

Bristol Mills Dam ad hoc Advisory Committee
Minutes of Meeting Tuesday, April 25th, 2017

Committee members present: Jim Albright, Pam Allen, Phil Averill, Bill Benner, Claire Enterline, Charles Farrell, John Freburger, James Hatch, Abby Ingraham

Also present: J. Crooker, R. Davidson, S. Grund, R. Guibord, S. Guibord, C. Hall, J. McLean, S. Moore, R. Poland

The meeting was called to order by chair Enterline at 6:02pm with a quorum present, and the Pledge of Allegiance was recited.

Enterline reviewed how public comments would work for the meeting. After further amendments discussed at the April 11th meeting, the March 28th minutes were approved unanimously, with one change in the March 28th meeting minutes (changing the name of the presenter in the minutes from Danille D'Auria of IFW to D. Jason Seiders of IFW). The minutes of April 11th were approved unanimously after little discussion. It was noted that the committee meeting had been advertised in the LCN.

HYDROLOGY/HYDRAULICS

Joe Mclean of Wright-Pierce presented information for several sections from the original scope of services. These hand-outs will become a part of the BDAC binder. He reviewed the terms hydrologic and hydraulic. Hydrology studies the flow (or rate) of water over the dam. Hydraulic is related to how high the water is moving over the dam. There are two categories of hydrologic conditions. The first is considered extreme or rare. This is when a major storm event occurs. The second condition is considered normal or what you would normally see. It was noted by Hatch that rare events were becoming more frequent and data exists showing this trend.

Using parameters set by the USGS for Maine, extreme flow estimates were reviewed for a 2, 5, 10, 25, 50 & 100-year event. He referred to Table 1 in Section 4.1.2. Median and mean flow estimates were reviewed for normal conditions (Table 2, Section 4.1.3). As expected, higher flows present in the spring months and lower flows in the summer months. He noted that the median flow may represent a more accurate reading of what is actually happening. He noted that December flows present high because of fall rains. It was asked whether these models took into account increasing frequency of 50- and 100-year storm events. McLean indicated that the models were based on data from 1899-1999, so may not account for more frequent extreme storms that have occurred since 1999. McLean will add a paragraph into the report discussing this topic and the expectation for more frequent extreme storms. It was noted that this will come into play when considering dam safety and spillway capacity.

McLean asked everyone to refer to Figures 1-5 (Pemaquid River Topographic-Bathymetric Survey & Water Level Assessment) found in Section 3. He noted that the

green line represents the best estimate of the April median level (highest), the red line represents the best estimate of the September median level (lowest) and the blue line represents when the dam was drawn down in October 2016. McLean observed that if the dam was completely removed water levels at Partridge Bridge and the Stone Arch Bridge would change by 13 inches.

When talking about hydraulic conditions of the dam the term freeboard is often used. Freeboard is the vertical distance between the top of the dam and the full supply level of the reservoir. McLean commented that during extreme conditions it is ideal to have one foot of freeboard. Table 4, Section 4.2.1 compares peak water heights of the current dam when all boards are in the sluiceway and when all boards are removed from the sluiceway during 2, 5, 10, 25, 50, & 100-year events. The calculations showed that with the boards in the dam, there is less than one foot of freeboard during all storms greater than the 2-year event at the Bristol Mills Dam, and without the boards in place, there is less than one foot of freeboard in all events greater than the 10-year event.

State agencies, MEMA & DEP, oversee and regulate dam classification. The Bristol Mills dam is considered a low-hazard dam of intermediate height. Low-hazard classification means that if the dam were to fail, lives would not be lost and there would be no structural failures. McLean explained that most low-hazard dams are left over from logging and mill operations. MEMA & DEP are only concerned with monitoring high hazard dams and hydroelectric dams. It was asked whether the safety standards (e.g. for freeboard requirements) were less because this is a low-hazard dam. McLean replied that yes, if it were a higher hazard dam, the freeboard requirements would be mandated.

It was asked that the town administrator look into whether we have insurance on the dam, and whether it is less because it is a low hazard dam.

McLean confirmed that much of the information being reviewed was obtained in a study performed by Wright-Pierce in 2015.

DAM SPILLWAY IMPROVEMENTS

McLean addressed replacement of the boards in the sluiceway with a stainless steel gate operated by electric or manual actuators. This gate would open downward on the face of the dam. An electric actuator would be more expensive to install but would provide safer conditions when lowering or raising the gate. The operation point could be done from a safe distance. A manual actuator is less expensive to install but it does require the user to be close to the gate in order to turn the gate manually and operate it. It is possible to have a catwalk over the dam for this purpose. Dam spillway improvements were covered in Section 4.2.2. He noted that the current situation of maintaining dam levels by removing or inserting boards is unsafe. He also noted that both options rely on someone to control the water level. The recommendation for this upgrade was requested by the Bristol selectmen after the 2015 dam report was completed, so this improvement is an additional cost to the projections in the 2015 report.

McLean also discussed the potential for erosion on the left side of the dam under extreme storm conditions. Wright Pierce has provided guidance to the town to reinforce this side of the dam with an earthen berm that will be reinforced to limit soil erosion and erosion around the dam, and to help with flood control in the event of a major flood. This recommendation was also provided to the selectmen after the 2015 dam report, and the expected cost (\$10,000-\$20,000) would be in addition to the cost projections in the 2015 report.

TOPOGRAPHY/BATHMETRY AND INFRASTRUCTURE

Section 3.1 covered information on topography and bathymetry and impoundment features. He referred to photos 1-30 found in the Impoundment Infrastructure Survey Photo Log. He noted the infrastructure of the impoundment mostly consists of residential structures (houses and docks) and some recreational areas (Ellingwood Park & the Bristol Mills Swimming Hole).

FISHWAY CONDITIONS

Initially, in 2014, Wright-Pierce was invited by the fish committee to examine the existing fishway and provide recommendations. Problems noted with the existing fishway included the location of the entrance (alewives are naturally drawn to the base of the dam), and the length and vertical height of the fishway. The current fishway is 75 feet long and rises up to 11 feet high without any resting pools. Alewives are more successful if they have a resting pool every 6-7 feet. McLean noted that a fish passage engineer from the US Fish and Wildlife Service (Curtis Orvis, USFWS) was also consulted before Wright Pierce and provided input describing these same concerns.

In the spring of 2014, DMR performed a PIT (Passive Integrated Transponder) tag survey. A small sample size of 22 fish were tagged. Detection antennas were placed in 4 areas of the existing fishway: the beginning, at the bend, in the middle and at the end. The 22 fish were released near the entrance of the fishway. The results of the PIT tag survey showed 6 fish passed the first antenna site, 5 passed the second site, 5 passed the third site and 2 fish made it all the way through the ladder to the fourth antenna site. It should be noted that several fish may have died after being tagged. Figure 1, Section 2.2.1 summarizes this information.

Benner asked whether an aluminum passage way for the fish would work. These types of fishways are often referred as an Alaskan steep pass fishway. McLean suggested that that aluminum fishways often have narrower channels and may not accommodate all species of fish (specifically mentioning shad). The current fishway (Denil style) is made out of concrete and is currently 3 feet wide. In the 2014 assessment, Wright-Pierce proposed a 4 foot Denil style fishway. This type of fishway could handle up to 300-400,000 fish annually. If the runs at Pemaquid River proved to be higher the ladder can easily be expanded to a double 4 footer. He summarized that DMR and other agencies,

specifically the USFWS, have done numerous research on material and styles of fishways that the committee could refer to.

Farrell cited a reference to Dr. Wilson's presentation about the pool and weir style of fishways. He noted they were shown to perform remarkably better than a Denil fishway. McLean responded that the pool and weir type fishway was looked at but it was twice as expensive. Denil fishways may require more maintenance (in replacing baffles every 5 years or so), but are less sensitive to water levels. He noted that aluminum baffles may be a higher upfront cost but can reduce long term maintenance needs.

It was asked whether the boundary of town property on the fishway side effects the planning and design of the fishway. McLean responded that the new fishway design leaves some room between the town boundary line, but that the flood control berm discussed earlier would be very close to the property line.

DAM CONDITIONS

In 2015, Wright-Pierce inspected the Bristol Dam and determined the dam was in fair to poor condition. Four major problems were found. (Section 2.3.1)

1. Water leakage occurring at cracks along the downstream abutment.
2. Chunks of concrete (spall) falling out.
3. Voids (loss of concrete) at bottom of downstream wall (piping).
4. Vegetation along embankment.

Part of the process to repair the dam involved injecting grout material into the dam to fill cracks, etc., then refacing the dam on the upstream and downstream side to fix the spalling, then filling the voids at the bottom and sides of the dam. It was decided to do the grout injection first and to make the superficial repairs to the concrete at the same time as the fishway work. In October 2016, the dam was drawn down and Knowles Industrial performed grout injecting services. Two rounds of injections were done at this time. McLean suggested that the grouting was likely 80% complete but there was still some leaking, and likely a third round of grouting was needed. He also suggested the injection work be inspected this year. Although some work has been done (the grout injections) Wright-Pierce still categorizes the dam as fair to poor with it now being closer to fair than poor. Satisfactory condition is the goal. Dam conditions are broken into five categories: Good, satisfactory, fair, poor, dangerous.

Albright asked about the range of cost for repairs. McLean noted that the 2015 report indicated a range of \$32,000-\$45,000 with a 40% contingency around this estimate, but after seeing more of the upstream face of the dam during the fall 2016 drawdown, he estimated repairs to be in the higher part of the range with the 40% contingency. McLean also noted these costs did not include the requests by the selectmen after the report including the installation of manual or automated flashboard control, and flood control on the left side of the dam.

CONCERNS/OPINIONS

- A property owner in Bristol Mills who lives above the dam along the river is concerned about loss of recreational usage and property values of his home if the dam was to be removed. In addition, the property owner noted the various wildlife he observed. Farrell asked if he would be willing to keep a list of the wildlife he saw.
- McLean mentioned that some of the problems noted in a 1998 MEMA report of the dam are still presenting.
- Allen asked about continuous spalling concrete. McLean said the goal is to get the dam to a satisfactory condition and then do regular inspections. His general recommendation for inspections was every 5 years.
- McLean stated that low hazard dams have no oversight from state agencies. The Town is allowed to decide what happens.
- Farrell wondered if the town will set aside money for future maintenance and if Wright-Pierce will include that as a line item in their assessment.
- Ingraham wondered if it was known how much money had been spent on dam repairs since 1998. Enterline noted that this analysis was included in the feasibility scope of services and will be part of the report to the selectmen. Hatch indicated this is not a good measure, because the dam did not receive repairs for that period, after there had been a report from the Maine Emergency Management Agency in 1998 that suggested immediate repairs. Averill suggested this analysis include the repairs made to the dam in the early 1990s as this was the last time the dam received maintenance.
- There was overall discussion about 50/100 year storms.
- Averill suggested they look at options that perform the same functions as the current dam (swimming, fish passage, fire protection) and find something that does it better.
- Bizarro asked if the committee would be polling the general opinion of the townspeople. The Chair responded there was a four month period after the draft feasibility study was completed for town discussions and the option for polling.
- Enterline noted that alewife runs would be starting soon and that volunteer help was needed to set up the leader fence and perform other fishway maintenance, and volunteers are also needed to help with the fish count. Interested people should contact the Fish Committee.
- Farrell asked if the feasibility study will include a suggestion for an escrow account for the town to set aside funding for future repairs. McLean replied the study would simply provide the cost estimates for initial investment as well as maintenance for decades into the future, and future funding would be up to the town.
- Comments from the public included a question about whether there was a time-table on sealing concrete over the grout work that was performed in fall 2016. McLean answered that there is not risk of damaging the grout if it is not sealed.
- Hall informed the committee of the Bristol Village Improvement Society meeting being held Thursday, April 27 at Bristol Congregational Church. He asked if a representative of the committee would be willing to attend.

ADJOURNMENT

It was unanimously approved to adjourn at 8.23 pm. The next meeting will be held May 9, 2017 at 6pm at the Bristol Town Hall. Agenda items to include: Dr. Zydlewski presenting on effect of passage obstructions on fish passage and communities.

Respectfully submitted,
Rachel Bizarro