**Mann Lake Dam**

**Water Level Tracking Data**

The Mann Lake dam is located across Mann Creek in the SE 1/4 of the SW 1/4 of Sec 30, T 41N, range 7E, Town of Boulder Junction, Vilas County. The dam is owned and maintained by the Town of Boulder Junction. The Mann Lake dam is classified as a small dam and is exempt from routinely scheduled safety inspections by the State or a consulting engineer. The dam (file no. 63.46, Seq. No. 01520, field books #966, #968, #975. Mann Creek file no. 63.56 (03186)) was reconstructed under a Chapter 31.02, Statutes WI Public Services Commission permit in the summer of 1964. In docket 2-WP-1969, the maximum water level is fixed at elevation 98.04 feet, Public Service Commission datum. (In the order, the earthen dike, which is part of the dam, was to be raised to elevation 99.5 feet, Public Service Commission datum.) The dam was surveyed on July 17, 1965 and bench marks 1089-C and D were established (bench mark D is the only one we are able to locate). Bench mark 1089-D is a square chisel on left wing wall, elevation = 99.68’

Current lake levels and lake management level objectives and measurements are in “flux”. (Based on file notes, the current staff gauge was set 7/16/81 at 1.08 (98.6’ Public Service Commission datum). It may have been reset at 1.8 ??? The present staff gauge has deteriorated and must be replaced. The replacement and new protocol involving resurvey and entry of data to SWIMS is underway. Present lake level monitoring is based on a measure from bench mark 1089-D, which is on the top of the dam’s left (looking from the lake) wing wall. Measurements of lake level are done by measuring down from the top of the wall to the water level. Measurements are taken with a yard stick in inches.

With much discussion and continued monitoring, it seems the current management or objective year around lake level is 15 inches down from the top of the wall. Looking at the dam file notes, the lake level might be pegged at 19.68 inches (99.68-98.04=1.64’ or 19.68”). Based on current evaluations 19.68” seems much too low. A major concern for higher water levels is erosion and deterioration of Dave W’s boat house pilling’s. (Dave W’s assessment is, “Dam got to 14” below the top of the dam, looking at my boat house, I think that’s an OK level right now”.) To recap the undocumented history from Bob Drewa, who lived on the lake for a number of years maintaining the dam, he shot for 16.5” from the top of the dam.

We will continue to monitor; collecting objective lake level measurements (which will be put into SWIMS after installation of the new staff gauge). We need to think very carefully about the objective level we attempt to manage to, looking for correlation impacts on the lake’s ecology. Lowering the lake level:

* Causes less shoreline erosion and protects the pilings and cantilevered piers
* Causes shallower, warmer water (warm water holds less oxygen and is not good for fish, “critters”, macro invertebrates, zooplankton, and algae)
* Reduces the volume of water to hold oxygen reserves for the winter
* Creates a shallower lake, exposing more bottom area to sun light, stimulating plant growth
* Reduces slightly the surface area where oxygen absorption from the atmosphere occurs
* Stimulates plant and algae growth providing more photosynthesis and oxygen production
* Leads to warmer water and more plant and algae growth in the summer which results in more end of year bio mass to die off in the winter when decomposition uses up available oxygen reserves, resulting in winter fish kills
* Could result in a stagnant, “no flow”, warmer water, algae chocked, lake in a drought period

**Water Level Tracking Efforts**

Present lake level monitoring is based on a measure from bench mark 1089-D, which is on the top of the dam’s left (looking from the lake) wing wall. Measurements of lake level are done by measuring down from the top of the wall to the water level. Measurements are taken with a yard stick in inches.

Measurements and active dam management began in October of 2016. Initially, measurements on file from 10/1/2016 were taken of water level flowing over the top board of the dam. It was recognized that these measurements were meaningless when it was found necessary to replace the dam boards and steel backing plate due to deterioration. These earlier measurements had no relationship to an established datum or bench mark, so they are not reflected in the log.

In April of 2017 after obtaining the WI DNR file notes on the dam and examining references to bench marks and established levels, dam boards and the steel backing plate were replaced. Extensive efforts were made to locate the referenced benchmarks. Of the four bench marks referenced in the file, bench mark D is the only one we are able to locate. Currently, the removable dam boards consisting of one 2x4” board and one 2x6” board can be used or removed in any combination allowing for maximum flexibility in efforts to manage the dam and the lake’s water level.

Objective, verifiable, meaningful, tracking data began on April 24th of 2017.

In June of 2017 a rain gauge was installed at the dam so that rainfall could be recorded and correlated with lake levels and efforts to manage the dam.

In June of 2017 a project was initiated with Vilas County Land and Water Conservation Department to replace the existing staff gauge. A new gauge will be surveyed in and placed at the existing staff gauge location, near the dam. The new WI DNR staff gauge protocol requires them to be resurvey each year and data recordings placed in the SWIMS data base on line for ready access by all potential users.

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| **Name** | **Date** | **Level** | **Notes** |
| Jenks | 4/24/2017 | 12 | 12” down from mark on top of left wall |
| Jenks | 4/26/2017 | 13 |  |
| Dave W | 4/30/2017 | 14 |  |
| Dave W | 5/1/2017 |  | Installed 2x6 |
| Jenks | 5/2/2017 | 14 ½ |  |
| Jenks | 5/4/2017 | 14 |  |
| Burditt | 5/6/2017 | 14 |  |
| Jenks | 5/7/2017 | 14 ½ | Lake level seems to have stabilized |
| Dave W | 5/10/17 | 13 ½ | Generally a wet, high water period for all lakes |
| Jenks | 5/10 | 13 ½ |  |
| Jenks | 5/13/17 | 13 | No rain for past week |
| Jenks | 5/15/17 | 13 | Rained most of the day ~ 1” |
| Dave W | 5/17/17 | 9 ½ | 6” of rain since 5/13 |
| Jenks | 5/18/17 | 10 | 4” of rain in past 48 hrs |
| Jenks | 5/19/17 | 11 | D.W removed top board yesterday |
| Jenks | 5/20/17 | 11 ¼ |  |
| Dave W | 5/20/17 | 11 |  |
| Jenks | 5/21/17 | 12 | ¼” of rain in past 24 hrs |
| Jenks | 5/22/17 | 12 ½ | Cold drizzle, no measurable rain |
| Jenks | 5/23/17 | 13 | Drizzling again |
| Jenks | 5/24/17 | 13 ¾ | ¼” of rain yesterday |
| Dave W | 5/25/17 | 14 | Put in board |
| Jenks | 5/27/17 | 13 |  |
| Jenks | 5/28/17 | 12 ½ | ½” of rain in past 24 hrs |
| Jenks | 5/29/17 | 13 | Another .3” of rain |
| Jenks  | 5/30/17 | 12 ½ | ½” of rain in gauge this morning |
| Jenks | 6/3/17 | 12 | Light rain last night |
| Jenks | 6/5/17 | 12 ½ |  |
| Jenks | 6/7 | 12 ¾ |  |
| Jenks | 6/10 | 12 3/4 |  |
| Dave W | 6/12 | 8 | Pulled Board |
| Jenks | 6/12 | 8 ½ | 5” of rain in past 24 hours |
| Jenks | 6/14/17 | 10 ¾ |  |
| Jenks | 6/15 | 11 ¾ |  |
| Jenks | 6/16/17 | 12 |  |
| Jenks | 6/17 | 12 3/4 |  |
| Jenks | 6/19 | 13 | 1 ¾ + inches of rain in past 24 hrs |
| Jenks | 6/21 | 14 | Stopped raining |
| Jenks | 6/22 | 14 ¼ | .5 cm of rain in gauge |
| Dave W | 6/23/17 | 14 1/4 | Put board back in |
| Jenks | 6/24/17 | 14 | .3 cm of rain in gauge |
| Dave W | 6/25 | 13 ¾ | Added 2x4 |
| Jenks | 6/26 | 12 ½ | .5 inches of rain in gauge |
| Jenks | 6/29 | 12 ¾ | 1.2 cm of rain in gauge |
| Jenks | 6/30 | 12 ¾ | .2 cm of rain in gauge |
| Jenks | 7/2/17 | 13 | No rain |
| Burditt | 7/4/17 | 13 | Normal, beautiful |
| Jenks  | 7/5/17 | 13 ¼ | .2 cm in gauge |
| **Name** | **Date** | **Level** | **Notes** |
| Jenks | 7/8/17 | 13 ¾ | .5 cm in rain gauge |
| Jenks | 7/11 | 13 1/2 | 1.6 cm in rain gauge |
| Jenks | 7/12 | 13 1/4 | .3 inches or .8 cm in rain gauge |
| Jenks | 7/16 | 13 ¾ |  |
| Jenks | 7/18 | 14 |  |
| Dave W | 7/20 | 14 | Took out 2x4 and placed 2x6 |
| Jenks  | 7/24 | 13 ½ | .5 inches in rain gauge |
| Jenks | 7/25 | 13 |  |
| Jenks | 7/30/17 | 12 ½ | A few beaver sticks in dam |
| Jenks | 8/4/17 | 12 ¼ | 1.1 inches of rain in gauge |
| Carrol | 8/12 | 11 ¼ |  |
| Jenks | 8/12 | 11 ¼ | Vandalism at dam: removed rain gauge, broke yard stick, pulled out all boards |
| Jenks | 8/15/17 | 12 | .4 inches of rain in gauge, 2x4 in place |
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