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VERMONT

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Agency of Natural Resources

MEMORANDUM

TO: For the Record
FROM: Steven Hanna, Dam Safety Engineer
DATE: August 14, 2015
SUBJECT: Inspection of Shadow Lake Dam, Glover, Vermont

On August 4, 2015, Steven Hanna and Jaclyn Kaehler made a routine inspection of Shadow Lake Dam in Glover, Vermont. A number of photographs were taken. The dam is owned by the Town of Glover. It was last inspected on September 6, 2012. The State Identification Number is 81.02. The inspection was carried out under the provisions of 10 VSA 1105. Jennifer Andrews, President, and Jack Sumberg, Selectman, were present.

OVERALL CONDITION

The overall condition of the dam remains POOR. However, admirable efforts have been made to improve the overall maintenance of the dam. The dam is now clear of trees, the training walls in the discharge channel of the principle spillway were built up and cracks in the auxiliary spillway were patched.

DOWNSTREAM HAZARD CLASSIFICATION

The dam is a Class 2, "significant hazard" dam based on a Dam-Break Flood Analysis done in April 1991.

JURISDICTION

Since the dam impounds more than 500,000 cubic feet any alteration, reconstruction or breaching would require prior approval from the Department under provisions of Title 10 of the Vermont Statutes Annotated, Chapter 43.

RECOMMENDATIONS FOR THE OWNER

1. Continue to maintain the brushing limits established. Periodically monitor all the tree and brush stumps for decay and destabilization of the slope.

2. Keep the upstream area of the dam, especially the area in the vicinity of the trash racks, clear of debris and brush to prevent the spillways from being clogged.

3. Keep the principal and emergency spillway discharge channels clear of debris to provide for full hydraulic capacity.

4. Continue to monitor the cracking concrete in the gatehouse foundation and the spillway outlet.

5. Continue to monitor the emergency spillway for deterioration, including erosion and undermining due to water flowing under the concrete.

6. Retain a professional engineer experienced in the design and investigation of dams to investigate, design and supervise construction of any needed repairs or improvements.

INSPECTION

The inspection of the dam was conducted on August 4, 2015 at 1030 hours. The weather was cloudy with temperatures in the 60's. The ground condition was damp. The level of the pond was slightly lower than usual due to a stop log rotting and breaking a few days earlier and being replaced. The following was observed:

1. Upstream Stone Wall: The upstream stone wall consists of large granite blocks. The wall appeared to be stable but irregular with a few blocks noticeably out of alignment. Trees remain at the left and right ends of the wall adding to the instability.

2. Embankment Section: Downstream of the stone wall is an earth filled section about 16 feet wide. The trees and brush previously reported had been cut, with the stumps remaining. The downstream clearing limit was good, but some brush remained in places. There was seepage noted to the left of the auxiliary spillway and was flowing clear.

3. Principal Spillway:

   a. Approach: The approach was mostly clear with minor woody debris present.

   b. Control Section: There was a crack in the left side of the concrete gatehouse foundation; otherwise the concrete appeared to be in good condition. The bridge across the principal spillway channel was in fair condition with the support timbers showing some deterioration.

   c. Outlet: The sluice gate was viewed from inside the control house. It had some rust but otherwise appeared to be in good condition and is operated frequently and was well greased. The discharge channel was rocky with minor debris. There had been some scour in the outlet channel due to Tropical Storm Irene. Training walls along the outlet channel were built out of stone and were preventing any erosion along the sides.

4. Abutments: Trees and brush remain on both the right and left abutments. The abutments were dry and firm and appeared firm and good for line and grade.

5. Auxiliary Spillway: The spillway is an uncontrolled concrete ogee crest type structure. Cracks in the training walls had been patched. There was some minor debris in the upstream portion of the spillway. Minor soil loss was noted along the training walls on both sides. Although not seen during the inspection it was said that water travels under the concrete spillway and exits in the channel during higher flows.

HYDROLOGY AND HYDRAULICS

The drainage area at this site is about 3328 acres. The lake surface area, at normal pool, is about 188 acres with storage of about 1432 acre-feet. At the dam crest, the pool stores 2283 acre-feet. The maximum discharge capacity for the unobstructed spillway is 107 cubic feet per second. The emergency spillway has a maximum hydraulic capacity of 346 cubic feet per second.