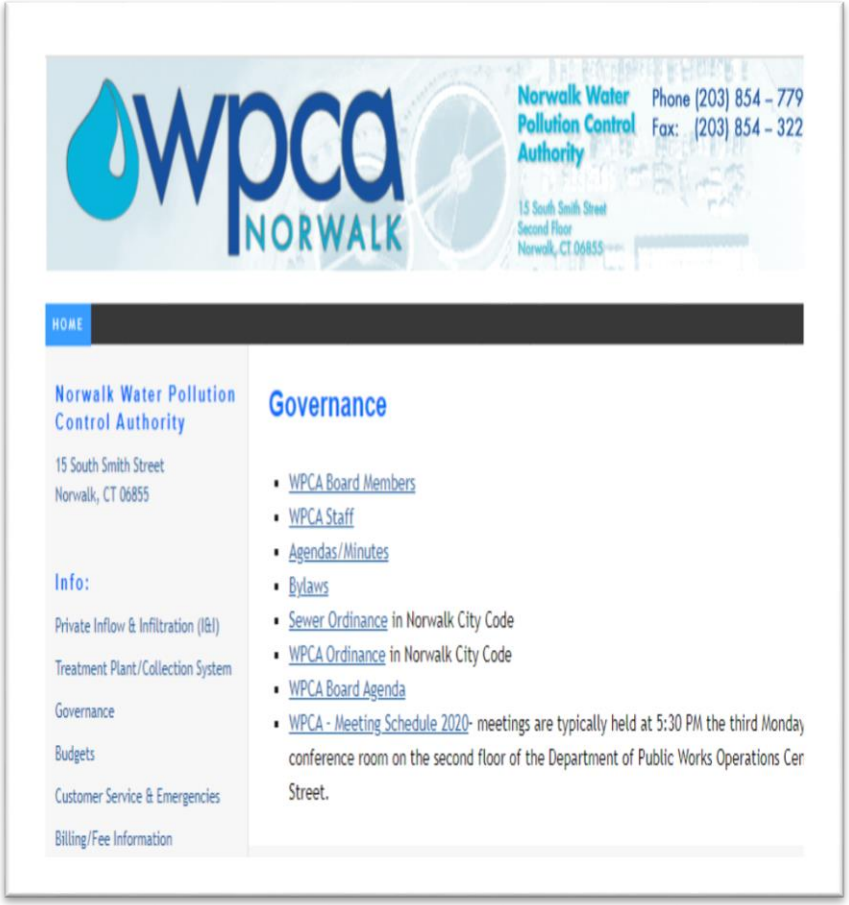
City of Norwalk
NPDES Permit Renewal

City of Norwalk
Water Pollution Control Authority (WPCA)

- **Water Pollution Control Authority**:
  - Enterprise Fund ~ $19MM Operating Budget
  - Staff members – 3 persons
    - Customer Service: 203-854-3200
  - Board of Directors – 9 persons
  - Ex Officio members – 2 persons
  - SUEZ - Contract Operator
    - Sewer Emergency: 203-943-0222 (24/7)
  - Meetings are held 3rd Monday of the month
    - www.wpcanorwalk.org
- **Wastewater System - Primary Components:**
  1. Collection System
  2. Pump Stations
  3. Wastewater Treatment Plant (WWTP)

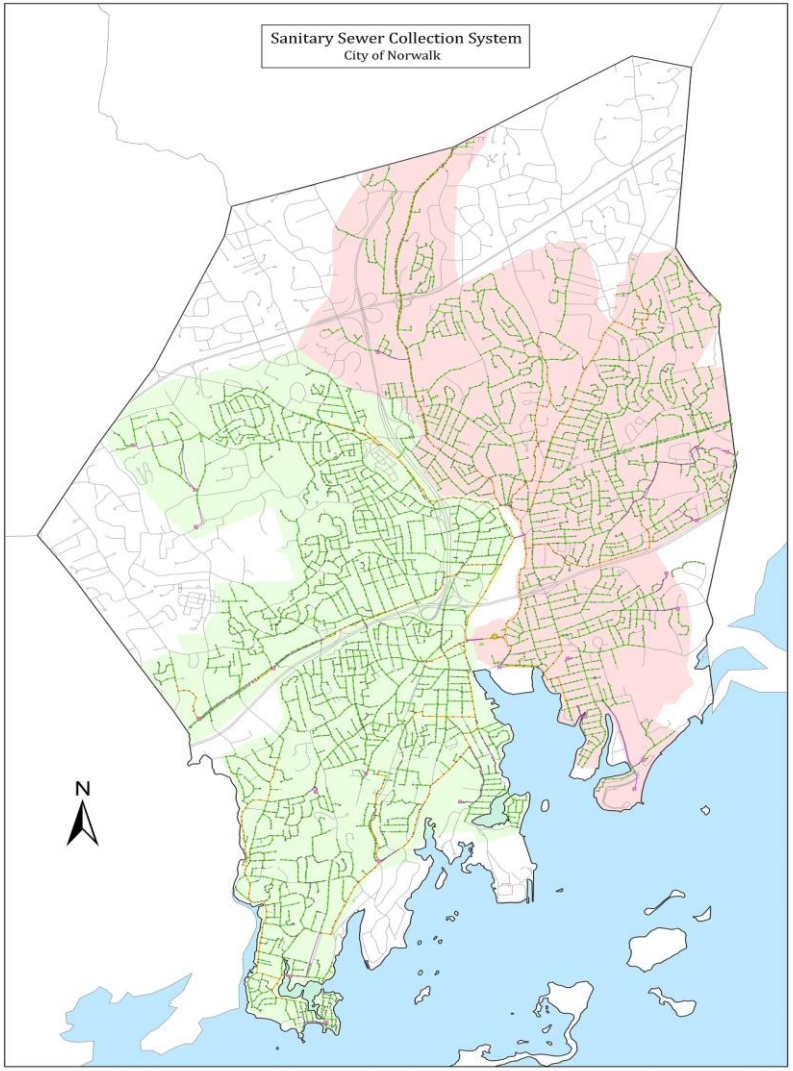


NPDES Permit Renewal Application

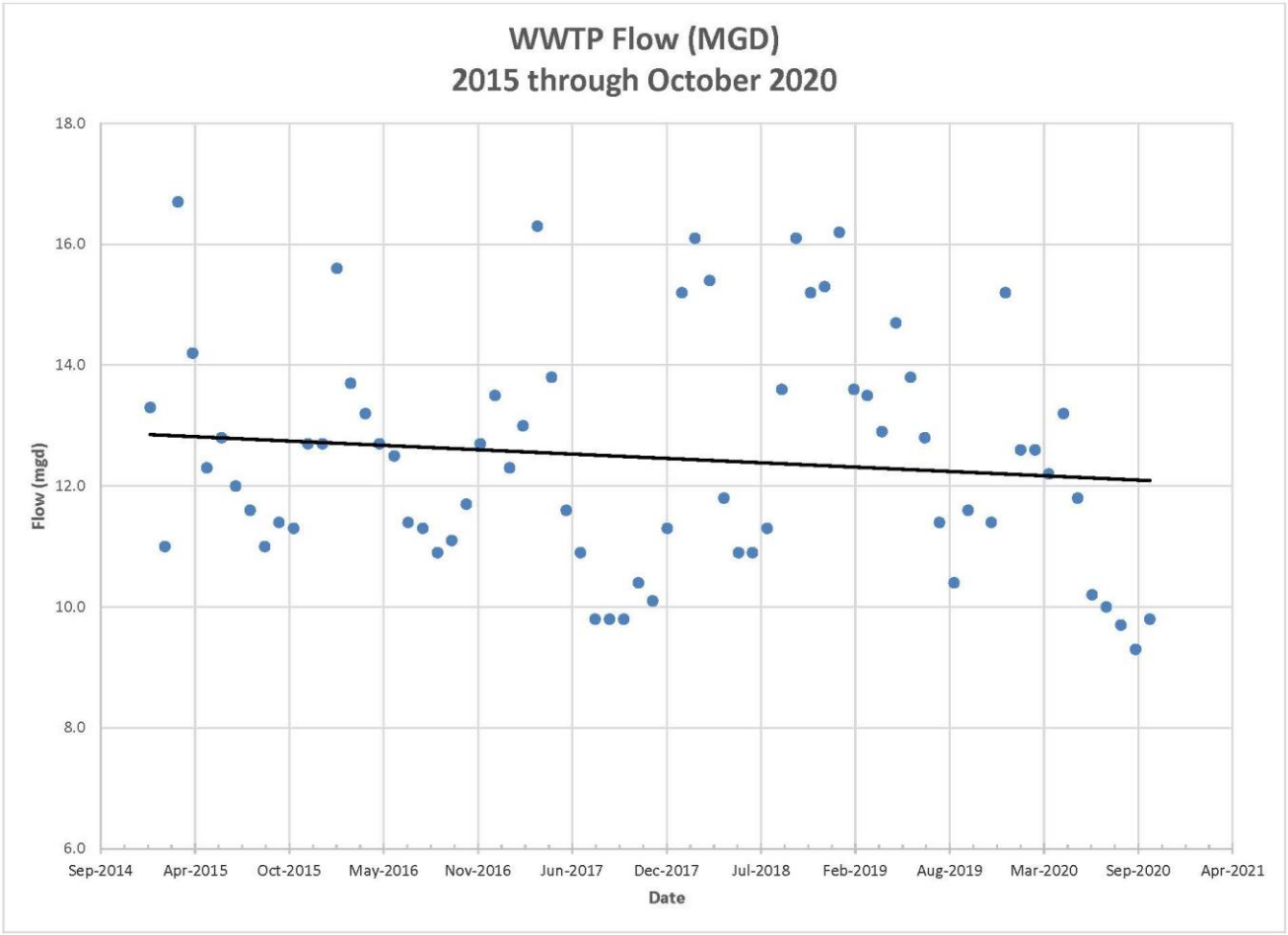
- On September 8, 2018, the WPCA submitted NPDES renewal application No. CT201812006 to the DEEP on behalf of the City of Norwalk prior to the September 24, 2018 renewal deadline.
- On October 17, 2018, the DEEP provided the WPCA with notice that the NPDES application was complete and ready for review for technical adequacy.
- The notice also confirmed that the WPCA's existing NPDES permit would continue in force and effect beyond its March 23, 2019 expiration date until such time as the Commissioner of DEEP issued a final determination on the renewal application.
- On September 9, 2020, the DEEP issued a Notice of Tentative Determination to Approve the renewal application and a draft NPDES permit.
- On October 8, 2020, the WPCA provided the DEEP with comments on the draft NPDES permit. The DEEP also received a petition for a public hearing and a request to extend the comment period which was granted until November 8, 2020.

Collection System

- **Service Area**:
  - City of Norwalk
  - Town of Wilton ~ 4% of total flow
  - Town of Westport (11 customers)
- **Norwalk System**:
  - Gravity mains ~205 miles (6” to 72” dia.)
  - Gravity assets ~6,500
  - Manholes ~6,400
  - Force mains ~6.7 miles
  - Major siphons – 2 locations
- **Total Average Flow**:
  - 11.5 MGD - 1-yr average
  - 12.6 MGD – 3-yr average



Collection System Flow



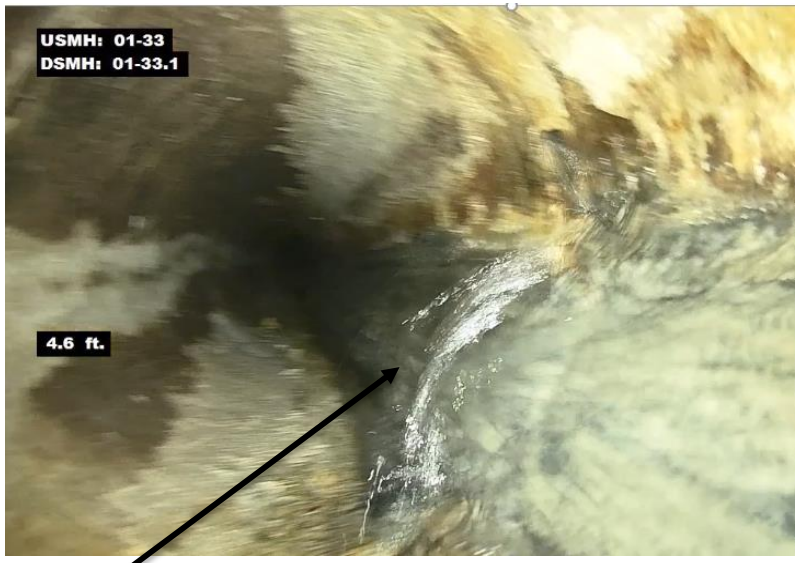
Collection System Highlights

- **Current Projects:**
  - Selection of new collection system consultants ~$1.25MM
  - Sanitary Sewer Various Locations Improvements ~ $6.3MM
    - *CIPP Lining ~ 46,000 ft of gravity sewer*
    - *Excavation ~ 1,500 ft of gravity sewer*
- **Recently Completed Projects:**
  - Westport Avenue Force Main Discharge Relocation ~$126k
  - Ann Street Siphon WWTP sluice gate automation
  - Beacon Street Interceptor Service Area Rehabilitation ~$2.7MM
- **Pollutant Source Tracking:**
  - Partnership with Harbor Watch
  - Dick Harris and Norm Bloom and Son (Copps Island Oysters)
  - CTDEEP / EPA
- **Capacity, Management, Operation, and Maintenance (CMOM):**
  - Annual report to EPA and CTDEEP

Collection System
Inflow and Infiltration (I/I) - Infiltration Elimination

- What is Inflow and Infiltration?
- Elimination of Infiltration
  - CCTV Inspections – 2 miles/month minimum
  - CIPP Lining
  - Excavation Repairs
  - Manhole Sealing

CCTV Mobile Camera



Infiltration Identified by CCTV

Collection System
CCTV Footage Used to Eliminate Infiltration

Collection System
Sanitary Sewer Various Locations Improvements Project
Cured-in-Place Pipe (CIPP) Lining

Pre Lining – 8-inch VCP
Midrocks Drive – Easement

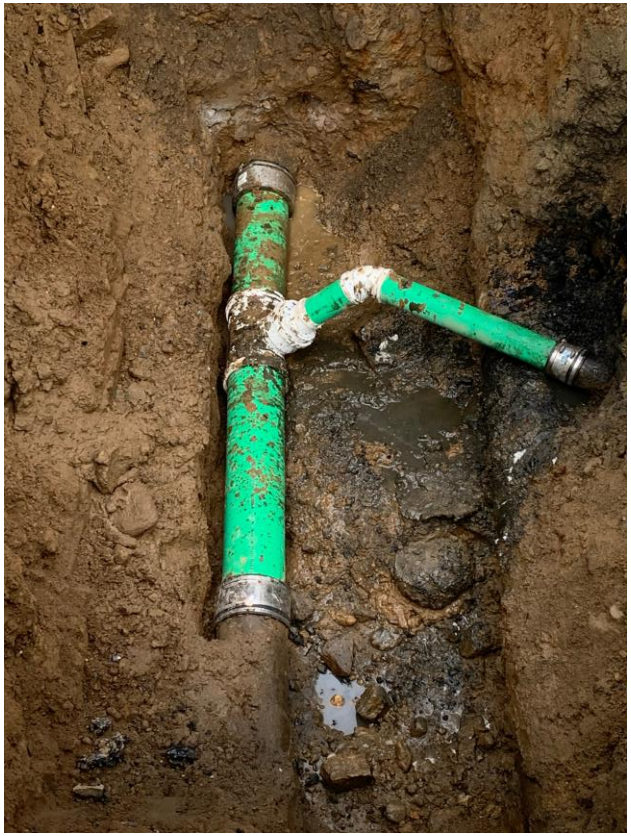
Post Lining
Midrocks Drive - Easement

Collection System
Sanitary Sewer Various Locations Improvements Project
Cured-in-Place Pipe (CIPP) Lining

Pre Lining – 8-inch VCP
Raymond Street

Post Lining
Raymond Street

Collection System
Sanitary Sewer Various Locations Improvements Project
Excavation Repairs



Deformed/broken pipe replaced with PVC pipe and shielded banded couplings

Collection System
Sanitary Sewer Various Locations Improvements Project
Manhole Rehabilitation

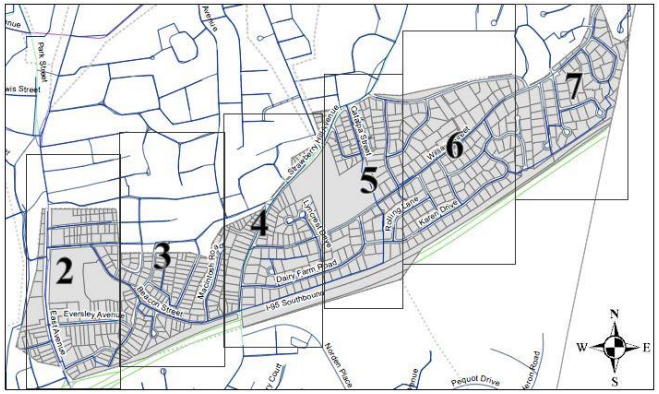
Before

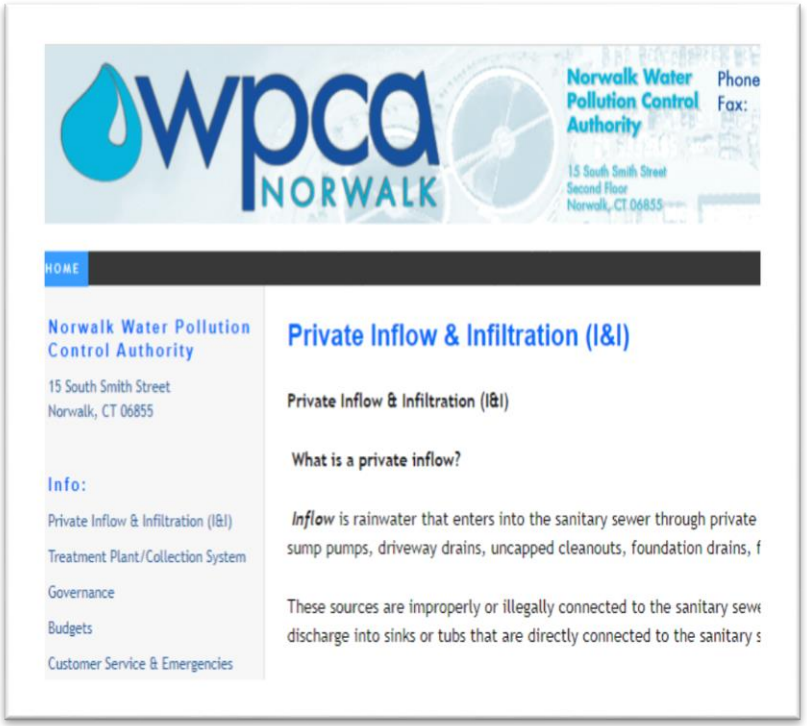
After

Collection System
Westport Avenue PS Force Main Discharge Relocation

Collection System
Inflow and Infiltration (I/I) - Inflow Elimination

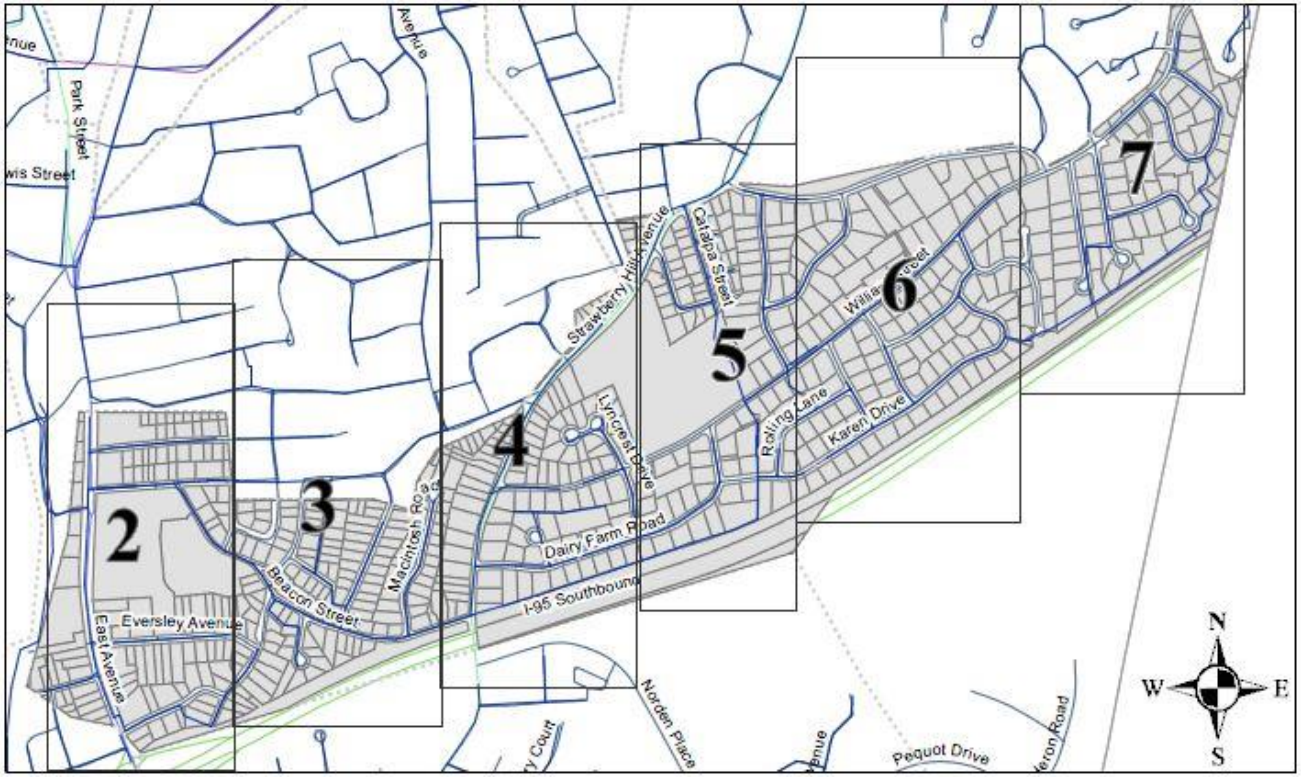
- Elimination of Inflow
  - Sewershed-wide rehabilitation projections
  - 2 catch basins disconnected in 2020
  - Educational materials re: Inflow - WPCA Website
    - www.wpcanorwalk.org/inflow-infiltration
  - Smoke testing and Dye testing when necessary



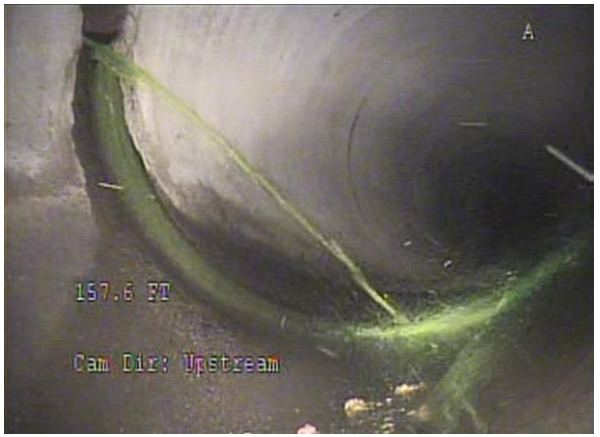


Collection System
Beacon Street Interceptor Service Area Rehabilitation Project

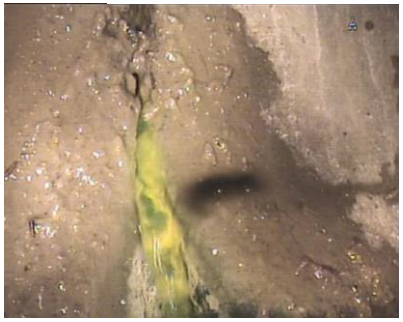
- *Service Area ~ 6.6 miles*
- *CIPP Lining ~ 26,000 ft of gravity sewer*
- *Test and seal ~ 700 joints and ~400 laterals*



Collection System
Pollutant Source Tracking

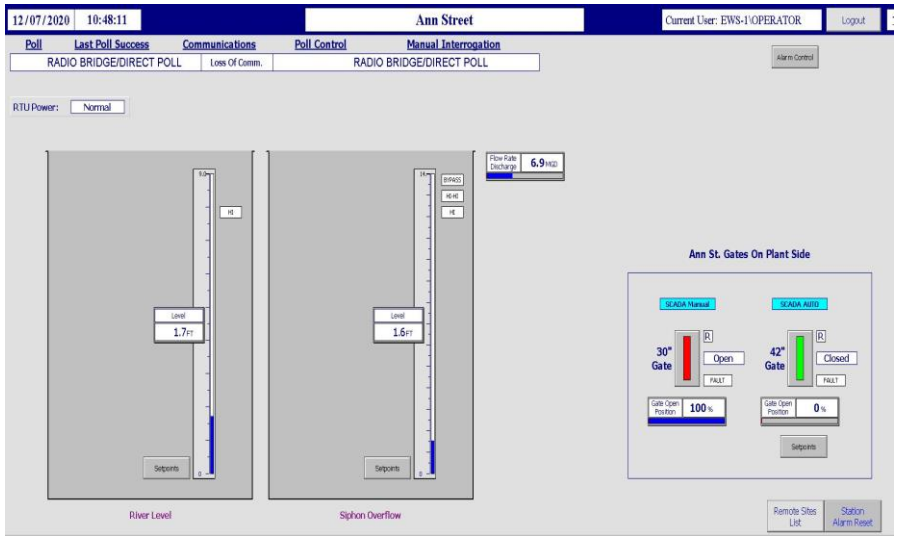


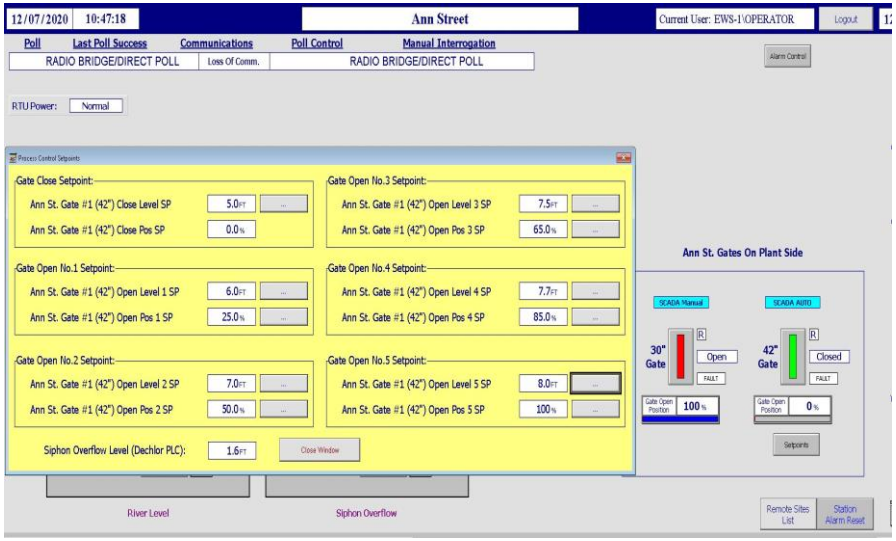
HARBOR WATCH
at Earthplace



Collection System
Norwalk Shellfish Education

Collection System
Ann Street Siphon - WWTP Sluice Gate Automation





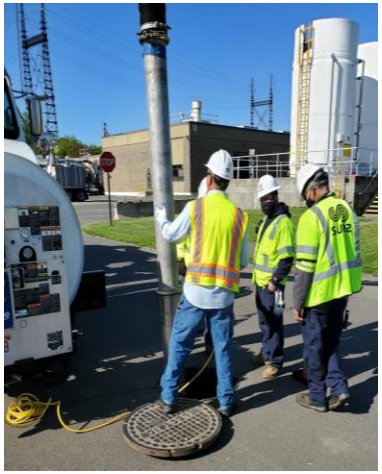
Collection System

- Future Projects:
  - 2 Knight Street Interceptor Relocation and Improvement ~$1.8MM
  - Smith Street 36” Sanitary Sewer Interceptor Rehabilitation – CIPP Lining
  - Shady Beach Pump Station Force Main Rehabilitation – CIPP Lining

Collection System Contract Operator

- SUEZ – New Contract Operator – May 18, 2020
  - New Collection System equipment: CCTV Truck, Jet/Vactor Truck, Pole camera
  - New Technology: SL Rat, Smart Covers, IT Pipes
  - New GIS Position
  - Sewer cleaning, cctv inspection and PACP scoring monthly requirements
  - Industrial Pretreatment Program: SUEZ sampling, testing and reporting ~475 locations annually

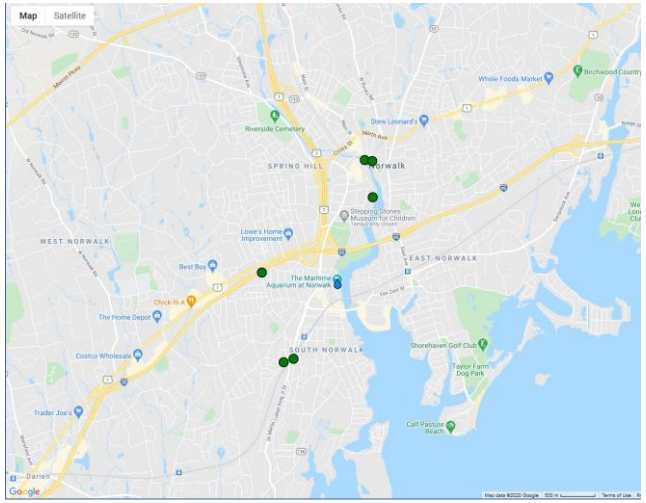
Collection System
New Collection System Equipment



Vactor Truck and Personnel

CCTV Truck and Equipment

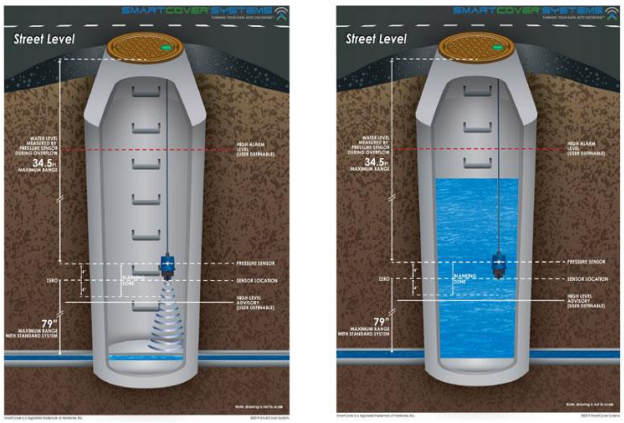
Collection System
Innovative Equipment - Smart Covers



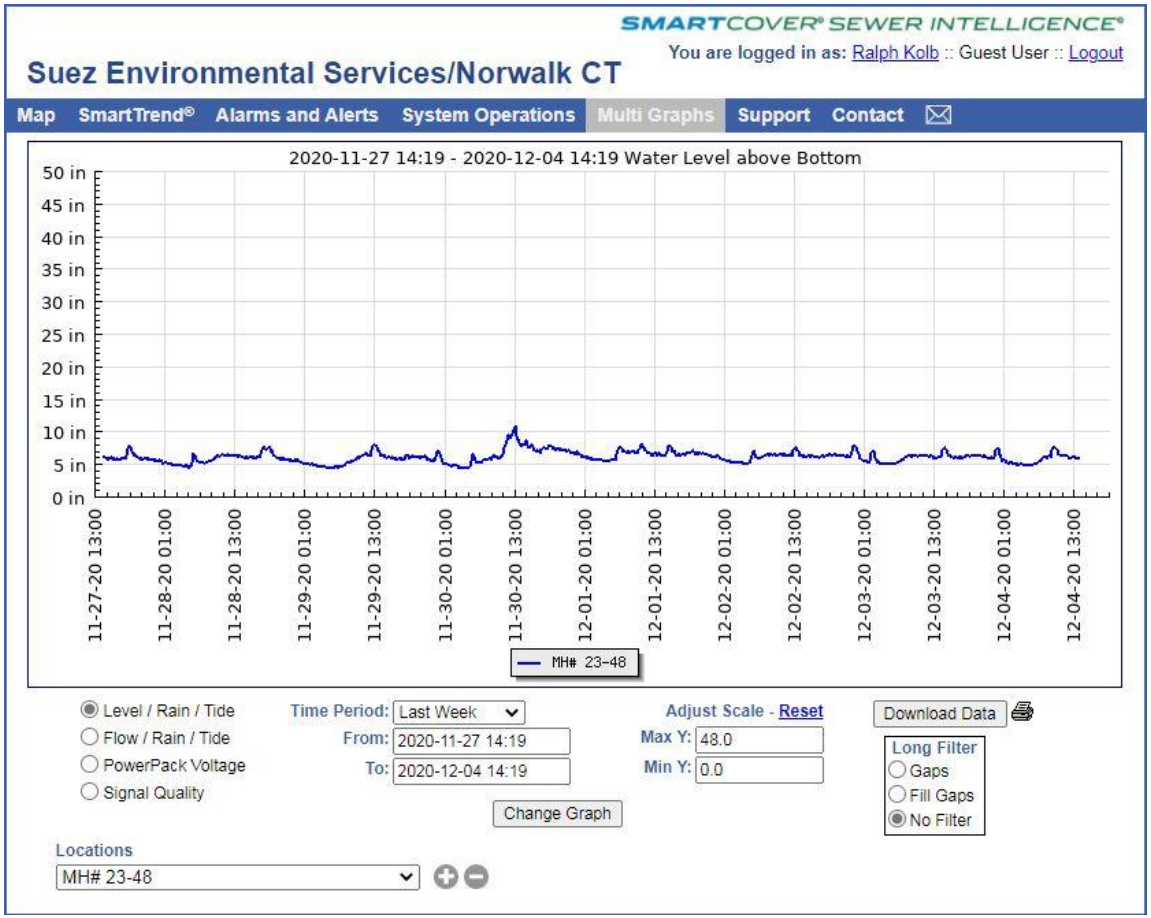
Location Map

Unsubmerged – low water levels

Submerged – high water levels

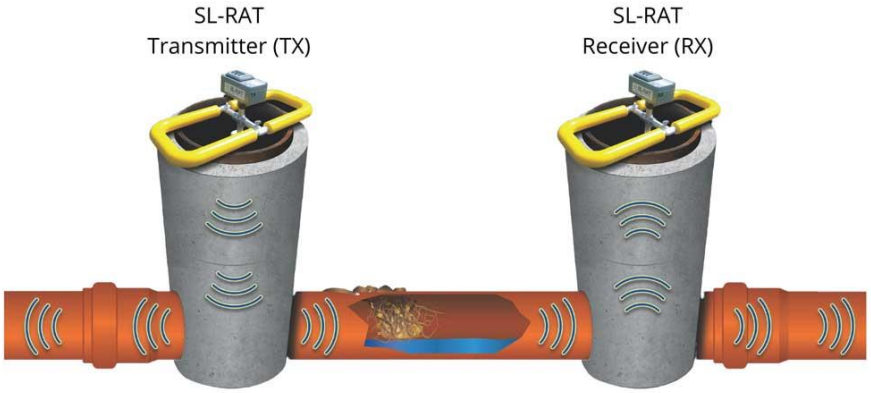


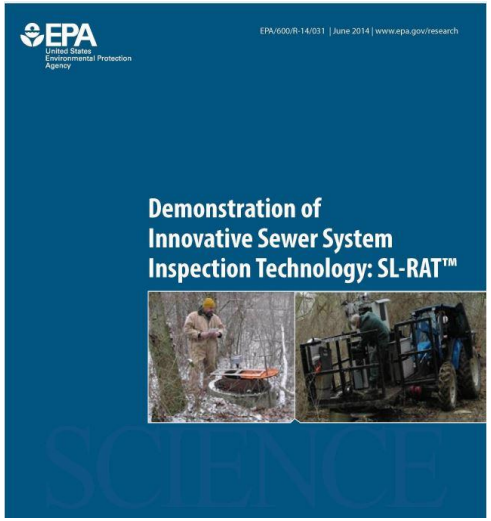
Smart Cover System

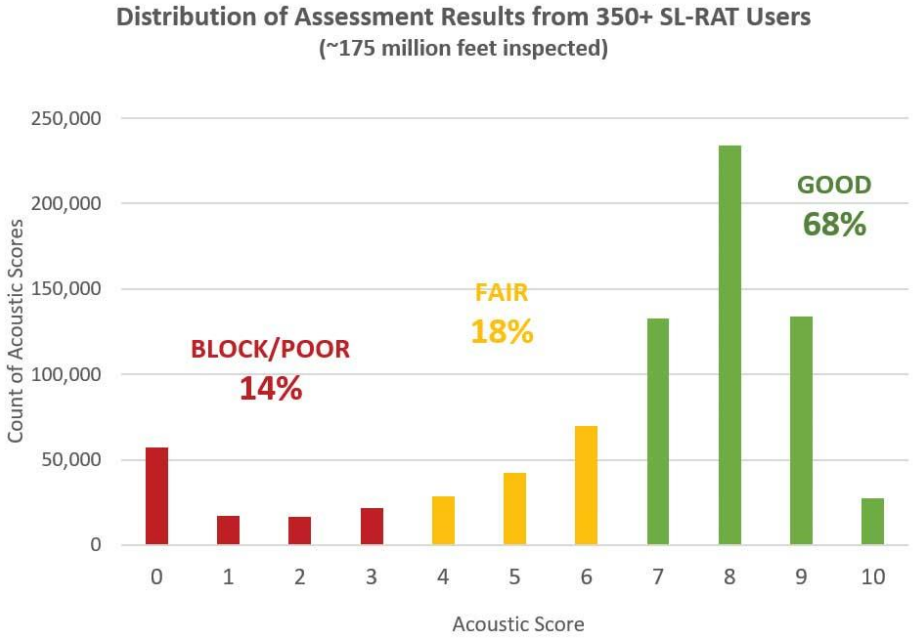


Wastewater level (in) within Manhole

Collection System
Innovative Equipment - Sewer Line Rapid Assessment Tool (SL RAT)

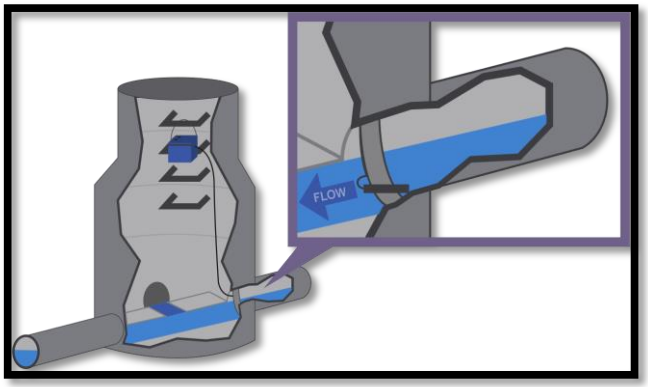






Collection System Consultants

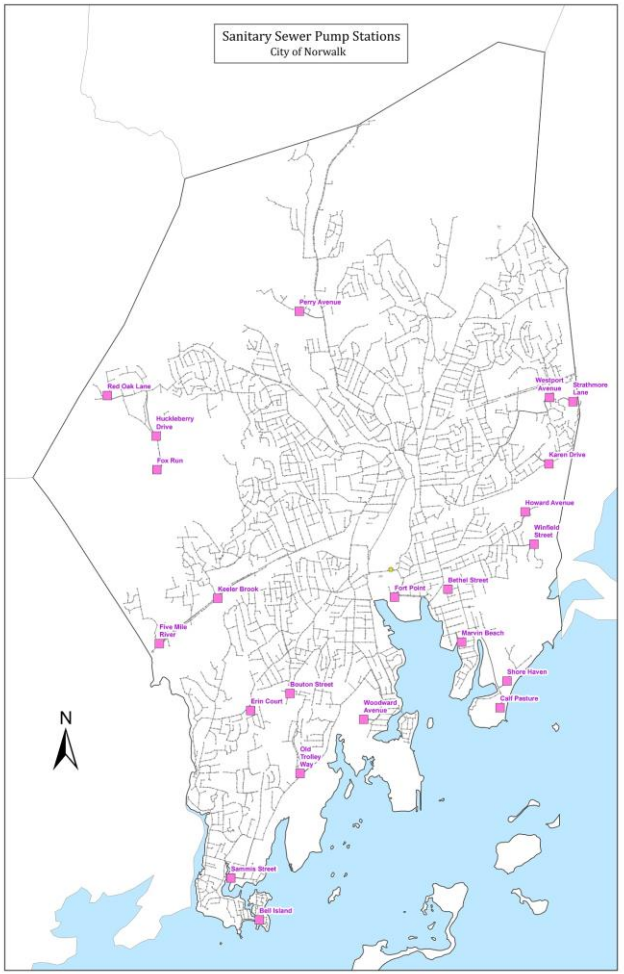
- Brown and Caldwell and Woodard & Curran
- Consultant Goals:
  - Flow monitoring of entire collection system (Spring 2021)
  - Update hydraulic model
  - Review collection system information (risk matrix evaluation):
    - *Interceptors (large diameter gravity pipes)*
    - *Gravity pipes*
    - *Force mains*
    - *Manholes*
    - *Inflow/Infiltration (I/I)*
    - *Capacity/hydraulic bottlenecks*
    - *Future development projects and impacts*
    - *Hot Spots (i.e. roots, grease, etc.)*
    - *SUEZ Data: CCTV and NASSCO PACP scoring of assets, SL RAT*
  - Update Sanitary Sewer Collection System Master Plan
  - Develop long-term rehabilitation projects



Flow Monitor

Pump Stations

- 22 Pump Stations:
  - 1931 - Fort Point Street
  - 1950s thru 1970s – 19 stations
  - 1980s – 2 stations
  - Type:
    - Wet well / dry well - 17
    - Submersible - 5
  - Size: 0.2 mgd to 10 mgd
  - Emergency Generators (Kohler)
  - Flygt Pumps
  - 2019 Pump Station Asset Management Plan



Pump Stations
Completed Projects

- Pump Station Asset Management Plan ~$170k
  - *Infrastructure age / condition (mechanical, electrical, structure, etc.)*
  - *Future flow and Capacity Evaluation*
  - *Force main capacity*
  - *Climate Change and Flood Impact Mitigation*
  - *Energy Efficiency*
  - *Develop long-term capital improvement program projects*

- Marvin Beach, Westport Ave, Fort Point St Pump Station Upgrades ~$2.3 MM
- Marvin Beach Pump Station Force Main Replacement ~$365k
- Bethel St Pump Station Force Main Replacement ~$70k
- End of Term Replacement with OMI ~ $600k
  - Shady Beach, Bouton St, Fox Run, Woodward Ave Pump Station Improvements
  - Extra spare pumps (located at maintenance shop) – for 17 stations

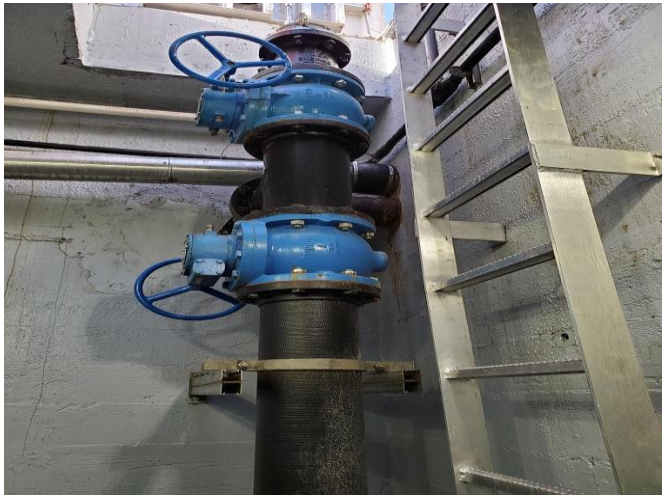
- Pump Station Generator Project – new generators at 9 stations ~$700k
- Secondary Control System – installed on medium and large stations (10 total)

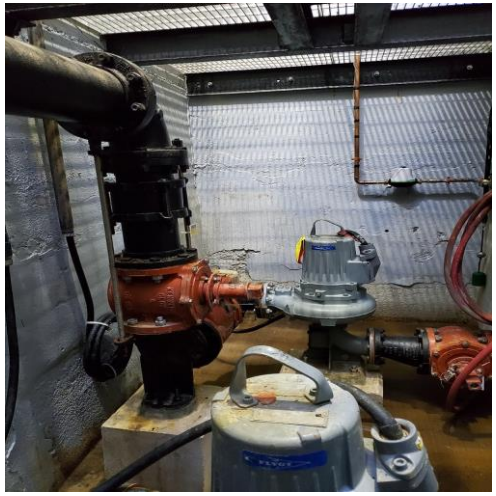
Pump Stations
Marvin Beach Pump Station Improvements

Under Construction

Wet Well Concrete Work

New Electrical and Pump Controls





New Flygt Dry Pit Pumps and Piping

Completed Project

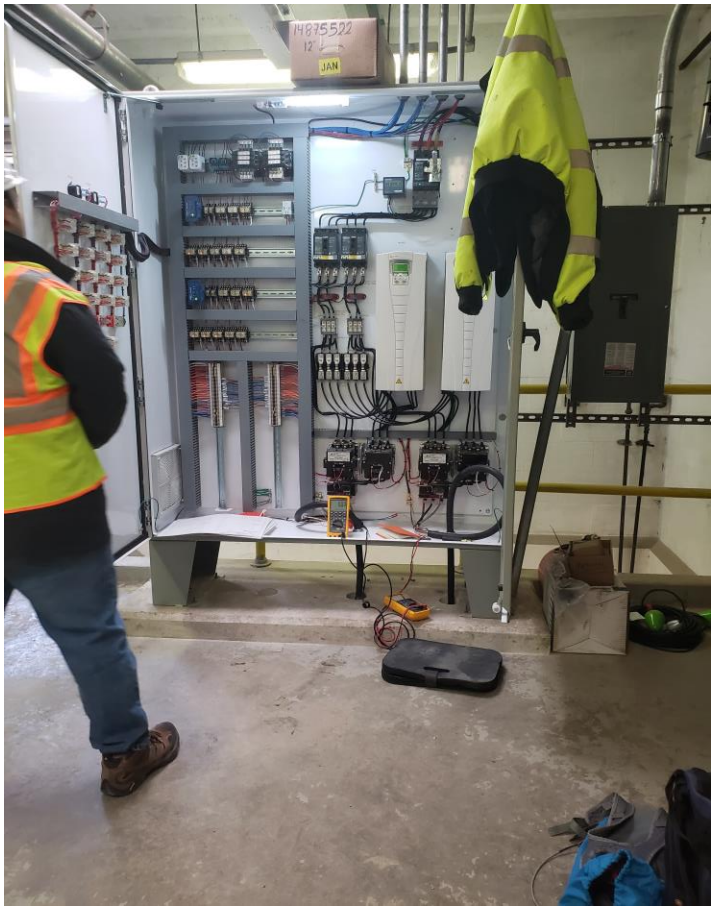
Pump Stations
Marvin Beach Force Main Replacement

Drilling Rig Setup

New Force Main Location

Pump Stations
Westport Pump Station Improvements

New Flygt Dry Pit Pumps and Piping



New Pump Controls and VFDs

Pump Stations
Wet Well Epoxy Coating

Fort Point PS Wet Well Coating

Westport Ave PS Wet Well Coating

Marvin Beach PS Wet Well Coating

Pump Stations
ETER Projects

Woodward Ave PS

Shady Beach PS

Fox Run PS

Pump Station Generator Projects

Howard Ave PS

Bouton St PS

Shady Beach PS

Bell Island PS

Westport Ave PS

Pump Stations
Current and Future Projects

- Five Mile River, Old Trolley Way, Woodward Avenue, & Karen Drive Pump Station Upgrades ~$6MM
- Keeler Brook Pump Station and Force Main Replacement ~$6MM
- Secondary Control System – continue to evaluate locations

Wastewater Treatment Plant History and Background

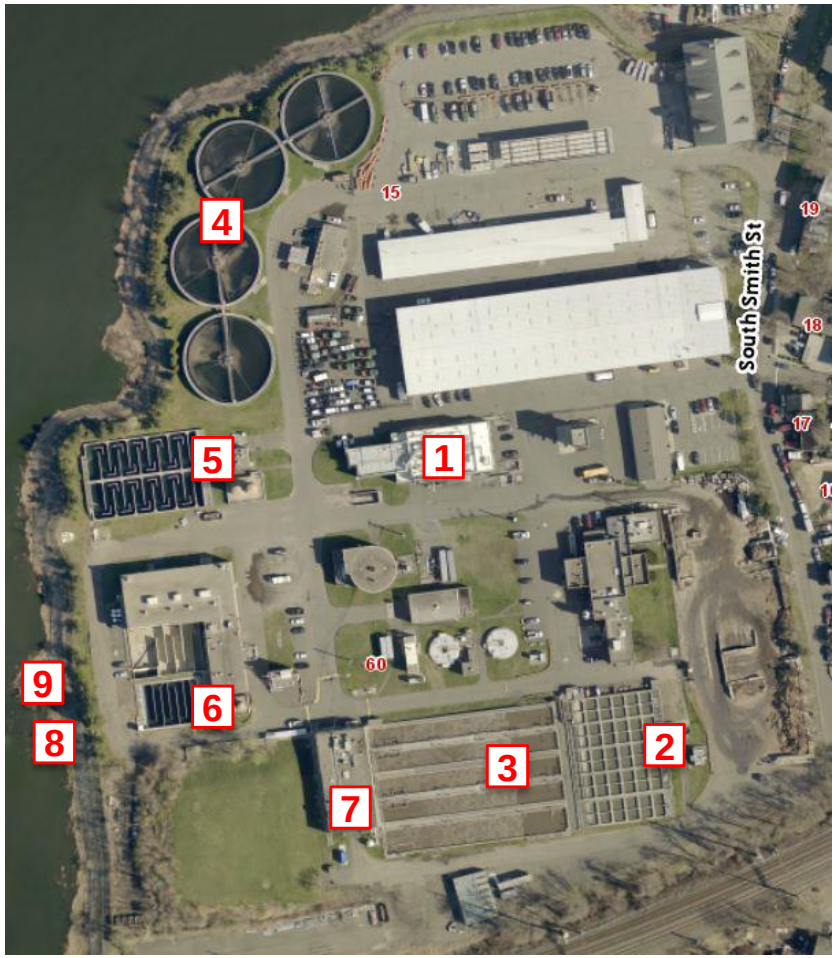
- 1880's – Collection System
- 1931 – Wastewater Treatment Plant (WWTP)
- 1950's – WPCF Additions and Alterations
- 1960's – Primary Treatment
- 1970's – Secondary Biological Treatment
- 1980 – Wet Weather Treatment
- 1990's – Biological Nutrient Removal (BNR)
- 2012 – CSO/Wet Weather Preliminary Treatment
- 2020 – Wet Weather Improvements

Wastewater Treatment Plant Criteria

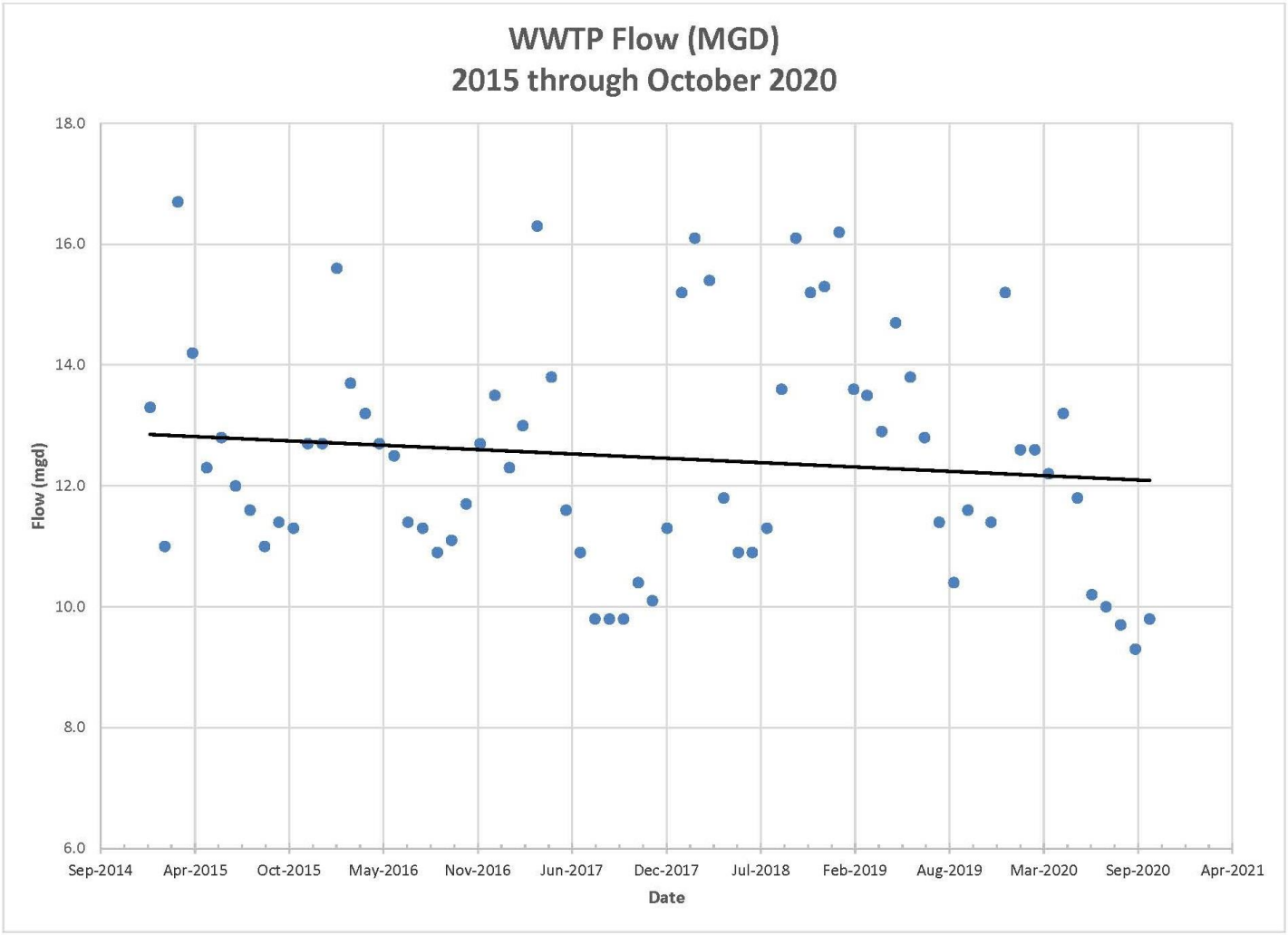
- Design Flow Capacity:
  - 18 million gallons per day (mgd)
  - Headworks – 95 mgd
  - Full Process Treatment – 30 mgd
  - Wet Weather Treatment – 65 mgd
- Historical Flow Data:
  - 11.7 mgd – 1-yr average
  - 12.6 mgd – 3-yr average
- Historical Total Nitrogen Data:
  - 513 lbs/day – 1-yr average
  - 611 lbs/day – 3-yr average
- Sewer Billing Accounts:
  - Residential ~21,400
  - Commercial ~1,900
  - Parcels on Septic ~4,200

Wastewater Treatment Plant Processes

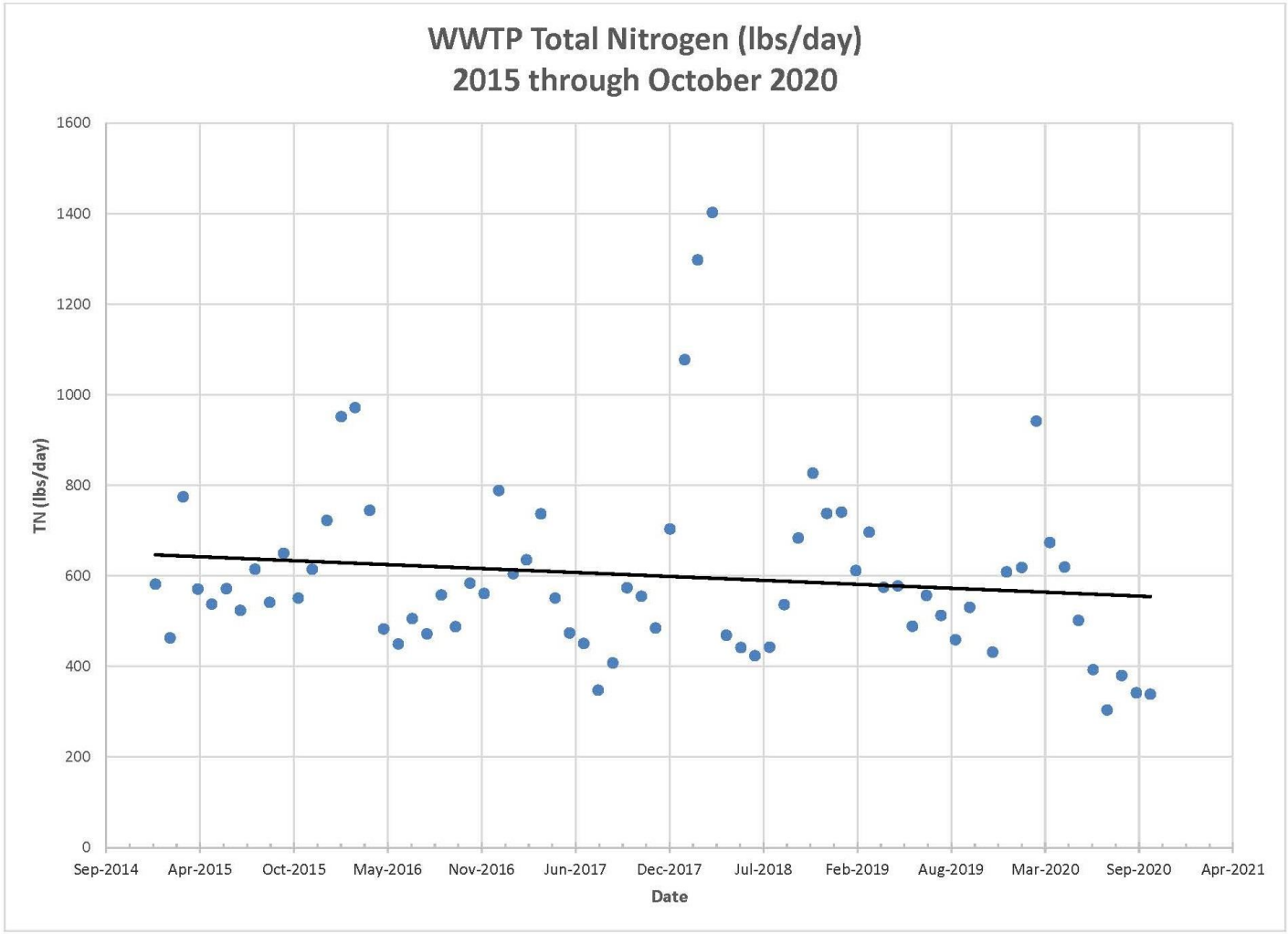
1. Preliminary Treatment
2. Primary Treatment
3. Advanced Secondary Treatment (BNR/Activated Sludge)
4. Final Settling
5. Disinfection
6. Dechlorination
7. Solids Handling
8. Final Effluent Discharge (Outfall 001-1)
9. Wet Weather Treatment Discharge (Outfall 002-1)



Wastewater Treatment Plant Flow



Wastewater Treatment Plant Total Nitrogen



Wastewater Treatment Plant Completed Projects

- New Contract Operator – May 2020
- Outfall 002 – Chlorination and Dechlorination Improvements ~$2MM
- Main Lift Pump Replacement ~$4.8MM
- Chemical Tank Replacement ~$318k (Sodium Hypochlorite and Sodium Bisulfite)
- End of Term Equipment (i.e. pumps, mixers, drives, etc.) Replacement ~ 100 pieces - ~$2.6MM

Wastewater Treatment Plant
End of Term Equipment Replacement



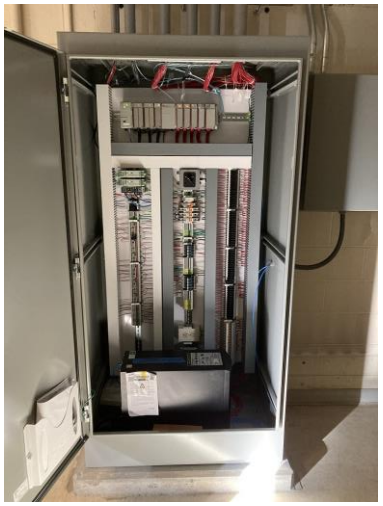




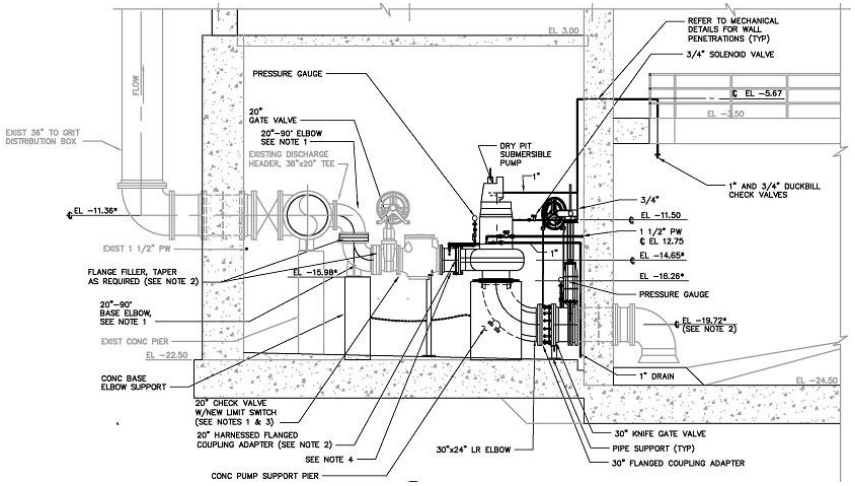




Wastewater Treatment Plant
Outfall 002 – Chlorination and Dechlorination Improvements



Wastewater Treatment Plant
Main Lift Pump Replacement



Wastewater Treatment Plant
Chemical Tank Replacement

Sodium Bisulfite Tanks

Sodium Hypochlorite Tanks

Wastewater Treatment Plant
Current and Future Projects

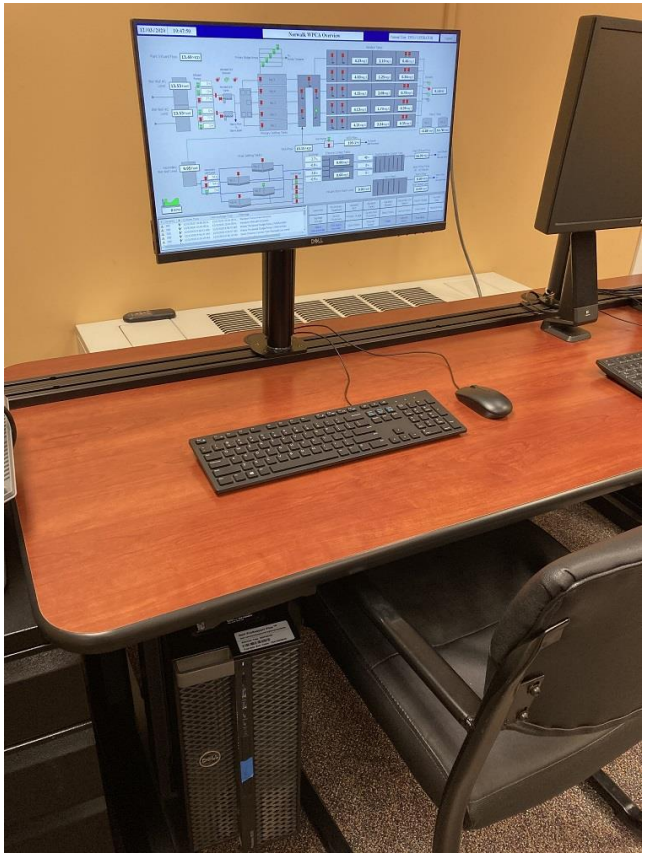
- Aeration Tank and Electrical Infrastructure Improvements – Phase I
- Scum Improvements
- Facility Plan Update
- BNR Analyzers - SUEZ
- Aeration Tank / Blower and Electrical Infrastructure Improvements – Phase II

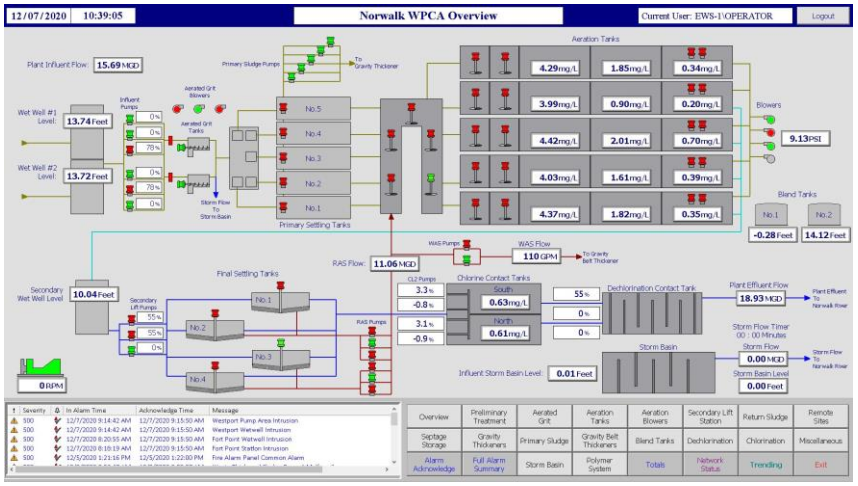
Supervisory Control and Data Acquisition (SCADA)

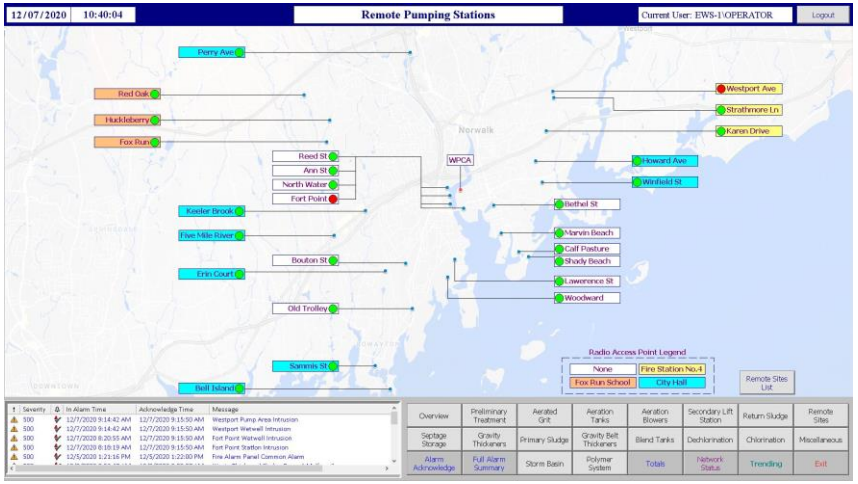
- **Recently Completed Projects ~$550k**
  - Phase I - New redundant SCADA server, operator workstations, HMI software, and fiber optic network
  - Phase II - New HMI process screens/graphics, historian, process control improvements, PLC processor upgrades, and alarm updating
  - Phase III – mobile application, expand integration of existing equipment into SCADA, and enhanced security
    - **Current Project ~ $160k**

Supervisory Control and Data Acquisition (SCADA)

Work Station







Wastewater Treatment Plant Contract Operator

- SUEZ – New Contract Operator – May 18, 2020
  - 2-yr procurement process
  - 10 year initial contract, with Two - 5 year renewals
  - New Collection System equipment: CCTV Truck, Jet/Vacuum Truck, Pole camera
  - New Technology: SL Rat, Smart Covers, IT Pipes
  - New Dewatering Equipment: centrifuge, odor control and associated equipment
  - Aeration System Improvements: BNR analyzers and blower
  - 2040 End of Term Equipment Replacement (ETER)
  - Industrial Pretreatment Program – inspections, sampling, and educating
  - Increased System operation and maintenance requirements
  - SCADA System - renewal/replacement items and frequency requirements
  - Nitrogen Performance Incentives
  - Environmental Guarantees and Effluent Guarantee Limits
  - Critical Equipment and Predictive Maintenance Schedule
  - Replacement and Renewal of Equipment – $10k or less, WPCA responsible for above

Conclusion

Current WPCA Operations

- Newly installed equipment throughout collection system, pump stations and treatment plant
- New Contract Operator within innovative approach, cutting edge technology and renewed enthusiasm
- Reduced flow to facility, despite ample development
- Comprehensive Collection System Analysis – Spring 2021
- CCTV benchmarks in place and being met to address infiltration
- Sewershed-wide projects addressing inflow
- No discharge from emergency outfall at Ann Street in 2+ years
- Only 1 discharge from Outfall 002 in 2020
- Lowest number of wastewater system bypasses in 10 years during 2020 (7 events)
- Best Nitrogen figures in history of facility - #2 in CT (2019 and likely 2020)
- Model-setting relationships with local environmental organizations
- Primary Objective: enhance water quality for Norwalk River and Long Island Sound

*****

The information within this presentation demonstrates the City's compliance with the proposed NPDES permits.

The City of Norwalk respectfully requests DEEP accept the tentatively approved NPDES permit in its current form as the effective operating permit for the City.