



Minutes

June 5, 2020

Virtual

**WAC Members:** Mary Adelstein, Craig Allen, Philip Ashcroft, George Atallah, Wayne Chouinard (vice chair), Adrianna Cillo (BWSC), Zhanna Davidovitz (MIT), Stephen Greene, James Guid (AB), Taber Keally, Karen Lachmayr (chair), Belinda Stansbury, Kannan Vembu, Dan Winograd

**Staff:** Andreae Downs

**MWRA:** Wendy Leo, Sally Carroll

**Guests:** Lexi Dewey (WSCAC), Lou Taverna (Advisory Board), Stephen Kaiser

**VOTE:** May Minutes, FY20 Annual Report, vote to retain current WAC leadership—all unanimous.

**REPORTS:**

Advisory Board: Planning for returning to the office on the 4th floor in Charlestown. Still working remotely, but occasional returns for payroll and accounts processing. Won't be as big a challenge to return to the office, only 3 people on staff, and everyone has their own closed space. May do staggered schedule. Bigger challenge is AB meetings. ExComm normally meets in office. AB meetings offsite, but probably can't host them with 6' distancing.

June's PFAS workshop will instead be interviews with panelists and put on website. Same with the August field trip--not happening. Looking into options, like virtual tours of MWRA facilities.

Working with communities on their budgets: Belmont, not increasing rates. Braintree looking to lower rates. Looking for more developments on that.

River School of Weston is looking to connect to the MWRA wastewater system, 77K gallons

AB will also be continuing to monitor the installation and updating of wastewater metering, which has been put on hold because of COVID

MWRA: Still on split shifts, gradually increasing the number of people in the office. With distancing, masks, and enhanced cleaning.

Prison Point and other construction delayed until August, but will come out even in the end.

CSO communities being asked to continue ongoing maintenance. Heavy cleaning of structures re-starting now--grit and sand accumulates, takes up capacity--was interrupted by pandemic. In

some areas. underperformance of CSO regulators may be related to accumulated grit and sand in the interceptors.

WAC/WSCAC contracts approved

Clinton: will be doing a small project to improve the dechlorination system. Phosphorus removal step added complications to the chlorine removal.

Chair: Congratulated WAC on year well done. Thanked committee members for their time and service. Reminder that all members are working pro-bono. Huge thanks to ED, terrific job, organizing topics, ideas, logistics gathering information.

Want to especially acknowledge WAC's pivot during the pandemic in topics and logistics—pretty amazing and hard work by ED getting WAC into virtual meetings, many trainings. Also, committee members for doing such a good job with this transition.

WAC didn't always have this year-end meeting to plan and brainstorm. This meeting is a little more unstructured than our usual meetings. Chair started in 2008. Nice to have this open-ended time to discuss.

Director: Full report at end of minutes. Review of fiscal year's highlights (in Annual Report)

## **DISCUSSION—**

### **Annual report draft**

Comments: Report is succinct and covers all the points, but gets into details quickly and may be losing sight of the big picture. WAC has always been pushing maintenance. It's the reason we are here. The communication of that is important. Energy efficiency and climate change are also important. Co-digestion and removing wipes from the system are possibly solutions, but are second tier. Those items should not be equalized. Some are solutions to the problems, and perhaps not the only solutions.

### **Focus for Fiscal 2021/Suggested topics**

Andreae: Have collected the following topic suggestions already from members and observers:

- Combined Heat and Power plant—can it be done faster than the current timeline of 10 years?
- COVID updates, flows and solids, operations at Deer Island, water demand changes, tracking in sewage
- Pelletizing plant—contract renewed (to December 2021 or 22). Is pelletizing the right solution? Will regulations and concerns about PFAS, phosphorus or other CECs make recycling via pellets non-viable? New technology to remove PFAS...
- I/I grants, loans and the loan deferrals.
- Pipe and interceptor maintenance

Mary: Sea level rise. Will this affect access to Deer Island? Are there still viable proposals for a sea wall? Salt water intrusion, also into CSO pipes?

Also, BioBot and uses of it in epidemiology.

Adrianna: COVID water and wastewater impacts

Craig: Effects of COVID on MWRA finances, wastewater volumes, relative health risks

Karen: follow COVID— perhaps how sewage can be used to monitor for pathogens generally.

Taber: MWRA wants to stay away from monitoring pathogens in sewage, but perhaps wants to make the permissions process easier. It's not what MWRA does, and have enough monitoring requirements as is. Second sea level rise and salt water intrusion, as part of maintenance— something to re-visit.

Martin (in conversation with Andreae): OMSAP and what it may be interested in having monitored in the effluent, including those CECs that may be hazardous to environmental or human health. How this should be funded will be key.

Kannan: interested in using sewage for disease screening, water security systems—illegal sewage connections/dumping (Wendy: there are big fines for that, if you get caught. The rag issue in Weymouth is still not solved—sewer mysteries? Philip—a federal wastewater plant on the border with Mexico, had a regular issue with bodies washing in from Mexican sewers. Only plant he ever ran with severe issues mental health and stress)

Belinda: emerging contaminants, particularly with so many biotech pop ups along the Charles, could bring in the MassBio council and TRAC

Stephen:

## **Maintenance**

I don't think we need to go into their daily work routines, but want to see that it is be managed and budgeted. What is changing as the equipment ages? How is the Capital budget is being impacted by replacement of old/obsolete equipment? Are there instances where spares are need to be stockpiled as suppliers stop having these items available. We are planning on longer life of a piece of equipment but that depend on certain spare parts. I recall that we had early replacement of some electrical equipment because the controllers were no longer serviceable for want of parts.

## **Operations**

How are operations changing with technology (remote operating, automated operation), monitoring, what we are learning and what we are expecting. Climate Change is a major concern. The earlier impact will be severe storms and tidal surge. Monitoring for flow management improvements. Remote and automated virus/drug sampling. The sampling would be to gather intelligence and not intended for enforcement. What contingencies seem reasonable with our current experience with some emergency that had a very widespread impact. What should the MWRA be doing now to be operating efficiently in 2030? What are staff plans, succession and training needs for the future? It is not going to all be robots and

computers. Technology certainly is playing a role. Just as the absence of technology will have an impact if it is not available.

#### Biosolids/residuals

This issue is not going away. Contaminants will dictate management options. Underscores that TRAC alone cannot manage; some substances may need to be banned from use on a state or national level. Even with that it may be a decade before the contaminant is below levels of concern. Thinking of the problems with molybdenum in cooling water treatment chemicals.

#### Education and Outreach / Commenting

I think this occurs as needed and we are managing well

Zhanna: TRAC—has been a few years since heard from them, and would be interesting to know how they are handling CECs.

Wendy: With CECs, there's a regulatory gap. Items that are not causing an operational problem in the NPDES program aren't monitored unless caught in a whole effluent toxicity test (which MWRA conducts). Generally, that test is not a solution, but we can only monitor what the law regulates. We regulate industries because we can under the law, but whatever households are putting down the drain is hard to regulate—mostly education.

George: on a call with office in CT. Creating new permits for industrial discharges. They are asking significant users to look for emerging contaminants such as 1,4 Dioxane. If CT is doing that, MA should be able to also.

Kannan: for emerging technologies, should we have a presentation from a company that is removing CECs from wastewater? Presentation by technology provider. Also, we discussed earlier about a presentation on anaerobic digestion (means to impact Deer Island process thru experiences learned by American Biogas Council)

Wendy: this would be most interesting if anyone is doing this at scale.

#### **Leadership**

Karen and Wayne are happy to continue as chair and vice chair for next year.

Next Meeting September

## Director's Report

### OMSAP ad-hoc meeting 5/19

MWRA updates—monitoring with COVID-19 and update on nutrients—Betsy Reilley

Since pandemic, limiting staff exposure and on-site presence. Operations continue mostly as usual.

Monthly water column sampling Feb-Oct. As of March, could not obtain a ship to perform sampling. In late April got approval to use a ship, delayed due to weather. April survey went out May 4. May survey for May 11 pushed out to May 18, but completed. Because of the physical distancing requirements, sampling crew reduced. Reduced the number of samples. Provincetown Center for Coastal Studies did their sampling in 3 sites in Cape Cod Bay for both April and May.

Flounder survey for April 27—done May 11-13, but did not catch the full complement of 50 fish at Nantasket. Hard-bottom video survey planned for June.

PPCP Presentations—Goals to determine, what contaminants are a concern, what are the sources, pathways, impacts, role of WWTP in releasing PPCP Hoping to get a list of PPCP of high/moderate priority, sources, transport, effects, WWTP roles, future actions.

Duest—plant flow at DI dropped after the governor's order, and then it started to rain, which increased flow.

Ken Keay—2019 nutrient loading several hundred tons below warning threshold (set in 1988 for 2020). This warning threshold was just a projection, not based on science of what limits the harbor and bay could handle. Increased loading because of increased population. Deer Island got its platinum award again this year.

Do CSOs play into that calculation? No.

Peter Burn—overview of Contaminants of Emerging Concern

- Considering modifying the monitoring program again, to better effect and greater efficiency
- Balance between better program and value for ratepayers
- What do we test for, what do others test for and what should we be testing for?
- PPCPs are an enormous list—sources are mostly WWTP, but also other sources
- Most interesting question is identifying and ranking PPCPs
- Unto themselves are endocrine disruptors—disrupt both human health and the natural world
- Not regulated by EPA
- At low concentrations have some effect—that makes testing for them difficult. Not usually acutely toxic, but chronic and developmental, reproduction and behavioral effects.

Todd Callaghan—priority lists and surrogates

- What are the known effects?

- MWRA already does a number of samples—key to fine-tune to capture other compounds
- Silent Spring sampled water in Cape Cod Bay, oysters, etc. and found PPCPs
- MassDEP had prioritized PPCPs, but no regulatory levels yet.
- Southern California research group narrowed CECs to about 15 in ocean sediments and in mussel tissues
- Also looked at a monitoring trigger quotient—also looked at observable effects. Those with some concerning effects narrowed the list of contaminants of concern to 8—none of which are PPCPs.
- Six on a list that does not have expected effects, but want to measure in estuaries (not in ocean water) slide
- Slide on what they recommend monitoring for ocean-effluent WWTPs

#### Mark Cantwell—research in the Coastal Northeast (ACESD research)

- Triclosan present and persistent in water, sediments. Getting phased out of consumer products—voluntary. UV disinfection seems to destroy it.
- Large study in Hudson River of pharmaceuticals: 70 sites, 2x in 2015.
  - High frequencies of most compounds—all remained above detection limit.
  - Spikes at WWTP discharges or tributaries with wastewater discharge
  - Closer to NY harbor, amounts rise despite dilution.
- Long Island Sound—concentrations higher in west, lower in east.
  - Most studies are of nutrients and hypoxia
  - Dilution and degradation play a role
  - Sucralose is a useful waste water tracer
- Narragansett Bay—spatial sampling design shows sucralose corresponds to pharmaceutical incidence
  - Also looked at how long compounds lingered. Caffeine is particularly persistent.
- Boston Harbor sampling 2015—despite CSO discharges, low concentrations of the pharmaceutical compounds found in Hudson Bay and Long Island Sound. One of the good things about moving the outfall into the Bay.

#### Discussion and next steps—Pederson

Peter Burn—seem to be few effects of the outfall re: PPCPs  
 There's MassBay testing for PFAS—on hold since labs are closed.

Another issue is what happens to compounds in the environment, whether they degrade or recombine into something more harmful. Also, whether compounds mixed together may pose additional harms. These appear to be open questions.

There's some data from 2010 that looked at PPCPs in MWRA influent and effluent, including caffeine, but nothing done since.

Is there an interaction with microplastics?

To what end monitoring? Suggestion, widely acclaimed, that not just for monitoring's sake, but for expected effects.

Triclosan will be better regulated and discontinued in some cases.

Future Meetings—Summary in June meeting of the 3 areas of emerging contaminants, PFAS. Microplastics PPCPs—>plan to write a white paper to MWRA, DEP, EPA and potential funders of research needed.

## EBC Workshop: Boston's 2019 Climate Action Plan

Third plan since 2007 (iteration in 2011 as well). Goal of carbon neutrality by 2050; 80% reduction by 2030.

### **Boston's Climate Goals**



#### **MITIGATION**

Reduce community-wide carbon emissions by

**50%** in 2030 & **100%** in 2050

Reduce municipal emissions by

**60%** in 2030 & **100%** in 2050



#### **ADAPTATION**

Prepare for sea level rise, hotter summers, and more rainfall during storms



#### **MOBILITY**

Empower Bostonians to access all parts of the city safely and reliably by transit, on foot or on a bike



#### **WASTE REDUCTION**

Become a zero waste community and increase the recycling rate from 25% to

**80%**



#### **CONNECTED COMMUNITIES**

Enhance community connectivity so that all families may thrive in a carbon-neutral, climate-ready Boston

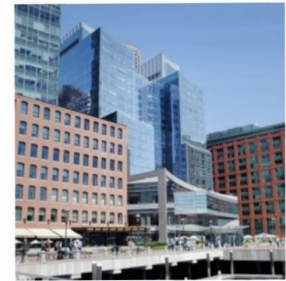


Includes new & existing buildings (building codes/zoning, retrofits, advocacy on building codes), transportation (moving in more efficient ways, electrifying--or use less green the rest), energy supply (community aggregation/choice, microgrids, state policies)

Includes metrics, resources dedicated to the goal.

## Over the next five years...

1. Construct new municipal buildings to a zero net carbon standard
2. Adopt a zero net carbon standard for City-funded affordable housing in Boston
- 3. Strengthen green building zoning requirements to a zero net carbon standard**
4. Invest in energy efficiency and renewable energy generation in municipal buildings
- 5. Develop a carbon emissions performance standard to decarbonize existing large buildings**
6. Expand workforce development programs for building decarbonization
7. Advocate for state building policies that align with carbon neutrality by 2050



Doesn't yet account for consumption emissions--next plan will look at decarbonize the consumption of Boston residents and businesses.

Will be producing an annual report, hoping it's useful to residents and businesses, and welcome feedback.

## MWRA Board 5/27

### Laskey report

13 employees either had or have COVID. 26 self-quarantined. Another 30 have gone to get tested.

Otherwise, de-cluttering to make cleaning easier in offices, updating air exchange to be more frequent, adding hand sanitizer stations at each doorway.

Reminds board that working with Biobot at Deer Island to test for SARS-COV-2. One way to detect the asymptomatic in the population at large. South Hadley is also. BWSC is partnering in this to track individual neighborhoods.

Biobots methods can also be used to track opioid addictions in the population.

### Administration. Finance

Draft final FY21 CIP—Pandemic has presented a number of challenges.



Complies with cap requirement. Focus on asset protection (67.7%) and water redundancy (20.8%)

What impact on the current expense budget (CEB)?

- Finances debt
- Direct connection from capital to current rate requirements
- Question of how much financing and when—all about structuring

SARS-COV-2

- MWRA working through that with teleworking, but has some impacts on construction
- 30 projects delayed 3 months, taking into account conservation commission meetings, on-site work. Dollars moved into out years also

Slide of top 9 projects—driving \$319m or over 30% of the budget



Project	Contract	Projected FY19-23 Expenditures \$s in millions
DI Treatment Plant Asset Protection	Clarifier Rehab Phase 2 - Construction	\$75.3
Corrosion & Odor Control	NI Odor Control HVAC Improvement Construction Phase 2	\$57.6
Facility Asset Protection	Chelsea Creek Upgrades - Construction	\$51.8
Facility Asset Protection	Prison Point Rehab - Construction	\$41.8
SEH Redundancy and Storage	Redundancy Pipeline Sect 111 - Construction 3	\$20.4
NIH Redundancy & Storage	Section 89 & 29 Redun Construction Phase 2	\$19.8
DI Treatment Plant Asset Protection	Gravity Thickener Rehab	\$19.5
NIH Redundancy & Storage	Section 89 & 29 Replacement - Construction	\$16.7
DI Treatment Plant Asset Protection	Fire Alarm System Replacement - Construction	\$15.8
<b>Total Contracts &gt; \$15.0 million</b>		<b>\$318.6</b>
<b>% of FY19-23 Spending</b>		<b>30.2%</b>
<b>Total Projected FY19-23 Spending</b>		<b>\$1,055.2</b>

Wastewater asset protection is the big driver of current and future capital spending.

Slide of top 6 projects for FY21, driving 86% of capital spending this year.



**FY21 Draft Final CIP – Top Spending Projects Excluding Community Loans in FY21**

Project	Contract	Projected FY21 Expenditures \$s in millions
Corrosion & Odor Control	NI Odor Control HVAC Improvement Construction Phase 2	\$20.0
Facility Asset Protection	Chelsea Creek Upgrades - Construction	\$17.7
Facility Asset Protection	Prison Point Rehab - Construction	\$15.7
DI Treatment Plant Asset Protection	Clarifier Rehab Phase 2 - Construction	\$14.5
SEH Redundancy & Storage	Redundancy Pipeline Section 111 - Construction 3	\$7.3
DI Treatment Plant Asset Protection	Gravity Thickener Rehab	\$6.6
<b>Total Contracts &gt; \$5.0 million</b>		<b>\$81.7</b>
<b>% of FY21 Spending</b>		<b>30.7%</b>
<b>Total Projected FY21 Spending</b>		<b>\$266.2</b>

- Nut Island Odor Control and HVAC—\$20m
- Chelsea Creek HW—74% complete. \$17.7m behind schedule, but able to do channels faster after learning from the first one.
- Prison Point rehab \$15.7m advertising this summer. Very tricky project. Will need two shifts/day to continue work while keeping operations open.
- Clarifier rehab phase 2, almost ready to advertise. \$14.5m this year but \$137.2m total— one of the biggest expenses in CIP
- Southern Extra High redundancy \$7.3 m
- Gravity thickener rehab \$6.6m 58% complete. Some delays b/c of pandemic. Tough getting contractor staff to the site.

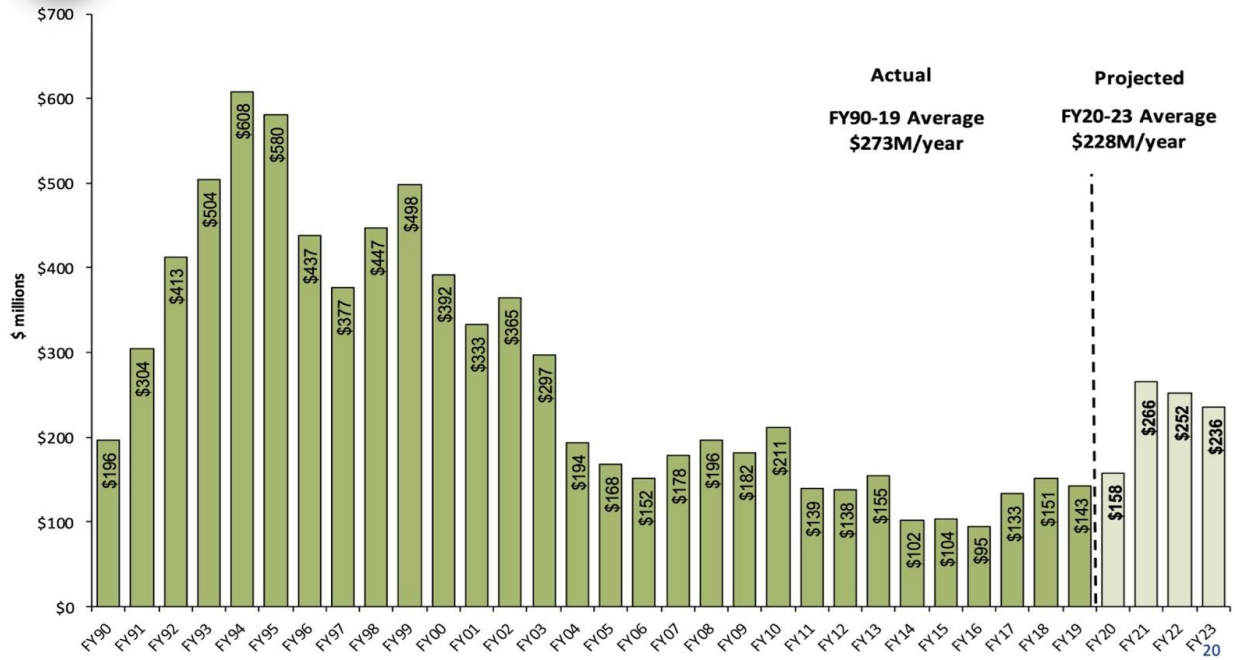
What’s new—12 projects totaling \$55. Biggest:

- Water tank painting
- Cosgrove tunnel rehab
- Beacon St. Line rehab
- Deer island roof replacement
- Clinton?

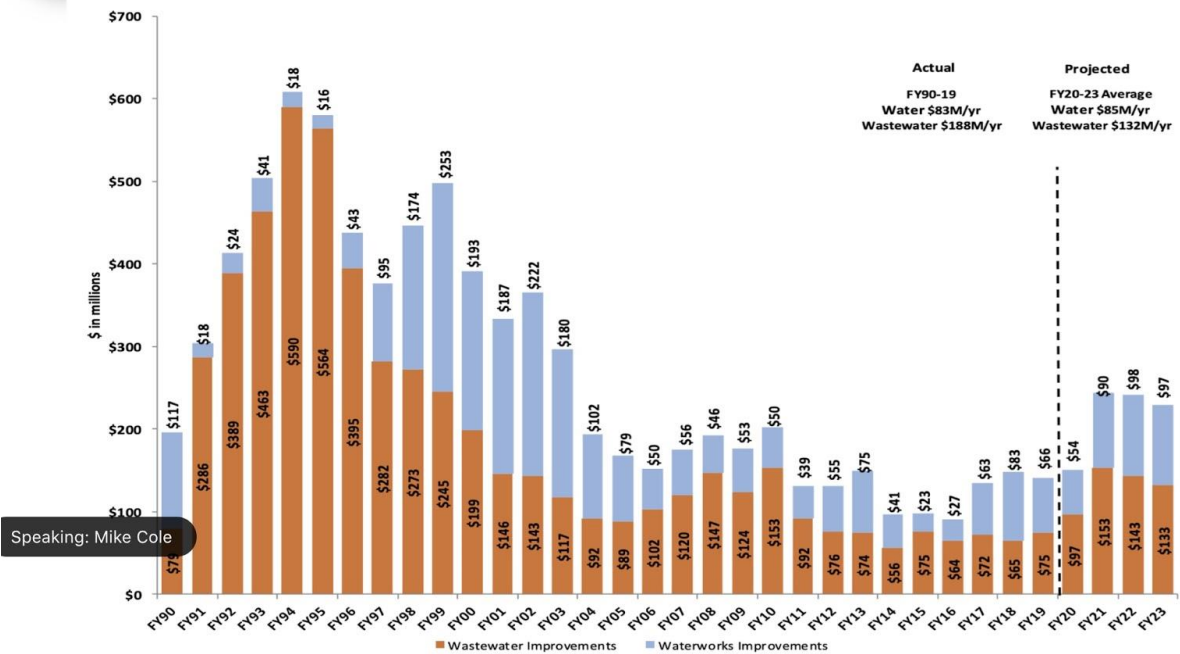
Total contract awards \$439m



## Historic and Projected Capital Improvement Spending



## Historic and Projected Capital Improvement Spending by Utility

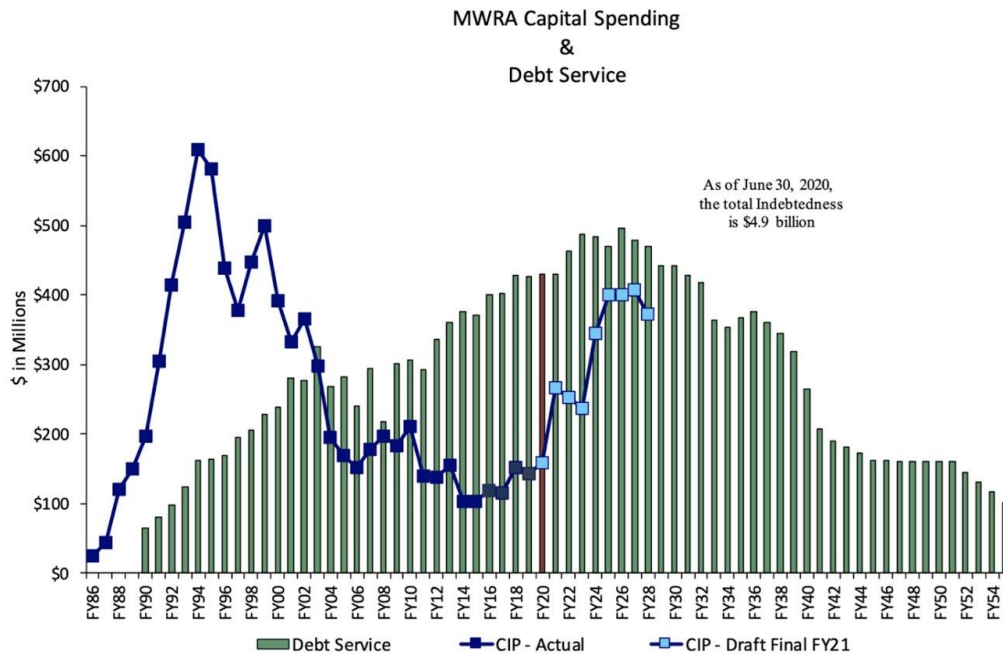


Speaking: Mike Cole

Outstanding debt is down about a billion \$ from peak.



## Capital Spending and Debt Service



Durkin: starting to anticipate federal stimulus by compiling projects that may be eligible.

### Orange Notebook

Just starting to see the impacts of the pandemic in this quarters Orange Notebook. Expect more in the next quarter.

(EnQUAL: Biweekly harbor wide monitoring continued until early March, and then was suspended because of laboratory field staff unavailability due to COVID-19 response. Seasonal CSO Receiving Water monitoring in variance waters will resume next month at a reduced level of effort.)

### Delegated Authority Report

Jennifer Wolowitz suggested, and several agreed, that the ceilings for delegated authority seemed low and should be raised. They may take this up later this year. Laskey agreed.

### Financial Update

Favorable variances so far.

### Contract for storage of MWRAs paper records

Jack Walsh questions why needed. Laskey points out not just storage, but needs fire suppression, since the records are paper. \$3 million at \$15.74/sf in Walpole (lowest of six bidders)

Insurance Renewal

General liability, workers compensation, property... delegated to staff to execute.

Wastewater

WAC contract—approved. I get no raise (nobody on MWRA staff or WSCAC does either).

\$4.8 m grit and screenings hauling and disposal—approved

Water

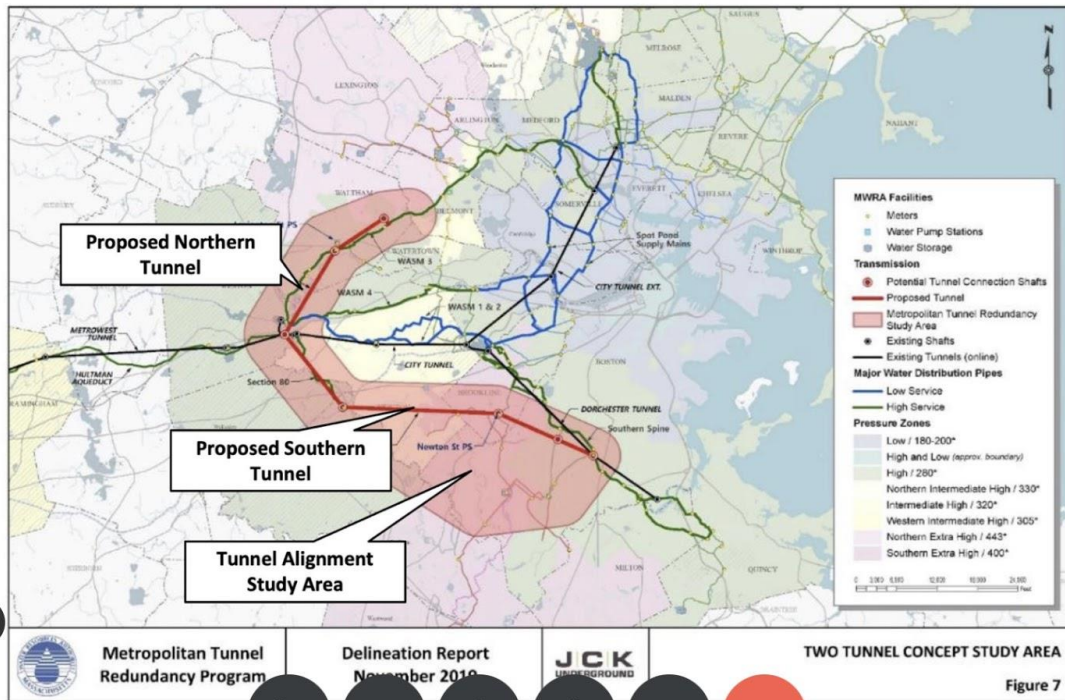
Water quality report—should be mailed in June

Allowed Quincy to get more loan \$\$ now for water pipeline rehab

WSCAC contract—approved.

Metro Tunnel Redundancy, preliminary design update.

# Metropolitan Tunnel Redundancy Program



flanagan

Alternatives analysis is critical. Need a team with diverse skill sets. Taking great care with procurement and the selection committee staffing.



## Preliminary Design Scope of Services

- Project Management, Regulatory Agency, and Stakeholder Coordination
- Environmental Notification Form - MEPA
- Evaluation of Alternatives
- Environmental Impact Report - MEPA
- Geotechnical Subsurface Investigation and Evaluation
- Base Mapping and Survey
- Preliminary Design

Now have shortlisted three firms to submit proposals:

- AECOM
- CDM Smith
- McMillen Jacobs

CDM ranked well, and has lowest bid at \$15m

The selection committee also liked CDMs subcontractors best.

Vitale: who from MWRA on the selection committee Beth Card, John Colbert, Mark Johnson, Fred Brandon, and Kathy Murtaugh

## CSO Public Presentation 5/28

35-40 participants (WebEx count, so some people may be counted 2x)

Purpose of performance assessment is to verify whether long-term control plan goals are met

- Closed outfalls
- South Boston 25-year control
- Typical year activation frequency & volume

Verify compliance with water quality standards

Issue final report 12/21

Assessment started 11/17



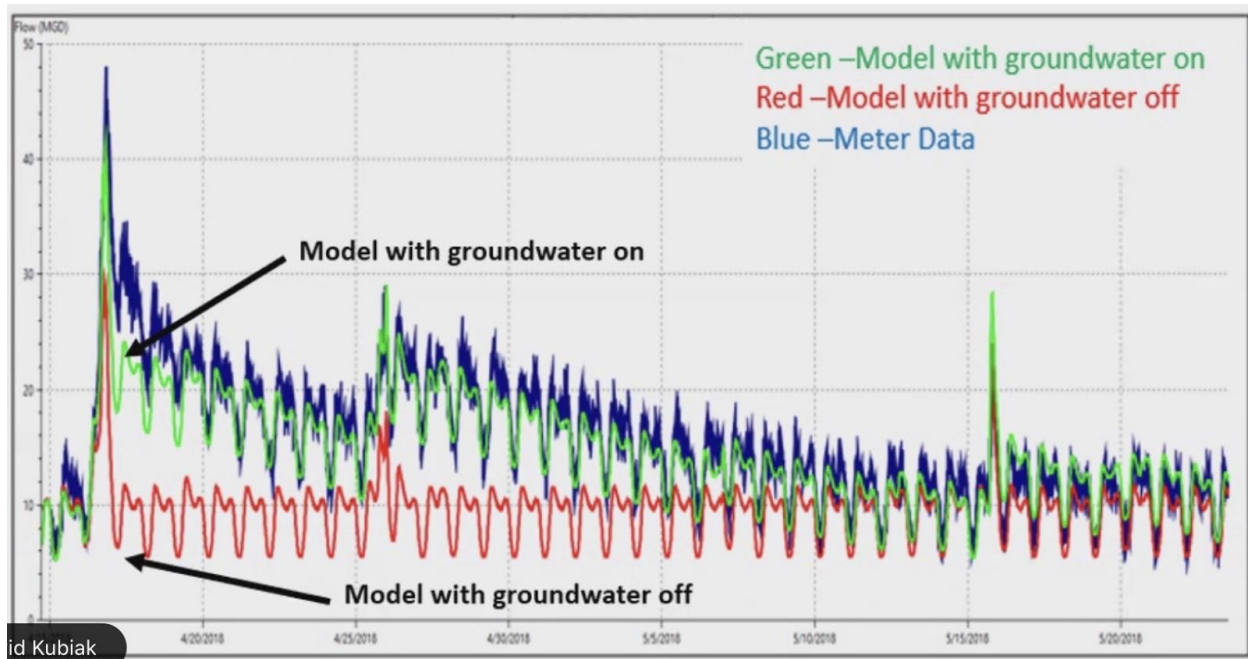
- Collected rainfall & calibration 2018-19  
Modeled 2019 typical year  
Still investigating site-specific overflow activity  
Developing receiving water models
- Lower Charles
  - Upper Mystic/Alewife
  - Water quality sampling ongoing

What's left:

- Continue to collect and analyze rainfall and CSO meter data
- Continue to quantify and compare CSO discharges from meter data & model
- Complete calibration of receiving water model by 12/20

Did a major, system-wide recalibration. Different efforts and results pulled together over decades

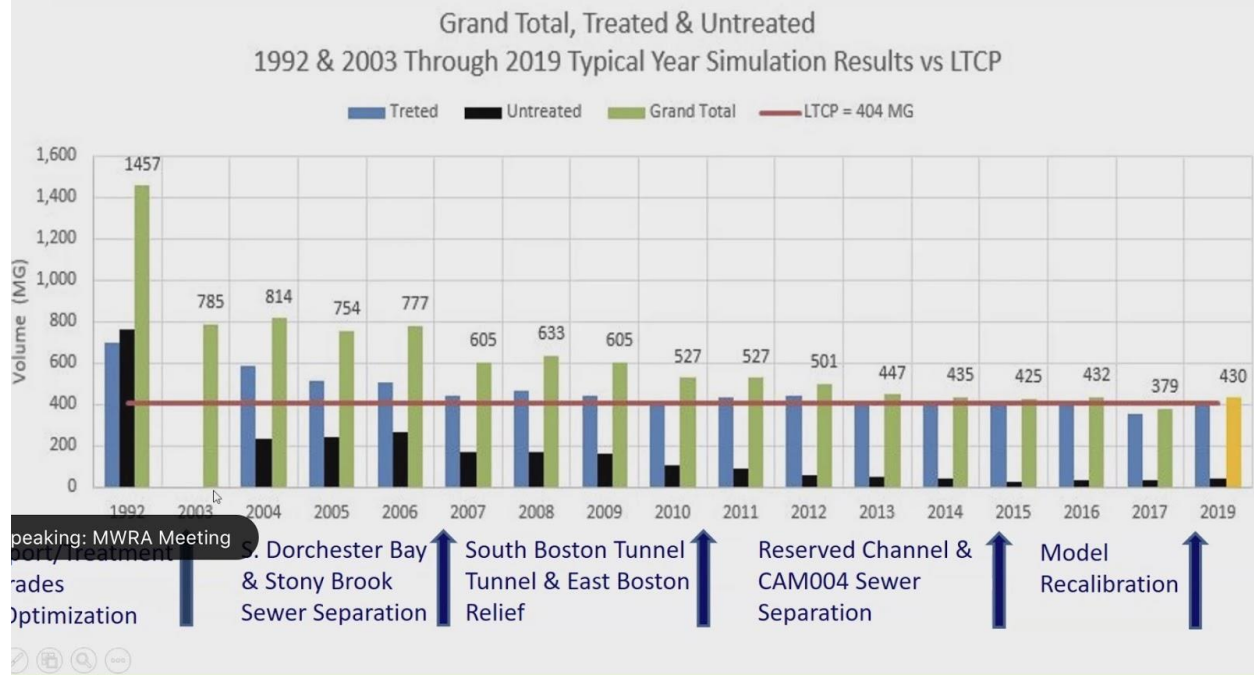
Comparing models to actuals, use industry standard deviation—know that meters themselves give an estimate of flow.



Variations in rainfall, system conditions (sediment?) ...

At this point, about 98% accuracy in model vs. actual storms. Small events are less predictable than larger ones.

# Tracking Attainment of LTCP Goals – Typical Year Performance



Verification: check that CSOs are actually closed, some “effectively” closed—i.e. 5 along South Boston beaches, which get some stormwater along the beaches and 25-year storms captured, so almost no CSOs.

Somerville 1A is only site above LTCP goals since recalibration

Investigating other CSO activity post-calibration





## Site-Specific Investigations

### Investigations into higher CSO activity and potential mitigation measures:

#### East Boston Outfalls

- Impact of nozzle restrictions
- BWSC sewer separation projects

#### Somerville-Marginal CSO Facility Outfalls MWR205 and SOM007A/MWR205A)

- Upstream stormwater flows (e.g. GLX impacts)
- Stop plank assessment and tide gate repairs
- CSO Variance required evaluations

#### Cottage Farm CSO Facility (Outfall MWR201)

- Cambridge partial sewer separation

#### Outfall BOS070 (Fort Point Channel) Regulators

- BWSC South Boston Interceptor sediment removal contract

East Boston outfalls—had higher # of activations—removal of debris brought them down. Also looking at more sewer separation work.

Somerville marginal—getting larger Stormwater & CS flows to the facility. More stop logs?  
Replacing downstream leaky tide gates?

Cottage Farm—some partial sewer separation in Cambridge, then will reassess.

Fort point channel regulators—removing sediment from the interceptors.

June 2019—MWRA filed a motion for a one-year extension. Granted with AECOM work plan for receiving waters, and water quality standard variances granted by MassDEP.

Teasing out CSO vs. non-CSO effects on receiving water quality.

Public Notification of discharges—being developed

Rapid notification required in the variance waters (mystic, Charles, alewife)

Installing equipment to gather the data


Expanding website: [www.mwra.com/harbor/html/cso\\_reporting.htm](http://www.mwra.com/harbor/html/cso_reporting.htm)

Includes activations, will add untreated CSOs. Can subscribe to text alerts—not live yet, plan to start this summer

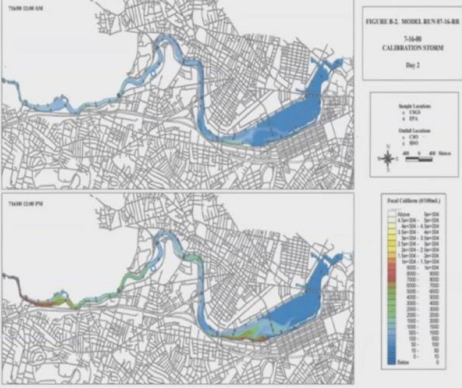
Chelsea sends out email notifications, Boston is working on a system about their own CSOs

Updating and calibrating water quality models

Also doing water quality data collection, in-stream sampling and stormwater sampling, coordinating with communities

 **Receiving Water Modeling**

- Update prior models to more current platforms
- Update with current information on stormwater and CSO sources and loads.
- Calibrate with current in-stream WQ data (a calibration report will be provided)
- Perform model simulations
- Provide WQ Assessment Report (Sep 2021)
- The model will allow for the assessment of remaining CSO (vs non-CSO) impacts on water quality in the variance areas.



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Model development and calibration to be complete 10/20

Assessment report on WQ—9/21, part of final performance assessment.



## Water Quality Assessment Approaches

- Calibrated model can be applied to current conditions
  - Design storms
  - Entire typical year
- Separate out effects of CSOs, stormwater, boundary conditions
  - Where loads are uncertain, estimate range of potential impacts
- Visual presentation of results
  - Alewife - bacteria counts vs distance at various times during/after storm
  - Charles - contour plots of bacteria at various times
- Tabulate duration of exceedance of bacterial water quality standards
  - Due to different sources
  - Under different weather conditions

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Most of the milestones achieved and projects completed, most volume reduced

But models recalibrated, and not matching LCTP goals, so will continue efforts and evaluate WQ impacts in receiving waters.

Reports on MWRA website (slide)



## For More Information

- Semiannual Progress Reports
- CSO Annual Discharge Estimates and Rainfall Analyses (April 30)
- Annual Water Quality Monitoring Summary Reports (July 15)

**All are posted on MWRA.com**

## **EBC Solid waste & COVID impacts**

David Biderman SWANA.

No playbook for how to respond to the pandemic.

Solid waste and recyclables not an effective vector for transmission.  
New CDC fact sheet for waste collection/recyclers

More waste from homes. Less from businesses. Seeing a lot of PPE litter and PPE in recycling, where it doesn't belong.

Some communities have suspended recycling and yard waste programs. Most have returned. Not NYC curbside organics (budget concerns). Some recycling facilities closed, at a time when paper mills are begging for materials. Price of corrugated cardboard is very high—over \$100/ton.

Increases in drop-off centers. People are dropping off after cleaning houses. Some challenges—masks, distancing.

Thinks the peak of residential volume is past—as businesses reopen, and people are done with cleaning house.

Steve Changaris, National Waste & Recycling Association (**NWRA**)