



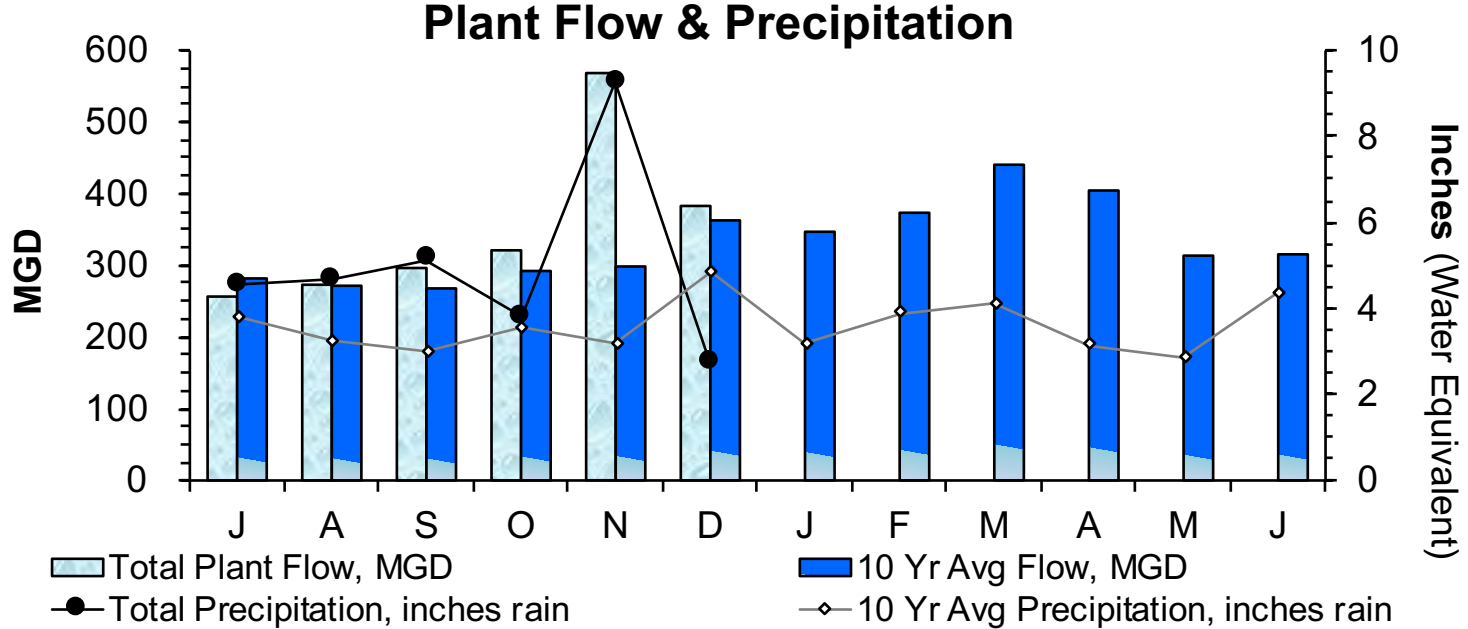


# Massachusetts Water Resources Authority



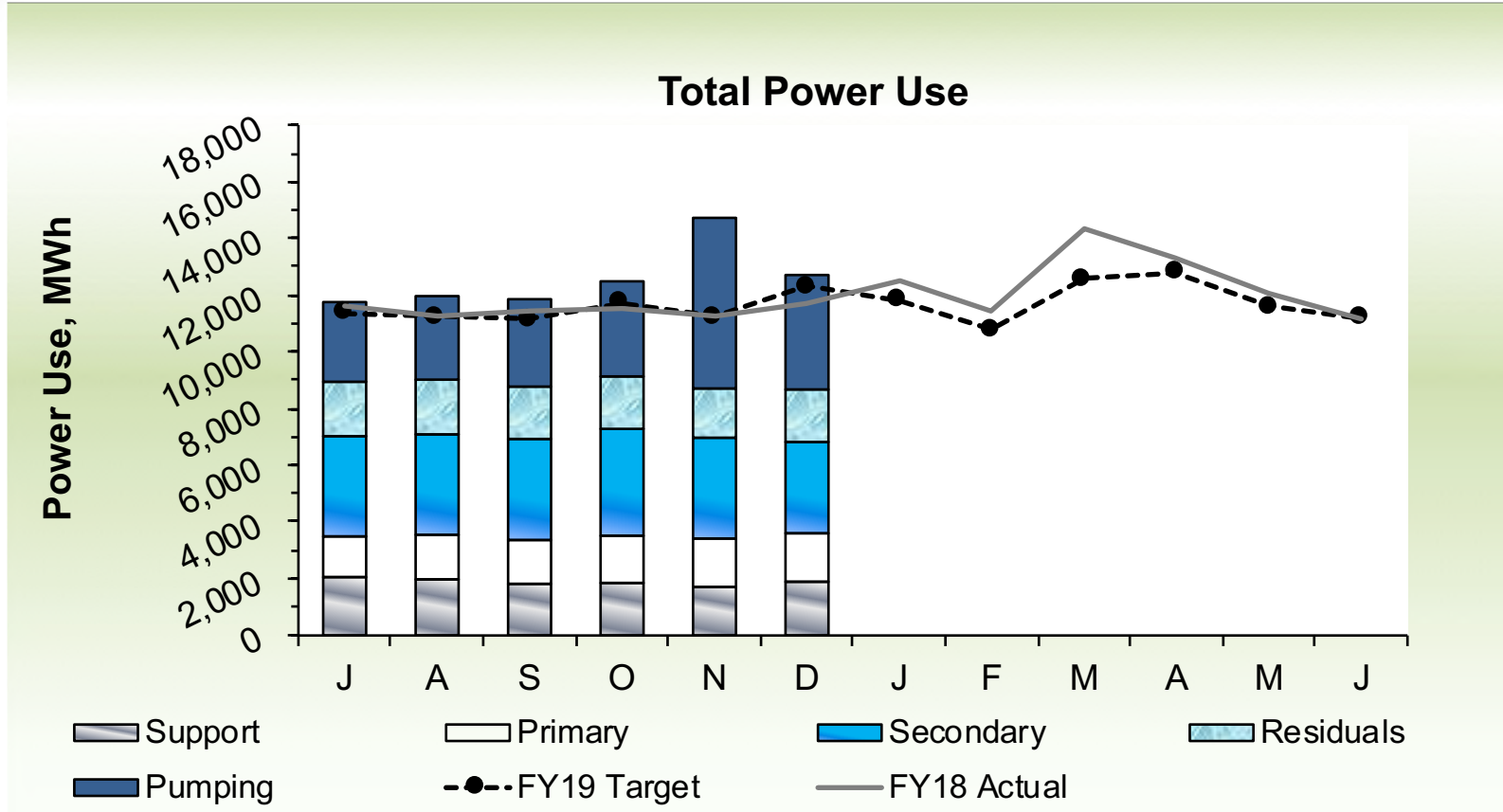


# Wet Fall Results in Increased Plant Flow





# Higher Flow Requires More Energy

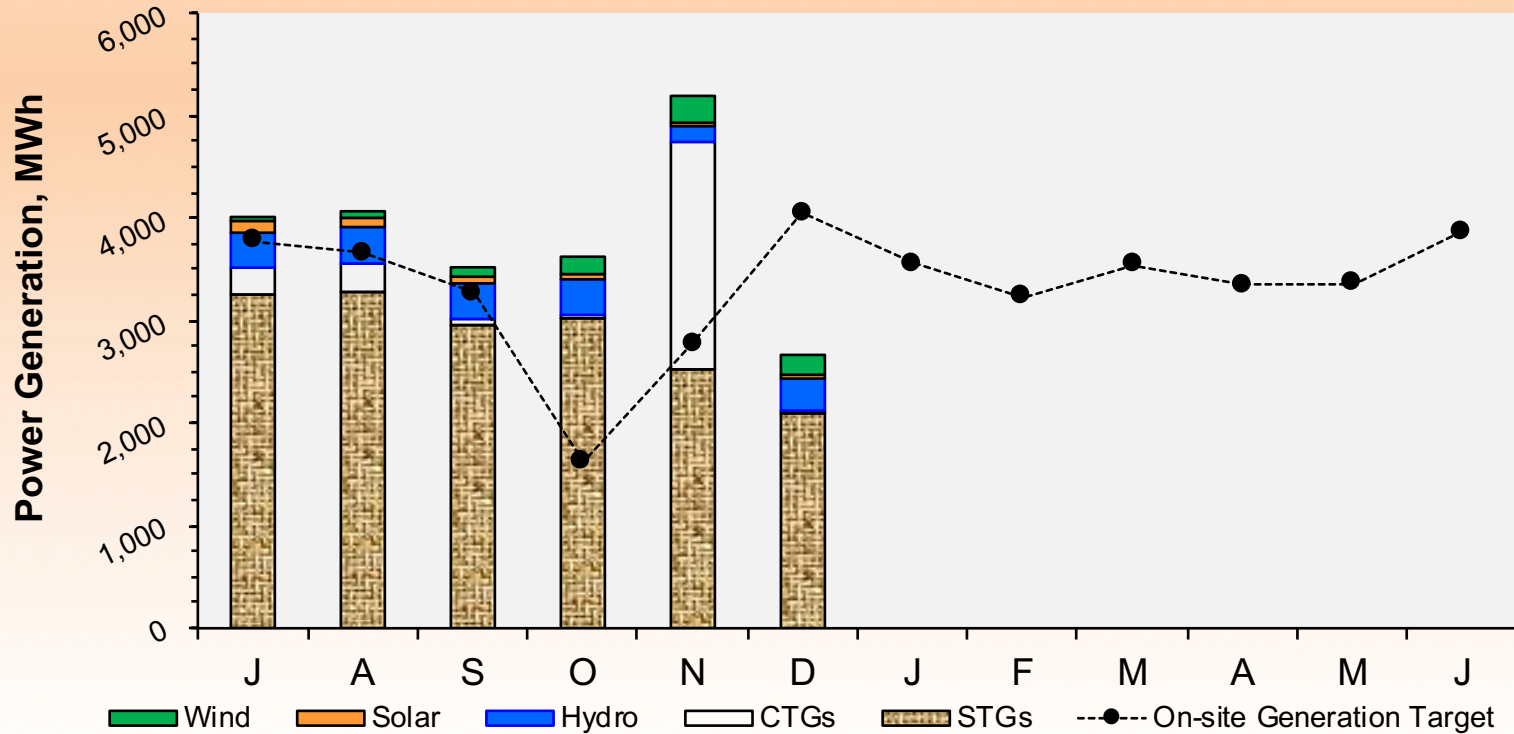






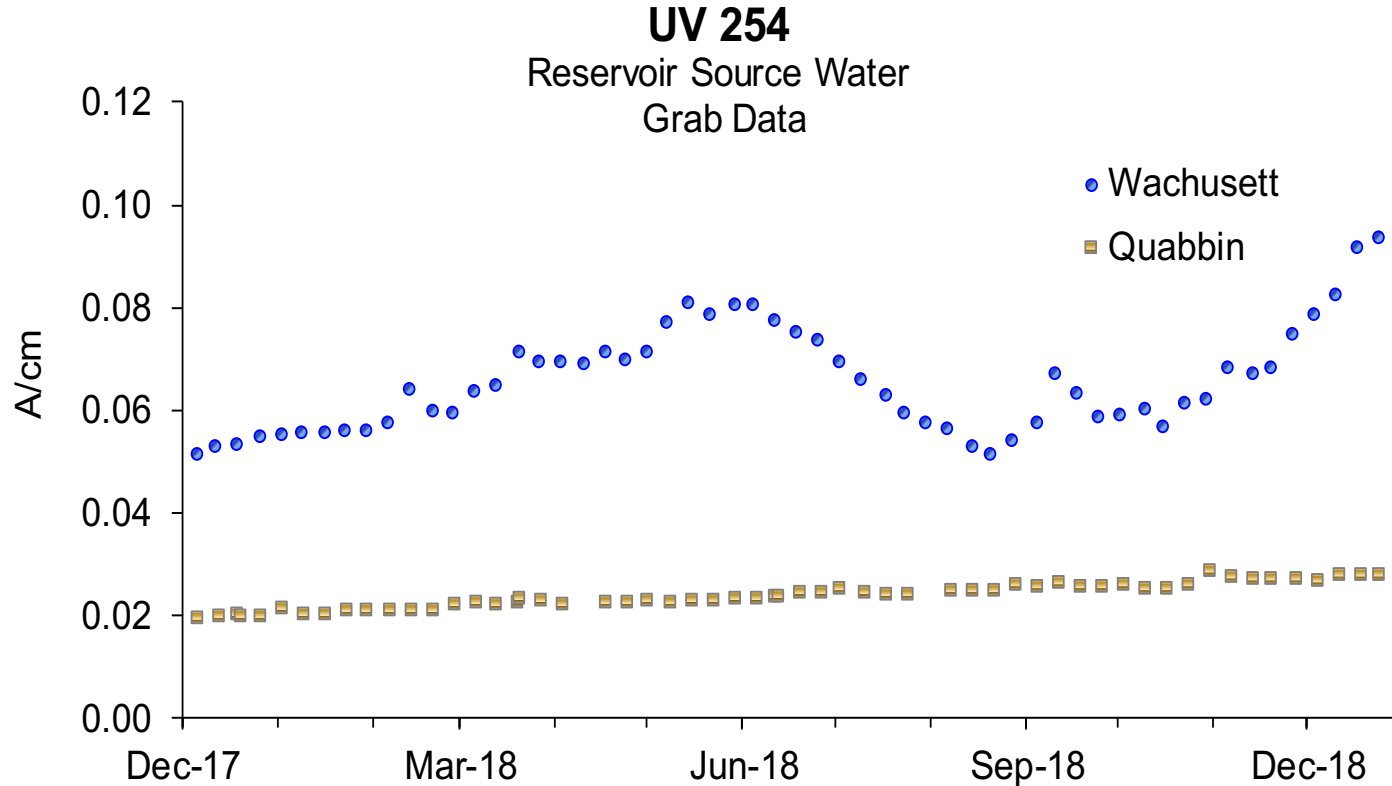
# CTGs Run During Storms for Reliability

## Self-Generation





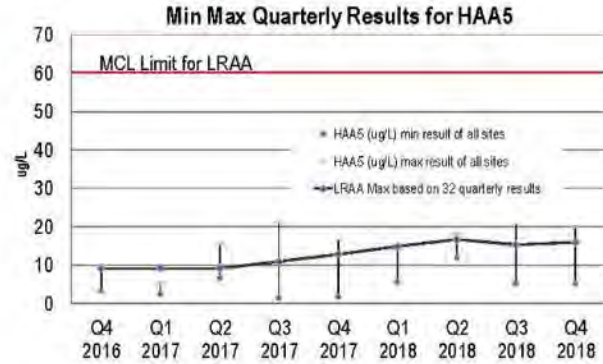
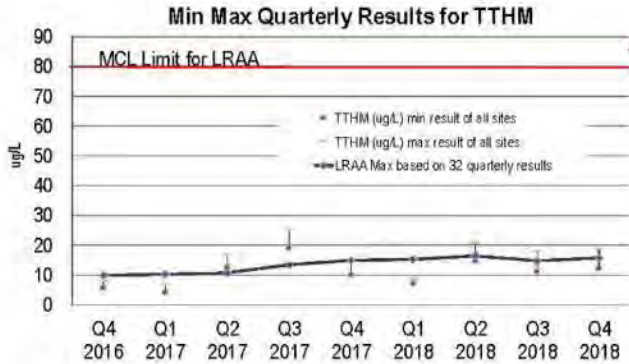
# Drinking Water Source Water



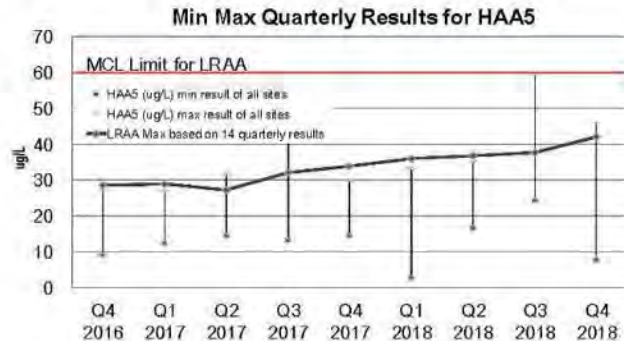
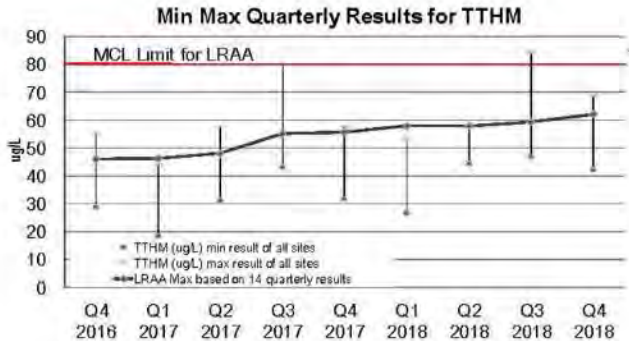


# Treated Water Quality

## MetroBoston Disinfection By-Products

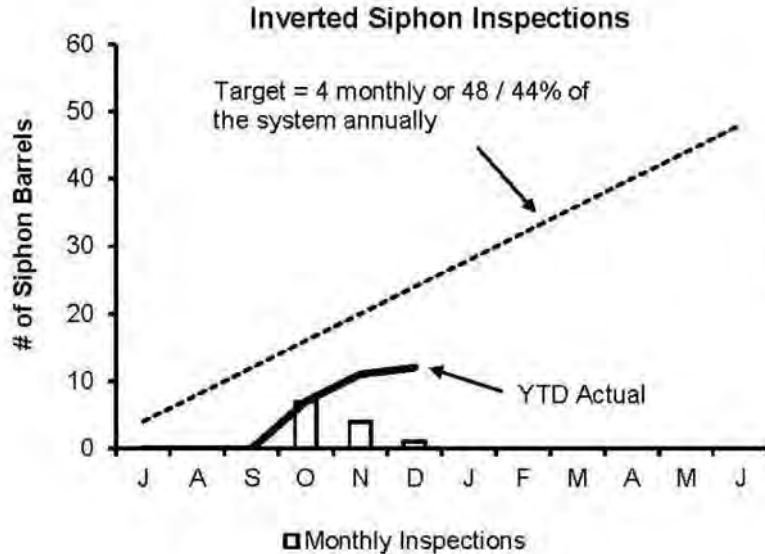


## CVA Disinfection By-Products (Combined Results)

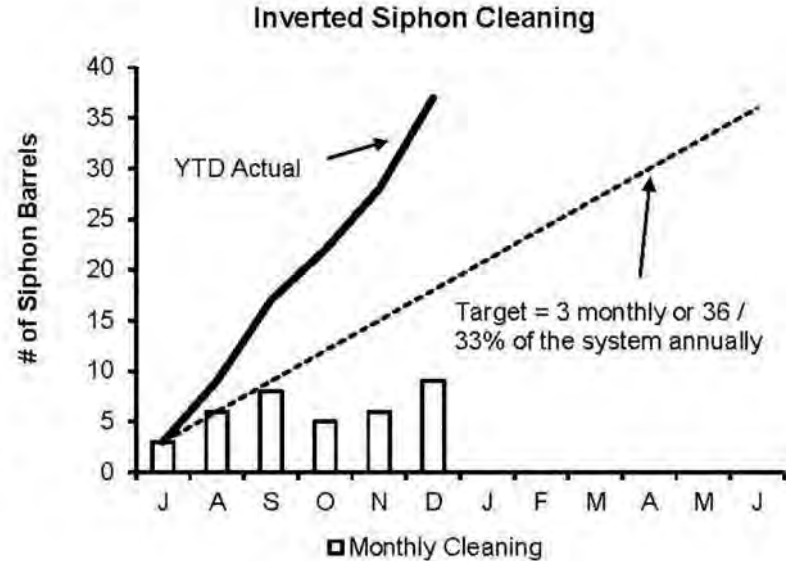




# Wastewater Structure Inspections and Maintenance



Staff inspected 12 siphon barrels this quarter. Year to date total is 12 inspections.



Staff cleaned 20 siphon barrels during this quarter. Year to date total is 37.



# Leak Detection and Repair

## Leak Backlog Summary

Month	J	A	S	O	N	D	Totals
Leaks Detected	1	4	4	1	0	1	11
Leaks Repaired	0	0	3	7	2	1	13
Backlog	10	14	15	9	7	7	n/a

During the 2nd Quarter of FY19, two new leaks were detected, ten leaks were repaired







***MWRA Fiscal Year 2020  
Proposed Current Expense Budget***

February 20, 2019





# ***Rates Management Strategy***

***Sustainable and Predictable Assessments***

***Multi-Year Approach***



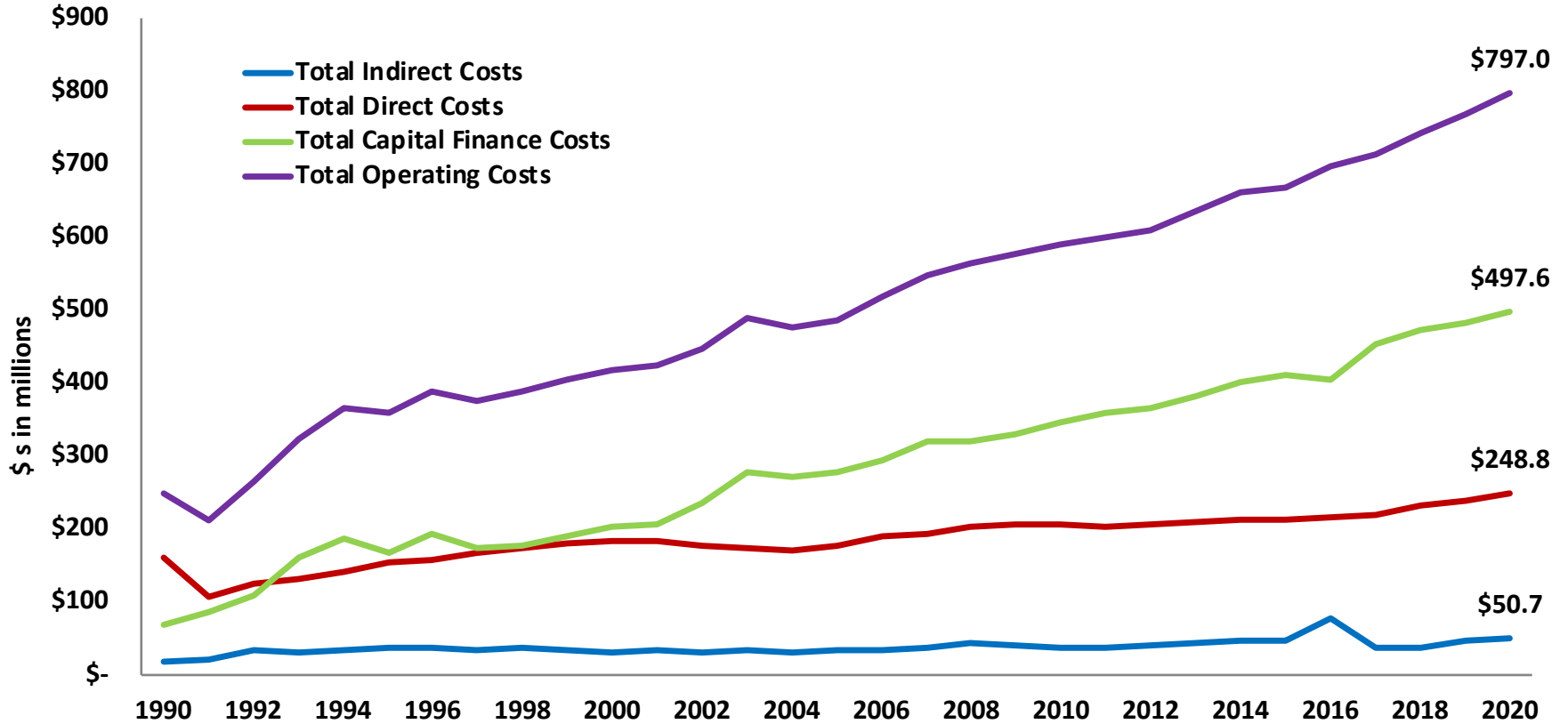


## Budget Drivers For Multi-Year Planning

- Capital Finance Expenses
- Existing Expenses and Revenue – Inflation, Changes
- Long-Term Liabilities



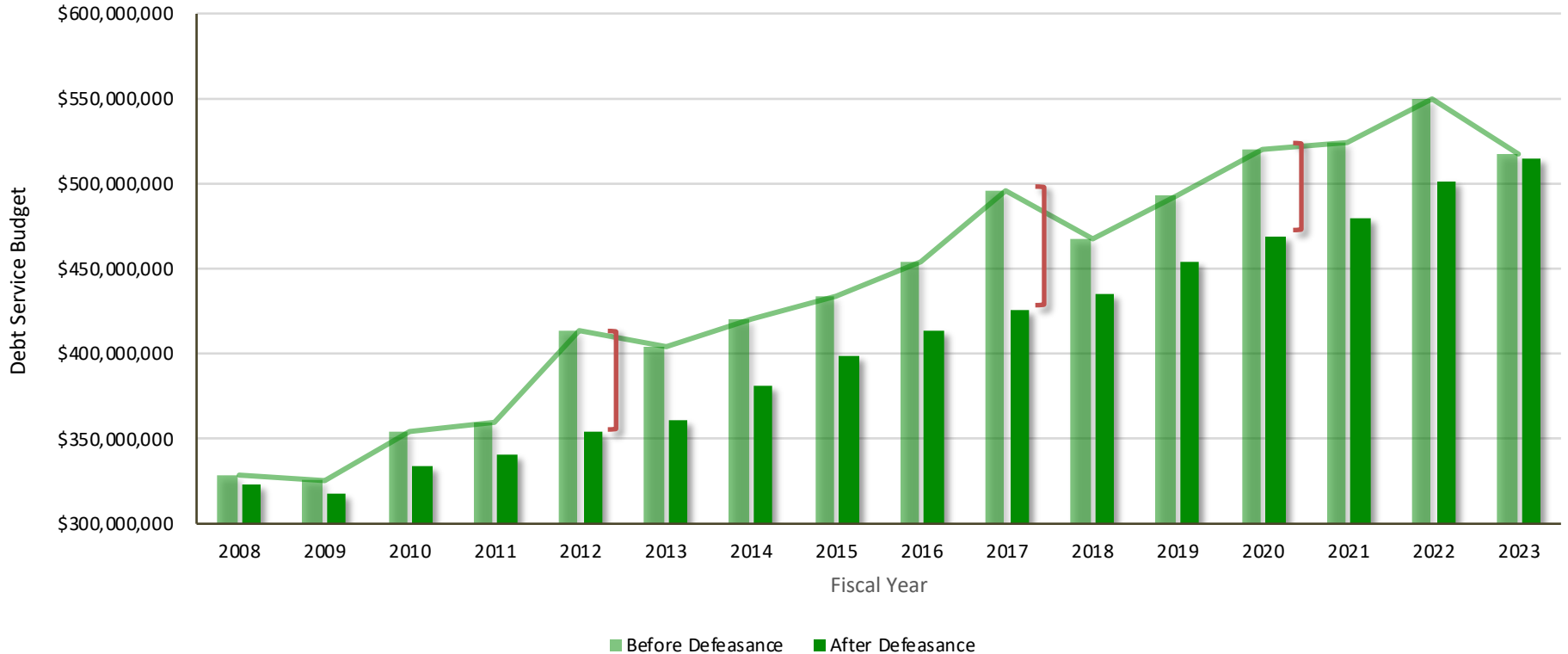
# Historical Budgeted Spending





# Defeasance Strategy

## Before and After Defeasance





## Expense Changes - HEEC

	<b>FY19</b>	<b>FY20</b>	<b>FY21</b>	<b>FY22</b>	<b>FY23</b>	<b>FY24</b>
Projected HEEC Expense <i>Net of \$6.5 reserve</i>	\$1.4	\$4.4	\$5.2	\$6.3	\$6.4	\$6.7

*Amounts in millions*



# Long-Term Liabilities

<b>Pension Funding Schedule</b>	<b>FY19</b>	<b>FY20</b>	<b>FY21</b>	<b>FY22</b>	<b>FY23</b>	<b>FY24</b>
	\$7.0	\$7.3	\$7.6	\$8.0	\$8.3	\$8.7

<b>OPEB Funding Schedule</b>	<b>FY19</b>	<b>FY20</b>	<b>FY21</b>	<b>FY22</b>	<b>FY23</b>	<b>FY24</b>
	\$5.6	\$6.0	\$6.1	\$6.1	\$6.2	\$6.2

*Amounts in millions*



# CEB Budget Structure

- Direct Expenses
- Indirect Expenses
- Capital Finance Expenses
- Non-Rate Revenue
- Rate Revenue

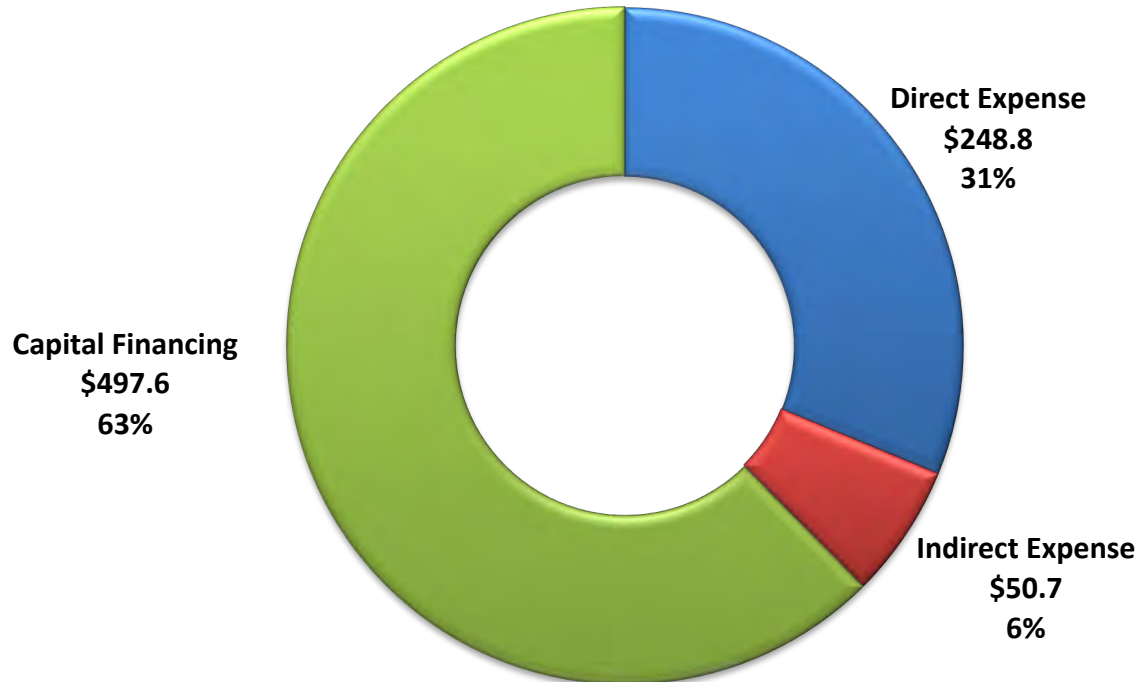
**ATTACHMENT A**  
FY20 Proposed Budget vs FY19 Projection of FY20

TOTAL MWRA	FY19 Final Budget	FY19 Projection of FY20	FY20 Request	Change FY20 Request vs FY19 Projection of FY20		Change FY20 Request vs FY19 Final Budget	
				\$	%	\$	%
<b>EXPENSES</b>							
WAGES AND SALARIES	\$ 107,002,001	\$ 110,646,705	\$ 110,520,570	\$ (120,215)	-0.11%	\$ 481,549	0.50%
OVERTIME	4,447,954	4,547,898	4,498,965	(33,127)	-0.73%	(48,933)	-1.10%
FRINGE BENEFITS	21,173,571	21,742,297	21,963,210	219,913	1.01%	791,630	3.74%
WORKERS COMPENSATION	10,830,452	2,488,018	2,554,256	(73,762)	-3.38%	(88,333)	-3.82%
CHEMICALS	32,560,633	11,155,366	12,087,580	932,214	8.35%	2,527,078	22.62%
ENERGY AND UTILITIES	13,538,727	23,554,689	24,199,103	644,414	2.74%	1,337,470	11.62%
MAINTENANCE	451,727	33,226,489	32,704,795	(521,694)	-1.57%	(521,694)	-1.57%
TRAINING AND MEETINGS	7,678,876	689,443	684,394	(5,052)	-0.73%	(5,052)	-0.66%
PROFESSIONAL SERVICES	31,081,008	7,804,258	8,254,491	450,233	5.77%	450,233	5.77%
OTHER MATERIALS	11,981,410	7,802,572	7,186,700	(615,872)	-7.77%	(615,872)	-7.77%
OTHER SERVICES		14,614,874	13,824,104	(790,770)	-5.39%	(790,770)	-5.39%
<b>TOTAL DIRECT EXPENSES</b>	\$ 249,114,521	\$ 249,712,449	\$ 248,791,896	\$ (920,553)	-0.37%	\$ 920,553	0.37%
INSURANCE	\$ 2,889,064	\$ 2,183,627	\$ 2,081,406	\$ (102,221)	-4.68%	(17,638)	-0.84%
WATERBRED PILOT	26,406,427	27,198,620	27,184,708	(13,912)	-0.05%	788,231	2.89%
RESC PAYMENT	1,388,832	4,360,983	4,426,516	65,533	1.5%	402,484	9.39%
ASTIGMATISM	1,453,262	1,854,618	1,854,618	-	0.00%	204,620	14.15%
ADDITIONS TO RESERVES	1,081,797	1,682,166	2,086,626	404,460	24.0%	315,000	28.9%
RETIREMENT FUND	7,000,000	7,111,000	7,111,000	-	0.00%	315,000	4.43%
POST-EMPLOYMENT BENEFITS	5,174,115	1,788,268	1,788,268	-	0.00%	315,000	17.63%
<b>TOTAL INDIRECT EXPENSES</b>	\$ 45,962,634	\$ 46,882,211	\$ 46,743,131	\$ (139,080)	-0.29%	\$ 139,080	0.29%
STATE REVOLVING FUND	\$ 89,880,339	\$ 92,045,982	\$ 91,138,682	\$ (907,300)	-0.98%	\$ 758,134	0.82%
SENIOR DEBT	270,633,979	210,845,482	204,715,071	(6,130,411)	-2.91%	(7,918,409)	-3.74%
SUBORDINATE DEBT	6,750,393	170,354,730	170,587,702	232,972	0.14%	78,551,400	46.10%
LOCAL WATER PIPELINE CF	14,200,000	4,750,393	5,846,613	1,096,220	23.0%	1,096,220	23.0%
CURRENT REVENUE CAPITAL	14,200,000	15,200,000	15,200,000	-	0.00%	1,096,220	7.20%
CAPITAL LEASE	1,000,000	2,170,000	2,170,000	-	0.00%	1,096,220	109.62%
DEBT PREPARATION	1,000,000	1,000,000	1,000,000	-	0.00%	1,096,220	109.62%
DEBT SERVICE ASSISTANCE	1,000,000	1,000,000	1,000,000	-	0.00%	1,096,220	109.62%
DEBT SERVICE RESERVE FUND	1,000,000	1,000,000	1,000,000	-	0.00%	1,096,220	109.62%
HEAVY CAPACITY RESERVE FUND	(944,736)	2,170,000	2,170,000	-	0.00%	1,096,220	109.62%
<b>TOTAL DEBT SERVICE</b>	\$ 482,469,268	\$ 496,714,647	\$ 497,668,647	\$ (950,000)	-0.19%	\$ 1,096,220	0.22%
<b>TOTAL EXPENSES</b>	\$ 295,077,155	\$ 306,596,666	\$ 305,535,027	\$ (1,061,639)	-0.35%	\$ 1,061,639	0.35%
<b>REVENUE &amp; INCOME</b>	\$ 295,077,155	\$ 296,418,387	\$ 297,433,374	\$ 1,014,987	0.34%	\$ 1,014,987	0.34%
RATE REVENUE	\$ 239,042,300	\$ 266,657,500	\$ 266,657,500	\$ -	0.00%	\$ 266,657,500	111.55%
OTHER USER CHARGES	6,138,768	6,421,640	6,239,263	(182,377)	-2.84%	(182,377)	-2.97%
OTHER REVENUE	6,013,630	6,108,135	6,030,630	(77,505)	-1.27%	(77,505)	-1.27%
RATE STABILIZATION	-	-	34,448,971	34,448,971	100.00%	34,448,971	
INVESTMENT INCOME	-	-	15,000,000	15,000,000	15,000,000		
<b>TOTAL REVENUE &amp; INCOME</b>	\$ 295,077,155	\$ 296,418,387	\$ 297,433,374	\$ 1,014,987	0.34%	\$ 1,014,987	0.34%
<b>Net Revenue Increase over FY19</b>				\$ 1,014,987	0.34%	\$ 1,014,987	0.34%



# FY20 Proposed Current Expense Budget (CEB)

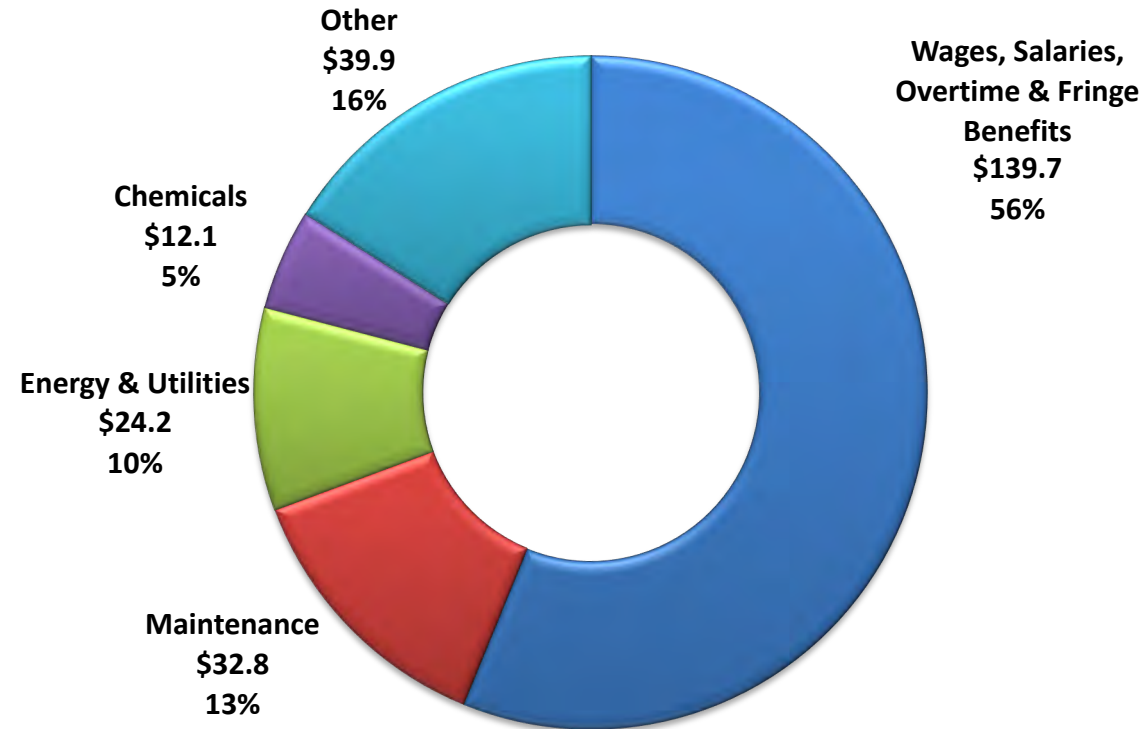
## FY20 Proposed Current Expense Budget





## Direct Expenses

*(\$s in millions)*

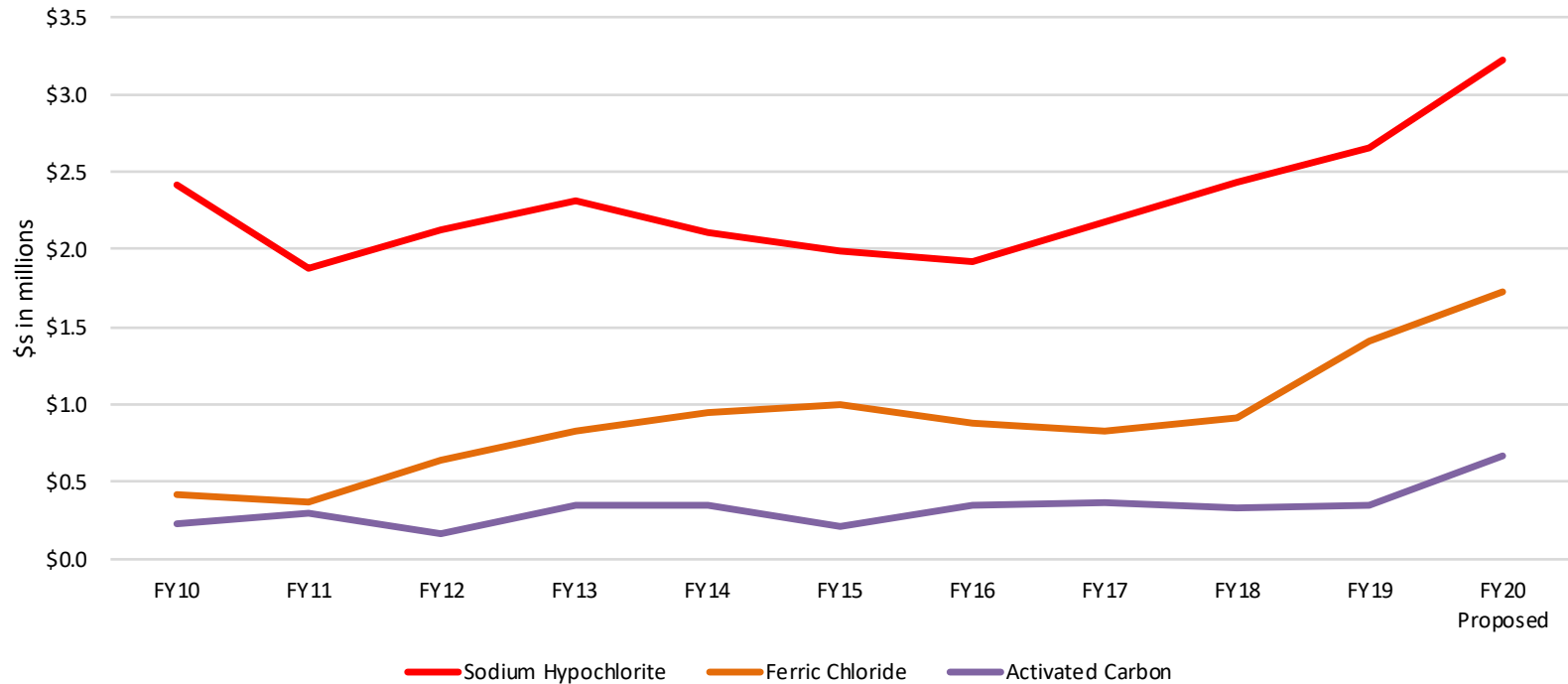


- Wages, Salaries, Overtime & Fringe Benefits: Reflects collective bargaining and tunnel redundancy staff
- Chemicals: \$1.2 M million increase
- Utilities: \$1.3 million increase
- Maintenance: \$.5 million increase





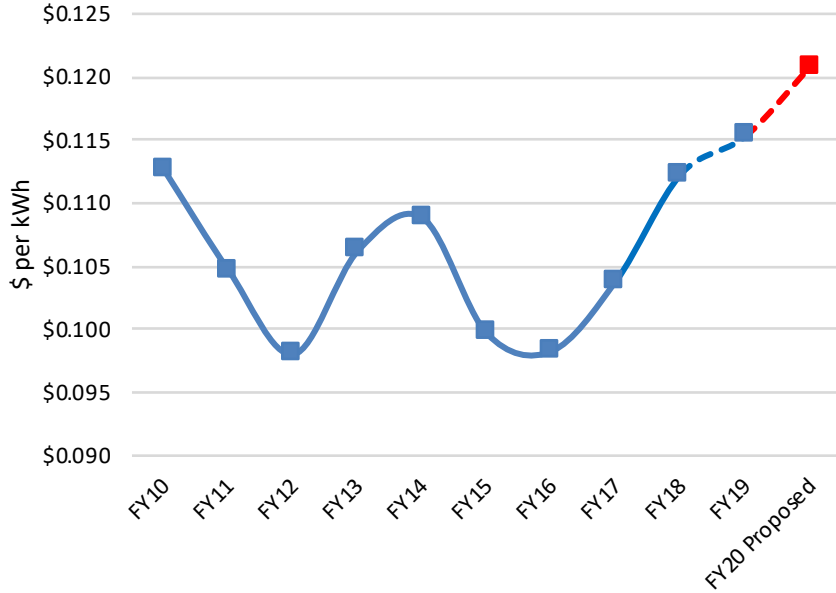
## Historical & Projected Chemical Cost





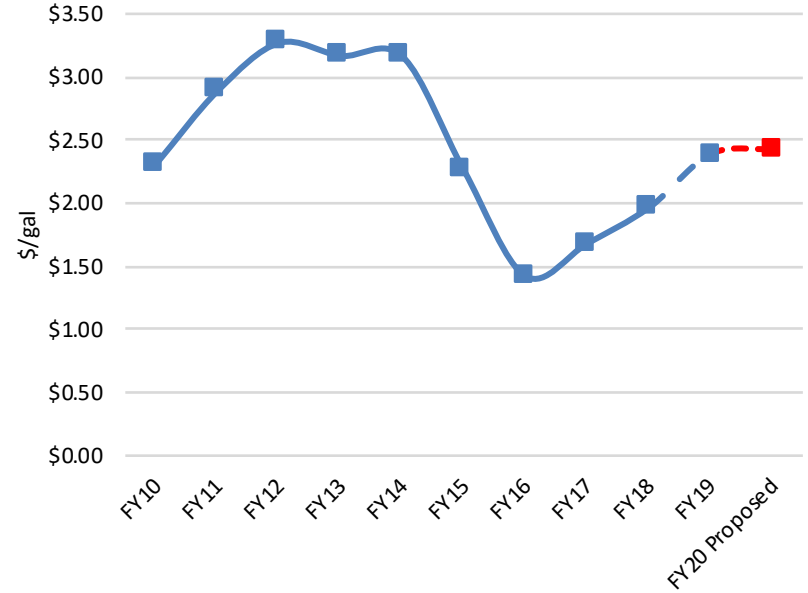
## Electricity

\$/kWh



## Diesel Fuel

\$/gal





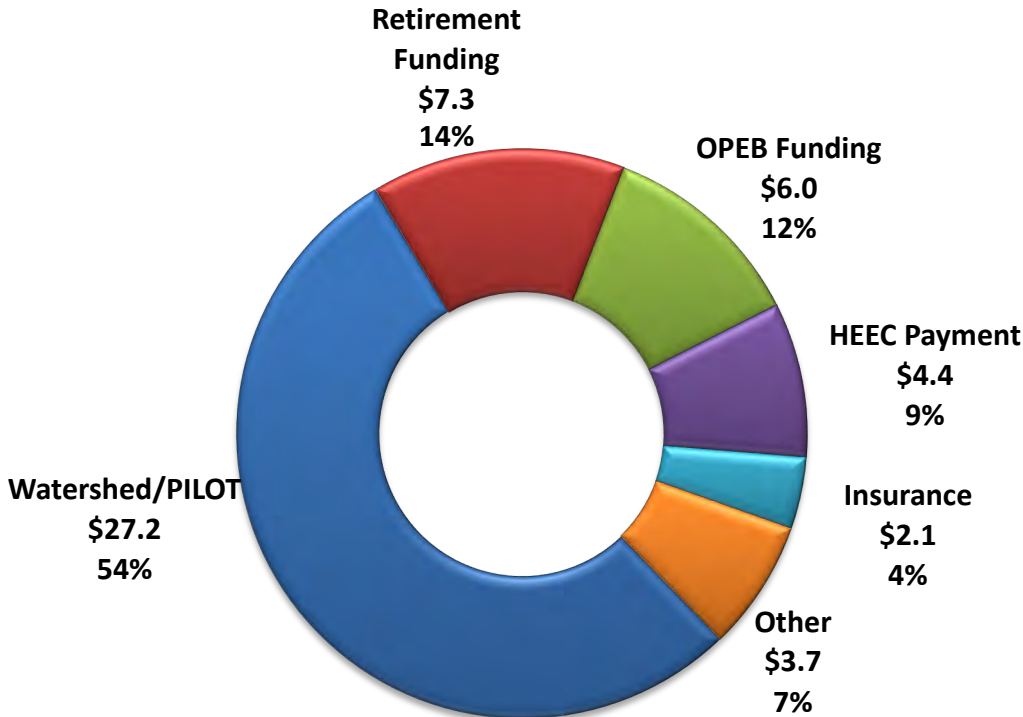
## Health Insurance FY11-FY20





## Indirect Expenses

*(\$s in millions)*

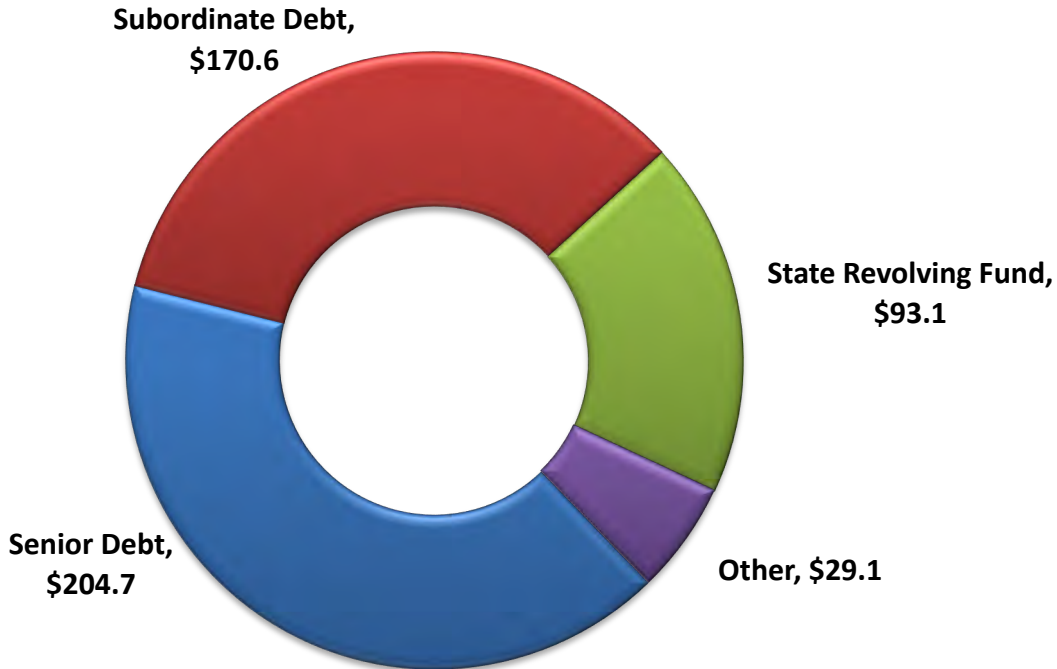


- Pension Fund: 95% funded
- OPEB Contribution: 50% of Actuarially Determined Contribution
- HEEC Cable: New cable coming online in FY20
- Watershed & PILOT: \$0.79 million increase



# CEB Budget Structure – Capital Finance Expenses

## Capital Financing (\$s in millions)



- Variable Rate Debt Assumption: 3.75%, 25 basis point increase
- Assumes \$15.0 million defeasance in FY19
- \$1 million increase to Current Revenue for Capital
- \$4.9 million prepayment of debt



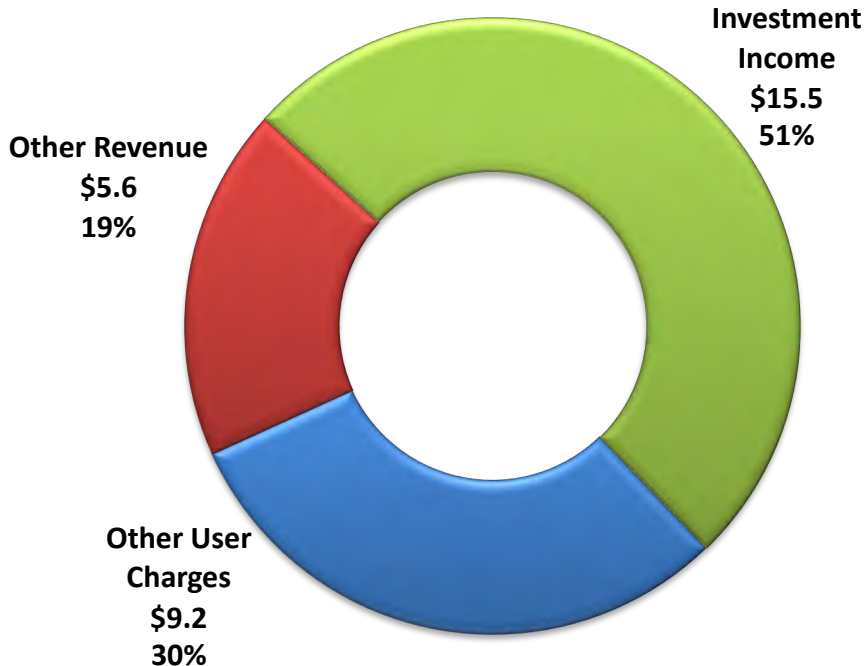
## MWRA All-In Cost of Variable Rate Debt





## Non-Rate Revenue

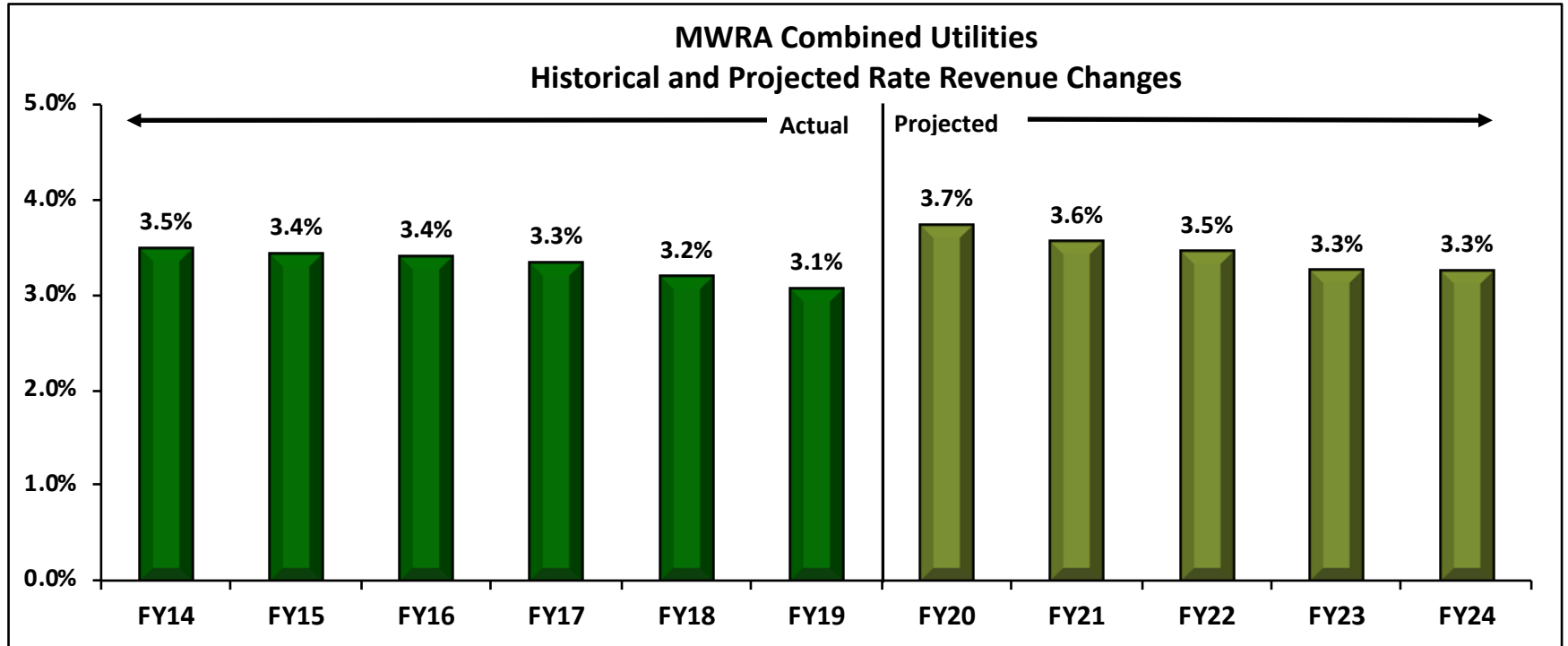
*(\$s in millions)*



- Investment Income: Short-term assumption increasing 50 basis points from 1.75% to 2.25%
- Other revenue: Reduction due to demand response and RPS programs
- Other User Charges: Reduction related to Entrance Fees and Water Treatment Residuals



# Actual and Forecasted Rate Revenue Changes

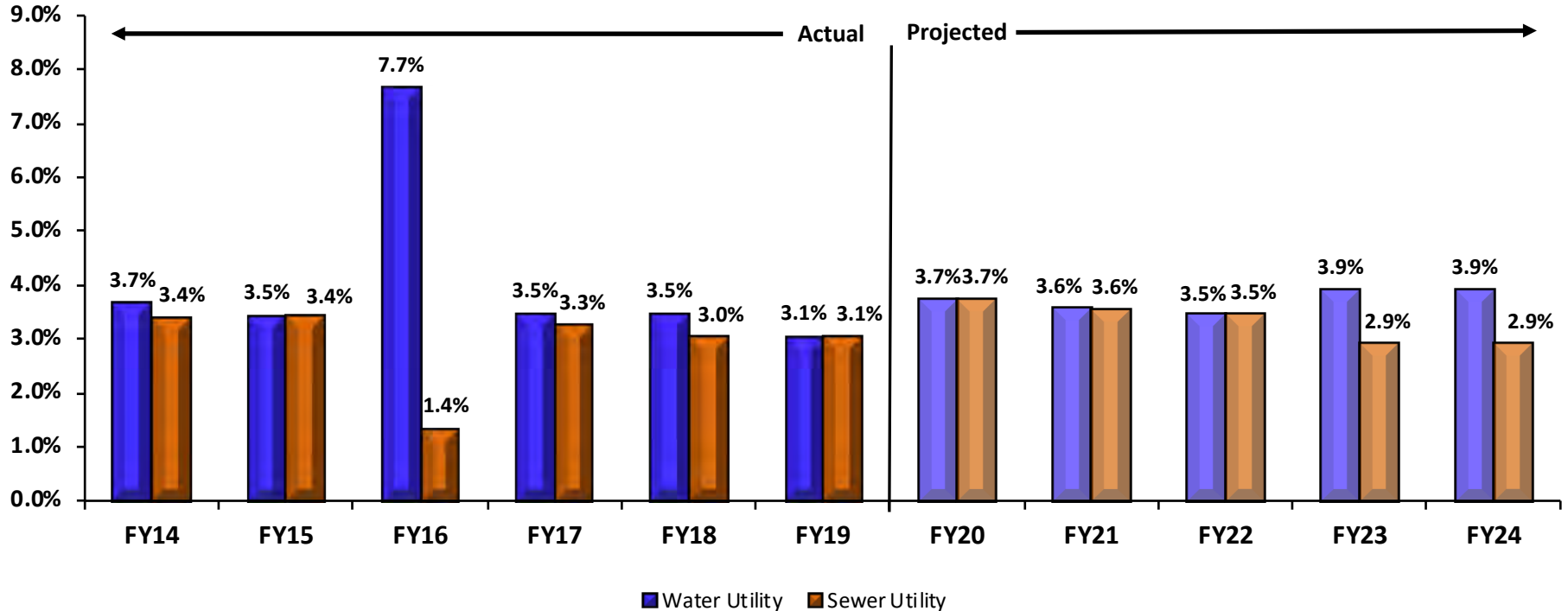






# Actual and Forecasted Rate Revenue Changes by Utility

MWRA Water & Sewer Utilities  
Historical and Projected Rate Revenue Changes





## FY20 Current Expense Budget Next Steps

- Transmit Proposed Budget to Advisory Board for 60 day review
- Public Hearing
- MWRA Board Hearing
- Staff will present Draft Final Budget in May
- Staff anticipate FY20 Budget adoption in June



*Thank You*





***Amendments to MWRA TRAC Regulations***

February 20, 2019



## 360 CMR 10.000: Sewer Use

Intended to protect the public health, safety, and welfare and the environment to ensure proper and safe operation of MWRA's wastewater treatment facilities by regulating the direct and indirect discharge of wastewater and pollutants to MWRA's Sewerage System

### Key Proposed Revisions:

- Creates a Group Permit for Dental Discharges
- Incorporates requirements for onetime only Discharges
- Allows for electronic submittals
- Allows for permitted Reclaimed Water Systems to discharge municipal sludge to the sewer
- Updates Clinton local limits
- Updates Incentive Program Charges



# 360 CMR 10.065: Group Permit for Dental Discharges

- Incorporating Requirement from:
  - 40 CFR Part 441
  - MassDEP: Amalgam and Wastewater Recycling for Dental Facilities, 310 CMR 73.00
- Group Permit for Dental Discharges (Category D1)
  - Universe of new facilities: ~1,000
  - Place or remove amalgam, except in emergency situations
  - BMP based requirements
    - Requires a properly sized amalgam separator
    - Removal efficiency of 98%
    - Proper maintenance
    - Can only use specific disinfectants and cleaning agents (no bleach, non-corrosive)
    - Retain all paperwork



## 360 CMR 10.101 and 10.102: Incentive Program Charges

- Increases permit and monitoring charges by 4% in FY20
- Increases permit and monitoring charges by 3% in FY21 through FY24
- Category 10 (Low Flow Permits) permit charge paid annually
- Permit charges for Construction Dewatering Permits paid when application is filed

### Notable Change to 360 CMR 10.023:

- Allows for MassDEP permitted Reclaimed Water Systems that are also permitted by the Authority and Municipality to discharge sludge resulting from the treatment of Municipal Waste into the Sewer







***Chelsea Creek Headworks Upgrade  
Contract 7161 - Change Order 26***

February 20, 2019



# Chelsea Creek Headworks: Screenings Ejection System







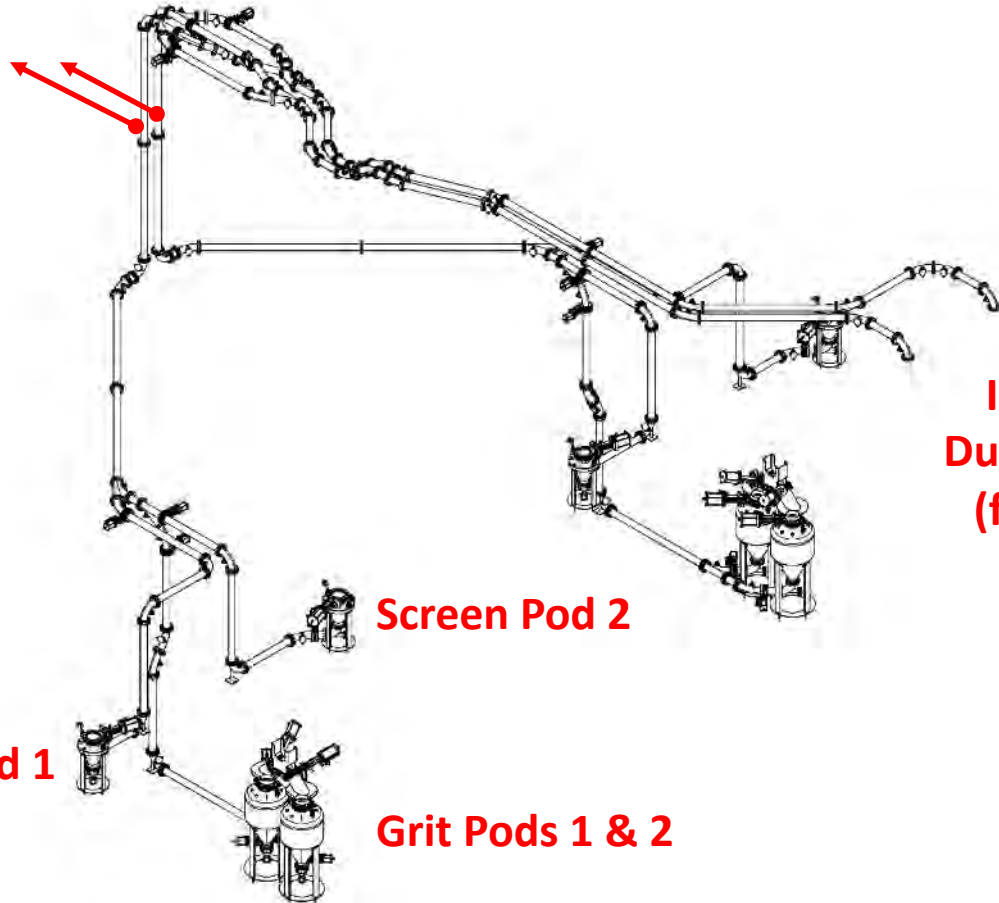
# Chelsea Creek Headworks: Pipe Routing & Access Space





# Chelsea Creek Headworks: Pneumatic Ejection Piping

**Outdoor  
Dumpsters  
(existing)**



**Inside  
Dumpsters  
(future)**

**Screen Pod 1**

**Screen Pod 2**

**Grit Pods 1 & 2**





# Chelsea Creek Headworks: Pipe Spools and Fittings





# Chelsea Creek Headworks: Ceramic Composite Lining







# Chelsea Creek Headworks: Engineered Pipe Supports







# Chelsea Creek Headworks: Base Elbow Support







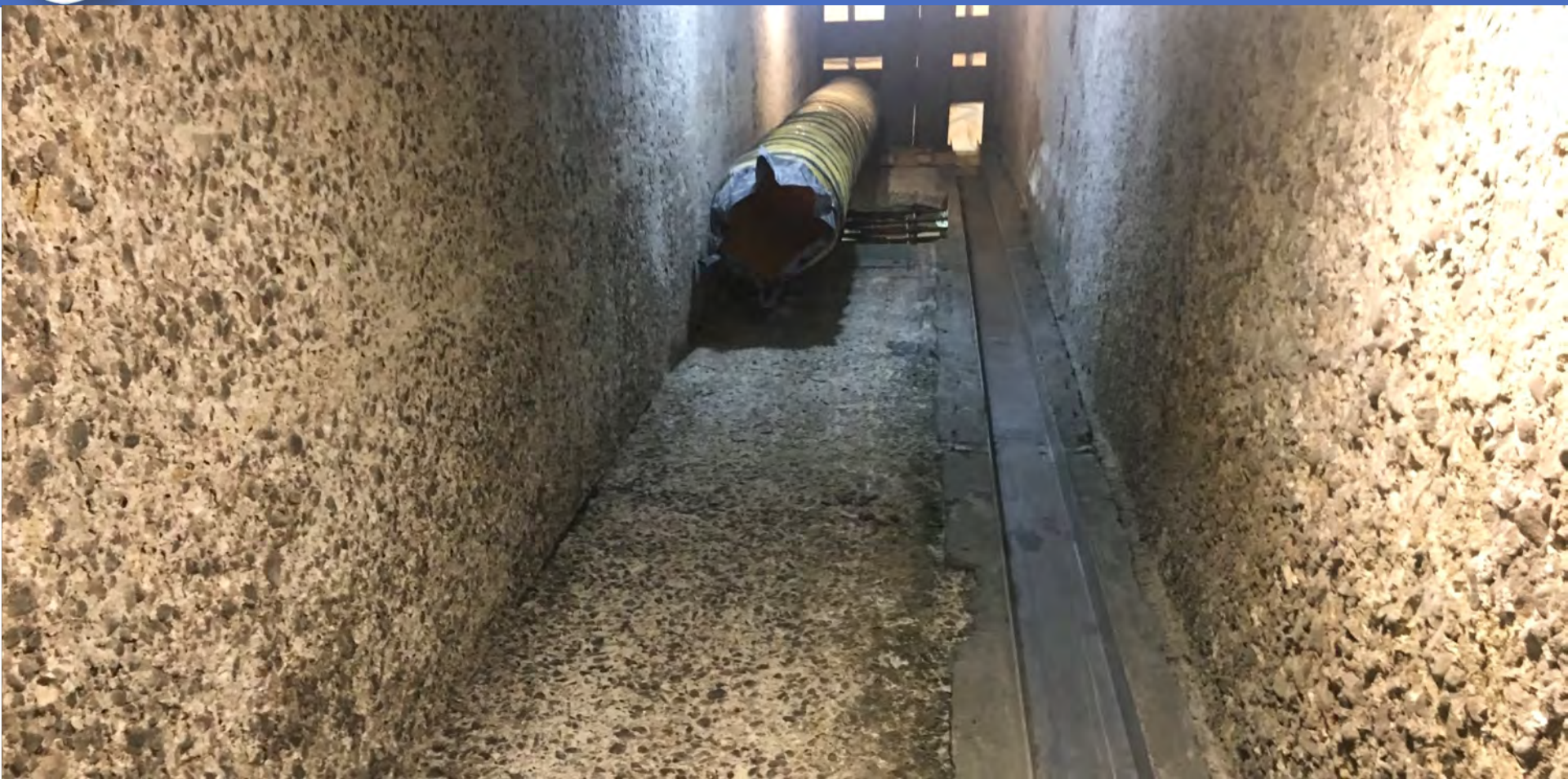
# Chelsea Creek Headworks: Channel 1 Influent Sluice Gate







# Chelsea Creek Headworks: Channel 1 Shaft Lining







***Alewife Brook Pump Station Rehabilitation  
Contract 7034, Amendment 6***

February 20, 2018





# Alewife Brook Pump Station







# New Pumps





# New Electrical Equipment and Pump Motors







# New Screens





# New Boilers







# New Standby Generator





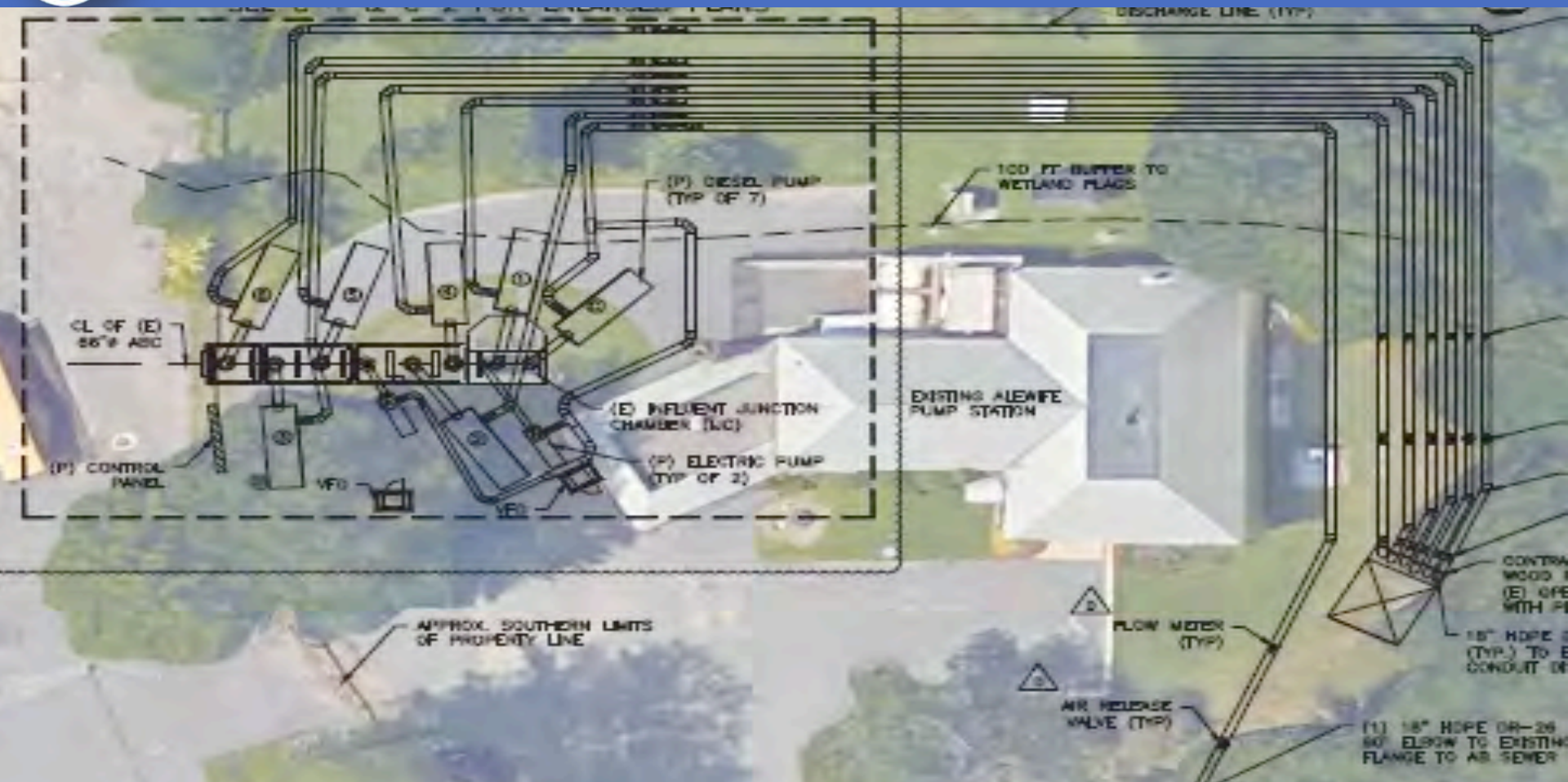
# Replacement Segment of Alewife Brook Conduit







# Bypass Pumping to be Removed





# Proposed Amendment 6

## Additional Time

- Extension of 93 days to align with construction contract

## Out of Scope Services

- |   |                    |
|---|--------------------|
| • Resident Engineering and Project Administration | \$35,940.18        |
| • Review of Additional Contractor Submittals      | \$32,168.31        |
| • Change Pump Strategy and PLC Programming        | <u>\$26,087.25</u> |
|   | \$94,195.74        |





***Dam Safety Compliance and Consulting Services  
Design Repairs and ESDC  
Contract 7614***

February 20, 2019





# MWRA Dam Maintenance Program

- Excellent compliance record
- >\$22 million invested
- Regular inspections
  - Correct deficiencies
  - Improve operations
  - Enhance safety and longevity



# Sudbury Dam Spillway

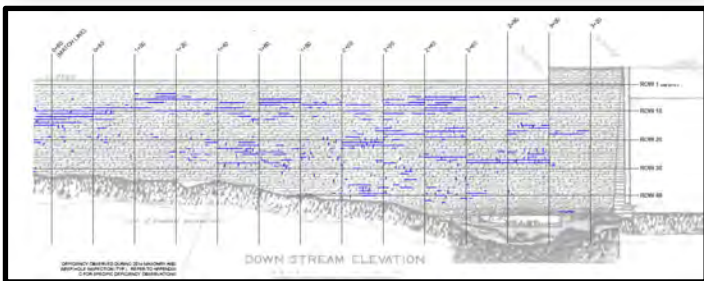
- Downstream face masonry repointing and repairs
- Diver inspection of upstream face
- Sudbury Gatehouse vent pipe repair



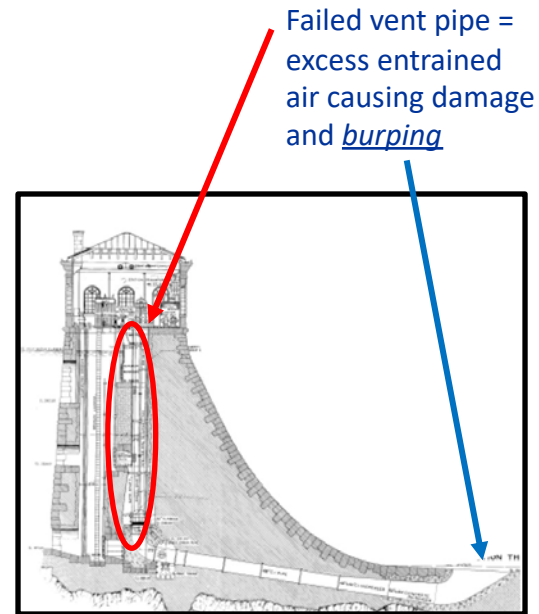
Missing mortar



Clogged weep hole



Extent of mortar deterioration



Failed vent pipe =  
excess entrained  
air causing damage  
and burping



# North Dike Reconnection at Leominster Pump Station

- Potential for wave overtopping during design flood
- Design repair contract to restore dike







# Foss Dam Overtopping Protection

- Analysis shows minimal freeboard during design flood (0.3')
- Require overtopping protection due to wave run-up
- Designing of armorng repairs for steep section of dam to withstand overtopping





# Foss Dam Overtopping Protection on earthen dam

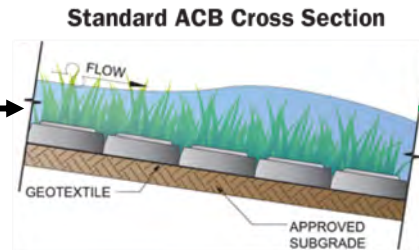


Steep section of Foss Dam

Example of overtopping of earthen dam, Forest Lake, Columbia, S.C., on Oct. 4, 2015



Example of armoring turf protection







# Piezometers at Wachusett North and South Dikes

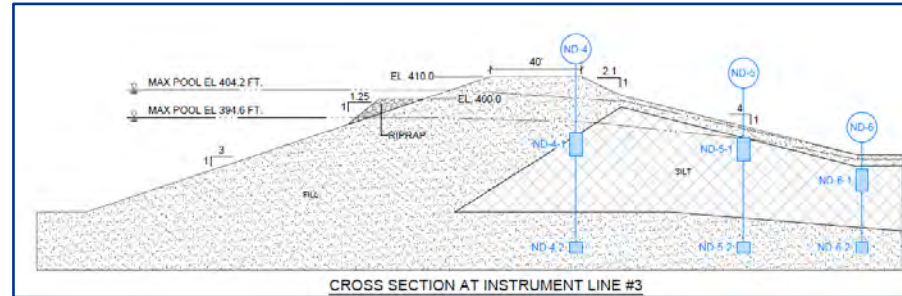
- Piezometers required to assess seepage and evaluate stability of the dam



Wachusett Reservoir North Dike from above



\* North Dike looking west







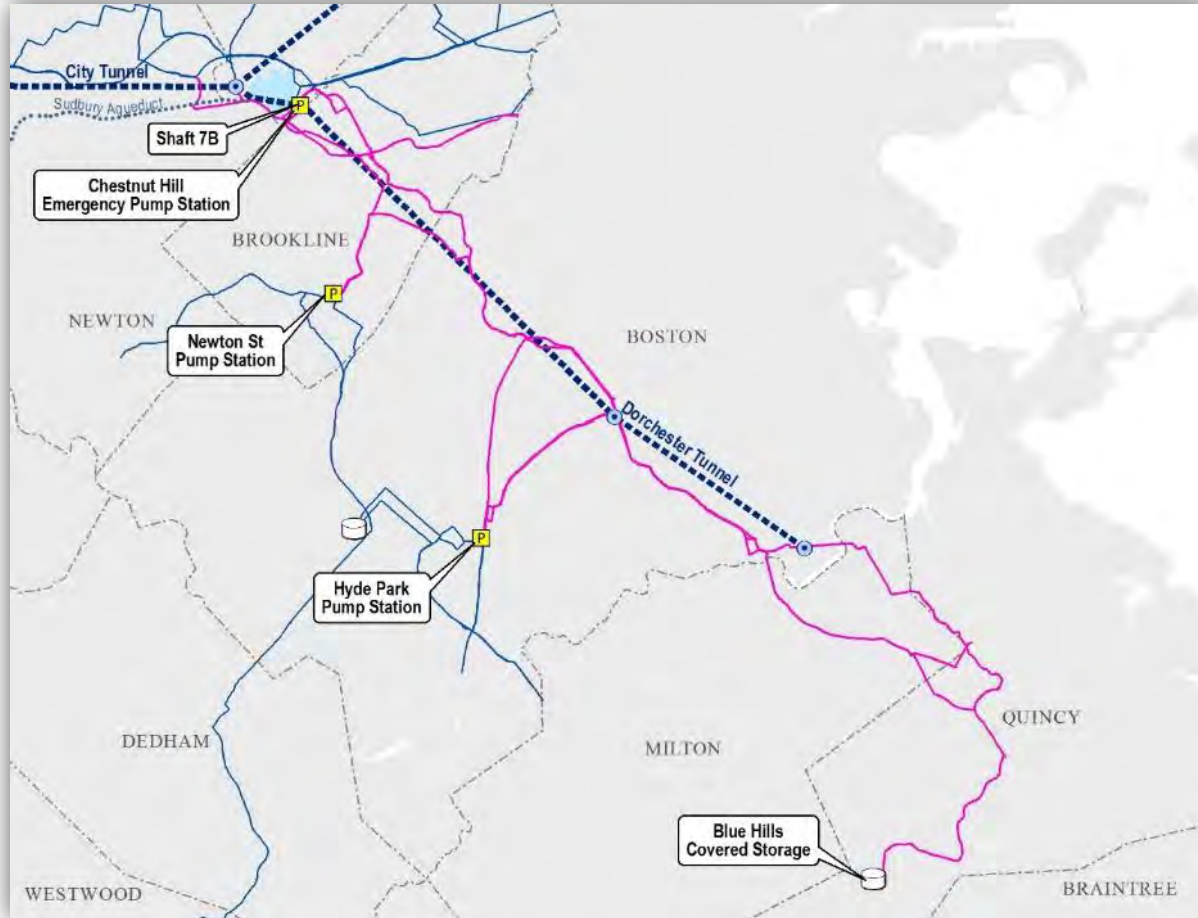
***Chestnut Hill Emergency Pump Station  
Improvements Design and Engineering  
Services During Construction***

February 20, 2019



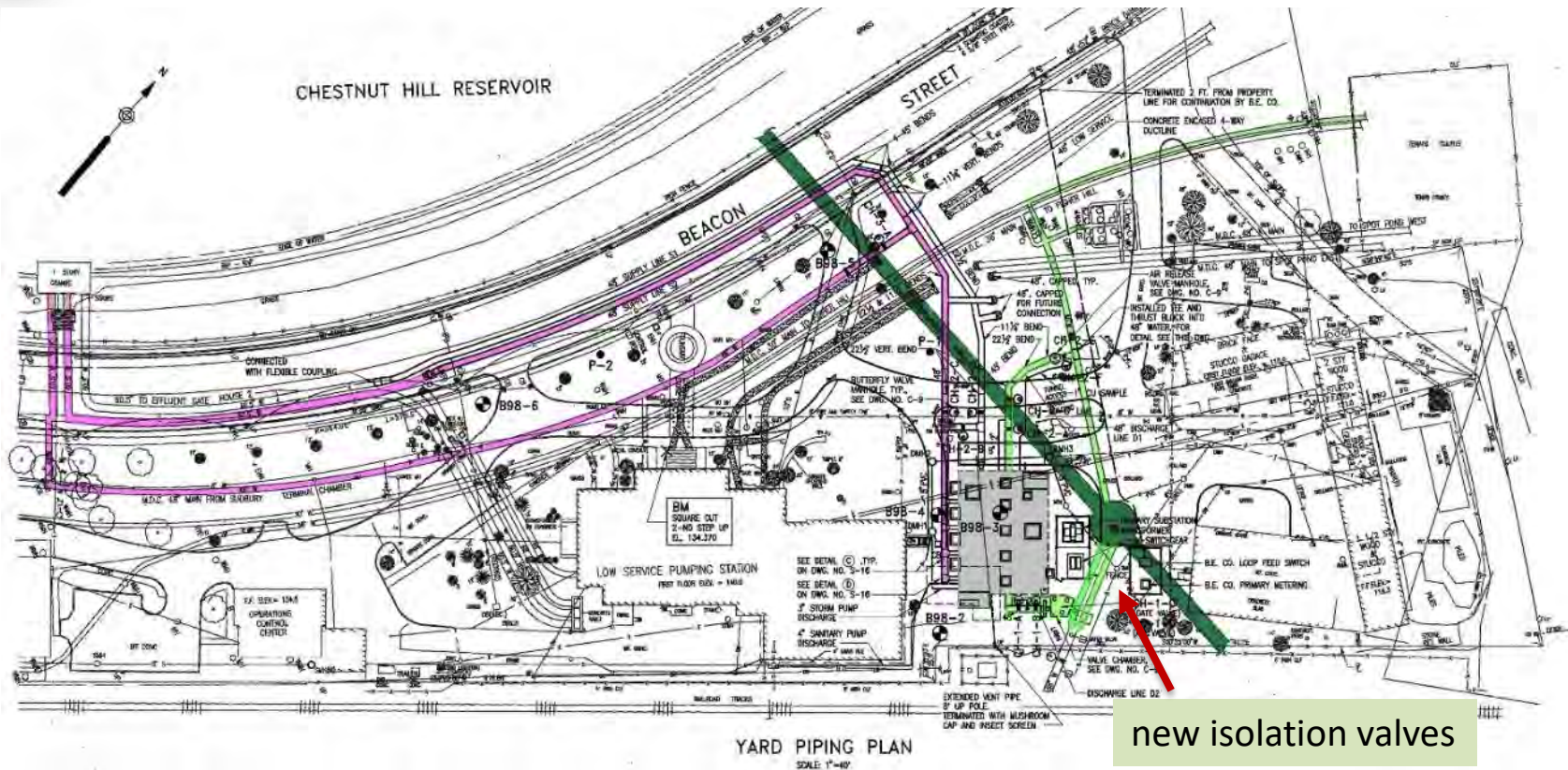


# Chestnut Hill Emergency Pump Station - Location





# Chestnut Hill Emergency Pump Station - Operation





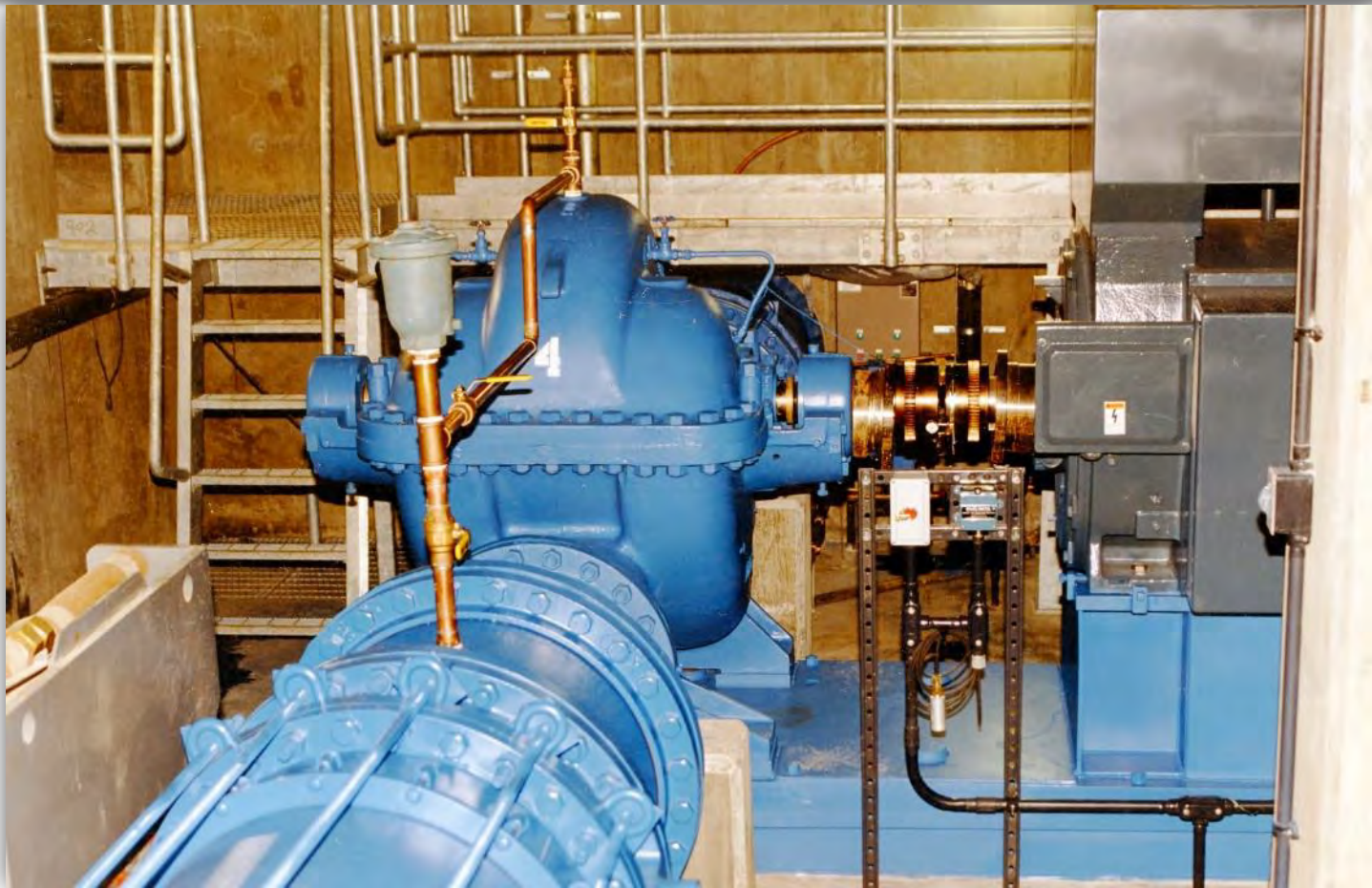
# Chestnut Hill Emergency Pump Station - Improvements

- Interim improvements until tunnel redundancy is complete
- Mitigate discharge and surge pressure in the event the Dorchester Tunnel needs to be taken out of service (replacement of surge control valves)
- Design of docking station for portable generator
- Design of isolation valves between station and tunnel





# Chestnut Hill Emergency Pump Station - Improvements







# Chestnut Hill Emergency Pump Station – Procurement Process

- Proposals Opened on December 20, 2018:

<u>Proposers</u>	<u>Amount</u>
Hazen and Sawyer, P.C.	\$2,074,166.81
<i>Engineer's Estimate</i>	<i>\$2,960,680.00</i>
Stantec Consulting Services Inc.	\$2,997,016.55

- Notice To Proceed: February 2019
- Contract Duration: 66 months

