



Sunnyvale Cleanwater Program

- Administration/Laboratory Building
- Food (Scraps) to Energy

Council Study Session
August 27, 2019





City of Sunnyvale Water
Pollution Control Plant

Bay Trail

Bay Trail

Carl Rd

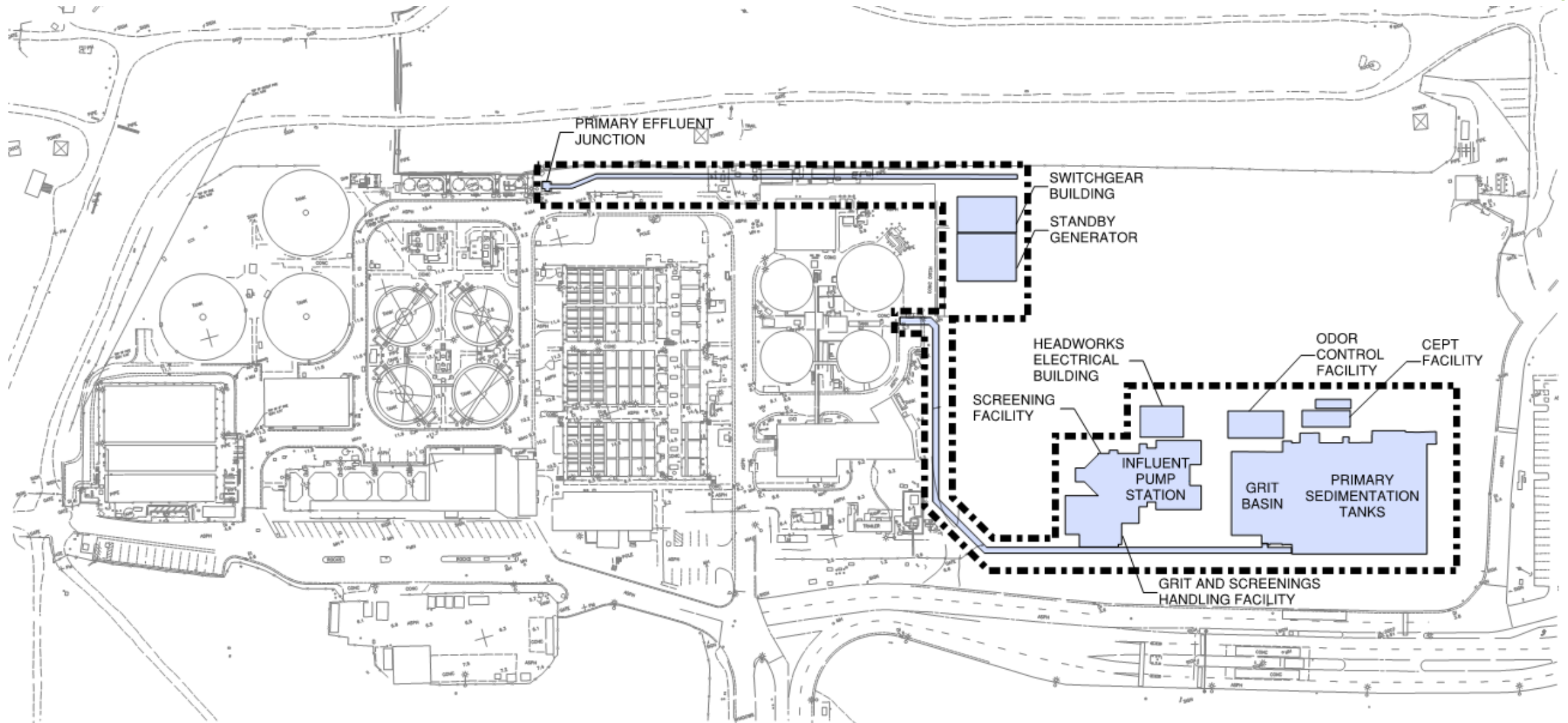
Borregas Ave

Carl Rd

Carl Rd

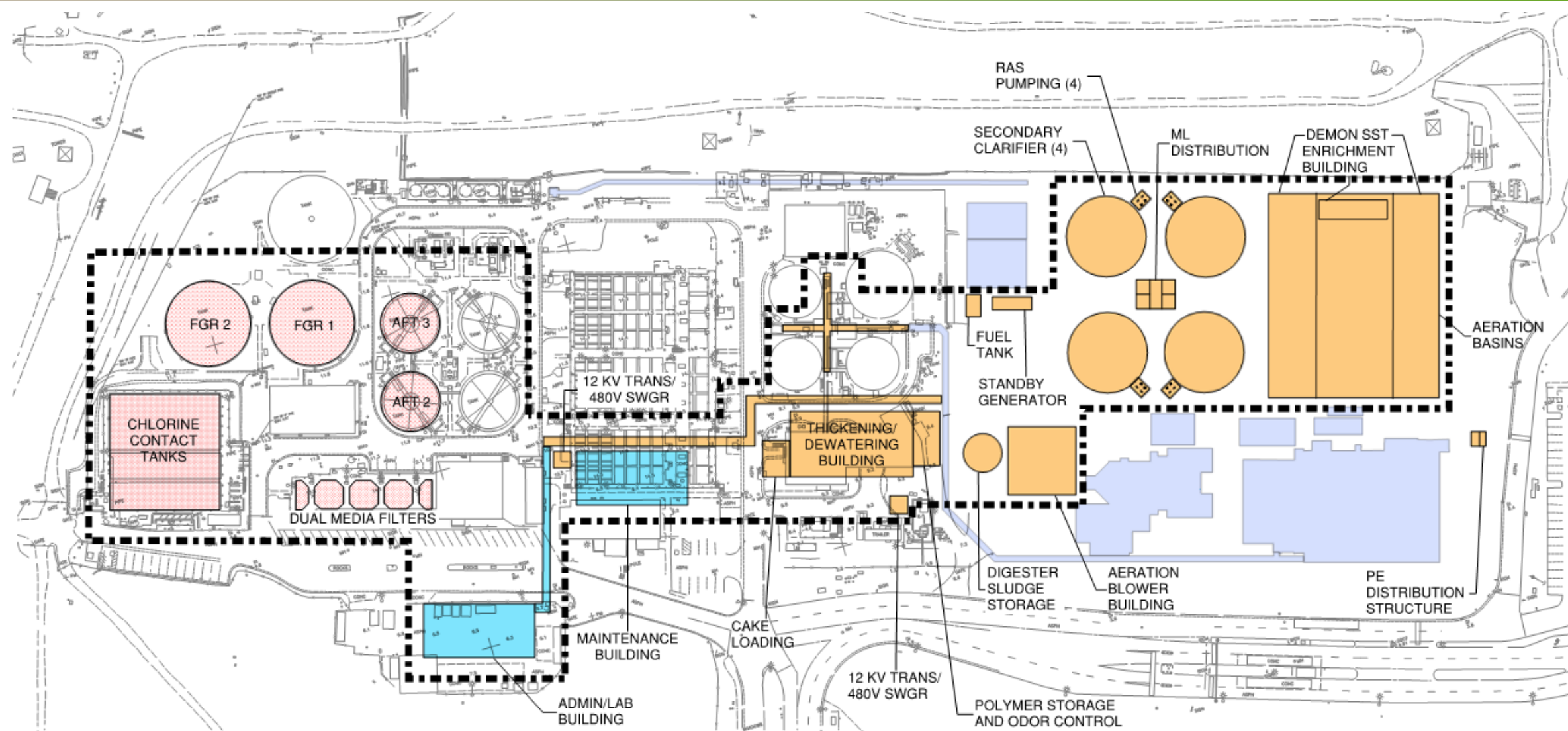
Carl Rd

Cleanwater Program Construction Activities

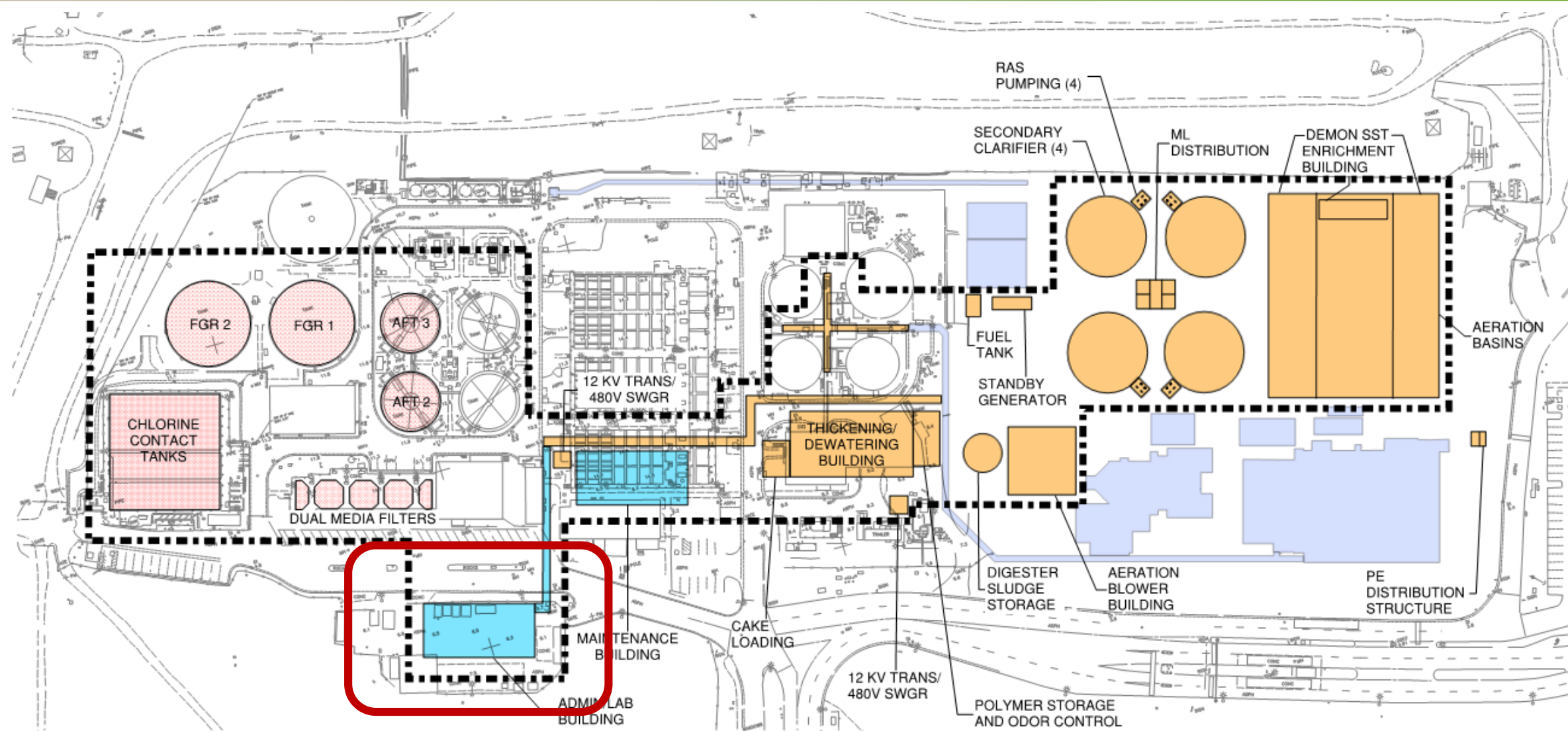


2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034

Cleanwater Program Design Projects



Cleanwater Program Design Projects



Administration/Laboratory Building

Master Plan location: Household Hazardous Waste Collection Site



Latest price tag: \$53M

- Building on a landfill:
 - Final cover
 - Landfill gas control
 - Runoff water management
 - Structural foundation challenges
 - Flood protection
- Uncertainty with meeting regulatory requirements
- Uncertainty regarding construction cost
- Building located outside of perimeter wall
- Discontinuity with the rest of the plant

Potential Off-Landfill Locations



Benefits of the new location

- Within the flood wall
- Fewer regulatory restrictions
- Improved synergy between various staff functions
- Shared common spaces

Building Relocation Assessment Strategy

- Identify potential off-landfill locations
- Assess utility relocation requirements
- Develop additional building concept(s)
 - ◆ Including combining admin/lab with the maintenance building
- Select preferred concept
- Develop Concept Design Report for WIFIA application

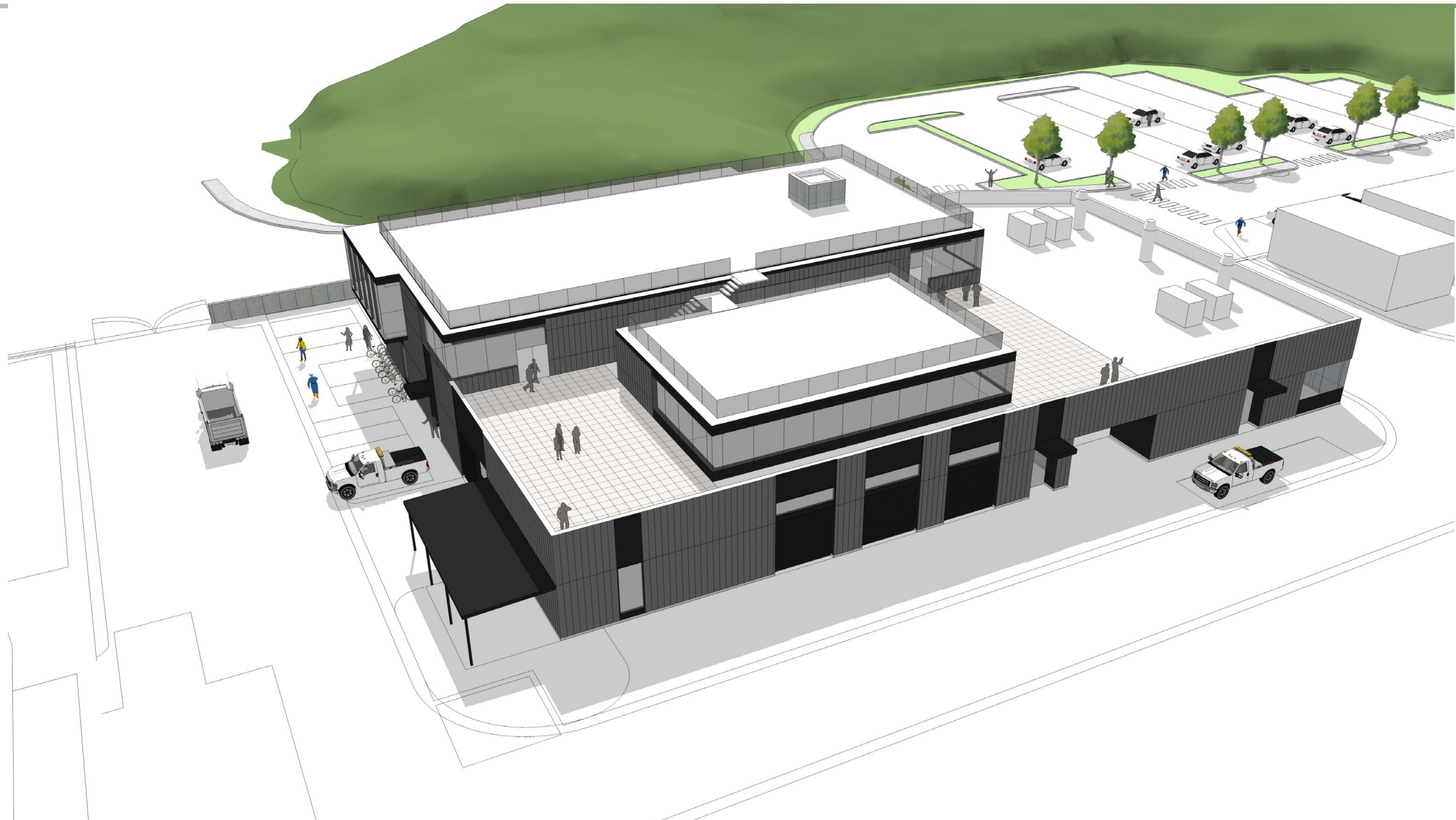
Preferred Alternative



Preferred Alternative



Preferred Alternative



Construction Cost Comparison

	<i>Project Budget</i>	Household Hazardous Waste Site	Alternative Location
	<i>(\$,000)</i>	<i>(\$,000)</i>	<i>(\$,000)</i>
Admin and Lab Building	\$37,868	\$ 53,027	\$ 37,139
Maintenance Building	\$8,100	\$ 8,100	
Utility Relocation	\$ -	\$ -	\$ 7,000
Total Construction Cost	\$ 46.0M	\$ 61.1M	\$ 44.1M

*Construction cost only, does not include design cost

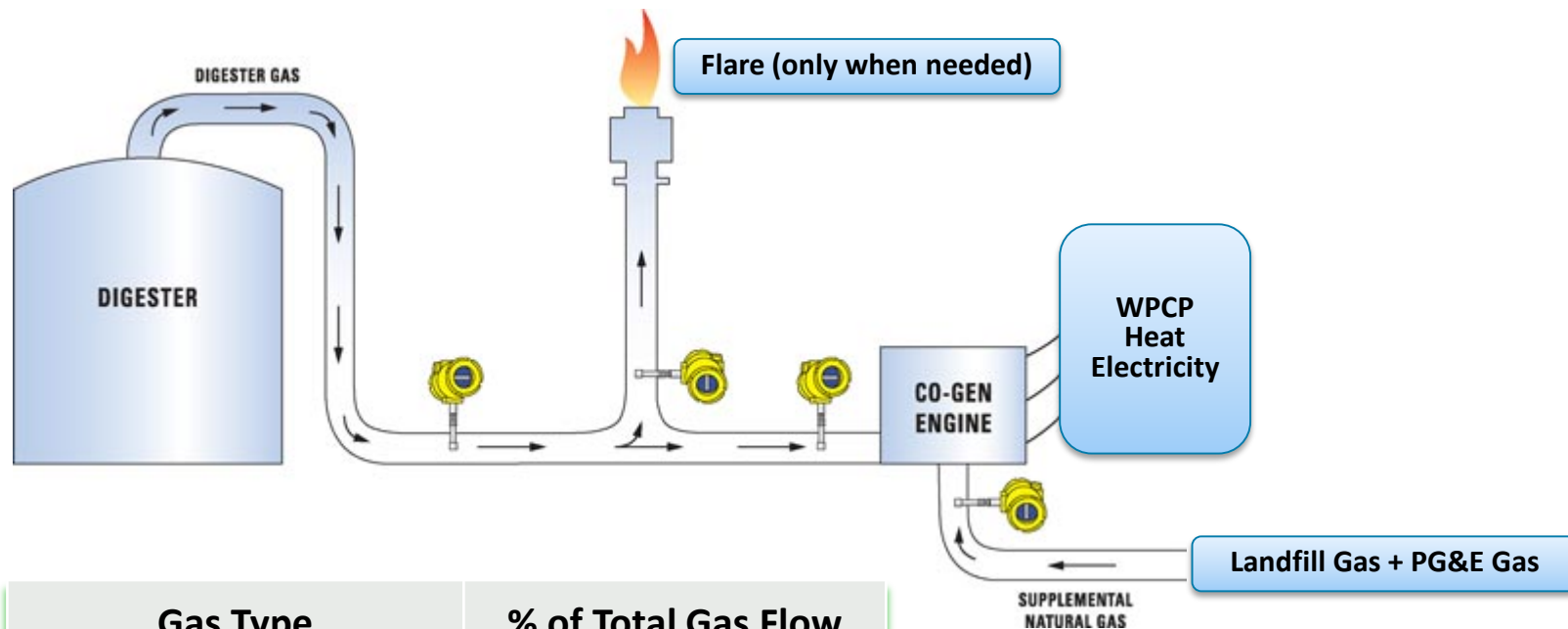
Next Steps

- Council approval of architect's contract amendment
- Proceed with preliminary design and design activities
- Proceed with this concept for WIFIA application

Food (Scraps) to Energy

WPCP Treatment Process and Co-Digestion

Co-digestion – processing food related waste using the Plant Digestors



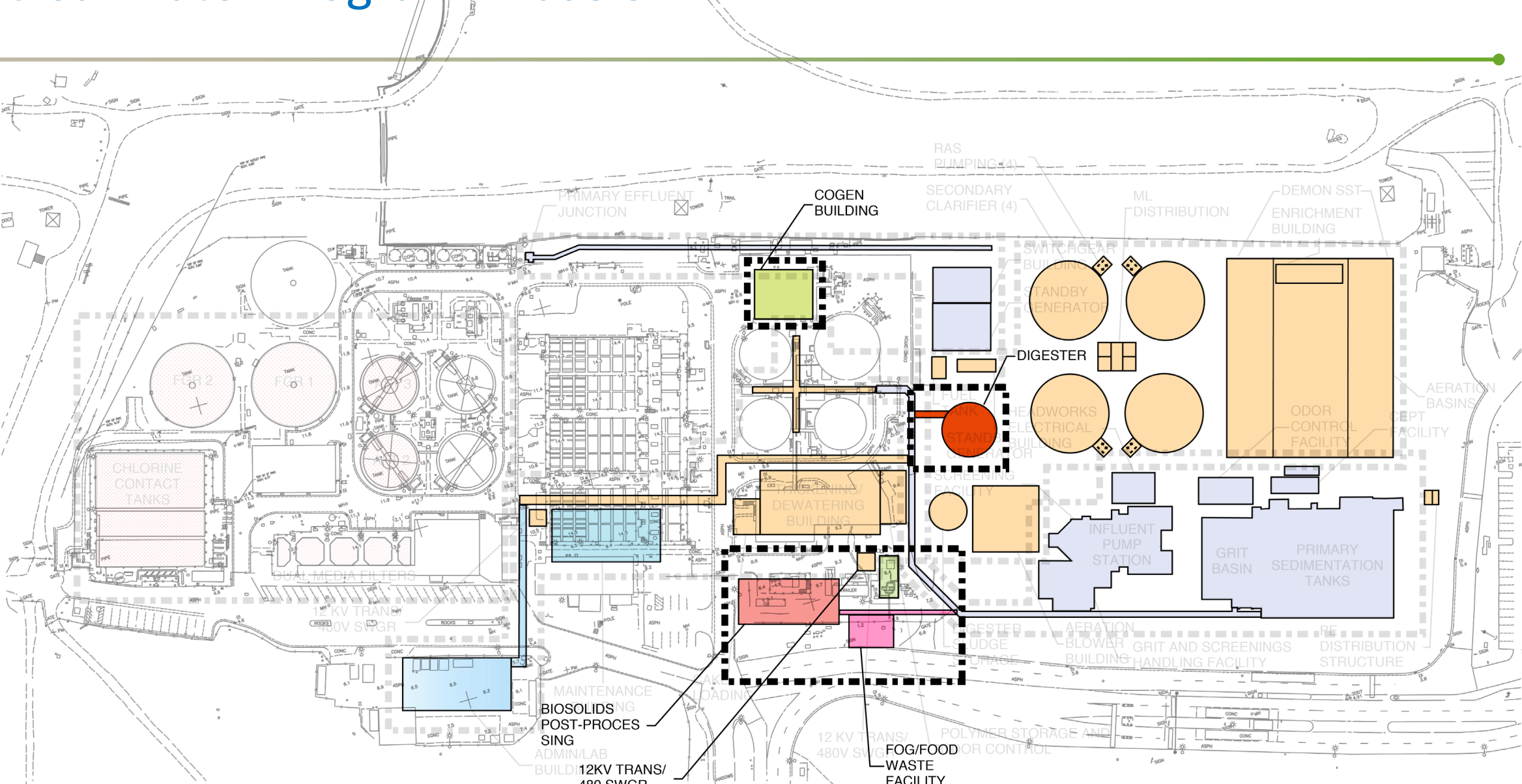
Gas Type	% of Total Gas Flow
Digester Biogas	29%
Landfill Gas	43%
Air Blended Natural Gas (PG&E)	28%



WPCP Master Plan and Co-digestion

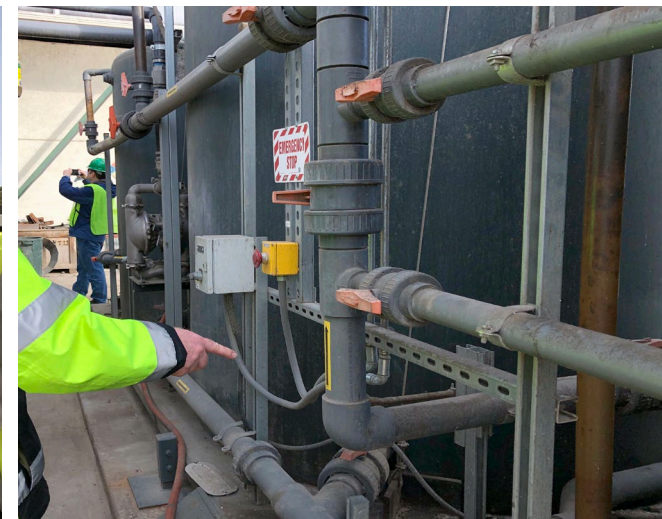
- Established a framework for implementing co-digestion
- Established digester design and loading criteria
- Contemplated more FOG (fats oils and grease) and very little Food
- Currently more food than FOG available

Cleanwater Program Phase 3



Food Scraps Collection & Processing

- The SMaRT station receives Food Scraps from residential and commercial sources
- Currently receives 30 tons per day
- Permitted for 99 tons per day

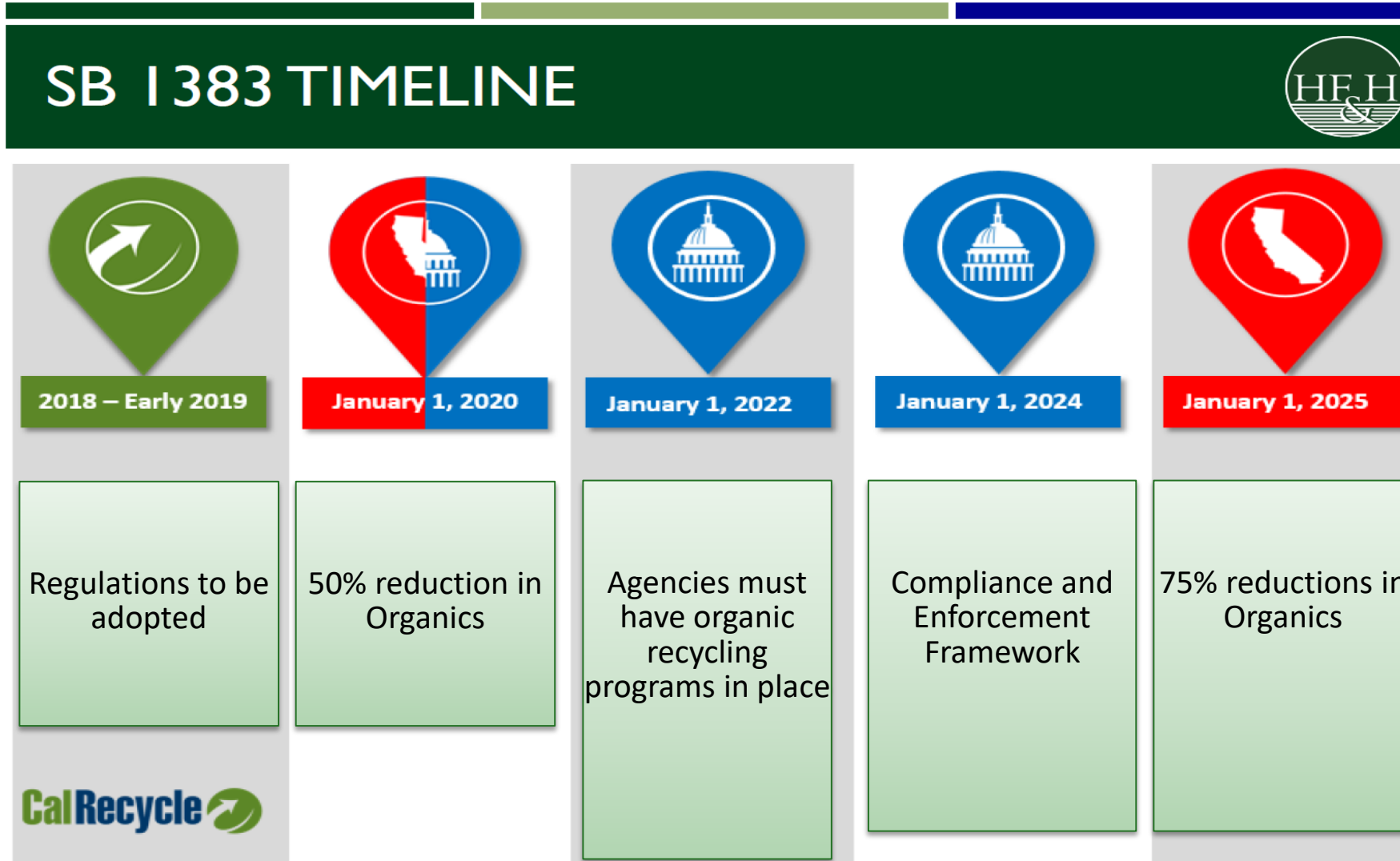


Food Scraps Collection & Processing – Background (Continued)

- Food scraps converted to mash
- Mash sent to SAFE facility in Santa Clara
 - Converted to animal feed ingredient
 - Bio-diesel ingredient or
 - sent to East Bay Municipal Utility District for co-digestion.
- Current Food scraps processing and disposal cost is \$700,000/year (30 tons/day)



SB1383 Requirements



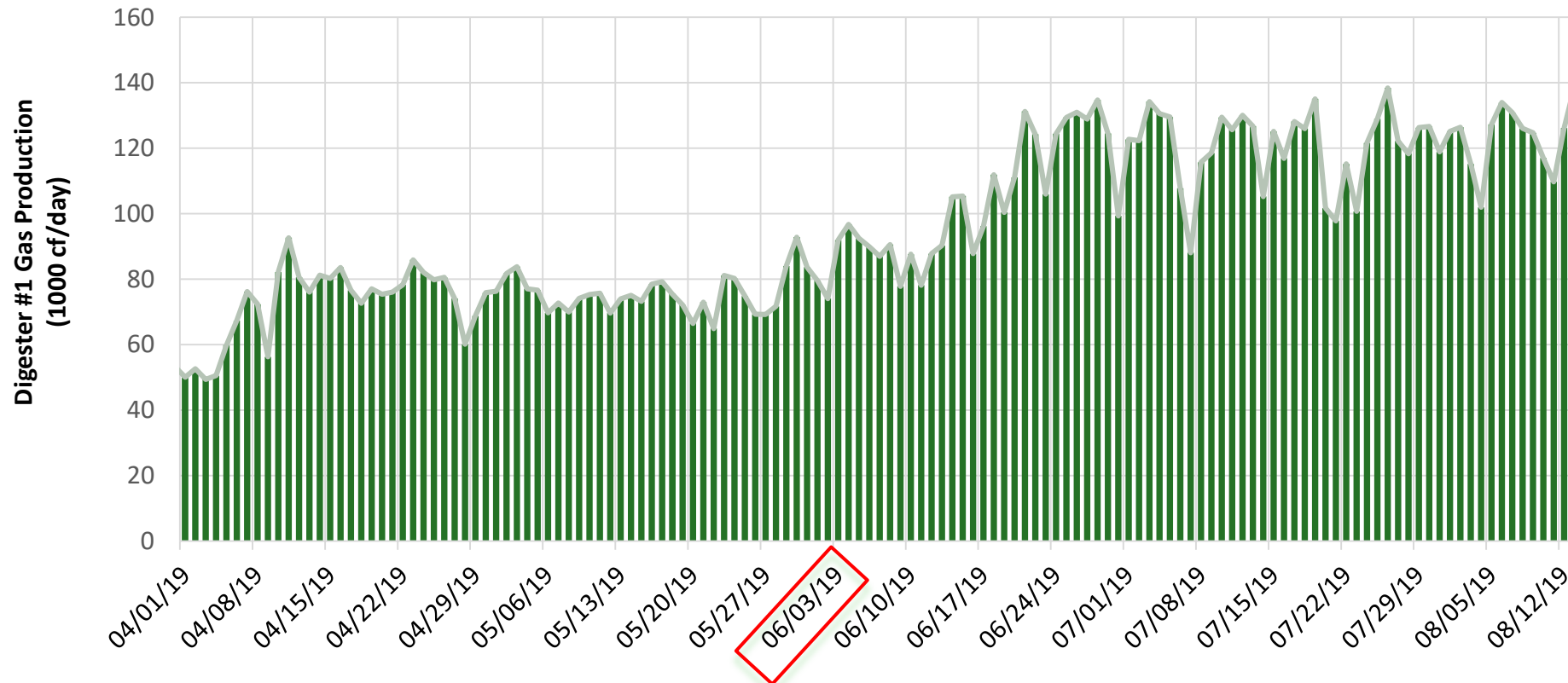
Food Scraps Co-digestion at Water Pollution Control Plant

- Meet SB1383 organics diversion requirements
- Reduce processing and disposal costs
- Price certainty
- Reduced truck trips and vehicle emissions
- Increased power generation
- Potential revenue opportunity



Food Scraps Co-digestion Pilot Study

12 tons/day of food scraps increased biogas production by 30%



Benefits to the Water Pollution Control Plant

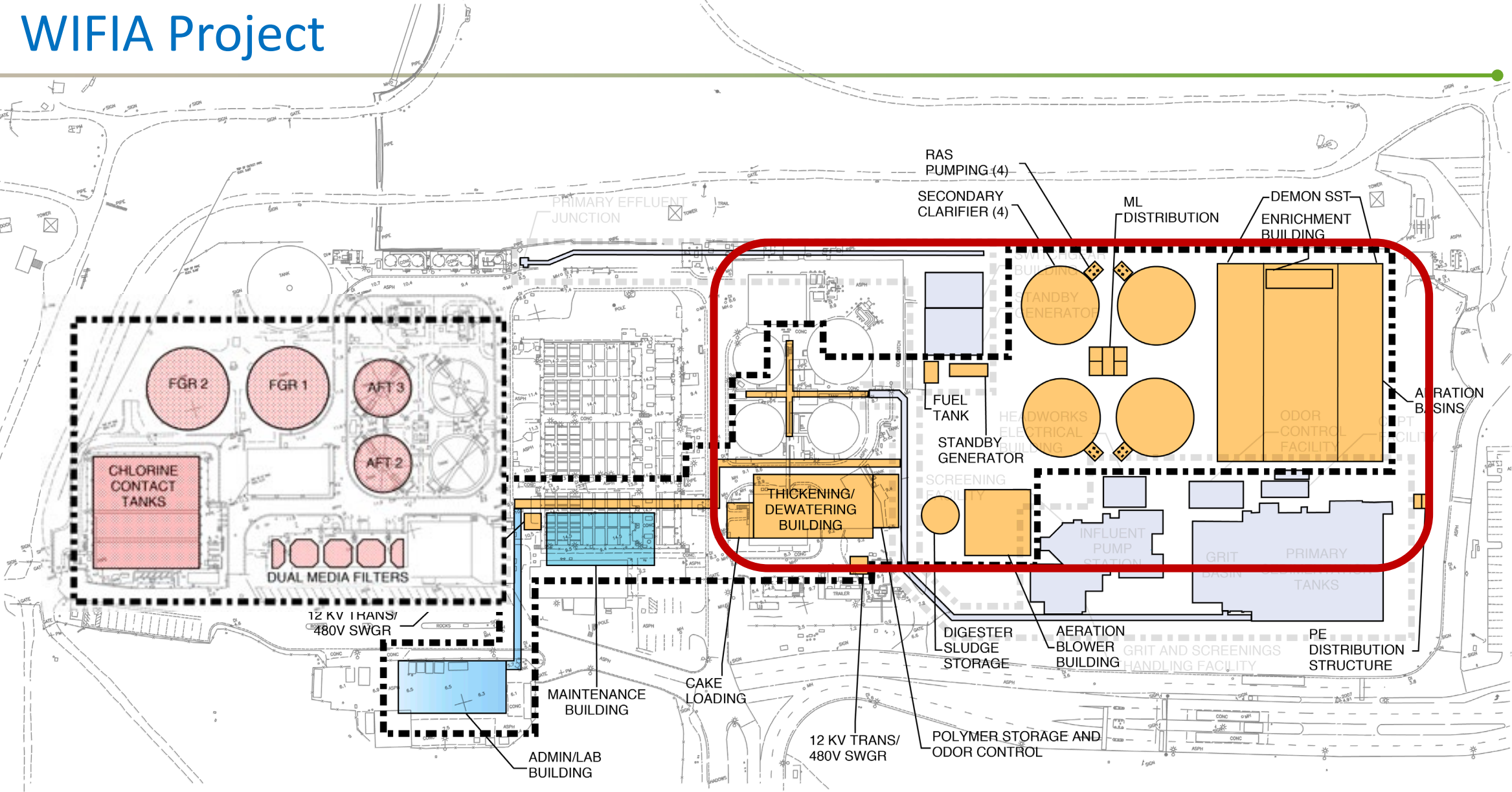
- More energy recovery: electrical power and heat
- Utilize Existing Digester Capacity

Year	Food Scraps (Tons/day)	Modeled Biogas Production (SCF/year)	PGF Recovered Electrical Production (kWh/year)	Potential Cost Saving (\$/year)
2019	10	8,011,165	405,487	\$ 121,646
2020	20	16,022,330	810,975	\$ 243,292
2021	25	20,027,913	1,013,718	\$ 304,116
2022	30	24,033,495	1,216,462	\$ 364,939
2023	35	28,039,078	1,419,206	\$ 425,762
2024	40	32,044,660	1,621,950	\$ 486,585
2035	100	80,111,651	4,054,874	\$ 1,216,462

Food to Energy Design and Construction Costs

- Additional Design Costs: \$0.8-1.6M
- Additional Construction Costs: \$8-16M
- These additional costs will be included in the WIFIA financing plan
- Shared by Wastewater and Solid Waste Programs (proportion to be determined later)

WIFIA Project



Food to Energy - Summary

- ↑ New regulations are going to increase Organic Processing Requirements
- ❓ Organics Processing Pricing and Capacity are uncertain
- ✓ Food to Energy project will provide price and capacity certainty
- \$ Reduce energy costs for WPCP Plant (~1.2 M/year)
- \$ Reduce Solid Waste Processing and Disposal Costs (~\$1.8 M/year)
- \$ Additional Capital Costs for Food Processing (\$9M-\$18 M)
 - Scope included in WIFIA Financing

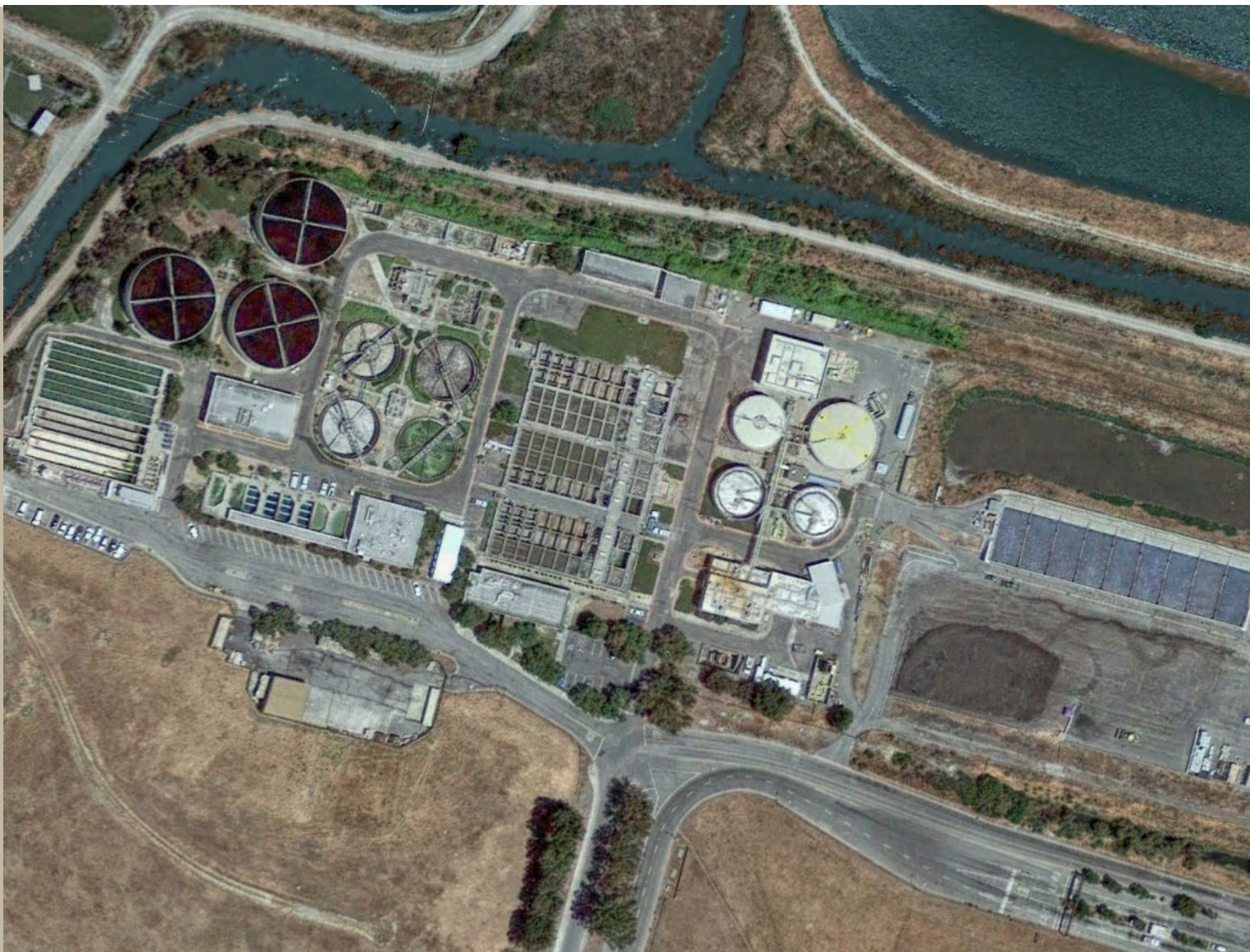
What's Next?

- Incorporate food readiness into the design for secondary treatment
- Budget mods...will be coming to Council later this year
- Proceed with this concept for WIFIA application



Questions?

Water Pollution Control Plant



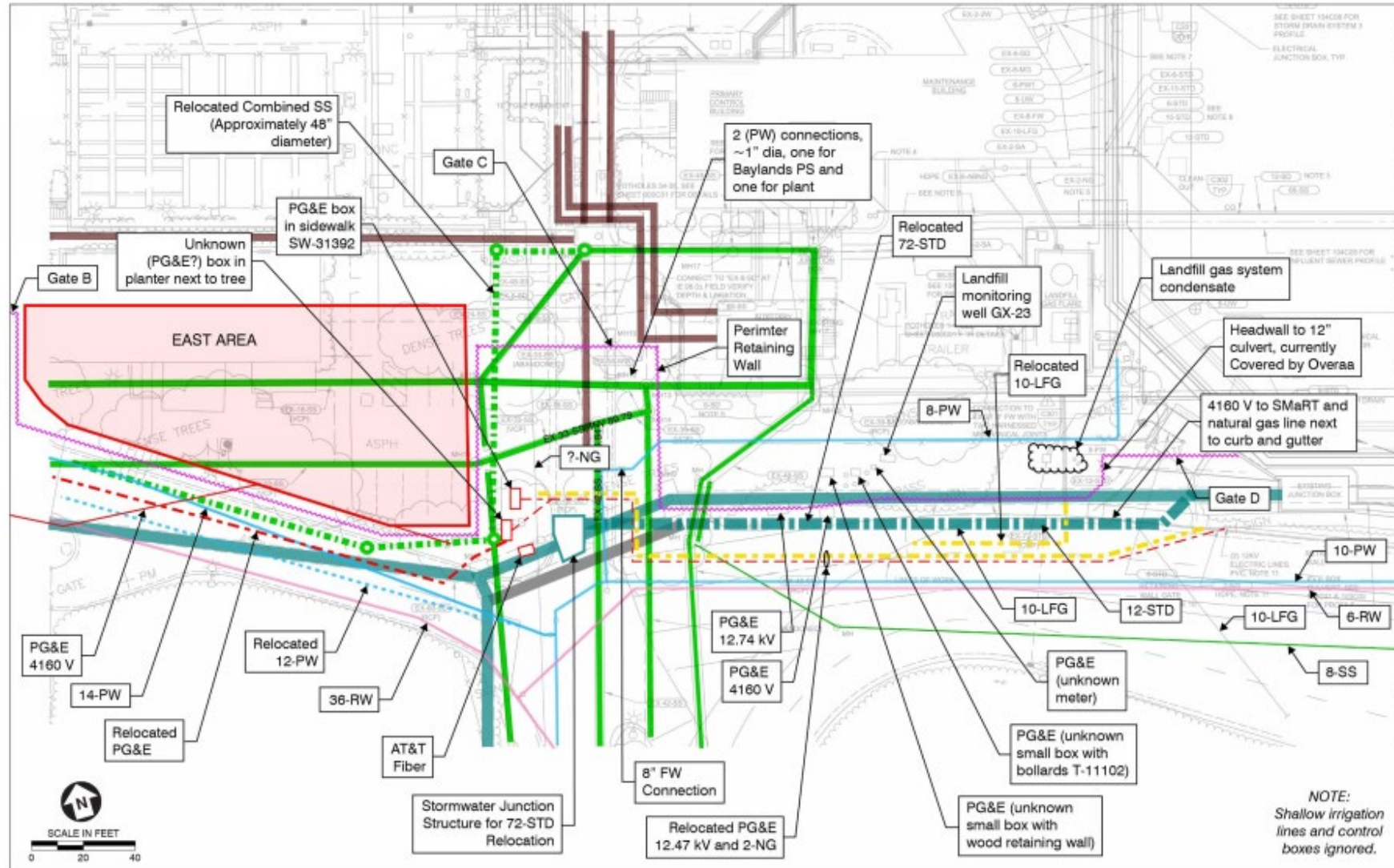
Master Plan-identified location: Household Hazardous Waste Collection Site



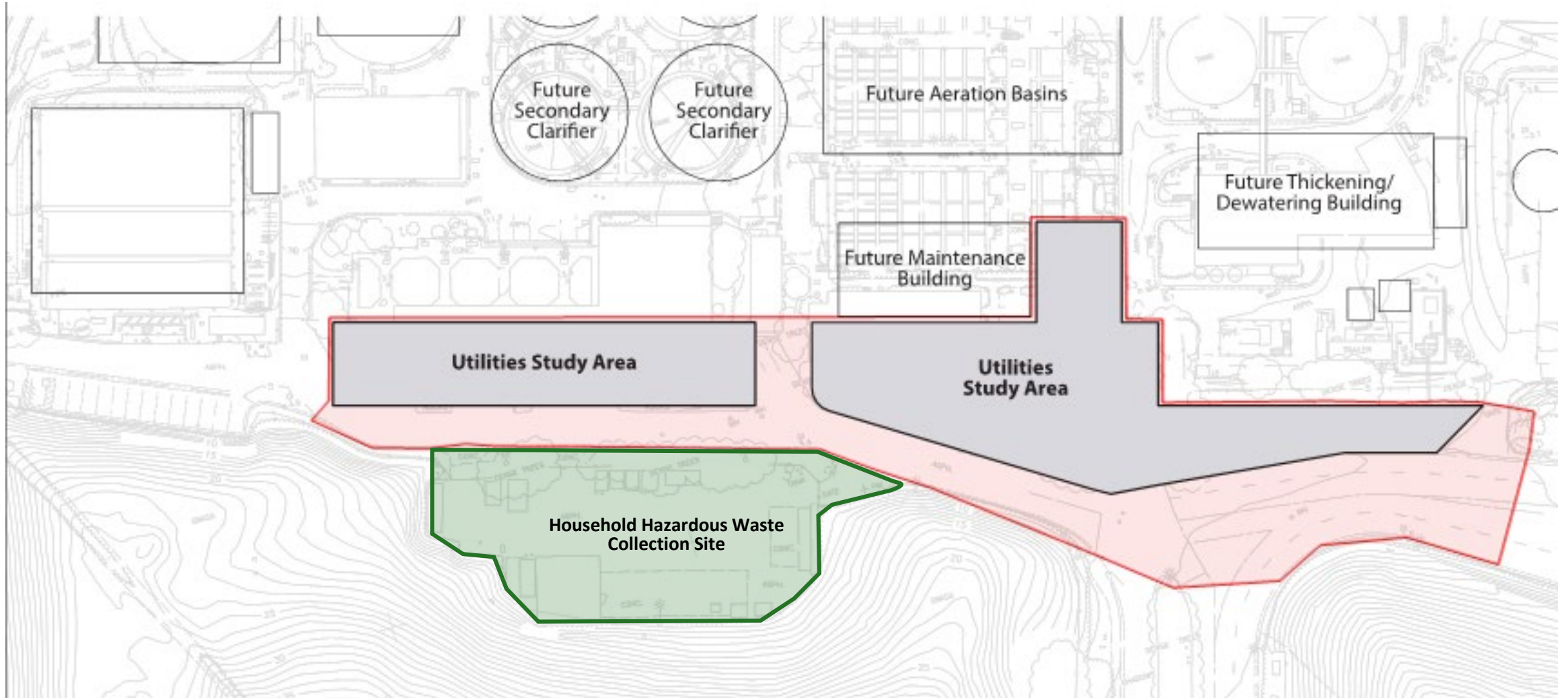
Issues

- Building on a landfill
 - Final cover
 - LFG control
 - Runoff water management
 - Structural foundation challenges
 - Flood protection
- Uncertainty with meeting regulatory requirements
- Uncertainty regarding construction cost
- Building located outside of perimeter wall

Utility Relocation Requirements



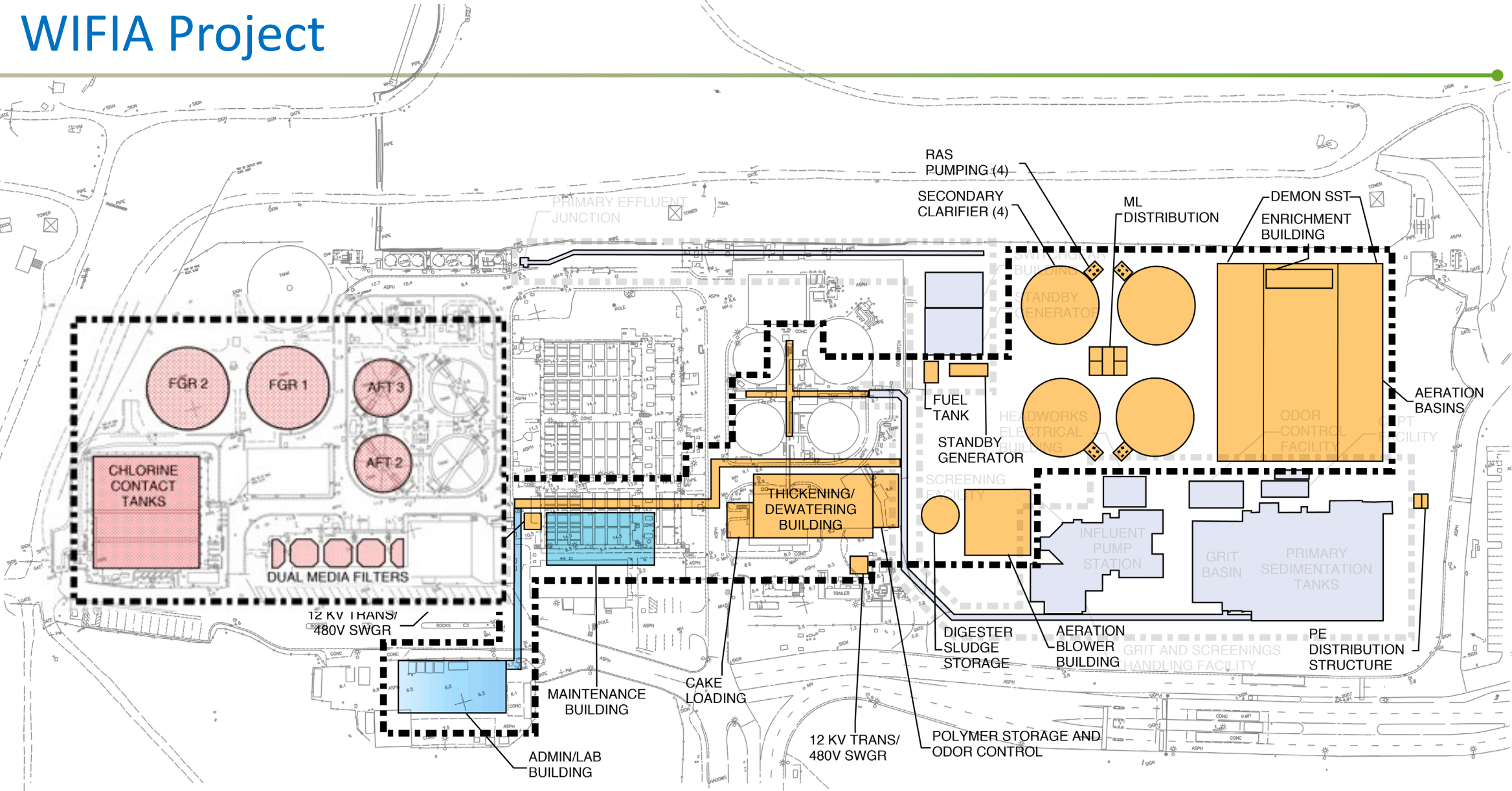
Potential Off-Landfill Locations



US EPA: Water Infrastructure Finance and Innovation Act (WIFIA)

- Submitted a Letter of Interest for combined project of approximately \$360M – successful, invited to submit an application
- Loan program provides financing for up to 49% of the project cost, i.e., \$180M
- Application that includes preliminary design due October 2019
- Loan closure approximately October 2020
- \$30M approximate debt service savings

WIFIA Project



WIFIA Project Elements Schedule

Food Scraps Processing

