



## **WSCAC Meeting**

October 8, 2013

Location: Southborough

### Members in Bold in Attendance:

Whitney Beals, WSCAC Chair, NE Forestry

**Andrea Donlon, CRWC**

**Gerald Eves, Trout Unlimited**

Michael Baram, BU & CFL

Martha Morgan, Nashua River Watershed

Mason Phelps, Millers River Watershed

**Bill Fadden, OARS and SuAsCo Wild & Scenic Rivers**

**Alice Clemente, Blackstone River Watershed**

**Elie Saroufim, Boston Water & Sewer**

**Paul Lauenstein, NepRWA**

Nancy Bryant, SuAsCo

Dona Motts, MA League of Women Voters

Martin Pillsbury, MAPC

### Non –Members in Attendance:

Lexi Dewey, WSCAC staff

Russ Cohen, DFW

Steve Estes-Smargiassi, MWRA

Andreae Downs, WAC

Sue Costa, WSCAC staff

Kurt Tramposch, NEWWA

Pamela Heidell, MWRA

### WSCAC Business

In Whit's absence, Lexi asked for the approval of May and June meeting summaries. Motions to accept the May and June summaries were made, seconded, and unanimously approved. The floor was then turned over to Pam Heidell for a presentation on the history of MWRA hydropower.

#### MWRA Hydropower-Pam Heidell

Pam stated that in a previous life she worked on hydropower development and always welcomes a chance to talk about it. Hydropower at the MWRA started with the 1895 Metropolitan Water Act that gave the Water Board the authority to have hydropower facilities under its control. Electricity was first transmitted in 1911 from Wachusett – the first known instance of hydropower transmission from a domestic source.

Two main factors in the generation of electricity from hydropower are head (elevation drop) and flow. The MWRA has a gravity system and takes advantage of it whenever possible. The Wachusett turbines are no longer in use as Wachusett is no longer used for active water supply.

Sudbury was the next hydropower project with three turbines. It generated a million kilowatt hours annually. The turbines at Sudbury were removed when the reservoir was taken off active status. The hydropower system would no longer meet today's safety standards.

Winsor Dam hydro facility came online in 1946. The turbine was intended to operate at 100 cfs but to meet the 20 mgd flow requirement in the War Dept. permit, the turbine ran only 5 to 7 hours a day. Operating the turbine for a few hours each day was not good for fish downstream. Winsor hydro was not originally licensed by FERC, but in 1989 FERC ruled that a license was required. When fire destroyed the switch gear in 1991, the MWRA was in the middle of the licensing process. After the fire, a decision was made not to repair the switch gear to restore hydropower to Winsor Dam and the licensing process was halted.

Q: What is the difference between kilowatts and kilowatt hours?

A: Kilowatts are a measure of horsepower where as kilowatt hours are a measure of energy.

All MWRA hydropower facilities have parallel (redundant) pipes to ensure that water can always get where it needs to be. Oakdale is the MWRA's largest hydropower facility and can generate 3.5 megawatts.

Pam provided interesting details on Oakdale and hydropower at the MWRA in general. She discussed the complexities of selling the power generated. Federal regulations require a utility to purchase the power generated by the MWRA with the purchase rate set by the state Department of Public Utilities Commission. The purchase rates vary.

Other renewable energies have more favorable regulations than hydropower. Wind and solar are eligible for net metering which means power generated can offset costs at other facilities. Thus, for those renewables, the power generated is worth the retail cost of power to you as the customer. For large hydropower facilities, the power is worth the lower regulated price set by the Public Utilities Commission. Pam noted that small hydro facilities (those generating 60 kilowatts or less) are eligible for net metering. At this point, the committee got deeper into the confusing and complex details of selling power to the grid – think demand charges.

Demand charges are the maximum amount of power you consume for a period of 5 or 15 minutes (no one could remember the exact time) during the billing cycle. Turbines go off-line for a variety of reasons – power glitches, maintenance, requests by the power company to name a few. MWRA can decide to go off line as a safeguard when impending storms approach. When they go-off line, they get a demand charge.

The meeting continued with a discussion and pictures of the generators at the Cosgrove Aqueduct and Loring Road. Pam noted that the timing on the Loring Road project was nearly perfect. MWRA was able to apply for and receive several grants that covered 96% of the all costs.

Q: If the head on Cosgrove is 55 feet and the head on Loring Road is 85 feet why does Cosgrove generate significantly more energy? Is it just the amount of water flowing through?

A: Yes, more water (180 mgd) flows through Cosgrove. Everything that flows into the John Carroll Water Treatment Plant flows through Cosgrove. Loring Road (20 mgd) serves only the low lying areas around Boston.

Q: How often is Loring Road off-line?

A: Maybe once a month. The operation of Loring Road is much smoother than anyone expected.

Q: Does Loring Road provide all the power for the Loring Road facility?

A: Yes, when it is running. It is rarely off-line so most of the bill is a demand charge.

Q: How about Cosgrove?

A: At Cosgrove there is not a lot of demand at the site so we sell 98% of the power to the grid. At Oakdale, 99% of the power is sold to the grid.

Pam shared pictures of Deer Island as well. Steve noted that unlike other facilities where the head varies seasonally, the head at Deer Island varies based on the tides. Hydropower is a significant part of renewable energy at Deer Island.

Q: What is the gas from the digesters at Deer Island used for?

A: Deer Island has gas turbines to generate heat and electricity. Roughly 20% of the electricity for the plant comes from the digesters. If you look at heat and electricity as energy, about 50% of the energy for Deer Island is from the digesters.

Pam noted that the pipeline from Quabbin to the McLaughlin fish hatchery will provide hydropower for the Ware Disinfection facility. The hydropower portion of the project is being funded by grants.

Q: What is the average spill of the Quabbin on a daily basis?

A: It varies greatly but you if you look at last January's report it is in the 50-70 mgd range depending on factors including demand, how dry the year is, and how much water is being transferred to Wachusett.

A discussion of the hatchery, spills, water released to Wachusett, etc. ensued. Pam spoke of the good relationship between DCR, MWRA, and the hatchery. There was some discussion of the 20 mgd that MWRA is required to release to the Swift versus the 6 mgd of water to the CVA pipeline. Pam noted that the water to the hatchery will not be diverted from the Y pool. The Y pool is the point at which the 20 mgd released to the Swift River and any water flowing over the spill meet. It's a favorite spot for local fisherman. Pam spoke on the design and path of the pipeline for the fish hatchery.

Q: Can you explain the 70 mgd versus the 20 mgd that have been mentioned?

A: The 20 mgd required releases to the Swift River come from the 1927 Acts of MA and are required to maintain the flow of the Swift River. The 70 mgd stems from a War Dept. permit that basically addressed the concerns of the State of Connecticut regarding the impact of Quabbin on the Connecticut River. The War Dept. permit requires releases of up to 70 mgd depending on the flow of the Connecticut River at Montague.

Q: If the maximum 60 kilowatt hours for net metering were revised in the future, would the turbine at the CVA be able to produce more power?

A: In general when you buy a turbine that's it. You might be able to change the setting slightly, but based on the head and the flow, we are not giving up much by staying under 60 kilowatt hours.

Q: What is the cost of the hydropower at the CVA?

A: The hydropower is roughly \$600,000. The whole project including the pipeline is about \$2.5 million.

FERC has jurisdiction over almost all hydropower projects and has power over interstate commerce. In July President Obama signed the Hydropower Reform Act. Pam explained the cumbersome process in effect before the new Act. Among other things, the Reform Act states that if you have an eligible conduit project you don't have to go through the conduit exemption process. Eligible conduit projects only have to file a Notice of Intent (NOI) that includes basic facility information, plans and maps. It's not nearly as particular as the exemption process. Pam noted she will be submitting the NOI for the CVA hydropower project shortly.

The Hydropower Reform Act charged FERC to come up with an abbreviated process for non-conduit projects. At present, for non-conduit facilities you can either file for an exemption or apply for a license. Pam noted that the process for both is basically the same.

There is regulatory uncertainty surrounding the potential restart of Winsor hydro. The existing turbine is oversized and development costs would be high. Grants for non-conduit projects are unavailable and the value of the power generated is thus, the Authority has no plans to pursue redevelopment of Winsor Hydro.

Q: There have been renewable projects in MA where the electric utility made an error in terms of sizing the capacity of the grid to accept power generated or the cost of the power lines etc. This happened in Falmouth and Princeton. Did that happen at Loring Road or other MWRA facilities?

A: No, that did not happen. However, the whole process takes much longer than you might anticipate. The utilities come back repeatedly for additional information.

Q: Can anyone speak to energy storage technology for renewables?

A: There are people looking at that but the MWRA views the grid as their storage facility. That being said, the power grid is going to need to think about storage as renewables increase.

Q: Does FERC want Winsor to be licensed or exempted?

A: FERC lets the applicant decide. Pam would choose to be licensed as that provides more flexibility if issues arise down the road.

Steve and Pam again noted that the Authority has no plans to pursue redevelopment of hydropower at Winsor Dam. There are other MWRA projects that make more economic sense and regulatory uncertainty is an added deterrent.

Q: What other renewable projects is MWRA looking at?

A: MWRA would like to put up another wind turbine at Deer Island but there isn't any grant money currently available.

Q: Who is paying for the repairs of the existing wind turbine at the Deer Island?

A: The insurance company.

Russ Cohen qualified his remarks by saying they had nothing to do with MWRA facilities. They are generic comments about hydro turbines and conduit turbines. He stated that in general, locating a turbine at a dam with discharges to the natural river channel directly below the dam is good especially with a parallel pipe system that diverges flow to the river from the turbine. As far as conduit hydropower, the potential problem is the flow in the stream. There are examples of streams with no flow below the dam. Hydropower should look at the impact to the stream and include a parallel pipe system.

Q: Does Stony Brook have a minimum flow?

A: Yes, below Framingham Reservoir #3. The Sudbury River operates in a narrow band so we release more water below except when we hold back for flood control. Pam noted that for nine months of the year, the flow in Sudbury is adequate for a turbine.

With that Pam concluded her remarks.

### MWRA Briefs-Steve Estes-Smargiassi

Steve complimented WSCAC on an excellent newsletter – the newsletter has subsequently been released to a wide audience. He noted that the MWRA is substantially along in the construction of the UV facility at the John Carroll Water Treatment Plant. For several weeks now, all water that goes to Metro Boston has been flowing through the new UV system thus adding the mandated secondary disinfectant. The UV is still in the testing mode but they anticipate finishing up in late winter.

One challenge of UV disinfection is *proving* that it is doing what it is supposed to do. UV simply shines light on the water so there is no residual left in the water to measure. MWRA must show they are operating the facility within a validation box of parameters. There is a software project under way to complete the needed data management and file the required paperwork with DEP.

The UV facility at Quabbin is moving forward and will be completed next summer, well before the October 2014 deadline. UV and free chlorine are the primary disinfectants at the Ware Disinfection facility.

The MWRA is looking at other facilities around the country to see how they are operated. Steve spoke about some of the plants MWRA staff has visited.

DCR and MWRA continue to work on aquatic invasive species. At Wachusett divers are removing Eurasian Milfoil further up the Stillwater basin. It will be a multi-year process. Water Chestnut was found in the Sudbury and was removed (we hope) before the plants set seeds. An inventory will be done next year to be sure that the seeds did not set. Russ suggested that the plants could be used as a feed stock for anaerobic digesters.

The MWRA has been looking into a policy on waste disposal. If homeowners and businesses are not composting, the garbage goes to a landfill. If you use a garbage disposal, the waste ends up at Deer Island and is turned into methane. MWRA is going to be encouraging people not to put fats, greases, rags or wipes down disposals. This is never a good idea.

Beginning in July, MassDEP has stated that food from commercial processes cannot be landfilled. Thus, MWRA is looking into accepting commercial food waste for its digesters. A pilot program has begun at Deer Island to see how the process might work. The nitrogen/phosphorus balance is being evaluated to determine where the food waste ultimately ends up – the digesters, the pellet plant, or the ocean.

Q: What are the economics of anaerobic digesters? How would fracking impact that?

A: The cost of natural gas is making some projects look less financially attractive.

The MWRA tries to be off the grid and revert to their generators on peak days during the summer. This helps flatten out demand for the electric utility and at the same time saves significant money regarding the yearly demand charge. The Authority works on demand management to save utility costs.

Q: There was a recent report from an MIT economist that says wind and solar are not economical. The two existing wind turbines at Deer Island are not necessarily economically favorable so why would MWRA be interested in another turbine?

A: The MWRA likes green power and the economics can work with clean energy subsidies. However, hydropower is better from an economic standpoint.

Steve noted that the Carroll Treatment Plant solar panels were cost effective very quickly because subsidies were available for the installation. Discussion of wind and solar and the economics of both continued with several people including Kurt, Steve, Pam, and Paul.

Q: Can you tell us about Hudson and Cambridge's purchases of water?

A: The town of Hudson is buying water for 6 months and they will likely renew for another 6 months. They are constructing a pipe from their well source to their treatment plant and that will likely take more than 6 months. Cambridge is taking water due to two construction projects – an MWRA project and a sewer separation project.

Steve concluded his remarks.

Lexi announced the signature drive to get the bottle bill on the ballot. She showed the group the Water Infrastructure Alliance flyer that WSAC signed on to. Rep. Dykema's bill, H.690-An Act relative to municipal assistance for clean water and economic development is not getting much traction. The Senate bill, S. 1880-An Act improving drinking water and wastewater infrastructure is moving quickly. Senator President Therese Murray would like to get something done before she leaves office at the end of the year. WSCAC can comment if members are interested. Staff will send members more information on this.

There will be joint meeting in November with WAC on the MWRA Master Plan (subsequently set for Nov. 19 at the WaterWorks Museum). Elections to appoint members to the Ex-Comm will be held in November. Lexi will speak to current Ex-Comm. members and then send an email to the committee. Paul commented that he hopes WSCAC will comment on the infrastructure bills.

The meeting was adjourned.