

History of Magician Lake Water Level

The following information is taken from copies of documents on file in the Cass County Water Resource Commissioner's office.

On October 14, 1957 the Cass County Board passed a motion "that the drain committee be requested to instruct the Drain Commissioner to request the Conservation Department to make a survey and report for the purpose of the establishment of the lake level of Magician Lake." Subsequently on May 13, 1958 the Cass board resolved "that a legal level of the waters of Magician Lake be established..."

On November 1, 1958 a hydrograph survey of water level was started. This particular survey ended on 9/30/1959. A review of these charts show a high recorded at the end of April 1959 of 762.88 and a low of 762.04 at the start of November 1958 and Late September 1959. Other surveys were also on file covering 1959 through December, 1960 and are discussed in the report issued following the completion of this survey.

In March, 1963 a report was issued by the Michigan Department of Conservation, Engineering and Architecture signed by 3 registered professional engineers. Excerpts from this report relate the background given above as well as some details of Magician Lake and how and where levels were recorded. In summary concerning the levels recorded, "The maximum recorded level of Magician Lake was 763.1 feet above mean sea level in June 1960 and the minimum was 762.1 feet in September 1959. The average level during the summer period of June to September was 762.4 feet in 1958 and 1959 and 762.9 feet in 1960. Recorded fluctuations during the summer periods were 0.3 feet in 1958, 0.6 feet in 1959 and 0.4 feet in 1960."

The report goes on to state that "Points considered in this study were shoreline erosion, ice and flood damage to shoreline installations, operation of domestic sewage disposal systems, boating, beaches, and fish and wildlife habitat." Further in the report it states "Undesirable saturation of lake side areas can occur if normal summer levels exceed 763.0 feet." It does say that this level can be exceeded for short and infrequent intervals without causing property damage. The report does discuss the sewage disposal systems but are no longer pertinent to Magician.

The report concludes with "In conclusion, the most desirable normal summer level for Magician Lake is 763.0 feet above mean sea level. This is a maximum normal level established by septic tank operations and to avoid the saturation of lake side areas and is high enough to provide adequate boating depths."

The report also discusses methods of control and recommended a dam at the culvert that passes under the road. We now know that it was located further downstream than that. The report recommends that “Stoplogs must be removed or replaced to maintain a legal normal level during the summer season. All stoplogs should be removed in late fall to lower the lake to its natural winter level and provide storage for spring flows. Stoplogs should be replaced in the spring as spring flows subside.”

The report discusses what steps would be necessary to establish a means of control and legal levels of Magician as well as a person who would be responsible for maintenance. “The dam operator must remove or replace stoplogs as necessary in order to maintain the legal level. It is suggested that he remove stoplogs in the fall after the resort season to provide storage for high spring run-off in the spring. After the spring runoff stoplogs should be replaced to maintain the summer lake level.”

The report also states that this operator “Keep a daily record of lake levels and a record of dam operation to provide data for future modification of operation if conditions warrant such action. Such records will provide dependable background data in case of future question of litigation over lake levels. These records should be filed with the County Boards of Supervisors...”

On September 10, 1962 a petition was filed in Circuit Court requesting establishment of legal levels for Magician Lake. On November 13, 1962, the court order was issued to establish the summer level at 763.0 feet above mean sea level and a winter level of 762.0 feet above mean sea level.

In a condensed description of Magician Lake outlet drain dated July 24, 1963 and prepared by T. A. Smith, Registered Civil Engineer (who’s name later appears on dam inspection reports as the designer) he proposed that a dam be constructed in said drain” (described earlier in the document) “...for the control of the water level of Magician Lake as specified in the court order...”

In an interoffice communication dated April 27, 1964 from Hathaway Hanes, CE, Engineering Section to Nicholas Olds, Asst. Attorney General the recommendation to place the dam at the road crossing was mentioned. However it states “The present plan calls for the construction of the dam at a point about one hundred feet below, or downstream, from the location recommended...” In this letter it also states that “We presume that the cost for... .. constructing the control dam will be borne by the riparians on Magician Lake and others who are benefited. “ There was an undated special assessment role in the drain commissioner’s file.

No actual records of the dam's construction were found in the drain commissioner's files but correspondences as early as March, 1965 indicate the presence of a dam.

What about the hole? None of the documentation specifically talks about the hole located in the present "stoplog" or board. According to Leo Schur, who was custodian for over 30 years, the hole was always there.

How does the hole affect the water level? Simple laws of physics, hydraulic, also demonstrate the lack of effect on plugging this hole. Since there is nothing on the downstream side, this is said to have free discharge. The only factors affecting how much water flows through this hole are the size of the hole, the depth of the hole and the shape of the opening or orifice. It doesn't matter what the size of the body of water is behind it. <http://www.mcnallyinstitute.com/13-html/13-12.htm> has a more detailed explanation for those interested in the engineering aspects. Using the appropriate numbers for the size of the hole in our dam and the depth from the top of the water to the center of the hole and the appropriate factor for the shape, it will take 30 days to lower the lake level one inch if there are no other factors. One inch is a whole bunch of water over 500 acres. So the hole alone is responsible for 1/30 of an inch a day. And since it's blocked to 80% that means only 20% of 1/30 of an inch is going through or 0.006667 of an inch a day.

So where's the water going? One word, evaporation! And July and August are the months that have the highest evaporation rates. Of course the normal outlet flow eventually ends up in Lake Michigan after passing through Silver Creek, Dowagiac Creek, Dowagiac River and the Saint Joe River.

Remember, this association does not maintain custodianship of the dam.

New staff gauge installed

On Wednesday afternoon, August 20, 2008, a crew from Wightman & Associates installed a staff gauge to display the current water level of Magician Lake. (See photo below) The gauge is located in Silver Creek on the south side of the road (Gilmore Avenue) crossing Silver Creek. Silver Creek is located on the southeast side of Magician about 1/2 mile from the east end. Wightman & Associates is an Engineering, Surveying and Architectural firm located in Benton Harbor. Cass and Van Buren Counties hired them to install this gauge as well as confirm several elevations. During this installation, they checked the elevation of the bottom of the dam in Silver Creek, the top of the board currently inserted in the dam and the current water level. The bottom of the dam checked at 762.01 which is within 0.01 feet of what it is supposed to be at 762.0. The top of the board inserted in the dam checked at 762.94 feet above sea level and the current water level measured exactly 763.0. 763.0 is the summer level set by court order and what was measured from the bottom of the dam earlier that day. These elevations are all established using the NGVD29 Datum. The gauge is mounted on a long pipe driven deep into the creek bed and attached with a series of U bolts that are rendered tamper resistant. It is graduated in one tenth of a foot increments which is 1.2 inches (See picture below). The gauge is intended to allow anyone to see the actual lake level relative to the court ordered level of 763.0 and to provide assurance that the level is maintained. Also, any modification to or tampering with this gauge or its location or elevation can result in a \$1000 fine and imprisonment.

