



Sunnyvale

# Wastewater Operations and Cleanwater Program

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- **Critical operation since 1950s**
  - *60 staff members at WPCP*
  - *Staffed 24/7/365*
- **Serves >150,000 customers**
  - *Population on the rise*
  - *Net influx of outside workers*
- **Treats 13 MGD wastewater**
- **Cleanwater Program**
  - *Comprehensive upgrades ~20yrs*
  - *Old/outdated facilities*



# Who We Are

## ***Operators***

Continuously monitor treatment processes and keep the WPCP running

## ***Maintenance Mechanics***

Ensure equipment and instrument functionality and reliability

## ***Laboratory Staff***

Analyze wastewater and drinking water samples to evaluate compliance and treatment process efficiency





# The “Bigger Picture”

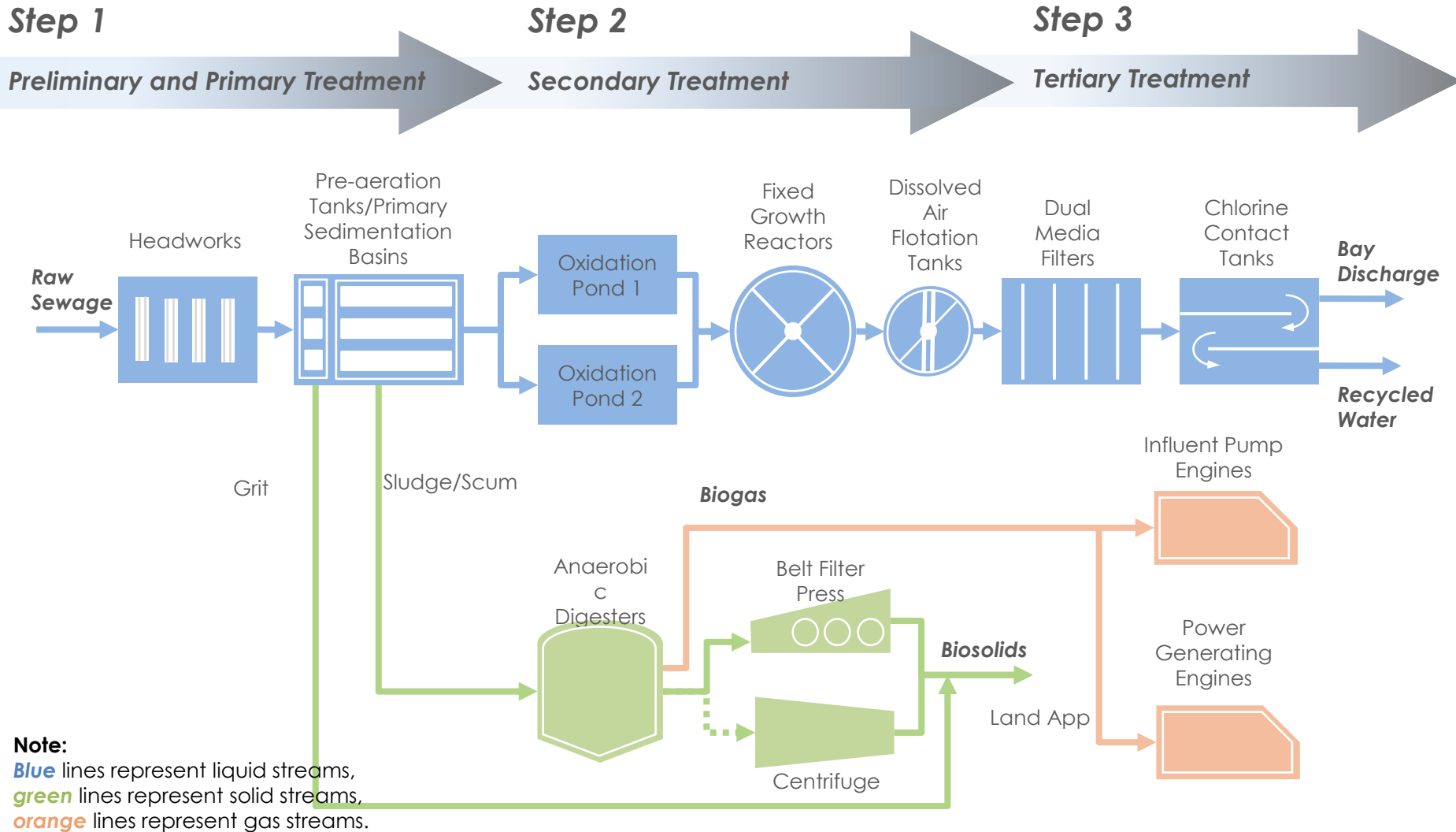




# Wastewater Treatment at WPCP



# Treatment Schematic



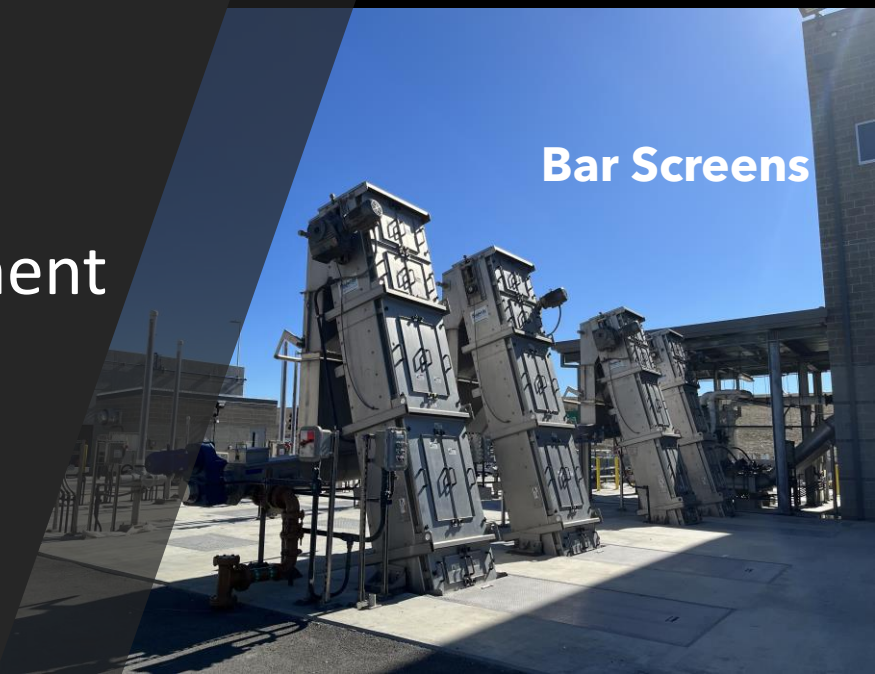


# Step 1

## Preliminary and Primary Treatment

- **Remove large debris/trash**
  - *Makes pumping easier*
  - *Protects downstream equipment*
- **Separate solids from liquid**
  - Inorganic solids → landfill
    - *sand/gravel*
    - *coffee grounds*
  - Organic solids → digesters
    - *Fats, oil, and grease (FOG)*
    - *Food waste*

Bar Screens



Preaeration Basins and Primary Sedimentation Tanks



# Step 2

## Secondary Treatment

- **Ammonia and organic removal**
  - *Ammonia toxicity in aquatic environments*
  - *Organic decomposition → oxygen depletion*
- **Fixed Growth Reactors (FGRs)**
  - *Seasonal variability of Oxidation Ponds*
  - *Ammonia performance backstop*
- **Air Floatation Tanks**
  - *Remove algae formed in ponds*
  - *Polymer + dissolved air*





# Step 3

## Tertiary Treatment

- **Dual Media Filters**

- *“Polishing” step → additional solids removal*
- *Activated carbon and sand*
- *Essential for recycled water production*

- **Chlorine Contact Tanks**

- *Final treatment step*
- *Pathogen reduction*
- *Disinfection/Dechlorination*
  - *Bay → full dechlorination*
  - *RW → partial dechlorination*



**Dual Media Filters**



**Chlorine Contact Tanks**

# NPDES Limits (SF Bay Discharge)

Parameter	Limit Type	NPDES Limit
CBOD (5-day, 20C)	Daily Max	20 mg/L
	Monthly Average	10 mg/L
TSS	Daily Max	30 mg/L
	Monthly Average	20 mg/L
Turbidity (Jun – Sept)	IMEL*	10 NTU
Ammonia (Oct – May)	Daily Max	26 mg/L
	Monthly Average	18 mg/L
Ammonia (Jun – Sept)	Daily Max	5 mg/L
	Monthly Average	2 mg/L





# Cleanwater Program



# SUNNYVALE CLEANWATER PROGRAM

## Capital Improvement Program

- *Largest in Sunnyvale history*
- *Upgrade WPCP aging infrastructure*
- *Equipment reaching end of useful life*
- *Meet current and future regulations*
- *More reliable and renewable power supply*
- *Use innovative technology to extent possible*
- *Protect against flooding and address sea level rise*

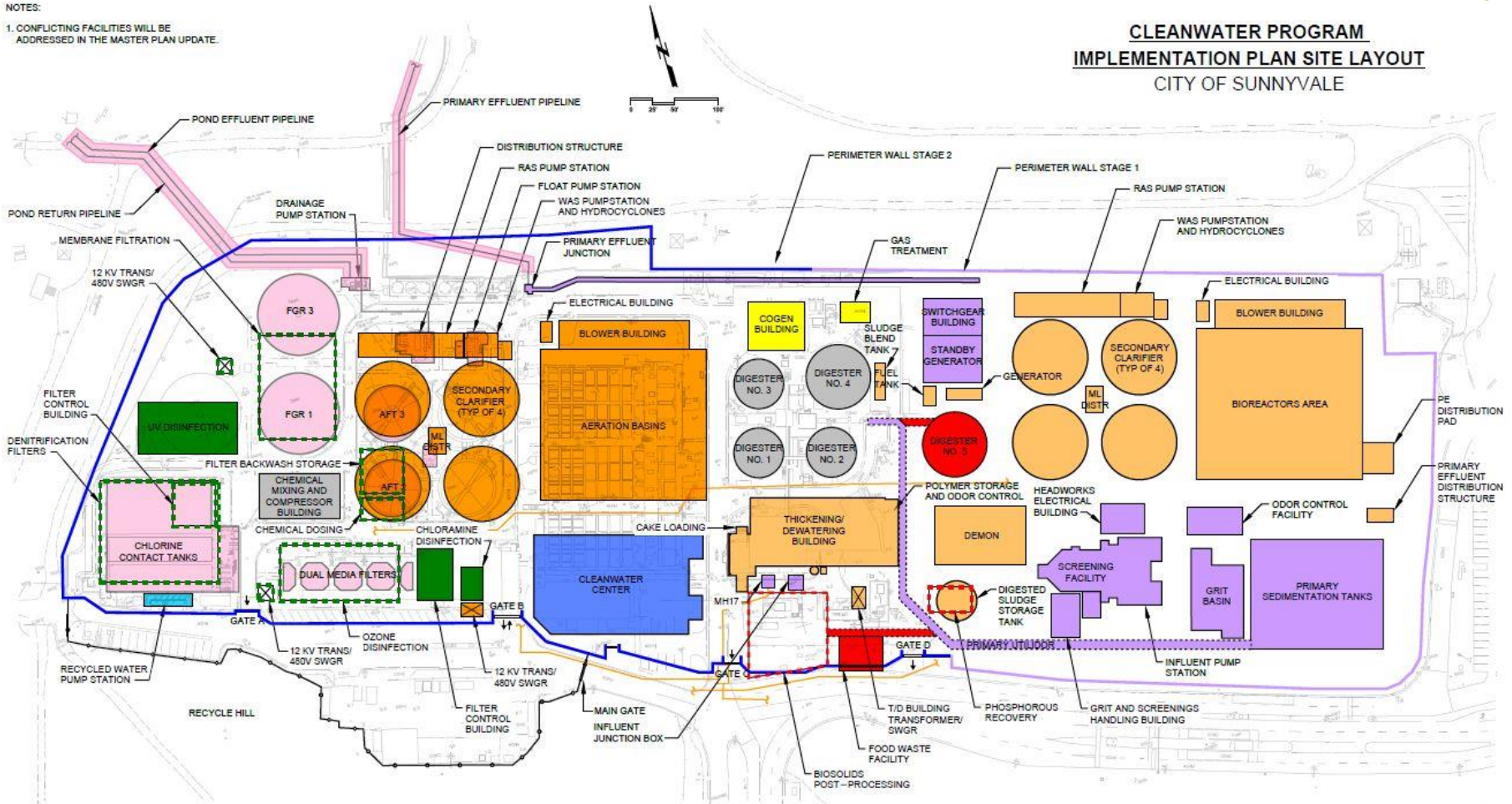




# The "Grand Vision" (2035)

NOTES:

1. CONFLICTING FACILITIES WILL BE ADDRESSED IN THE MASTER PLAN UPDATE.



**CLEANWATER PROGRAM  
IMPLEMENTATION PLAN SITE LAYOUT  
CITY OF SUNNYVALE**

PRIMARY	SECONDARY	TERTIARY	OTHER FACILITIES	OTHER
PRIMARY TREATMENT FACILITIES	EXISTING PLANT REHABILITATION	TERTIARY TREATMENT FACILITIES	CLEANWATER CENTER	UTILIDOR
PERIMETER WALL - STAGE 1	PERIMETER WALL - STAGE 2	<b>SOLIDS</b>	RECYCLE WATER IMPROVEMENTS	12 KV TRANSFORMER/480V SWITCHGEAR
	SECONDARY TREATMENT - STAGE 1	SOLIDS TREATMENT FACILITIES	EXISTING FACILITIES TO REMAIN	SECURITY FENCE
	SECONDARY TREATMENT - STAGE 2	COGENERATION UPGRADE	UNFUNDED FUTURE FACILITIES	



# Primary Treatment Facilities Project

- Replacing entire Preliminary and Primary Treatment Process
- *More efficient solids removal through cutting edge industry technology*
  - *Lowering emissions by swapping-out combustion engines for electric engines and controlling odors*
- In commissioning now!







June 2016



Feb 2024



# Headworks & Primary Treatment Facility Construction Time-Lapse







Sunnyvale

Thank you!  
Questions?