

Winery Process Waste



Overview

- Winemaking Process
- Application Types
- Treatment System Sizing
- Case Studies

Winemaking Process

- Harvest and Crush
- Fermentation
- Clarification and Racking
- Filtering and Bottling

Harvest and Crush



Harvest and Crush

- Grapes are picked, de-stemmed and crushed



Fermentation

- Yeast is added to convert sugars to alcohol



Clarification and Racking

Wine is siphoned off the lees into new, clean barrels



Filtration and Bottling



Application Types

- Boutique or Mass Produced
- Process Waste and Sanitary Waste
- Dispersal

Boutique Wineries

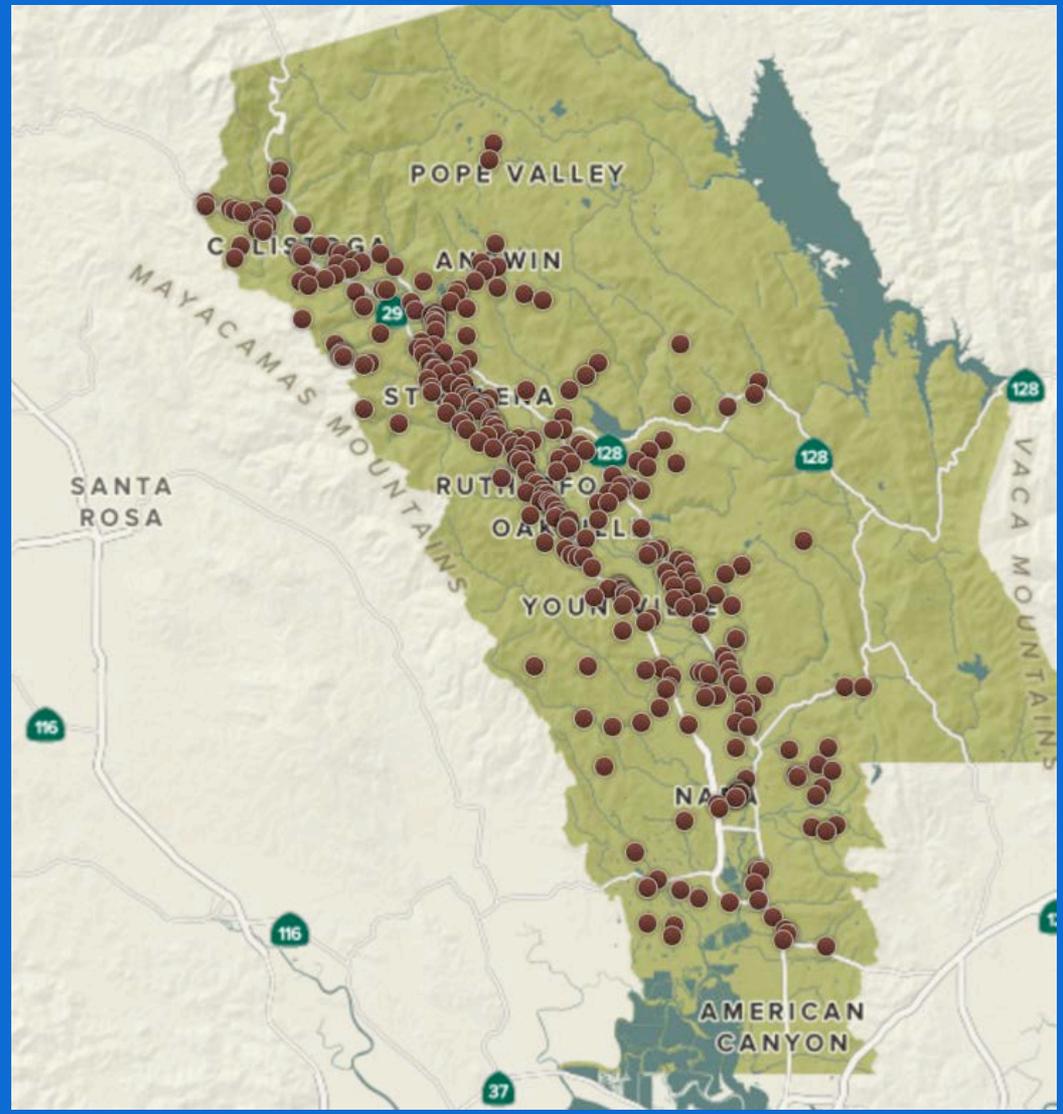
- Production is typically 10,000 cases per year or less



Mass Production Wineries



Napa Valley



Process Waste



Gamble Winery

Sanitary Waste



COURTESY | NRP&VAI

Chappellet Winery

Process and Sanitary Waste Mixed



Continuum Winery

Dispersal

- Drip to Vines
- Subsurface
- Municipal Sewer

Drip to Vines



Gamble Winery

Subsurface Dispersal



Continuum Winery

Municipal Sewer



Napa Sanitation District

Design Flow Calculations

Wineries measure in Cases of Wine per year

- 2.378 gallons of wine per case
- 6 gallons of wastewater generated per gallon of wine produced per year
- 1.5 gallons of that 6 gallons is produced during crush
- Crush is typically 30-60 days

Design Flow Calculations

- Gallons of wastewater/season = number of cases * gallons/case * estimated gallons of wastewater discharge/case
- Gallons/day = gallons/season / number of days in season
- Example:
 - ~ 20,000 cases/season * 2.4 gallons wine/case * 1.5 gallons wastewater/gallon wine = 72,000 gallons wastewater/season.
 - ~ 72,000 gallons per season / 60 days per season = 1,200 gallons/day.

BOD Assumptions

- Winery process wastewater can exceed 30,000 mg/L BOD₅
- Typical process waste averages:
 - ~ 3,000 – 7,000 mg/L BOD₅
 - ~ Design BOD₅ = 7,000 mg/L
- Typical Domestic Waste Strength: around 300 mg/L

Effluent Limitations for Process Winery Waste

The discharge of treated winery process wastewater to land by *spray* irrigation shall not contain constituents in excess of the following limits:

<u>Constituent</u>	<u>Unit</u>	<u>Maximum</u>
BOD	Mg/L	80
TSS	Mg/L	80

Effluent Limitations for Process Winery Waste

The discharge of treated winery process wastewater to land by method of *drip* irrigation shall not contain constituents in excess of the following limits:

<u>Constituent</u>	<u>Unit</u>	<u>Maximum</u>
BOD	Mg/L	160
TSS	Mg/L	80

Chemical Feed Basin

- pH Adjustment

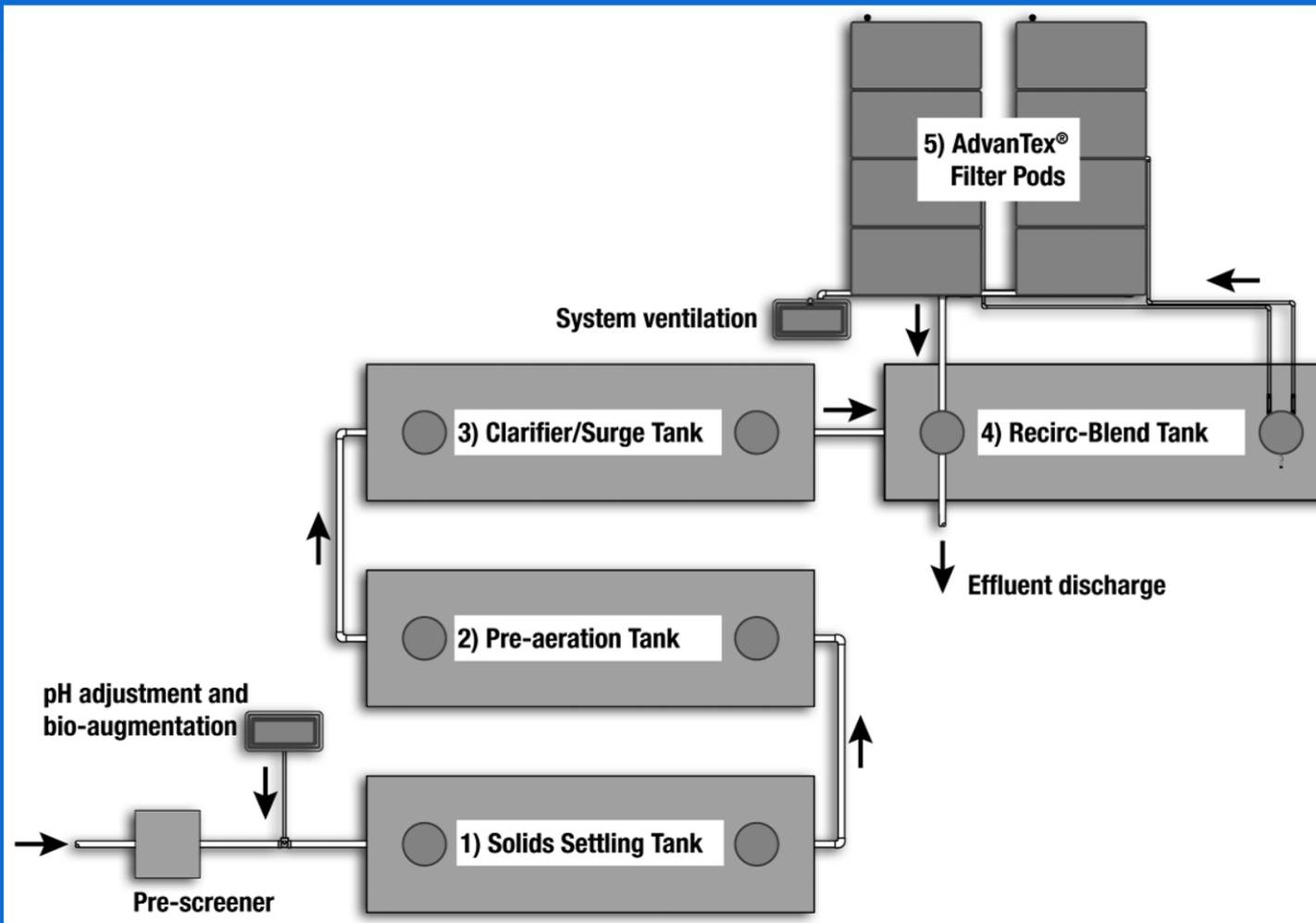


AdvanTex Treatment System

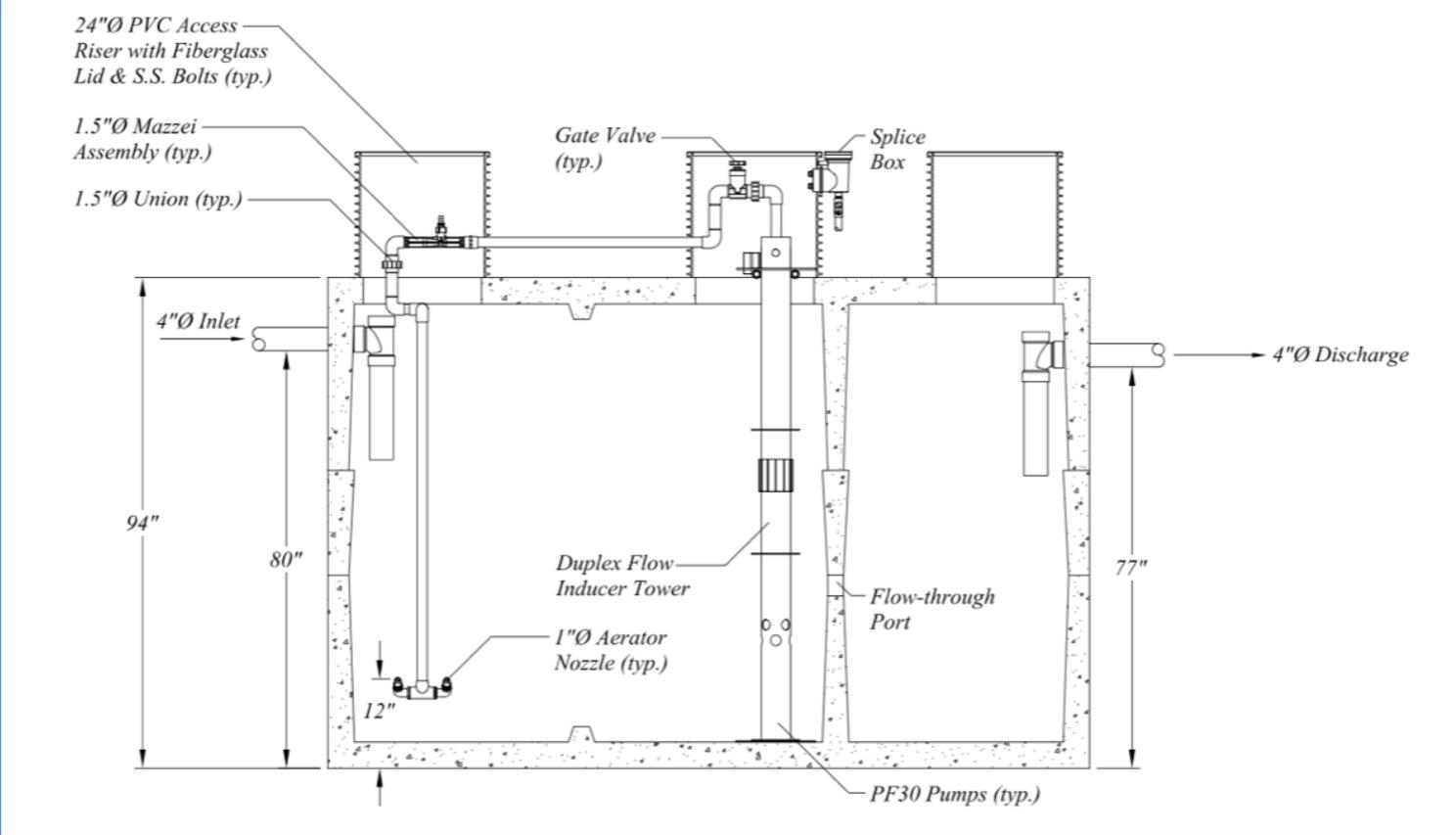
- Pretreated to 1,000 mg/L or lower BOD
- AdvanTex loading rate 3-4 gpd/ft² = 160mg/L BOD₅ and 80 mg/L TSS

- Total primary tankage 4.5x peak flow

Winery Process Waste Treatment Flow Path



Aeration



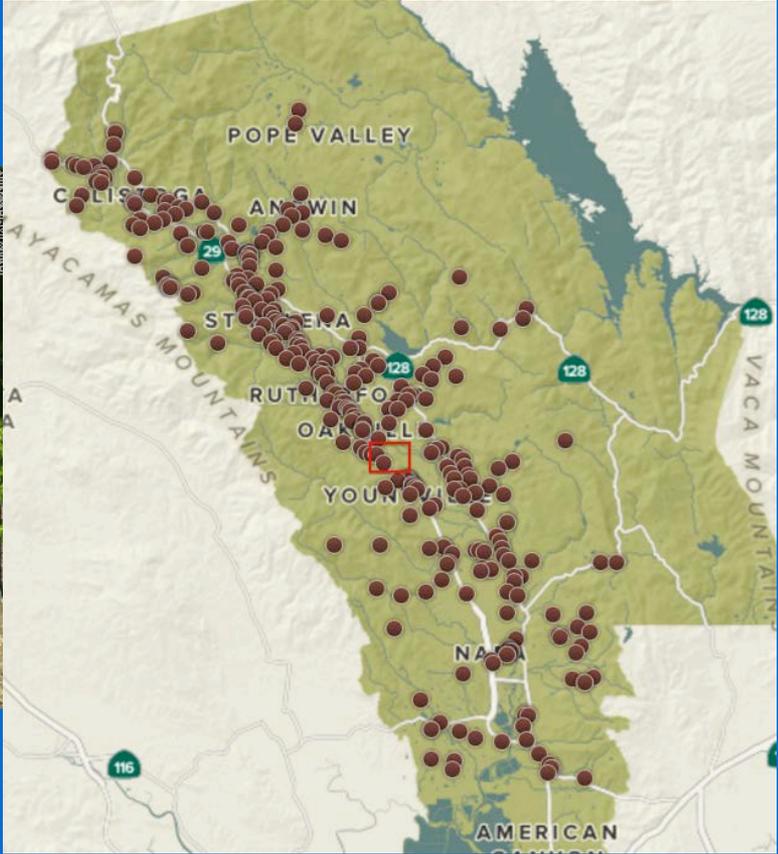
Telemetry Controls



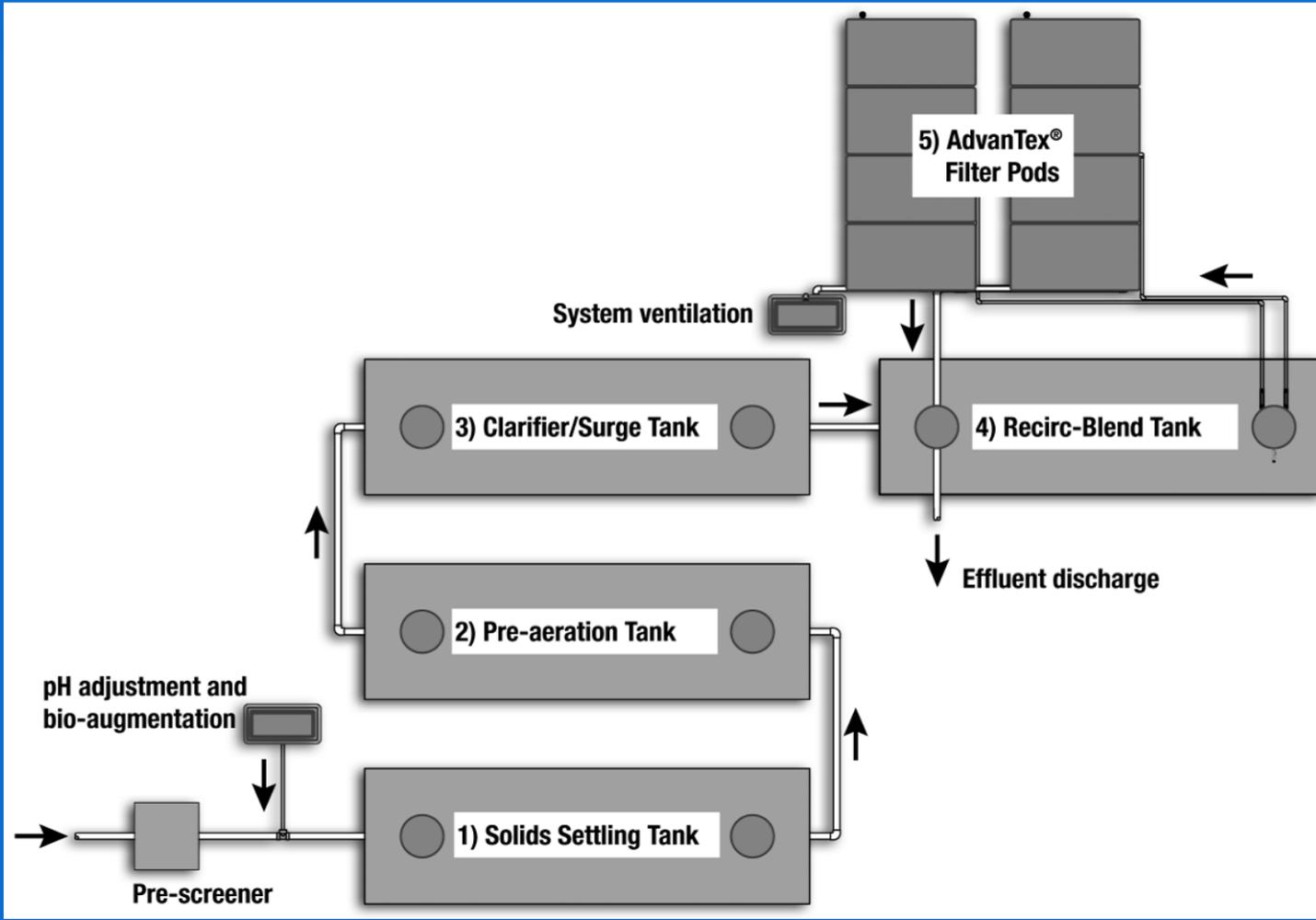
Case Studies

- Gamble Family Vineyards
- Continuum Winery
- Jessup Cellars

Gamble Family Vineyards



Gamble Family Vineyards



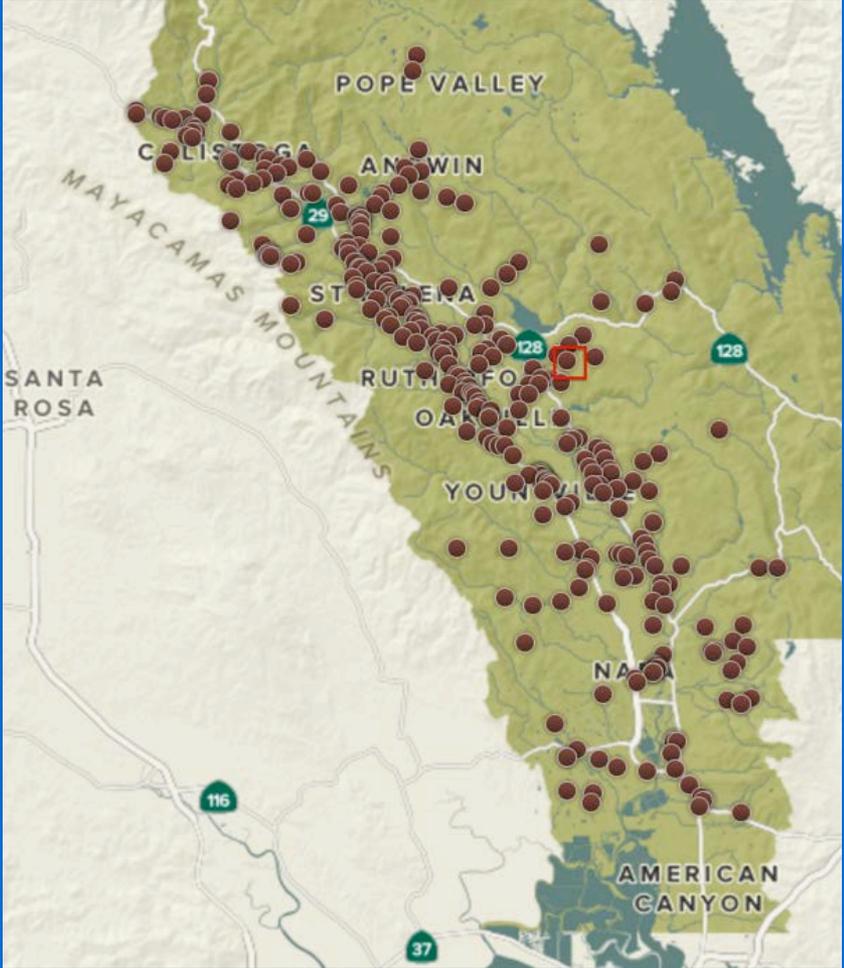
Gamble Family Vineyards



Gamble Family Vineyards



Continuum Winery



Continuum Winery



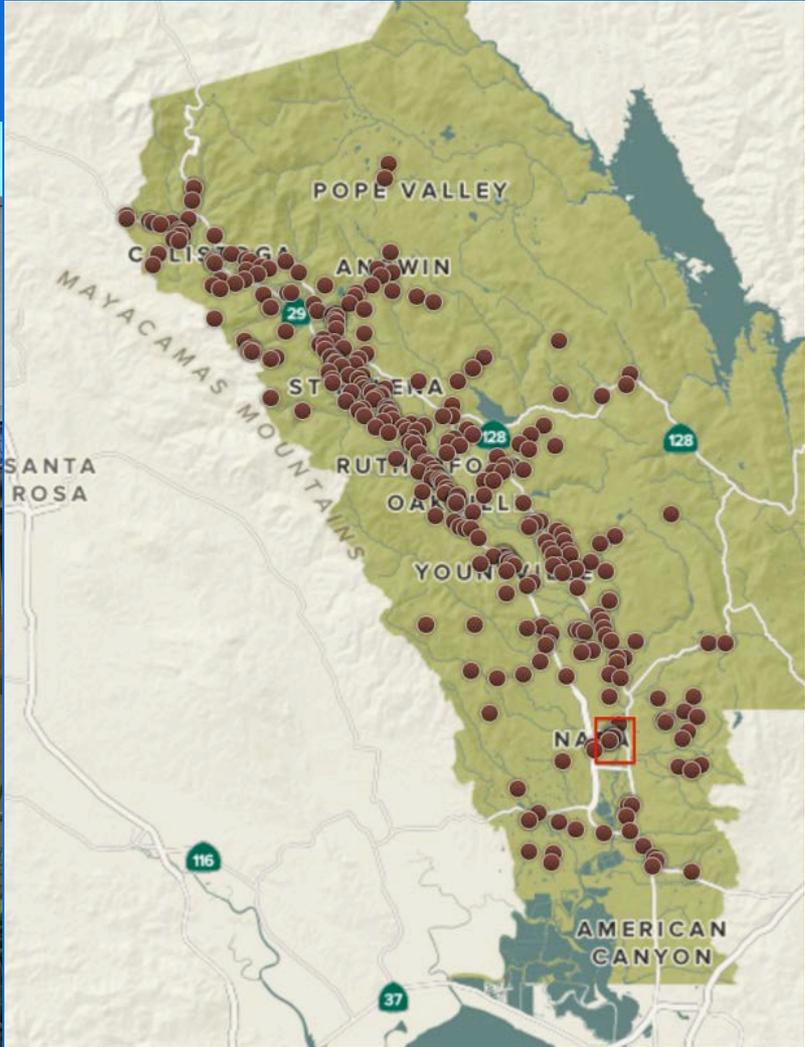
Continuum Winery



Continuum Winery



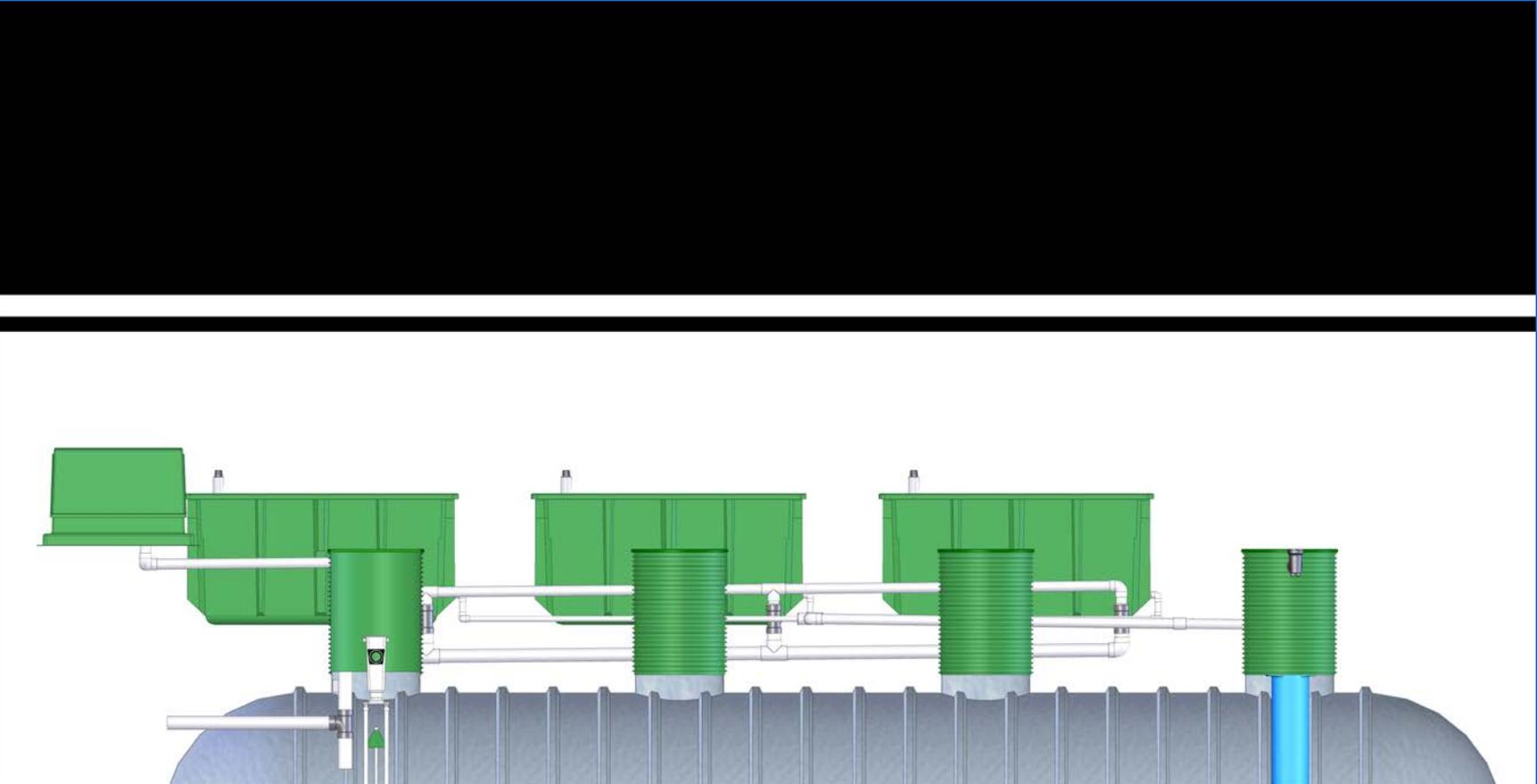
Jessup Cellars



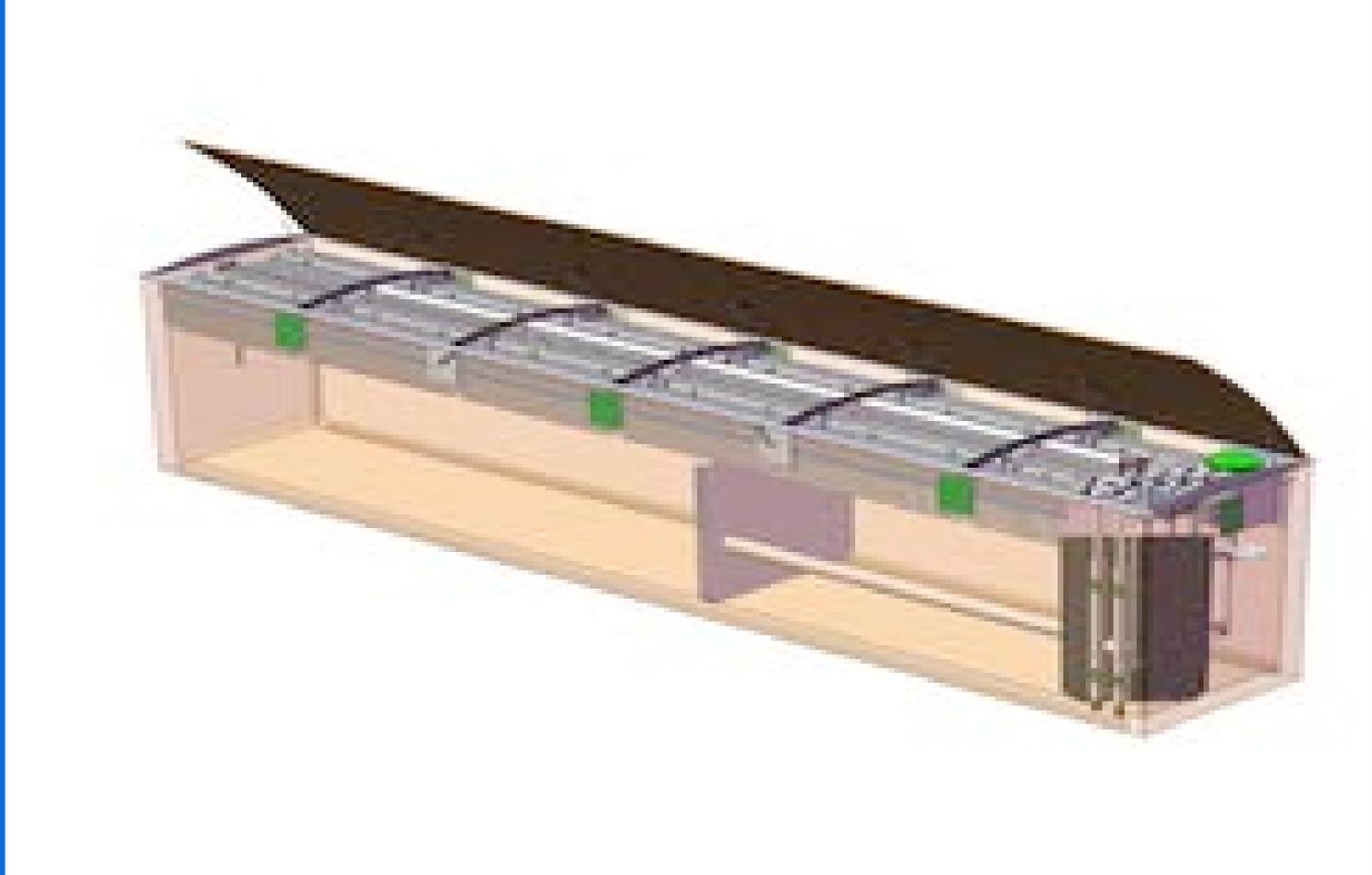
Jessup Cellars

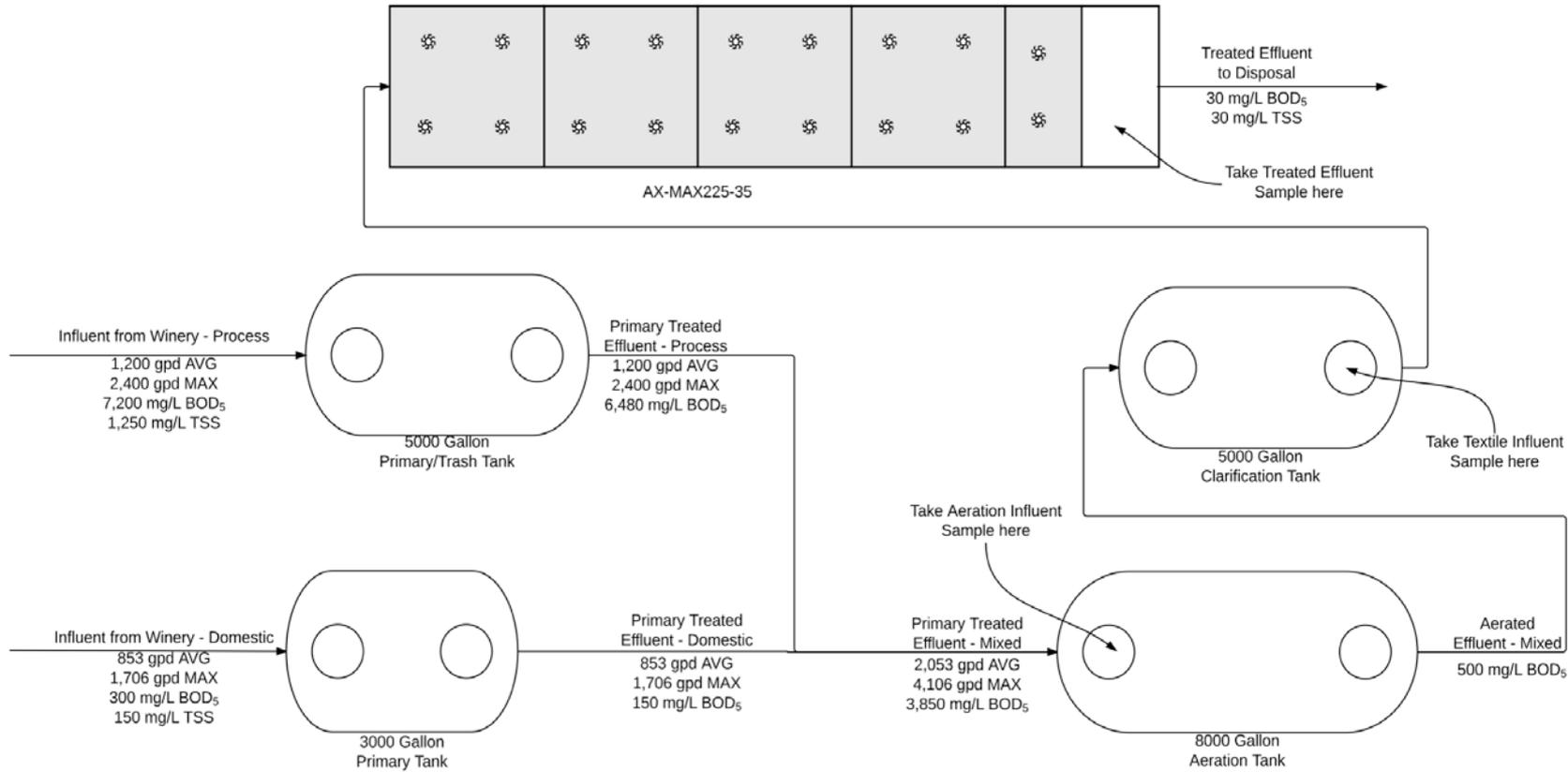


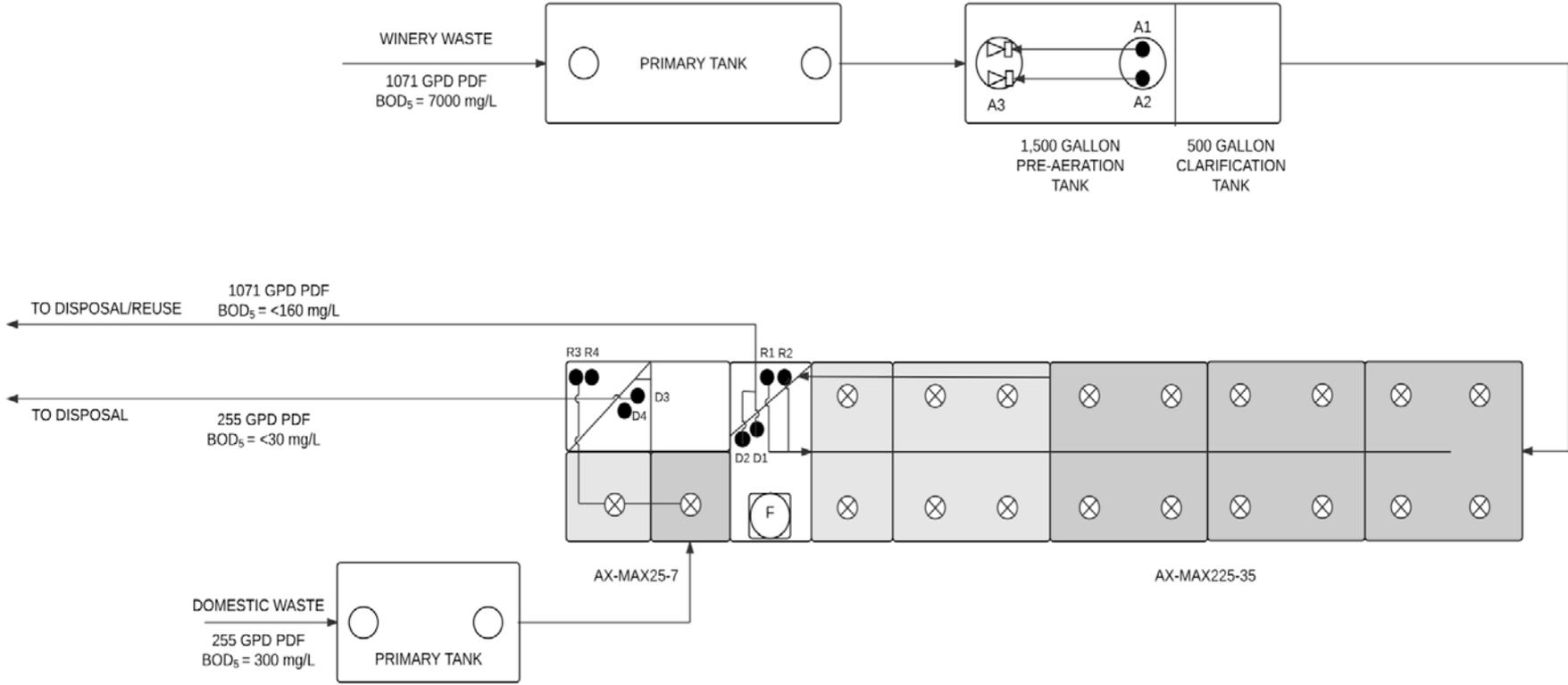
Recirc/Blend Tank



AdvanTex AX Max







Solutions for Decentralized Wastewater Treatment

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