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Summary of the 108-page FLTF Plan for the Restoration of the Four Lakes of Gladwin and Midland County dated May 2021

Read the full report here: [restoration_path_forward_final_5.17.21.pdf \(four-lakes-taskforce-mi.com\)](https://www.four-lakes-taskforce-mi.com/restoration_path_forward_final_5.17.21.pdf)

This provides a 5-page summary focused on Secord taken from the 108-page FLTF Plan for the Restoration of the Four Lakes of Gladwin and Midland County dated May 2021. We encourage you to read the entire report as it illustrates the detail, complexity, numerous required environmental studies, regulations, and professional approach to develop and implement this restoration plan. Here is a summary focused primarily on Secord:

On May 19, 2020, and after days of steady rain, the Edenville Dam in Gladwin County, Michigan, failed. The resulting surge overwhelmed the Sanford Dam in Midland County, causing it to fail. The upstream Secord and Smallwood dams were also damaged by the flood and the Federal Energy Regulatory Commission (FERC) ordered the private dam owner, Boyce Hydro Power (Boyce), to fully lower both lakes for inspection and repair. Ten thousand people were evacuated, the area was declared a national disaster by the president of the United States and the community was left with extensive economic, environmental and property damage.

The recovery (i.e., interim stabilization) and restoration of the four dams (Secord, Smallwood, Edenville and Sanford), and the four lakes (Secord, Smallwood, Wixom, and Sanford) (Four Lakes) along with their ecosystems is estimated to cost between \$250 and \$300 million.

FLTF published its Recovery and Restoration Plan in September of 2020. In it, FLTF committed to having a feasible plan for the restoration of the lakes by May of 2021. In December 2020, the counties obtained the title of the dams, gaining control of the properties, and making it possible to begin work in earnest to restore the lakes.

Engineering and financing to fund the capital improvements to restore the four dams are underway. **FLTF is committed to restoring Secord and Smallwood legal lake levels by 2024**, Sanford by 2025 and Wixom by 2026. FLTF's plan to accomplish this is summarized in the report.

Secord Dam Construction Requirements and Cost Estimates – from pages 37 - 41

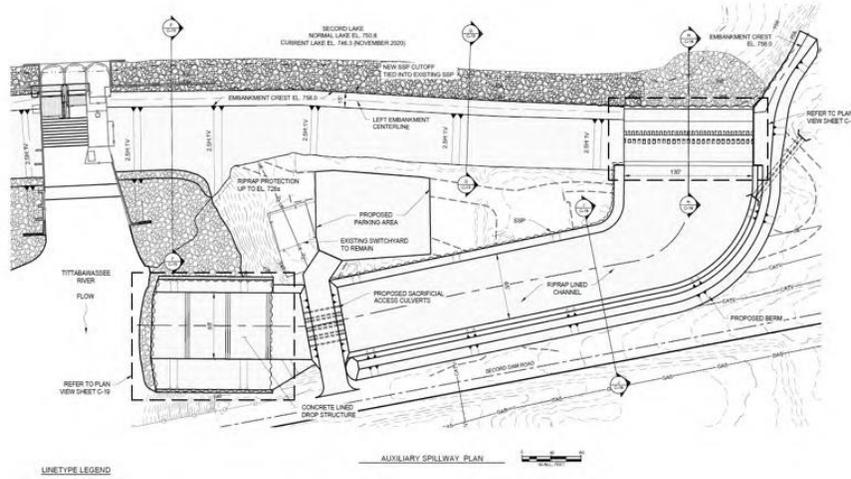
Several fundamental dam safety issues must be addressed before the water levels can be permanently raised:

- Insufficient spillway discharge capacity to meet regulatory criteria, including EGLE requirements.
- Inadequate downstream embankment slope and seepage stability.
- Inadequate height and length of the downstream spillway training walls to prevent overtopping and reduce erosion during high flow events.
- Embankments leak excessively and lack internal filters and drains to protect against seepage-induced internal erosion.
- Inadequate embankment slope armoring to prevent damage from erosion and back cutting during floods.
- Areas of structurally unsound concrete at spillway and powerhouse that need repair and stabilization.
- Restore dam to have a permanent low-level outlet to base pass flows during winter and provide a means to draw down the impoundment below the spillway sill elevation.

New Auxiliary Spillway

A new, 130-foot-wide pin flashboard overflow spillway will be constructed across the top of the left embankment at elevation 748.5 feet. Fusible steel pipe stanchions embedded in the concrete floor slab will support 42-inch-tall timber flashboards to maintain the normal summer pool at elevation 750.8 feet. The flashboard and pipe stanchions will be designed to fail by bending over downstream when flood flows exceed what the gated spillway can pass and overflow 12-inches to 18-inches over the top of the flashboards. These types of spillways have been used successfully at other dams for over 100 years.

FIGURE 19: Plan View of Proposed Secord Dam Auxiliary Spillway



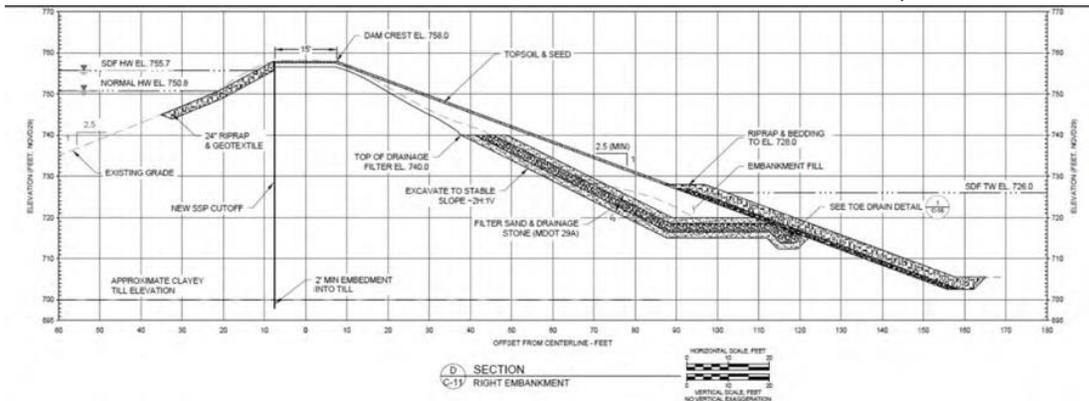
Powerhouse Modifications

To help manage ice on the crest gates, a reliable low-level outlet will be developed by retrofitting the existing powerhouse to pass base flows during the winter (100 to 200 cubic feet per second (cfs)) at a reduced winter pool three feet below the summer pool. This will be accomplished by removing the existing generator, turbine shaft, wicket gates, ancillary mechanical and electrical equipment, installing a bulkhead over the runner pit and fixing the runner into place. A new upstream slide gate will be used to control flows at the intake and provided with protective trash racks.

Embankment Repairs

The downstream slope will be flattened to improve stability and an upstream sheet pile seepage cutoff from the dam crest into the clay hardpan foundation will be installed across right and left embankment dams. The downstream overlay fill will include an internal filter and drainage layers will be installed to protect against seepage-induced internal erosion. The drainage systems will discharge to a weir to allow monitor seepage rates.

FIGURE 20: Cross-Section View of Secord Dam Embankment Repairs



Summary of Opinion of Probable Construction Costs for Second Dam

An engineer’s opinion of probable construction cost (OPCC) was developed to pass the ½ PMF + design storm with contingency based on the proposed preliminary design. The OPCC includes 25% contingency for all construction items and includes an allowance for site investigations, engineering design, permitting and construction engineering/management costs. The total OPCC for Second Dam to pass the ½ PMF + design storm is approximately \$25 million and is summarized as follows:

FIGURE 21: Second Summary of Opinion of Probable Construction Costs Based on the 30% Design

Item	Description	Estimated Cost
0.00	General Conditions	\$1,236,000
1.00	Site Preparation and Cofferdams	\$1,470,000
2.00	Site Demolition (Spillway and Powerhouse)	\$826,000
3.00	Left Embankment Repair and Stabilization	\$2,723,000
4.00	Right Embankment Repair and Stabilization	\$1,648,000
5.00	New Crest Gate Spillway and Outlet Works	\$4,542,000
6.00	Powerhouse Rehabilitation	\$1,000,000
7.00	Auxiliary Spillway Structure	\$1,415,000
8.00	Discharge Channel	\$3,739,000
9.00	Site Restoration	\$150,000
	Subtotal	\$18,749,000
	Contingency (25%, possible micropile underpinning)	\$4,687,000
	Construction Subtotal	\$23,436,000
	Site Investigations, Engineering, Permitting and Construction Management	\$1,700,000
	Total Estimated Cost	\$25,136,000

Permitting Summary for Second Dam – from pages 69 - 70

Second Dam did not fail, rather was ordered by FERC to be lowered. EGLE views the proposed construction activities at Second Dam as maintenance and improvement of an existing structure. This simplifies the environmental permitting requirements for construction. The proposed restoration schedule of the dam has construction beginning in early 2023. As part of this schedule, environmental permit applications would be submitted in 2022. To aid and expedite EGLE’s review of the application, EGLE permitting staff is involved in design progress meetings.

Concerning Part 301 (Inland Lakes and Streams), impacts are anticipated during construction. These impacts would primarily be the placement of fill below the ordinary high-water mark (OHWM). Likely impacts under Part 301 would include placement of riprap on the upstream face of the earthen embankment, riprap placement downstream of the dam and at the outlet of the proposed auxiliary spillway.

Regarding Part 303 (wetlands), temporary and permanent impacts are expected. To quantify the amount and type of existing wetlands on the Second Dam property, a formal wetland delineation was completed. Wetland impacts are estimated to be 0.71-acre, which exceeds the limit set by EGLE of 0.3-acre disturbance, mitigation will likely be required. These impacts are associated with re-sloping of the embankment, construction of an access road and construction of the

auxiliary spillway. The available space on the Secord Dam property is limited. FLTF anticipates mitigating for the construction impacts at the Smallwood Dam site, where FLTF has access to more property. Construction activities will take place within the Part 31 regulated 100-year floodplain. Impacts are expected in the area immediately downstream of the dam. These impact volumes have yet to be calculated; however, if compensating excavation this will be in the construction plans. FERC is in the process of terminating the active FERC license at the Secord Dam hydropower facility.

Upon termination of the license, regulatory jurisdiction will shift from the federal government to EGLE. The Dam Safety Unit within EGLE would need to provide a permit for any construction activities on the dam features including work to the embankments, spillway, tailrace area and powerhouse. As the design progresses, EGLE will continue to be actively involved to ensure all activities are permissible.

Lastly, the construction activities at Secord Dam will require an SESC permit. The Gladwin County Soil Conservation District will be the governing office to issue the permit. Typically, SESC permits are the responsibility of the contractor and this permit will be acquired once the project is bid, and the contract has been awarded.

Secord Lake assessment based on current planning estimates – page 87

\$11,353 principal to payoff and \$505/year for a lakefront parcel

\$2,838 principal to payoff and \$126/year for a backlot parcel

SLA Editor’s Note: *It is our understanding the \$505 / year includes ongoing special assessment district funding for operations and maintenance of the dams. More detail into how this is proposed is contained in pages 75 – 86 of the 108-page FLTF Plan for the Restoration of the Four Lakes dated May 2021. There is significant work earmarked for this area as well as the opportunity to secure state, federal and private funding to reduce the capital improvements costs to property owners.*

Secord Lake has 1,995 front lot parcels and 120 backlot parcels, for a total of 2,115 parcels. Of those parcels, FLTF has determined that 1,973 of these parcels will likely be assessable. Approximately 51% of the parcels on Secord are homesteaded, with nearly as many secondary homes as there are primary homes on Secord Lake. Based on the current assessment numbers and the below data which compares market value to assessment principal, Secord Lake has an assessment that a significant majority of the lake has an ability and willingness to pay. There is still more investigation on lake benefit to complete.

FIGURE 49: Secord Front Lot Homestead and Non-Homestead Parcels

	Number	Percentage
Total Parcels	1,995	N/A
Total Assessable Parcels	1,881	100%
Undeveloped/To be Resolved	71	4%
Parcels under 30% Assessment/Market Value	1,711	95%
Homestead Claimed	918	51%
Homesteads under 30% Assessment/Market Value	918	100%
Average Market Value for Assessable Parcels	\$154,054.00	N/A
Market Value at 30% Assessment	\$37,844.88	30%
Market Value Range for Assessable Parcels	\$2,800 to \$741,200	N/A
Second Quartile (Median Home Value)	\$137,600.00	50%

FIGURE 50: Secord Backlot Homestead and Non-Homestead Parcels

	Number	Percentage
Total Parcels	120	N/A
Total Assessable Parcels	92	100%
Undeveloped/To be Resolved	3	3%
Parcels under 30% Assessment/Market Value	76	85%
Homestead Claimed	40	45%
Homesteads under 30% Assessment/Market Value	40	100%
Average Market Value for Assessable Parcels	\$48,137.08	N/A
Market Value at 30% Assessment	\$9,461.22	30%
Market Value Range for Assessable Parcels	\$2,800 to \$218,400	N/A
Second Quartile (Median)	\$27,600.00	50%

Project Implementation — Risks and Conclusion – pages 97 & 98

Each lake faces risks that could negatively impact Four Lakes Task Force’s ability to implement a capital improvement project that is needed to restore the lake. Furthermore, each lake has risks that the lakes will be restored but the schedule to implement may be delayed. At this stage of the project, this initial report is based on 30% developed engineering concepts and provided a construction estimate of \$215 million with a +/- 25% confidence level. FLTF is moving forward with final engineering and permitting, and once final engineering is completed, our confidence level in the overall project cost, as well as an overall understanding of needed assistance with project costs, will increase.

Risks that can impact project cost and overall implementation and schedule do exist. The risks include issues ranging from spillway capacity requirements to the ability to finance the project. FLTF has conducted a risk analysis assessment to identify areas of risk and develop a corresponding mitigation plan to address the risk.

Critical Factors by Lake

Tabulated below are the critical factors for success that were identified in this Feasibility Report.

FIGURE 63: Critical Factors by Lake

Critical Success Factor	Criteria	Sanford	Edenville	Smallwood	Secord
Recovery Completion	Year	2023	2022	2021	2021
Projected Rebuild Completion Date	Year	2025	2026	2024	2024
Environmental Restoration Plan For Permitting	Required	YES	YES	NO	NO
Funded thru Start of Construction	Funds Needed \$\$ Millions	\$4 million	\$4 million	\$0	\$0
Projected Cost to Rebuild	Required Funds \$\$ Millions	\$51 million	\$121 million	\$18 million	\$25 million
Ability to Finance	Multiple Paths USDA Only Challenged	USDA	Challenged w/o Grants or other sources	Multiple	Multiple

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You can also visit these websites:

Four Lakes Task Force at <https://www.four-lakes-taskforce-mi.com/about.html>

and

Secord Lake Association at www.secordlakeassociation.org

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