City of Fall River

Solids Handling Optimization

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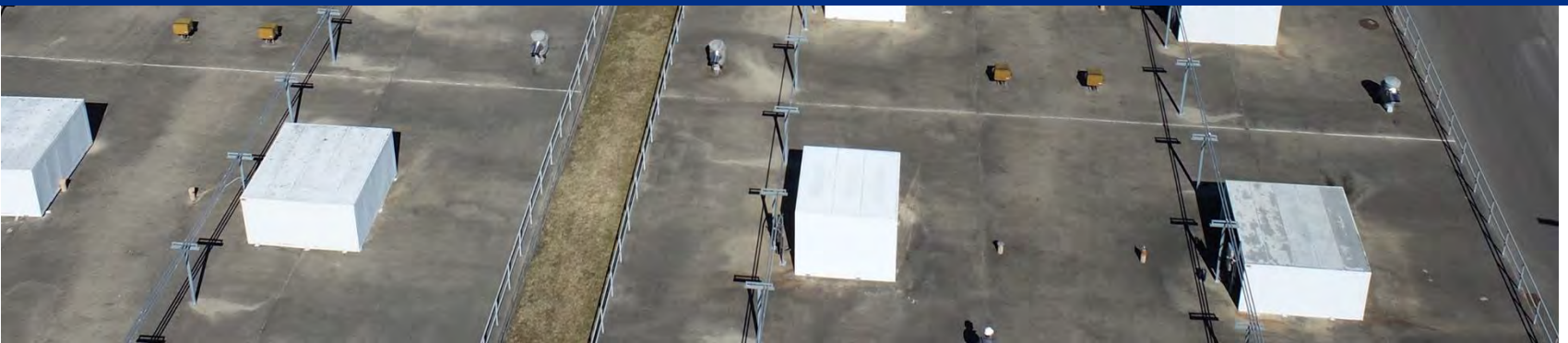
Agenda

1. Planning
2. Design and Construction
3. Operations

Planning



History

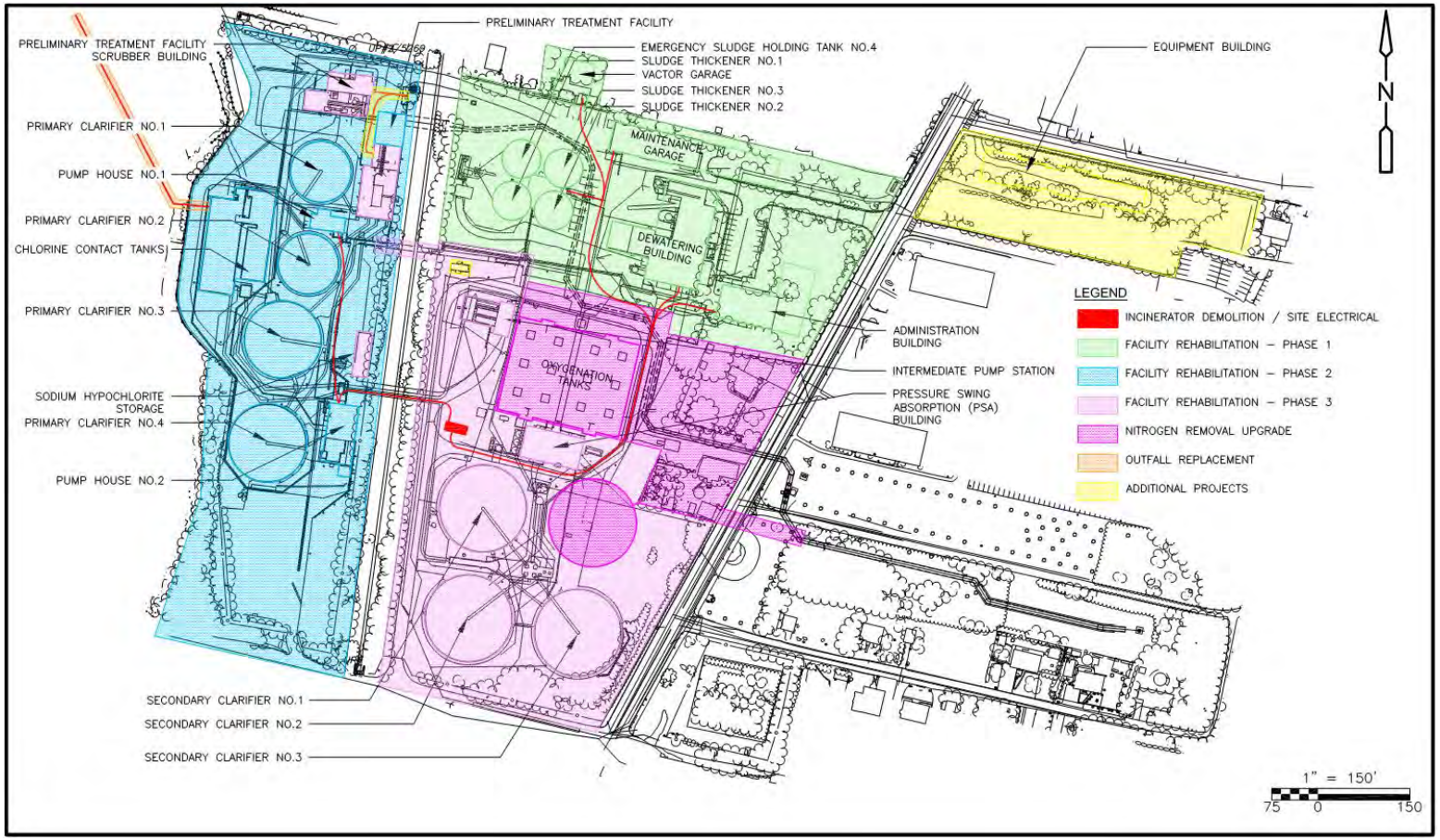
- 1857-1948 Direct discharge to receiving waters
- 1948-1952 Sewer outfalls converted to CSO outfalls with initial construction WWTF
- 1978-1980 Secondary Treatment Upgrade
- 1997-2000 Wet Weather Capacity Upgrade
  - Dry weather flow = 50 MGD
  - Wet weather flow = 106 MGD
- 2021 Site Electrical and Incinerator Demolition
- 2025 Solids Handling Upgrade

Planning Documents

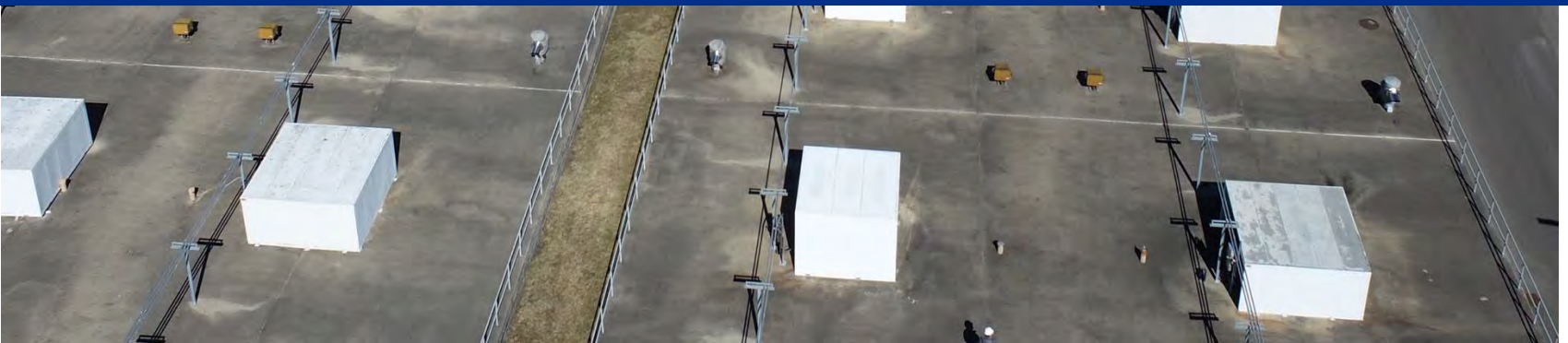
- 2015 Integrated Plan
  - Balance infrastructure needs (CSO, sewer, drainage, treatment, water), operation concerns, regulatory requirements, public health and safe issues and financial constraints of the community.
- 2018 Wastewater Facilities Plan
  - Build upon the Integrated Plan to develop phased implementation of upgrades to the treatment facility

Wastewater Treatment Facilities Plan

- Phased upgrade approach
  - Aging infrastructure
  - Reliability of operations
  - Potential permit modifications
  - Solids handling alternatives
    - Incinerator shutdown



Design & Construction

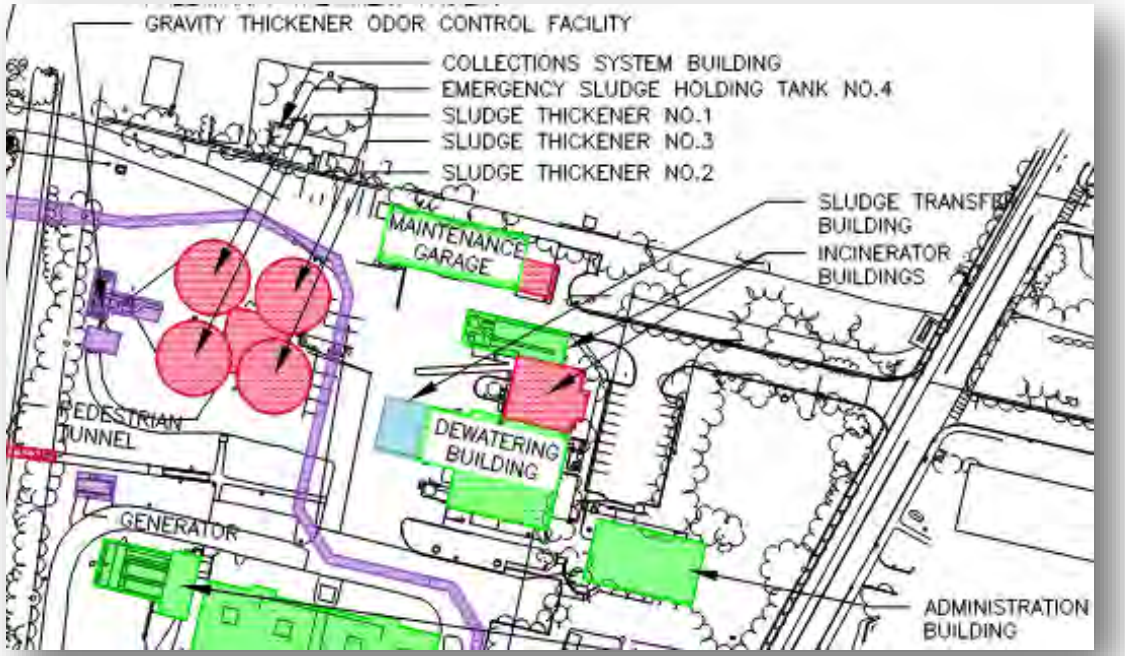


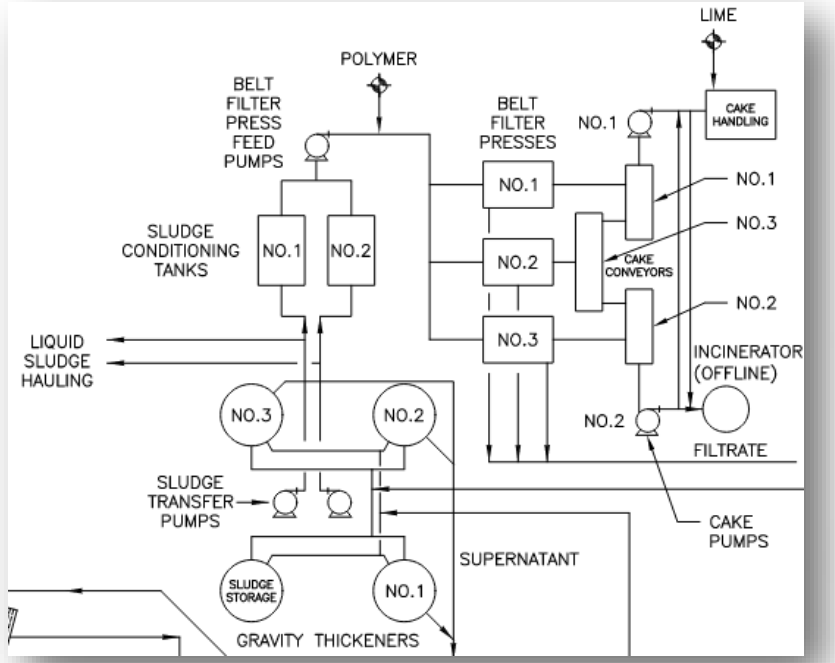
WWTF Contract No. 1
Site Electrical Upgrade and Incinerator Demolition

- Electrical Site Work
  - Reliable electrical infrastructure to support process and building facilities

- Incinerator Demolition
  - Permit modifications required abandonment of incinerator in 2016
  - Demolition required to move forward with future solids handling facilities

WWTF Contract No. 2 - Solids Handling Upgrade
Pre-Upgrade Solids Process

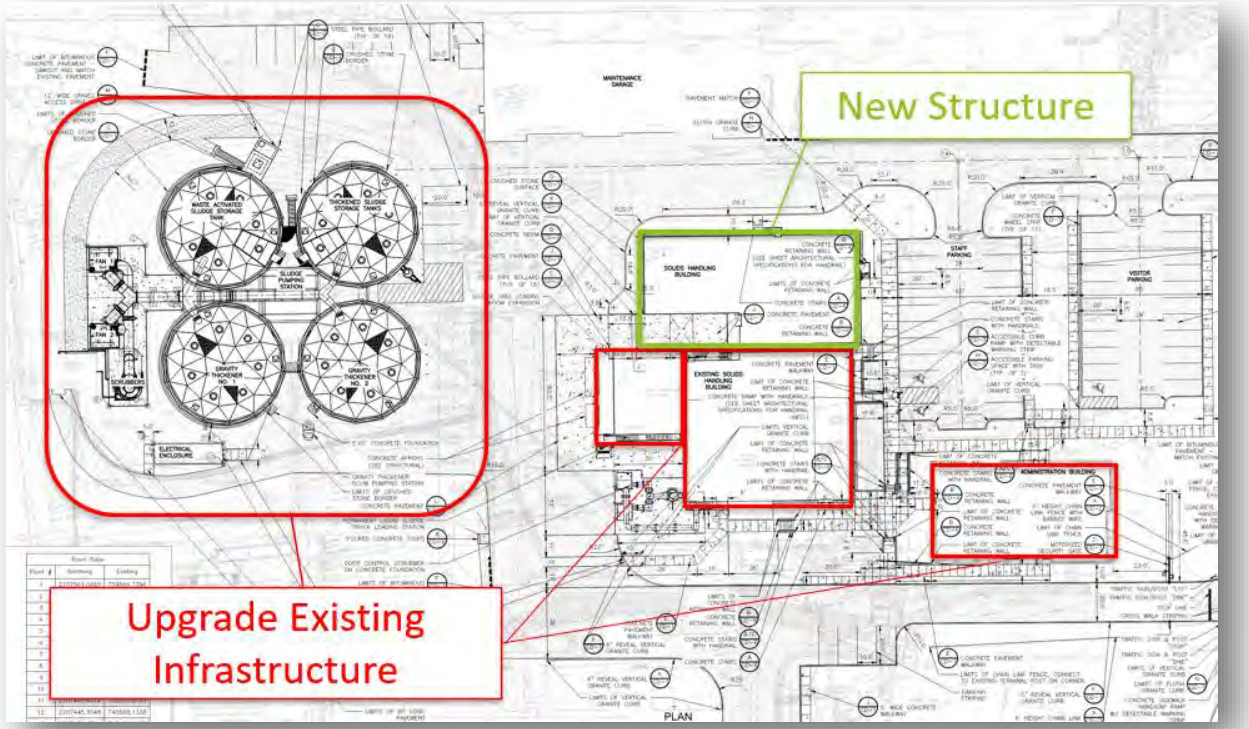




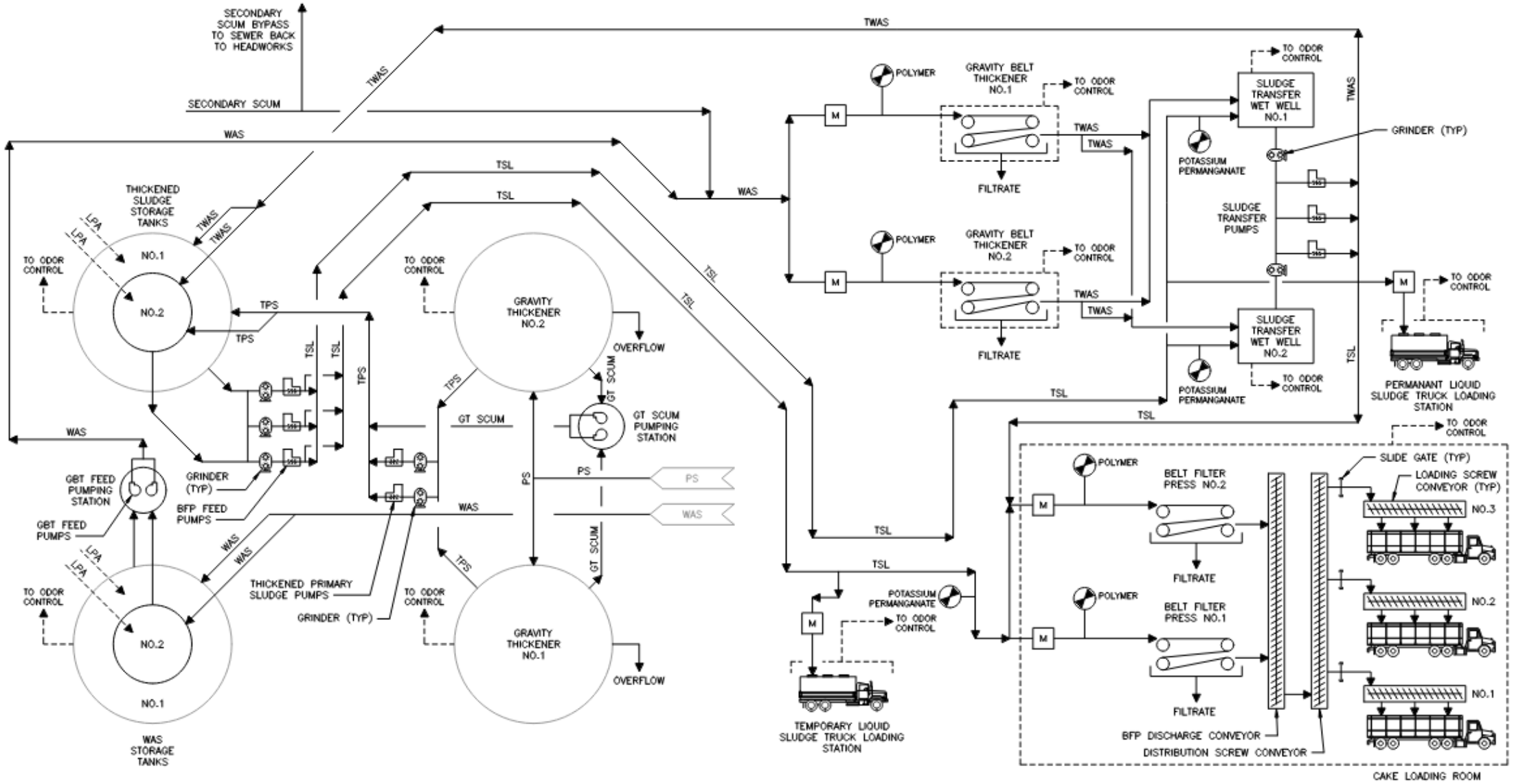
- Co-thickening GTs
- Mainly liquid hauling 1.5-3% solids
- Limited cake disposal options

WWTF Contract No. 2
Solids Handling Upgrade

- Design Considerations:
  - Current flows & loads
  - Future flows & loads (w/ HPO)
  - Future flows & loads (w/ nutrient removal)
  - Consider available disposal options and regional limitations
  - Provide versality for sludge disposal options by designing for both liquid or cake hauling and disposal
  - Improve sludge thickening and dewatering process (increase % solids; decrease truck hauls)
  - Create improved operations and maintenance facilities for staff



Process Flow Diagram



Gravity Thickener Complex

- Upgraded Configuration
  - 2 GT tanks for primary sludge thickening only
  - 1 WAS storage tank (dual ring)
  - 1 thickened sludge storage tank (dual ring)
  - Odor control system
  - Pumping systems
  - Dome covers
- Improved quality of thickened sludge
- Improved operations flexibility
- Reduce odors

Solids Handling Building

- Upgraded Configuration
  - 2 Gravity Belt Thickeners
  - 2 Belt Filter Presses relocated above cake dumpsters in lieu of long conveyors
  - Garage expanded for larger containers
  - New chemical feed systems
  - New odor control systems
    - GBT direct connection
    - BFP room connection

Facility Support Spaces

- Operations Building
  - Laboratory
  - Locker rooms
  - Office spaces
  - Control Center
  - Lunchroom

Facility Support Spaces

- Administration Building
  - Management Staff
  - Training Center

Maintenance of Plant Operations during Construction

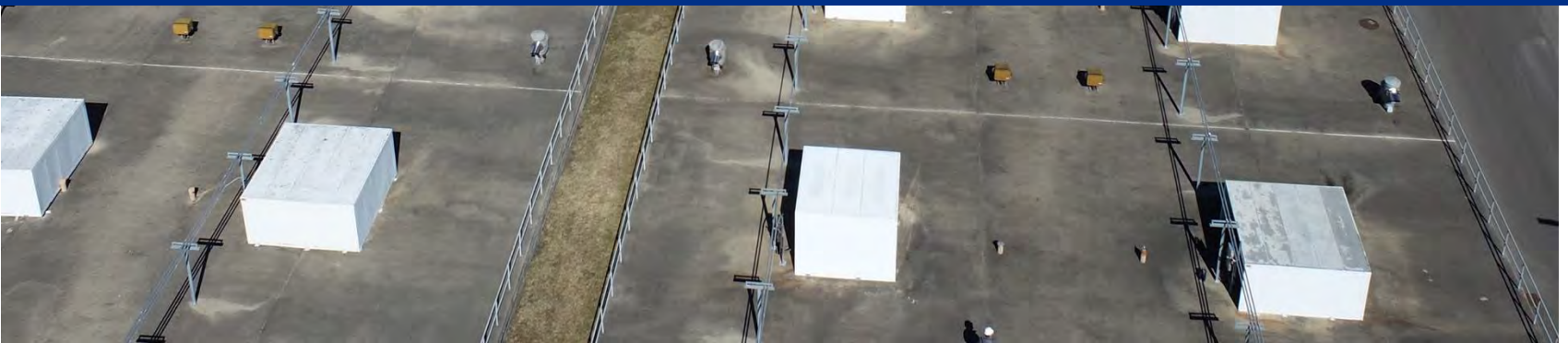
- Maintain thickening, odor control and liquid truck hauling
- Phased construction sequencing
  - SSTs upgrade, BFP demo, temporary thickening system
    - GT upgrade, GBT install
      - BFP install, conveyance and garage bay
  - Operations building construction
    - Administration building renovation
      - Site work
- Temporary Systems
  - RDT, sludge loading station, chemical and odor control systems

Overall Comparison of Optimization

- Before Upgrade w/o Incinerator
  - Co-Settling Gravity Thickeners
    - Minimal thickening 1.5-3% Solids
    - No contract for disposal
  - Belt Filter Presses
    - Redundant unit out of service
    - No contract for disposal
    - Hauling both liquid **AND** cake for disposal
      - Average liquid hauling **10-12 trucks** per day **AND**
      - Average cake hauling **2 trailers** per week

- Basis of Design Upgrade
  - Gravity Thickeners
    - Primary sludge to 4.5% solids
  - Gravity Belt Thickeners
    - WAS sludge to 5% solids
  - Belt Filter Presses
    - Combined thickened sludge to 25% cake
  - Hauling liquid **OR** cake disposal
    - Primarily cake disposal (liquid as backup)
      - Average **3 trailers** per week

Operations



GBT and BFP Startup

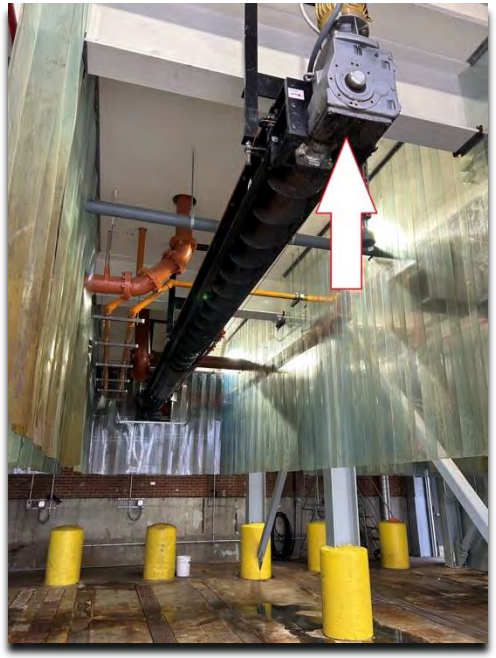
- Gravity Thickeners were not ready yet, so had to change some valve positions and install temporary piping to allow for co-blending of primary sludge with TWAS for dewatering.
- Cake started off at 20%, but then when GT's were started up, 28-30% cake.
- Where to bring 3,600 dry tons/year of cake?

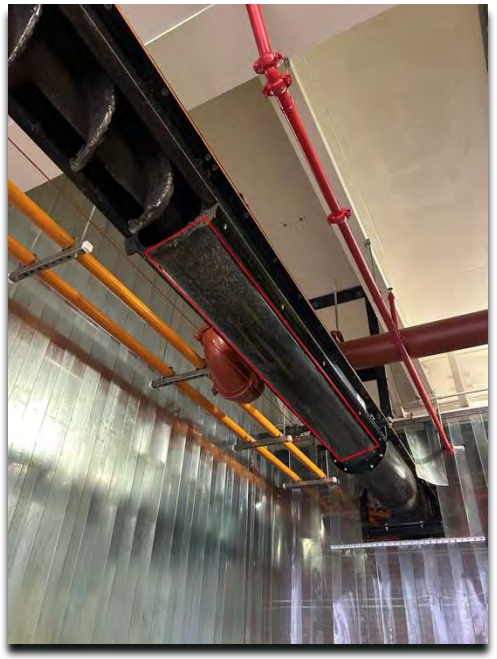
Disposal Decision

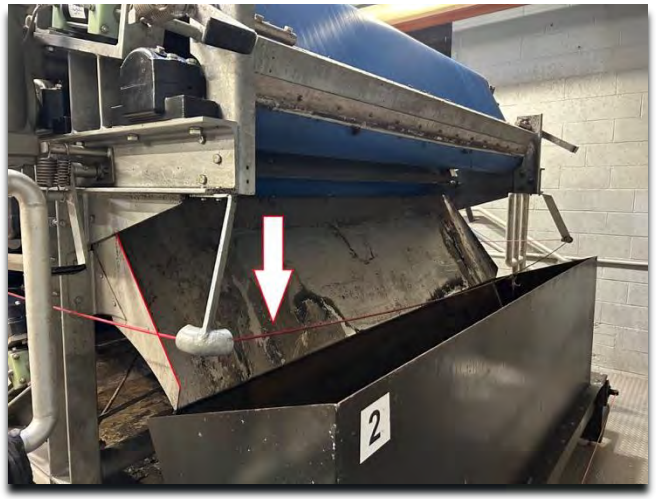
- Inframark researched options for disposal of sludge cake resulting in agreement with Synagro's EPIC division.
- Sludge cake is trucked to Westborough, MA, then put on rail to the Tunnel Hill Reclamation Landfill in Ohio.
- Fall River was 1st in region to implement this solution.

Equipment Tweaks

- Raise screw spreader a few inches to get trailer/bin to fit.
- Extended chute over spreader to reach shorter bins.
- Cake was getting hung up, so we increased the angle of BFP chute.







Safety First

- Needed to access top of bin to remove covers, so:
- Purchased scaffolding from HD and creatively assembled so operators can remove cover safely and efficiently.
- Liner installed in bin to ensure smooth exodus of cake when dumping at landfill.

Add-Ons

- As a result of successful cake disposal program, Fall River increased the scope:
- Built a vactor dump pad allowing for all collection system debris to go to EPIC.
- Including grit and rag bins from the headworks operation.

Questions & Discussion

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