

DRAFT Minutes
HARVEY LAKE DAM COMMITTEE
MEETING WITH BEN GREEN FROM DAM SAFETY SECTION
NOVEMBER 7, 2022

The purpose of the meeting was to discuss the project concept as well as some alternatives and listen to the Ben Green, PE from Dam Safety Section discuss permit challenges and what planning documents will need to be prepared and approved as part of the Dam Alteration Permit (DAP) Application.

The following individuals attended the meeting:

<u>Individual</u>	<u>Representing</u>
• Ben Green, PE	State of Vermont Dam Safety Program
• George Coppenrath	Barnet Dam Committee
• Don Easter	Barnet Dam Committee
• Red Dufresne	Barnet Dam Committee
• Richard Downer by phone	Interested Lake Owner and Dam Historian

The following items were discussed:

1. As listed in the agenda for this meeting, the project the dam committee members would like to submit under a DAP application is as follows:
 - Replace the stop boards with an automatic gate.
 - Install some grating and handrails. Ben Green indicated this work could be completed without the need for a DAP.
 - Repair or replace the bottom drain gate, stanchion, stem, and install a bar rack upstream of the gate
 - Cut off the east wall of the fish ladder to match the dam crest elevation
 - Install a larger crest gate or bladder (future selection based on costs yet to be determined) to provide passage of about 2,125 cubic feet per second (cfs). This figure is not precise as estimates vary significantly in hydrologic analysis performed in the past by others. M&M listed the 100-year runoff at 6,375 cfs. Inter Fluve later discarded this figure and proposed between 1,253 and 1,280 cfs. Dufresne Henry provided an analysis using Soil Conservation (SCS) methods and listed 4,360 cfs. DH also provided an analysis using Flood Plan Insurance (FPI) methods at 2,300 cfs and indicated that based on the watershed size, the 2,300 cfs was likely more representative of actual discharge from south Peacham Brook during a 100-year flood event. Importantly, the project goal is to modify the dam with gates, or use a bladder dam as required to discharge the 100-year flood flow from the South Peacham Brook to the Stevens River once the hydrology is finalized.
 - A monitoring and control system to monitor water level at the dam, at Harvey Mountain Road Bridge, and at the Lake near the beach. This data would control the gate or bladder to discharge what is contributed from South Peacham Brook.

Ben Green indicated the automation system would be required as part of any automated gate.

- Remove the accumulated silt upstream of the dam. Ben indicated that this work and the two items below may either be permitted under the order (DAP) or may require a stream alteration permit.
 - Install erosion protection on the downstream west side of the dam.
 - Construct one or more spur dikes to focus flow to the east to prevent silt deposition in this area.
2. George pointed out that the primary project goal is to reduce the adverse water quality effects due to backflow from South Peacham Brook into the lake during high flow events.
 3. List of the work items necessary to support this project. Ben went over the required items under a successful DAP Application. Ben recommended that step one should be a hazard determination as if the dam is determined to be low hazard, many of these items are not as arduous as otherwise required,
 - a. Most of the items require the services of a registered professional engineer
 - b. Although the DAP application is short many attachments are necessary including:
 - i. A Basis of Design Report is required.
 - ii. A Hydraulics and Hydrology (H&H) analysis is required.
 - iii. A structural stability analysis may be required unless it is reclassified as a low hazard dam. There was discussion at the meeting regarding the foundation and whether the dam was tied into bedrock. Richard indicated that based on the plans the dam was tied into the previous dam substructure which rested on hardpan not bedrock.
 - iv. A "Control of Water Plan" which entails Operational and Maintenance items and procedures is required.
 - v. An incremental Downstream Assessment and Dam Breach Analysis
 - vi. Various Town Permits may be required including Approval of Flood Plain Management modifications
 - vii. A Stream Alteration Permit may be required
 - viii. Wetland Permits may be required
 - ix. Fish & Wildlife permits may be required
 - x. Flow minimums will need to be analyzed before and after construction may be required
 - xi. An Army Corps Permit will be required.
 4. Permit Challenges based on the project components above. Ben offered to gather as many regulators together to discuss the project concepts in order to identify any issues and perhaps obtain findings of "permit not required". The Dam Committee would be required to show the project using pictures and marked up plans to convey the extent of the project components at this meeting.
 5. Alternatives:
 - a. What if the State Owned the dam? What would a project look like?
 - i. Ben indicated that since the dam is an existing structure, it seemed to make sense to modify the dam as discussed to reduce backflow given

the challenges of land acquisition permitting factors that would be difficult with a new dam located near the lake outlet. The dam modifications also seemed less costly when compared to a new dam that would be required to meet all the regulations.

- b. Joe gave Ben a copy of the March 1983 Report prepared by Dufresne Henry and remarked that this report was the best one and the engineer had the right solution way back then. Red remarked that the report was prepared by F. David Dean who had since retired from Dufresne Henry, Inc.
6. George went over the timeline of previous planning activities:
 - a. 1970 - old dam owned by GMP removed and replaced with State of Vermont approval;
 - b. 1970 - new dam ownership transferred to Town of Barnet;
 - c. 1983 - study of the problem of phosphorus loading in Harvey's Lake (only 13 years after construction) was commissioned by Eric Melzer from the State Department of Water Resource and Environmental Engineering. That study provided several options for reducing the backflow.
 - d. Since 1983 the Town of Barnet has taken several steps to reduce phosphorus loading by constructing diversion ditches, etc. The State of Vermont has not proposed any additional steps Barnet residents can take to protect the lake.
 - e. Since 1983 the Town of Barnet has applied for and received grants from the State of Vermont, the Federal government, and NGOs of approximately \$250,000 and nothing has been accomplished.
 - f. The Town of Barnet is responsible for the maintenance of the dam; the State of Vermont is responsible for the quality of the water in the lake.
 - i. "*Protect, maintain, enhance and restore water quality in rivers, wetlands and lakes*"(from DEC website: DEC Mission-Driven Priorities.
 - ii. Barnet officials hope to work in conjunction with State Agencies on finally after 4 decades of inaction toward solving the problem
 7. There was discussion of the extent of the downstream inundation analysis done by Inter Fluve but all were unsure of the results and if this work was usable to reclassify the dam as low hazard. Ben recalled that downstream inundation did not appear to be a significant issue but was going to research this in more detail. It seemed likely the dam could be reclassified as low hazard by a formal analysis.
 8. There was some discussion the Dufresne Henry 1983 recommendation for an upper dam. Don indicated that it was likely that land acquisition would not be a problem given the current landowners. But again, the regulations have changed much since 1983 and just the costs to breach the existing dam may be more than the cost to install gates. The costs to build a new dam meeting the current regulations may be extensive based on the Inter Fluve cost estimates.
 9. George asked if there is any money for this project as it would really be a water quality improvement project. Ben did not know of any state or federal funds for this type of project.
 10. Ben reiterated that the improvements could be permitted in total, but construction could be phased over 5 to 10 years.

11. Tree cutting was discussed, and Ben noted that trees should be removed within 20 feet of the structure.
12. Ben noted that the existing dam when modified would need to meet all permit criteria.
13. Ben indicated that he would send a link to Red to obtain all information in the state file on Harvey Lake Dam as well as a list of engineers with previous experience with dam permitting and design. Ben noted that M&M has been reorganized and is now doing business as SLR. Ben also had sent a link to the state statutes for this work. As of this writing, Ben completed this task and the information is now on the Lake Association Server maintained by Sherm Sprague.