

**Minutes**  
**Dec. 7, 2018**

The Wastewater Advisory Committee to the MWRA met at MAPC, 60 Temple Pl., Boston, MA.

**Attendees/Contributors:**

**WAC:** Mary Adelstein, Craig Allen, George Atallah, Wayne Chinouard, Adrianna Cillo (BWSC), Stephen Greene, Taber Keally, Martin Pillsbury, Dan Winograd (phone)

**Guests:** Belinda Stansbury (PAI), Kennan Vembu (Natick), John Reinhart (MYRWA), Julie Wood (CRWA), Paul Keohan, Charlie Jewell (BWSC), Erica Casarano (AECOM), Wendy Leo, Jeremy Hall, David Kubiak, Maret Smolow, David Wu, Chris Goodwin (MWRA), Juliet Simpson (MIT SEA Grant), Susy King, Cathy Vakalopoulos (MassDEP)

**Staff:** Andreae Downs

**FUTURE MEETING DATES/TOPICS**

**NEXT:** TUESDAY, Feb. 12 10:30am, Water Works Museum, 2450 Beacon St., Chestnut Hill: MWRA 5-year Master Plans

**VOTES:**

November minutes

Nomination of Belinda Stansbury and Kannan Vembu to WAC membership.

**EXECUTIVE DIRECTOR'S REPORT:** Discussion of Tour date—May 3 or 10? Sense May 10 good. Suggests Prison Point CSO facility since about to be reconstructed and of interest in terms of clogs, CSO treatment.

**MWRA UPDATES:**

Changes to outfall monitoring program as part of OMSAP workshop. Clinton phosphorus facility in mothballs for the winter—seasonal facility starts again in April. Wet fall. Releasing water from reservoirs after the wet fall.

**AB UPDATES**

On Friday December 7, the Advisory Board Executive Committee will be hosting a “Spaghetti” session to casually discuss hot topic issues and “see what sticks”. The session will help for planning meetings priorities in the coming year. The starter topics on the agenda are Storm Water Issues, Rates Management, and Unaccounted for Water”.

At the November meeting, the Advisory Board discusses the preliminary findings of the annual water and sewer retail rate survey. For the 2018 calendar year, using the AWWA (American Water Works Assoc.) standard of 120 HCF (hundred cubic feet) per household usage annually,

the average combined water and sewer bill for MWRA communities was \$1599. This is an increase of 2.59% from last year's combined bill of \$1558. In comparison, the average wholesale rate change for wholesale communities in June of 2018 was 3.07%. When factoring in local, state, and federal data, the average household usage in the MWRA service area is estimated to be 70.5 HCF a year with an average combined bill of \$878.

The next Advisory Board meeting will be held January 17, 2019 in Canton at the Canton Public Library.

## **PRESENTATION: CSO MONITORING AND PERFORMANCE ASSESSMENT UPDATE**

Jeremy Hall:

A tremendous amount of work has happened since last year's update.

Finished CSO regulator\* inspections, constantly reviewing meter installations and hydraulic conditions at 57 active regulators. AECOM evaluating meter data collected so far, whether metering sites are adequate for their purposes, and whether meters can be selectively removed.

Modeling update. Incorporating inspection results, commencing calibration updates using recent meter data.

Regular coordination with CSO communities, sharing data and system evaluations.

(\*Regulators—structures upstream of each CSO outfall, control and direct flows to DI system and overflows to the outfall—configurations (e.g. overflow weir, high overflow pipe) and hydraulic conditions vary. →



Sharing meter results between MWRA and community and vice versa. Looked at every existing meter, and whether it met the needs of the program and is properly calibrated. Also looking at changes to the monitoring program, as needed. In a couple of places, installed temporary supplemental meters.

ADS—the name of the environmental service company that manufactures the meters & provides data analysis. Each meter (collects and transmits data) has one or more data collection sensors, measuring level, velocity/pressure/flow or tide gate position (inclinometers).

Modified or eliminated regulators as part of the CSO program. Scope of work includes documenting that these are indeed permanently closed.

For instance: Picture of a closed CSO regulator →

Monthly meter data collected. MWRA issued first semiannual progress report on November 30, 2018, including metering plan, approach and CSO discharges in storms April 15 through June 30, 2018. Next report in the spring of 2019 will also report progress with calibration of the hydraulic model.



### **What's done so far?**

Inspections of active and closed regulators—needs to be documented. Confirmed that “44” (corrected to 40 after the meeting) of original 84 CSOs are “closed” or converted to storm drain only. 35 are entirely closed to CSO. Five are “effectively” closed—CSO is prevented up to a 25 - year storm along the South Boston beaches. Work includes verifying that South Boston CSO storage tunnel achieves that level of control. Before tunnel approximately discharges/year to the beaches. No CSO discharge since tunnel brought on-line on May 4, 2011, but haven't had a 25 - year storm or greater to test the system, but the tunnel appears to be working as designed – will be verified.

Total number of storms April 15-June 30 (first semiannual progress report): 27. Overflows at 23 storms (corrected after meeting to 9 storms). More rainfall in 2018 than average – good for data collection.

MWRA compares actual rain storms to Typical Year storms (key basis for CSO performance objectives) Looking at inches per hour and now at cloud bursts, peak intensities and how they affect CSOs. Peak intensity later in the storm may have more effect on CSO than earlier. Also looking at groundwater and its influence on CSO.

Charlie: weather has changed. How do you adjust for that?

We did look at typical year & whether it has changed. It hasn't. We had a wet 2018, but two dry years before.

DK: focusing in on each storm. Calibrating model. It is the model that is used to determine whether meeting the court ordered level of control (based on “Typical Year” rainfall – 93 storms from 40-year record to 1992).

SG: Is the data correlated to the catchment area?

Yes. 20 gauges in all for this CSO study provide coverage of catchment areas.

Calibration of the hydraulic model, used to predict CSO discharge frequency and volume in the typical year, is included in the Consultants contract. Model calibration works best when a range of storm

magnitudes, intensities and durations is available. In order to maximize the range of storms it was a high priority to capture the spring of 2018 storms. The Consultant designed, installed, and got meters running by 4/14. The temporary metering portion of the MWRA Post Construction Monitoring and Performance Assessment is unprecedented in size. The amount of data in which the consultants are crunching is unbelievable. The cost of the CSO metering program alone is over a million dollars.

With all the storms since the metering program began—it been like Christmas. We have collected some great data. The data being used to identify active or relatively inactive CSO outfall, Calibrate the model, verify model predictions, and quantify CSO discharge (volume and duration).

Each metered location required its own design because each location is unique. The design takes into consideration for access, wastewater flow conditions, physical restrictions, tide gates, etc. Each site has a meter that is connected to sensors used to collect the data.

The information is also being collected from the (26) permanent community meters, MWRA meters, etc. AECOM reviewed the data that was collected from the community meters. If the meters installed were not collecting the data that was required suggested improvements were made. AECOM also reviewed the MWRA's suggested metering plan (Exhibit 4 of the contract) Based on the review AECOM suggested modify the program to meter all active regulators. Not only the locations where the model predicted overflow in typical year and /or 2-year design storm. As anticipated, at a few locations, adjustments to metering program has occurred after AECOM reviewed the initial data. We will continue to adjust meters and or relocate when needed in order to collect accurate reliable data

What is the purpose of the meters?

Identify relatively inactive CSO outfalls, calibrate model and verify predictions, quantity CSO discharges.

Data from each meter collected in 5-minute intervals. Uploaded every 2 hours. The 5-minute data collection is important because overflows can happen in less than 15 minutes. The decision to collect data in 5 minutes' intervals was made because using 15-minute data only (common practice) for data collection could result in missing an activation or miscalculating the duration and volume.

Example of a typical flow measurement (capturing depth and velocity) and a typical level (depth) setup within a standard regulator configuration. Two regulator examples →



Metering program constantly evolving. To ensure accurate reliable data.

What does ADS field professional do?

Determine what equipment needed and where

Install meters in the regulators

Calibrate the inclinometers, sensors etc.

Periodically check equipment, clean sensors, replace batteries

Verify data results—check data. Want to be sure the meters are continuously collecting good data.

Goal—95% uptime at each sensor location.

Most regulators are over 100 years old.

AECOM office staff, After the ADS field staff verify the data it is passed on to the AECOM engineers and the data is reviewed again, to correlate with system conditions, evaluate the contributing factors that happened before the rainfall, make sure the data makes sense.

Looking for trends and where activity isn't predicted by historical model results: Or where discharges vary from historical predictions. Also looking for any unreasonable data, or data that just didn't make any sense— might indicate that equipment (sensors) needed updating or replacing.

Model variances: upstream of Stony Brook outfall in the Charles; Fort Point Channel—

### Meter Data Review Collected Apr 15-Jun 30, 2018

#### Not consistent with historical model estimates

Outfalls where meter shows regulator activity not predicted by model:

- MWR023 (Charles River)
- BOS070 (Fort Point Channel)

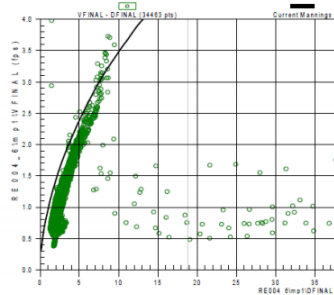
Outfalls where discharges vary from historical predictions:

- CAM005 (Charles River)
- SOM01A (Alewife Brook)
- CHE008 (Chelsea Creek)

#### Unreasonable Data

Where the data doesn't make sense.

- CAM001 (Alewife Brook)



headwater. Massive storm drains upstream, and CSO regulators that discharge upstream into those massive storm drains. Both are former wetlands/brook systems.

What we are showing with this slide ← is that we are responding to this data, not just ignoring it and saying “our model says this.” We are not necessarily trusting meter data or model results. Trying to make the two align as closely as possible.

The Fort Point outfall and Stony Brook are draining what used to be wetland but was filled. (Widett Circle—was South Bay, for example).

Wood: CAM05—hasn't Cambridge metered for years? Is this new metering? Jeremy: We are seeing activations there that weren't anticipated. May be a blockage or something physical going on. Not far away is CAM007, both tied to same interceptor system. It is not discharging, and should be simultaneous. We supplemented the Cambridge meter there to get the dry weather flows, not just the overflow data.

Removal: once there is sufficient data to calibrate the model, meters may be removed. At regulators where the data indicates no overflows or the possibility of an overflow the meter may be removed. MWRA is carefully documenting reasons for removal of meters for the regulators.

Will this be used as part of I/I program?

Dave:

Interceptor meters are used for I/I in communities to identify in each community how much I/I is coming in. Those are permanent meters, used also in this analysis

Modeling, incorporating at least 3 storms with varying intensities and duration and ground water conditions will be used for calibrating the MWRA's model. The calibrated model will be used to verify typical year level of control.

Taber: any corresponding wet weather sampling to correlate cleanup to results?

George: when remove rain gauges how will be able to predict? Only added 3 temporary rain gauges. Rest are permanent.

Martin: had a lot of rain events. None seem to have been high intensity. Will model be able to extrapolate larger storms?

Dave: still waiting for that one larger storm before we finish calibration. Still praying for rain.

MWRA is continuing to collect receiving water samples with a focus on Charles and Upper Mystic/Alewife.

MWRA submitted the Draft Water Quality Analysis Plan to DEP/EPA in July (2018). MWRA is currently having discussing with EPA and DEP about their concerns with the MWRA water quality assessments.

Wendy: We have performed sampling since 1989. Data showing improvements in parts of the harbor over the years, particularly re CSOs—annual CSO report from Spring 2015 has a lot of the long-term trend data. MWRA submitted its Water Quality Report in July. In some cases, separating sewers has decreased water quality, because the stormwater is no longer being treated at the plant.

Jeremy: The semiannual reports are where the MWRA will be showcasing the data that has been collected. The focus for the second annual report, due out in April 2019, will include the steps taken to upgrade the hydraulic model, follow up on the recommendation made in the first report

to perform additional regulator investigations, and discuss the steps taken to remove meters where sufficient data has been collected.

~~Dave: when I ask about 27 storms vs 23 storms. There were 27 April 15 - June 30 in that period. Jeremy said 23 storms caused a CSO discharge. At what location? Why did they get a discharge - high intensity. Often short. But 23 activations - where did they occur? Suspect it's the Somerville Marginal CSO treatment facility. There's a difference in water quality. That information is already provided in the semiannual report - outfall by outfall. If 23 is true, it is associated with Somerville Marginal Treatment Facility. Based on further review of the activation tables, 9 not 23 storms caused activations during April 15 to June 30.~~

Julie: if minimum volume for an overflow is 100<sup>th</sup> of an inch is that surprising?

Dave: the response may be to raise the weir. It may flood people upstream in the big storms. That's why want a model to ensure the higher weir won't flood upstream.

Paul K: do you have an interval before a storm is considered separate? Wendy: 12 hours.

George: how long will this model be used? Does it take into account more buildings?

Dave: always updating, based on a new project, something unexpected in the data. 2015 updates included 35 projects (sewer/stormwater projects that change MWRA system). Adding more pieces to the model. Communities are provided our hydraulic model add their own systems (generally in much greater detail than is needed for our modeling needs). The model will last as long as it's useful. As modeling technology improves, we may change models.

George: do you send it out or is it in-house?

It's in-house.

Development projects add huge additional sanitary (mostly) flows, could compromise benefits of the CSO control plans. DEP requires any large project to pay to remove 4:1 new flow in I/I. DEP has authority over that and the communities are responsible for enacting. We review every MEPA project and always pushing communities to comply with DEP regulations.

### **Good topic for future**

Projects tend to reduce stormwater runoff.

Adrianna: When you close one outfall, how does that affect other nearby areas?

The main reason to close an outfall is because of a sewer separation project that removed significant volume of water. Whenever we consider closing an outfall, we model it first. Changes such as closing an outfall could impact other areas therefore it is important to see how the entire system is affected.

One of the locations where the metered discharges are higher than what the permit requires is Somerville O1A, which discharges to Alewife Brooke—large volumes of stormwater into our system. We are required to take more of that water at DI. We did the work to divert that water, but haven't opened up yet because of number of projects going on in that area in the area that would be negatively affected if we opened it. Now that we can open it, are looking at how much more water we can send to DI without causing problems at other outfalls.

CSO is treated at 4 large CSO treatment facilities. One of the long term goals is to get most of the flow to these facilities.

Any video monitoring?

Not yet. Put in critter cams at Chelsea OO8, because of the fats oils and grease & other problems.

John Reinhart: what's the treatment at the CSO facilities?

Coarse & fine screening, chlorination, dechlorination, and at some locations, basins to store flow and send back to DI after the storm. If still too much, slow flow down to reduce solids and oxygen demand. Monitor the water discharged.

What kind of quality water does come out?

Wendy: we test for bacteria, residuals, chlorine, TSS, BOD—enterococcus and fecal coliform. We generally meet limits, but there are challenges particularly with fecal coliform and chlorine residuals. Hard to pace the chemical addition when the flows vary a lot. At Union Park having issues with Ph, but think it may be a measurement issue. Not really a pattern.

You can see the results of testing on MWRA website: Harbor & Bay, look for NPDES permit compliance.

Mary: How does water coming out post-treatment compare with the receiving water?

Wendy: Charles river basin water quality is a lot better than it used to be. Not worse than Cottage Farm discharge.

Dave: Our facilities required to remove bacteria at a higher level and when raining, the Charles isn't meeting these levels.

David Wu: Sometimes the Charles is cleaner than the CSO discharge. But upstream of Cottage Farm (most upstream CSO discharge) is the worst water quality. Very large storm drains upstream of that area.

Julie: downstream of Cottage Farm, rarely have a bacterial violation.



Dave K: if we demonstrate that we can meet those levels of control in the permit, it shows that CSOs will not contribute to violations of the bacterial standard at least 98% of the time. I would guess that stormwater contributions to exceedences are more likely the source.

Martin: why we have an MS4 permit.

Julie: rainfall comparison—is that in the report?

Yes.

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### **Director's Report—November meetings**

#### **10/30/18 Deer Island CAC**

Laskey: Irish memorial to over 800 Irish immigrants who died during the Great hunger 1847-1850. Celtic cross base is in, currently being constructed. 17 years in the making.

DI water tank scheduled to be repainted this spring.

Gravity Thickeners are being rehabbed currently. Unexpected corrosion. Being re-done with higher quality steel.

HEEC cable coming to DI. Will be some truck traffic as excavation (started this month) for the cable on the island. Should be energized by Sept. 2019.

Fish pier—bids were too high in August. Are re-bidding and bids due Nov. 13. Same plan, but only 20 parking spaces—posted fishing pier access only. On-island staff will check via security camera. Will have h/c access ramps off the walkway.

Q hours for the parking lot? DI parking lot now has night parties—can hear them.

FL: 24/7

Q: Extra traffic will come through my neighborhood! Who gave you permission.

Q: live on Taft Ave, and can't leave driveway during the shift change.

FL: Answer is Winthrop Police.

Winthrop Chief—we are in charge up to the white line. Roadway is not 20mph as posted—those are illegal signs.

Q: parking lot is endangering some of the birds and wildlife on the island, and should not be paved. Can you put in pervious pavement? Or reconsider the configuration—curbside vs. meadow? Also consider letting residents of Winthrop to come onto the plant and park further in.

FL: can look into pervious pavement—want not just dirt, but then you run into accessibility issue.

Main gate—all security stuff and advisories say this shouldn't be allowed. Without full time staff

at the entrance, couldn't do it. Curbside parking would block part of the driveway in. Need to provide access for fire trucks and chemical deliveries.

Q: what number to call when noise starts?

A: same as the odor control number. Answered 24/7.

Public safety: FL—we got the message, patrols have increased—all 3 departments. More parking tickets, interactive speed signs.

Winthrop 93 calls Tafts and DI. Directed patrols. 1 hit & run, 2 suspicious activities.

State police have been towing illegally parked cars.

Winthrop Chief: when department lacks equipment, MWRA buys it for them. Winthrop police also were able to I.D. the truck that hit the speed sign—so MWRA could collect insurance (\$5K).

Environmental police swept fishermen on the island and verified that all had fishing licenses.

Resident saw a drug deal go down in the parking lot on a Sunday daytime. Suggests a regular patrol there. Another one says regularly sees traffic in & out of the parking lot at 1am-2am.

Resident suggests keeping just parking lot have, enforcing dawn-dusk, let fishermen use the pier—then don't get the traffic or the unsafe behavior and don't have to pave the meadow.

FL—MWRA bought very expensive high-pixel cameras that can pick up license plates, 3 directions, on the parking lot.

Fish pier parking will have police call boxes. Residents want 24/7 patrol and presence. Usually up hill, where no lights.

Resident: lack of trust—started as fishing only pier, now allowing the public to come to see the view.

Discussion on hours & access—crime, traffic, access, running after dark (winter hours). Residents don't agree on or on data.

Resident worries that with Uber/Lyft and limebikes, folks will find out the pier has a great view & is a great party spot—and that there will be huge crowds.

FL—there's no drinking allowed in a public park. Also notes that the fishermen in Quincy parked on the residential streets to go fishing, and the neighbors wanted the gate open so they would park at Nut Island instead. That's why want the parking lot open 24/7.

**11/13/18 OMSAP**

Official notes will be available from PIAC—on OMSAP website or on request.

Berman: promise of Harbor cleanup was that it wouldn't be at the expense of the bay or cape cod. The PIAC role to bring public's concerns to MWRA and OMSAP.

But in meantime, water is warmer and there are more storms. More sensitive tests. Ask important questions. Ensure not surprised—know what's coming.

Ken Keay: overview of MWRA monitoring plan. 40 monitoring questions. Monitoring began in 1992. Regularly reviewed. Contingency plan developed—76 parameters and trigger thresholds. Changes made in 2004 and 2011, but still monitoring those contaminants that were of concern in 1990. In 2016 added a voluntary study of pH; sample for alkalinity, dissolved inorganic carbon since 2017. Eutrophication model: run annually 2000-16. Show that even if nutrients doubled, no effect on the bays. Special study of floatables 1999-2010—almost never saw anthropogenic floatables, except fat. Also studied sediments with USGS.

Betsy Reilley: 25+ years—questions asked & answered. Deer Island won Platinum 11 award—11 continuous years of compliance with NPDES permit. Pretreatment program won 2016 award for excellence from EPA. Ambient monitoring: documented boston harbor recovery. Long term data sets. Understand impacts of effluent on the environment. But times are changing. Understand from data that the changes seeing are regional, not due to the outfall.

Program designed to ask questions, do monitoring needed to answer, and adjust as learn, or new questions arise. What learned? 33 questions—10 dropped. Feel original questions have been thoroughly answered. Contingency Plan thresholds do not allow for modification of the monitoring program.

Bottom line: 17 years of monitoring has answered the questions. Understand that the outfall is the biggest contributor to the environment of Mass Bay. What other questions about effluent impacts are there & how can they be answered? Suggests short term studies have more flexibility and are more responsive. Also help local science. Need to ask what the benefits of monitoring long-term are, and what is not being answered, what concerns still exist and which ones no longer exist. Emerging issues, new technologies available.

Can mwra track ocean acidification and temperature? BR: yes, we are looking at pH. Have to understand relationship to outfall. Berman: public concerned about diatomaceous algae (washes up on beaches), increase of scup and black sea bass in harbor. Climate effects on Gulf of Maine covered by an MIT study last year.

Mark Smith—office of research & standards (DEP): 617-292-5509 emerging contaminants. More than 112 unique organic and inorganic chemicals. Thousands added daily. Regulate 650+. Up to 2007 ad how process. 1997 added mercury. 2002 Perchlorate—standards in 2006 for drinking water. 2007 Emerging Contaminants Workgroup formed. Focus on information sharing,

prioritization, strategies. Screening process—eliminate those chemicals over which DEP has no jurisdiction. Looking at PFAS, dioxins. Particular priorities: risks to children, frequency, exposure potential, public awareness in press, eco-risk, chemicals that exhibit persistence, bioaccumulate, toxicity.

Priority 10: perchlorate, 1,4 dioxane, PCE, jTCE, RDX, tungsten, PPCP, Cyanotoxins, aoparticles, PBDEs, per- and polyflouro alkyds (PFAS).candidates include micro plastics. No standards means no compliance monitoring required. But occurrence monitoring helps assess risks & whether need regulation. In wastewater: PFAS, pops, microplastics, nano? PCB by-products? PFAS— incredibly stable & long lasting, bioaccumulate, soluble. Concern because are toxic, developmental effects, reduce immune responses, endocrine disruption—particularly thyroid. Children at risk. Long half-lives, persistent, widespread. Used in textiles, paper coatings, fire-fighting foams, waxes.polishes, waterproof down, hairsprays, manufacturing. Multiple sources of exposure, including drinking water, fish.... TRAC governed by Toxic Substances Control Act— amended in 2016. EPA has authority to collect information on uses—since 2006, 294 new uses in US. Safe Drinking Water Act has health advisory for two—PFOA and PFOS. Guidance, not regulation, adding GenX and PFBS. Various states have come up with different regulations for drinking water. PFOS/A already considered hazardous waste in MA. Cleanup standards coming out. Expect they are in wastewater and in sludge. May be a candidate for occurrence monitoring at outfall.

PCPs—71% increase in use 1994-2005, detected in septic & downstream of WWTP. Endocrine disrupters, pollution prevention, public awareness. Plastics: persistence, increasing amounts, microbeads, micro fibers (weathering) food chain effects? Carrier effects. How to monitor?

Juliet Simpson: Climate change—warmer ocean—more heat than originally predicted. Warming faster in gulf of Maine: Last decade in particular—question: how does this affect the biology, more extreme precipitation, increased storm intensity, sea level rise, ocean acidification

- bacteria—decreased O<sub>2</sub>, increased temperature, so bacteria change processing of nitrogen, carbon. Increased light from storms.
- Phytoplankton: less light, increased temps, change in nutrient availability—reduced productivity, reorganization of communities, harmful algae blooms
- Zooplankton, nekton, benthos—already see a lot of change: species range is shifting, food web alterations—fish may. Not be adapting to earlier blooms of various plankton, diseas intensity, new pathogens, acidification also affects non-shelled species—behavior changes— earbones of the squid can't grow and can't hear as well. Fish can't smell as well.

Questions include how will climate interact wth outfall how can we distinguish changes between climate & outfall? What new technologies can be used for these studies?

Is climate change affecting ocean currents? Yes—big question still to be answered. Methane hydrates? Off coast of Carolinas seeing more seepage. Not sure our area has methane deposits

AMO oscillation is now in its 40 year decline, and may affect temperatures of MA bay independent of climate change.

Break out: climate: Neracoos is looking at ocean at ecosystem scale from Long Island Sound to Nova Scotia, using MWRA data in the model. Open call for the advisory council there. Hoping to get another buoy on the coast. Testing of dredge material from the harbor for contaminants. How does temperature affect benthic diversity? If the Atlantic oscillation (now at peak temps) follows previous patterns, will the diversity decline? Would the outfall have any effect on diversity? How do we separate the background AMO effects from the outfall effects? Future permits can't be based on a static background assumption.

Emerging contaminants: which are of highest concern? Those that survive the process. Cost of testing—can these be tested as a class? Yes for PFOS, not so much for drugs. Can monitor endocrine disruptors as a class. How to reduce expense of monitoring? Background levels important before adding effluent levels. Behavior of materials that leave the outfall also important to measure, to determine the impact. National effort to understand these contaminants and a question whether our bay has a particularly unique burden. Can't really answer the question for every outfall across the nation. What happens to chlorine-resistant microorganisms in the effluent, and do they survive the treatment process? Not testing for them.

In CA studying emerging contaminants in SF bay & contribution of WWTP there.

Michael Connor: retired general manager, East Bay dischargers authority. Alternative outfall monitoring.

Standardize monitoring tools, measure cumulative impact, develop stakeholder consensus. CA does regional monitoring programs:

SF Bay—\$4m—SFEI is a non-profit, gets grant \$ as well as POTW \$; So Cal. Bight—\$800K, SCCWRP—in-kind from POTW (\$2m), and fed/state grants; Interagency Ecological Program—how much fresh water to So Cal & what impact? \$26M, from fed/state agencies, plus in-house cost-sharing.

SF leadings are lower than MWRA's. Track various leadings from various outfalls in the SF Bay. Could be done for MassBay. Set up region-wide collaborative, simplified parameters, so all treatment plants aren't doing multiple non-detects. Also joint fact-finding. Tripled budget because proof of concept was so effective. About 1/3 in special studies, 1/3 in status & trends monitoring of the top contaminants. Money comes from all dischargers—dredgers, s/w agencies, industry and WWTPs. Funding is stable, clear objectives relevant to decisions, sound science, adaptive, reported to public—once a year. Tire grinding (on roads/freeways) and brake pad liners (copper source) identified as contaminants in bay. Monitor for micro-plastics \$800K from foundations to study. Also figuring out how much is removed via wastewater treatment. Most of what gets through treatment are plastic fibers—probably from clothing. Also looking at

nutrient loading, particularly nitrogen. With coordination, can give a snapshot of the whole bay. High-quality, rapid data sets on DO and fish—>impacts on fish and benefits of control. With NPDES delegation, could update study/monitoring—regional, cumulative issues, new technology for fact-finding, etc.

Break out group wrap up: Questions: what questions would monitoring answer in future? Should MWRA continue outfall monitoring? How limit the questions? How much of the responsibility for maintaining long term data should be MWRAs? Can future science be more flexible and responsive to real-time data and questions? Use a consortium like SF bay? Special studies?

Emerging contaminants: no standards because these are emerging. Pharmaceuticals may be more plentiful in MA bay because of local biopharma industry than in other water bodies.

Climate: issue of timescale. Decided not to worry about sea level rise. MWRA monitoring data needs to be evaluated in a regional context. Sharing and coordinating are important.

Panel: Looking at next questions to be answered by outfall monitoring. EPA: have small grants for shorter-term studies, regional collaboration on monitoring. BR: MWRA already collaborating with and supporting several bay partners/watershed groups—microbial tracing; satellite monitoring. Berman: supports collaborations, but sometimes the only way things get funded is through leverage. Question to spend MWRA dollars wisely.

## 11/14/18 MWRA Board

**Wastewater:** Alewife Brook Pump Station: nearing the end of the project. Going extremely well so far. Replaced roofs, doors, windows, three pumps for wet weather ea. 37.5mgd, replaced screens and grinders, all motor controls—all controls elevated. Also replaced air handling, a/c. Finished capital project part, now into testing. Capacity dry weather is 15mgd (typical 9-13 mgd). Wet weather capacity 37.5mgd each (3 pumps). During testing—average 35mgd. Finishing testing and SCADA control are dependent on the weather. Critical to success of CSO programs.

Chelsea Creek HW change orders: Gas monitoring system is dated and not compatible with the new SCADA system. Replacing. Additional water connection piping to avoid a water main at same elevation. Adding valves under the sidewalk to avoid disrupting traffic. Additional pipe for the fire suppression. February first process channel (new) should be operational. Most concrete work is complete, awaiting hardening and equipment for odor control. Ready to replace roof and old odor control next summer.

**Water:** Lead & copper rule: John Carroll wonders if the communities will actually use the \$100m in lead loans. Estes-Smargiassi: just the lead service lines will cost \$100m. Then there's also gooseneck connections. MWRA is worried about an increase in lead levels in some fully served communities; trying to figure out why this is happening and whether there are actions MWRA can take.

—Pipe break at Wachusett lower gate house, due to testing of the new pump station via old cast iron mains. Also need to replace one of the Carroll plant generators.

**Personnel:** several promotions and hires in finance—Kathy Soni's position still open.

**A&F:** Internal Audit annual report—FY18 over 25% of savings = costs not paid out due to successful audits. This year looked at debit cards, overtime & time sheets, police details, leases. Also audit consulting firms, check reasonableness of prices.

—Orange Notebook: Preventive work orders' kitting (making sure all materials are collected on-site in the stockroom ahead of any work order)—allow work to happen rather than having workers waiting at the stockroom window. Went from 0% in 2003, reached 100% by 2011. Now goal set at 100% of all maintenance work orders. Now at 55%. \*\* Secondary treatment in first quarter 99.6%. Met all permit limits. \*\*Investment income—short term interest rates were higher than estimated, but investments performed as expected. Surplus in interest income. Durkin: interest rates likely to rise 3-4x in 2019. MWRA assuming 3.5% interest. Mostly been above what charged, so get variance.

—Budget Update: first quarter on track. \$6.4m under budget. \$2.6 is debt service variance, about \$500K is additional interest income. Budget department focus is on the risky parts of the budget—fortunately a low percentage—like interest rates, overtime for wet weather...

—New 3-year MOU with electrical utilities to realize savings for energy conservation. Under old MOU reduced KWH by over 5%/year. Saved over \$1m. Get a higher rate of return from utilities for saving energy than if just did the energy conservation project without the MOU. Includes energy audits, consulting on construction projects that could save energy, etc.

Full Board—Matt Beaton update—he's been spending time at the site of the gas explosion/fire in the Merrimack Valley.

—Fred Laskey: Honored Kathy Soni on her retirement. Attributed MWRA strong bond rating to Soni's budget oversight. 20 years @ MWRA.

—rain events like late February. Nor'easter coming in later that week. 2018 will close out as wetter than normal. By end of Oct. already had all the moisture of a normal year. Quabbin still spilling (started early Oct), 90mgd. Wachusett is approaching its spillway. Releasing over the crest gate, but over their normal operating ceiling. Can't release more because would cause downstream flooding. Sudbury is also over its normal operating band, approaching spillway. Downstream at the Saxonville meter, the Sudbury River is close to flood stage. 5 storms since 10/27, over 8" rain at all 3 remote headworks. CSO facilities operating within capacity. No SSOs.

—Aqueduct trails Program—celebration 11/7 in Wellesley. 21mi of 27 are open. Aqueducts mostly E-W, rail trails mostly n-s and connect to create a network.

—OMSAP meeting 11/13—FL sense of meeting that MWRA answered most of the questions for which OMSAP created, but questions re: PCPs, drugs, plastics and climate may be coming in future. But mostly very pleased with improvement of the harbor.

## 11/15/18 Advisory Board

Honored Kathy Soni for 20 years of fighting with Joe Favaloro

James reported on Wednesday's meeting of the Alliance for Water Efficiency, which has several models and scenarios for setting water rates. Available for MWRA members at no charge. Also had models for managing and preparing for the politics of rate setting. Some info additionally on tier structures for water rates.

Lenna reported on OMSAP:

Sean Navin: water "surveys" going to homes—not MWRA—apparent attempt to collect residents' information & possibly sell a water treatment system.

Ken Keay on outfall monitoring, 2017 results. Had a small red tide event. Concentrations of contaminants continue to fall. Fauna are healthy & diverse. There continues to be increased nitrogen (ammonium) near the outfall, but not further away from the outfall. Appears not to have any effect on the Bay.

James Guidod on the 2018 Water & Sewer Retail Rate Survey: MWRA 2017 rates using 90,000 gallons annual usage came to average \$1,558.47/year combined. For 2018 average \$1,598. When adjust for what communities actually use, water side comes out to average of \$345.58/annual. Combined about \$878. 10 year difference is \$398/year. Rate of increases is leveling off.

Average sewer costs for MWRA communities was \$1,034, a 2.82% increase. Based on 120 HCF (90,000 gallons/year). Changes in sewer rates—Woburn had -21% change Natick +9%. Weston saw the highest increase in rates, but only a water community. Woburn at +10% is combined.

Core communities average combined increase 2.9%. Retail rate increases were less than the wholesale rate, on average for the last two years. Of the nationally surveyed communities, average rate was \$1,369 vs. MWRA's nearly \$1,600. Average increase was 4.2%. More comparison communities are charging more than MWRA than in previous years. Similarly in MA—higher increase but lower average rates.

Usage rates—Boston and Quincy at about 45 hcf. Lexington at higher range at 107 hcf. Weston at 154 hcf. Combined bills: lowest Burlington at \$230. Belmont on high end at \$1900.

Stormwater: 2017–4 communities had a s/w fee. 2018—still 4. Most communities starting with an action plan, not a fee.

David Koppes: weather impacts on operations—



Ops Committee—talking about wastewater metering Jan. 8, 10 am, Burlington.

Favaloro: Legislatively, filing bills as needed rather than at the start of the session. In January will start introducing AB to the freshmen legislators. New message, on top of DSA, billion-dollar redundancy project. December 7, executive committee meets for a half day to brainstorm. Open to all members.

