

CORRESPONDENCE MEMORANDUM


STATE OF WISCONSIN

Date: June 27, 1978

File Ref: 3500

To: Douglas Morrissette - Wakanda

RECEIVED

From: Ken Johnson 

JUN 30 1978

SD Hdqrs.

Subject: Control of Water Levels on Buffalo Lake

The water levels on Buffalo Lake in Marquette County have been a source of controversy from the time which the department acquired control of the dam to present.

In 1976 a hearing was held and resulted in an order establishing formal water levels on Buffalo Lake. The order states that water levels shall be held below 769.13 mean sea level (.22 gage) during the period of October 1 through May 20. It further states that water levels shall be maintained between ~~769.63~~ and ~~769.13~~ (.72-.22 gage) from May 20 through October 1.

Regulating the water surface in this narrow range of elevations becomes a problem which demands constant attention of the dam operator with often inadequate results in the eyes of local residents.

In the past the department has manipulated flashboards on the spillway to control water levels. This becomes a bothersome and dangerous task depending on the amount of flow at the time of the manipulation.

Instead of controlling water levels with flashboards it has been proposed that the three sluice gates in the former lock chamber be used. This requires that a flashboard configuration be permanently affixed to the spillway.

Different flashboard configurations were tested in a computer model which simulated lake elevations. Input into the model was taken from an actual period of record from 1936 through 1950 excluding 1941 and 1942. These years of record were the only years available for which outflows from the reservoir could be determined. Although relatively short, the record encompasses an array of extremely wet and dry years. 1938 was the wettest year on record, while 1949 was the fourth driest in a 62 year record.

The model assumed that the gates would be opened when ever the water surface exceeded .52 (gage) in the summer. All three gates were opened simultaneously at one, two and four-foot increments to try to attenuate rising elevations. During the winter months gates were opened whenever the elevation exceeded .22 (gage, the winter maximum). This procedure showed that even under the most constant gate operation there will be times when the maximum and minimum elevations will be exceeded.

This spring the 188-foot spillway was filled with 172 feet of 6-inch flashboards. This configuration appears to be one of best that were tried on the model. As a result of the model developed, we are suggesting that the 172 feet of spillway be maintained year round and that the auxiliary sluice gates be operated as follows:

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From October 1 through May 20 all three gates will remain open at least one foot. The gates should be opened more as needed to avert exceeding the maximum winter elevation of .22 (gage).

From the period of May 21 through October 1 the target elevation will be .52 (gage). Gates will be closed during this period except to attenuate rising water levels.

This operating procedure with the present flashboard configuration showed that for the test years the lake fell below the minimum elevation an average of 3.4 times per summer, and exceeded the maximum during the planting season 8 times in 12 years. During these 8 times all gates were wide open and the maximum was still exceeded. Again this was one of the better trials and points out the fact that using only gate operation there will be times when normal water levels will not be met.

If you have any questions concerning this matter, feel free to contact me at 266-2151.

KJ:kb

cc: Dale Brege - Montello Area Office