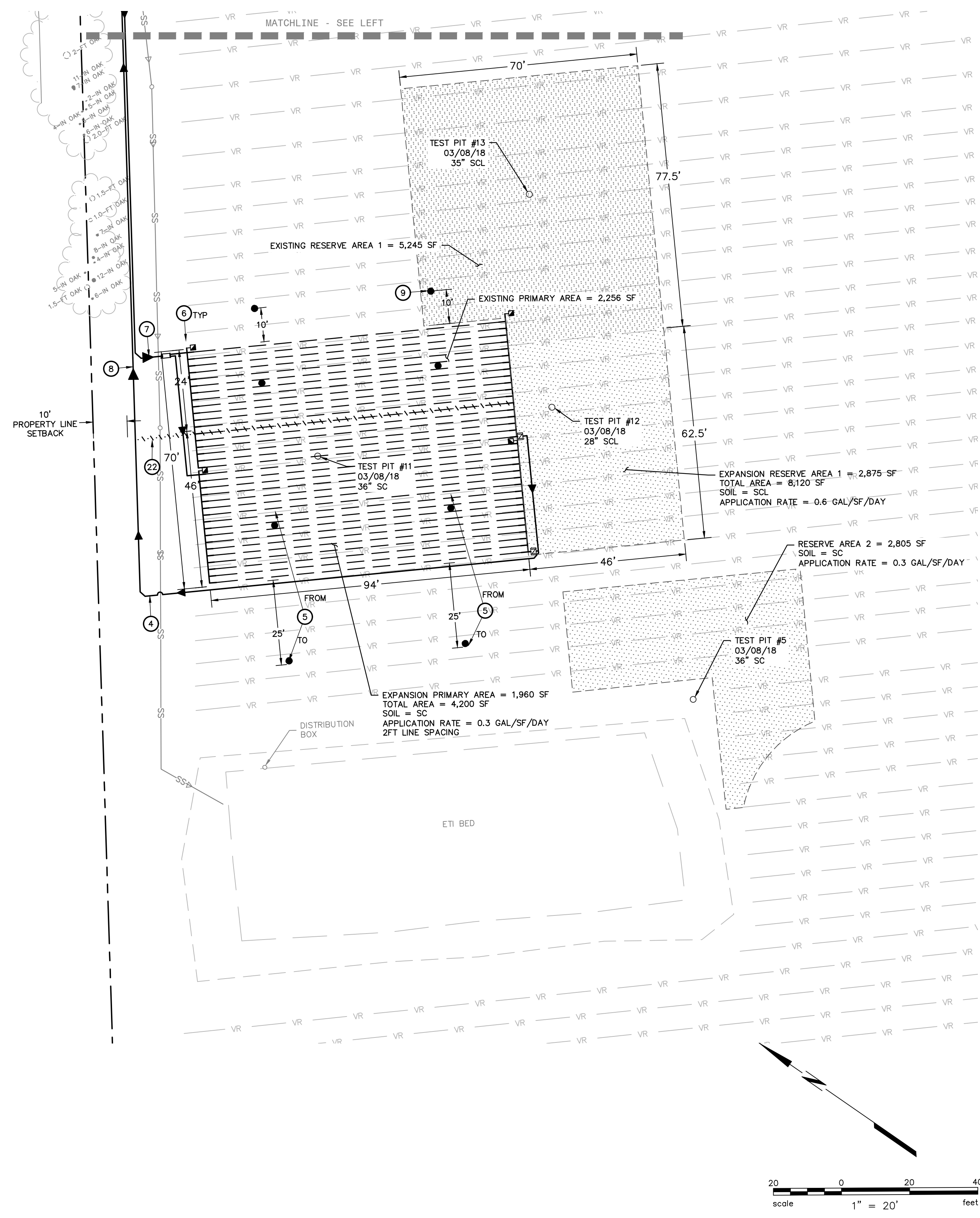
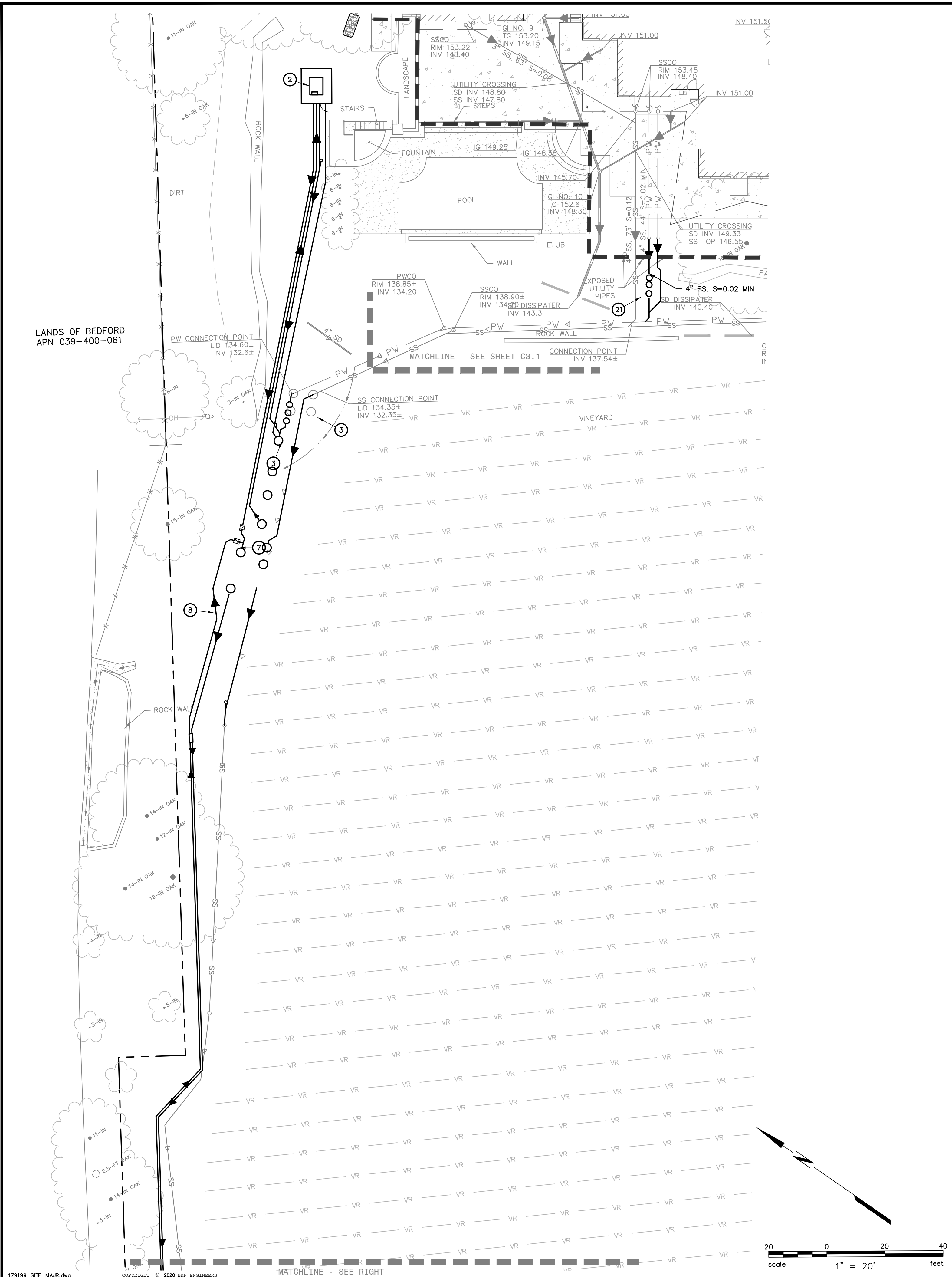
**SIGNORELLO WINERY - MAJOR MODIFICATION**  
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**UTILITY PLAN**

Revisions	
No.	Description

Date: APR 2020  
Scale: AS SHOWN  
Design: JEP  
Drawn: MRK  
Approved: JAK  
Job No: 20179189

Drawing Number:  
**C3.2**

- KEYNOTES:**
- ② CLOACINA PRETREATMENT SYSTEM AND SHED. UNDER SEPARATE PERMIT.
  - ③ SEPTIC TANK.
  - ④ RETURN LINE.
  - ⑤ RELOCATED MONITORING WELL.
  - ⑥ AIR VACUUM BREAKER RELEASE VALVE.
  - ⑦ SUPPLY LINE INSTALLED UNDER SEPARATE PERMIT.
  - ⑧ RETURN LINE INSTALLED UNDER SEPARATE PERMIT.
  - ⑨ MONITORING WELL INSTALLED UNDER SEPARATE PERMIT.
  - ②② REMOVE OR ABANDON EXISTING UTILITY IN ACCORDANCE WITH LOCAL REGULATIONS.



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