



Minutes

February 3, 2023

Remote via zoom

Attendees:

WAC Members: Adrianna Cillo (BWSC), Craig Allen, James Guiod (AB), Kannan Vembu (vice chair), Karen Lachmayr, Mary Adelstein, Philip Ashcroft, Stephen Greene, Taber Keally, Dan Winograd

Absent: George Atallah, Martin Pillsbury, Wayne Chouinard (chair), James Ferrara (National Grid)

Staff: Andreae Downs

MWRA: Wendy Leo, Steve Rhode, David Granados, Meg Tabacsko, Devon Winkler, David Duest, Sally Carroll, Jaqueline Collins

Guests: Mariana Matus (Biobot) Lexi Dewey, Tami Segal (Deputy Chief of Staff, MA HHS), Susy King (DEP), Anne Lowery (DEP), Judy Pederson (OMSAP), Alfredo Vargas (Newton DPW) Katie Webster (PAI), Gwen Spaeth (Save Alewife), Pete Frick (ADS), W. Robinson, David White (Arlington Conservation Commission), Paul Lauenstein (WSCAC), Omaira Portillo (Biobot),

VOTE: January Minutes

REPORTS:

Director—full report attached—Sen. Eldridge and Rep. Garballey have filed HD2639, our wipes labeling bill—the language only affects “non-flushable” wipes, but includes an education component.

- Andreae will be sending out a new conflict of interest/ethics training for all WAC members, once the state portal is ready for us.
- OMSAP may not be included in the new draft permit for Deer Island. OMSAP (the outfall monitoring science advisory panel) is exploring other ways of staffing this volunteer group, since EPA feels it cannot, and answer bigger questions about the health of the harbor and Mass Bay that are not strictly outfall-related, but are important (warming water, contaminants of emerging concern). This will require funding. OMSAP is looking at non-profit partners who may be able to step up. MWRA will still be required to do regular monitoring of water quality & temperature.

- Drought regulations: The Water Resources Commission has approved revisions to drought regulations: **Lexi Dewey** in December, DEP regulations DMR 310 36.0.0 that extends water management rules to 63 additional public water suppliers and 87 golf courses during drought conditions. Surface water supplies (reservoirs) will have to have 2 years of reserve. Public parks can be watered, but only at night; street tree watering will be allowed.

AB: James Guidod: The 2022 Rate Survey is now published, and on the Advisory Board's website. It includes many more communities and great data.

- Budget review has started, as the AB has the MWRA draft capital budget in hand. The current expense budget will be transmitted in February. Some topics the budgets will cover include PFAS, supply chain shortages, inflation, interest rates...
- The Advisory Board will move offices in the next couple of months, as the lease on the Charlestown offices is up in March. (WAC will move also)

MWRA: Wendy Leo: Deer Island completed its 16th year without a permit violation—so platinum 16

- Published final CSO & SSO discharge notification plan for public comment. Creating signs for public access points in CSO affected areas so they can be in place before the next recreational season: <https://www.mwra.com/01news/2023/012723-cso-comment.html>
- No official authorization for the Clinton WWTP permit. Maybe April start date.
- No DI draft permit yet. Think EPA may want climate change and environmental justice elements that aren't in the current permit.
- OMSAP will meet Feb. 10th
- Published an Annual Report on Progress of Additional CSO System Optimization Measures: <https://www.mwra.com/cso/variances/013123-csovariancemitigationprojects.pdf>
- Capital projects: some have been delayed, but expected to start in the near future: Clinton influent pumps, Braintree-Weymouth pump station rehab and replacing the tide gates for Somerville Marginal Facility
- MWRA is also moving out of Charlestown to Chelsea and Deer Island
- Plenty of job openings still. Some departments are making due with fewer staff than they need. Internships should be advertised soon.
- EPA came out with revisions to their affordability guidance.

PRESENTATION

Mariana Matus, CEO and co-founder, BioBot.

—>Deer Island holds the world record for continuous daily testing for COVID in wastewater—started very early with BioBot at the beginning of the pandemic.

Biobot Analytics-beyond COVID

Matus: background in computational biology and microbiology. Did her PhD at MIT in wastewater epidemiology.

The Biobot HQ and lab is in Cambridge.

See sewers as a resource; an immense amount of value in wastewater, not just health information, but also the nutrients and such that can be recycled.

Data in wastewater can be mined for public health insight and to identify and help solve society-wide problems:

- Pandemic detection before an outbreak is otherwise detectable
- Mental health changes
- Infections
- Drugs, both illicit and legal
- Man-made threats

Biobot's mission is to improve the health and safety of communities.

Ms. Matus co-founded Biobot in 2017 with Newsha Ghaeli; an architect & engineer, they met at MIT, as Ms. Ghaeli was working on smart cities technology. Both globally-minded as Matus is from Mexico and Ghaeli is Iranian-Canadian. Want to impact health globally.

Founded in 2017, when nobody was thinking about detection of viruses in wastewater. Since COVID, there is now a "wastewater intelligence market"—early warning system, includes all users.

Precedence was in polio detection in some countries. Europe & Australia were using wastewater testing for illicit drugs. The pandemic made the value of this intelligence visible.

The benefit of using wastewater testing, is that it includes everyone on the system—in the US, 80% of the population is connected to a sewer. That includes all—including those who lack access to clinical care. The data can include diet, medications, illicit drugs, and of course viruses.

Biobot has one of the largest wastewater testing systems in the world & has partnered with several state health departments and the CDC, and the World Bank. Sentinel sites are in all 50 states, some US territories and some provinces of Canada.

Biobot has been conducting wastewater monitoring for Covid-19 in Massachusetts since March 2020



- Partnership with the Governor's Office COVID-19 Command Center and MA DPH
- We cover almost all of the State between the MADPH, CDC NWSS and municipal wastewater monitoring programs

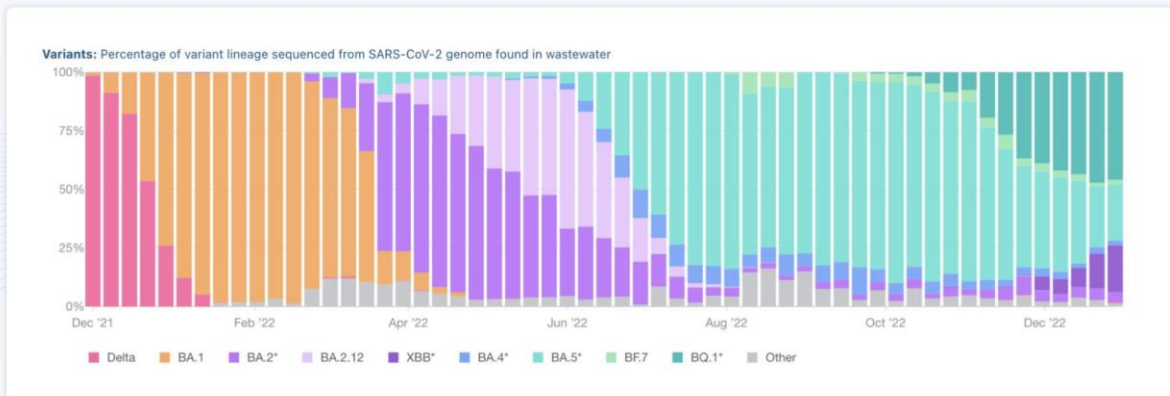
They are collecting COVID sewage data for most of MA, and are sampling at the manhole level in Cambridge and Boston. COVID trend data has not only been shared with the public from the beginning, it is regularly cited in the media as a way to help the public make health decisions.

For a while in Chelsea, Biobot was testing at the manhole level to allow the city and its nonprofit Chelsea Project to target testing and interventions to those neighborhoods with the highest virus levels.

Hospitals in the Boston area also use the wastewater data to plan for increases or decreases in COVID admissions. The Cambridge School District also uses the data to decide on prevention measures.

They are also sequencing the COVID viruses to detect variants.

National-scale SARS-CoV-2 variant data Dec. 2021- Dec. 2022



→ CONFIDENTIAL PROPRIETARY

12

Biobot is constantly compares its sequencing from wastewater to clinical sequencing, and it matches well. This is interesting because it allows early detection of new variants, before they hit the clinics. COVID variants can emerge in a matter of weeks—before a test without sequencing can be developed.

When Monkeypox was found in the US, the CDC commissioned Biobot to test at all of its state sentinel sites for it. Monkeypox is much rarer than COVID, which meant Biobot had to concentrate the wastewater to find it—can detect a single case in the population. That proves the concept that wastewater testing can detect the very early emergence of a new pathogen.

Biobot was testing sewage before the pandemic—mostly for drug overdose and treatment information.

Overdoses & consumption—in 2018 did a sewer study in Cary, South Carolina, and showed that while substance use was high in expected neighborhoods, it was high all over town, and the drug of choice was prescription opioids. With the data, the city implemented an awareness campaign about the drugs, and was able to achieve a 40% reduction in overdoses.

Biobot expanded monitoring — for fentanyl, methamphetamine (which does not respond to Narcan), cocaine, and as a background/control—Nicotine. The first three are the main drivers of overdoses. Can test at scale to help communities make informed decisions. Can also detect co-consumption, or mixing of meth/morphine/nicotine.

They also can inform hospitals if the main substance being used is the one they are treating for when presented with an overdose—so clinics can respond more effectively.

Mapped the consumption of cocaine, fentanyl and meth in the US, and found patterns of usage in different communities:

Insights into nationwide consumption trends



Our **database and proprietary machine learning algorithms** enable us to generate unique insights on population health



This information gives policy-makers & data customers the ability to **make more informed decisions**

Uncovering trends in drug co-consumption



- HIGH MORPHINE, NICOTINE, AND METHAMPHETAMINE USAGE
- MODERATE GENERAL USAGE WITH ELEVATED FENTANYL
- LOW GENERAL USAGE WITH MODERATE COCAINE
- LOW GENERAL USAGE WITH MODERATE COCAINE AND FENTANYL

Federal agencies were aware that the east used more fentanyl and the west more meth, but now can track usage and changes to that pattern.

Poop, pee and wastewater receive 94% of pathogens that infect humans. They were surprised in reviewing the literature—expected pathogens of the gastro-intestinal tract, but found many more that are shed into wastewater.

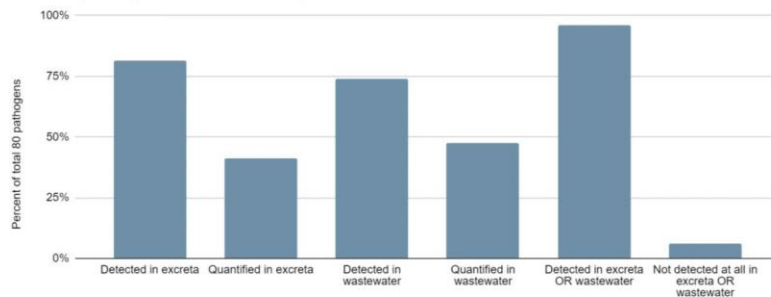
94% of pathogens detected in WW, stool, or urine

BIO BOT Biotbot Analytics

→ APRIL 2022

Pathogen biomarkers in wastewater, stool, and urine: an informal survey

Percent pathogens detected and quantified



In the future—may use wastewater testing for infectious diseases: Norovirus, influenza, RSV, Gonorrhea, Hepatitis C and perhaps other emerging pathogens.

Drugs: adding Xylazine. Can also test for drug treatments, to see if they are matching up with the drugs used—Naloxene, Narcan, Methadone, Buprenorphine.

Questions & Answers:

One area of MA (Norfolk County) is not covered by your sentinel testing. Why?

(Mariana will get back to us on that)

What about privacy?— this is a new type of data asset, and one could do a whole workshop just on that and the regulations around it. Fortunately, individual privacy is generally protected, because the data is aggregated. As long as the collection point is appropriate (that is, not testing individual sewer laterals), then privacy is assured. Biobot has pledged not to collect genomic data; their interest is in publicly-accessible health data for public health purposes.

That said, the data does measure a community—whether a city, town, neighborhood or catchment area. That's a level of privacy not yet addressed by the law. It's an opportunity. Biobot aggregates at the county level on its (website) dashboard, not at the catchment or neighborhood level.

Another question is who has access to the data. Biobot has made all its data public and encouraged the communities it works with to share that the collection is happening, and to share the data, so everyone affected can benefit from the data collection.

Is Biobot working with Project Microbiome?

No.

Any plans to provide personal test kits? (So, individuals could test themselves for a pathogen in the community)

We have wondered about that. It makes sense, but not sure how it would be implemented.

Explain more about sentinel sites and manhole testing in Cambridge and Boston.

We prefer the wastewater treatment plant as a sentinel site—they have the expertise and the sampling equipment, and they cover the largest swathes of population.

Manhole testing allows for more specific population data, say from just one municipality in a system like MWRA's. And to tailor your public health interventions to the neighborhood level, you might go to a particular collection point within the system.

Biobot is testing in manholes in Cambridge (4) and Boston (10 or 11)

Can this method be used to identify PFAS source hotspots in a collection system?

It's a very interesting area—we could look at whether and how PFAS are metabolized by the human body, or if they are passing through when taken in via drinking water. I don't think that research has been done.

(Note that EPA and DEP require monitoring for PFAS from industrial users, and in wastewater and sludge. Most of this is done by the TRAC (Toxics Reduction and Control) department of MWRA.

How sensitive is the sampling? Could it be disrupted by a heavy rain, for instance?

Sample collection is the critical part of the testing—where, how, and how often matter. 24-hour composite, which is standard in the industry. From a manhole, also use equipment that runs 24 hours.

Could you track a person by their DNA in the wastewater to a particular neighborhood? Theoretically, yes, but it would be a difficult technical problem because human DNA isn't very present in wastewater. I did sequencing of DNA for all wastewater, and not even 1 % matched human DNA.

How do you measure mental health in the wastewater?—we know that stress hormones are excreted—cortisone, epinephrine, adrenaline, and are abundant in sewers. We can pinpoint neighborhood variations for mental health interventions.

What man-made threats do you envision being able to detect in wastewater?—synthetic biology; genetic engineering.

What other testing of sewage is happening at MWRA?—the state health department requested that MWRA participate in testing of sewage sludge in 300 utilities. They are a Stanford/Emory U startup (Verily) is testing for the next 18 months for COVID, Monkeypox, Flu A&B and RSV. The results are on the MWRA website. And unlike the Biobot data, we only have data for a few months, not for three years.

NEXT MEETING (amended since Feb. 3): **THURSDAY, March 16, 10 am** on MWRA budgets and new 5-year cap for the Capital Plan, jointly with the Advisory Board and WSCAC

Director's Report January 2023

Water Resources Commission 1/3

MA is still in a drought.

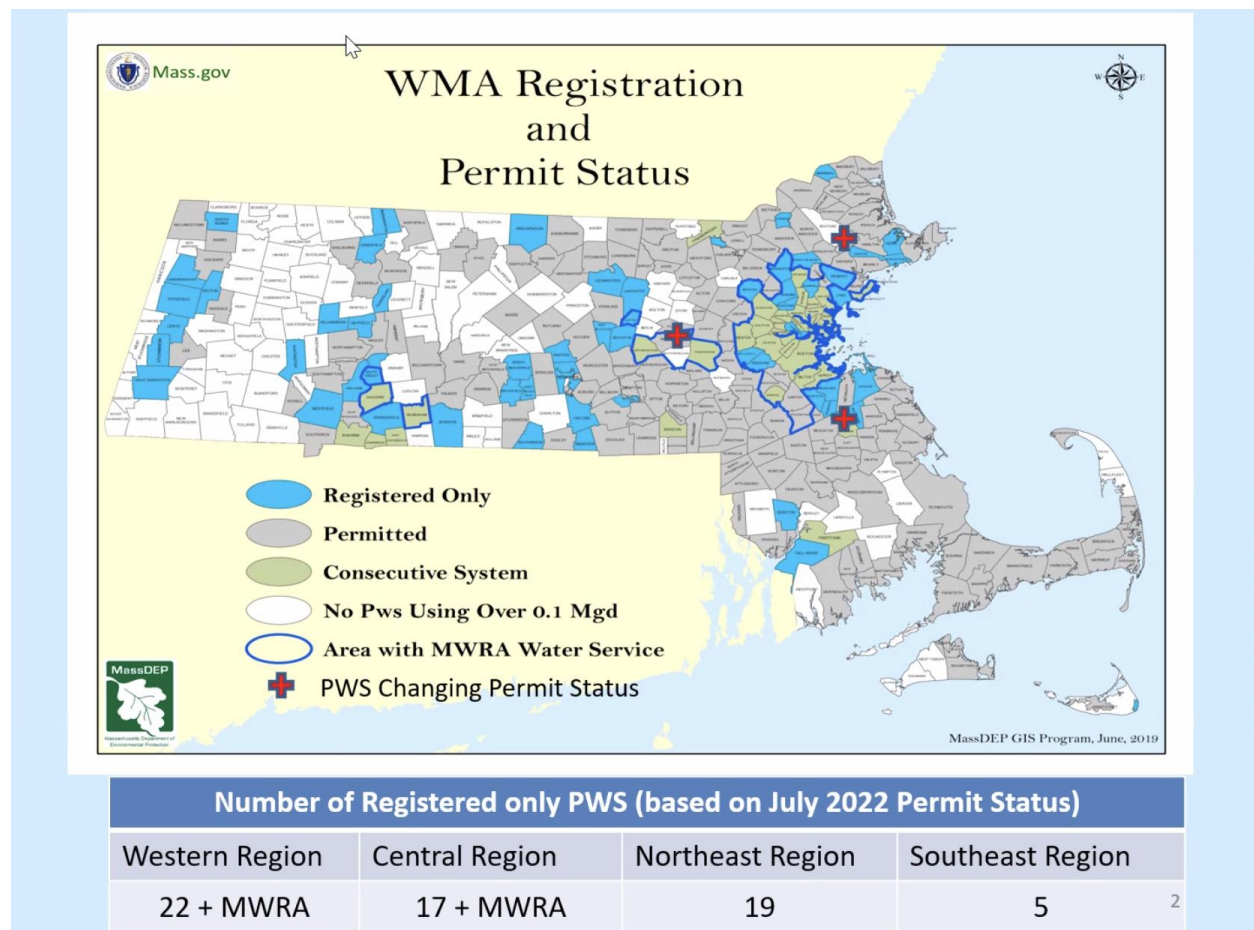
Special meeting on water management act regulations--especially in light of drought.
(310 CMR 36.00) Revisions, 2023

Stephanie Cooper, DEP: Final regulations in response to climate-change-fueled drought. Gives DEP more tools to address.

Kathy Baskin, DEP: agrees and asks for a positive vote on the regulations.

Duane LeVangie: changes to the revisions:

These changed regulations only apply to the communities in blue:



The regulations add multi-year drought storage and define non-essential outdoor water use.

They allow DEP to align these communities with the drought management plan regulating non-essential outside water use based on drought status.

Also adds drought watering reductions for registered golf courses. Keeps most greens irrigated, but roughs and fairways, landscape and ornamentals have further restrictions.

Also added as essential: splash pads, swimming pools, some boat cleaning to prevent salt/invasives. Parks & public ballfields (but at dawn/dusk), shade trees on public ROW.

Discussion revolves around boat washing and golf and whether they should be essential, given that fish can't swim when there is no water in the river. Baskin responds that this is a step forward, and perhaps should go further in its next revision.

Also discussion of how the new regulations will or won't affect the cost of water.

Is 3 years of storage enough? Julia Blatt--no, but vote yes on this because it's better than what we have now.

Jenn Pederson--too short timeframe to review everything before the vote (2 hours) and not enough consideration of groundwater suppliers who feel they have enough water to withstand a drought. Thinks should postpone vote or vote no.

Vandana: what is before us for a vote is already being implemented during droughts, and so asks for a yes vote. Notes need to prepare better for droughts, which are increasing in duration and intensity. Also notes communities that may feel they have enough water for normal supply, but can't respond with enough water pressure when there's fire during a drought.

Vote--majority in favor.

WSCAC 1/10

Director's report: Summarizes new DEP and DCR director resumes; new water management act changes approved at WRC (above).

Some drought relief in rivers; groundwater is taking longer.

MWRA is no longer transferring Quabbin water to Wachusett. Chestnut Hill and Foss reservoirs are drawn down to kill invasives. Since the end of December, reservoirs are in normal range.

Annual Conflict of Interest statement needs member review. Next year is the test & certificate. Won't be ready until the end of the week.

AB Report: John Carroll (1985-2023) is retiring from the MWRA Board, and will remain until a replacement is elected.

January 19 meeting--annual retail rate survey. MWRA communities 3.15% as a rule. More MA communities included in this year's survey. (Paul L: that's lower than inflation). James: usually, retail rate is lower than wholesale rate.

MWRA Report: 88.5% full at Quabbin, well within normal range. Just under 13" of rain--above normal. Not transferring to Wachusett. Taking Ware River water for Quabbin, which is allowed when it is full (as in now).

Looking forward to new chair--Commissioner Rebecca Tepper--next Wed. Board Mtg. Board & MWRA will miss John Carroll's institutional memory.

Replacing pieces of fluoridation system, storage tanks, chemical building at Carroll Treatment Plant. MWRA won't be adding fluoride for the duration of the work. Concern isn't for teeth or dentists, but for tracing source water.

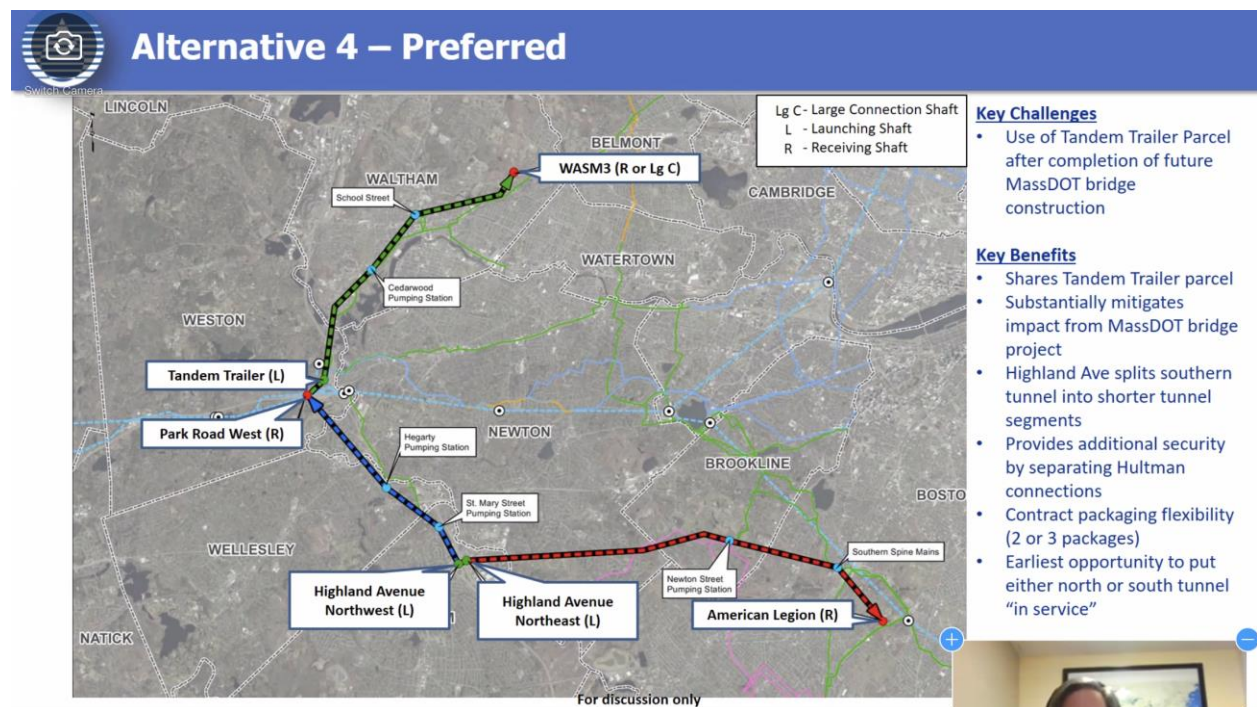
System expansion study of MetroWest continues--many more communities.

Sharon opted to filter rather than join MWRA. Question on other chemicals in drinking water--estrogens and Prozac.

MWRA--tested Quabbin--non-detects for pharmaceuticals. But if you are downstream from wastewater discharge, will find pharmaceuticals. No indication yet that they affect human health--most are tested for prescription-level dosage on humans.

PRESENTATION:

Metro tunnel program: First tunnel procurement bid documents out in 2027.



Waltham has asked MWRA to look at alternatives to the Fernald Hospital site.

Will have 2 shaft connections at I-90/I-95 area, mostly where MWRA currently is located. Will use tandem trailer lot off Rt. 30 in Weston for staging.

Another link in the south tunnel, and valve at Highland Ave, Needham near I-95

Another connection at American Legion highway in Morton St. in Dorchester. Will use wood-processing site of DCR's.

North Tunnel connection shafts: using MWRA site at School Street, Waltham. Also, Cedarwood school, Waltham.

South connection shafts: Hegarty school in Wellesley; St. Mary's St. in Needham near Sudbury Aqueduct

Geotechnical: already done 16 deep rock test boring, need to do another 30-35 borings. About 400-450' deep. Many different kinds of rock in the area--upland crystalline (granite) to more sandy/sediment like rock. It will be varied, and challenging.

Spoils disposal locations are still being determined.

May have up to 3 boring machines. Each will be named (probably by school pupils). Talk of tracking on social media and engaging students with STEM education, etc.

Will this trigger Interbasin Transfer? No--this is a redundancy tunnel. But if the system expands, that will be a conversation.

MWRA Board 1/18

Present: Chair: R. Tepper. Secretary: A. Pappastergion, P. Flanagan, J. Foti, B. Peña, H. Vitale, J. Walsh, P. Walsh, M. White-Hammond, J. Wolowicz

Absent: Vice-Chair: J. Carroll

REPORT OF THE CHAIR: thanks for a warm welcome.

REPORT OF THE EXECUTIVE DIRECTOR: Laskey--\$96K grant from DEP with utility grants will mean heat pumps installed. Notified by NEFCO that they had a 21E demand letter from composting facility in Westminster in regards to PFAS contamination of the compost. Waltham continues to worry MWRA on the location of the redundancy water tunnel. Water usage is usually down in winter, Ware is the smallest reservoir. Transfer water from Ware into Quabbin around now

EXECUTIVE SESSION

- i. Approval of December 14, 2022 Executive Session Minutes
- A. Litigation
 1. Annual Litigation Summary and Update

WASTEWATER POLICY & OVERSIGHT

- A. Information
 1. MWRA's Ongoing Contribution to Wastewater Based Epidemiology

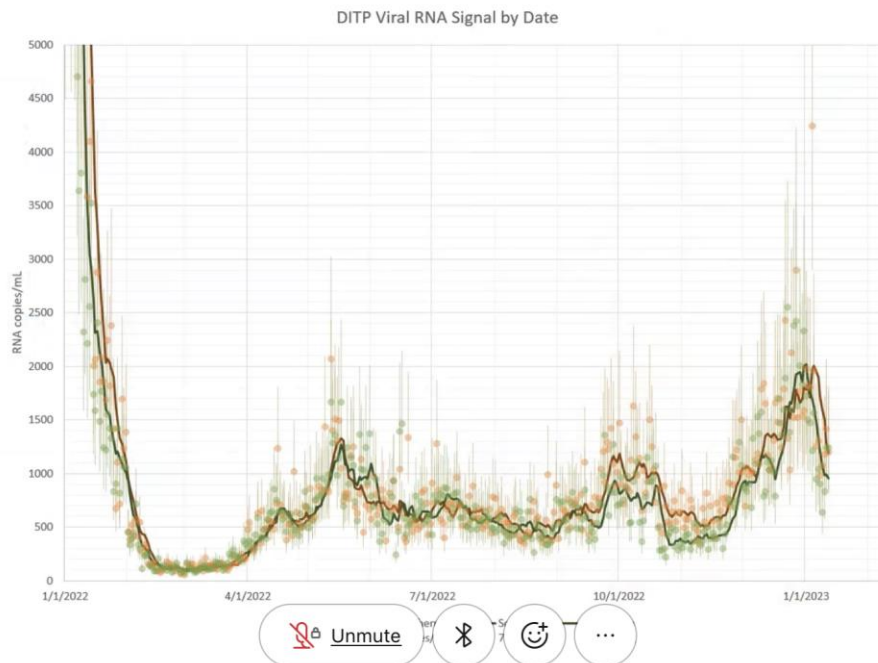
Dave Coppes, Steve Rhode: overview of the sewer system: 43 sewer communities, 4 combined, 4 CSO facilities. 4 headworks facilities, DI 360mgd, peak 1.3 bgd

2 pump stations--N & S, samples are collected from N&S pump stations at DI. Sampling for viral RNA since March 2020--sent to Biobot & MIT

Current Data



Current Data from MWRA.com



) Timing of last year's peak (omicron) and drop off are similar to this year's

Comparison of wastewater signal to cases:

Think the reason is that more people are self-testing and not reporting to doctors or DPH

Results: First report of COVID detection in wastewater in US; longest continuous daily sample record in the world?

The current program continues via DPH. Expect to continue thru 2023. Share with DPH Command Center.

Samples submitted now 3x week. New partnership with Verily. Link will change, but is also on the MWRA website.

Will include testing for other viruses--monkeypox, RSV, etc.

Jack Walsh: where would people report home COVID test results? Not sure anyone knows how to do that.

DPH website is saying they are OK with illnesses not being reported to them. But it makes wastewater testing all that much more important to indicate incidences of infection.

WATER POLICY & OVERSIGHT

A. Information

1. Update on Temporary Fluoride Shutdown for Construction

Carolyn Fiore, Steve Estes-Smargiassi, Valerie Moran

Overview & map of the MWRA water supply.

Overview of the hydro power generated; treatment of the water 3x, then add fluoride
Fluoridation equipment is at the end of its useful life (30 years), pipes, feeders, control units--either need replacing or can't get replacement parts.

Will require shutdowns 3-6x for 2-3 weeks each time. Instead, staff decided to shut down once for the duration of the project. Increased safety and reduced risk for contractor's personnel. Also reduces need for a nearby hazmat response team. Local fire chief also thought this was a good idea--hazmat team is not in Marlboro.

MWRA has fluoridated since the 1970s. Coordinated with DPH because of fluoride's importance for dental health. Approved.

Outreach program is the extent of mitigation--all water superintendents and health officers will be notified. Will also be on the MWRA highlights page & on the water quality & fluoridation pages.

Schedule: use the remainder of fluoride by late Feb.

Mid-March, stop fluoridation, turn it over to the contractor.

Work--April to May, tested

Late May restart fluoridation. Progress on the MWRA website.

Hammond-White: how important is this for dental health?

Estes-Smargiassi--DPH felt no need to reach out to dentists for a 2-month shutdown. Not likely to need additional fluoride treatments.

H-W: What kind of media notification is MWRA doing? Would be better to over-inform people.

A: Media tends to pick up anything on MWRA.com front page. Will be sure to be ready to answer questions.

JFlanagan, Foti: agree that should just do press release/conference. Don't feel people look at the website.

Pappastergoin: our customers are the communities, not the ratepayers. Up to the communities to notify ratepayers.

H-W: can we provide a flyer that communities can use to notify ratepayers?

Laskey: we can add stuff to local bills. I was concerned would need to hand out fluoride rinse, but that's not necessary.

H-W: message--always good to brush 2x/day. Now a good time to start.

Tepper: if you don't give someone something to do about it, maybe raises concerns. Giving people an action can mitigate fear.

Estes-Smargiassi: sounds like we should reach out to DPH on what is appropriate for people to do if concerned. A number of communities don't fluoridate water, even near MWRA communities.

PERSONNEL & COMPENSATION

A. Approvals

1. PCR Amendments – January 2023

Wendy Chu:

2. Appointment of Kristen Patneau, Manager, Energy
(promotion)

3. Appointment of Martin McGowan, Director, Construction
(promotion)

4. Appointment of Kristen Schuler Scammon, Associate
General Counsel, Litigation (external hire)

5. Appointment of Kimberley A. McMahon, Associate General
Counsel, Labor and Employment (promotion)

ADMINISTRATION, FINANCE & AUDIT

A. Information

1. Delegated Authority Report – December 2022

Michelle Gillen--explains the purpose & background of delegated authority & reassures the board that even the sole source bidders are heavily vetted.

Jack Walsh questions a sole-source bid--

Explain difficulties hiring and getting more bids, as well as MWRA efforts to reach out to more bidders.

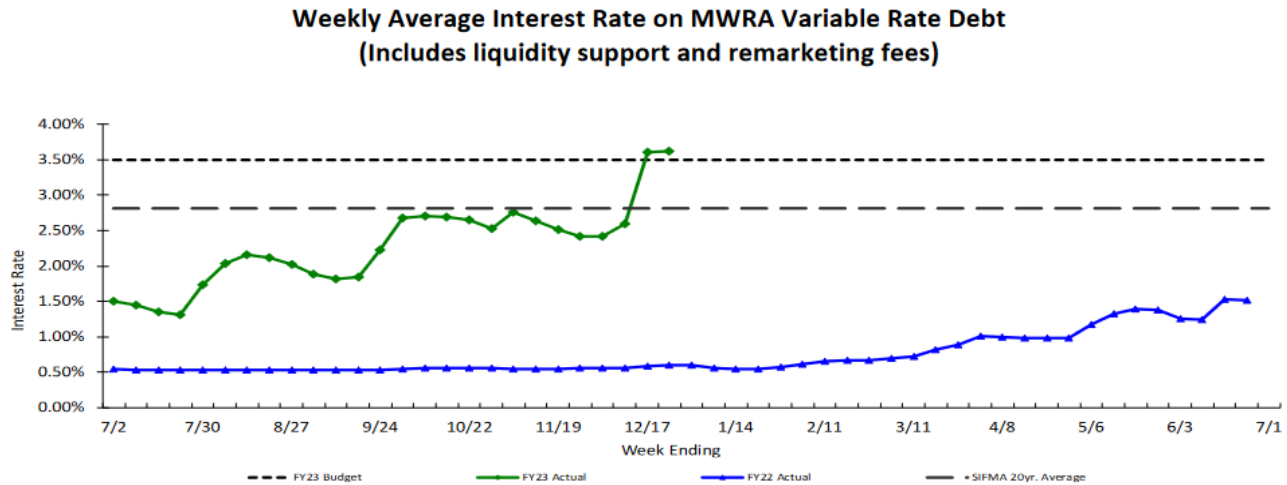
2. FY23 Financial Update and Summary through December 2022

Tom Durkin: underspending in CEB--staffing still too low. Chemicals higher. Inflation easing, but YTD is still high. Diesel purchase, for example.

Indirect expenses (watershed reimbursement to DCR)--underspent by about \$700K Cap. expenses--16% of budget. 0 variance as of now. Debt is taken on fixed schedule. Explains fixed and variable rate borrowing, defeasance strategy.

Variances: more \$\$ in odor control because of lower flows (drought/wastewater).

The graph below reflects the FY23 actual variable rate trend by week against the FY23 Budget.



The volatility in MWRA’s budget is inflation. Durkin feels debt and other major expenses are under control.

B. Approvals

1. Transmittal of the FY24 Proposed Capital Improvement Program and Proposed FY24-28 Spending Cap to the MWRA Advisory Board

T Durkin: This year, disaggregating the Metro Tunnel (water) program from the CIP baseline cap.

Also using a spending rate adjustment. MWRA is required to budget for every position in every budget, but regularly run a vacancy rate. Can quantify that in dollars, and address the funds less likely to be expended (about 25% less). Adjusting the final budget with that figure in mind.

Mike Cole: two tables--last 5 years budget and actual 5 years’ spending.



Review of FY19-23 Cap

FY19-23 Base-Line Cap		FY19	FY20	FY21	FY22	FY23	Total FY19-23
	Projected Expenditures	\$179.2	\$276.1	\$251.3	\$194.9	\$150.4	\$1,051.8
I/I Program	(19.2)	(25.7)	(24.3)	(27.9)	(26.1)	(123.2)	
Water Loan Program	(8.3)	(8.4)	(7.2)	(5.6)	(2.8)	(32.4)	
MWRA Spending	\$151.7	\$241.9	\$219.7	\$161.4	\$121.4	\$896.2	
Contingency	9.9	15.9	14.5	11.0	8.2	59.4	
Inflation on Unawarded Construction	0.7	5.0	7.8	7.2	8.5	29.3	
Chicopee Valley Aqueduct Projects	(0.0)	0.0	0.0	0.0	0.0	(0.0)	
FY19 Final FY19-23 Spending	\$162.3	\$262.8	\$242.0	\$179.6	\$138.1	\$984.8	

FY23 Final		FY19	FY20	FY21	FY22	FY23	Total FY19-23
	Projected Expenditures	\$142.9	\$150.4	\$148.4	\$164.4	\$278.5	\$884.5
I/I Program	(39.6)	(33.7)	(31.3)	(30.6)	(25.1)	(160.3)	
Water Loan Program	(13.8)	(4.3)	(14.9)	(12.0)	(23.4)	(68.4)	
MWRA Spending	\$89.4	\$112.3	\$102.2	\$121.8	\$230.0	\$655.8	
Contingency	0.0	0.0	0.0	0.0	14.6	14.6	
Inflation on Unawarded Construction	0.0	0.0	0.0	0.0	2.2	2.2	
Chicopee Valley Aqueduct Projects	(0.0)	0.0	0.0	0.0	0.0	(0.0)	
FY23 Draft Final FY19-23 Spending	\$89.4	\$112.3	\$102.2	\$121.8	\$246.8	\$672.6	

\$s in millions



FY24 Proposed CIP – Upcoming Cap Period Projections

FY24 Proposed		FY24-28	FY29-33
	Projected Expenditures excl. Metro Tunnel	\$1,566.8	\$1,233.8
Metropolitan Tunnel	\$141.3	\$553.9	
I/I Program	(166.3)	32.5	
Water Loan Program	(25.4)	117.9	
MWRA Spending	\$1,516.5	\$1,938.1	
Contingency	105.6	167.2	
Inflation on Unawarded Construction	76.9	315.1	
Chicopee Valley Aqueduct Projects	(0.6)	(4.4)	
Projected Spending before Adjustment	\$1,698.4	\$2,415.9	
Spend Rate Adjustment (25%)*	(424.6)	(604.0)	
FY24 Proposed FY24-28 Spending	\$1,273.8	\$1,811.9	

Largest projects:



FY24 Proposed CIP – Top Spending Subphases Excluding Community Loans in FY24

Project	Subphase	FY24 \$s in Millions
DI Treatment Plant Asset Protection	Clarifier Rehab Phase 2 - Construction	\$22.6
Metro Redundancy Interim Improvements	Waltham Water Pipeline Construction	\$13.5
Quabbin Transmission System	Wach LGH Pipe & Boiler Replacement Construction	\$11.2
NIH Redundancy & Storage	Section 89 & 29 Repl - Construction	\$10.8
New Connecting Mains-Shaft 7 to WASM 3	CP3-Sect 23,24,47, Rehabilitation	\$9.8
Braintree-Weymouth Relief	B/W Improvements - Construction	\$9.1
New Connecting Mains-Shaft 7 to WASM 3	Sect 25 & 24 - Construction CP-2	\$9.0
DI Treatment Plant Asset Protection	Fire Alarm System Replacement - Construction	\$7.5
DI Treatment Plant Asset Protection	DITP Roofing Replacement	\$7.0
Siphon Structure Rehabilitation	Construction	\$6.3
DI Treatment Plant Asset Protection	MCC & Switchgear Replace Construction	\$6.0
Facility Asset Protection	Hayes Pump Station Rehab Construction	\$6.0
New Connecting Mains-Shaft 7 to WASM 3	Section 75 Extension - Construction CP-1	\$6.0
Metro Tunnel Redundancy	Geotechnical Support Services	\$6.0
Metro Redundancy Interim Improvements	CP3 Shafts 7, 7B, 7C, 7D	\$5.7
Metro Tunnel Redundancy	Preliminary Design & MEPA Review	\$5.1
Total Contracts > \$5 million (excl. Loan Programs)		\$141.5
% of FY24 Spending		41.3%
		\$342.9

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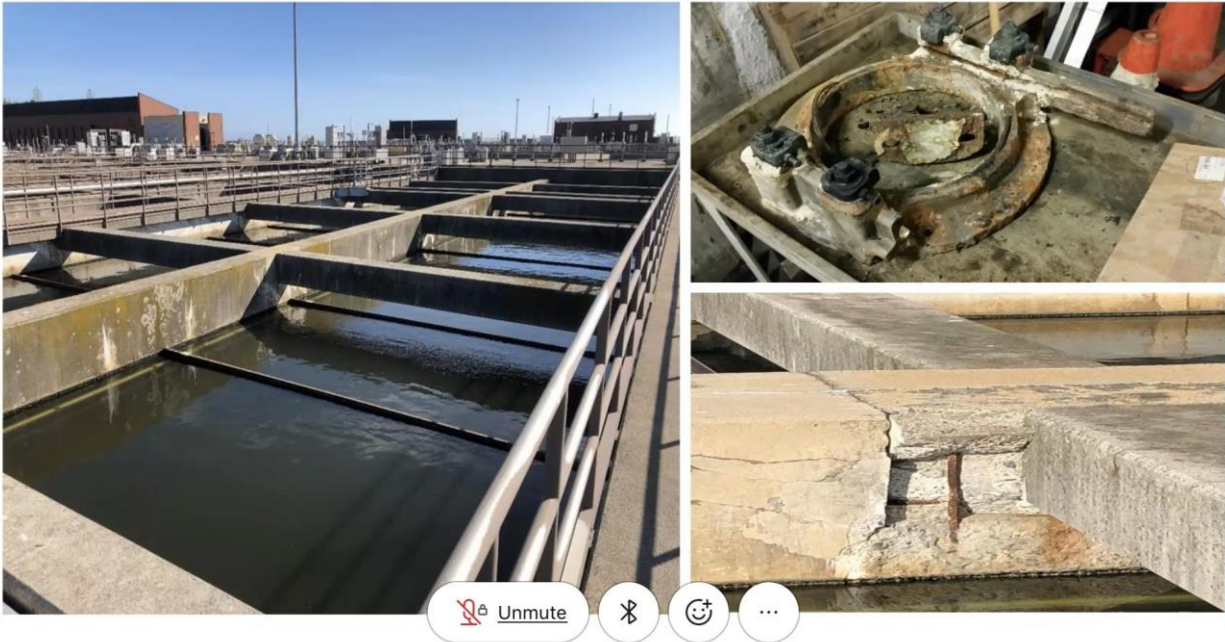
Dave Coppes: Outline, with pictures, of CIP projects completed under the last 5-year cap--Chelsea Creek Headworks, water tunnel redundancy projects, lined wastewater pipelines.

Bigger projects:

DI clarifier Phase 2--having difficulty getting bids, getting contractors, getting materials, contractors having staffing issues.



FY24 Proposed CIP – Clarifier Rehabilitation Phase 2



Next big project on DI: Combined Heat & Power Plant.

Kathy Murtagh--Metro Tunnel project, status--still in design, concept. Construction manager 2026, design to bid-ready designs after that. Spending will ramp up in the next 5 years to make this possible.

DCoppes:

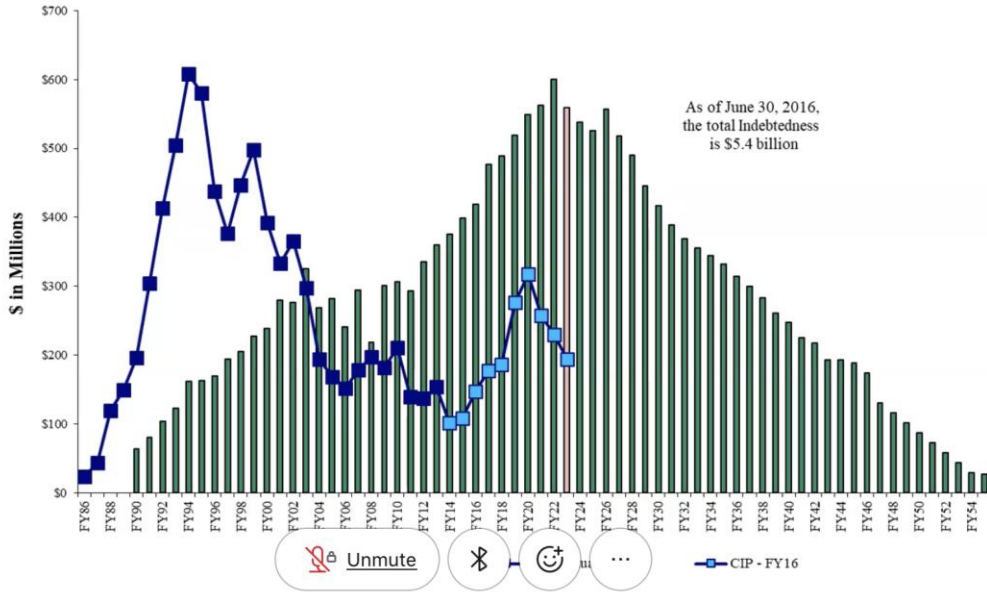
- South System Pump Station Variable Frequency Drive (pumps) replacement-- station continues operation while construction ongoing.
- Ward St. & Columbus Pk Headworks construction.
- 5 wastewater pump stations rehabilitation--beyond the cap period: Framingham (\$24m), Squantum, New Neponset, Quincy, Intermediate
- CSO control plan--continue to work on within the CIP.

Debt Service & relation to CIP--Matt Horan



Capital Spending and Debt Service – FY16

MWRA Capital Improvement Spending & Debt Service

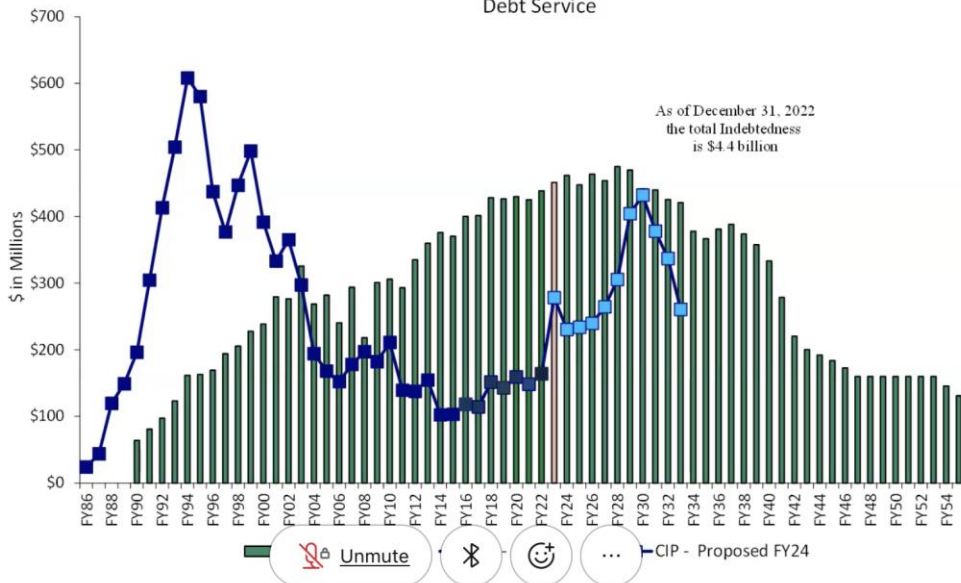


The effect of defeasance:



Capital Spending and Debt Service

MWRA Capital Spending & Debt Service



Recap:

- Continue to focus on asset protection and redundancy
- Tunnel: \$1.8billion estimate, based on inflation

Jack Walsh remembers tunnel project at \$1.2billion. Is that final? Spending is bigger than any he has worked on for a decade.

TDurkin: we are still making our best efforts, but even when submit the final staff summary, we won't know the final cost exactly. But costs are in control to the extent that they can be controlled.

Patrick Walsh: has MWRA reached out to Boston contractors?

MWRA has reached out to contractors who might not know about its work--construction market is busy; MWRA has some required qualifications (DCAMM) that aren't usual. But MWRA is breaking apart large projects to make it easier for smaller contractors to bid on parts of the work.

Advisory Board 1/19

Presentation of Difference Maker Awards to former Speaker Robert DeLeo and Speaker Ronald Mariano "the MWRA Caucus." DeLeo cites the Advisory Board & MWRA structure as a model of good governance that he has tried to apply to MassPort.

Report of the Executive Director--Favaloro & Romero: Met new Commissioner Rebecca Tepper. Progress on co-permittees with EPA. Met this morning with MetroWest communities on joining MWRA water system. Romero expects more movement.

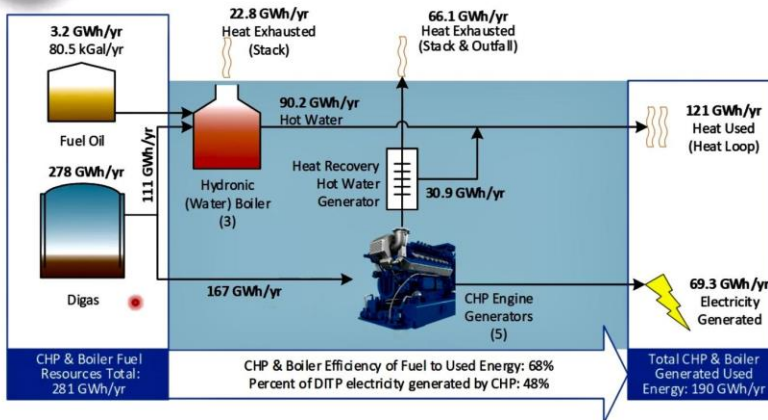
Presentation: Deer Island Wastewater Treatment Plant Combined Heat and Power System – Christian Murphy, Program Manager I&C--joined MWRA 7 years ago & used to work on energy systems & CHP. Licensed electrical engineer

Current contract--evaluates the existing CHP and find ways to maximize on-site generation, reduce energy purchases. Shows current system--produces around 64% of energy (60% by cost) used on Deer Island.

Evaluation: reciprocating engine (like a car) or combustion turbine (like a jet). The reciprocating produces the most energy.



Consultant Proposed Design - Schematic and Energy Flow*



- New building for equipment
- Design and construction cost: \$82M

Total Energy Used at DITP (Thermal & Electrical)	Total Energy Generated from On-site Resources	Percent of Energy from On-site Resources
265 GWh/yr	197 GWh/yr	74% by Energy 78% by Cost

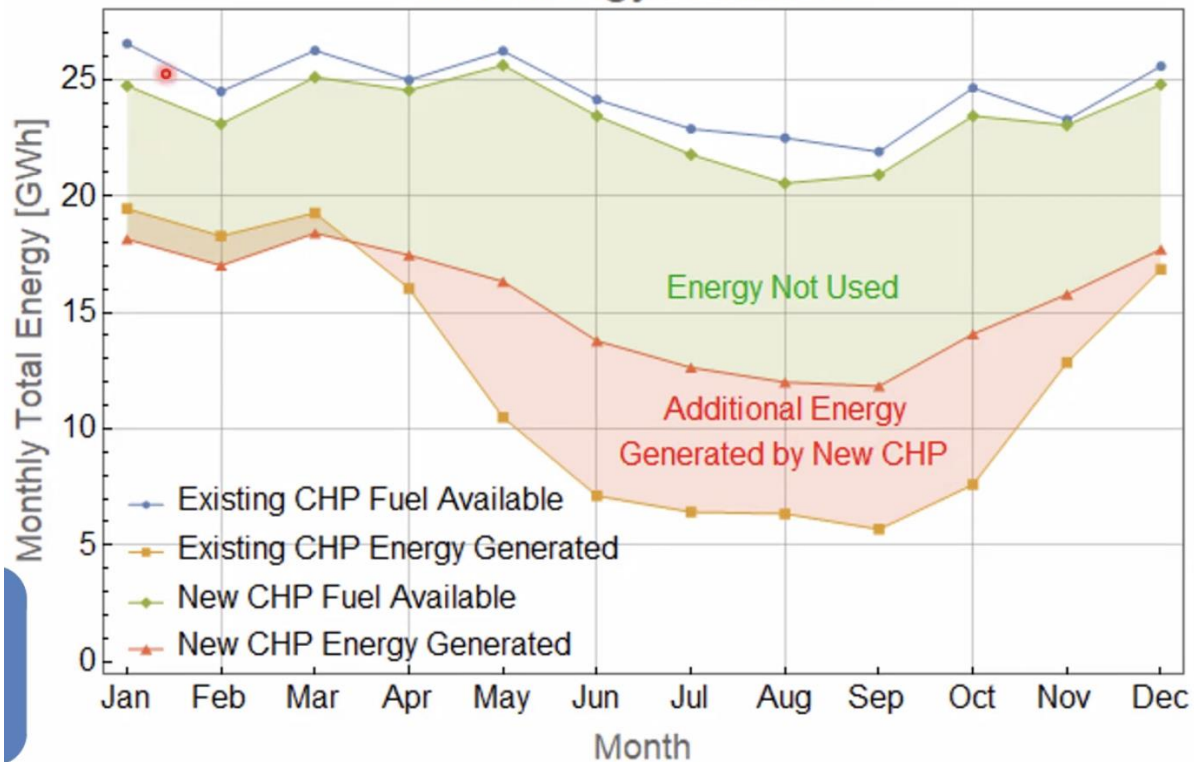
*Based on preliminary sizing and overall design

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Consultant ran simulations of 7 years of performance to predict future performance & needs on DI

Old CHP--30 GWH/yr. New CHP--69 GHW/year; difference is efficiency of 40% vs 10%.

Monthly Total Fuel Available and Energy Generated



7

The new system should generate significantly more energy, particularly in the summer when energy isn't needed to heat the digesters.

Net present value calculation over 25 years to account for the value of money. Adds the O&M costs, discount rate & boiler replacement costs to get to the positive number of \$43.1m saved with new system.

Adds in GHG reductions--reduction of 16,800 metric tons or 42million car miles. Social cost of carbon: \$775k/year (general benefit to society).

Onsite generation from 57% by energy to 74%; or 65% by cost to 78%. Eliminates 30 fuel oil truck deliveries/year and eliminates the hazards of the high pressure steam system.

8-10 year timeline.

Presentation: 2022 Annual Water & Sewer Retail Rate Survey – James Guidod, Advisory Board Director of Finance

More non-MWRA Commonwealth communities (200, up from 100). Uses the metric on 120 hcf/household (90,000 gallons--not what most New England households use) to compare rates. Also use the adjusted--using DEP data.



Then & Now

	2020	2021	2022
MWRA Wholesale Assessment Increase	1.00% (FY20-FY21)	2.95% (FY21-FY22)	2.85% (FY22-FY23)
Average MWRA Retail Rate Increase	2.83% (CY 2020)	2.92% (CY 2021)	3.16% (CY 2022)
Average MWRA Service Area Combined Retail Cost (120 HCF)	\$1,709 (per year)	\$1,760 (per year)	\$1,820 (per year)

Average water bill just for water is just over \$700. On lower end: Burlington. Higher end: Reading.

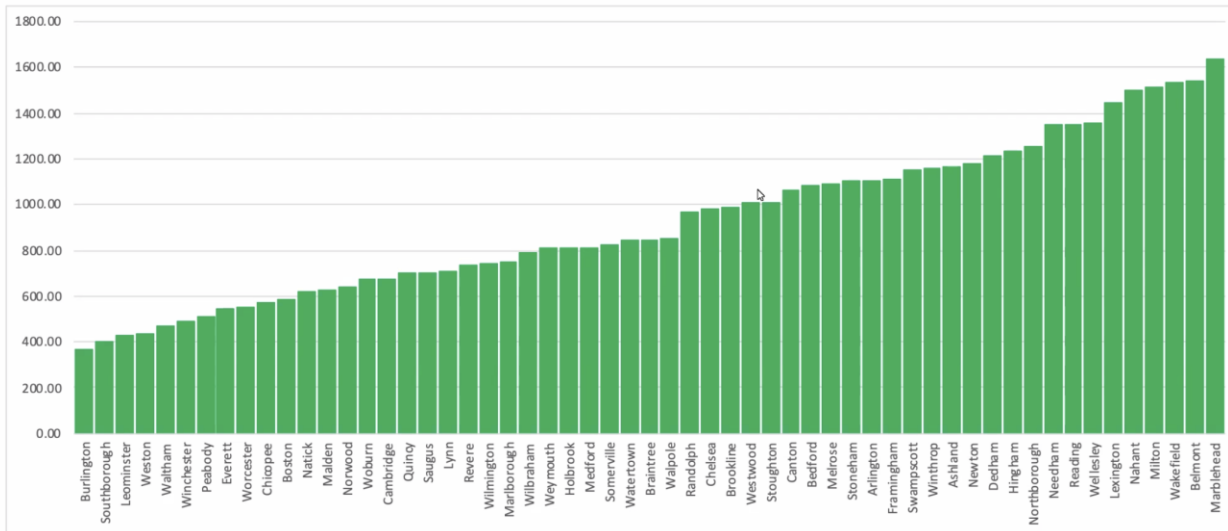
Average sewer utility: just over \$1100.

Average combined bill is \$1,800

BUT--based on usage--how do communities compare: lowest per household users are in Cambridge, highest in Weston



Adjusted Data



Checking in with non-MWRA communities in the Commonwealth. Average combined bill is just over \$1,500 for 120 HCF.

National communities--not a healthy sample size: again, just over \$1,500 per household.

Committee Reports

Executive Committee – Louis M. Taverna

- Update: Timeline and process to elect an Advisory Board representative to the MWRA Board of Directors--

Retirement of John Carroll is an opportunity for a new AB member to become a board member. Three-year terms. So need to vote someone in to take Carroll's remaining time (through June 30) as well as his next term.

Executive Committee will discuss and nominate in Feb. Elections in March meeting. Nomination letters accepted.

Finance Committee – Elena Proakis Ellis

- Update--New FY24 CIP is with AB for review. Starts off the new 5-year CIP cap.

Operations Committee – John Sanchez

- Update

OMSAP 1/19

Attendance: Aaron Hopkins, Michele Barden (EPA), Ben Haskell, Bruce Berman (PIAC), Todd Callahan, Melissa Campbell, Catherine Coniaris, Mel Cote, Betsy Davis, Erin Flannery-Keith,

Claire Golden (DEP), Jeff Rosen, Lynne Jennings (EPA), Ryan Joyce, Juanita Urban-Rich, Judith Pederson, Julie Simpson, Jeff Kennedy, Lealdon Langley (DEP), Matt Romero (AB), Meagan Riley, Mark Patterson, Pete DeCola (NOAA), Laura Schifman (DEP), Prassede Vella (EEA), Vi Patek, Ellen Weitzler (EPA), Peter Burn, Jeff Rosen (OMSAP)

Ellen Weitzler: Meeting to focus attention on future of an outfall monitoring panel in the new draft Deer Island permit (yet to come--maybe by March)--EPA called the meeting. OMSAP is unique in EPA permits.

EPA feels many of the outfall questions have been addressed. Some remain, including new questions that go beyond the outfall--warming, PCPs and other CECs. Thinking about a new Science Advisory Panel. Concerns of legal counsel that continuing to include OMSAP in the new draft may not be consistent with federal conflicts of interest. EPA feels OMSAP should not be in the DI permit, but be a regional entity--focused on all discharges to MassBay. Examples around the country of independent SAPs.

Have already discussed with MWRA briefly.

Lynn Jennings (EPA): not trying to dissolve OMSAP, but the questions for which OMSAP was created are mostly answered. The new questions are regional--like PFAS--and are important. Commitment for bigger science advisory panel focus. Broader approach makes more sense.

Brainstorm collectively--how to continue & staff up. But not tie to one permit in the region. Advantage: to the extent needed grant \$\$ to answer some of the new questions can be hindered by current construct.

Lealdon Langley (DEP)--offer assurances that MassDEP seen advantages of OMSAP. Would be problematic if SAP no longer available. Don't want to re-start b/c would be difficult to re-constitute. MassDEP does not have capacity to host. Would participate and remain a member.

Julie Simpson--own thoughts. Need for greater understanding of changes in the bay. Goals: have a SAP; Coordinate monitoring and regular data assessment (assuming MWRA continues monitoring in permit); develop scientific consensus to inform management. Want the SAP to persist despite changes in administrations

Potential models: MassBays hosts--has geographic scope & expertise. Need more funding to add capacity. Possibly state funding or multiple stakeholder support.

Another possible model:

Southern California Coastal Water Research Project – a brief intro

Founded 1969 as Joint Powers Authority (public agency), initial focus on wastewater impacts in Southern California Bight

Current member groups: stormwater and wastewater agencies, state and federal regulatory agencies

SCCWRP goals (paraphrased):

1. Undertake scientific investigation to understand coastal ecological systems and their relationships to human activities;
2. Serve as a respected source of unbiased coastal water quality science;
3. **Develop scientific consensus on issues relevant to management decisions and member agencies;**
4. **Stimulate conversion of science to action**

And "... plays a key role in developing and facilitating long-term monitoring programs, promoting stewardship and sharing of environmental data, and informing regional planning efforts and regulatory compliance strategies."

9 M. ...

Bruce Berman (PIAC): what would be needed to make OMSAP possible in future? (heard ½ of a staff person or about \$100K) Could DEP find the resources?

OMSAP isn't just very useful (and not just for managers). It has also been instrumental in communicating to residents about the health of the bay and the harbor (and that's because of PIAC).

EPA--the ambient monitoring will remain in the permit, however what is measured may change.

Berman: need for regular, dependable funding.

EPA--having this required in the permit is not feasible for EPA. Looks like self-dealing.

Berman--you could require a contribution to "science" in some way that does not present a conflict. Very concerned about a period with no OMSAP as you work toward a bigger, better OMSAP.

Jeff Rosen--OMSAP requires a significant amount of (volunteer) participants' time and energy. It will need a firm structure with clear funding and clear mission--otherwise it will float around & folks won't give time. Marine data inputs are going to make a quantum leap--with major amounts of new data--gliders, sensors, at various depths. OMSAP needs to look forward to be effective. Wind turbine siting will mean billions of new dollars. Gulf stream is changing its course, major impact on fisheries. And southwest of MassBay has a nagging little dissolved oxygen problem that could expand. Shame on all of us if we don't do the necessary science.

Judy Pederson: stresses need for funding. Notes that Buzzards Bay and other parts of the northeast Atlantic could use similar science panels.

Todd Calahan: how can we create funds based on NPDES permits and contributions to the pollution?

EPA: Unlike states, EPA does not charge for permits, and has no means to collect funds that way.

Berman: DEP does have that authority via Chapter 91.

EPA: we are no longer issuing joint permits with MA. WWTP get two separate permits.

Lealdon: what needed--staff person, mission statement, perhaps another meeting, definition of scope (geographic)

EPA: also would like to fill gaps in the data that the current monitors don't pick up. Will help with permitting solutions. NH coast folks & stormwater folks working together in their small stretch of coast--without getting control of non-point pollution different measures will be needed there.

EPA: has ambient monitoring requirements in many permits.

Request to re-convene on this topic. Another OMSAP meeting on Feb. 10. and hands up--but hard stop at 8.