



VINEYARD TEAM

Promoting Sustainable Winegrowing

Reducing Inputs:
Irrigating with Winery Wastewater
Mai Ann Healy, Regional Manager - BioFiltro



- Primary Source Points: Wash downs, barrels, pressing, crush pads, rackings.
- Industry Average Wine to Water Ratio 1:6 gallons
- Industry Average Biological Oxygen Demand Discharge: 2,500 - 10,000 mg/L
- Industry Average Total Suspended Solids: 500 - 2,000 mg/L
- BOD Requirement for Vineyard Irrigation: 40 - 160 mg/L (99 - 94% Reduction)
- Salt and Nitrogen



Traditional Wastewater Treatment Methods

Methods With No Resource Recovery

- Industrial Sewer
 - Industrial discharge fees and city discharge limits
 - Slugs can result in hefty fines or cease and desist
- Septic System
 - Solution for small scale wineries with low BOD loadings
 - High BOD and constant fluctuation can alter performance
 - Can only function with certain soils & effluent cannot be recaptured
- Hold & Haul
 - Production is limited to storage tank capacity
 - Price range is \$0.15 - \$0.35/gallon



Traditional Wastewater Treatment Methods

Methods With Resource Recovery

Aeration Ponds

- High energy demand - aerators operate 16-24 hours a day
- 30 - 90 day retention - odors
- Sludge management and chemical expense
- Cost opportunity of land designation



Traditional Wastewater Treatment Methods

Methods With Resource Recovery

Fine Bubble Air Diffusion

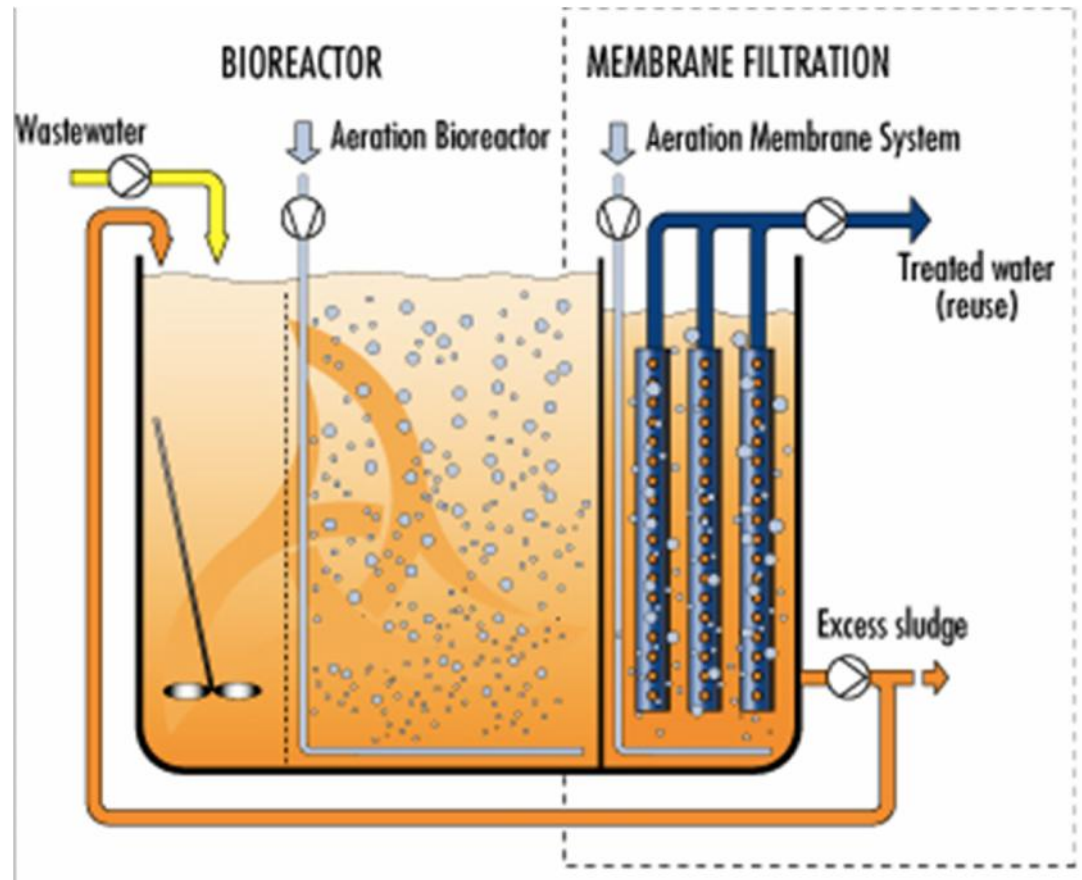
- Utilize approximately 50% of energy when compared to traditional aeration ponds
- Sludge management and chemical expense
- Maintenance requires draining entire lagoon - interruption in production



Traditional Wastewater Treatment Methods

Methods With Resource Recovery

- Membrane Bioreactors (MBR)
 - Energy Intensive
 - Sludge management and chemical expense - membrane reject
 - Limited Production Capacity
 - Replacement Cost of Membrane
 - Heavy Operational Cost
 - Underperform in extreme climates



Challenges of Reutilizing Wastewater

- Biological Oxygen Demand
 - Reduce >99% onsite
- Controlled Application Nitrogen
 - Groundwater contamination
- Salinity
- Suspended Solids
 - Plugging of drip line irrigation systems
- Monitoring Regulations
 - NPDES
 - WDR
 - Untreated and Treated Wastewater
- What is the Price (Cap) of Doing Business Right?



What We Do

Provide a patented wastewater filtration system which harness the power of Mother Nature to remove up to 99% of contaminants in 4 hours



Reimagine Wastewater

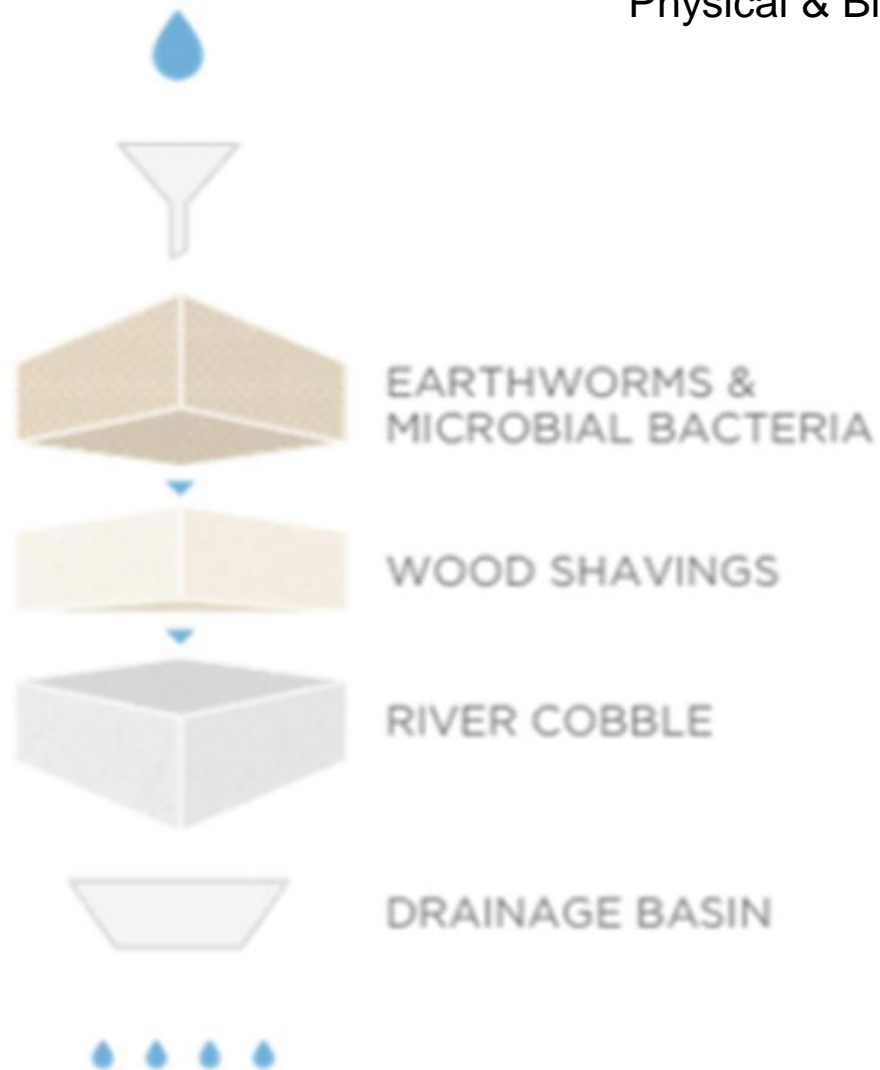
The Neil Jones Food Company, Firebaugh, CA



Our BIDA® System

- Modular Passive Aerobic Percolating Biofilter
 - Open top 5' tall structure
 - 4 hour process
 - 95% less energy
 - Completely automated
- Symbiotic Relationship of Worms and Bacteria
 - Chemical Free
 - Sludge Free - Zero Waste
 - pH Range: 6 - 8
- Beneficial Byproducts
 - Irrigation grade quality effluent
 - >99% BOD & TSS and >95% Total Nitrogen
 - Worm castings

Replicating Mother Nature Physical & Biological Filtration



SUSTAINABLE & NATURAL BYPRODUCTS

Effluent from BIDA® System at a Winery

















6 Countries

26 Years of Research and Development

130 Plants Worldwide

3.2 Billion Gallons Treated Annually

Plants on Antarctica and in the Atacama Desert

Offices in the United States, Chile, and New Zealand

Pros

- Cost Effective
 - Modular, retrofit or new closed system
- Uses up to 95% less energy than traditional wastewater solutions
 - California utilities give incentives/rebates, up to 50% of total installation cost
- Sustainable & Natural System
 - Odorless, chemical & sludge free system
 - Onsite resource regeneration
- Effluent can be used in drip line - has already passed through one irrigation system
- Performance Guarantee
 - Unlike equipment warranties, BioFiltro guarantees water quality parameters and executes all major maintenance and upkeep

Cons

- System Start Up Time
- Footprint
 - The size of a BioFiltro can be estimated using GPD/4
- “New Technology” - too simple to be true



- Variety of technologies
- Wastewater reuse is becoming common practice
- Increasing regulations demand innovation in traditional treatment systems
- Consumer push for sustainable practices and processes
- The duty to be double or triple bottom line companies.





Chile

New Zealand

USA

Thank You

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