

Minutes
December 2, 2016

The Wastewater Advisory Committee to the MWRA met at the DEP offices at One Winter St., Boston

Attendees/Contributors:

WAC: Taber Keally (chair), Mary Adelstein, Craig Allen, Stephen Greene (by phone), Adrianna Cillo, James Guidod (Advisory Board), Karen Lachmayr, Beth Miller, Zhanna Davidovitz

Guests: Wendy Leo, Maret Smolow (MWRA), Julie Wood, Katie Friedman (CRWA), Jill Horwood (Boston Harbor Now!), John Reinhart (MyRWA), Lenna Ostrodka (Advisory Board), Marilyn McGrory (DCR), Rachel Bargatti (Friends of Fort Point), Maria Rose (City of Newton), Trish Garrigan (EPA), Jessica Fosbrook (City of Somerville), Charlie Jewell (BWSC)

Staff: Andreae Downs

FUTURE MEETING DATES/TOPICS

NEXT: Friday, February. 3, 10:30am: **Coordinating Underground Infrastructure,**

VOTES:

November 2016 minutes approved
Craig Allen approved as WAC vice-chairman

EXECUTIVE DIRECTOR'S REPORT:

Fertilizer pellet workshop—Massachusetts's agricultural fields are already saturated with Phosphorus, and could become a source for P if not carefully controlled. This, plus MDAR regulations could make marketing Bay State Fertilizer difficult in the state.

Environmental Business Council Breakfast—gave a sense of what municipalities are hearing about the reasonableness of EPA and DEP permits

Advisory Board—operations are looking at differing ways to invest I/I funds from MWRA

Looking at WAC leadership—Stephen Greene's 20 years not a necessary commitment for chairmanship/vice chairmanship. Craig has volunteered to take the vice chair position for a half year, and step up to be chair for the next fiscal year. Think a less intimidating model would be to have one-year rotating chairmanship, as the position is not as time consuming as might be thought. This also offers an opportunity to get involved in leadership.

MWRA UPDATES:

On Deer Island—the valve and pump replacement for the 10 giant pumps in the North Main Pump Station continues.

Cross Harbor Cable—Eversource will be shutting down power to DI during December while investigating the underwater outlines of the cable. The runs on back-up power during these outages.

ADVISORY BOARD UPDATES: Dec. 8, the metropolitan tunnel redundancy discussion for water supply is scheduled for 9 am at Boston College. The AB will also be posting stormwater resources on its website for communities.

PRESENTATIONS & DISCUSSION:

Charlie Jewell, Boston Water & Sewer Commission: How BWSC is planning and evaluating green stormwater infrastructure (GI)* installations.

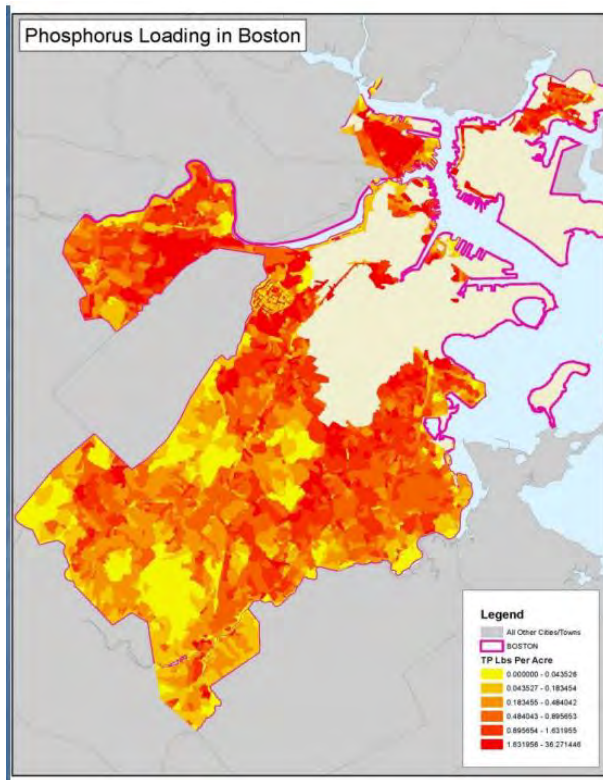
***Definition:** bioswales, infiltration trenches, rain gardens—other infrastructure that retains rainwater, treats it with a natural process, and discharges clean water.

Background: BWSC is working under a 2012 stormwater consent decree from EPA (Environmental Protection Agency) to remove phosphorus from water entering the Charles River. (The Charles has too much phosphorus—one of the factors that makes for toxic algae—cyanobacteria—blooms—and in 2007 EPA issued a TMDL—total maximum daily load—for phosphorus in the Charles).

The consent decree requires Boston to:

1. Determine where phosphorus in the lower Charles is coming from
2. Develop an implementation plan for “Best Management Practices” (BMP)
3. Construct three green infrastructure projects

1. Determine where phosphorus in the lower Charles is coming from:



BWSC expanded their phosphorus investigations to include the Neponset River. They divided the city up into catchment watersheds—identifying from which areas water flowed to each outfall. They then measured the phosphorus amounts at each outfall.



2. Develop an implementation plan for “Best Management Practices” (BMP)
The Implementation Plan was issued October 2016. But in the meantime, the commission has:

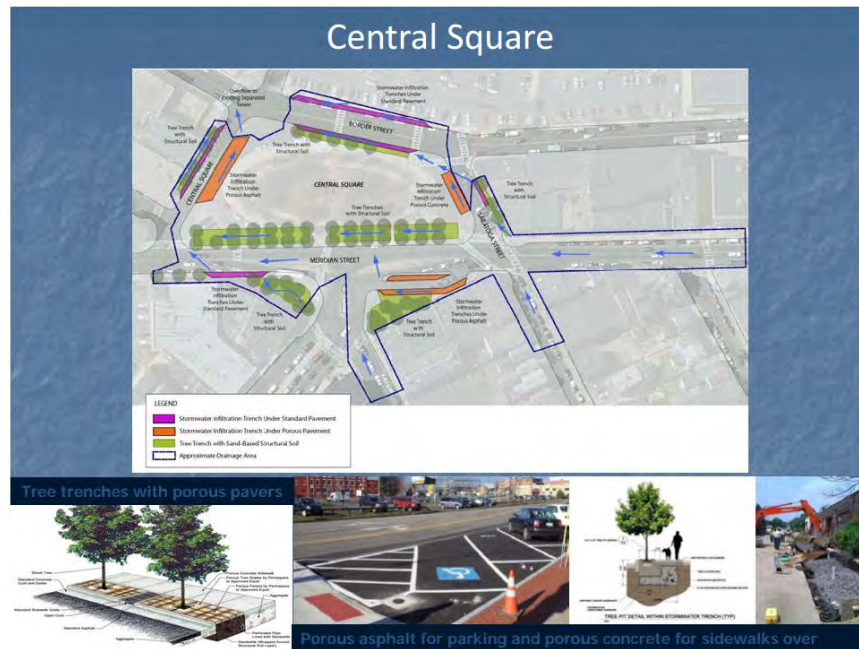
- a. Required every new development/redevelopment to retain & treat the first inch of rainwater on site. (BWSC does not require any particular kind of treatment—it can be in-pipe as well as “green” as defined above)
- b. Created a database to track all private

stormwater retention infrastructure. The next step will be to measure how effective it is.

Maintenance: Boston is looking at installing new infrastructure, but it needs to work. And for green infrastructure, maintenance is key. Part of the reason BWSC is tracking private stormwater infrastructure is to monitor maintenance. However, the city hasn't decided yet who will maintain even its own green infrastructure.

3. Construct three green infrastructure projects
EPA dictated Central Square (East Boston), Audubon Circle (Mission Hill), and City Hall Plaza projects. BWSC added some public schools that were being renovated, added an underground gravel structure to Daisy Field along the Muddy River.

Status: Central Square is currently under construction and should be completed in 2017— includes porous pavement, porous concrete, infiltration trenches, pavers, all to try out. BWSC has installed monitors to see how they are working.



Audubon Circle went out to bid and awarded and will be constructed in 2017. Mostly rain gardens, infiltration trenches along the road. Will also include monitoring structures.

All of these installations require multi-agency collaboration: transportation, parks, schools etc. BWSC is reaching out to other agencies to ask them to add in GI as they are doing other renovation or building projects. BWSC now has a full-time GI staff member.

City Hall Plaza—not yet planned.

Schools: BPS has a master plan to renovate schools. Five are now being renovated. BWSC approached them to ask them to include green infrastructure as a part of renovation.

- Irving—were re-doing the parking lot. In construction now. Infiltration trenches, raingardens, many different techniques. Half of this is GI, half is not, so teachers can show kids the difference.
- Hernandez—construction 2017
- Ellis, Jackson, Kennedy schools 2017-18

Teaching them how to put in GI. Working to also develop a curriculum so the schools can teach kids about what it is supposed to do. Targeting 5 & 7 grades.

Maintenance: constantly comes up. BWSC will maintain for the first 3 years—after which it is the schools' job. BWSC will train the school staff.

Daisy Field: Boston Parks Department property near Jamaica Pond—putting in an underground gravel infiltration chamber under the natural-turf field—takes about 1/3 of the area. Will also put in signage near the parking lot to describe what BWSC is doing. Will capture water from 75 acres.

Really wanted to put in an above-ground wetland. But wasn't possible, so this is underground infiltration.

How maintaining the media? Will capture sediments with filters at two locations.

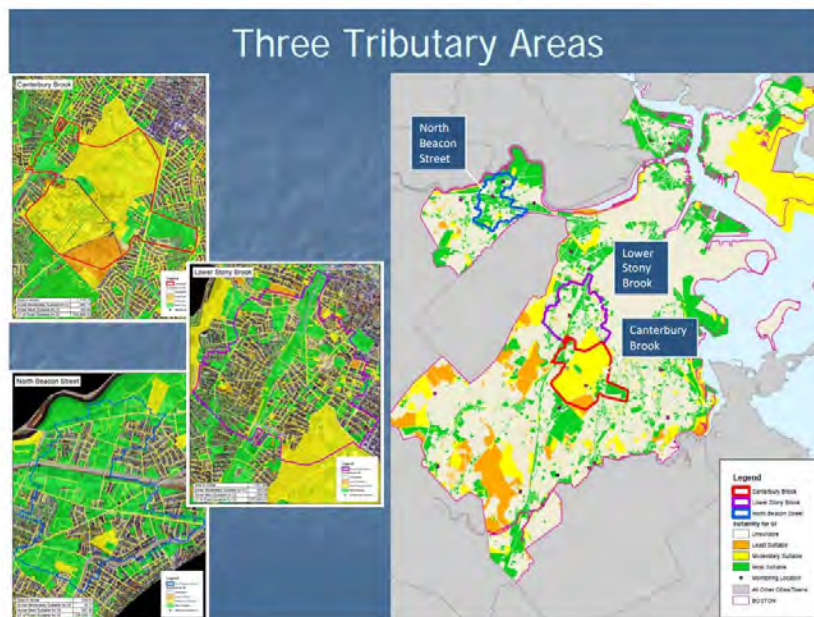
Will it compact over time? University of NH stormwater division looked at this, and no, it shouldn't be an issue.

Why Daisy Field? Because the hydraulics work there, and so much water comes to that spot. So you could do a lot of dispersed green infrastructure—but we are testing out whether you can put in one big green infrastructure piece and how that measures up.

Why not Fort Point Channel Park—near the Children's Museum? That would be a good location, but everything we are doing, you'll notice, drains to the Charles River. We are trying to tackle the phosphorus.

Three Catchment Areas:

North Beacon St., Canterbury Brook, Lower Stony Brook



We picked these three areas for the phosphorus loadings, but also because of the land uses inside them.

- Canterbury Brook has a lot of open space in it.
- Lower Stony Brook has a mixture—residential areas, medium-sized parks
- North Beacon is a very dense urban area.

We had three consultants come in and tell us what we could do in each area—what was interesting—Canterbury Brook lends itself to larger infrastructure. Stony Brook can take a bit of both, some not as big. North Beacon, because it's so congested, needs infrastructure on site.

The Commission was interested in what we don't know. We have GIS with a data layer showing land use. But where possible, we are taking soil samples to find out what the soils look like in each area, and whether it will lend itself to green infrastructure. We are also doing runoff samples for phosphorus. The models say we have this much phosphorus, but while we are out there, we are checking what's really out there—if it's raining.

We have mostly finished up the screening—for site selection, and what we are doing now is getting samples—but of course since we started, we haven't gotten any rain.

Obstacles:

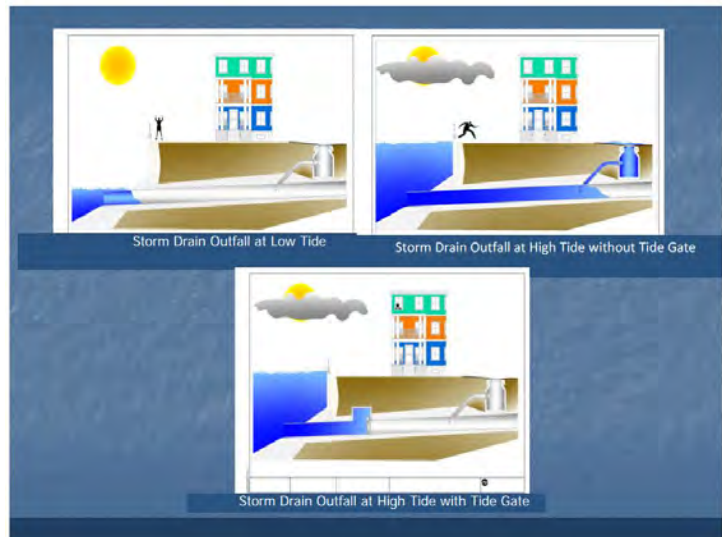
One of the biggest is that the Commission does not own the land—we have to work with other people—both public and private.

Climate Change:

The Commission is looking at more intense storms—and also sea level rise, and storm surge. One thing Boston's looking at is regional solutions that might hold back water. Why BWSC is interested, is we may need tide gates in our stormwater outfalls to prevent water flowing backwards and into low-lying areas of the city. We are using topographic maps to identify these areas and installing tide gates where we need them. →

But Boston's in a unique spot. We have the water coming down (rain) and coming in (tide). We are going to get it both ways.

If we get a lot of rain at the same time as a storm surge, however, the water coming down will have nowhere to go.



Property owners need to be aware that they should look at backflow prevention for their sewer and drain connections, so they are prepared when the water gets high.

Another issue is downtown, where we still have a combined system. Those catch basins still flow to them. It's another daunting aspect.

These are some of our recommendations. Where green infrastructure comes in is in conveyance and control alternatives to relieve hydraulic pressure. We are installing it for water quality issues. But we know that if you put it in, it does retain some of the stormwater. It won't solve everything. But if you can hold water, it can help.

Also, looking at low-lying areas upstream in Boston that can hold water to prevent surface flooding. Holding water up there in a rain event, and release it slowly after the rain is over. We are starting to look at that now, too.

Recommendations

- **Modify CSO and storm drain outfall operations**
 - Determine if backflow prevention is required on storm drain outfalls and investigate private outfall vulnerability
 - Install tide gates using recommended design flood elevations
 - Reevaluate tide gate maintenance and replacement procedures with rising tidal conditions
- **Develop and pilot alternatives to cover catch basins or isolate areas flooded by storm surge**
- **Identify drainage, conveyance and control alternatives to alleviate hydraulic stresses on sewer and storm drain systems**
- **Pursue regional solutions to protect assets and operations from coastal flooding**

Stormwater GI/LID Recommendations

- Complete demonstration projects
- Establish 25 year BMP implementation Plan
- Review three tributary area study results
- Work with Parks and Public Works to establish schedule for GI during their CIP (20 year schedule)
- Learn from other cities and adjust program
- What additional information needed
- Maintenance program

DISCUSSION:

Whether reviewing regional solutions? Hard enough to talk to each other in Boston—lots of big departments.

Could building codes help? Yes, working with ISD on their issues.

Another interesting issue is not just our outfalls, but all the private ones—if they flow backwards, it won't matter what we do.

Have you thought of adding current wetlands to the map of green infrastructure in Boston? We haven't. Focus on the stormwater/phosphorus model. Secondly, need to know where the GI installations are now, so we can make sure they are maintained and inspected. Also asking—how will inspection program work?

While maintenance is important, keeping the wetlands we have now is also part of keeping the system working. We need to know where the natural hydrology is now. We are also trying to build on it. That's what Daisy Field is all about. Reinstating some of this stuff.

Boston is one of the few municipalities without its own wetland ordinance.

This is a very big, expensive thing. How are you going to finance this? How much does it cost? Possibly, maybe the city may be looking at the feasibility of a stormwater fee. We have seen estimates all over the place from 100-500 million. Trying to get better information/better idea of what it will cost the city to do this.

Also looking at where the phosphorus is coming from.

One of the issues in the phosphorus in agriculture workshop—in some cases, because the field has been regularly fertilized, the soil itself may be a source of phosphorus.

Coordination—sounds like your vision & parks vision not aligning. Do you see that changing? Yes—mayor's on board with this. Parks on board. Question is who is going to maintain this?

What about a stewardship opportunity? Commission is still responsible for what it currently does—clearing catch basins, for instance. Can't take on public works jobs like tree pruning or street sweeping and say ratepayers will pay for this. This is where the mayor comes in.

Example in Leominster of DPW learning to take care of green infrastructure because it had such strong community support.

Adopt-a-space maintenance examples from other areas—San Francisco has residents volunteer to clear catch basin grates before rainstorms; Portland, OR and Seattle have residents or shopkeepers who keep green infrastructure strips clear of litter.

Roslindale Green & Clean—takes on maintenance of parks every year.

Issues with wetlands near fields include mosquitos and other hazards—not that not a good idea, but possibly not where fields are in high demand.

This is where education is so important—not just about keeping areas free of water, but also what’s in the rainwater? Can it be re-used?

Lancaster, PA doing amazing stuff with public artworks and green infrastructure

Sewer separation—how does that complicate stormwater?

Yes—in some ways. Best, however, to treat upstream—and restore nature.

Is there a difference in quantity of water or quality at the Charles?

Good question—Commission hasn’t measured water quantity. For water quality, the most effective remediation is still finding and removing illicit connections.

Julie Wood: Cambridge struggled with this also. Essentially, when separating the system, now converted CSO issue into a stormwater issue. But you do reduce phosphorus and bacteria.

Any data on what structures work best? No—looking at it, using data from other cities. Also, need to know your soil.

In remaining combined areas, what role will GI play there?

Bringing it city wide, no matter where a new development is. Focus on separated areas first to comply with the consent decree.

Suggestion that a tour of green infrastructure in Boston is needed: Permeable alley, asphalt, concrete

At some point also, Boston will have to take on the vacuuming of the permeable alleys and other permeable pavements.

KG: north Cambridge really appreciating the green infrastructure installed there; it’s beautiful.

SG: Lowell has a permeable alley—also an arts installation.

[Transformed Decatur Way to Open as an Art Space in Lowell | UMass ...](https://www.uml.edu/News/press-releases/2016/DecaturWay053116.aspx)
<https://www.uml.edu/News/press-releases/2016/DecaturWay053116.aspx>

JG: BWSC looking at paint that appears only when it is wet.

Cambridge has poetry painted in such paint on sidewalks.

<https://www.cambridgema.gov/arts/programs/poetryprograms/sidewalkpoetry>

DCR did a demonstration project in Ipswich--

<http://www.mass.gov/eea/docs/dcr/watersupply/ipswichriver/twg-tour-guide-final.pdf>

Neponset River Watershed used tree boxes to contain stormwater. DPW in Milton is still pondering how to maintain it—the medium probably needs to be changed. But in front of schools, so used in school curriculum.