



Tertiary Filtration and Disinfection Improvements at Whitecap WWTP



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TACWA - Corpus Christi
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Syllabus What to Expect



Whitecap WWTP 101



Some History



Some Science



The Challenges



The Solutions

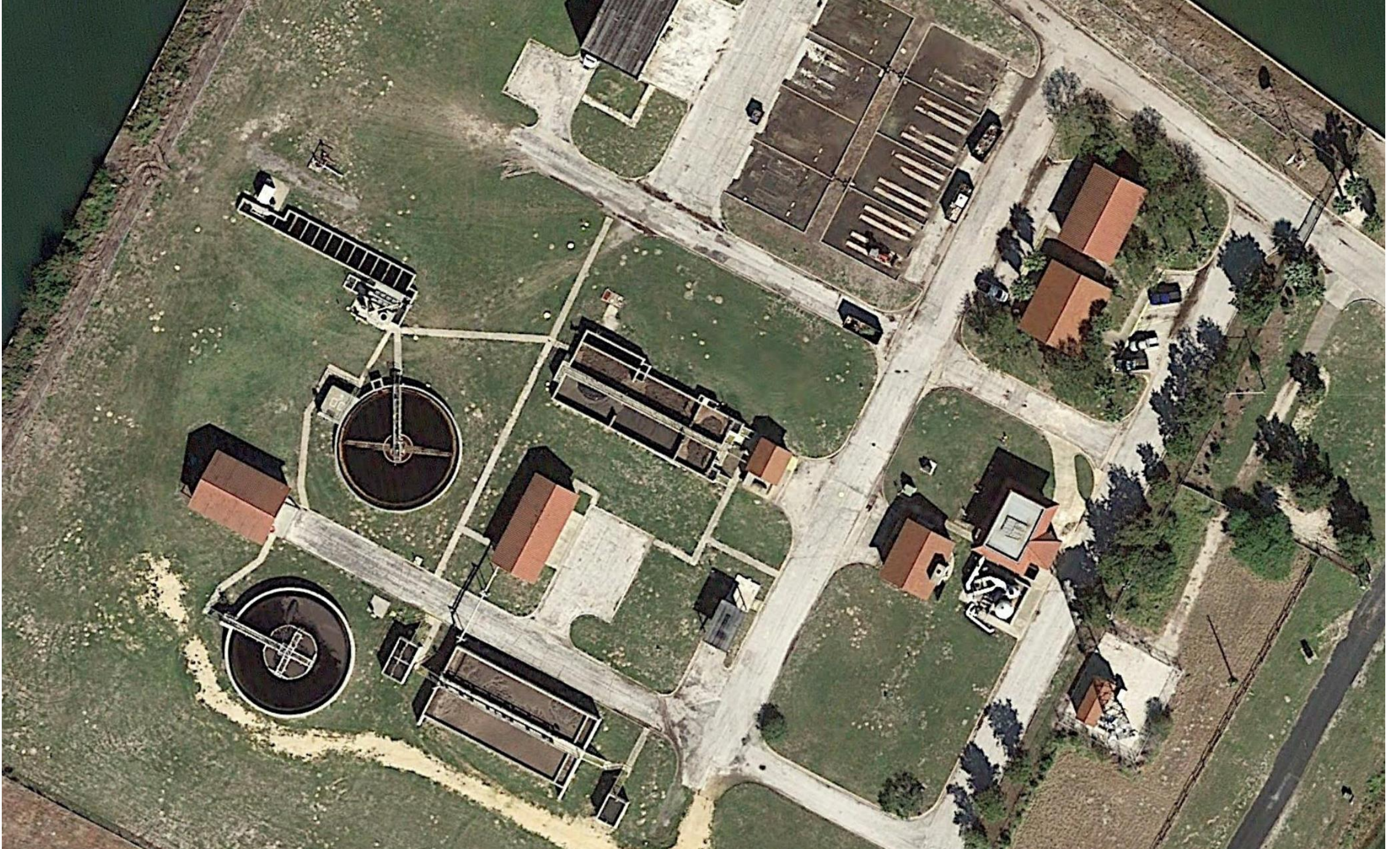


Design & Implementation

Whitecap WWTP

- Permit Limits
 - 2.5 MGD / 7.5 MGD
 - 20 mg/l BOD
 - 20 mg/l TSS
 - 35 CFU or MPN / 100 ml Enterococci

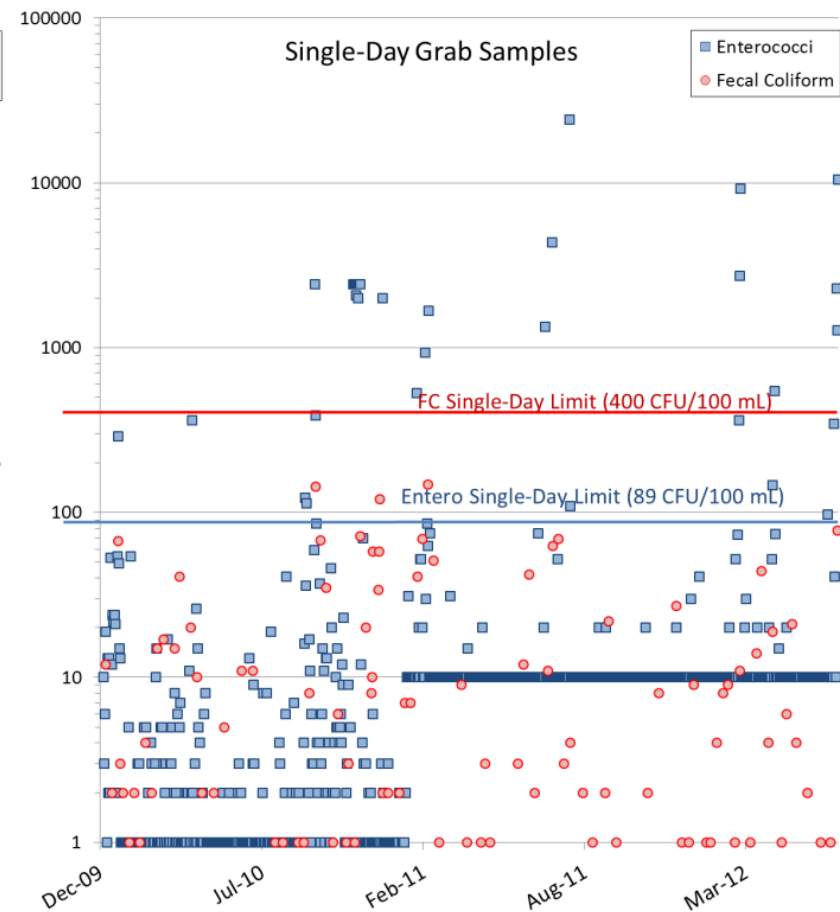
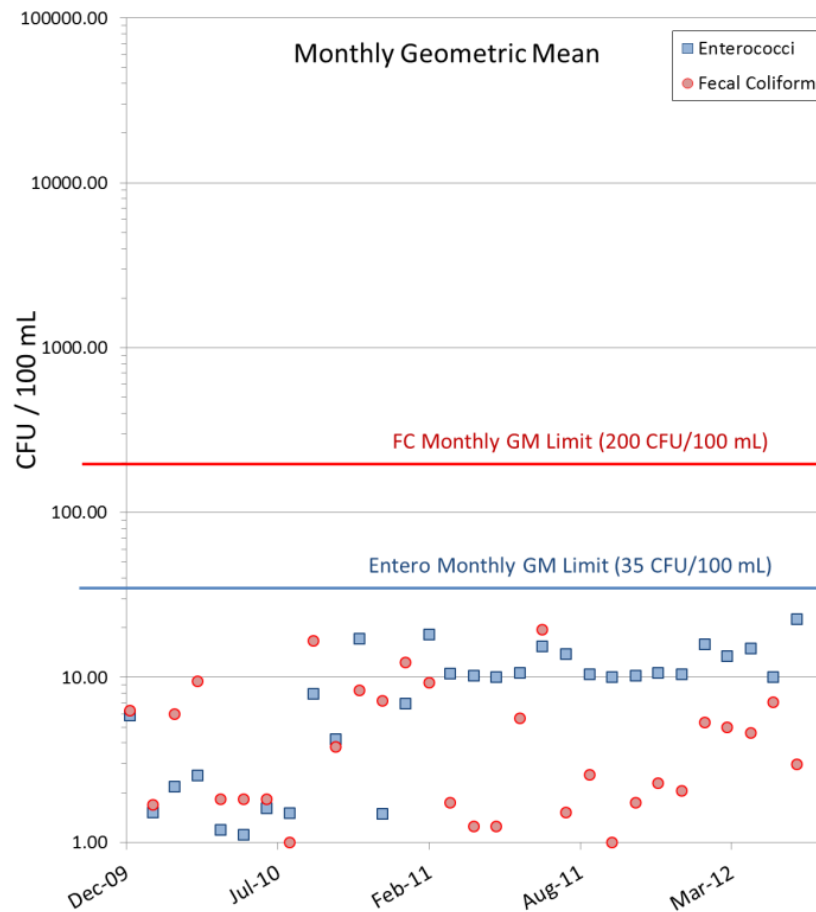




Permit History

Permit Period	Indicator Organism	Monthly Geometric Mean (CFU / 100 ml)	Daily Max (CFU / 100 ml)
Prior to 2009	Fecal Coliform	200	400
2009 to 2014	Enterococci	35	89
2014 to Current	Enterococci	35	104

Enterococci Exceedances



UV Disinfection

- UV wavelengths targeted for DNA inactivation in bacteria and viruses
- Key Factors
 - Transmittance (UVT)
 - TSS

4 TSS Permit Violations

UVT Grab Samples

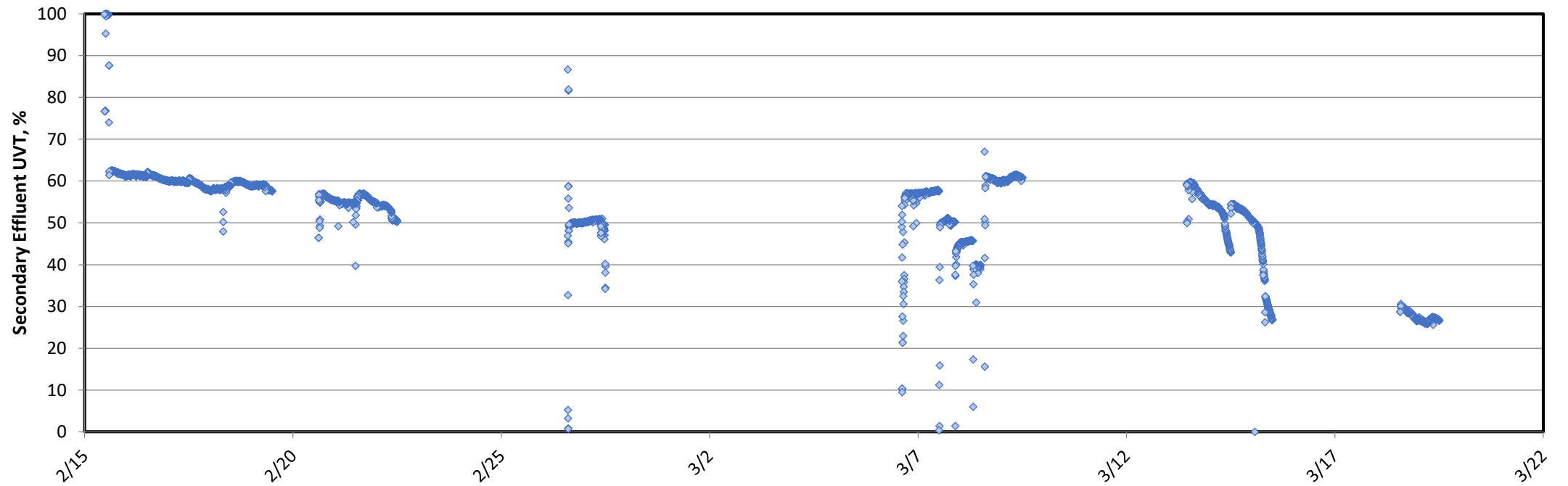
44%

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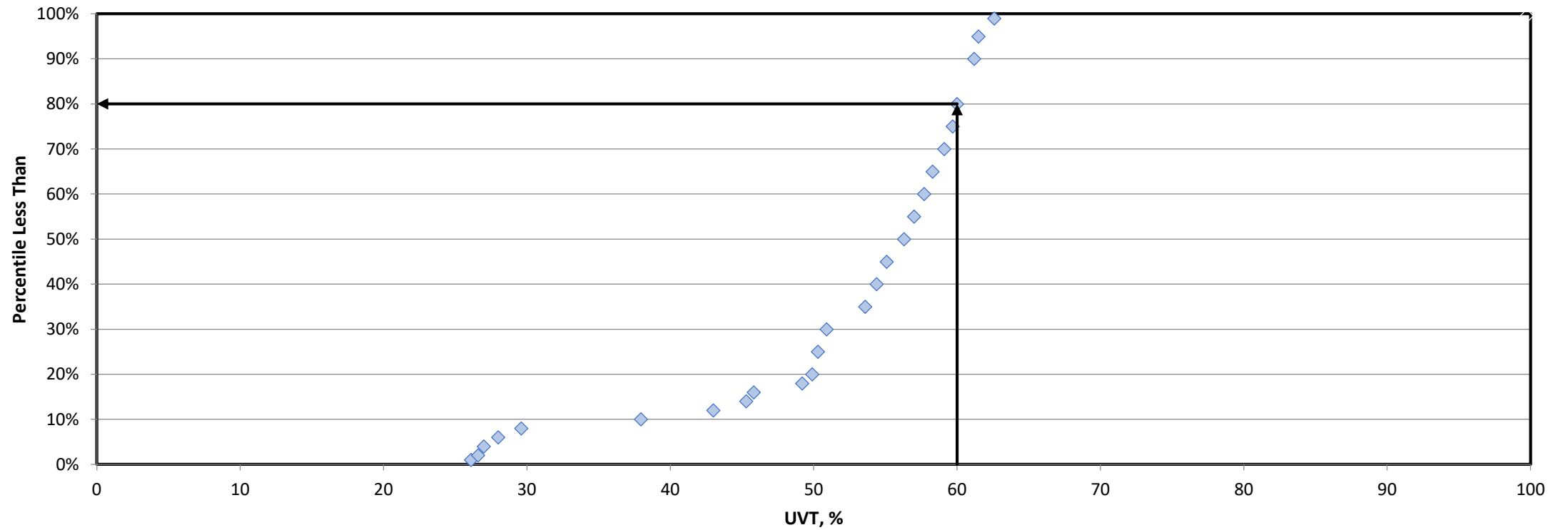
UVT Study

Continuous UVT Sampling



UVT Study

Continuous UVT Sampling



The Challenges

- Insufficient Deactivation of Enterococci
 - Low UVT
 - High TSS





Addressing Low UVT

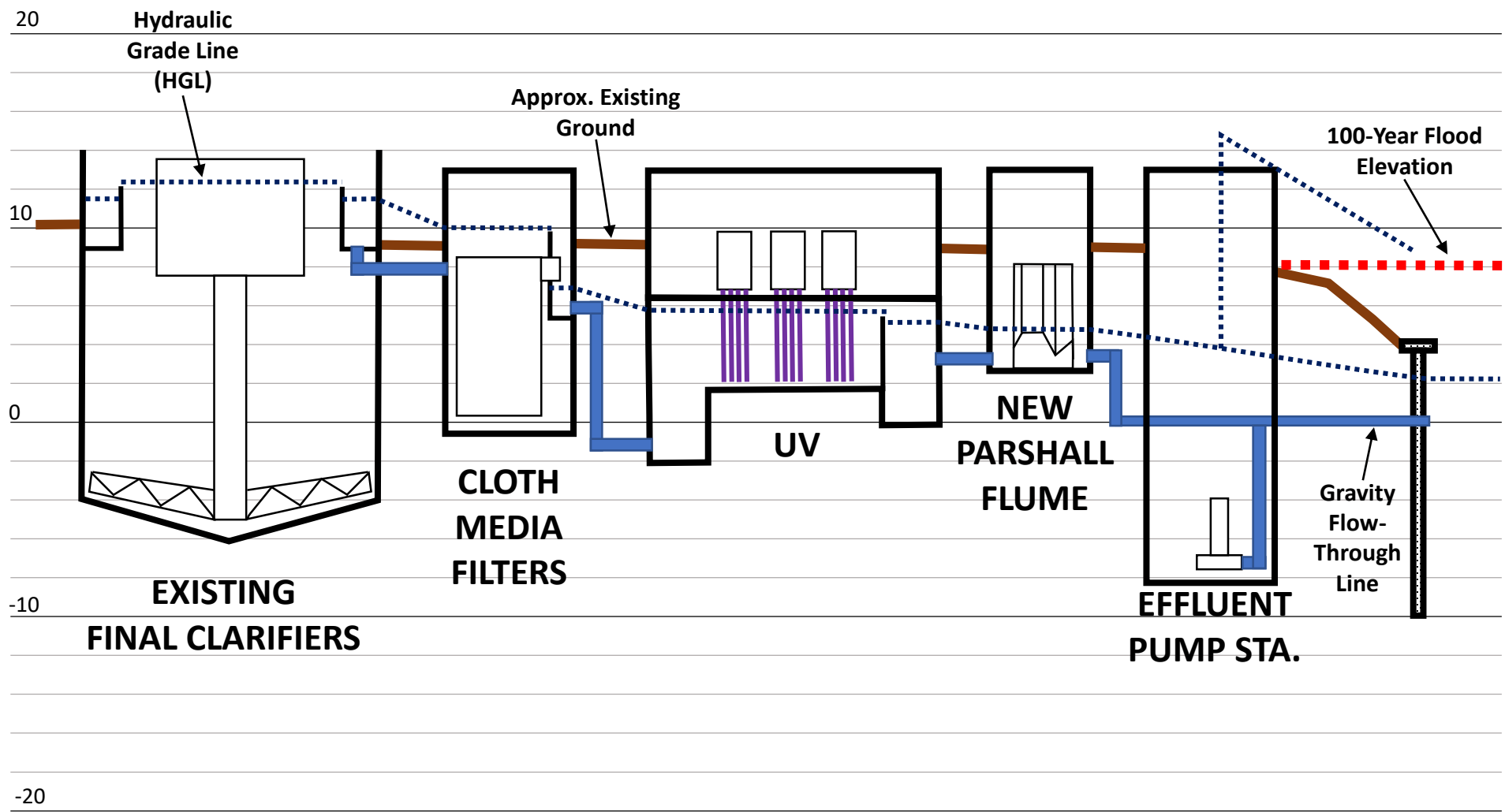
- Option 1 – More UV
- Option 2 – New UV



Addressing High TSS

- Tertiary Filtration – Cloth Disk Filters
 - TSS/Turbidity Reduction
 - BOD Reduction

The New Challenge



Project Scope



Tertiary Filters

Filter Basins
Canopy
EI&C



New UV Disinfection System

UV Channels
Canopy
EI&C



Effluent Re-Lift Pump Station

Automatic Bypass
Submersible
Pump Station
New Discharge
Piping



Process & Equipment Selection - Filters

- Automatic Backwash Function
- Minimize Headloss
- Forward Filtration During Backwash
- Two Manufacturers were Pre-Selected

Filter Design

- 3 Filter Basins / 15 “Disks”
- Firm Capacity of 7.5 MGD
- Automatic Backwash
- Currently Producing < 0.8 NTU Filtrate





Process & Equipment Selection - UV

- Vertical Configuration
- Low Pressure / High Output
- Smart Ops / Flow Pacing
- Mechanical Cleaning & Air Scour Mechanism

- One Manufacturer Pre-Selected

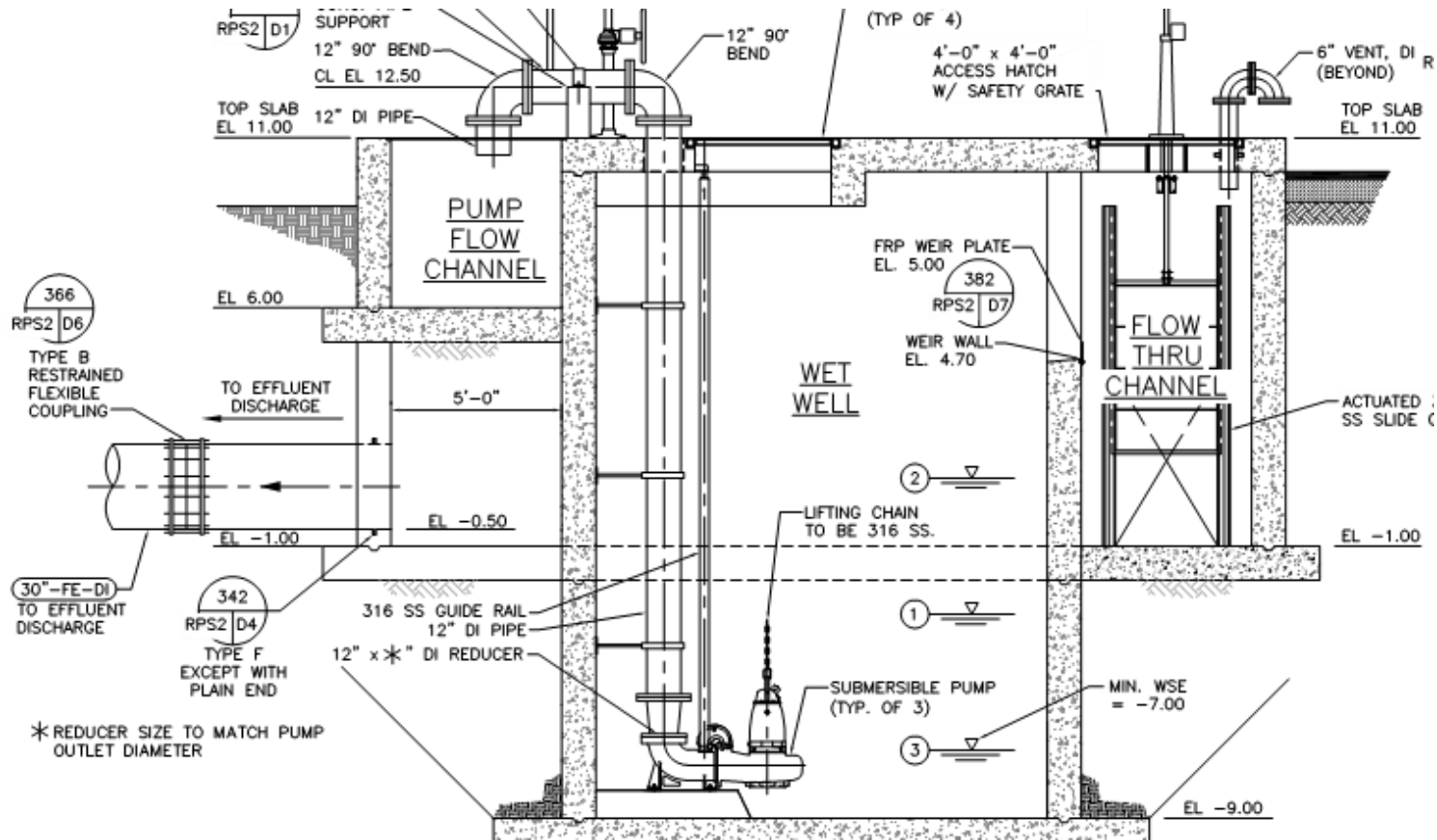
UV Design

- 2 New Channels
- 3 Modules per Channel (1 Standby)
- Low Pressure – High Output Lamps
- Appurtenances:
 - Canopy
 - Motorized Jib Crane & Hoist
 - Air Compressor
 - Chemical Dip Tank
 - Independent Channel Drains



UV Canopy Design

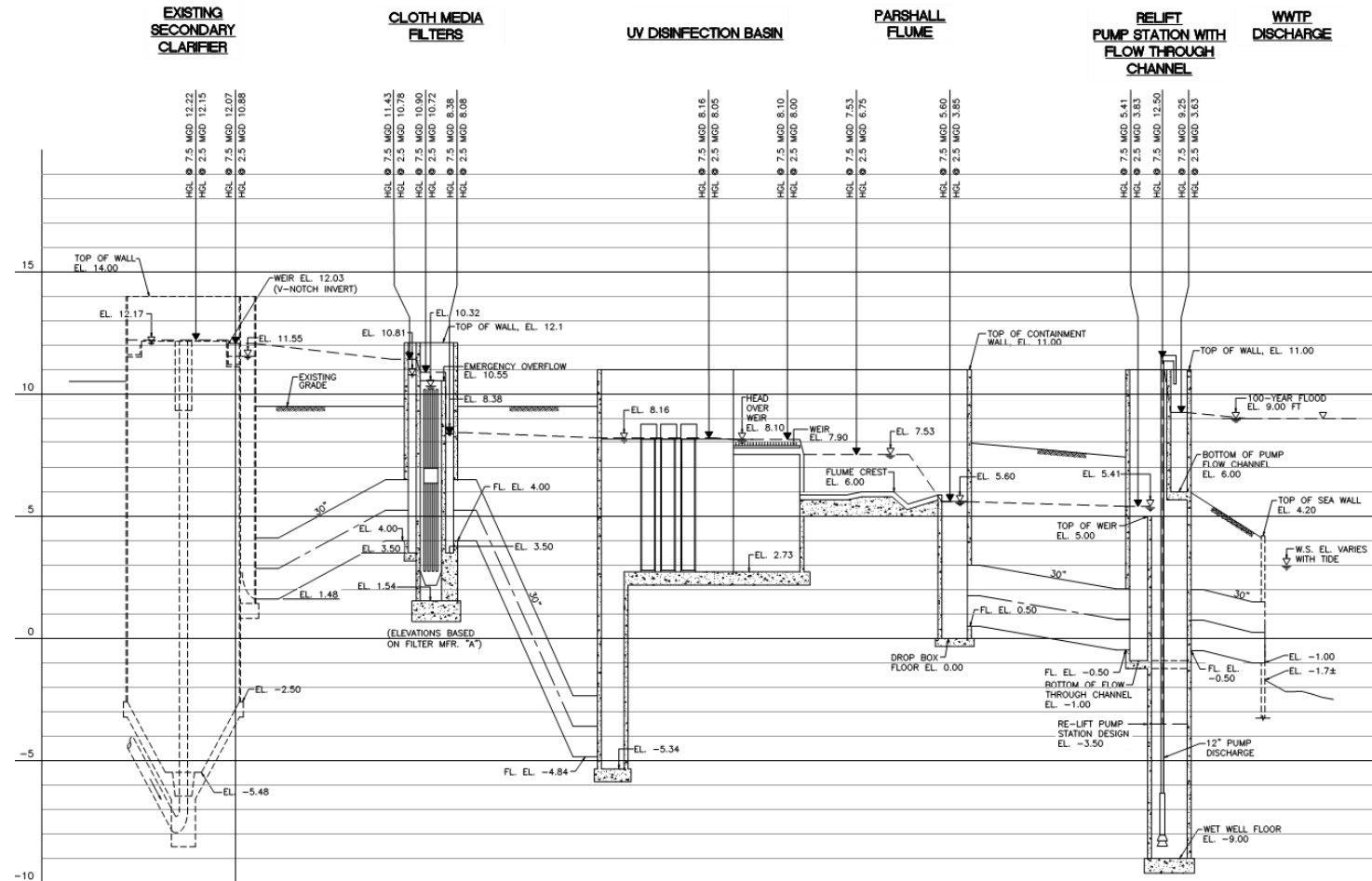




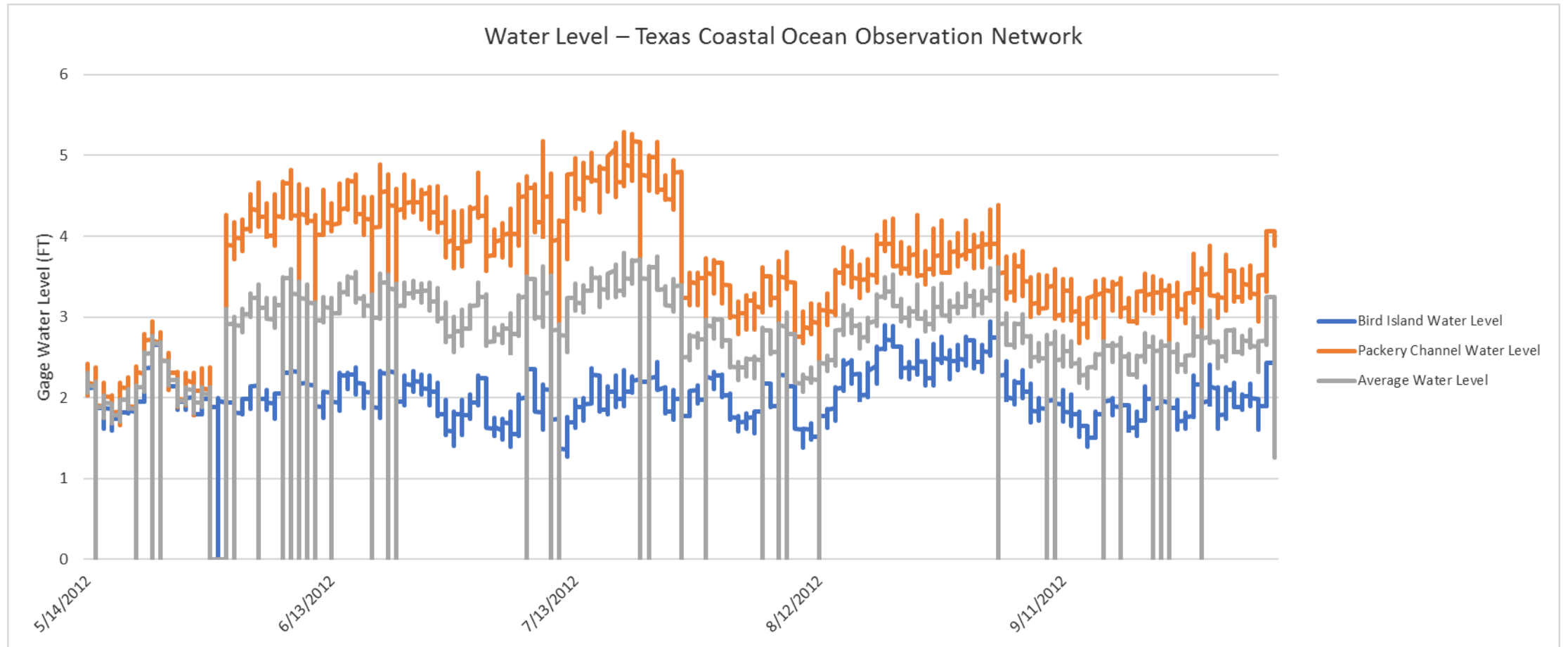
- Bob Carle said "Flygt"

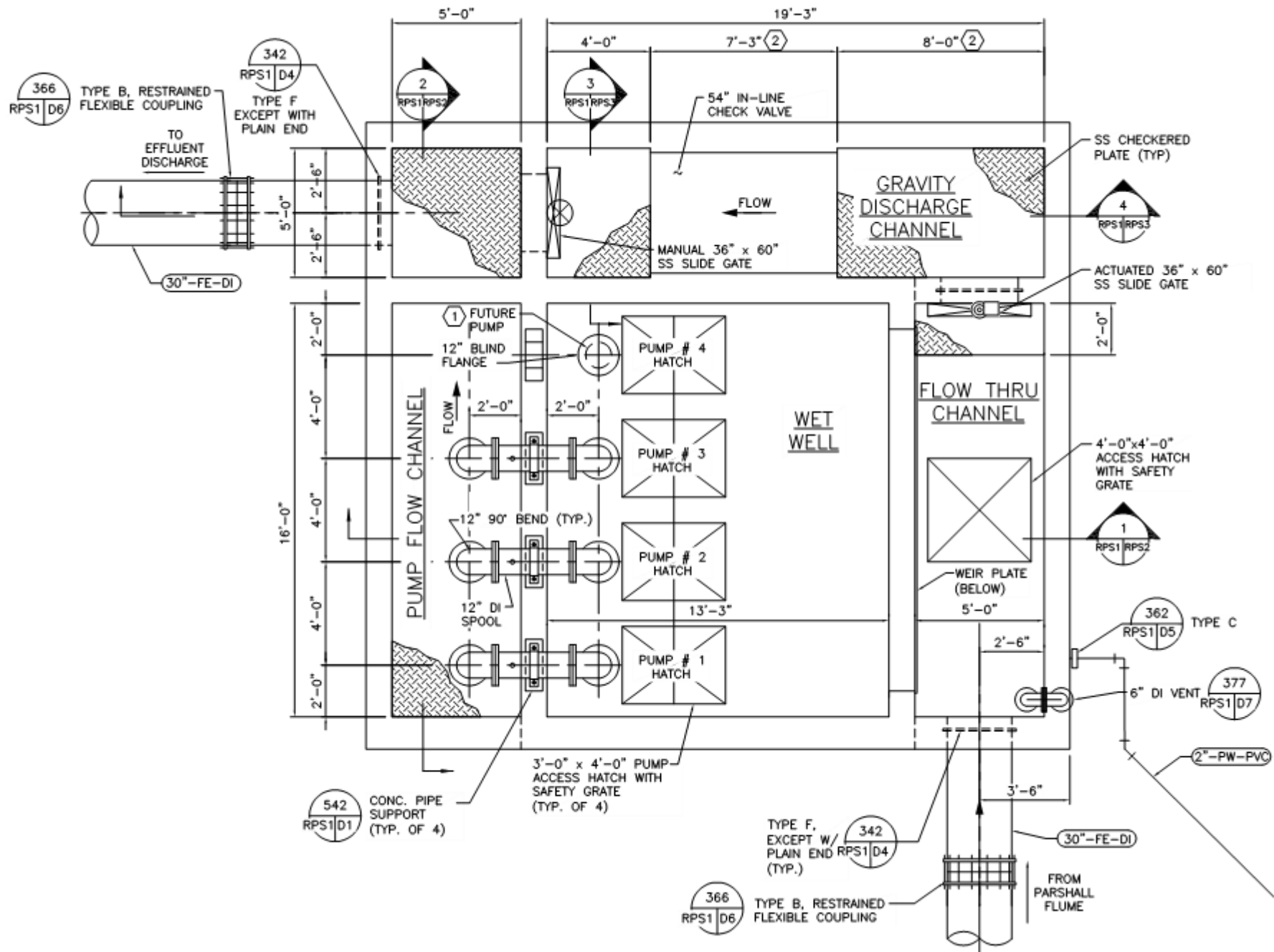
Process & Equipment Selection - Pumps

Re-Lift PS Design



Re-Lift PS Design







Other Improvements

- Electrical Building
- Backup Generator
- Fuel Tank



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