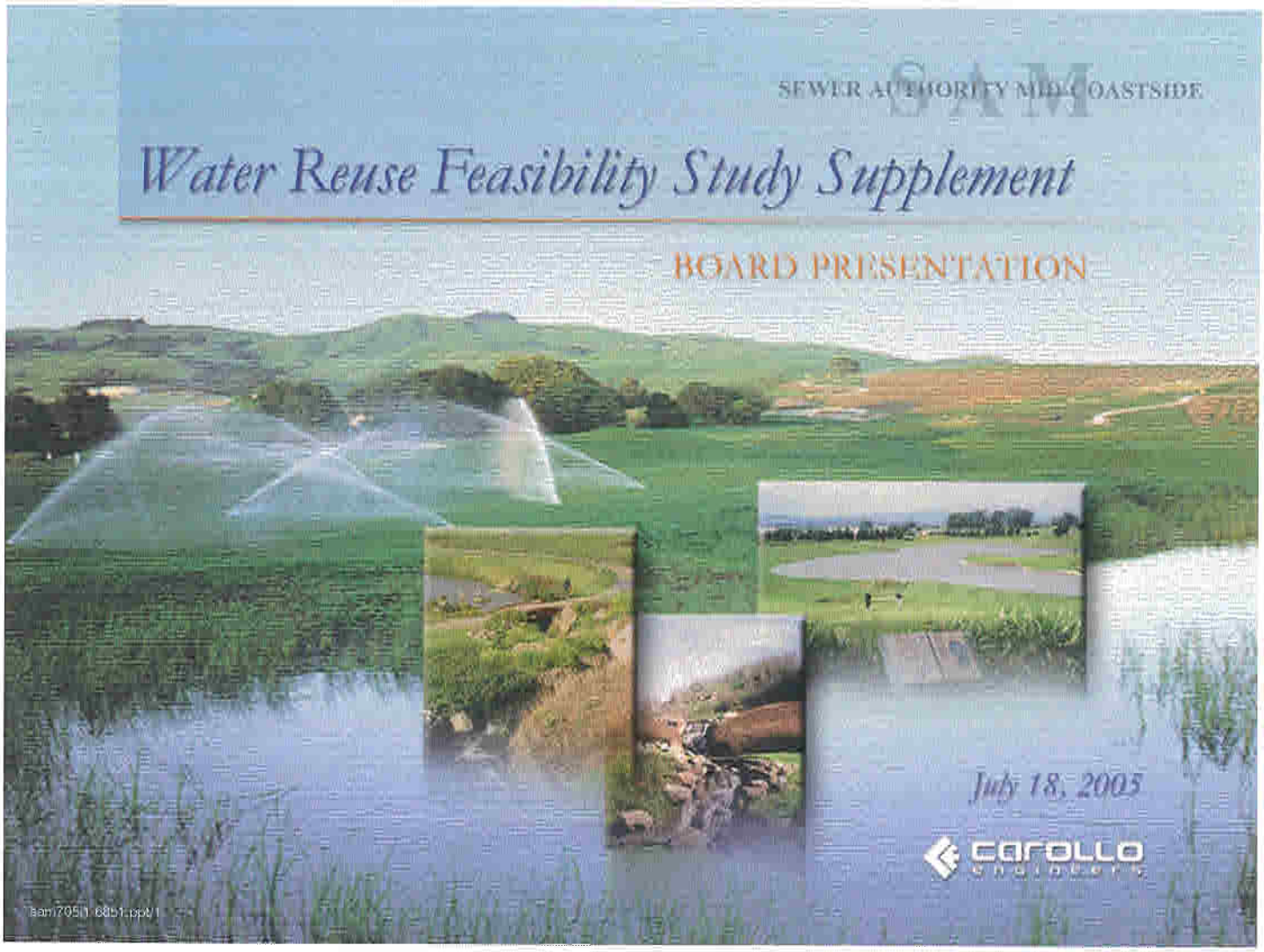
Handed out
July 18, 2005
Board Meeting



Presentation Content

- General acceptable uses
- Irrigation and creek uses
- Bench scale testing results
- Reuse options 1 and 2
- Costs
- Permitting
- Schedule

Title 22 of Water Code
Treatment Level vs. Uses

Treatment Level	Approved Uses
Disinfected Tertiary Recycled Water	Spray Irrigation of Food Crops Landscape Irrigation Nonrestricted Recreational Impoundment
Disinfected Secondary – 2.2 Recycled Water	Surface Irrigation of Food Crops Restricted Recreational Impoundment
Disinfected Secondary – 23 Recycled Water	Pasture for Milking Animals Landscape Irrigation (restricted) Landscape Impoundment
Undisinfected Secondary Recycled Water	Surface Irrigation of Orchards and Vineyards (limited harvesting) Fodder, Fiber and Seed Crops

Disinfected Tertiary Recycled Water

- Wastewater that has been adequately oxidized, coagulated, filtered, and disinfected to meet Title 22 requirements

Treatment Process vs. Proposed Uses

Recycle Water Use	Required Treatment of Secondary Effluent	
Turf irrigation (golf courses, parks)	Tertiary Gypsum conditioning (if needed)	
Agricultural irrigation - (crops, cut flowers, or nurseries)	Tertiary	
Stream flow augmentation	Tertiary Nutrient Removal	Post-aeration Cooling
Groundwater recharge	Tertiary Nitrification/denitrification Coagulation/flocculation Filtration	UV disinfection Reverse osmosis Nutrient Removal

EDCs are Not Expected to be a Concern for Irrigation

"Plant material, due to their physiological limitations, are unable to uptake any but the simplest forms and very small molecules, such as water. That is why there is no data on plant uptake of organic compounds - EDC's included."

per Dr. Bahman Sheikh, independent reuse consultant

Water Quality Guidelines for Irrigation

- General
  - Agricultural irrigation general concerns are:
    - salinity, sodium, excessive chlorine, nutrients, and trace elements
  - Ions of most concern for wastewater reuse are sodium, chloride, and boron

Water Quality Guidelines for Irrigation (Cont.)

- SAM Effluent
  - Compared SAM effluent to irrigation water quality guidelines
  - All parameters, except combined nitrogen, are considered slight to moderate
  - Combined nitrogen is considered high

Water Quality Guidelines for Creek Enhancement

- Must comply with:
  - Inland Surface Water, Enclosed Bays and Estuaries Plan
    - State Implementation Plan
    - California and National Toxics Rule
  - San Francisco Bay Basin Plan
- Minimum standards include limits for:
  - Salt, toxicity, dissolved oxygen, temperature, ammonia, metals, pesticides

Treatment at Calera Creek Water Recycling Plant - City of Pacifica

- Tertiary treatment including:
  - Sequencing batch reactors (combines aeration and clarification)
  - Sand filtration
  - UV disinfection

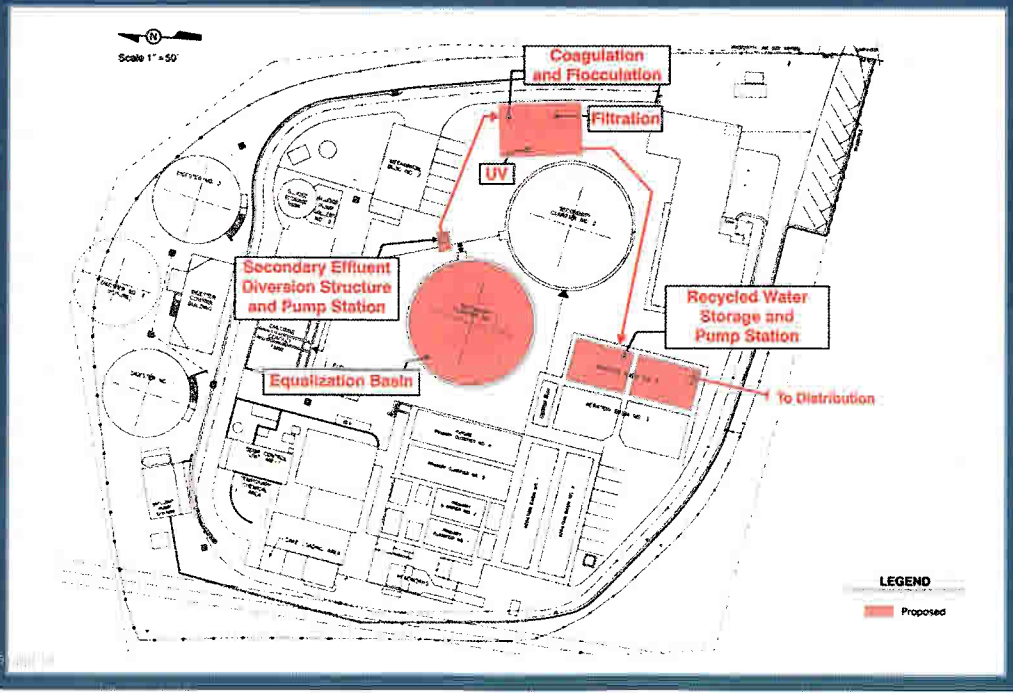
SAM Bench Scale Testing

- Purpose: Help with tertiary preliminary process type and sizing
- Conclusions:
  - SAM effluent contains high amount of small particles
  - Lots of small particles require coagulation and flocculation before filtration
  - High dose of coagulant or ballasted flocculation is probably needed

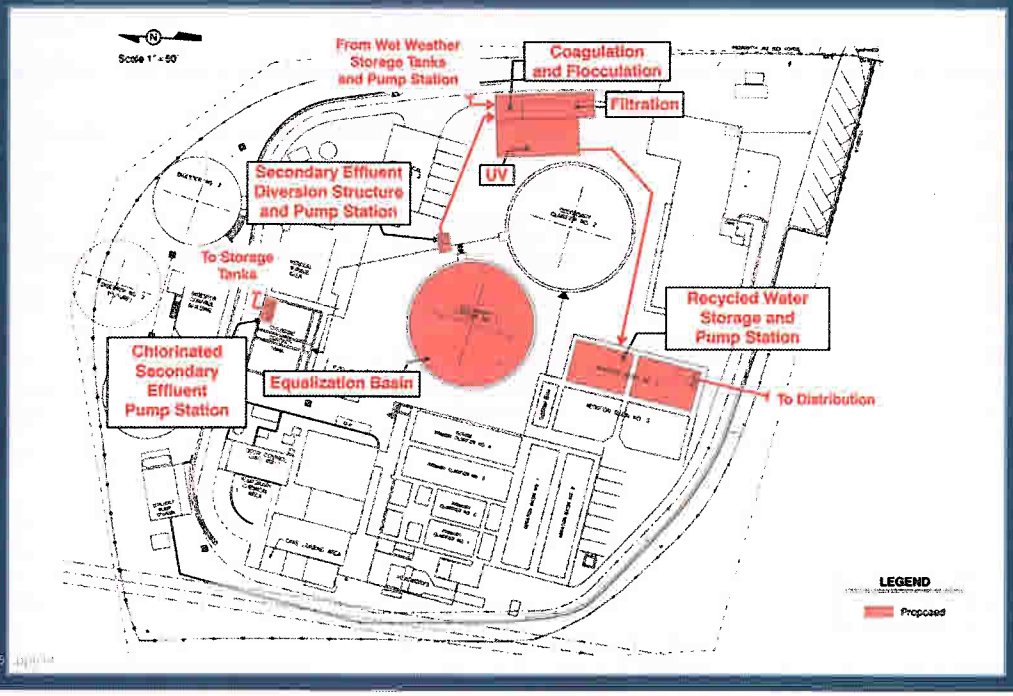
Water Recycling Options

Option	Name	Tertiary Flow (mgd)		Planned Type of Use
		Summer	Winter	
1	Seasonal Irrigation	1.65	0 (discharge to ocean)	Irrigation Stream Flow Enhancement
2	Seasonal Irrigation and year round stream flow augmentation	3.0	3.0 (storage then supplement creek)	Irrigation Stream Flow Enhancement

Option 1 Site Schematic



Option 2 Site Schematic



Option 2 Storage Tanks

Common Facilities for Options 1 and 2

- Both Options:
  - Revisions to secondary clarifiers (to include equalization)
  - Secondary effluent diversion structure and pump station
  - Coagulation/flocculation/filtration facilities
  - UV system
  - Chemical systems (alum, polymer, gypsum)
  - On-site pipelines/conveyance/valving
  - On-site storage (converted aeration basin)
  - Recycled water pump station

Additional Facilities for Option 2

- Storage tanks (2 at 3.5 MG each)
- Chlorinated secondary effluent pump station (15 mgd)
- Storage tank pump station (3 mgd)

Planning Level Cost Summary

Description	Option 1	Option 2
Project Costs[1] (Present Worth)	$5,140,000	$14,560,000
Annualized Project Costs (5% over 30 years)	$335,000	$948,000
Annual O&M costs	$575,000	$1,765,000
Total Annual Costs	$910,000	$2,713,000
Dollars per Acre Foot	$740	$1,210

Note: (1) Not including off-site pipelines.

Permits Required to Upgrade WWTP to Title 22 Unrestricted Use

Permit Type	Agency	Justification
NPDES	SWRCB/RWQCB/ DHS	Revise existing permit to include reuse
CEQA	SWRCB/RWQCB	Environmental compliance
Construction	California Coastal Commission	Construction along coastal region
Building	City of Half Moon Bay	Construction in the City
Air	Bay Area AQMD	Construction and Operation

Additional Permits Required to Discharge to Pilarcitos Creek

Permit Type	Agency	Issue
CEQA	SWRCB	Environmental impact review and permit
Endangered Species Act	US Fish and Wildlife Service	Section 7 Consultation and Incidental Take Permit, Biological Opinion
CWA-Section 404 Permit	US Army Corps of Engineers	Wetlands
CWA-Basin Plan	Regional Water Quality Control Board (RWQCB)	NPDES Waste Discharge Requirements; Beneficial Use
CWA-Section 303 Inland Surface Water Plan	State Water Resources Control Board (SRWCB)	Water Quality Criteria
Fish and Game Code Section 1601	Department of Fish and Game (CDFG)	Stream Bed Alteration - Outfall Construction

Schedule