Mystic River Water Quality Science Forum
Date: January 24, 2013
Location: EPA Regional Office – 5 Post Office Square Boston, MA
Conference Room: Court Room 6 – 15th floor

NOTES

Enforcement and MS4 Permit update Todd Borci (EPA) Dave Webster (EPA)

- >14,000 gallons sewage/day removed from storm drains since 2007; in excess of additional 150,000 gallons/day removed in wet weather
- Suffolk Downs case – CAFO case. Remedy already in place
    - $1.25M penalty, 3.5M in construction, $725k in supplemental projects (SEPs)
    - SEP – MyRWA sampling for 3 years, Saugus River sampling for 4 years, Belle Isle boardwalk
- Boston Water and Sewer – small penalty $235,000, $160,000 in SEPs
    - Lateral connections from homes will be fixed
    - Covered all of Boston, will need to investigate and repair all outfalls and CSOs
- EPA is still in the field and still sampling.
    - A lot of sampling in Mill Creek. There have been outfalls discharging sewage. Found pharmaceuticals. Narrowed area down to a 50-60 foot area of stream for illicit discharges
    - Doing this kind of work where we can

- MS4 update (Dave Webster)
    - EPA has been out with drafts several years ago. Received a lot of comments. There are several changes based on the comments, another draft will be reissued soon. In NH, the same situation. Will see public notice in January for a new draft NH permit. A renotice of the MA permit will be released around April 2013. These dates are on EPA's website as well as some tools that will help with compliance.
    - Tried to include some of the IDDE and forensic work as well as TMDLs in the new draft permit. It also looks to encourage LID and other types of GI.
    - It is moving along, but has been delayed.

State of the Mystic - Water Quality and Environmental Conditions (Patrick Herron)

- EPA/MWRA provide in-kind lab services
- Bacteria
    - Measured with *E. coli* and *Enteroccocus*
    - For 2012 – Boating safe 82% of the time in dry weather, 42% of the time in wet weather; Swimming safe 55% of the time in dry weather, 9 % in wet weather.
    - Trend 2003 – 2012 – in dry weather boating is around 80%, swimming is around 55%; in wet weather
    - Problem areas – Mill Brook, Winn Brook, Alewife Brook, Mill Creek

- This work takes time – particularly in dry weather. There are miles of stormwater pipe, but this is key to improving our grade. CSOs and SSOs are a big problem in the Mystic. December 27th, we had SSOs occur in the Mystic and 3MG were released into the Mystic River. The Mystic is the only site in the Boston area that had these overflows.

- Nutrients
  - No real numeric standards for P in Massachusetts
  - Winn Brook – high bacteria load in Belmont, very high P; Alwife Brook, receiving loads from Mill Brook
  - Progress has been made since 2002, but most averages are above the "standards." Is P creating a problem in the Mystic River Watershed?
  - Winn Brook has made a lot of progress in reducing P inputs; Winn Brook/Alewife Brook have quite high levels; Meeting House Brook, a little better
  - There are no incentives in place for municipalities in the Mystic watershed to reduce nutrient inputs; nothing in the 2003 MS4 permit.
  - How can we get the municipalities to make progress?
  - Water chestnut/water lily both growing out of control due to P available to them.
  - Water chestnut is a freshwater plant,
  - Nutrient load is a significant cost to anyone who wants to use the river for recreation, or value it for aesthetics
  - 2001 – 1 ac. Of water chestnut; 2012 – 18 ac.; takes 5 years to begin to see a difference. Each plant drops 10-15 seeds per year and those can sit at the bottom and germinate up to 15 years. 2010 – 2012 over $200,000 spent. Need to clear the river every year until it's gone. It is hard to see success as of yet.
  - The P data goes back to 2002, MWRA has old P data. Many of the segments are listed for nutrients.
  - EPA has taken some steps to get low P fertilizer in place
  - Need incentives for communities to reduce runoff with P in place

Q – what can we look forward to improvement? A – looking forward to EPA's MS4 permit being released. Also some NPDES permits are up for renewal, we could make those stronger. This would help with dry weather flows. We will hopefully getting good information out of the North Hydraulic Study coming out of MWRA. Knowing there's a funding need for infrastructure, this would transfer into stormwater infrastructure. Make the case to the governor that the maintenance and improvement of infrastructure is important.

Island End IDDE Success Story: What Does It Really Take? (Andrew DeSantis)

- Chelsea's IDDE program was initially just response to citizen complaints. In 2008, it was formalized due to EPA enforcement; in 2009, the city wrote an IDDE plan
- Field investigation methods – bottom up approach: manhole inspections, drain segments isolation, CCTV, dye testing, ZoomCamera techniques
- Island End Case Study
  - Carter Street Pump Station – there is no direct discharge to the river, would see dry weather flows and sewage materials in the pump station as early as 2001.
  - Found sewage from a tomato facility. The illicit was eliminated on the property owner in 2004. Construction cost was that of the property owner
  - Did more CCTV of the sewer. Found another illict from a development – moved in 2004; found another cross connection and eliminated that in 2005.

    - Still found food waste in the pump station; a collapsed sewer rerouted to the drain – eliminated in 2007. This eliminated food waste at the pump station, but there was still running in dry weather – more investigation
    - Additional inspection found two illicits in April 2010. Working to remove these now.
    - 12 years of IDDE efforts. Have removed 7 illicits and hundreds of gallons of wastewater moved. $800,000 spent. Pump station is still running in dry weather.
    - Where do we go next? Continue the IDDE investigations in 14 catchment areas.
    - Chelsea has 25 outfalls.
- Why does Chelsea have 45 connections? Chelsea is at the bottom of the MWRA connections.
- What are the incentives to a property owner to not do this? Does the city issue fines to property owners who create cost connections? The basic threat is that the city will shut off the water.

MWR205 CSO Status and Update (Rick Trubiano, Rob King)

- In 2009 evaluated the CSO facility in Somerville (it's under Rt-93). Services 700 acres of combined sewer area. It only operates in wet weather
- When it discharges, it goes out outfall 205.
- TV inspection work has been done in Somerville and at the CSO facility
- 2009 – DEP and EPA found elevated counts in dry weather. Contacted MWRA. Improvements and inspections were done to the infrastructure.
- In 2009, popped manholes and inspected the system.
- Found 29 inputs to the drainage
- Collected dry weather sampling both up and downstream of the facility. Found a grease blockage.
- Could leakage be getting through? There seemed to be minimal leakage through the gates – 1-2 gallons per day.
- MWRA samples the outfall only when it's activated
- There is no notification at this site for recreation – MWRA is working on it.

Herring Restoration Efforts and New Opportunities (Katrina Sukola)

- Herring Count – in years past, population was declining.
    - >600 count periods – tons of volunteers
    - Had 12 count periods/day
    - Stop the program on June 22 after two weeks with no fish
    - Volunteers made observations beyond the fish counting. Used all the data to estimate the number of herring in the river. Estimate 21,052 fish counted; used model to estimate 198,000 fish.
    - A lot fish traveling through in May and June
    - Found no relationship between precipitation and fish passing through. Want to look at air and water temperature. They are working now to retrieve the data
- Herring Habitat Assessment at 9 sites
    - Collected water temp, dissolved O2, and water clarity, in some sites collected nutrient data
    - At all the sites, sampled, they were suitable for spawning and nursing 100% of the time
    - Alewife Brook/Mystic River are impaired for habitat and dissolved O2. More than 10% of the time, these sites failed to meet the criteria. Little Pond and Spy Pond met the criteria 100% of the time. Nitrate/Nitrite, Little Pond suitable; Spy Pond impaired, but

only missed the standard one time. Alewife Brook/Mystic River impaired for nitrate/nitrite; total phosphorus is impaired at all the sites 100% of the time (EPA standard for habitat).
    - Overall – suitable for spawning and nursing; impaired for dissolved O2, nitrate/nitrite/total P
    - Cambridge is working to improve stormwater inputs to Alewife Brook
    - USACE/Malden River doing work – wetlands restoration, etc
    - Renovation at Center Falls Dam in Winchester
- When the Earhart Dam is closed, the fish are pooling at the gates. They can get through with boat traffic

Lexington's Volunteer Stormwater Monitoring (David Pavlik, Emily Schadler)
Passed around equipment used and collection forms

Land conservation volunteers used as an example
1 yr testing and learning strategy
Program similar to other programs
Focused on staying small initially
1.5 hr training program
Assign each team 10 outfalls
10 weeks to do their own investigation – on their own
    Basic assessment location, condition, quantity of water
    Identify WQ issue
    Measure temp and screen for NH3 – do this 5 times
    Data returned to Town after 10 weeks
Town reviews data and identifies list for staff follow up

28 outfalls surveyed during pilot program - 2 teams
78 total outfall visited by volunteers

Lessons
    Give them good tools
    Provided outfall maps
    Volunteer kit
    Put 5 kits together
    Data management is a challenge
    Follow up is time commitment
    Keep it small but useful
    Good people working on the project

Questions: Glad to see the interest, Vine brook is a problem area from years ago, are you working on this?
Dave – The Town is working on this.

Q – How did you get your volunteers? A – Went through land stewardship volunteer list. Did three public presentations and also posted articles in the newspaper.

Historic Chloride levels in the Mystic (Roger Frymire)

Ellen Henrietta Swallow Richardst – studied at MIT in Chemistry – First female in program Life long association at MIT
She noticed undisturbed area had lower chloride levels
Map of Chlorid levels
Presented increases in Chloride in local waterbodies – mostly attributed to road salt

Before road salt became such an issue sewage was a source of elevated chloride

Cyanobacteria found in orange floc at the end of outfall pipe

Mystic December 27 got to see the results of new DEP form for SSO
At end of storm coinciding with extreme high tied overflowing at SSO locations
Calculated volumes using 2010 reporting volumes
Roger associates aquatic

2010 rain amounts – two small events were 2-3", two bigger events were more like 5-7"

Real–Time Monitoring of Water Quality and Cyanobacteria (Tom Faber)

- Buoy to assess water quality conditions and to track cyanobacteria blooms. At Blessing of the Bay Boathouse in 2012
- Pick areas with high recreational use and known history of cyanobacteria blooms. The data are kept real time on password protected website
- 2010 – Wedge Pond; 2011 – Spy Pond; 2012 – Blessing of the Bay
- 2010 – Did not see any blooms
- 2011 – In Spy Pond, there was a bloom on the other side of the pond. Did not pick it up with the buoy
- 2012 – Main stem of the Mystic. Partnered with the Town of Somerville, used the town canoes to service the buoy. This was the first year the town rented out canoes. Will likely keep this same spot for 2013
- Monitored from mid-June thru late September
- Temperature – pretty normal. Higher temps in the Charles, likely due to discharges
- Dissolved O2 – there is daily fluctuation below MA water quality standards.
- Specific Conductance – can correlate with chloride levels. Some elevation in early July. Could be attributed to boat traffic coming through the locks
- pH – Can see some elevated pH values, usually associated with elevated aquatic plant growth
- Phycocyanin – pigment found in cyanobacteria
- Also collect water quality samples – chlorophyll-a, cyanobacteria cell counts
    - Saw some elevated phycocyanin values and high cyanobacteria counts – 5 of 6 cyanobacteria cell count samples were above the state notification level
    - State had advisories in several waterbodies in the Mystic in 2012. They sample in Spy Pond and then issue advisories; the state does not do any sampling in the Blessing of the Bay area. Much of the notification to DPH comes from MyRWA's sampling.
- Needs to analyze the data and discuss them with Roger and MyRWA

General Discussion, Recommendations, and Next Steps (All)

Comments/Discussion

- Where does trying to develop a TMDL fit into the priorities? Is this on anyone's radar screen right now? Roger: assume talking about a nutrient TMDL. Right now we need to still focus on the sewage, since this is a big loader of P into the watershed
- EK – how do we translate this good data into meaningful action? It is very expensive to do this work. At the watershed association, we are trying to get the word out and trying to develop more of a public concern. How do we persuade the Boston Metro area that this is a worthy project. We need to spend the same $ in the Mystic as was spend in the Charles.

Ideas for next year:

- Enjoyed presentations by municipalities about work they are doing, need to continue to present this
- More focus on Roger's presentation – solutions to SSO problem. Going forward what needs to be done/partners, etc. What is the scale of the solution?
- Roundtable Discussions – would help municipalities learn from open discussion (could be done in Muni Subcommittee)
- Could consider 10a-2p. It is hard to get in so early
- What is the impact of the herring migration
- Will the new permit cause municipalities to consider fee-based funding mechanisms? (Stormwater Utilities) MyRWA tried to sell munis on this idea. Munis will consider it when the new permit is released.
- BMPs for stormwater utilities – how it's working, etc.