City of Manawa
Manawa Mill Pond Dam Replacement
Feasibility Analysis Summary

May 28, 2025

Presented By:
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Cedar CORPORATION

Introduction

Brandon Strelow
Community Infrastructure Consultant

Joe Pingel, PE
Water Resources Engineer

Cedar Corporation: Introduction

- *50 Years in Business*
- *100 Employees throughout Wisconsin*

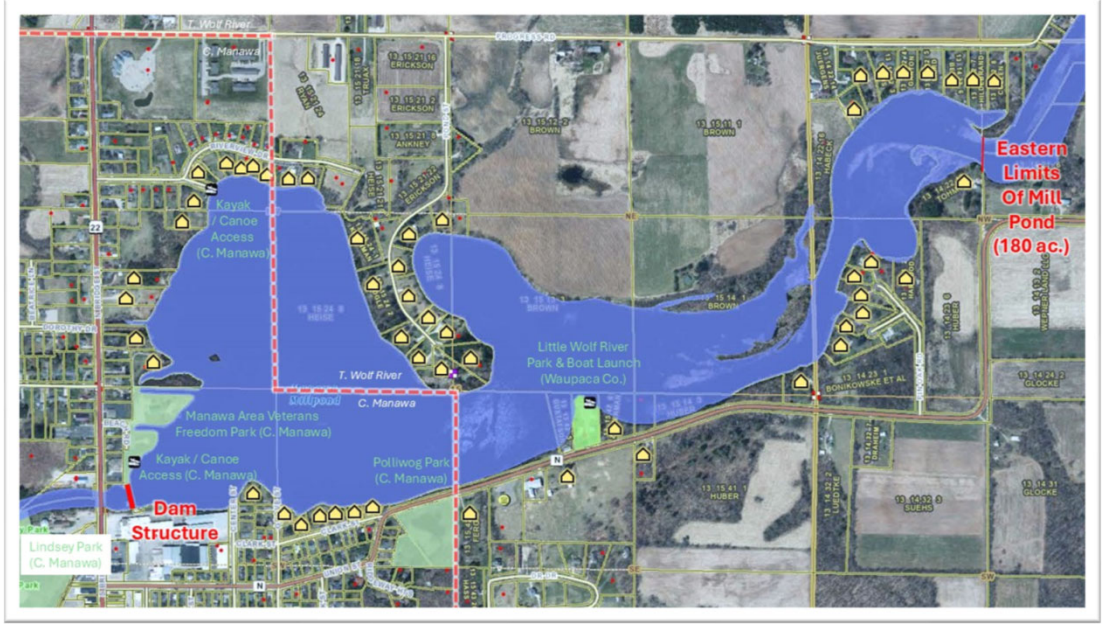
- *Professional Services:*
  - MS4 Compliance
  - Municipal Engineering
  - Transportation Engineering
  - Structural Engineering
  - Water Resources
  - Planning, Grants, & Economic Development
  - Architectural Services
  - Environmental Services
  - Wetland Delineations

Manawa Dam Overall Goal

- **Build a new dam and restore the Millpond**
  - **Based on meetings with the City of Manawa and the Town of Little Wolf**

Manawa Mill Pond

- 180-acre lake with 4.9 miles of shoreline
- Max depth of 12 feet
- Average depth of 6 feet
- 70 acres in the City
  - 22 parcels; 18 with homes
- 110 acres in the Town
  - 44 parcels; 35 with homes



Summary of the Storm Event

- On July 5, 2024, the City of Manawa experienced a catastrophic rainfall event:
  - 5.7 inches of rain in a 4-hour period
- This storm event resulted in significant flooding and created an emergency at the dam
- City Staff, Manawa Rural Fire Department, and Wiscons8, LLC responded to the emergency
- The Dam overtopped and earthen embankment failed

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Summary of Damages

- Dozens of homes evacuated
- 2 roads were damaged
- City's Wastewater Treatment Plant was flooded
- Boil-Water advisory
- Lindsey Park
  - $56,000 cleaning up debris
- $100,000 on 24 separate properties
- Damages at the Dam

Initial Response to the Dam Failure

- **Emergency work was completed as required**
- **Non-Emergency Work is dependent on funding**
  - **Most Grants will not pay for work already completed or in progress**
- **City of Manawa initiated efforts to stabilize the riverbank starting in September of 2024**
  - **Obtained a grant from USDA-NRCS: $462,310.20**
  - **Designed and Bid the work out in January**
  - **Worked through the permitting concerns with WDNR**
    - **Sturgeon and Walleye spawn was a major concern**

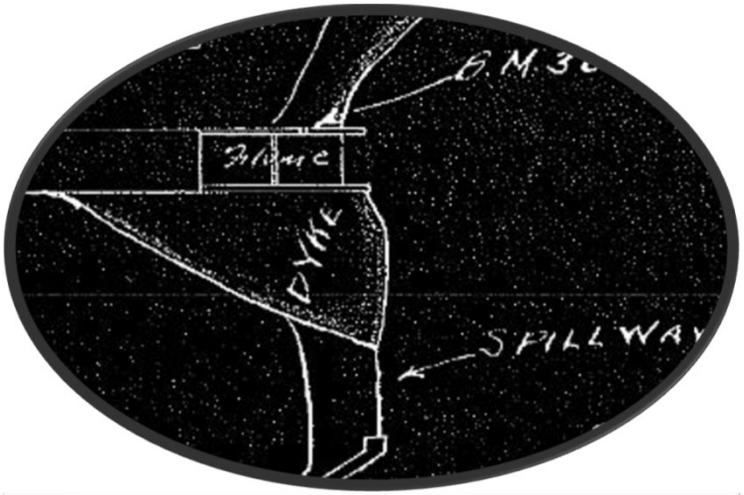
Initial Response to the Dam Failure

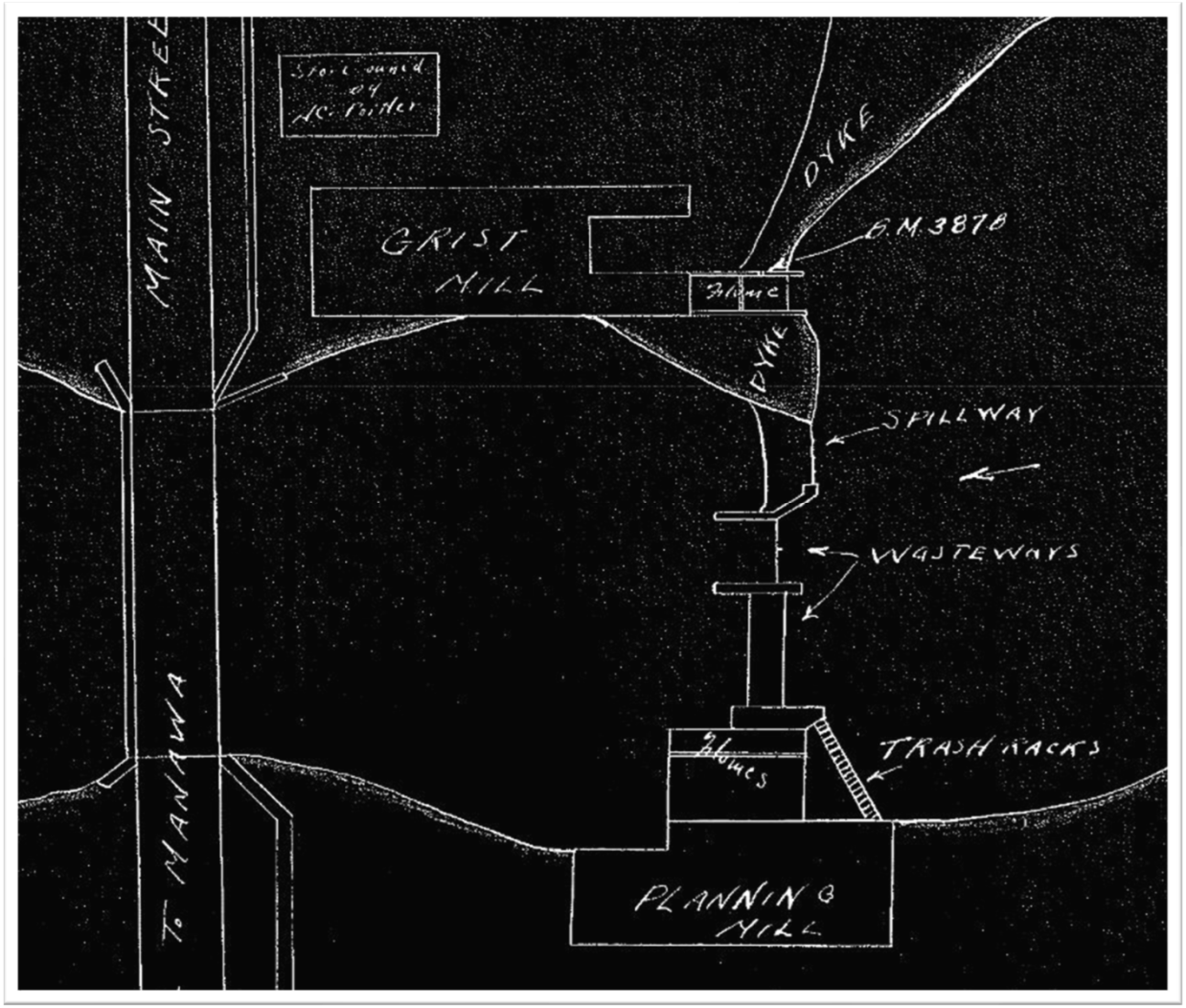
- Met with the Town of Little Wolf
- Met with the WDNR and hosted a public meeting
- Met with State Officials
  - Senator Rachel Cabral-Guevara (District 19)
  - Representative Kevin Petersen (District 57)
- Federal Budget Request
  - Senator Tammy Baldwin
- Formally completed a structural analysis on the Dam
- Manawa Mill Pond Dam Replacement Feasibility Analysis

History of the Manawa Dam

- **First authorized by the State in 1891**
  - **“maintain”**
  - **Likely constructed prior to 1891**
- **Around 1915, Dam was used for private power generation**
  - **Inspection reports at that time indicate the dam was reconstructed several times with the concrete added around 1913**
- **1920 Plans show the Planning and Grist Mill**

1920 Plans


DYKE
SPILLWAY


MAIN STREET
GRIST MILL
DYKE
SPILLWAY
WASTEWAYS
TRASH RACKS
PLANNING MILL

History of the Manawa Dam

- In 1928, the Dam was sold to Wisconsin Power and Light
  - The powerhouse we see today was constructed in 1929
- Power generation at the Dam was discontinued in 1958
  - Sold to Manawa Dam Corporation
- By 1967, the Dam was in dire need of repairs
- The City of Manawa acquired the Dam in 1968
  - Began temporary repairs to pursue possible funding
- The mayor of Manawa sent a letter to the Governor requesting funding assistance in 1976
  - Ineligible for funding at that time

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History of the Manawa Dam

- **Emergency drawdown court order was issued in 1977**
  - **One report references signs of failure**
  - **Seepage and water piping through the dam were also noted**

- **City hired a structural engineer in 1977**
  - **The Dam was noted as being in critical condition**
    - **Primary recommendation was to replace the Dam**
    - **Secondary if funds were not available was to repair the Dam**

- **Dam was repaired in 1979**
  - **Took over a decade to make the necessary repairs**
  - **Some of the repairs have now failed**
    - **Original timber structure had missing rocks. The void was grouted**

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History of the Manawa Dam

- **Mid 1980s: the Dam began generating power again**
  - **Powerhouse portion of the dam was sold**
- **1987 Inspection**
  - **Water was again piping through the Dam with a noticeable vortex**
  - **Repairs were completed mid 1990s**
- **2010/2011 Inspection**
  - **Cavitated Spillway**
  - **Deteriorated piers**
  - **A seven square foot cavity in a wall**
  - **Seepage flowing under the Dam**
  - **Repairs were completed in 2011 and 2012**

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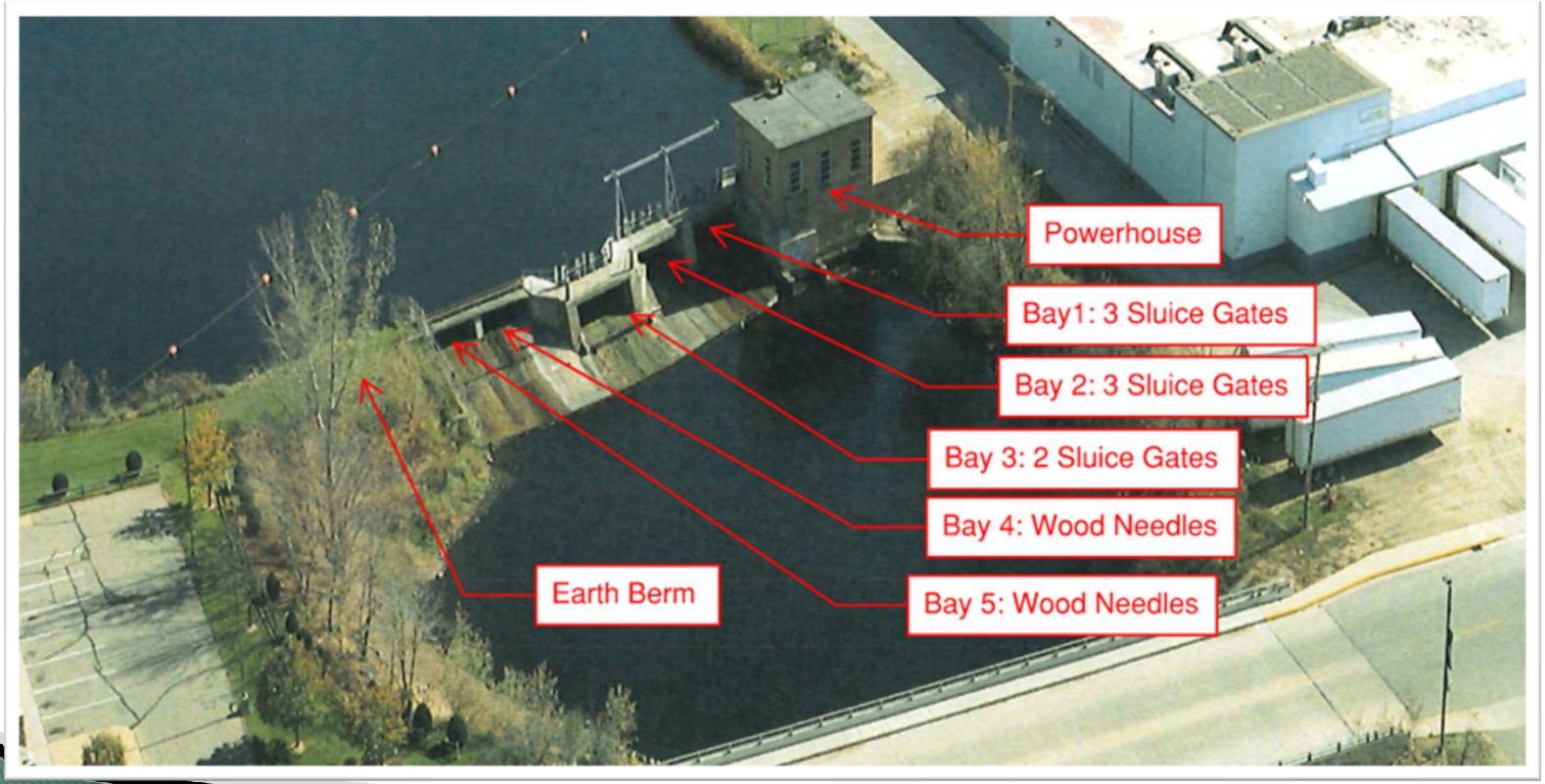
Structural Assessment

- **Monitoring the Dam since the breach**
- **Most Recent Inspection May of 2025**



Structural Assessment

- **Bay 1 and Bay 2**
  - **Deteriorated concrete present at the gates**
  - **Downstream apron is spalling and cracking**
  - **Underside of walkway:**
    concrete is spalling and reinforcement is exposed
  - **Efflorescence observed at cracks in powerhouse wall**

Structural Assessment

- **Bay 1 and Bay 2**

Structural Assessment

- **Bay 1 and Bay 2**

Structural Assessment

- **Bay 3**
  - **Spalling and cracked concrete at the gates**
  - **Upstream base is the timber and stone cribbing with concrete or grout overlay. The stone and concrete overlay is deteriorated and cracked.**
  - **Underside of walkway:**
    concrete has severe spalling and reinforcement is exposed

Structural Assessment

- **Bay 3**

Structural Assessment

- **Bay 3**

Structural Assessment

- **Bay 4 and 5**
  - **Upstream portion of these bays shows major loss of material, below and behind the concrete apron**
  - **Leaking and separation between abutment and apron**
  - **The concrete walkway above theses bays is noticeably sagging**
  - **There are serious cracks where the walkway meets the abutment**
  - **Downstream apron is significantly spalling and cracked throughout**

Structural Assessment

- **Bay 4 and 5**

Structural Assessment

- **Bay 4 and 5**

Manawa Dam: October 2024

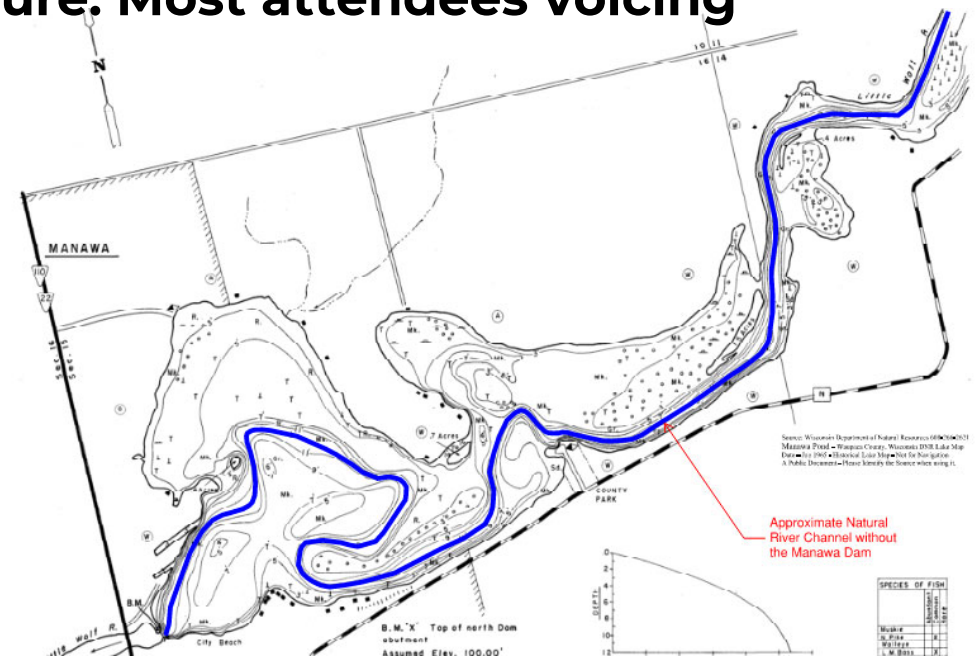
- **Photo shows:**
  - **Pond side of the Dam**
  - **Timber cribbing**
  - **Failed grout Section**
  - **Undermining of concrete Dam**

Structural Assessment

- **Inspection Conclusion**
  - **Due to the condition of the existing Dam and the history of the previous repair work to the foundation, repair of the Dam is not feasible, and a complete replacement is recommended.**

Dam Alternatives

- **Concept 1: Natural/Dam Removal**
  - **Since the breach, the river has largely returned to the original channel.**
  - **Existing dam would need to be demolished.**
  - **Several meetings since the failure. Most attendees voicing desire to restore the Millpond.**



Dam Alternatives

- **Concept 2: Dam Repair**
  - **Portions of the Dam are over 130 years old**
  - **An emergency court order was issued in the 1970s due to the condition of the Dam**
  - **Previous repair work shows significant deterioration**
  - **Portions of the original Dam appears to have washed out**

- **The Dam is no longer repairable**

Dam Alternatives

- **Concept 3: Dam Replacement – No Hydroelectric**
  - **Demolish the existing Dam and powerhouse**
  - **Powerhouse**
    - **Privately owned and coordination is required with owner**
    - **This portion of the dam was not structurally inspected**
    - **Near 100 years old**
    - **Additional evaluation is needed if the powerhouse is to remain**

- **Cost: $8,400,000**

- **Consideration:**
  - **This should be a 100-year decision**
  - **Connecting into a structure that is almost 100 years is not recommended**

Dam Alternatives

- **Concept 4: Dam Replacement with Hydroelectric**
  - **Demolish the existing Dam**
  - **Powerhouse**
    - **Privately owned and Coordination is required with owner**
    - **This portion of the Dam was not structurally inspected**
    - **Near 100 years old**
    - **Additional evaluation is need**
  - **Federal Energy Regulation Commission (FERC) Licensing**

- **Not recommended for the City to take over the License**
- **Discussions are needed with Wiscons8, LLC**

Funding

- City of Manawa
  - Prior to the breach, borrowed money to complete several infrastructure project.
  - Near borrowing capacity

- Town of Little Wolf
  - Similar community populations
  - Similar number of properties impacted by the Millpond
  - Recommended to discuss an agreement between the Town and the City of Manawa
    - Cost share on reconstruction
    - Cost share on maintenance
    - Outline each others' responsibilities and rights
    - Joint ownership

Funding

- General Tax Levy/Bonding
- Referendum
  - To exceed spending limits
- Tax Increment Financing
  - Amend TID #3 to include the Dam if determined to be eligible
- State and Federal Budget Requests

Funding

- **Grants**
- **More detailed funding strategy in the report…. Impacts overall timeline for restoring the Millpond**

Funding Method	2025		2026			
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Annual Budgeting						
BCPL Loans						
USDA CFG Loans						
Project Referendum						
Grant Seeking						
USACOE CAP Sec. 14						
WDNR Municipal Dam Grant						
State Funding Request	*Monitoring and Advocacy*					
Federal Funding Request	*Monitoring and Advocacy*					

Time Frame and Permitting (Assuming Funding is Available)

- **Design: 6 months**

- **City of Manawa: Chapter 300 Floodplain**
  - **Hydrologic and Hydraulic Study Required (Flood Study)**
    - **To demonstrate the new Dam will not increase the 100-year flood elevation**
  - **WDNR does the review on behalf of the City**
  - **Up to 6 months; can not finalize the design until approved**

- **FEMA**
  - **Conditional Letter of Map Revision (CLOMR) – before construction**
  - **Letter of Map Revision (LOMR) – after construction**
  - **Can not start until WDNR approval of Flood Study (Chapter 300 Floodplain)**
  - **3 Months**

Time Frame and Permitting (Assuming Funding is Available)

- **WDNR Waterways and Wetland Permit**
  - **Individual Permit process requires a 90-day public comment period**
  - **A total of roughly 6 months for the permitting**
  - **Cannot complete the dam design until approved**

- **FERC –Hydroelectric Power Generation**
  - **Coordination required to deregulate the Dam**
  - **Coordination required to modify the Dam**
  - **Permitting timeline not known at this time**

- **Design, Permitting and Bidding Summary**
  - **Approximately 18 Months**

Time Frame and Permitting (Assuming Funding is Available)

- **Construction Timeline**
  - **Approximately 9 to 12 months**

- **Potential Total Time Frame: Design through Construction**
  - **2 to 3 years**

Recommendations

- **Dam is not repairable**
- **Based on discussions: the goal is to restore the Millpond; therefore, Concept 3 or 4 is required**
- **Discuss long-term plan for the powerhouse with the Owner**
- **Pursue funding from identified grants**

Recommendations

- **Hold a Public Hearing**
  - **Discuss impact of seeking grants on restoration timeline**
  - **Discuss referendum to exceed spending limits**
- **Formalize Discussions with the Town of Little Wolf**
  - **Joint ownership**
  - **Construction and maintenance cost**
- **Share the report with State and Federal representatives**
- **Cedar Corporation to begin design and permitting**

Questions

Manawa Dam Concept Plan

Thank You!