

Winery Process Waste



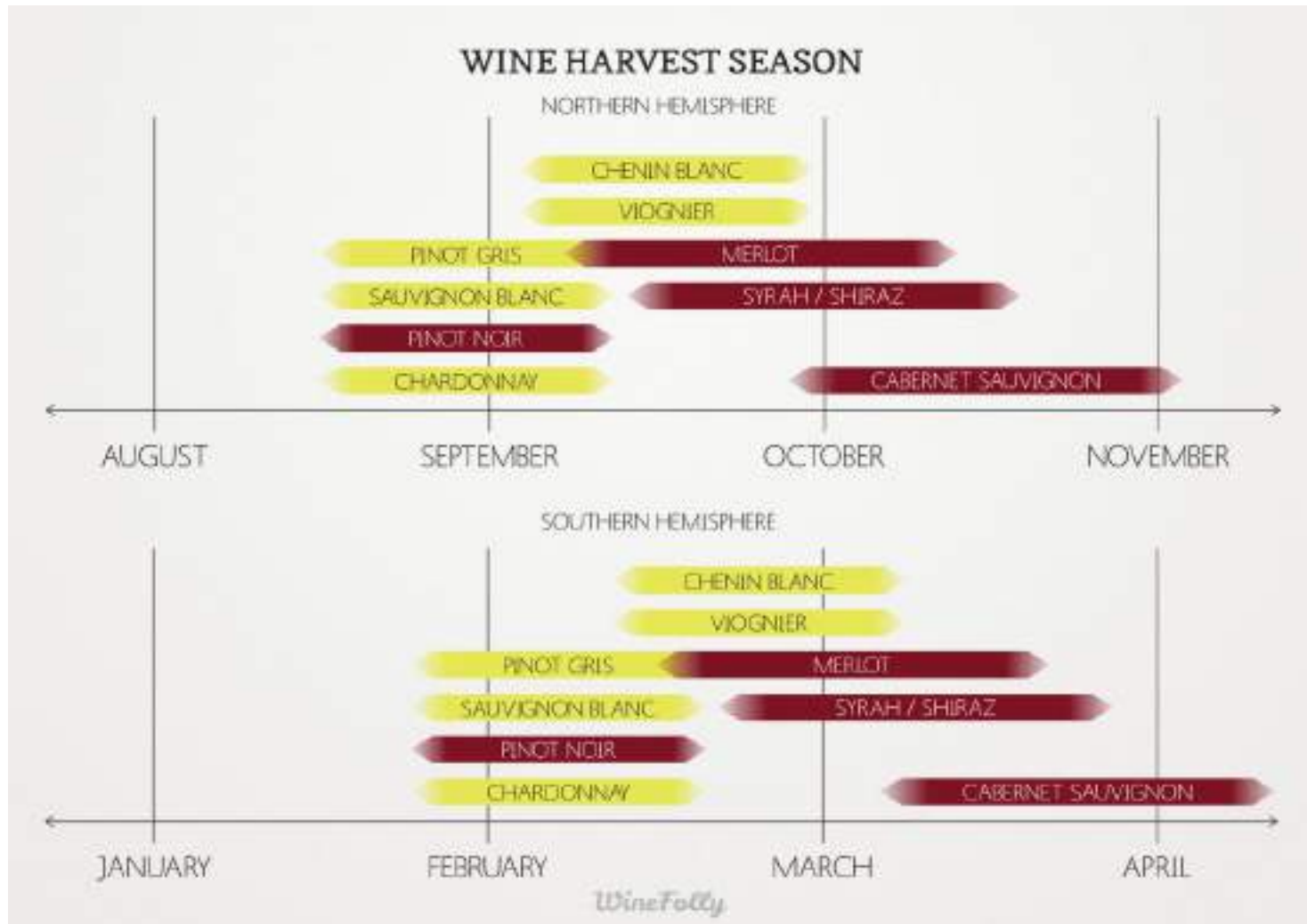
Overview

- 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



Winery Design Parameters

- Flows
- Waste Strength
- Treatment Goals

Winery Flows – Boutique

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

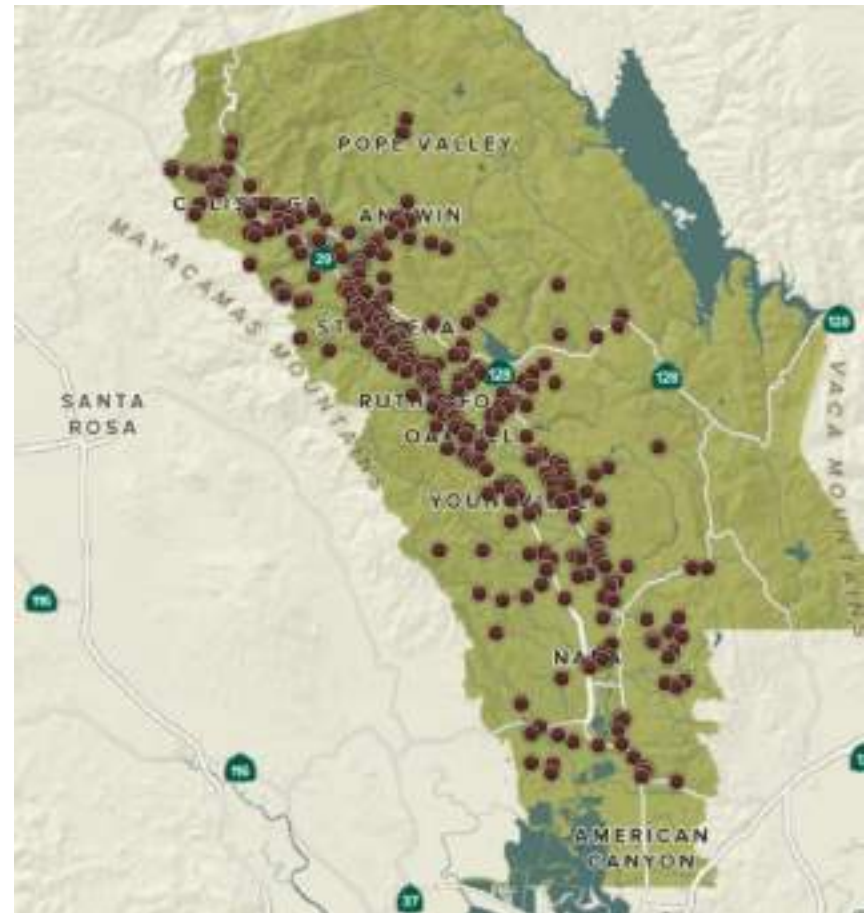


Winery Flows - Mass Production



Napa Valley

- 475 wineries
- 1,000 different wine brands
- 80% produce fewer than 10,000 cases annually
- 95% family owned



Design Flow Calculations

- 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.

Process Waste Characteristics

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

Process Waste Characteristics

- Pretreat BOD to 1,000 mg/L with aeration
- Flow = 1,250 gpd
- Treat to 160 mg/L



Gamble Winery

Sanitary Waste Characteristics

- 300 mg/L BOD which is typical
- Flow = 1,500 gpd
- Treat to 30 mg/L BOD



Chappellet Winery

Process and Sanitary Waste Mixed Characteristics

- 750 mg/L BOD
- Flow = 1,500 gpd
- Treat to 30 mg/L



Continuum Winery

Treatment Goals

- Drip to Vines
- Subsurface
- Municipal Sewer

Drip to Vines

- 160 mg/L BOD
- 80 mg/L TSS



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:

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	160
TSS	mg/L	80

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

Subsurface Dispersal

- 30 mg/L BOD
- 30 mg/L TSS



Continuum Winery

Municipal Sewer

- 15.4 MGD capacity
- Fee based on waste strength

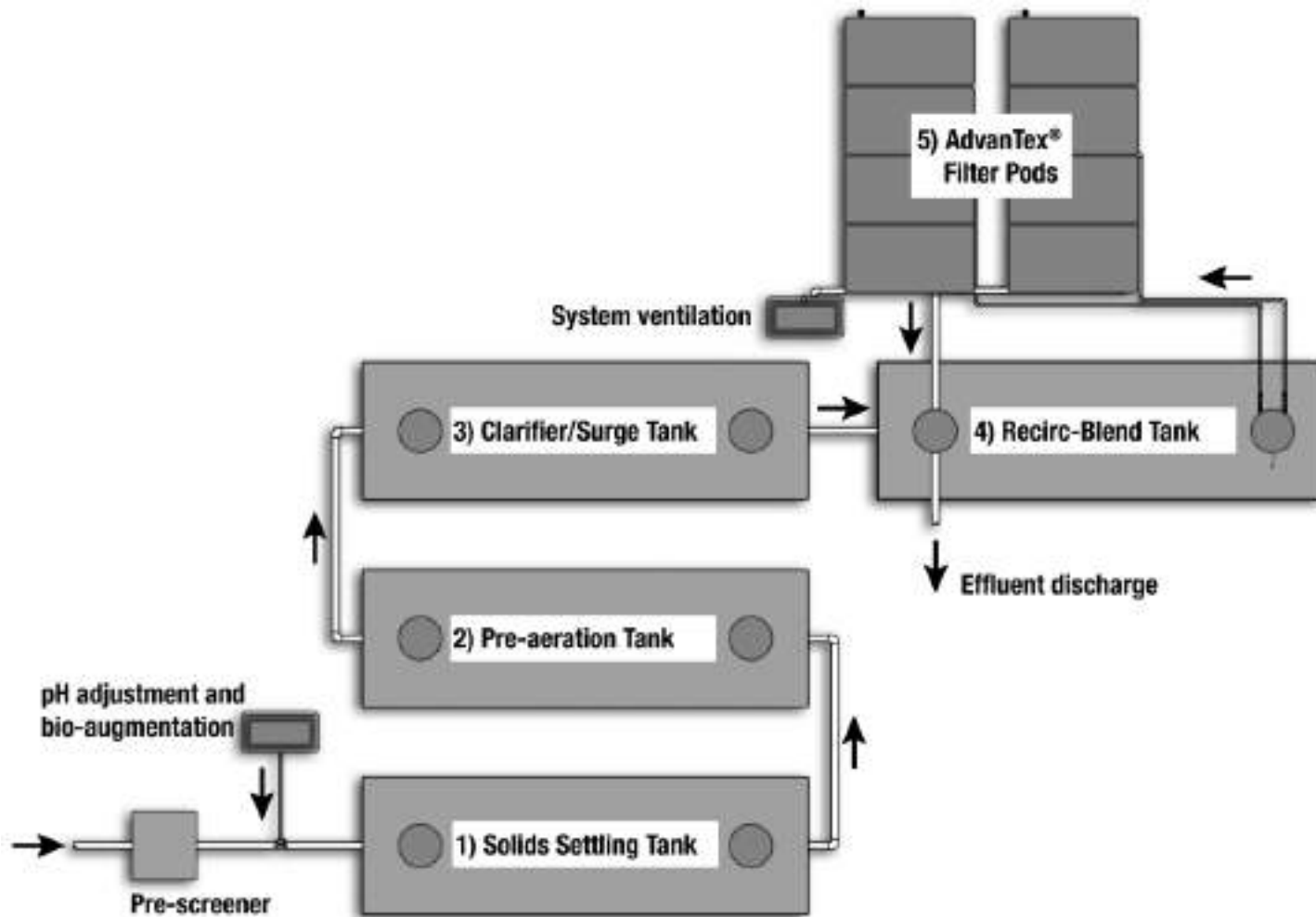


Napa Sanitation District

Winery Design Summary

- Flows
- Waste Strength
- Treatment Goals

Winery Process Waste Treatment Flow Path



Chemical Feed Basin

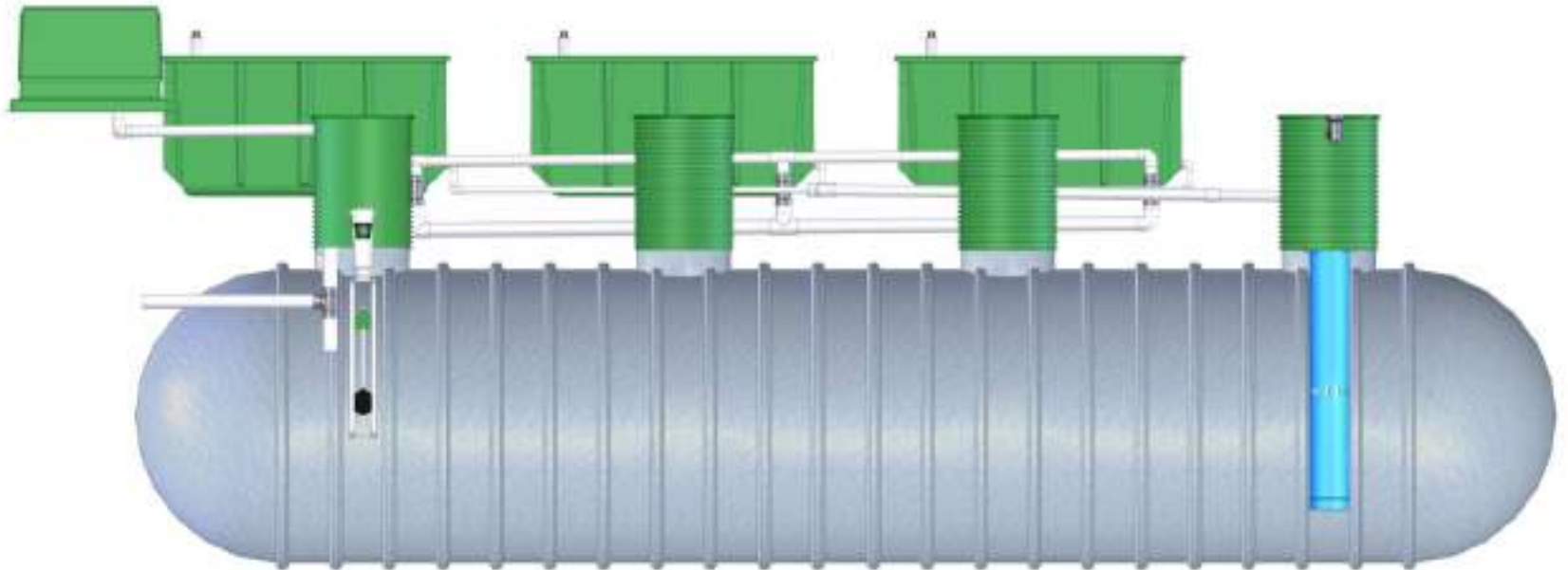
- pH Adjustment
- Heritage Systems



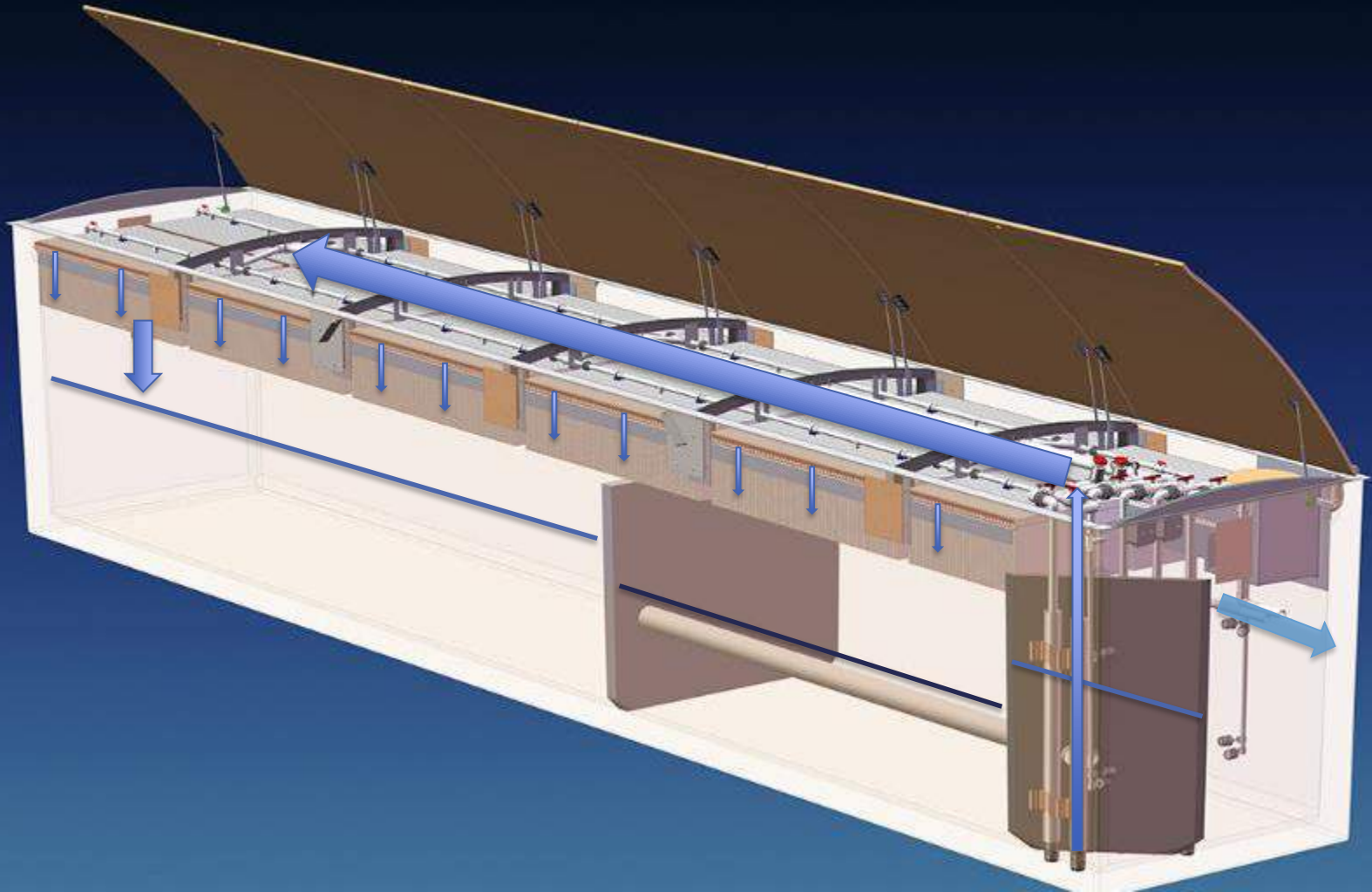
AdvanTex Treatment System

- 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

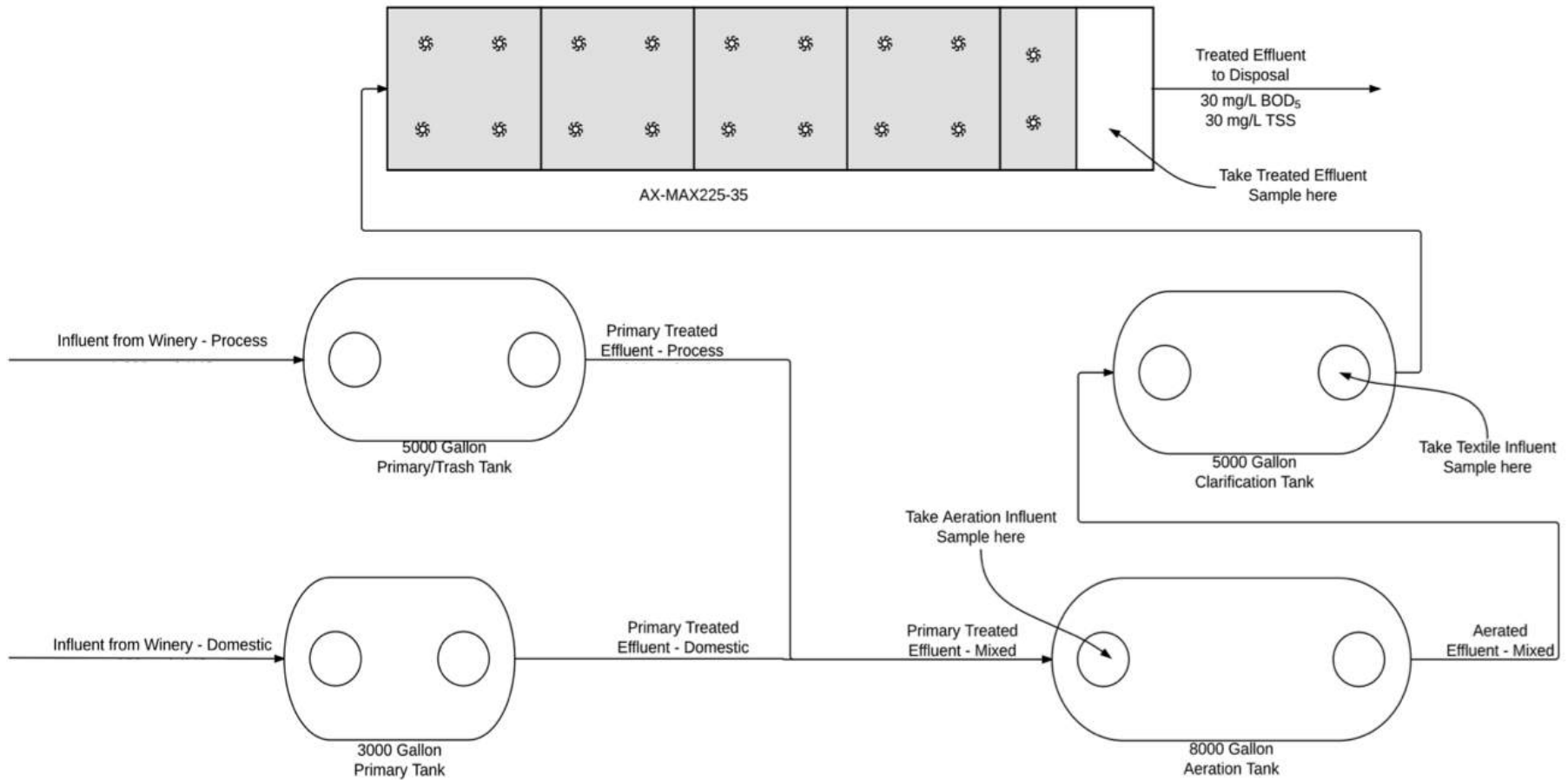
Recirc/Blend Tank with AX100's



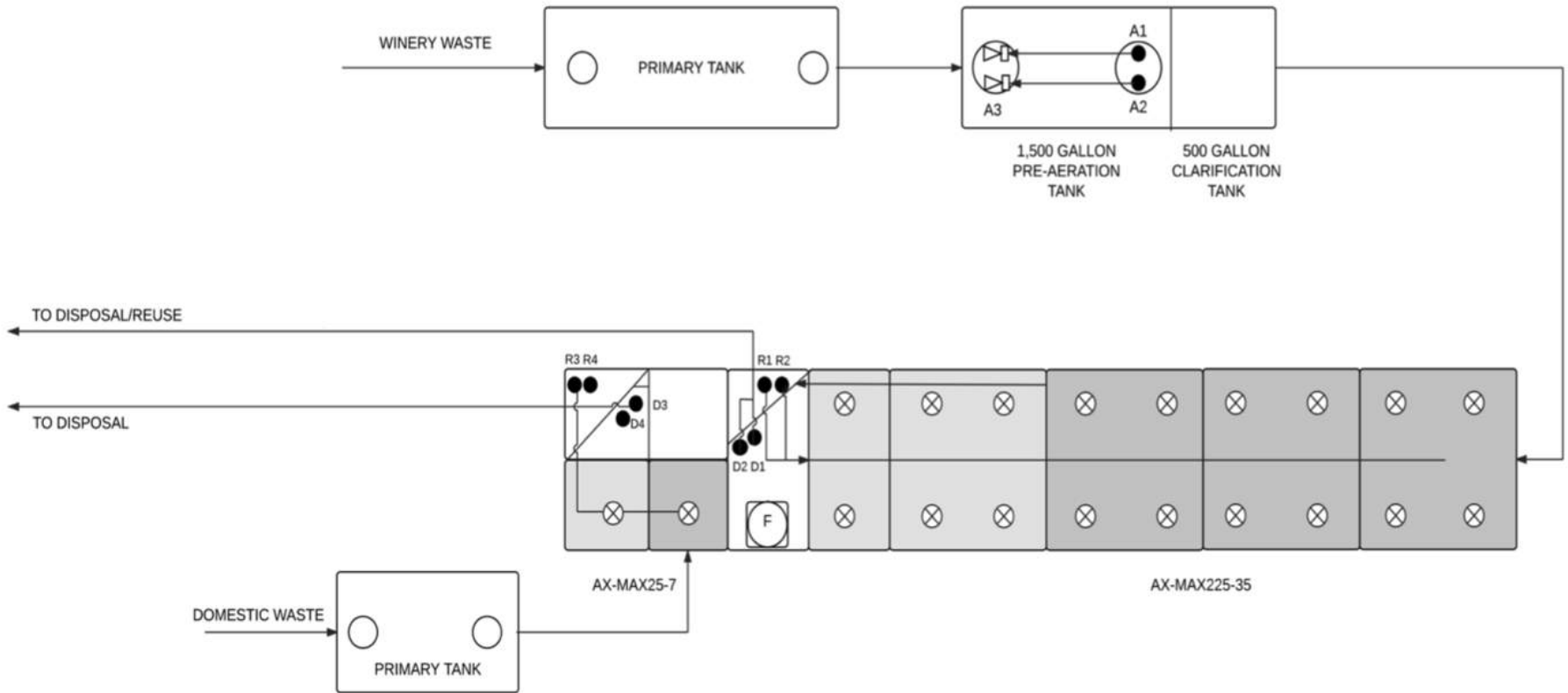
AdvanTex AX Max



Process Flow Diagram - Combined



Process Flow Diagram - Separate



Telemetry Controls



Case Study and Example

Bin To Bottle

- 1036 gpd avg flow
- 98 mg/L BOD avg effluent
- 63 mg/L TSS avg effluent



Solutions for Decentralized Wastewater Treatment

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