

Posey Lake Outlet

MDNR ID #02265

Hazard Potential: Low

Lenawee County, Michigan
Hudson Township Sec. 3, 4 (T6S, R1E)
Rollin Township Sec. 34 (T7S, R1E)

Inspection conducted June 18, 2015
Act 451 P.A. of 1994 Part 307

Owner of Lake Level
Lenawee County

Represented by: Jennifer L. Escott
Lenawee County Drain Commissioner
320 Springbrook Ave., Suite 102,
Adrian, Michigan 49221

Inspectors:

Joseph P. Brezvai

Lenawee County Drain Commission

Brian J. Cenci, P.E.

Eng., Inc.

Professional Engineer:

Brian J. Cenci, P.E.



Brian J. Cenci
10-18-15

POSEY LAKE DAM LAKE LEVEL

LAKE LEVEL HISTORY

Due to the hydrologic configuration of the Posey Lake drainage basin, the lake level often times fluctuated two to three feet between storm events. This proved to be a nuisance to homeowners; one month houses would be flooded and the next month boats would be drydocked. It soon became evident that some sort of control structure was prudent in order to protect the value of the property.

Although the actual date is unknown, some residents constructed an earth embankment and fixed log dam in the outlet channel. This prevented abnormally low levels in the lake and, consequently, boats were no longer being drydocked.

Unfortunately, the high water levels created by Spring ice and snow melt were still uncontrollable. As a result, the level would rise roughly two feet each year. Because of this, the lake association initiated a more in-depth investigation that was conducted by the Michigan Department of Conservation (MDC).

In September 1955 the MDC studied the watershed's hydrology and prepared design flows. Due to the short time span for study, the hydrograph could not be completed for higher magnitude storms. The values used were based more on an "educated averaging" of similar lakes with more complete data. Based on the averaged 90 CFS flow for a 25 year storm and the geographic shape of the lake, the MDC recommended certain steps be taken.

The present log dam had to be replaced with a suitable structure designed by a registered engineer. They also suggested that the lake level be dropped six inches during the Winter months for sufficient retention of Spring runoff. The MDC concluded that the discharge channel was inadequate.

Per the MDC's study, on October 11, 1955 the Honorable Rex B. Martin, Circuit Judge (Lenawee County), set the legal lake level as 947.0 feet above sea level. It was further ordered that there may be deviations from that set level during the period October 10 to March 10 by lowering of the level up to and including six inches during that period, thereby lowering of the lake was intended to provide additional storage volume for excessive Spring runoff.

For the next thirty years there were considerable problems with maintaining the actual lake level at 947.0 feet above sea level. The structure helped somewhat but the Spring storage was not sufficient. Many houses were still routinely being flooded out; this prompted further investigation.

According to a 1982 study by the engineering firm, Jones and Henry (Toledo, Ohio), several problems existed. "The chief problem is the restriction at Dowling Highway." The undersized pipe may be a result of a grossly underestimated design flow. Jones and Henry suggested 140 CFS as a design flow compared to the 90 CFS used by the MDC. The condition of the outlet channel was also criticized. They concluded that the bulk of the problem is caused by downstream obstacles and the lack of adequate storage capacity in the lake.

Due to the lack of storage room, the original 1955 court order was amended on January 10, 1983. This amendment increased the Winter storage from six inches to one and one-half feet. Since this court order, the level has been reasonably maintained.

Fluctuations in the lake level from large rainfall events continued in the lake though out the 1980's and 1990's. On July 29, 2000 an informational meeting between landowners at Posey Lake and the Lenawee County Drain Commissioner was held to discuss concerns with the lake level and water quality issues. A petition was later returned by the Posey Lake Home Owners Association to the Drain Commissioner requesting an engineering study be performed to address concerns with the fluctuating lake levels.

The Lenawee County Drain Commissioner contracted with Progressive AE, of Grand Rapids, MI to conduct a

flow capacity study on the dam structure and outlet channel. In August 2001 Progressive AE concluded that there are inadequate capacities with the control structure and outlet channel. The study recommended improvements to outlet channel prior to the control structure and to evaluate the function of the outlet channel prior to implementing any changes to the control structure. The outlet channel was deepened, widened, and culverts enlarged in 2002 and 2003 according to design by Progressive AE.

The construction of the Posey Lake Drain was completed in 2003 and the function of the outlet will be evaluated with rainfall events and the operation of removing and installing planks at the lake level control structure.

STRUCTURE

The existing dam controlling the lake level is a concrete structure with two wooden stop-log sections. Each section has four stacked wood planks, each 3"x 6"x 5'3". When all four of the planks are properly placed, the elevation of the top log, which also regulates the lake level, has an elevation of 947.0 feet above sea level. From October 10 to March 10, the upper three logs are removed to reduce the lake level by ½ feet. This is necessary to protect the cottages from flooding. Drawings and pictures of the actual structures are included in the appendix. The dam outlets into the Posey Lake Drain maintained by the Lenawee County Drain Commissioner.

RECOMMENDATIONS AND CONCLUSIONS

See attached report.

It should be noted that the amount of money available to spend on a lake level is limited to \$10,000.00 per year. In order for the Drain Commissioner to exceed this limit an emergency condition must exist or a petition by the district is necessary. Because the funds are limited, it would be prudent to perform the aforementioned recommendations as monies allow.



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
LAND AND WATER MANAGEMENT DIVISION
DAM INSPECTION REPORT

This form is to be used for inspection reports required by Part 307, Inland Lake Levels, for those dams that do not meet the size criteria as defined by Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Dams six (6) feet or more in height, as defined by Part 315, and impounding five (5) acres or more at the design flood elevation, must meet the inspection report format as outlined in Section 31518 of Part 315.

A person failing to comply, or falsely representing dam conditions, is guilty of misconduct in office.

DAM NAME Posey Lake Outlet		DAM ID 02265	COUNTY Lenawee
DATE OF INSPECTION June 18, 2015	NAME OF WATERBODY Posey Lake	SECTION, TOWN, RANGE Sec. 4 T 7-S, R 1-E	LEVEL THIS DATE 947.75
DATE ELEVATION SET BY COURT 1-10-1983	LEGAL LEVEL 947.00 Summer 945.50 Winter	DRAWDOWN LEVEL 945.50	HIGH WATER MARK ELEVATION 948.83

EARTH EMBANKMENTS LEFT EMBANKMENT 20 FT. RIGHT EMBANKMENT 20 FT. TOTAL LENGTH 50 FT.
(LOOKING DOWNSTREAM)

	UPSTREAM	CROWN	DOWNSTREAM
VEGETATIVE COVER	Grass	Grass	Grass
EROSION	None observed at the time of inspection	None observed at the time of inspection	None observed at the time of inspection
SEEPAGE			None observed at the time of inspection
SLIDES, SLUMPS & CRACKS	None observed at the time of inspection	Crack noted in abutment from previous report might be settling but doesn't appear to be getting any worse	None observed at the time of inspection
ANIMAL BURROWS	None observed at the time of inspection	None observed at the time of inspection	None observed at the time of inspection
WAVE ACTION PROTECTION	Yes, some rip rap		Yes, rip rap as part of drain project
REMARKS*	None, good condition	Embankment seems ok, no settlement noticed	None, good condition

CONTROL STRUCTURE

TYPE Straight Drop with 2 5-foot wide stop logs.	YEAR CONSTRUCTED 1959	STRUCTURAL HEIGHT (top of dam elevation minus stream invert) 7.3 feet
LENGTH OF SPILLWAY 10 feet 6 inches	FREEBOARD 3.5 feet	HYDRAULIC HEIGHT (design flood elevation minus stream invert) 5.8 feet
VERTICAL PIPE SIZE None	HORIZONTAL PIPE SIZE 24 inch	HEAD (normal headwater minus normal tailwater) 4.1 feet

DESCRIBE CONDITION OF THE FOLLOWING ITEMS.

STOPLOG VALVES AND GATES (open and close to check condition): Check location of top stoplog in relation to top of riser pipe intake box or fixed crest, for leakage, and condition of stoplogs, valves and gates. Good condition.
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OUTLET PIPE: Check for damage from ice, logs, vandalism; inside discharge pipe for settlement and/or joint separation; condition of pipe coating.

Good condition.

CONTROL STRUCTURE (continued)

CONCRETE STRUCTURE: Check for erosion; location of cracking or spalling. If old or new; settlement; need for crack repairs. Overall in Fair condition. Prior inspection reports indicated surface cracks on the northeast wall and in the northwest footer. Cracks were reported in these reports as not critical and were just to be monitored. Based on previous inspection reports and photos, both these cracks do not appear to be getting any wider or larger and the ground around these areas does not appear to be settling. A benchmark was set up by the LCDC's office to monitor settling and these cracks.

WALKWAY & RAILING: Check if in place or removed, condition, and if adequate protection provided.
The concrete walkway appears to be shifted slightly. Monitor this to see if it continues to shift.

TRASHRACK OR LOG BOOM: Check if operable.
N/A None Exists

EMERGENCY SPILLWAY: Size, type, and condition.
24" pipe downstream is in good condition and the drain downstream was cleaned out within the last 7 years and appears to be in good condition.

INLET & OUTLET CHANNELS

	INLET	OUTLET
SIZE	20 to 25 foot wide open channel to Lake	20 foot wide open channel to arched crossing under roadway.
EXISTING CONDITION	Good	Good
EROSION	None	None
DEBRIS & OBSTRUCTIONS	None	None
RIPRAP PROTECTION	Yes, in good condition	Yes, in good condition
REMARKS*	None	None

RECOMMENDATIONS

List work needed, how to be done, by whom, estimated cost, source of funds, recommended completion date. If emergency, to what extent. ADDITIONAL COMMENTS.

Inspection Ordered By: Jennifer L. Escott, Lenawee County Drain Commissioner
Lenawee County Delegated Agent

Brian J. Cenci, P.E.

4063 Grand Oak Drive, Suite A109

INSPECTOR'S NAME (PRINTED)

ADDRESS



Lansing, MI 48911

SIGNATURE

CITY, STATE, ZIP CODE

No. 6201053847

517-887-1100

P.E. REGISTRATION NO.

TELEPHONE NUMBER

Please submit this completed report and photographs of the dam, downstream channel, and deficiencies cited in the report to:

DAM SAFETY PROGRAM
LAND AND WATER MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
PO BOX 30458
LANSING MI 48909-7958

*NOTE: If space is inadequate for remarks, attach additional sheets as needed.

POSEY LAKE LEVEL CONTROL STRUCTURE



West Side of Posey Lake Dam



East Side of Posey Lake Dam



Crack-Northeast Side



Crack-Southeast Side; Shows walkway shifted slightly