

Four Lakes Task Force

Smallwood Lake Update on Repair & Schedule

February 4, 2021



Four Lakes Task Force



AGENDA

- ❑ Introduction and Welcome – Mark Mudge
- ❑ Priority Topics – Dave Kepler
- ❑ Repairs to Restore Legal Lake Levels – Rick Anderson
- ❑ Schedule – Ron Hansen
- ❑ Summary– Dave Kepler



PRIORITY TOPICS

Dave Kepler
President, Four Lakes Task Force



Our Communities Must Be Stewards of the Lakes



We are committed to bringing back Smallwood Lake. We have a plan that is funded up to the approval of financing for construction.

We will need community support and advocacy to make this plan work.



We are addressing the critical issues to stabilize and secure the dam by this May. This only reduces risk at the lower lake level.

It was wrong for Boyce and others to suggest a few repairs would allow the lake to be filled.



Smallwood Dam is a high hazard dam. The dam was not healthy before the May 19 flooding and it is unsafe to raise the water levels until the dam is permanently repaired.

Critical Repair Investigation Is Not Completed

- ❑ **Independent Forensic Team Investigation Findings.** FERC staff confirmed the investigation is still in progress. FLTF expects the investigation will be completed in 2021, but neither FERC, the State, nor FLTF have any control over the investigation team. The team is completely independent.

We may have to adjust some engineering, but feel it is an appropriate cost risk to maintain the schedule





RESTORING LEGAL LAKE LEVELS

Rick Anderson
Lead Dam Safety Engineer, GEI Consultants

Main Repair Priorities for Smallwood

7

There are several fundamental repair issues that must be addressed before the water level can be raised:

- ❑ Insufficient spill capacity to meet regulatory criteria, including State of Michigan requirements.
- ❑ Structurally unsound spillway rollway and training wall concrete.
- ❑ Embankment lacks filters and drains to protect against seepage-induced internal erosion.
- ❑ Inadequate embankment slope armoring to prevent damage from erosion and back cutting during floods.

Smallwood Dam falls significantly short of current design standards in terms of safely passing the design flood.



Critical Repair Items (continued)

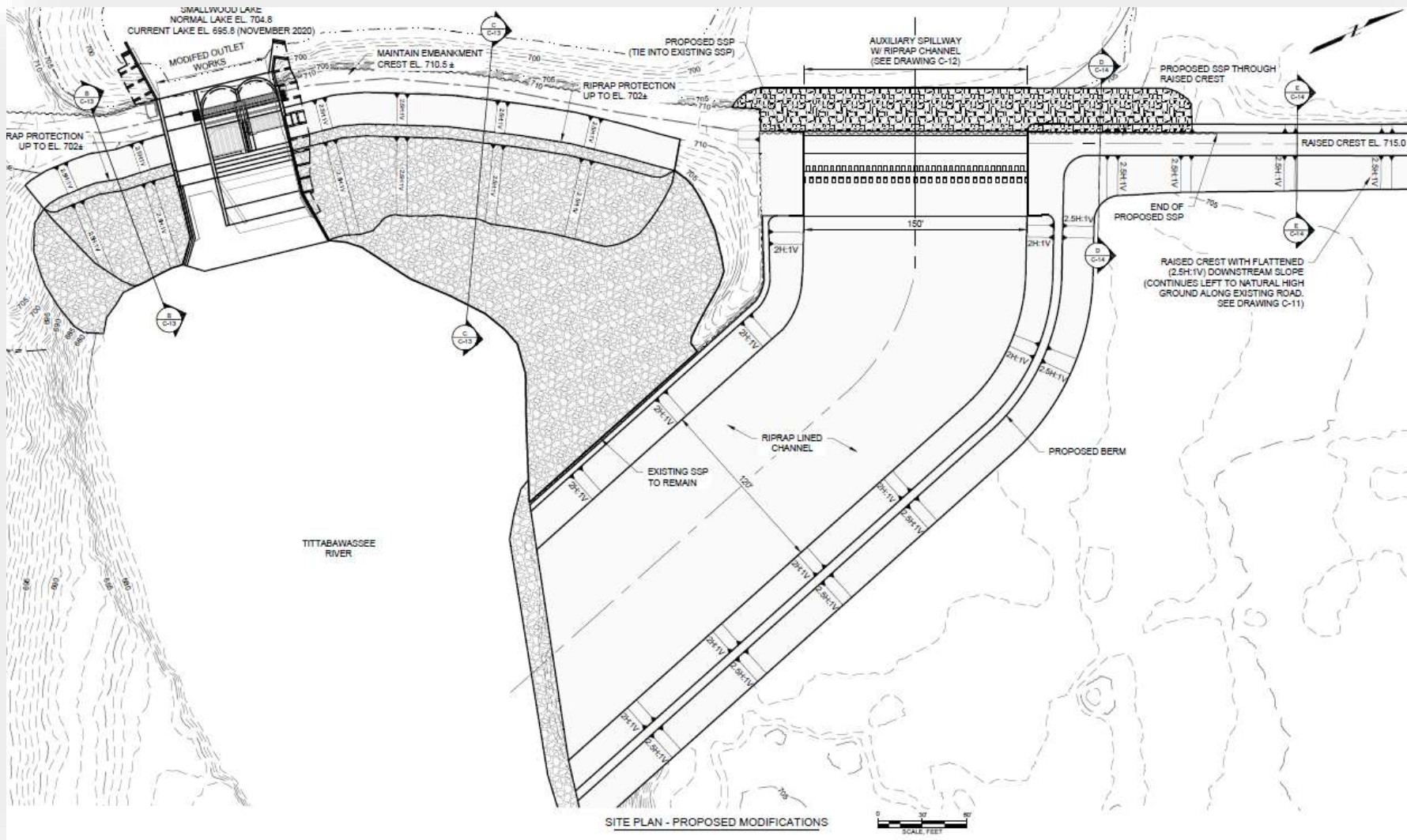
- ❑ **Spillway Adequacy.** Smallwood is classified a High Hazard dam. The existing “zero freeboard discharge capacity” (i.e., filling the lake to the brim with no room for wave action or wind run-up) is 10,200 cubic feet per second (cfs).
- ❑ According to the latest flood analysis, the capacity needed is at least 24,100 cfs.
 - ❑ ***A risk-based study is not yet completed to determine the final capacity.***
- ❑ These values will likely change based on the probable maximum precipitation (PMP) and updated flood studies currently planned for completion this year.

- ***It would not be responsible for the Smallwood Lake Community or FLTF to bring up the lakes before new increased spillway capacity is installed.***
- ***It is very unlikely that regulators would permit such an action.***

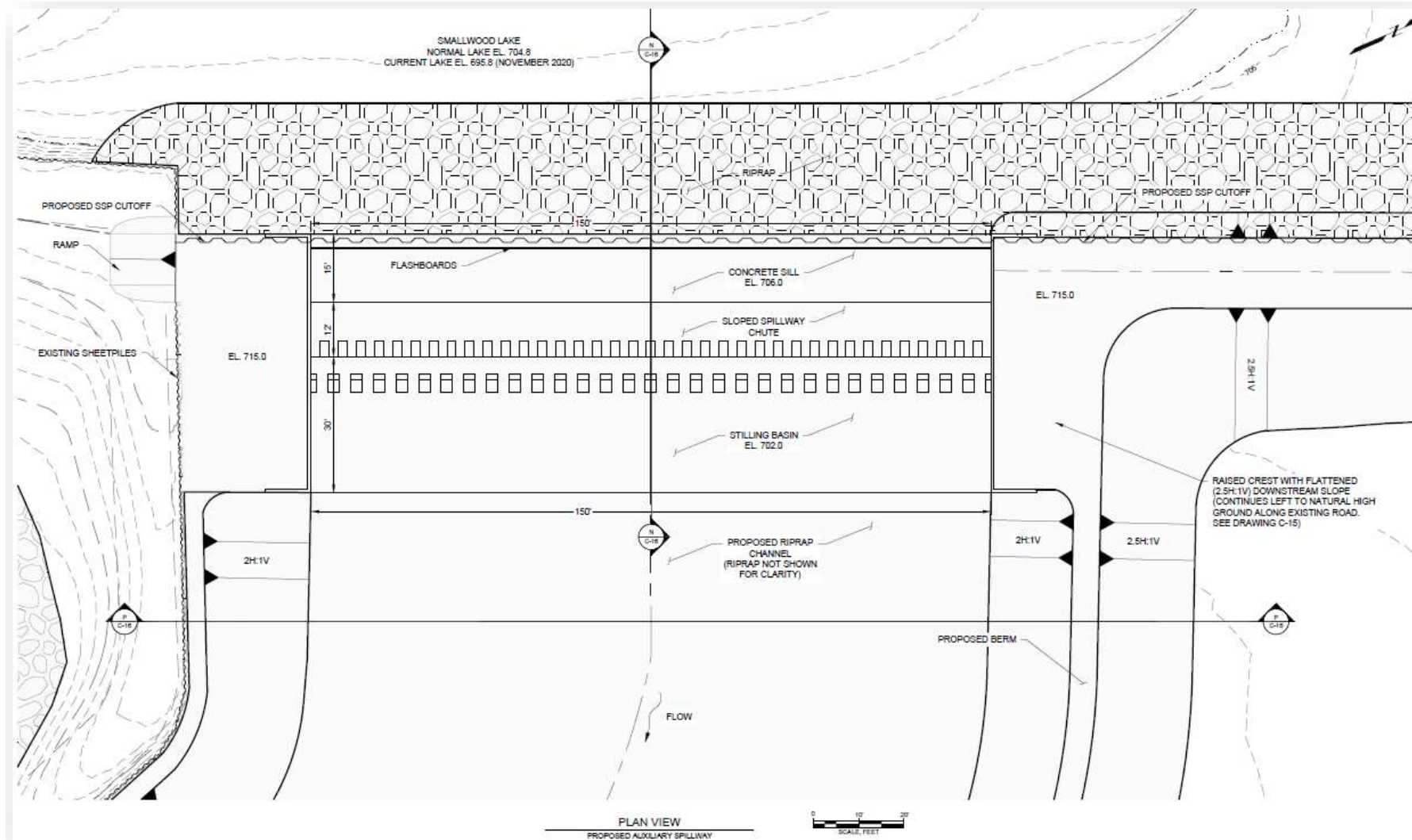
Engineering Requires an “Inflow Design Flood” (IDF)

- ❑ **The FERC flood requirements were prescriptive and based on rain studies from 1993.** With the recent 2017 and 2020 rains, FLTF is redoing flood studies to ensure the dam design is risk-based and considers regional rain and flood studies.
- ❑ **Spillway capacity is based on an Inflow Design Flood that requires these steps:**
 1. Site-specific Regional Probable Maximum Precipitation (PMP) studies which are underway. The PMP study will inform flood studies that are in final development.
 2. Inundation mapping for a range of frequency of flows from the 100-year flood to the Probable Maximum Flood (PMP)
 3. Identify potential failure modes for each dam over the range of flood flows
 4. Quantify the Consequence of Failure Analysis for each failure mode flow
- ❑ **The IDF is established by applying risk-based decision-making criteria to the above**
 - ❑ FLTF process aligns with FEMA guidelines
 - ❑ The Michigan Dam Safety Task Force is recommending the guidelines for Michigan dams

Smallwood Dam – Proposed Repair Plan View



Proposed New Auxiliary Spillway



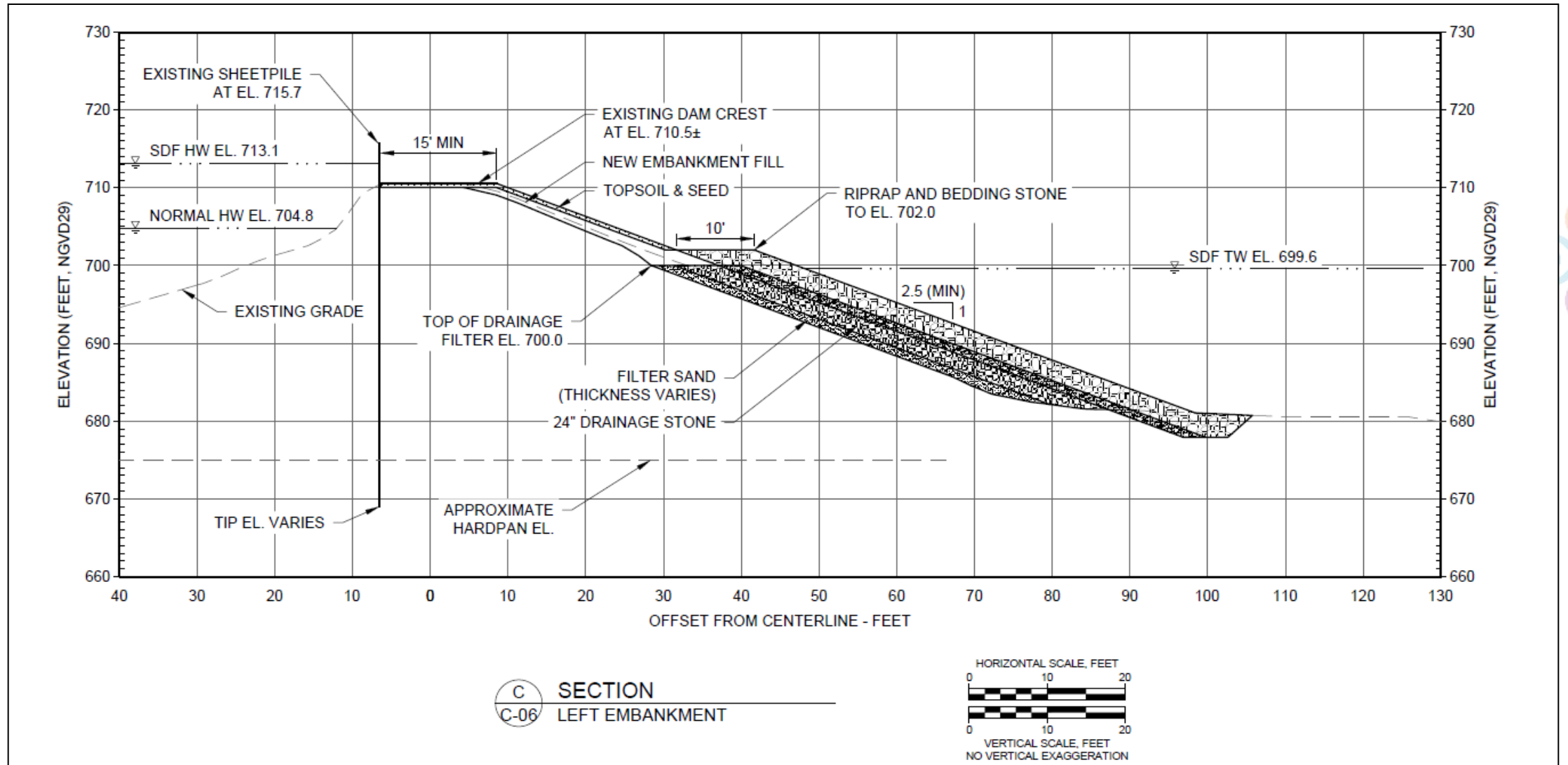
Critical Repair Items

- ❑ **Water Retaining Structures.** The earthen embankments are of similar design to the Edenville embankment, which failed during the May 2020 flood event. The upstream steel sheet pile wall helps protect the embankment against overtopping, however spill capacity is lacking and the embankments have inadequate internal stability against seepage and slope protection during floods.
- ❑ A July 21, 2020 FERC letter identifies concerns with embankment seepage, sloughing and the functionality of the drainage system.



- ***Geotechnical investigations and structural analyses are required to address these concerns.***
- ***Until these issues are addressed, the ability of the embankments to safely withstand another flood event is uncertain – at best.***

Embankment Stabilization



Coffer Dams (Temporary Dams)

Could we use a coffer dam or temporary dam to bring back the water while final repairs are being made?

A coffer dam, which is a temporary structure, is generally used to isolate a portion of the structure to enable repair in the dry. It does not have the functionality or durability of a permanent dam and would be an unjustified use of funding since it does not address the major dam safety issue of insufficient spillway capacity to meet State or Federal dam safety standards.





SCHEDULES AND TIMING

Ron Hansen
Engineer for FLTF, Spicer Group. Inc



Schedule Considerations and Constraints



We all have a duty of care to keep people safe. The Edenville Dam failed. Smallwood lake cannot come up until the dam is repaired to current standards.



Final construction timeline is dependent on receiving regulatory permits, financing approval, and establishment of the assessment rolls.



Part 307, and other Michigan statutes dictate the process. We are running parallel paths to get to the start of construction.



Engineering Design Phase

Engineering is more than just design and building of a dam. There is significant modeling, environmental impact study and permitting required.

Flood Study

PMP and PMF Study

IDF Finalization

Surveying and Easements

Inspections

Soil Borings

Embankment Analysis

Spillway and Gate Analysis

Contractor Pre-qualifications

Environmental Analysis

Wetlands, Streams,

Floodplains, Mussels, Ecosystem,

Recreation

Final Design Engineering

Geotechnical

Structural

Hydraulics

Environmental

Transportation

Drainage

Electrical

Mechanical

Soil Erosion

Landscape/Restoration

EGLE Approval

USDA Financing Approval

Local Approval

Contract Documents

Specifications

Bidding

Computation of Cost

Notice to Proceed

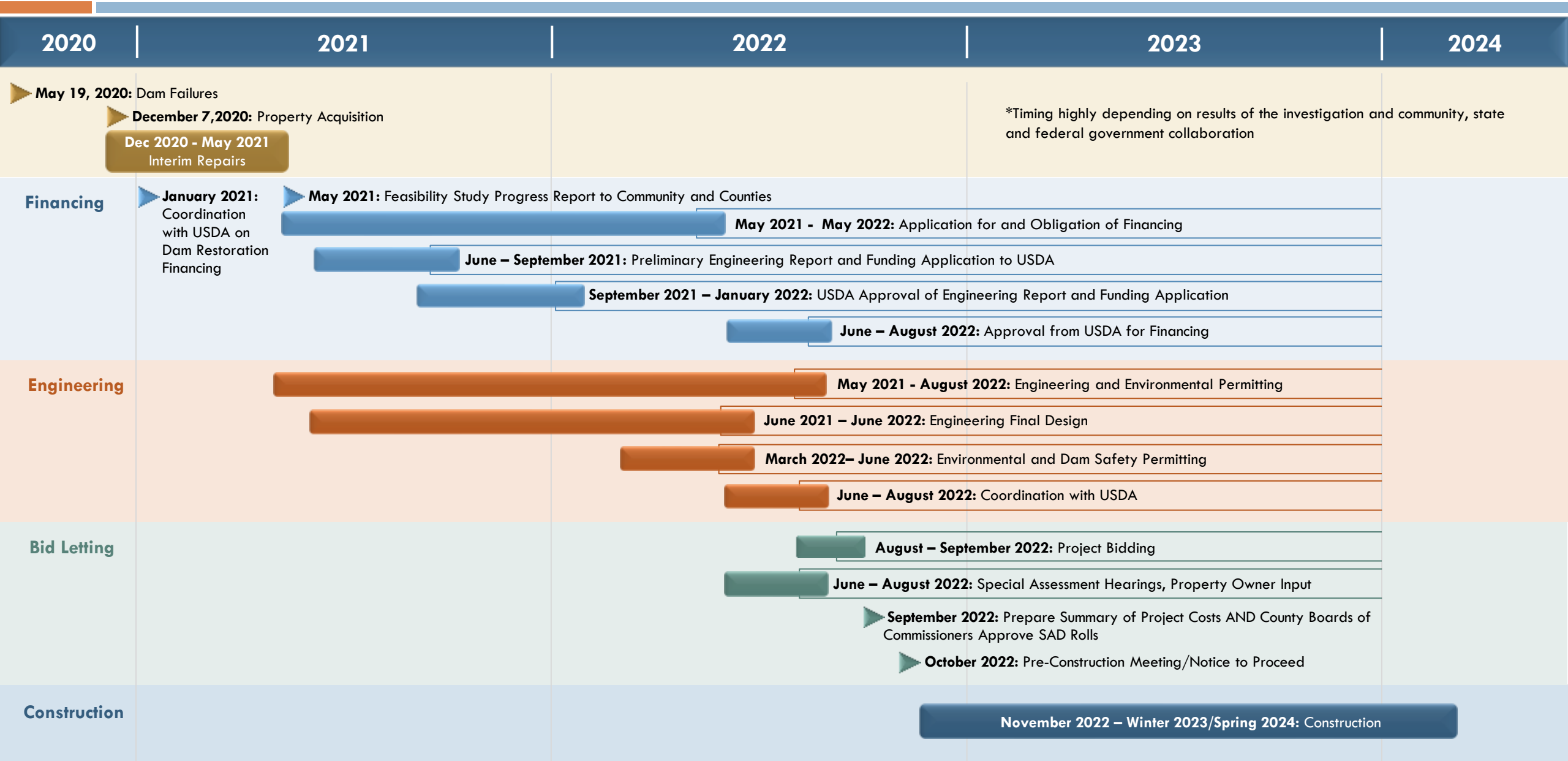


Before Construction May Begin We Need:

- ❑ Independent forensic investigation report
- ❑ Engineering
 - ❑ Preliminary engineering reports
 - ❑ Inflow Design Flood needs to be established
 - ❑ Final design and construction plans
- ❑ Submittal and Approval for USDA funding approval
- ❑ Environmental Studies and EGLE Permitting
- ❑ Bid letting and Computation of costs
- ❑ Special assessment hearings and appeals
- ❑ Approval of special assessment roll by county



Smallwood Lake Recovery and Restoration Plan* (Expedited Project Timeline)



*Timing highly depending on results of the investigation and community, state and federal government collaboration

Financing

Engineering

Bid Letting

Construction



SUMMARY

Dave Kepler
President, Four Lakes Task Force



Other Considerations

22

- **Secord and Smallwood lakes levels to be raised before Sanford and Wixom**
 - ▣ These two dams are getting all the priority and funds needed to restore the lakes
- **FLTF has allocated the funds to get the dam to approval of financing construction**
 - ▣ While new grants may offset assessments, we won't hold up the plans while we wait
- **Special Assessment District is legal and "Part 307" is the legal process for funding**
 - ▣ The methodology and SAD webpage will be updated later in February
 - ▣ The costs that were presented in December will not be updated until the May report
 - ▣ *The SAD website will be updated this month & webinar in March will provide more detail*
- **Hydropower will not reduce the assessments in the next decade**
 - ▣ And would add to the time to bring the lakes up
- **There is significant effort to manage Smallwood over the next 3 years**
 - ▣ Operations and Construction Report
 - ▣ Bottomland protection and weed control

Closing Thoughts

- ❑ **Smallwood Dam is need of significant repair.**
 - ❑ This was a hidden fact from the community for a decade
 - ❑ It is unfortunate that Boyce and others misled the community last year, and FERC's lack of action until December 9th created a false expectation.
- ❑ **We understand the urgency to restore the lake levels for the lake property owners, the local businesses and the county.**
 - ❑ But we all have a stewardship responsibility to do this safely as we restore the lake and its ecosystem
- ❑ **We are committed to bring back Smallwood Lake**
 - ❑ It is easier for government agencies if we just gave up
 - ❑ It will take community advocacy to keep this timeline





THANK
YOU

- ❑ See website for future meetings
- ❑ Sign up for weekly updates at bit.ly/FLTF-subs
- ❑ Send questions to info@fourlakestaskforce.org