



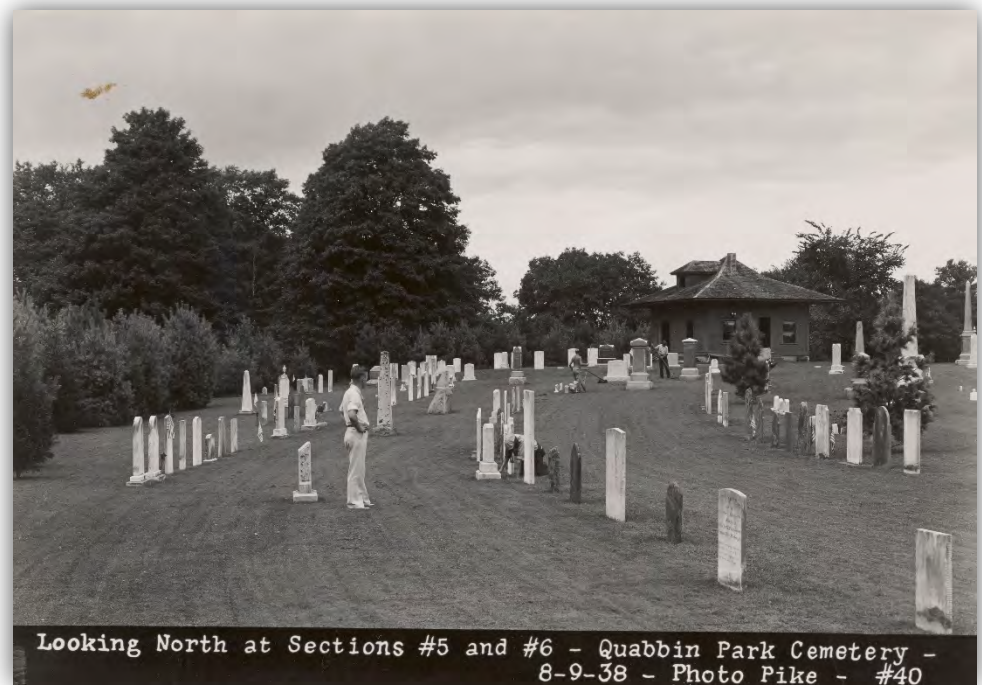


***Update on Quabbin Park Cemetery***

September 18, 2019



# Quabbin Park Cemetery





# Water Supply



Well Pump House



Temporary Water Buffalo



# Administration Building





# Administration Building





# Other Buildings



Maintenance Garage



Vault Building



## Other Buildings



Storage Shed







***Design and Engineering Services During  
Construction for Quinapoxet Dam Removal  
Contract 7347***

September 18, 2019



# Location of Quinapoxet Dam at Wachusett Reservoir





# Quinapoxet Dam







***Section 56 Replacement – Saugus River Crossing  
Design and Engineering Services During Construction  
Contract 7454***

September 18, 2019



# General Edwards Bridge, Lynn





# General Edwards Bridge







# Section 56 at General Edwards Bridge



Section 56

Pipe, Supports and Wooden Walkway



Deteriorated Pipe Support and Beams

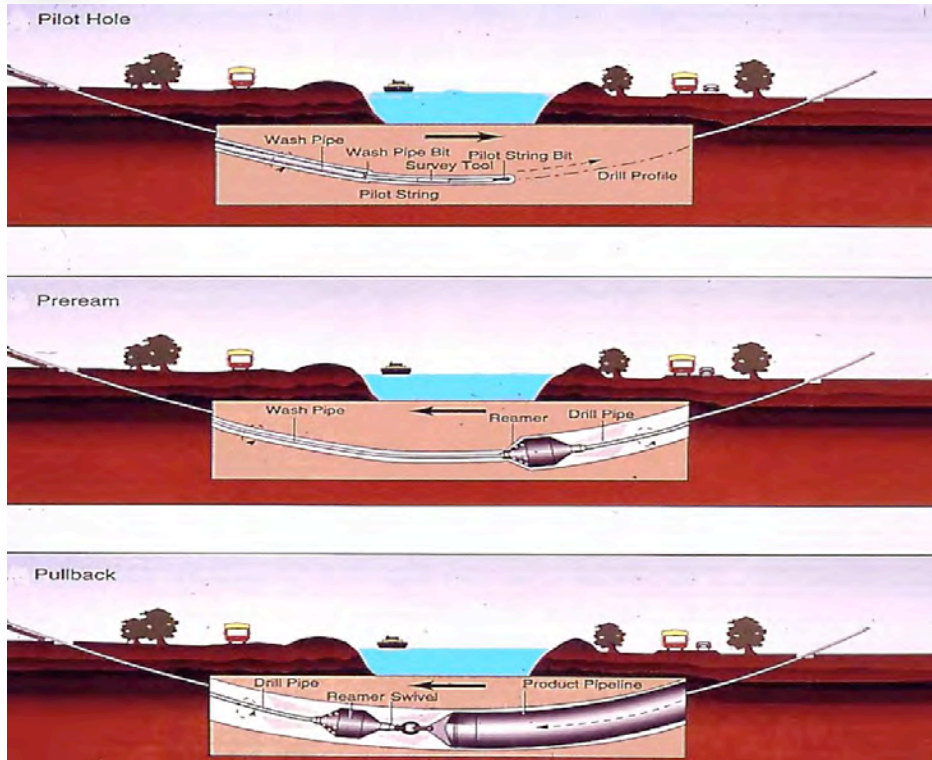


## Need For Project

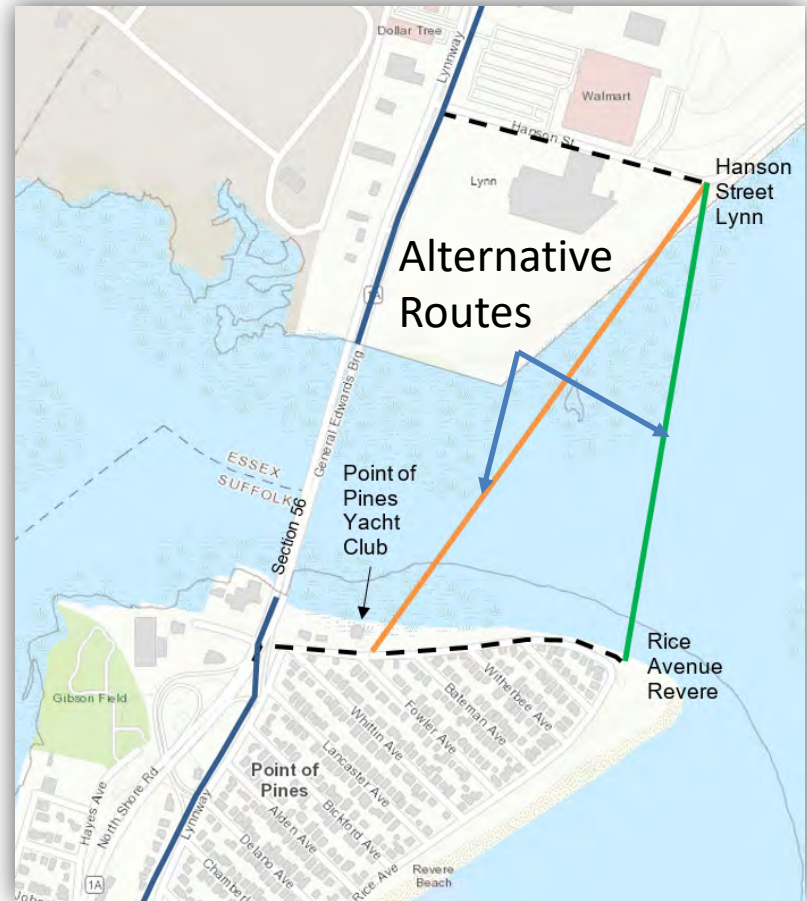
- Section 56 pipe crossing of the General Edwards Bridge was removed in 2019 under Contract 7536
- Severe corrosion from pipe age and environmental conditions
- Replacement is needed to provide redundancy for Revere, Lynn (General Electric), Nahant, Swampscott and Marblehead



# Construction Method and Pipe Route Alternatives



Horizontal Directional Drilling





# Proposals

PROPOSER	RANK	PROPOSED COST	PROPOSED HOURS
AECOM Technical Services, Inc.	1	\$3,345,887	17,996
Weston & Sampson Engineers, Inc.	2	\$3,763,863	21,259
Engineer's Estimate		\$2,732,900	15,686



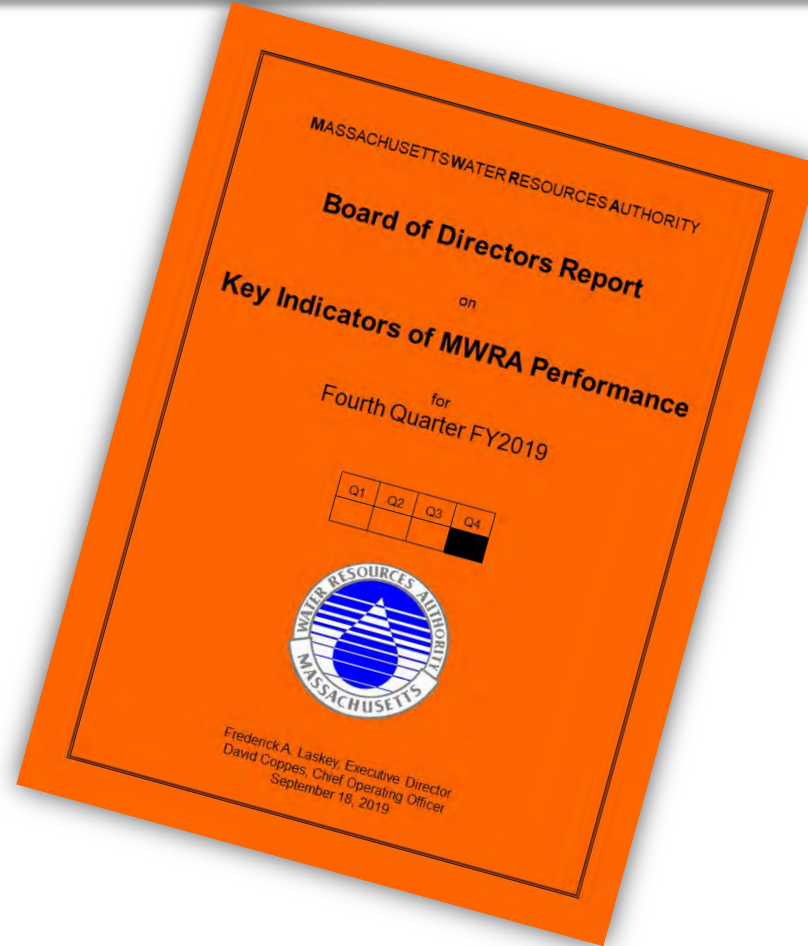
# Schedule and Award

ITEM	START	DURATION	END
Preliminary Design	November 2019	24 Months	November 2021
Final Design and Permitting			
Bid Documents Available			
Construction	February 2022	12 Months	February 2023



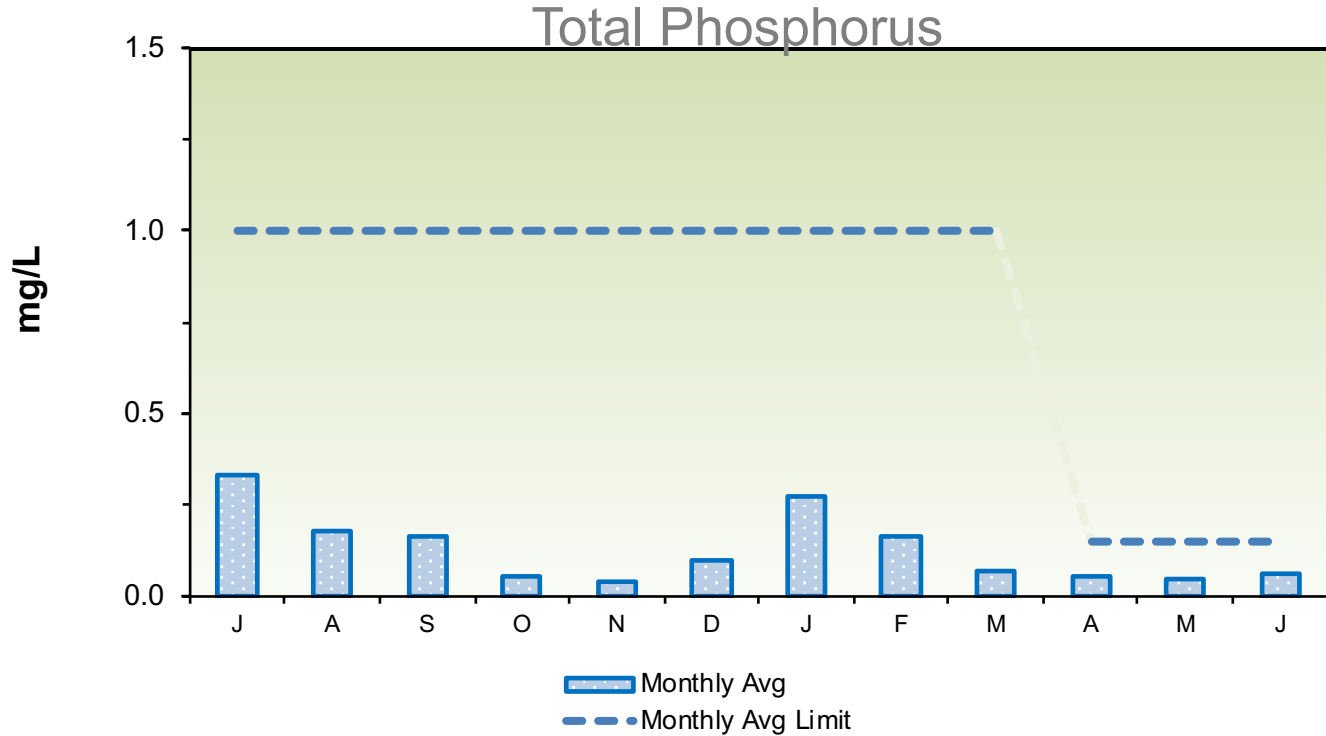


# Massachusetts Water Resources Authority





# Clinton Wastewater Treatment Plant – Phosphorus





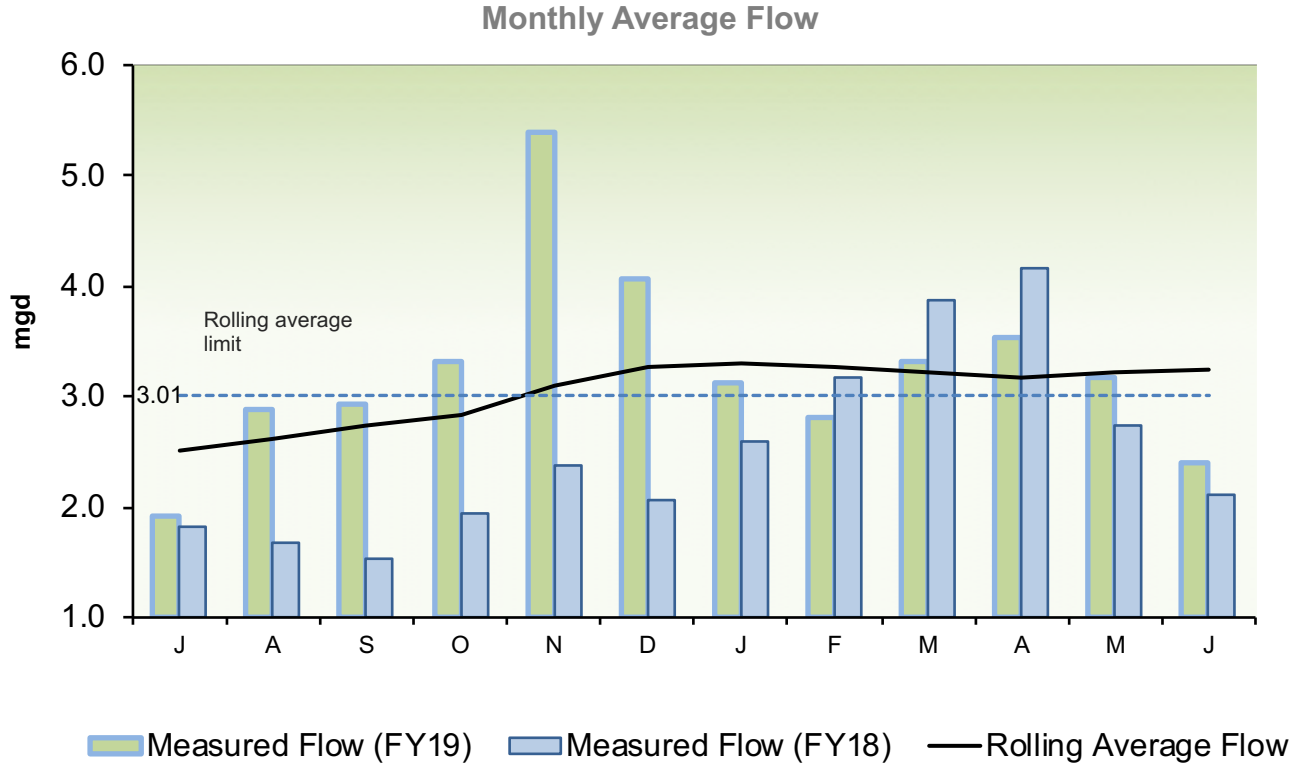


# Clinton Wastewater Treatment Plant – NPDES Compliance

<i>Effluent Characteristics</i>		<i>Units</i>	<i>Limits</i>	<i>April</i>	<i>May</i>	<i>June</i>	<i>4th Quarter Violations</i>	<i>FY19YTD Violations</i>
Flow:	12-month Rolling Average:	mgd	3.01	3.17	3.21	3.23	3	8
BOD:	Monthly Average:	mg/L	20	1.3	0.9	7.1	0	0
	Weekly Average:	mg/L	20	2.2	1.6	23.5	1	1
TSS:	Monthly Average:	mg/L	20	4.2	3.6	3.9	0	0
	Weekly Average:	mg/L	20	5.4	3.7	5.4	0	1*
pH:		SU	6.5-8.3	6.9-7.5	6.7-7.4	7.1-7.5	0	0
Dissolved Oxygen:	Daily Average Minimum:	mg/L	6	8.7	8.4	8.2	0	0
E. Coli:	Monthly Geometric Mean:	cfu/100mL	126	6.0	5.0	6.0	0	0
	Daily Geometric Mean:	cfu/100mL	409	14.0	14.0	31.0	0	1
TCR:	Monthly Average:	ug/L	17.6	4.7	0.1	0.0	0	0
	Daily Maximum:	ug/L	30.4	57.1	2.5	0.0	2	2
Copper:	Monthly Average:	ug/L	11.6	5.8	3.5	4.8	0	0
	Daily Maximum:	ug/L	14.0	5.8	3.5	5.0	0	0
Total Ammonia Nitrogen: June 1st - October 31st	Monthly Average:	mg/L	2.0	0.11	0.10	0.04	0	0
	Daily Maximum:	mg/L	3.0	0.15	0.14	0.14	0	0
Total Phosphorus: April 1st - October 31st	Monthly Average:	mg/L	0.15	0.05	0.05	0.06	0	0
	Daily Maximum:	mg/L	RPT	0.08	0.08	0.09	0	0
Acute Toxicity*:	Daily Minimum:	%	≥100	N/A	N/A	>100	0	0
Chronic Toxicity*:	Daily Minimum:	%	≥62.5	N/A	N/A	25	1	1



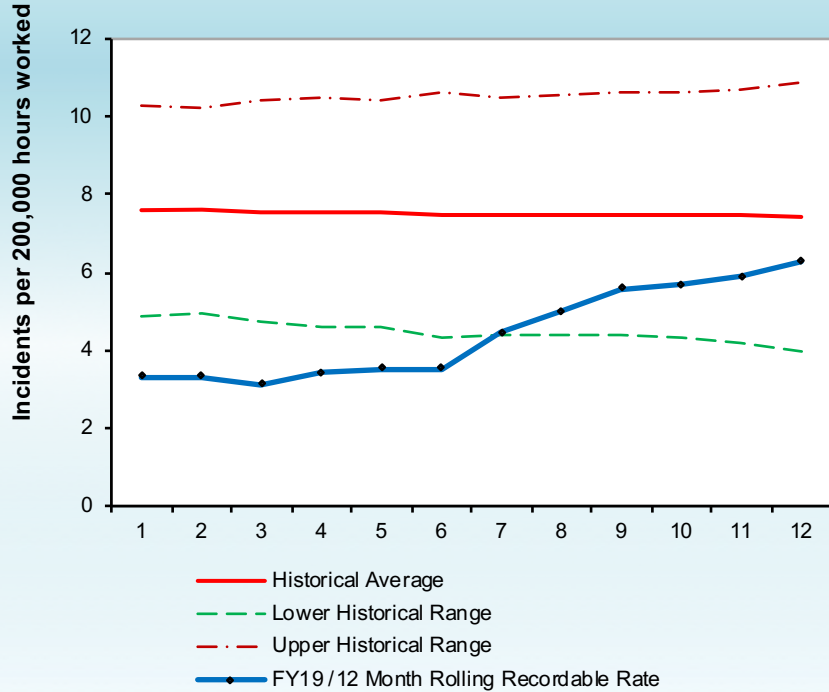
# Clinton Wastewater Treatment Plant – NPDES Compliance



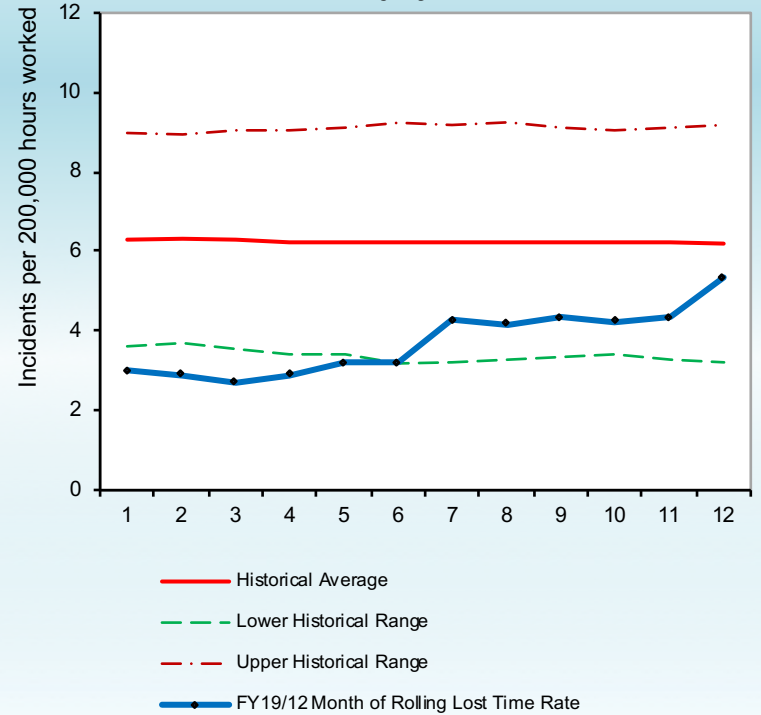


# Worker Safety Reporting

## Recordable Injury & Illness Rates

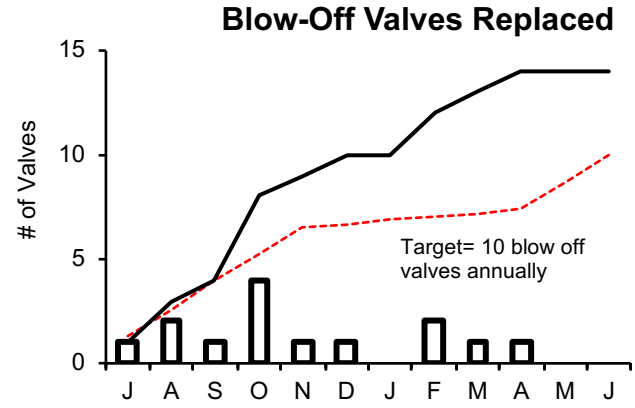
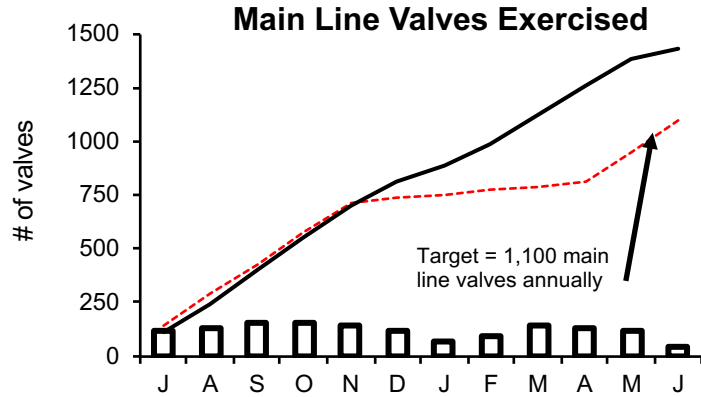


## Lost Time Injury & Illness Rates





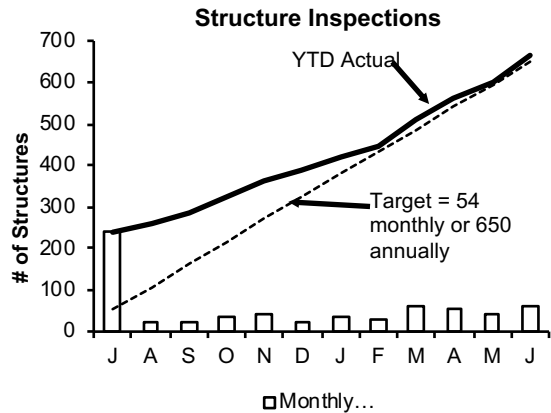
# Water Distribution System Valves



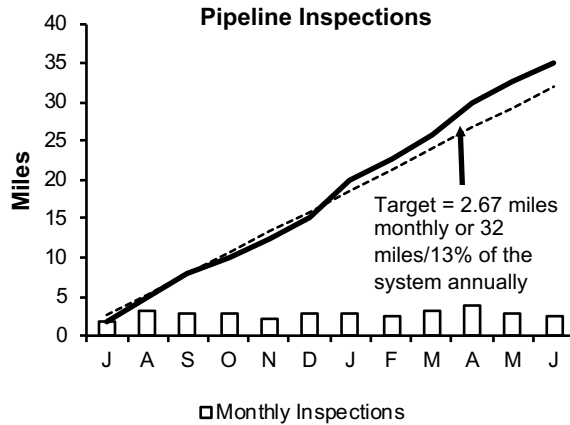
Type of Valve	Inventory #	Operable Percentage	
		FY19 to Date	FY19 Targets
Main Line Valves	2,159	96.8%	95%
Blow-Off Valves	1,317	98.6%	95%
Air Release Valves	1,380	95.1%	95%
Control Valves	49	100.0%	95%



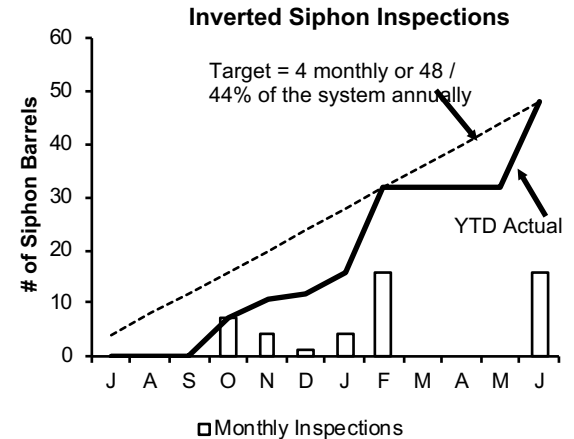
# Wastewater Pipeline and Structure Inspections



Staff inspected the 36 CSO structures and performed 86 additional manhole/structure inspections during this quarter. The year to date total is 665 inspections.



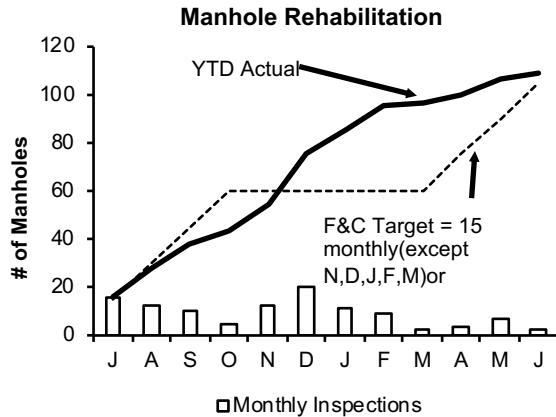
Staff internally inspected 8.79 miles of MWRA sewer pipeline during this quarter. The year to date total is 25.83 miles. No Community Assistance was provided this quarter.



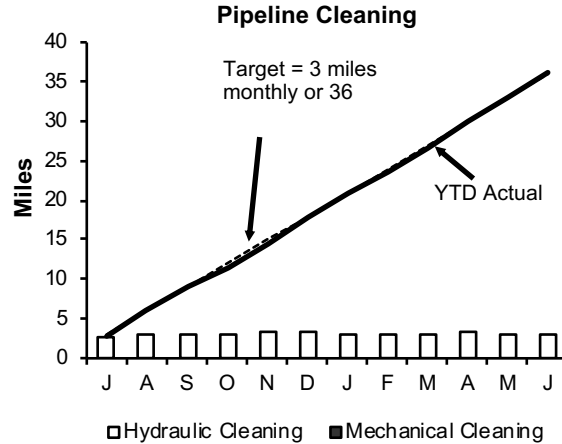
Staff inspected 20 siphon barrels this quarter. Year to date total is 32 inspections.



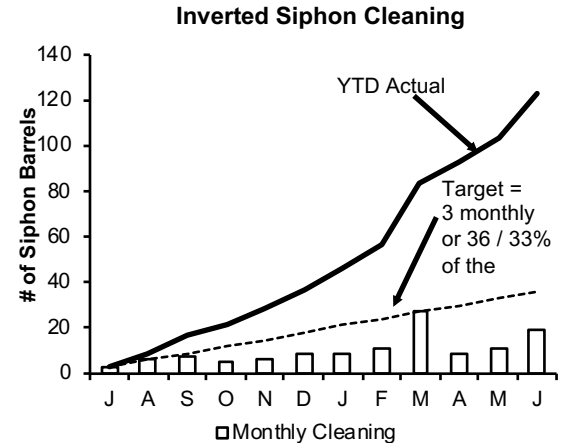
# Wastewater Pipeline and Structure Maintenance



Staff replaced 12 frames & covers during this quarter. The year to date total is 109.



Staff cleaned 9.93 miles of MWRA's sewer system and removed 47 yards of grit and debris during this quarter. The year to date total is 36.17 miles. No Community Assistance was provided this quarter.

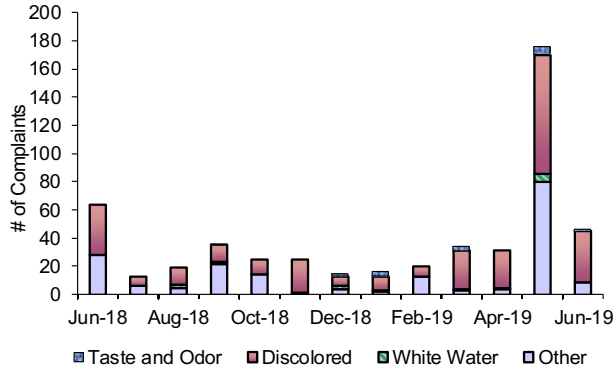


Staff cleaned 39 siphon barrels during this quarter. Year to date total is 123.

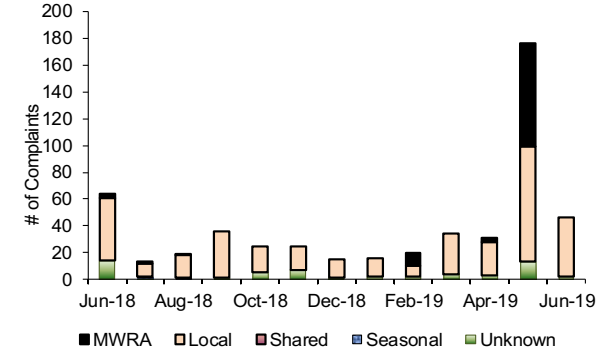


# Drinking Water Complaints

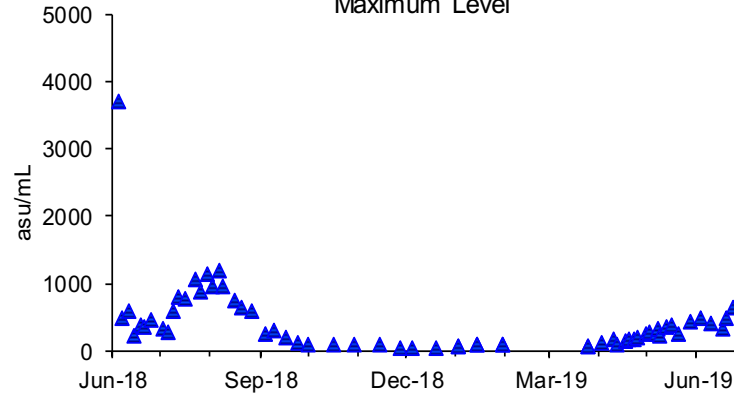
### Water Quality Complaints



### Water Quality Complaints By Responsible Party



### Total Algae at Wachusett Reservoir Maximum Level



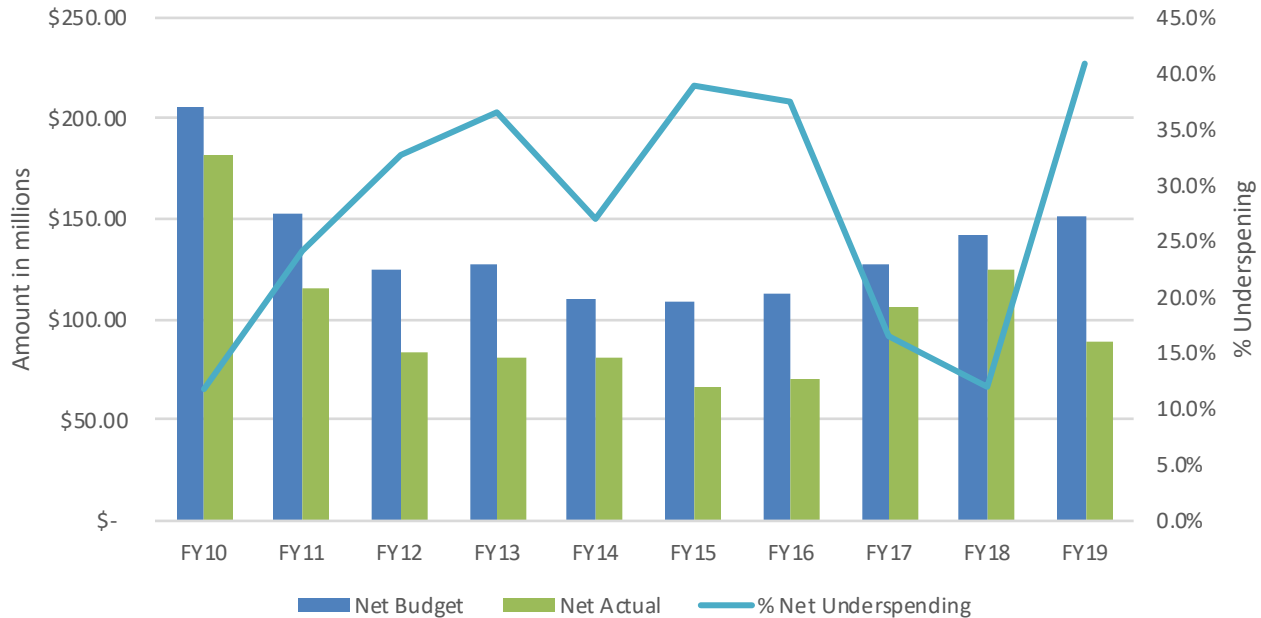






# FY2019 CIP Spending

## CIP Net Budget Variance Analysis



	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Net Budget	\$ 205.50	\$ 152.40	\$ 125.10	\$ 127.90	\$ 110.50	\$ 109.27	\$ 112.64	\$ 126.95	\$ 142.27	\$ 151.35
Net Actual	\$ 181.30	\$ 115.70	\$ 84.10	\$ 81.20	\$ 80.60	\$ 66.64	\$ 70.35	\$ 106.08	\$ 125.17	\$ 89.43
Net Variance	\$ (24.20)	\$ (36.70)	\$ (41.00)	\$ (46.70)	\$ (29.90)	\$ (42.64)	\$ (42.29)	\$ (20.87)	\$ (17.10)	\$ (61.92)
% Net Underspending	11.8%	24.1%	32.8%	36.5%	27.1%	39.0%	37.5%	16.4%	12.0%	40.9%





***2019 Boston Harbor Beach Update***

September 18, 2019



# Boston Harbor Beaches Monitoring



- MWRA involvement since 1996
- Daily monitoring/beach flagging program for more than ten years
- Beach postings based on:
  - Samples exceed 104 MPN/100 mL enterococcus
  - 5 sample geometric mean exceeds 35 MPN/100 mL
  - Rain threshold exceeded (precautionary)



# Mass DPH Change in Posting Methodology for 2019

- Before 2019, samples after rain excluded from geometric mean
- May 2019: MA DPH updated instructions - no exclusions
- Increased postings at daily sampled beaches
- MWRA will meet with DPH and DCR staff to request change
- South Boston Beaches were open every day this summer

Beach	Days Posted (previous method)	Change	Days Posted (2019 method)
King's	35	<b>+18</b>	53
Tenean	64	<b>+1</b>	65
Wollaston	24	<b>+5</b>	29
Malibu	21	<b>+11</b>	32
Constitution	14	<b>+4</b>	18
Net postings added by the change:		<b>39</b>	



# Boston Harbor Beaches Monitored By DCR



- Monitoring at >10 DCR harbor beaches, some weekly and some daily
- State law requires at least weekly monitoring at all public beaches
- Beaches labeled in **bold** are monitored by DCR and MWRA





## ***HEEC Cable Financing***

September 18, 2019





## Recap

- 1989 permit issued to “co-permitees” Boston Edison Co. (HEEC) and MWRA
- 1990 Cable complete
- 2004 Army Corp of Engineers asserts violation of permit
- 2005 Referred to Dept of Justice, MWRA informs Court
- 2016 US sues MWRA and HEEC, motion to dismiss fails
- 2017 Conditional resolution of litigation accomplished – New Cable
- 2019 New Cable complete



- MWRA faced with protecting the original cable
  - 15 months no power through cable
  - Rely on CTGs for primary power
  - Rent back-up generators as required
  - Dredge and armor cable
  - **Total Cost to MWRA estimated at \$96 million**
- Cost could not be capitalized
- Could not use tax-exempt bonds – private activity
- Original cable 27 years old – estimated life 30-50 years
- \$220 million Federal appropriation in jeopardy



# New Cable Plan

- I. Negotiations begin \$110 million paid by MWRA over 30 years (later revised to \$115.6 million)

Project Cost	\$115,600,000
Term	30 years
ROE	9.6%
Assumed tax rate	30.0%
Grossed up ROE	13.70%
<b>Financing Cost<sup>1</sup></b>	<b>\$367,631,535</b>

*<sup>1</sup>financing cost modeled as level debt-service loan*



## New Cable Plan cont.

### II. Eversource agrees to \$17.5 million credit

Project Cost	\$115,600,000
Credit	(\$17,500,000)
Net Project Cost	\$98,100,000
Term	30 years
ROE	9.6%
Assumed tax rate	30.0%
Grossed up ROE	13.70%
<b>Financing Cost<sup>1</sup></b>	<b>\$311,977,972</b>

**Saving \$55,653,563**



## New Cable Plan cont.

### III. MWRA offers to pay 50% at or before substantial completion

Project Cost	\$115,600,000
Credit	(\$17,500,000)
Net Project Cost	\$98,100,000
Remaining cost to finance	\$49,050,000
Term	30 years
ROE	9.6%
Assumed tax rate	30.0%
Grossed up ROE	13.70%
<b>Financing Cost<sup>1</sup></b>	<b>\$155,988,986</b>

**Saving \$155,988,986 – Cumulative Savings \$211,642,549**



## New Cable Plan cont.

### IV. MWRA proposes Eversource blend the rate down by using debt

Remaining cost to finance	\$49,050,000
Term	30 years
ROE	9.6%
Equity Share	45%
Assumed cost of Debt	4.5%
Debt Share	55%
Weighted Average Cost of Capital	6.80%
Assumed tax rate	30.0%
Grossed up Weighted Average Cost of Capital	9.70%
<b>Financing Cost<sup>1</sup></b>	<b>\$102,011,519</b>

**Saving \$53,977,467 – Cumulative Savings \$265,620,016**



## Progress Payments - AFUDC

- Memorandum of Agreement dated May 28, 2017 included language

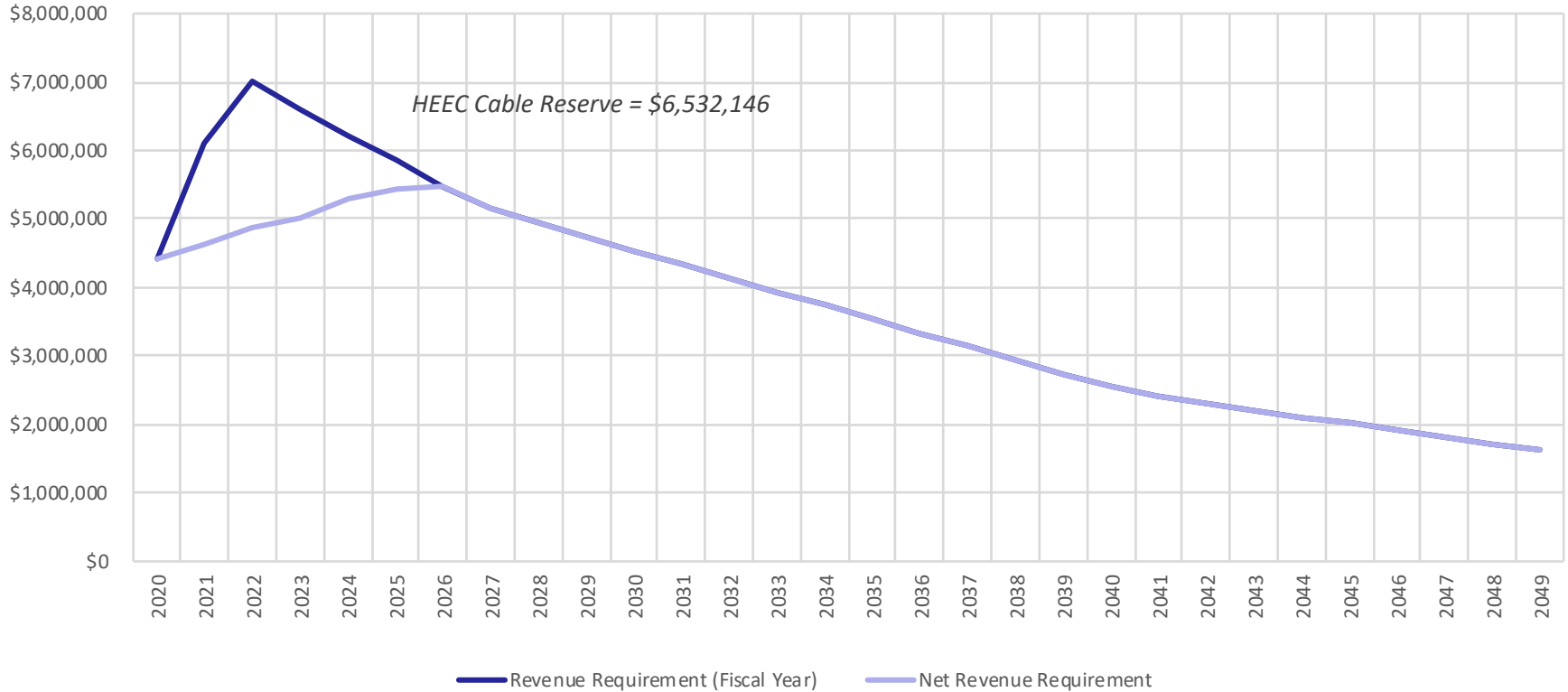
*“4. (b) ...MWRA will pay one-half (50%) of the Total Cost (net of such credit) to HEEC at the in-service date of the New Cable **or earlier if the Parties mutually agree to advance payment...**”*

- MWRA and Eversource agreed November 19, 2018
- To minimize the Allowance for Funds Used During Construction (AFUDC), MWRA is making progress payments up to the 50% of the estimated project cost.
- **This is estimated to save MWRA \$2.9 million in interest cost on construction in progress.**



# Capacity Reserve

## Application of HEEC Cable Reserve to Capacity Charge





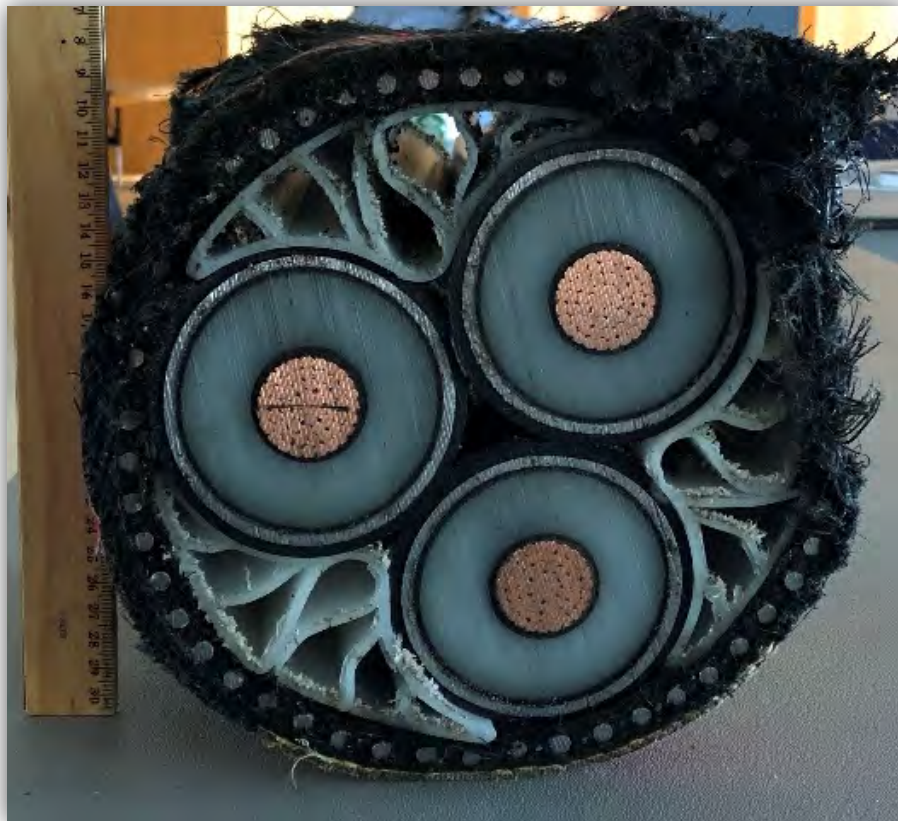


## Co-permittee Issue

- The Advisory Board recognized the importance of not being a co-permittee.
- On the advice of MWRA's General Counsel, to avoid the unfortunate complexities of being a "co-permittee" again, MWRA refrained from involvement in all matters relative to the installation of the cable. Issues of permitting, easements, and construction procurement were left to Eversource.
- MWRA staff did not approve plans, contractor selection or negotiation of any terms or any other issues except when necessary as the customer.
- The DPU will ultimately determine the appropriateness of all expenses when requested to approve the tariff.



# Closing





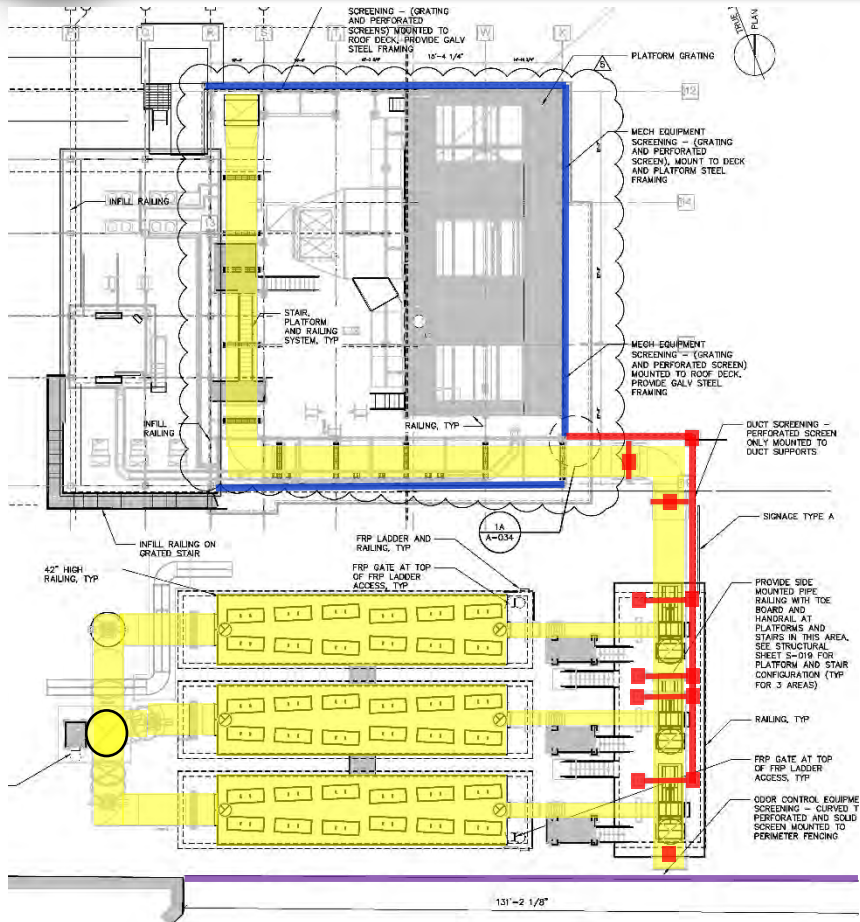


***Chelsea Creek Headworks Upgrade  
Contract 7161, Change Order 32***

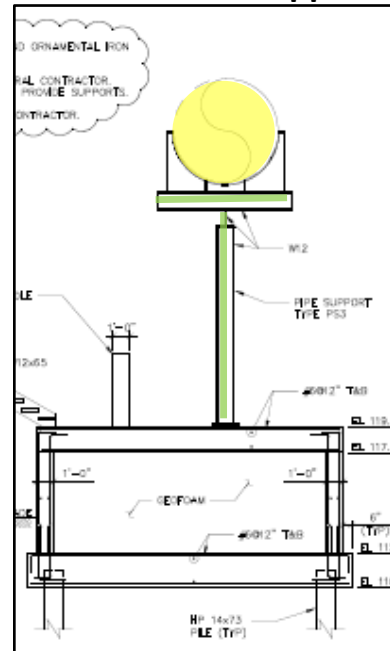
September 18, 2019



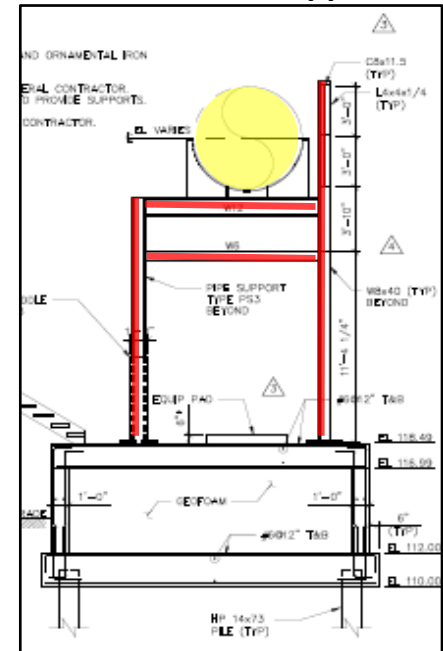
# Chelsea Creek Headworks: Screening and Duct Support Plan



## As-Bid Duct Support



## Revised Duct Support



- Equipment Screen (CO#29, Item 2)
- OC Duct Supports & Screen (CO#32, Item 1)
- Perimeter Fence Screen (CO#32, Item 2)



# Chelsea Creek Headworks: Odor Control System





# Chelsea Creek Headworks: Odor Control System









# Chelsea Creek Headworks: Fire Department Services





# Chelsea Creek Headworks: Lower Roof Duct Supports





# Chelsea Creek Headworks: Temporary HVAC System





# Chelsea Creek Headworks: 1-Megawatt Standby Generator





# Chelsea Creek Headworks: Channel 2 Grit Equipment



