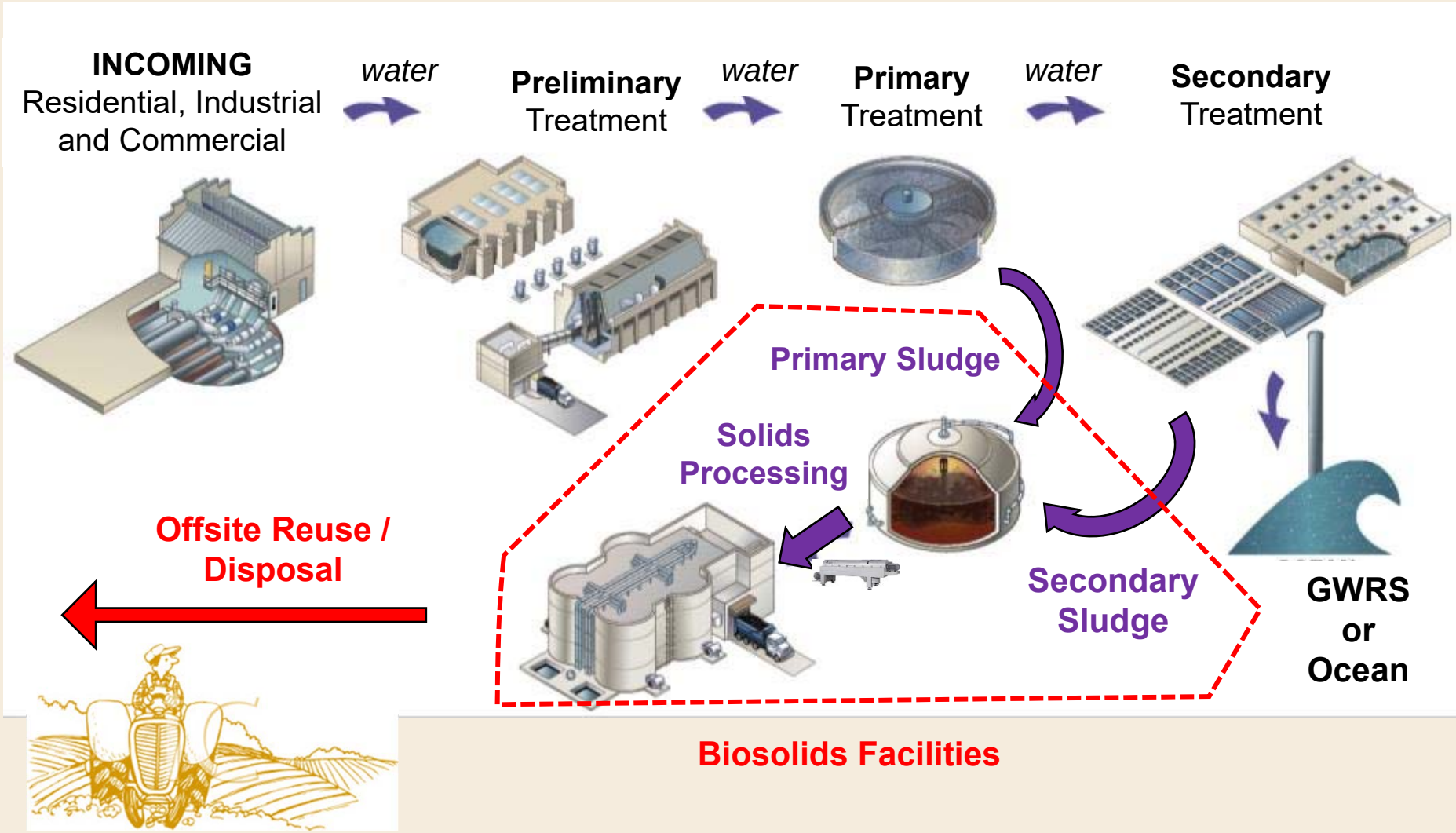
Information Update
Biosolids Master Plan, PS15-01

April 2017
Operations Committee
Administration Committee

What are Biosolids?



Drivers for Biosolids Master Plan

- Biosolids require large capital and on-going costs
- Condition and seismic issues with Plant 2 digesters
- Previous Biosolids Master Plan completed in 2003
- Opportunity for greater resource recovery
- State requirement to divert organics in trash from landfills

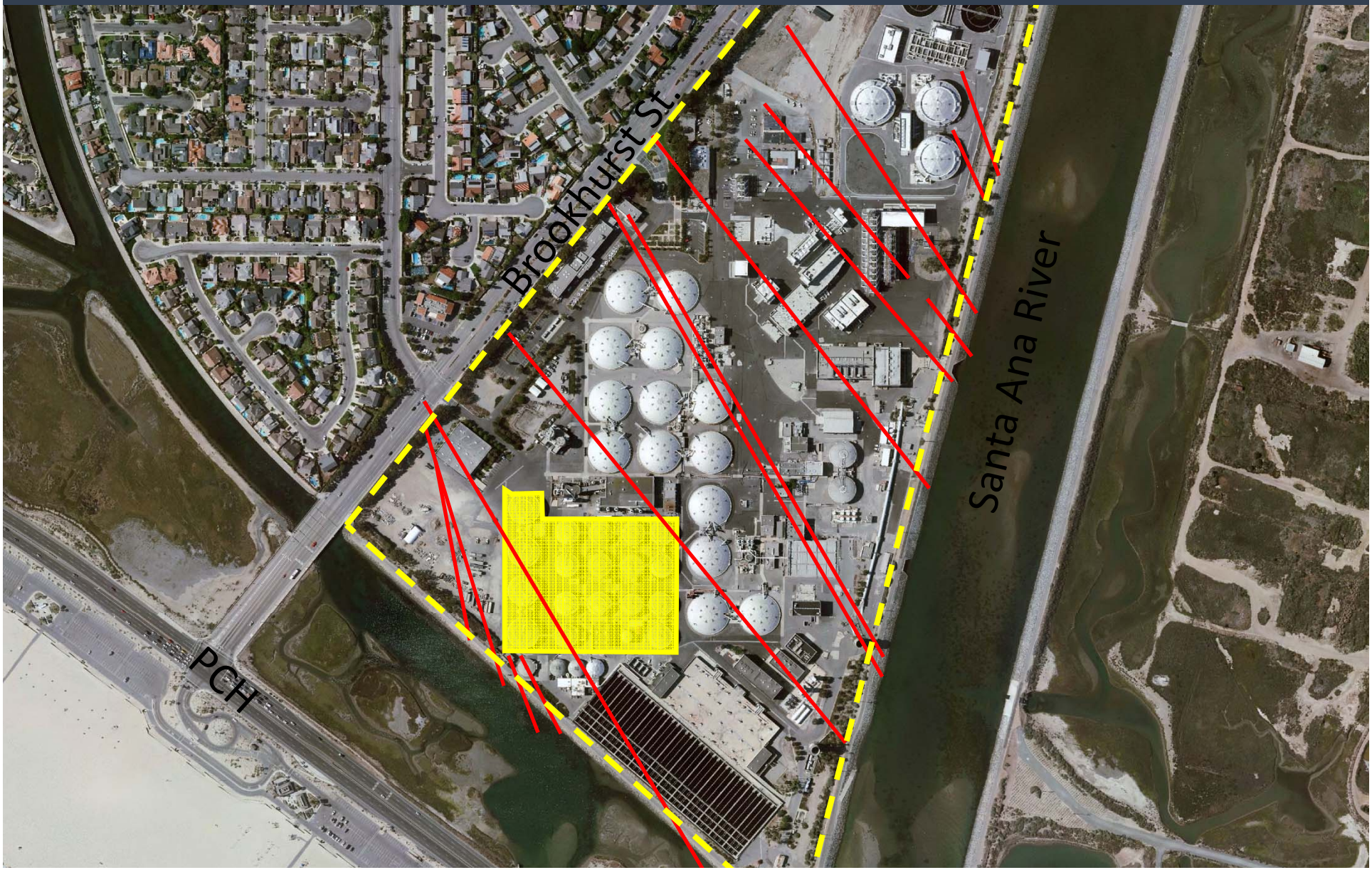
Biosolids Costs

- Biosolids reuse / disposal
  - ~$17 million /year
  - 12% of net operating requirements
- Biosolids-related capital projects
  - >$500 million currently budgeted
  - 17% of total capital program
  - 28% of proposed budget update for 2017/18

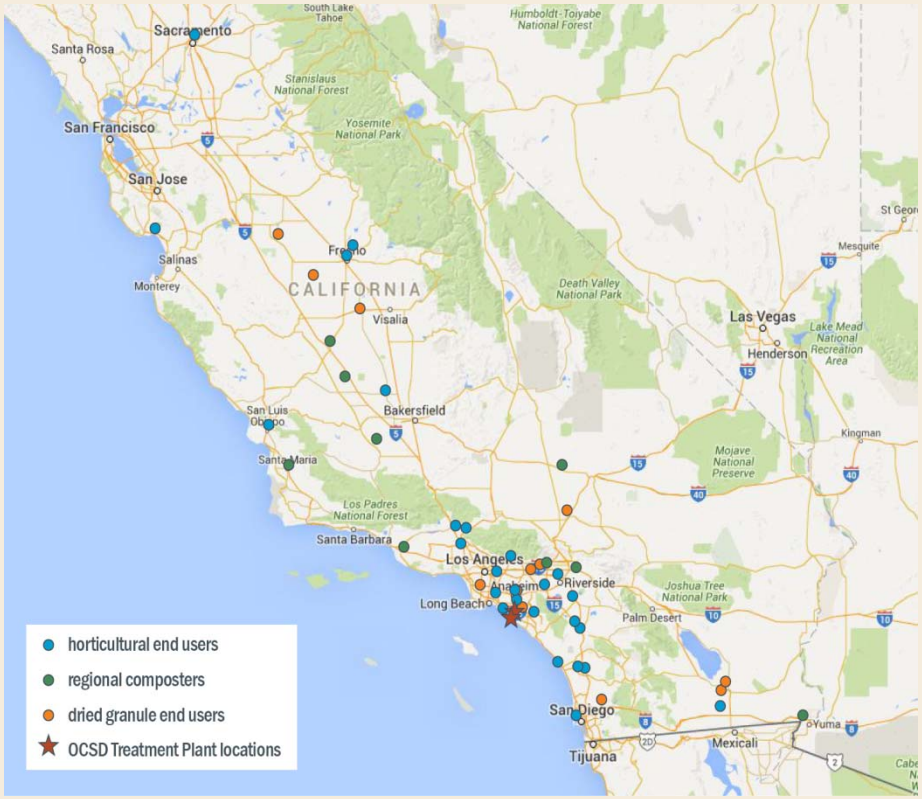
Plant 1 Solids Facilities good with completion of current projects (P1-100 & P1-101)

Plant 2 digesters need replacement

Newport-Inglewood Fault Runs Through Plant No. 2/ Liquefaction Hazard Zone



Market Research



- Agriculture and Horticulture users
- 83 potential users contacted
- 36 meetings
- Samples of potential products showed to potential users
- Data collected to determine cost and capacity for various reuse options

Key Market Findings

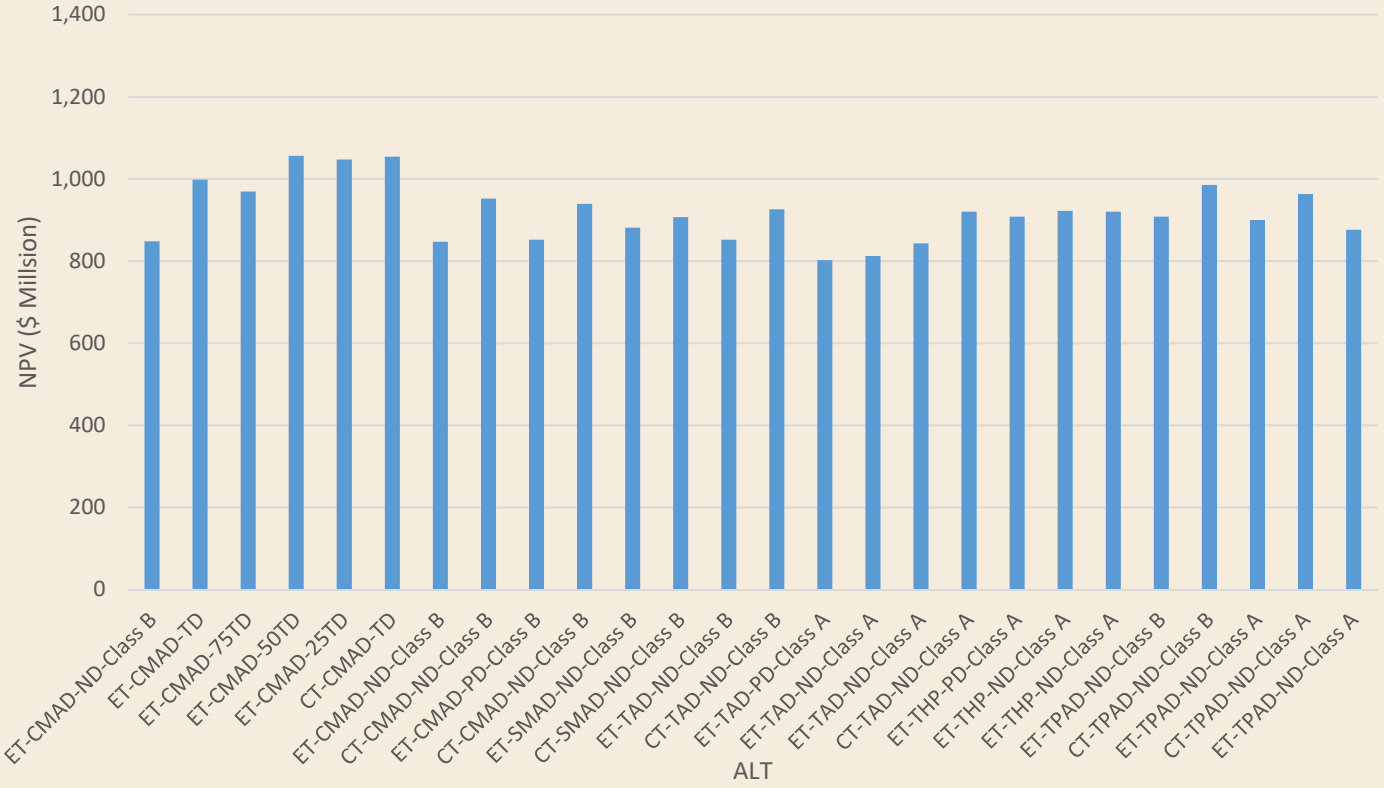
- Bulk products to agriculture key component
  - California will require Class A for direct land application
  - Arizona expected continue to accept Class B into future
  - Class A provides more options, but not a goal by itself
- Horticulture markets are much smaller, but high quality products would be more valued

Plant 2 Biosolids Facilities

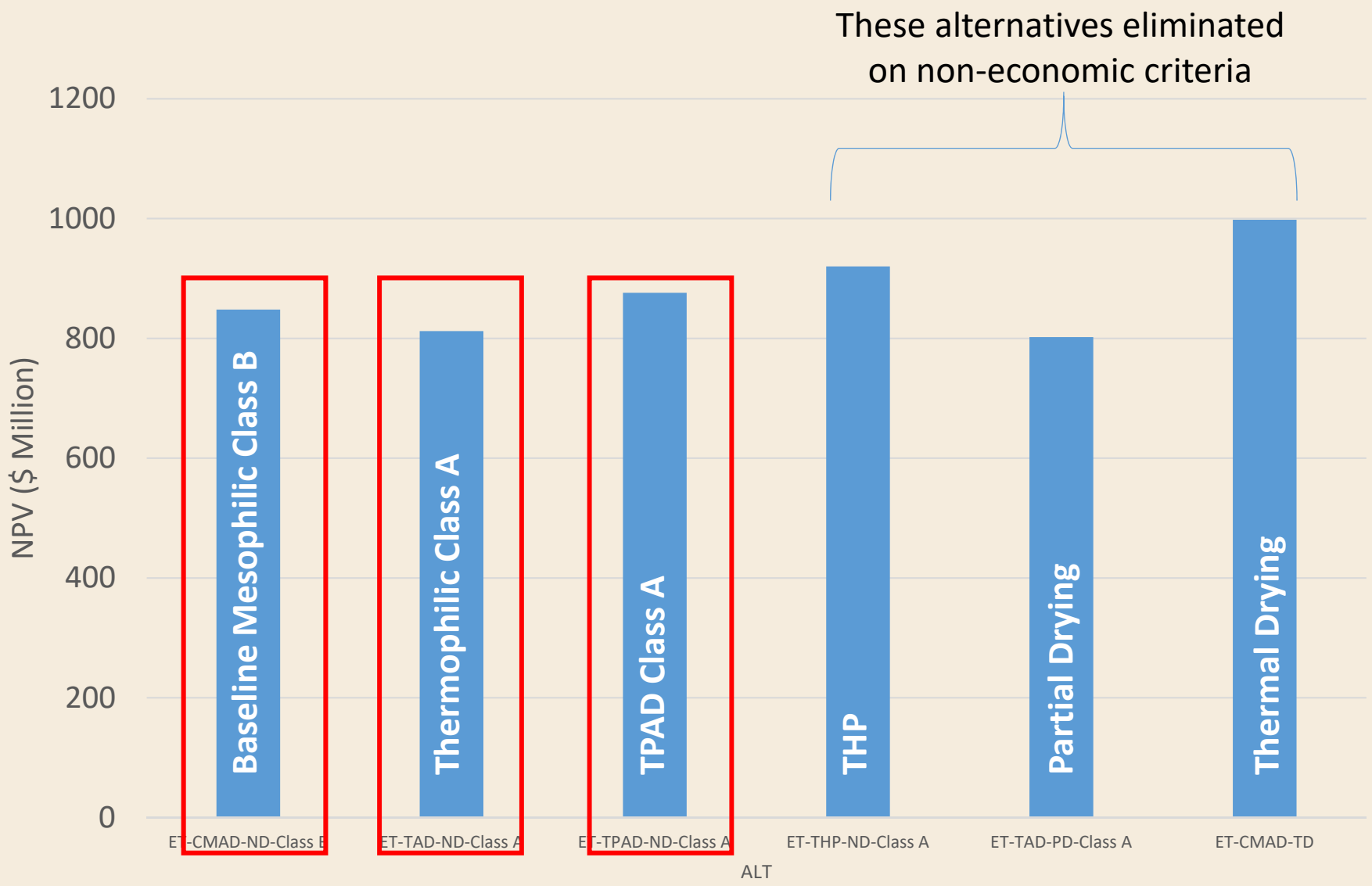
Alternative Selection

End-to-End Alternative Combinations Evaluated

- 27 combinations of processing and products with end use



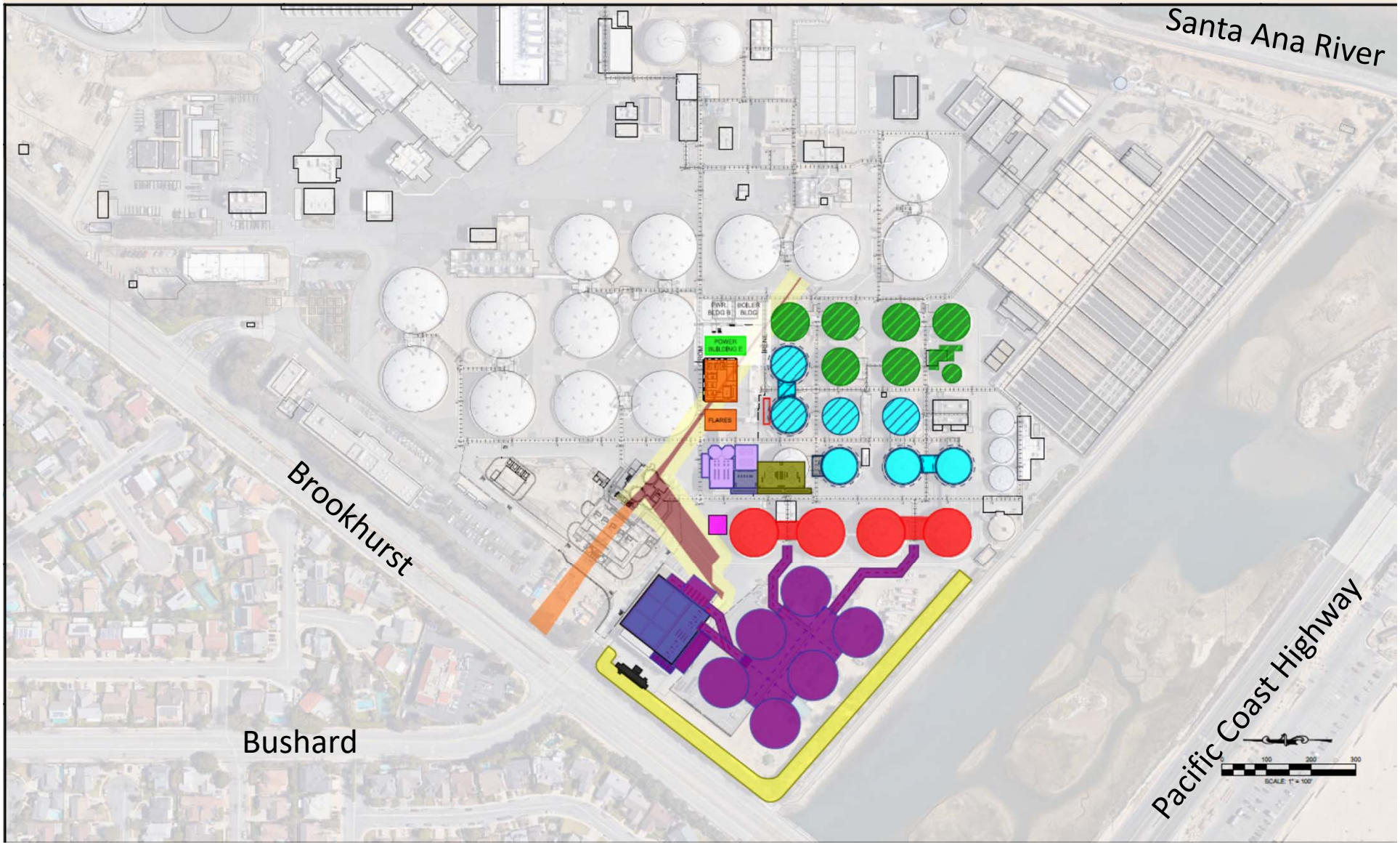
Screening narrowed to 3 alternatives



Tiebreaker Considerations

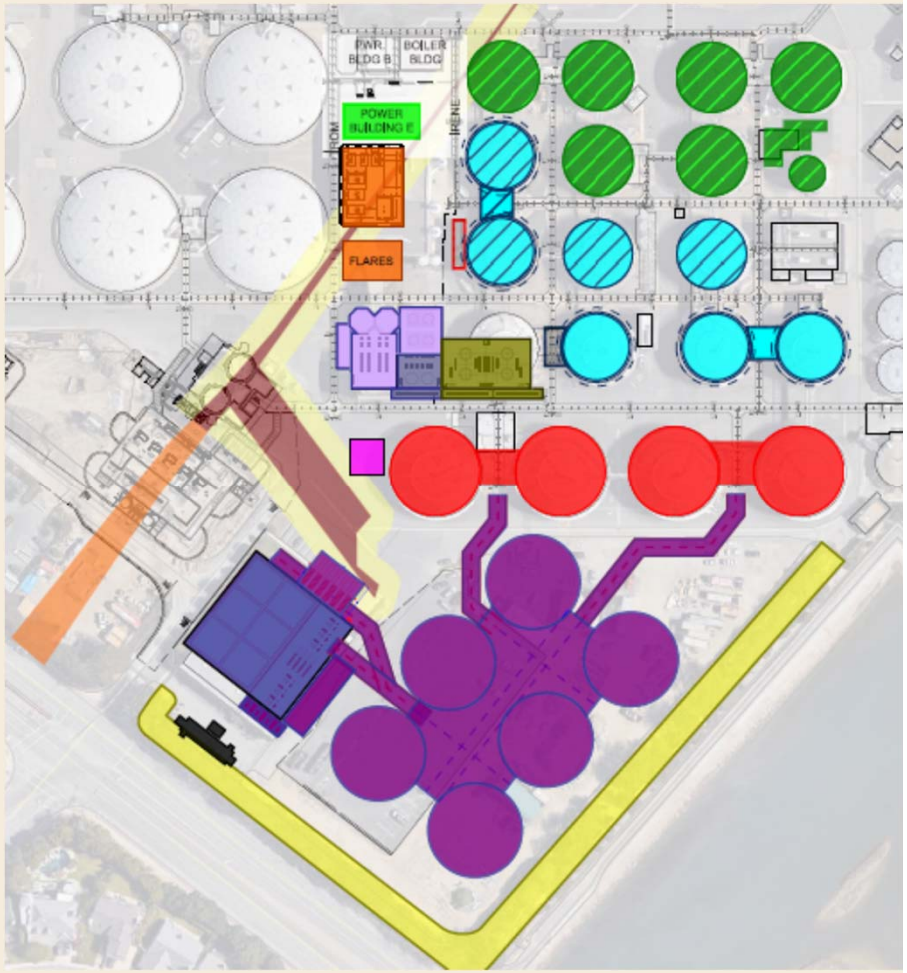
1. **Diversity for biosolids program**
   - Plant 1 produces Class B biosolids – no plans to change
   - Providing Class A at Plant 2 diversifies reuse options
   - ➢Eliminated Baseline Mesophilic Class B Alternative
2. **Early mitigation for seismic risk**
   - All alternatives will meet seismic standards
   - TPAD Class A addresses seismic risk after first project.
     - Maximizes life of existing digesters
     - Allows subsequent project to be delayed
     - Allows keep existing digesters if they can be rehabilitated

Layout of Proposed Facilities



TPAD Class A – Minimum Initial Project

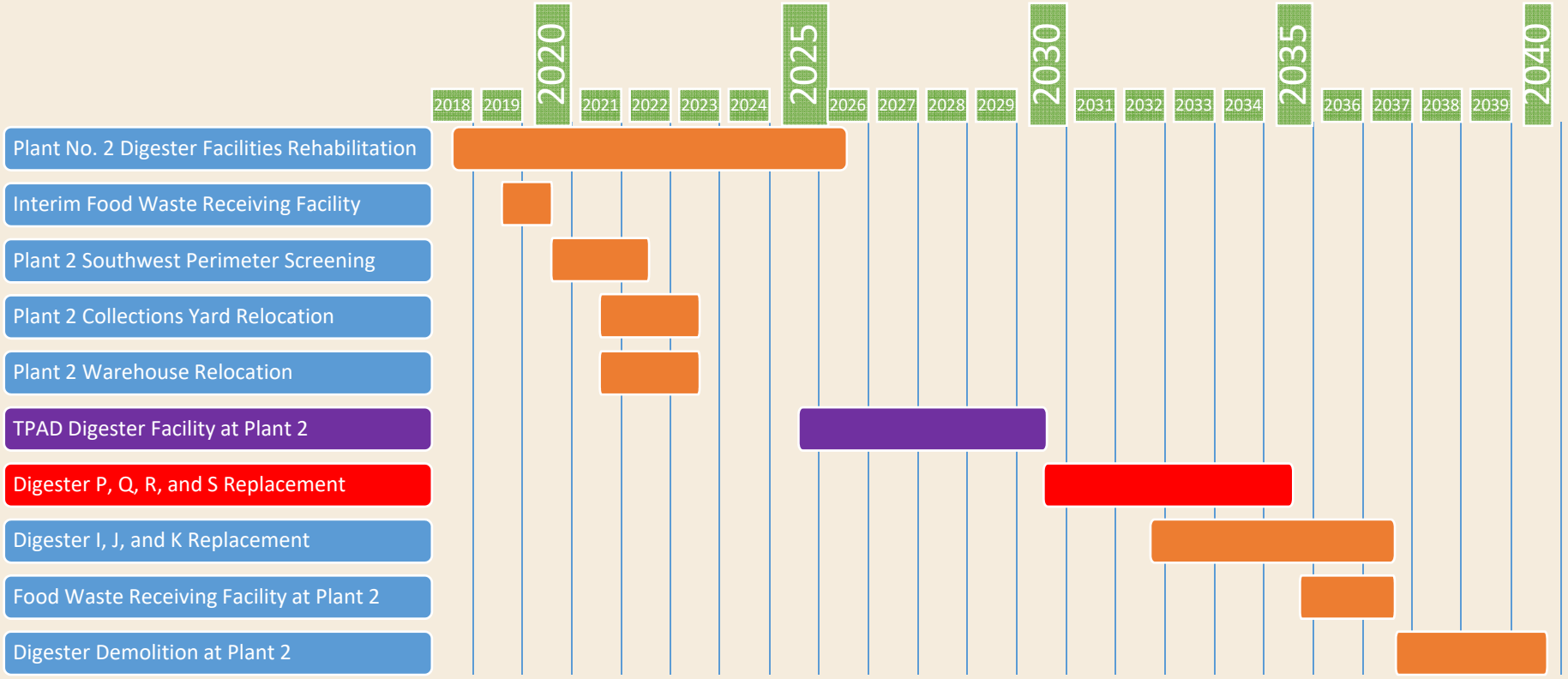
- Initial project includes:
  - Six 110-ft digesters, 30 ft tall
  - Batch tanks for Class A (~$25 million)
  - Sludge feed facility
  - Cooling system
  - Relocation of warehouse, collections yard
- Meets Class A without existing digesters, but with less gas production
- Construction cost $194 million (2017)
- Total project cost $419 million
  - Escalation to mid-point of construction
  - Non-construction costs
  - Contingency



Proposed Plant 2 Biosolids Projects

- Preparation Projects
  - Southwest Perimeter Screening, P2-125
  - Warehouse Relocation, P2-126
  - Collections Yard Relocation, P2-127
- TPAD Digester Facility at Plant 2, P2-128
- Digester P, Q, R, & S Replacement, P2-129
- Subsequent projects
  - Replace 3 existing small digesters
  - Demolish remaining digesters

Digester Replacement Construction Schedule

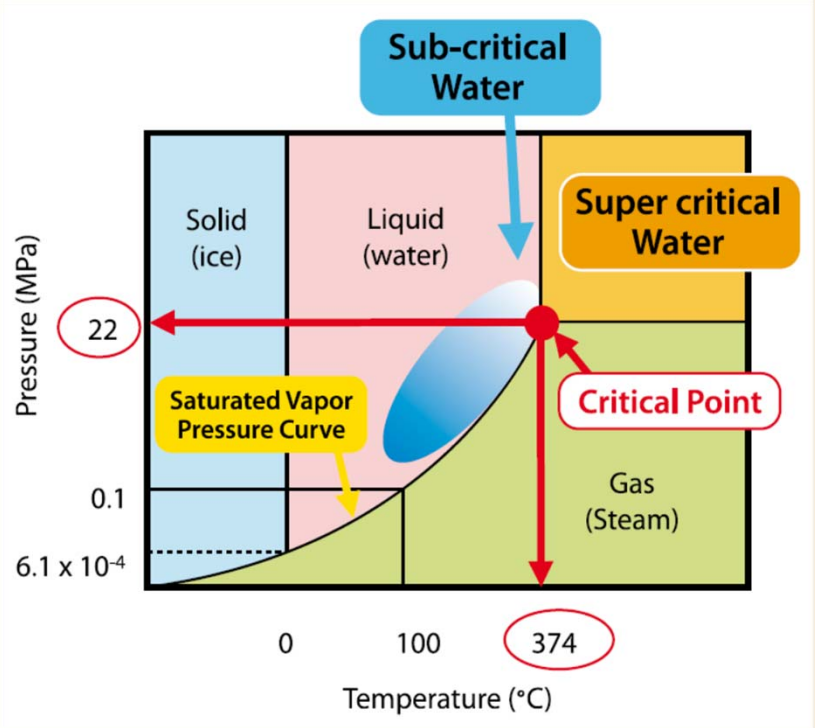


AquaCritox Demonstration Project Evaluation Study, Project No. SP-125-17

Alternative Selection

AquaCritox

- Uses high heat and pressure
- Complex processes and equipment
- No existing full scale facilities
- Pilot plant in Valencia, Spain in progress



AquaCritox Demonstration Project Evaluation Study

- Report prepared by vendor (SCFI Group Limited)
  - Proposed a facility at Plant 2
  - Concept layouts, sizing developed
  - Construction and operating costs estimated
- Biosolids Master Plan consultant assigned to review report, technology, and economic case for a project

Conclusions from Review of SCFI Report

- Underlying technology is proven for other applications
- Significant operational concerns
  - Corrosion, scaling, material compatibility
  - Highly specialized equipment
  - Equipment reliability not known
  - Pilot plant has not been in continuous and reliable operation
- Life cycle costs reviewed

AquaCritox Demonstration Project Economics

Expense	SCFI	Biosolids Master Plan Consultant Costs and Comments	
Construction Cost (unescalated)	$26,500,000	$34,500,000	• Ground improvements • Building for process equipment
Operations & Maintenance (NPV)	$19,700,000	$46,600,000	• 24/7 Operator required
Repair and Replacement (NPV)	$0	$11,700,000	• 15-year equipment life assumed
Power Generated NPV	-$6,000,000	-$6,000,000	
Total NPV	**$40,200,000**	**$86,800,000**	
NPV Unit Cost, $/ton	$505	$1,090	

For reference, unit cost for full digester replacement is $540/ton, but at a much larger scale.

Recommendations

- Do not pursue a Demonstration Project at this time
- Visit pilot plant in Spain when SCFI reports consistent and continuous operation
- Continue to monitor for key concerns
- Staff will seek grant opportunities and operating partners