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Engineers • Consultants • Inspectors

February 13, 2018

Iron County Board of Commissioners

Iron County Courthouse
Gene Smith, County Administrator
2 South Sixth Street, Suite 7
Crystal Falls, MI 49920-1413

RE: Tri-Annual Lake Level Inspection – October 20, 2017
(Sunset Lake, Fortune Lakes, and Stager Lake)
GEC #990-34

Dear Commissioners:

Enclosed is a copy of our Inspection Record on the three noted lake-level control structures. Tom Clark continues to monitor and make maintenance upgrades to level control structures. Some additional maintenance and repair work is planned. The lake levels continue to vary somewhat from their “legal summer” levels as adjustments were made, reacting to the fall rains.

SUNSET LAKE



The water control structure at Sunset Lake remains in fair condition (see report and photos). At the time of the inspection there were two full length stop logs and a third center section stop log in place. The center stop log created two separate weirs to maintain water levels higher during low flow conditions.

Recent rains have raised the lake level such that water was flowing across the entire structure at the time of the inspection. Even though the stop logs leak, there was sufficient flow through and over the control structure to raise the lake level several inches over the 2014 levels. The 2017 fall water level (1.76') is about 7½" higher than the October 2014 level (1.14') and 4½"



Consulting Engineering • Construction Management • Building/Structural Design • Environmental Services
Grant Procurement & Administration • Land Surveying • Zoning Administration • Building Inspection • GIS Services



higher than the August 2011 lake level (1.38'). If the structure would have been removed, the water level would still be about the same level as 2011, as the downstream water level in 2017 was about the same as the 2011 lake level. My understanding is that this control structure is not planned to receive significant attention in the future. The adjacent yard area near the control structure is saturated at these lake levels. I am not aware of downstream impediments that would cause water to back up into the outlet stream below the control structure.



There are no changes to the east wing wall of this structure that separated from the main concrete structure years ago. Our recommendations listed below for this structure are the same as previous years. I noted no additional side seepage around the structure but the District should continue to observe the structure to determine if any additional erosion or seepage occurs over the next 3 years. Although the lake levels are the highest we have observed, I suspect the neighbor will attest the water levels reach this somewhat routinely each year. Considering what we have observed over the past 15+ years, there may be no reason at this point to do wing wall repair as noted in previous reports. The earth mounding on the east side of the structure next to the broken wing wall has created a seepage barrier. The repairs the Commission could consider are:

- Reinstall a lake level gauge and calibrate it to the USGS elevation. We can then verify the lake level is within the allowed legal levels.
- If there are lake level concerns, adjust the stop logs in the early fall to accommodate fall rains that cause lake level increases so flow remains within the weir area.
- Provide additional rock protection on the inlet side of the control structure.
- Dredge out the inlet side of the control structure.

FORTUNE LAKES



The water control structure at the outlet of the Fortune Lakes remains in similar stable condition since the 2014 inspection. A 3" x 8½" wood stop log is in place. The stop log has a continuous buildup of sediment on its upstream side. Water no longer flows between the stop log and the bottom sill plate. Tom and his "work crew" plan to pour a new sill plate this coming year to

prevent future short circuiting issues. Some water still bypasses around the wood control structure but it has been significantly reduced from previous year's work. There are three additional stop logs stored above the weir structure. The water level is about 2" higher than the 2014 inspection and very close to the 2011 lake levels. The difference is that 2011's lake levels required a stop log to be placed above the sill plate to attain the required lake level.

This crossing is an attractive sitting area for the public. Additional protective boards and patio blocks were added on both side embankments to raise and level the area. The work done in this area makes it a very attractive portage location.

- Tom would like to raise the NW corner of the downstream area of the structure to provide a more level and stable area to walk and access the downstream flowage.
- Over time the wood control structure will deteriorate and require upgrades. As funds allow, the Board should consider replacing the wood structure with concrete/concrete block in the spillway area.

STAGER LAKE



The water control structure at the outlet of Stager Lake remains in good condition since the 2014 inspection. The stiffening supports added to the north end to reduce the seepage look to be remaining solid. The level control structure paint is in reasonable condition after three more years. The 4'x14' painted deck area and control structure above the deck allows safe access to the control weir area for level adjustment and maintenance.

The GPS elevation control for Stager Lake dam area is now in the form of a level gage mounted to the leading edge of the control structure. The lake level, at the time of inspection, was virtually the same as in 2014. That level was about 1288.33 or 4" above the legal summer level of the lake. The fall rains typically cause the lake levels to raise as we've seen in the past.

- The present 2x8 wood level control boards have water seeping under them in several spots. As funding allows, a better long-term solution would be to add a layer of concrete block above the existing concrete block spillway structure. The concrete block dam would be extended to the northeast to tie back to the existing higher ground. The other option is to bring clayey soil fill in to the downstream area of the north section of the control structure. This would be done during winter months when the lake is frozen and could be leveled and compacted in the summer months.

- Concrete bags have been placed on the south inlet side of the control structure to create a seepage protection area. The area behind the concrete bag cavity was filled to seal this area from seepage and that area remains reasonably sealed off.
- The existing CMP culvert through the control structure serves no function. The inlet has been sealed off there appears to be no seepage of water through the culvert.

LAKE LEVEL ISSUES - GENERAL

Having GPS elevation benchmarks at the Stager and Fortune Lake outlet structures make it convenient to verify the lake levels are within their prescribed limits. This information makes it convenient to determine if additional seepage control work is required at the control structures to maintain those levels. The Stager Lake and Fortune Lakes have graduated gauges affixed to the inlet areas of the control structures but the markers need numbering so calibration can be done. I also need the cross reference information to correlate the Sunset Lake marker readings to USGS.

INSPECTION INTERVALS

Each inspection that we have done over the past 20+ years provides a written as well as pictorial review of the lake control structures. It is important that routine inspections be performed on the dam structures, not only to fulfill State requirements but to verify the structures are maintained.

From a local funding perspective, I believe it to be more prudent to see monies spent continuing with maintenance repairs and physical improvements to the dam structures than on inspections, so if the interval between inspections can be adjusted, a savings could be realized.

Tom Clark and his "work crew" are to be commended for the maintenance of the control structures. The overall area of the control structures has improved over the years.

It has been a pleasure working with Tom. If you have any questions regarding this report, please contact me.

Yours truly,

GENERAL ENGINEERING COMPANY

Jerry A. Foellmi

Jerry A. Foellmi P.E.
President Emeritus, Project Manager
Michigan P.E. #6201050116

JAF/jaf

Enclosures

Cc w/enclosure: Tom Clark, Iron County Drain Commissioner



Engineers • Consultants • Inspectors

LAKE LEVEL CONTROL STRUCTURES

INSPECTION REPORT

for

**SUNSET LAKE
FORTUNE LAKE
STAGER LAKE**

October 20, 2017 Inspection

Prepared by:

GENERAL ENGINEERING COMPANY
916 Silver Lake Drive, P.O. Box 340
Portage, WI 53901
Phone: (608) 742-2169
GEC No. 990-34



Owner:

IRON COUNTY
c/o Gene Smith, County Administrator
2 South Sixth Street, Suite 7
Crystal Falls, MI 49920-1413
Phone: (906) 875-3301

SUNSET LAKE

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

DAM INSPECTION REPORT
(Act 146, P.A. 1961, As Amended)

Name of Water Sunset Lake	County Iron	Town, Range, Section Near Center Sec.7, T43N, R34W
Date Elevation Set by Court June 10, 1958	Legal Level Summer 1547.0, Winter 1546.5	Drawdown Level No Known Information
Date of Inspection October 20, 2017	Level This Date Missing lake level gauge, (Need cross-reference to USGS elevation)	High Water Mark Elevation Lake level overtopping structure at inspection.

EARTH EMBANKMENTS TOTAL LENGTH: N/A (Embankments Include Creek Banks and Lake Shoreline).

	UPSTREAM	CROWN	DOWNSTREAM
VEGETATIVE COVER	Marsh Grass/Trees	Marsh Grass/Trees	Marsh Grass/Trees
EROSION	None	None	None
SEEPAGE	N/A	N/A	None Noted
SLIDES, SLUMPS & CRACKS	None	None	None
ANIMAL BURROWS	None Noticed	None Noticed	None Noticed
WAVE ACTION PROTECTION	None	N/A	N/A
REMARKS	<p>The control structure was placed near the Sunset Lake outlet into Sunset Creek. Water level is 7½" higher than 2014 readings due to recent rains. No changes to the concrete structure from 2014. Overflow weir board is now divided into 3 sections with the middle section blocked off. Weed growth at the inlet to the structure continues to encroach. Downstream flowage level is 6" lower than the lake level but about the same as the 2011 lake level.</p>		

CONTROL STRUCTURE

Type Poured Concrete/Concrete Block	Designed By Not Known	Year Constructed Dates Scribed In Concrete are 12-2-61 & 9-1970
Warning System None	Length of Spillway 8.2 Feet	Head: 0.5 Feet with full length boards in Place
Vertical Pipe Size None	Horizontal Pipe Size None	Freeboard 0.22 Feet (2 5/8")

DESCRIBE CONDITION OF THE FOLLOWING ITEMS.

<p>Stoplog Valves & 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 & gates. The overflow weir consists of a 2x4x4' low weir stoplog plus 2x6x8' and 2x4x8' full length stoplogs above it. The top board is divided into 3 sections w/ the center section boarded up.</p>
<p>Outlet Pipe: Check for damage from ice, logs, vandalism; inside discharge pipe for settlement and/or joint separation; condition of pipe coating. N/A</p>

CONTROL STRUCTURE CONT.

Concrete Structure: Check for erosion; location of cracking, if old or new; settlement; need for crack repairs.
 Concrete structure was likely placed in two phases (12-2-61 and 9-1970). The structure remains in fair condition with spalling of the upstream face. The east wing wall settlement down and away from the main structure has stabilized. Old, existing concrete sandbags along the upstream and downstream perimeter have deteriorated away. There is no apparent settlement of the main spillway structure. An upstream lake level gage was installed around 2001 but is gone. The estimated level reading, based on previous water levels, would be 1.76 feet. The corresponding USGS elevation needs to be established and a level gauge re-installed. This structure doesn't look to have much of an impact on the lake level.

Walkway & Railing: Check if in place or removed, condition, and if adequate protection provided.
 N/A; none in place.

Trash Rack or Log Boom: Check if operable.
 N/A, none in place.

Emergency Spillway: Size, type, and condition. The control structure is the emergency spillway. There is relatively flat land on the west side of the structure that would flood if the lake level rose to the 2' mark on the gauge that is now missing.

INLET & OUTLET CHANNELS

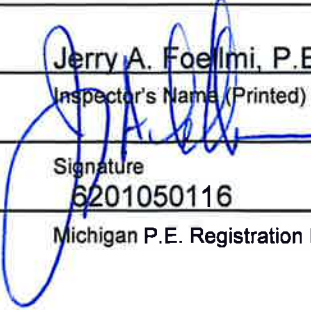
	INLET	OUTLET
SIZE	Lake narrows to 18-20 foot wide spillway	16-18 feet
EXISTING CONDITION	Natural channel	Natural channel
EROSION	None	Minor streambed erosion at structure outlet
DEBRIS & OBSTRUCTIONS	Marsh grass and reeds in vicinity are now becoming more prevalent, creating a partial blockage of the flow from the lake.	Sediment and marsh grass/reed growth has stabilized and have only a minor impact on the outlet stream flow.
RIP RAP PROTECTION	None	Rip-rap now covered with grasses.
REMARKS	Siltation in the area may pose marsh grass issue in the future.	Structure is at the Sunset Lake natural outlet into Sunset Creek; no apparent seepage around structure noted.

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. Two full length opening stop logs were in place. The lake level was about 7½" above 2014 which was deemed a "normal" level from previous inspections. The downstream flowage level has increased only a couple inches compared to 2014 levels. Debris in the downstream creek has not increased. The displaced east wing wall hasn't moved appreciably since the 2014 inspection. Adjacent cedar tree does not appear to be a problem any more. I would not recommend work on east wing wall as the area doesn't appear to be a leakage threat.

Inspection Ordered by Tom Clark, Drainage Commissioner
Iron County Drain Commission

Jerry A. Foelimi, P.E.
 Inspector's Name (Printed)

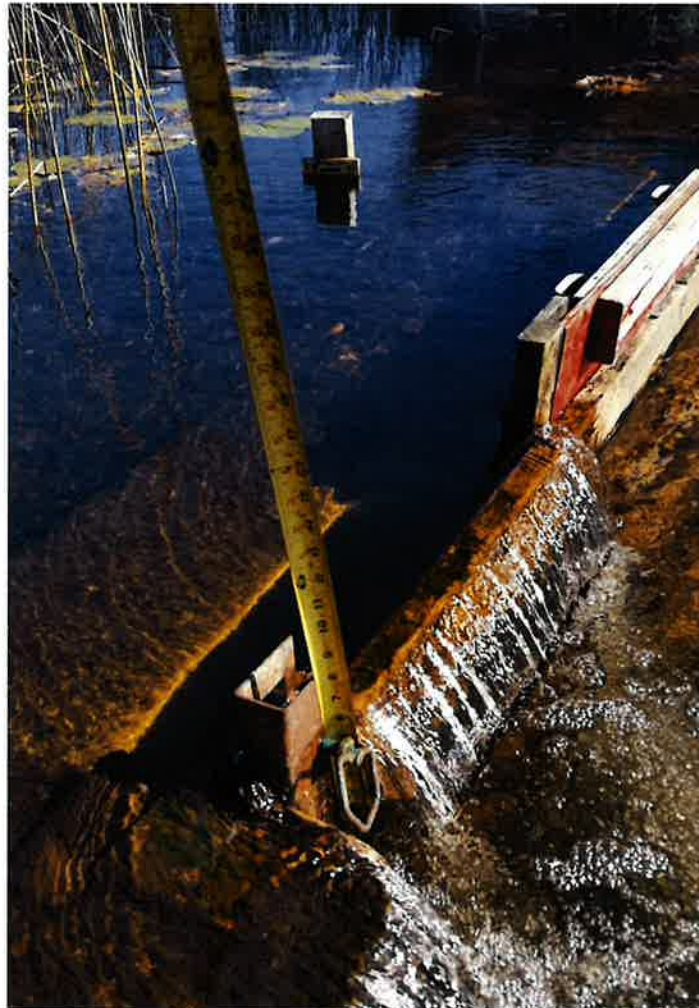

 Signature

6201050116
 Michigan P.E. Registration No.

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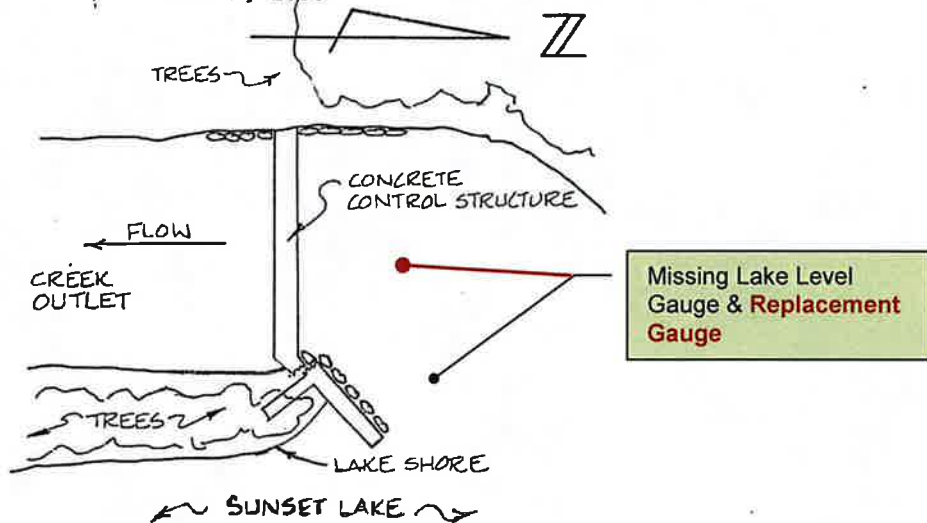




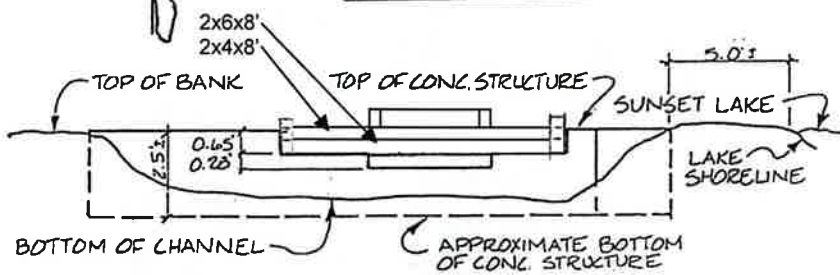
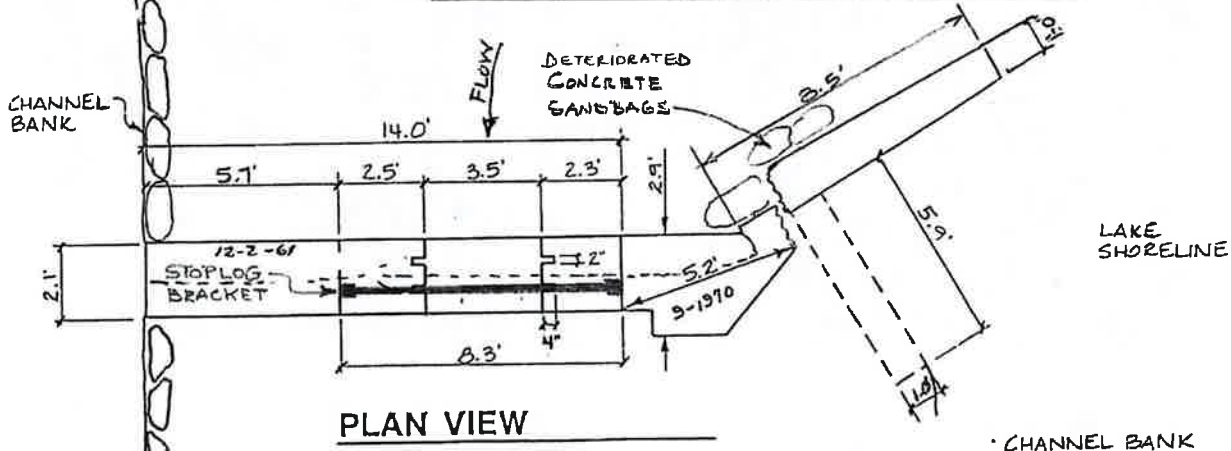
LAKE LEVEL CONTROL STRUCTURE
SUNSET LAKE
 IRON COUNTY, MICHIGAN

SEPT. 27, 1990'
 OCTOBER 24, 1997 August 29, 2008
 November 12, 2001 August 12, 2011
 June 7, 2005 October 15, 2014

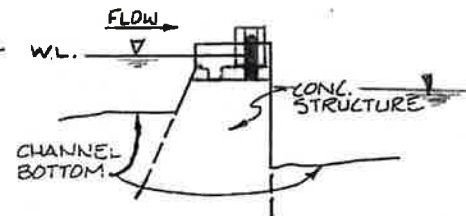
October 20, 2017



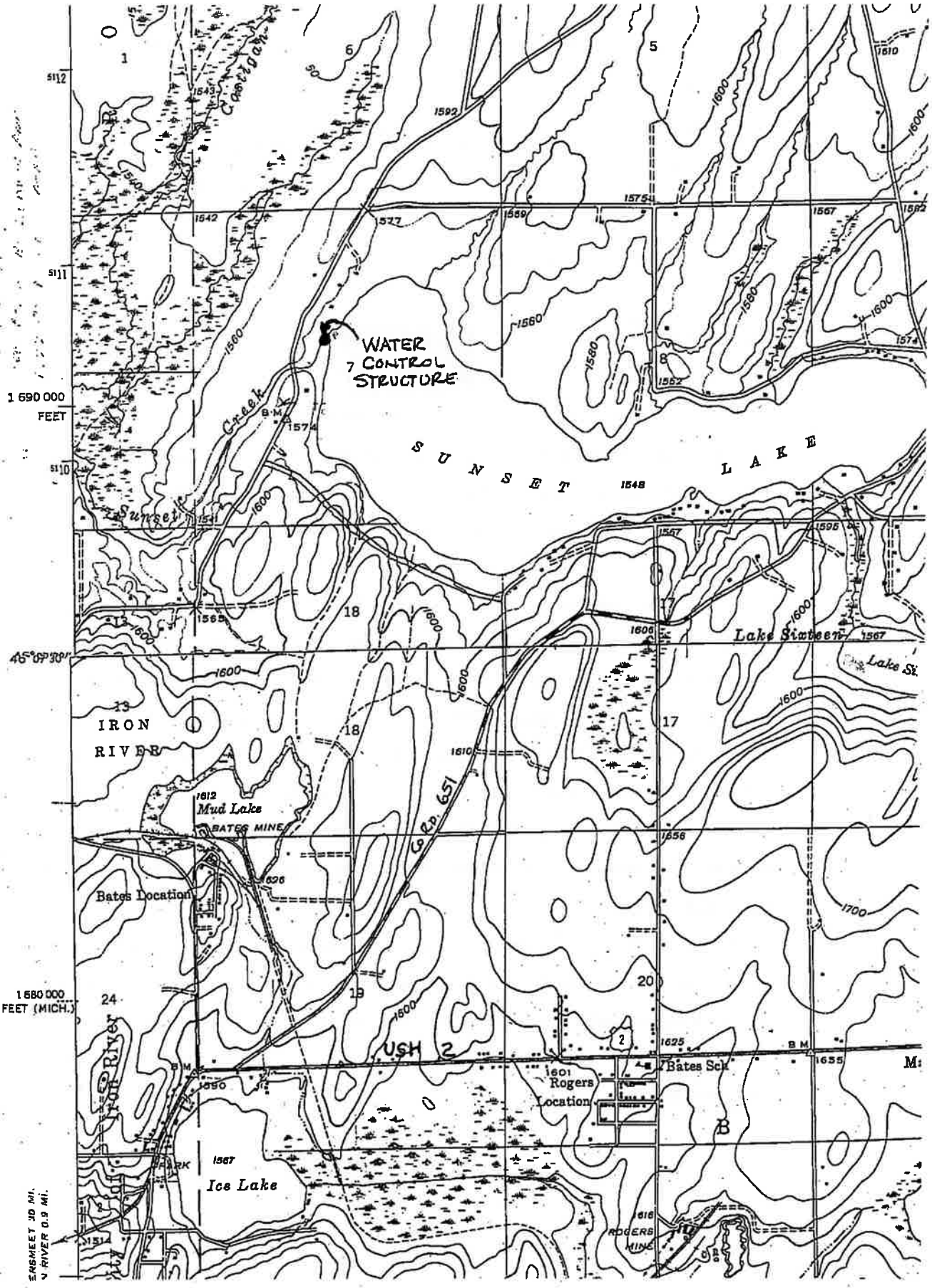
LOCATION MAP (414 W. SUNSET LAKE RD.)



PROFILE VIEW - DOWNSTREAM SIDE



SIDE VIEW



ERSHEET 30 MI.
N RIVER 0.9 MI.

STATE OF MICHIGAN

THE CIRCUIT COURT FOR THE COUNTY OF IRON -- IN CHANCERY

In the Matter of the Establishment of the :
Lake Level of Sunset Lake, located in : ORDER ESTABLISHING
Bates Township, Iron County, Michigan. : LAKE LEVEL
: File No. 6716

FINAL ORDER OF DETERMINATION OF LEVEL OF SUNSET LAKE:

At a session of said Court, held in the Court House, at Crystal Falls, Iron County, Michigan, on the 10th day of June, 1958.

Present: The Hon. Ernest W. Brown, Circuit Judge.

It appearing to the Court from the evidence presented by the Board of Supervisors through the prosecuting attorney, Oswald G. Casanova, and after hearing all interested persons appearing in Court that sufficient cause has been shown why the normal level of said lake should be established and determined and that the statute governing the same has been complied with;

NOW, THEREFORE, In pursuance of the provisions of Act 194 of the Public Acts of 1939, as amended, I do hereby fix the summer level of Sunset Lake at One Thousand Five Hundred and Forty-seven feet (1547') above sea level and the winter level at One Thousand Five Hundred Forty-six and Five-tenths feet (1546.5) above sea level, said winter level to commence on the 1st day of November and to terminate on or about the 1st day of May, within the discretion of the agent of the Board of Supervisors to be hereafter appointed by said Board, said sea level to be based on U.S. Geological survey datum (1929 adjustment).

The Board of Supervisors is hereby ordered to set a permanent monument commemorating the establishment of these levels in some suitable place in proximity to said lake within one (1) year from the date hereof and a copy hereof shall be forthwith recorded in the office of the Register of Deeds for Iron County.

Ernest W. Brown
Ernest W. Brown, Circuit Judge

Helen Johnson
Helen Johnson, Clerk of the Court

FORTUNE LAKE

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

DAM INSPECTION REPORT
(Act 146, P.A. 1961, As Amended)

Name of Water Fortune Lake	County Iron	Town, Range, Section Near SW Cor. Sect. 23 T43N,R33W
Date Elevation Set by Court June 4, 1970	Legal Level: 1365.90 – Black Mark on Pipe (1365.70 Nov 1-May 1 Optional)	Drawdown Level No Known Information
Date of Inspection October 20, 2017	Level This Date: 1365.6 (3 1/2" below black mark on pipe)	High Water Mark Elevation Top of spillway planking (10" to 12" above mark or elev. 1366.9+)

EARTH EMBANKMENTS TOTAL LENGTH: Approx. 200 feet on east side and 100 feet on west side
(embankments blend into existing terrain)

	UPSTREAM	CROWN	DOWNSTREAM
VEGETATIVE COVER	Trees/Brush	Trees/Brush/Grass	Trees/Brush
EROSION	None Noted	None Noted	None Noted
SEEPAGE	N/A	Primary seepage is at sill plate in spillway. Minimal seepage occurs around sides of the structure. Side embankments are fully stabilized. Stop logs and sill plate adjustments are the main challenges to control seepage.	None Noted
SLIDES, SLUMPS & CRACKS	None Noted	None Noted	None Noted
ANIMAL BURROWS	None Noticed	None Noticed	None Noticed
WAVE ACTION PROTECTION	None	N/A	N/A
REMARKS	It appears the earth embankments were constructed to narrow the outlet channel. Side embankments have been bolstered with bentonite clay, treated lumber, filter fabric, concrete bags and fill for protection. Embankments are clear of brush, trees and beaver dam debris on either side of the control structure. A bench has been placed at the portage.		

CONTROL STRUCTURE

Type Treated Lumber	Designed By Martin Penkevich	Year Constructed August 1990
Warning System None - (No Tamper sign in place)	Length of Spillway 9 Feet	Head 12" (design)
Vertical Pipe Size None	Horizontal Pipe Size None	Freeboard N/A

DESCRIBE CONDITION OF THE FOLLOWING ITEMS.

Stoplog Valves & 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 & gates.

Timber structure has stoplogs supported by a timber sill - stoplogs can be manually lowered into place over the wood sill. The sill board has rotted and needs to be replaced. Tom plans to have this done in 2018. 4"x4", 4"x6" and 3"x8½" stop logs are available for use. Water boils under sill and through stoplogs when they are in place. Bypassing of the main structure is minimal because the east and west emergency spillways have been improved. The fall rains have increased the flow such that the design water level is being maintained without stoplogs. The downstream water level is held up by beaver dams and is within a few inches of the lake level. A USGS control elevation benchmark has been GPS established at the site (1365.90) but needs to be re-marked. The structure remains in very good condition.

Outlet Pipe: Check for damage from ice, logs, vandalism; inside discharge pipe for settlement and/or joint separation; condition of pipe coating.

N/A

PR-4526

CONTROL STRUCTURE CONT.

Concrete Structure: Check for erosion; location of cracking, if old or new; settlement; need for crack repairs.

N/A

Walkway & Railing: Check if in place or removed, condition, and if adequate protection provided.

Treated wood - walkway with wood handrail; 3" x 8" stoplog top support/handrail. All components are in good condition but should be repainted in the next three years. This area is an attractive location for canoe/kayak portaging.

Trash Rack or Log Boom: Check if operable.

N/A

Emergency Spillway: Size, type, and condition.

6" to 12" wide emergency spillway area on either side of the control structure. These locations are not well defined but are parts of the end areas of the control structure. The Drainage Commissioner removed stoplogs due to fall rains. The levels should be checked with possible addition of a stoplog to keep the water levels near design requirements. There is little drop to the downstream flowage due to beaver dams in that area. This needs to be addressed to allow this structure to better handle storm events.

INLET & OUTLET CHANNELS

	INLET	OUTLET
SIZE	Lake outlet narrows to 9' at spillway	Outlet widens to 12' at entrance to downstream pond area.
EXISTING CONDITION	Inlet area has been raised and structured to prevent seepage and provide level access	Natural state
EROSION	None	None
DEBRIS & OBSTRUCTIONS	None	None
RIP RAP PROTECTION	Raised and structured inlet area to protect control structure.	Rocks
REMARKS	Water level is at normal levels, per the 1" bar south of spillway structure and the water level gauge nearby. The pipe and/or level gauge need to be re-marked to show BM.	Spillway channel lined with rocks and rotten timbers from old control structure. Downstream water level is several inches higher than past inspections.

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.

The sill plate and upstream area adjacent should be cleaned out to allow a replacement sill plate to be installed/constructed. A new sill plate will allow the stoplogs to seal the water flow better. Over the next three years, the structure should be repainted. A sloped area in the NW downstream area should be raised/leveled to maintain seepage protection and allow the handrail to be repositioned. This structure remains in very good overall condition.

Inspection Ordered by

Tom Clark, Drainage Commissioner

Iron County Drain Commission

Jerry A. Foelimi, P.E.

Inspector's Name (Printed)

Signature

6201050116

Michigan P.E. Registration No.

General Engineering Company

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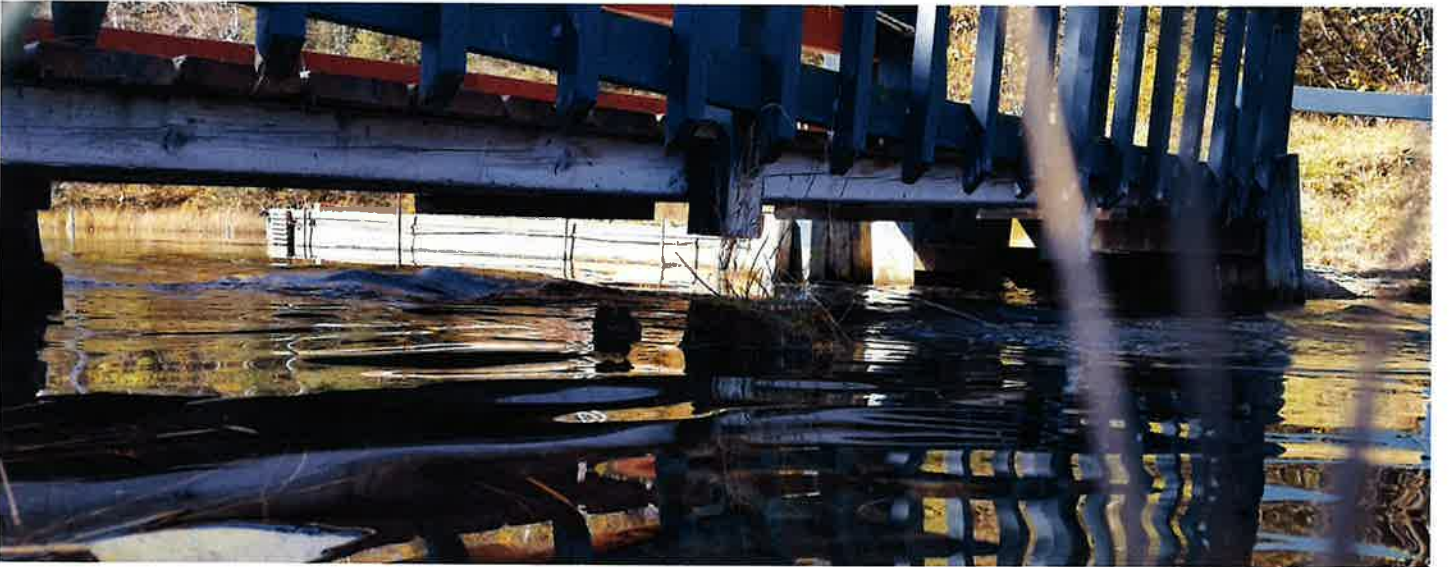
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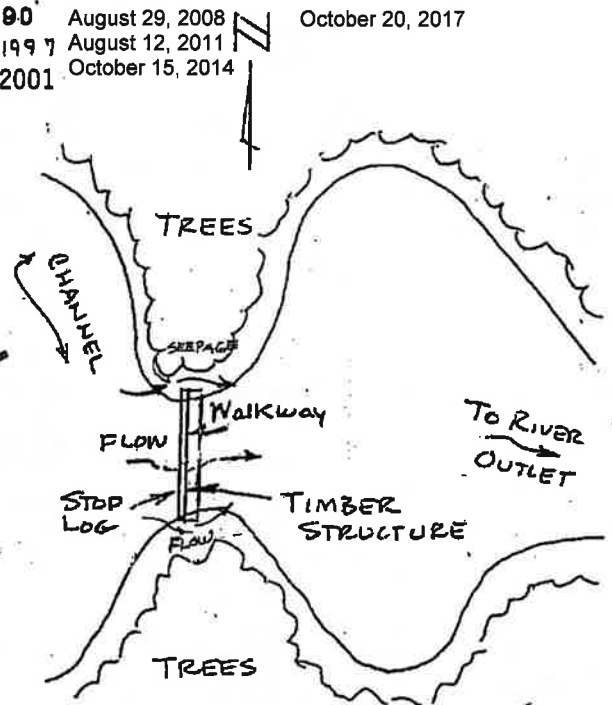




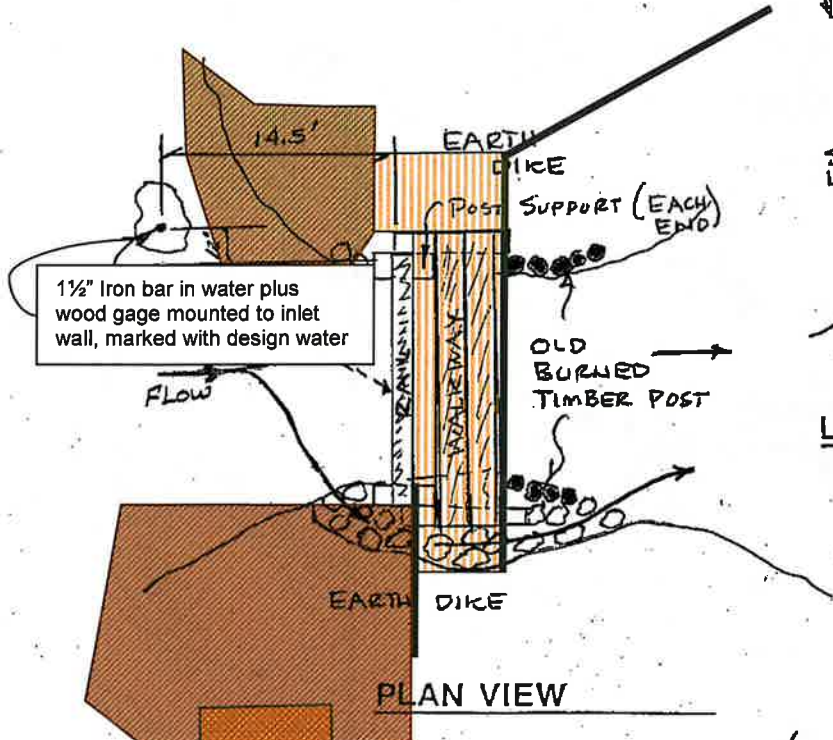
LAKE LEVEL CONTROL STRUCTURE
 FORTUNE LAKE
 IRON COUNTY, MICHIGAN

SEPT. 27, 1990 August 29, 2008 October 20, 2017
 OCTOBER 24, 1997 August 12, 2011
 November 12, 2001 October 15, 2014

TIMBER STRUCTURE
 CONSTRUCTED IN AUG. 1990
 June 7, 2005



LOCATION MAP (BIG W USH 2)
 ENTRY @



PLAN VIEW

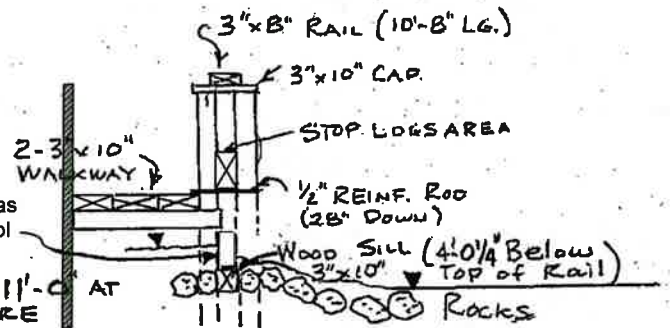
Walkway Independent of
 Stop Log Control Structure

(W.L. 3'-4 1/4" Below Top of Rail)

ELEVATION DIFFERENCE
 FROM UPSTREAM TO DOWN-
 STREAM IS APPROX 12"

8 1/2" Stoplog installed as
 needed for level control

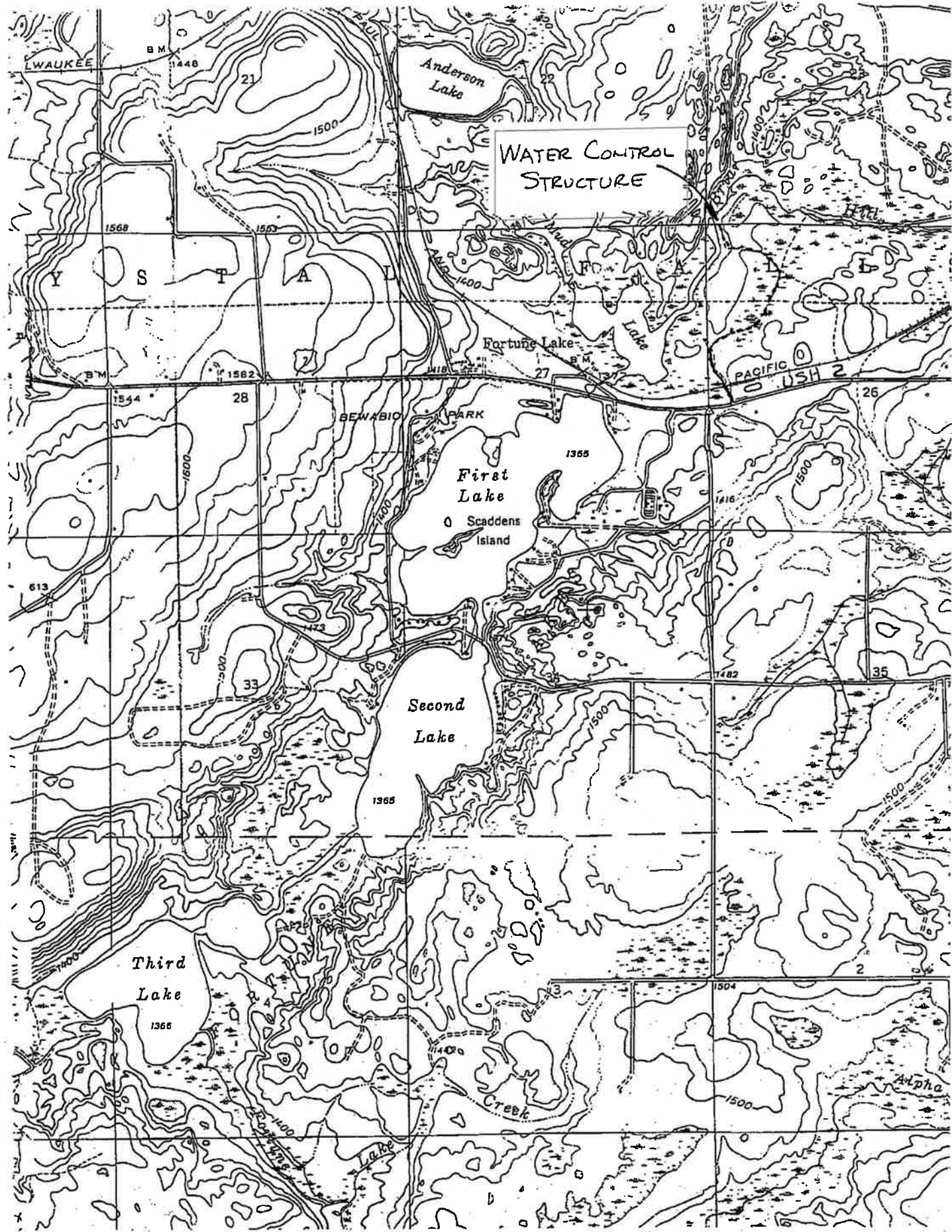
CHANNEL
 WIDTH = 11'-0" AT
 STRUCTURE



W.L. OVER SILL =

(Note: Sandbags + Rocks on either side of Sill)

ELEVATION



STATE OF MICHIGAN

CIRCUIT COURT FOR THE COUNTY OF IRON

In the Matter of the Establishment of
Lake Level of Fortune Lake located in
Crystal Falls Township, Iron County,
Michigan

ORDER ESTABLISHING
LAKE LEVEL

File No. 2.3/

At a Session of said Court, held at the Court House in
the City of Crystal Falls, Iron County, Michigan, on the
12th day of June, 1970.

Present: Honorable Ernest W. Brown, Circuit Judge.

FINAL ORDER OF DETERMINATION OF LEVEL
OF FORTUNE LAKE:


It appearing to the Court from the evidence presented by the
Board of County Commissioners through the Prosecuting Attorney,
Oswald G. Casanova, and after hearing all interested persons appear-
ing in Court, that sufficient cause has been shown why the normal
level of said lake should be established and determined and that the
statute governing the same has been complied with; NOW, THEREFORE

In pursuance of the provisions of Act No. 146 of the Public
Acts of 1961, commonly referred to as the Inland Lake Level Act,
as amended, I do hereby fix the normal water level of the said Fortune
Lake at 1365.90 feet above sea level, provided, however, that the said
normal water level may be reduced to 1365.70 feet, commencing on the
first day of November and terminating on or about the 1st day of May,
said reduction to be within the discretion of the duly appointed agent
of the Board of County Commissioners, to be hereafter appointed by
said Board and said sea level to be based on U.S. geological survey
datum (1929 adjustments).

The Board of County Commissioners is hereby ordered to
set a permanent monument commemorating the establishment of
these levels in some suitable place in proximity to said lakes, within
one year from the date hereof and a copy hereof shall be forthwith
recorded in the office of the Register of Deeds for Iron County.

Countersigned:


T. F. Hendrickson, Clerk


Ernest W. Brown, Circuit Judge.

STAGER LAKE

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

DAM INSPECTION REPORT
(Act 146, P.A. 1961, As Amended)

Name of Water Stager Lake	County Iron	Town, Range, Section T42N-R32W, SE1/4, Section 32
Date Elevation Set by Court July 21, 1958	Legal Level Summer 1288.0, Winter 1287.5	Drawdown Level No Known Information
Date of Inspection October 20, 2017	Level This Date 1288.33 (same level as shown in 2014 photos).	High Water Mark Elevation 1288.4

EARTH EMBANKMENTS TOTAL LENGTH: N/A (Outlet Creek Banks & Lake Shoreline Create Earth Embankment)

	UPSTREAM	CROWN	DOWNSTREAM
VEGETATIVE COVER	Trees/Brush	Trees/Brush	Trees/Brush
EROSION	None	No change from 2014.	None
SEEPAGE	N/A	Moderate seepage along north end of structure due to high water level. Minor seepage at south end. Minor seepage under stop log.	None
SLIDES, SLUMPS & CRACKS	None	None	None
ANIMAL BURROWS	None Noticed	None Noticed	None Noticed
WAVE ACTION PROTECTION	None	N/A	N/A
REMARKS	The control structure was placed at the creek outlet for Stager Lake. Routine cleaning of beaver dams is done by drainage commissioner. Repair & Upgrading work on structure and north end have stabilized the structure. Existing 15" culvert under overflow weir passes only a minor amount of flow through the control structure. The control structure and platform allow for convenient operation. Structure remains in good condition.		

CONTROL STRUCTURE

Type Concrete Block/2x8 Planking	Designed By Not Known	Year Constructed Not Known
Warning System None	Length of Spillway 7.4" Feet	Head 26.5"
Vertical Pipe Size N/A	Horizontal Pipe Size 15 Inches (CMCP) – non functional	Freeboard 8 Inches above design level

DESCRIBE CONDITION OF THE FOLLOWING ITEMS.

<p>Stoplog Valves & 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 & gates.</p> <p>Painted wood stoplogs in place. Wood stoplog weir is set to allow normal flow over weir. 2x8 wood planking over concrete block structure allows main flow to exit over weir. Leakage between concrete block and wood planking on either side of the weir structure occurs due to high water levels. A 4'x14' painted platform and control structure was added to make the structure more accessible and easier to maintain. Fall rains have increased the water level in the lake and adjustments to the stop logs should be made to re-attain design lake levels.</p>
<p>Outlet Pipe: Check for damage from ice, logs, vandalism; inside discharge pipe for settlement and/or joint separation; condition of pipe coating.</p> <p>Outlet pipe is a 4' section of 15" corrugated metal pipe. Pipe is rusted and serves no function. Seepage around pipe has been reduced significantly.</p>

CONTROL STRUCTURE CONT.

Concrete Structure: Check for erosion; location of cracking, if old or new; settlement; need for crack repairs. Concrete block and stoplog weir structure are solid. No settlement noticed at this time. The 2x8 painted, treated wood cap allows the control structure to function during high flow conditions with only minor seepage. The area around the 15" CMP has been repaired, reducing bypass flows. Much of the area on the upstream side of the structure has silted in and filled in with wetland plants, which protects the structure from wave action. No seepage was noted under the structure except thru culvert pipe. Seepage around the north and south ends of control structure has been reduced by use of silt fence, boards and concrete pillows. Even with the high lake level conditions, leakage between the concrete block and wood planking is not excessive. The water level is about 4" above the legal summer level. A lake level gauge has been mounted to the outlet structure.

Walkway & Railing: Check if in place or removed, condition, and if adequate protection provided. The control structure and access platform remain functional and structurally sound.

Trash Rack or Log Boom: Check if operable.
N/A

Emergency Spillway: Size, type, and condition. The treated wood planking on either side of the weir structure serves as the emergency spillway.


INLET & OUTLET CHANNELS

	INLET	OUTLET
SIZE	6 feet	9 feet
EXISTING CONDITION	Convergence of 3 small marsh streams at lake outlet	Natural creek
EROSION	None	None
DEBRIS & OBSTRUCTIONS	None noted	Rocks, bush and trees in area
RIP RAP PROTECTION	At base of structure	At base of structure
REMARKS	None	The channel banks are covered by trees, brush, and occasional boulders.

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.
The Drainage Commissioner maintains proper water flow and protects against beaver dams. The legal lake elevation marker is installed next to the outlet weir. Reference numbers should be added to the marker to check against the design level. The present 2x8 wood level control boards function well and are being maintained. As funding allows, a better long-term solution would be to add a layer of concrete block above the existing concrete block spillway structure. The concrete block dam would be extended to the northeast to tie back to the existing higher ground. The walkway and control structure should be repainted prior to the next inspection in 2020.

Inspection Ordered by Tom Clark, Drainage Commissioner
Iron County Drain Commission

Jerry A. Foellmi, P.E.
Inspector's Name (Printed)

Signature
6201050116
Michigan P.E. Registration No.

General Engineering Company
916 Silver Lake Drive, P.O. Box 340
Portage, WI 53901
Address
(608) 742-2169
Telephone No.





LAKE LEVEL CONTROL STRUCTURE
STAGER LAKE
 IRON COUNTY, MICHIGAN

SEPT. 27, 1990⁺

OCTOBER 24, 1997

November 12, 2001

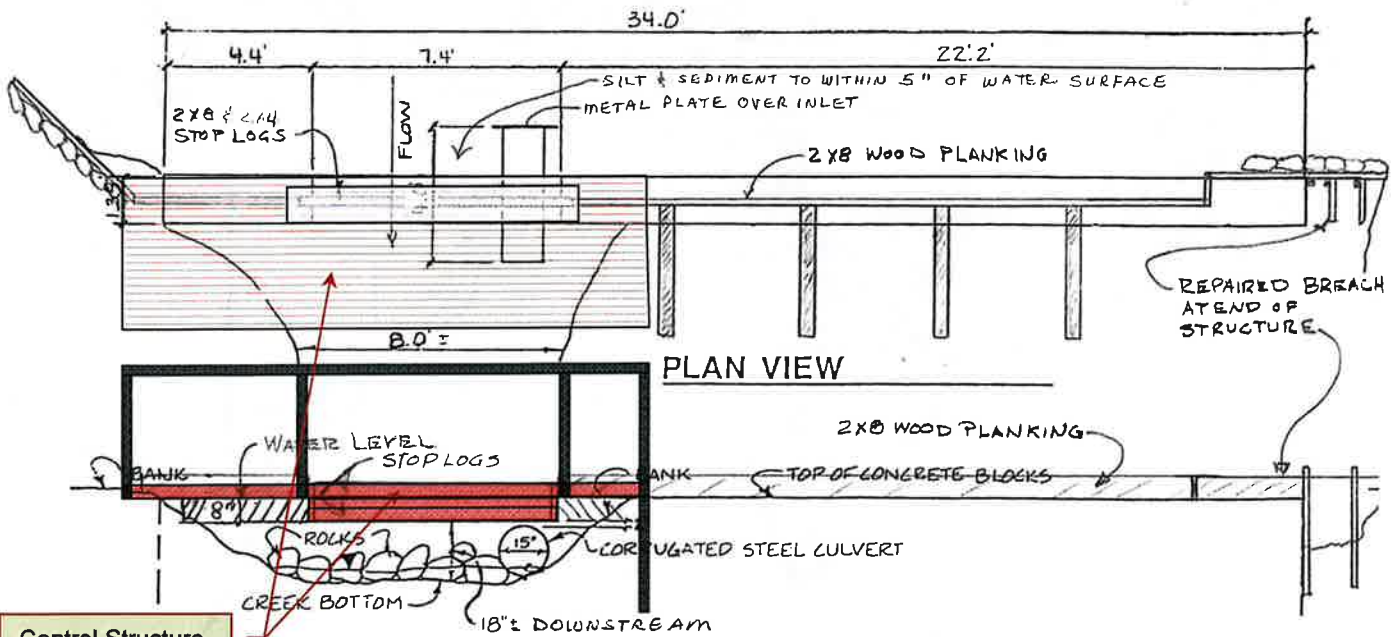
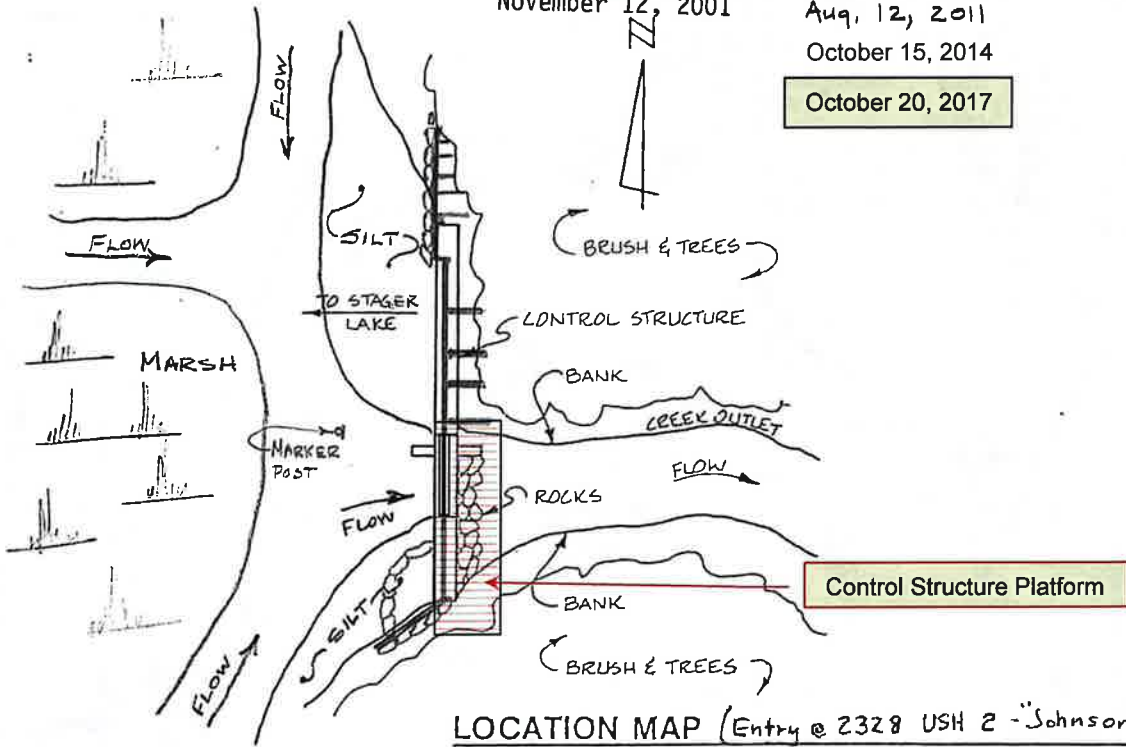
June 7, 2005

Aug. 29, 2008

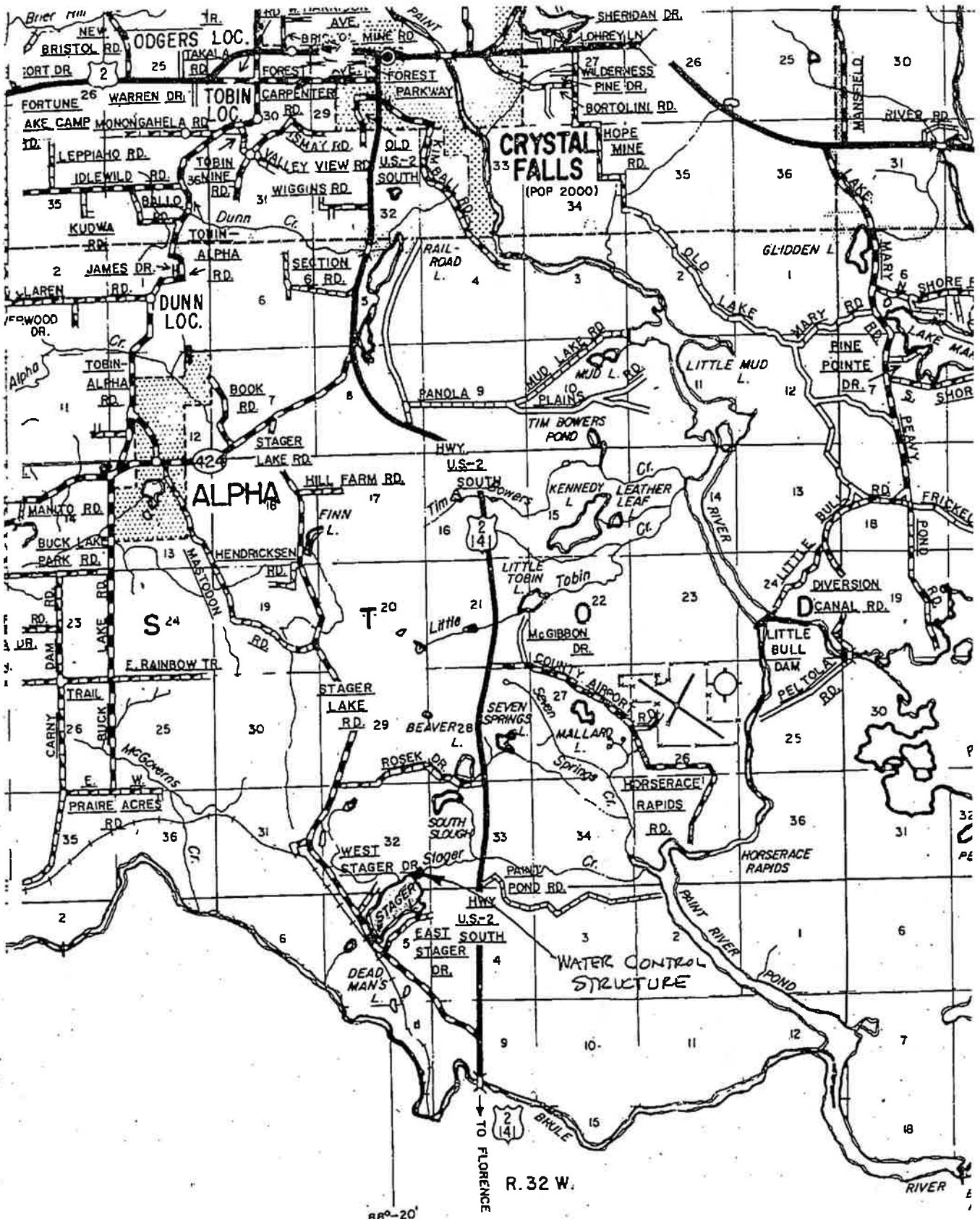
Aug. 12, 2011

October 15, 2014

October 20, 2017



Control Structure Platform



STAGER LAKE

STATE OF MICHIGAN

THE CIRCUIT COURT FOR THE COUNTY OF IRON -- IN CHANCERY

In the Matter of the Establishment of the :
Lake Level of Stager Lake, located in : ORDER ESTABLISHING LAKE LEVEL
Mastodon Township, Iron County, Michigan :
: File No. 6715

FINAL ORDER OF DETERMINATION OF LEVEL OF STAGER LAKE:

At a special session of said Court, held in the Dickinson County Court House in Iron Mountain, Michigan, on the 2nd day of July, 1958.

Present: The Hon. Ernest W. Brown, Circuit Judge.

It appearing to the Court from the evidence presented by the Board of Supervisors through the prosecuting attorney, Oswald G. Casanova, and after hearing all interested persons appearing in Court that sufficient cause has been shown why the normal level of said lake should be established and determined and that the statute governing the same has been complied with;

NOW, THEREFORE, In pursuance of the provisions of Act 194 of the Public Acts of 1939, as amended, I do hereby fix the summer level of Stager Lake at One Thousand Two Hundred Eighty-eight feet (1,288') above sea level and the winter level at One Thousand Two Hundred Eighty-seven and Five-tenths feet (1,287.5') above sea level, said winter level to commence on the 1st day of November and to terminate on or about the 1st day of May, within the discretion of the agent of the Board of Supervisors to be hereafter appointed by said Board, said sea level to be based on U.S. Geological survey datum (1929 adjustment).

The Board of Supervisors is hereby ordered to set a permanent monument commemorating the establishment of these levels in some suitable place in proximity to said lake within one (1) year from the date hereof and a copy hereof shall be forthwith recorded in the office of the Register of Deeds for Iron County.

Ernest W. Brown
Ernest W. Brown, Circuit Judge

Helen Johnson
Helen Johnson, Clerk of the Court