Embro Dam Class Environmental Assessment

UTRCA Board Meeting

Scott Robertson, P.Eng.
Mariëtte Pushkar, M.Sc., P.Geo

January 30, 2024

Matrix Solutions Inc.
A Montrose Environmental Company

Agenda

- Environmental Assessment Study
- PRELIMINARY Project Implementation Plan
- Next Steps

Matrix Solutions Inc.
A Montrose Environmental Company

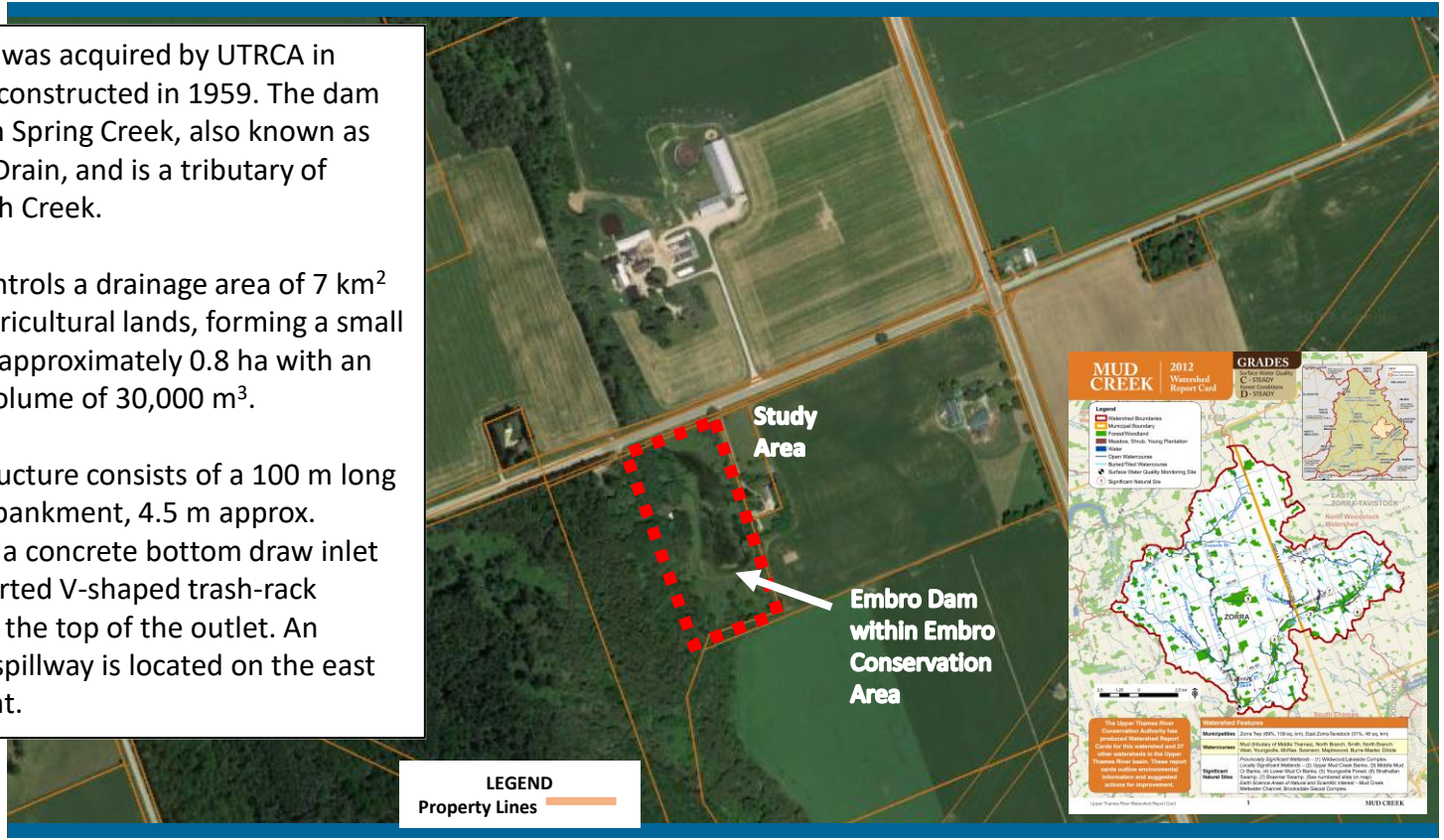
Environmental Assessment Study

STUDY LOCATION

Embro Dam was acquired by UTRCA in 1958 and reconstructed in 1959. The dam is located on Spring Creek, also known as Youngsville Drain, and is a tributary of North Branch Creek.

The dam controls a drainage area of 7 km^2 of mostly agricultural lands, forming a small reservoir of approximately 0.8 ha with an estimated volume of 30,000 m^3.

The dam structure consists of a 100 m long earthen embankment, 4.5 m approx. height, with a concrete bottom draw inlet with an inverted V-shaped trash-rack anchored to the top of the outlet. An emergency spillway is located on the east embankment.



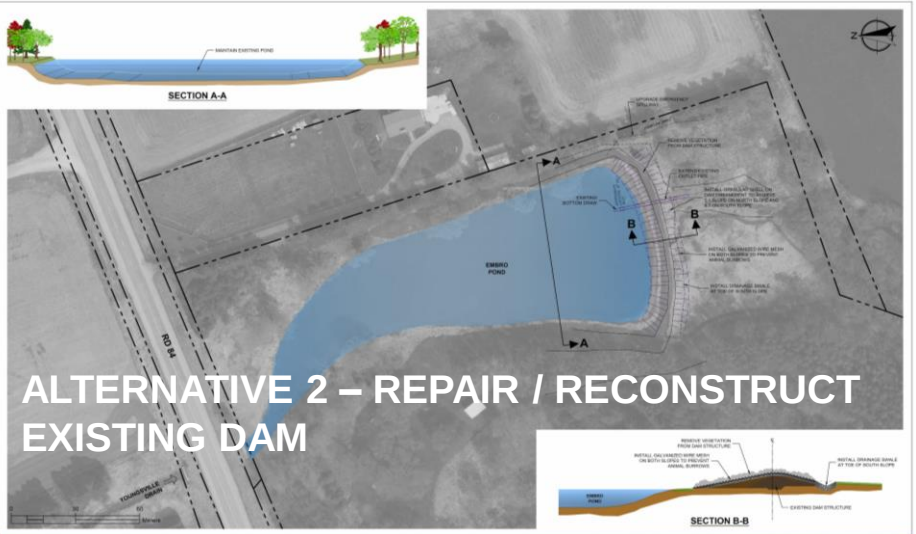
PROJECT HISTORY AND PROBLEM STATEMENT

- Dam safety and stability assessment studies (2007/2008) identified related concerns with the structure
- Most recent Dam Hazard Classification on the structure completed in 2015
- Class EA project initially commenced in 2015
- Draft EA project file report completed in 2017
- Per comments received, UTRCA undertook additional cultural heritage assessments (2022)
- EA process recommenced Fall 2022
- EA updated and presented to Township and UTRCA Board (Winter 2023)
- Community Liaison Committee established (meetings held late Summer and mid-Fall 2023)
- Project implementation plan developed (Fall 2023 / Winter 2024)
- Township of Zorra endorsed EA Study – 2024-01-17

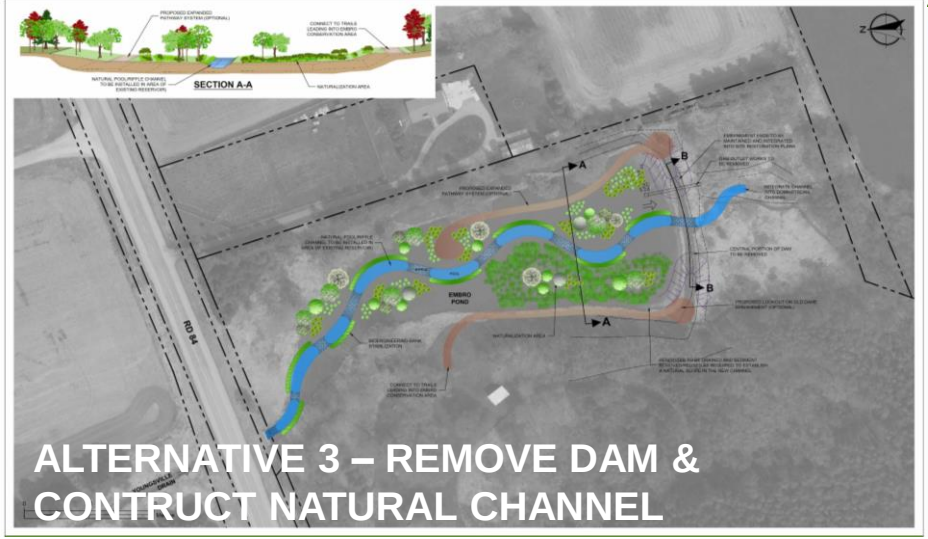
Significant concerns related to the structural integrity and hydraulic capacity of the Embro Dam have been identified through recent engineering assessments.

A Class Environmental Assessment was initiated to evaluate a range of alternatives to address the identified issues in consideration of the environmental, social, economic, and technical aspects of the dam.

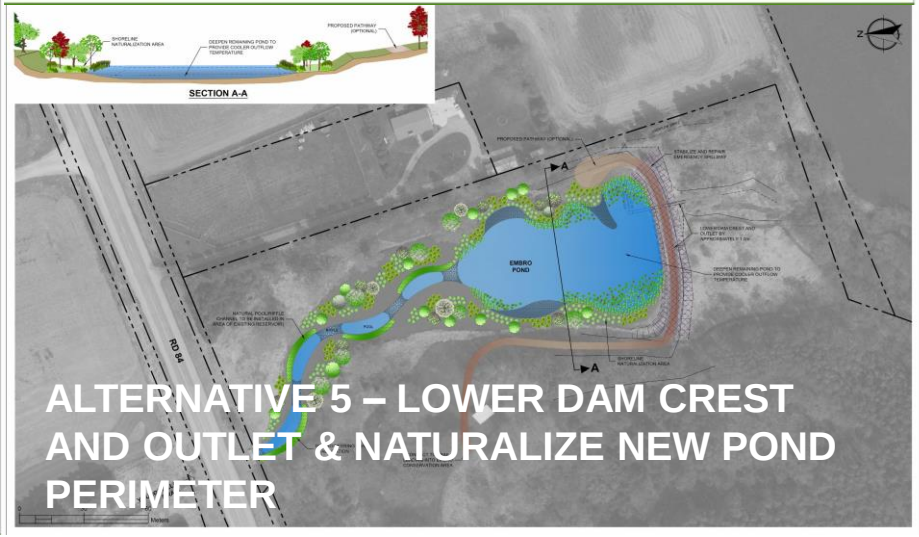
ALTERNATIVE 1 – DO NOTHING



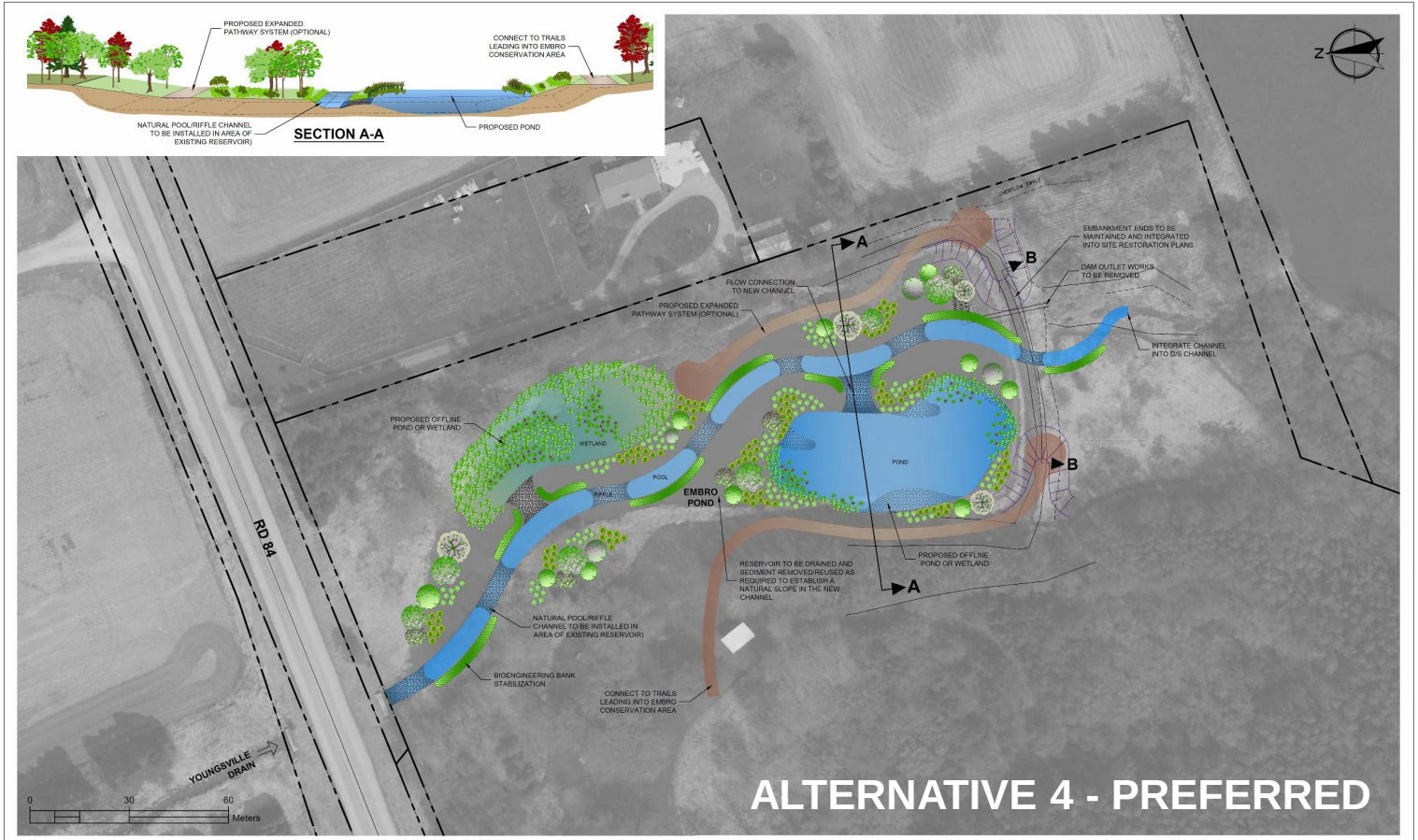
ALTERNATIVE 2 – REPAIR / RECONSTRUCT EXISTING DAM



ALTERNATIVE 3 – REMOVE DAM & CONTRUCT NATURAL CHANNEL



ALTERNATIVE 5 – LOWER DAM CREST AND OUTLET & NATURALIZE NEW POND PERIMETER



ALTERNATIVE 4 - PREFERRED

UPPER THAMES RIVER CONSERVATION AUTHORITY

Embro Dam Class Environmental Assessment
UTRCA Board Meeting
January 30, 2024

Matrix Solutions Inc.
A Montrose Environmental Company

IMPACTS OF PREFERRED ALTERNATIVE

Technical

- may interfere with nearby shallow groundwater wells
- eliminates dam safety hazard

Environmental

- enhances terrestrial corridor and vegetation diversity
- improved water cooling
- removes fish migration impediment, improve species diversity
- enhances aquatic habitat through channel restoration
- Re-adjustment to an unattenuated flow regime

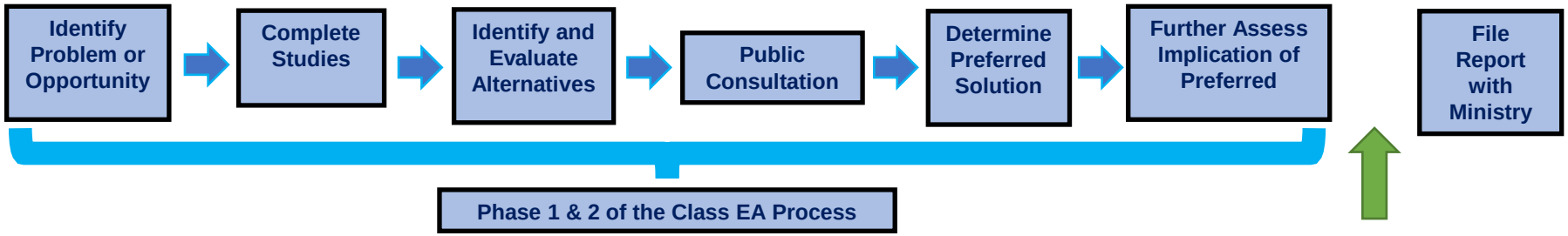
Social/ Cultural

- recreational opportunities will change
- loss of still water fishing and recreation boating
- possible trail enhancement, educational signage, and “birding”/viewing of wildlife species

Financial

- larger capital outlay, reduced short- and long-term operational costs

CLASS ENVIRONMENTAL ASSESSMENT PROCESS



Conservation Ontario Class Environmental Assessment for Remedial Flood and Erosion Control Projects

If implementation is not initiated within 5 years of Project Approval, it will require review in accordance with the EA planning and design process and the preparation of new documentation.

Project Implementation Plan - PRELIMINARY

Planning Steps

- Technical Assessments
- Continued Consultation
- Detailed Design
- Permits and Approvals
- Implementation
  - Site preparation
  - Fish rescue
  - Phased removal
  - Post-construction Monitoring/Management

Technical Studies

- Watershed hydrology review
- Archaeology – limited Stage 2
- Hydrogeology – adjacent wells (review records, monitor)
- Sediment characterization (if offsite transport required)
- Environmental – vegetation, reptiles

UPPER THAMES RIVER CONSERVATION AUTHORITY

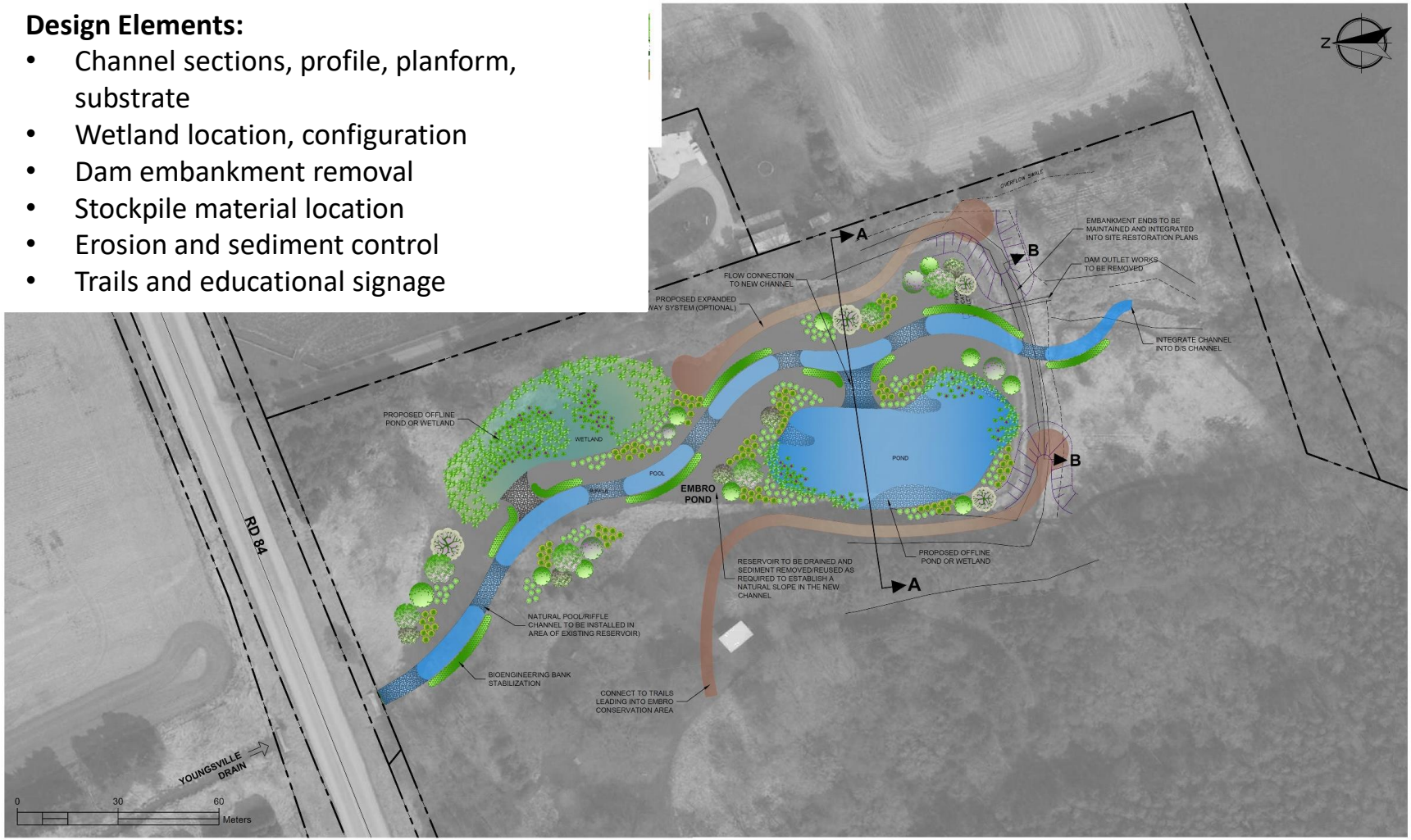
Matrix Solutions Inc.
A Montrose Environmental Company

Continued Consultation

- Indigenous communities
- Community Liaison Committee (CLC)
- Regulatory agencies (MNRF, DFO, MECP, MCM, UTRCA)

Design Elements:

- Channel sections, profile, planform, substrate
- Wetland location, configuration
- Dam embankment removal
- Stockpile material location
- Erosion and sediment control
- Trails and educational signage



Implementation Strategy

Year 1 (UTRCA)

- Technical studies
- Agency consultation
- Staged removal of stoplogs within the outlet structure (late spring)
- Opportunity to seed exposed sediment during drawdown period
- Monitoring (UTRCA)

Year 2 (estimated construction: $80,000)

- Open-up dam embankment
- Construction of outlet channel
- Monitoring (UTRCA)

Year 3 (estimated construction: $60,000)

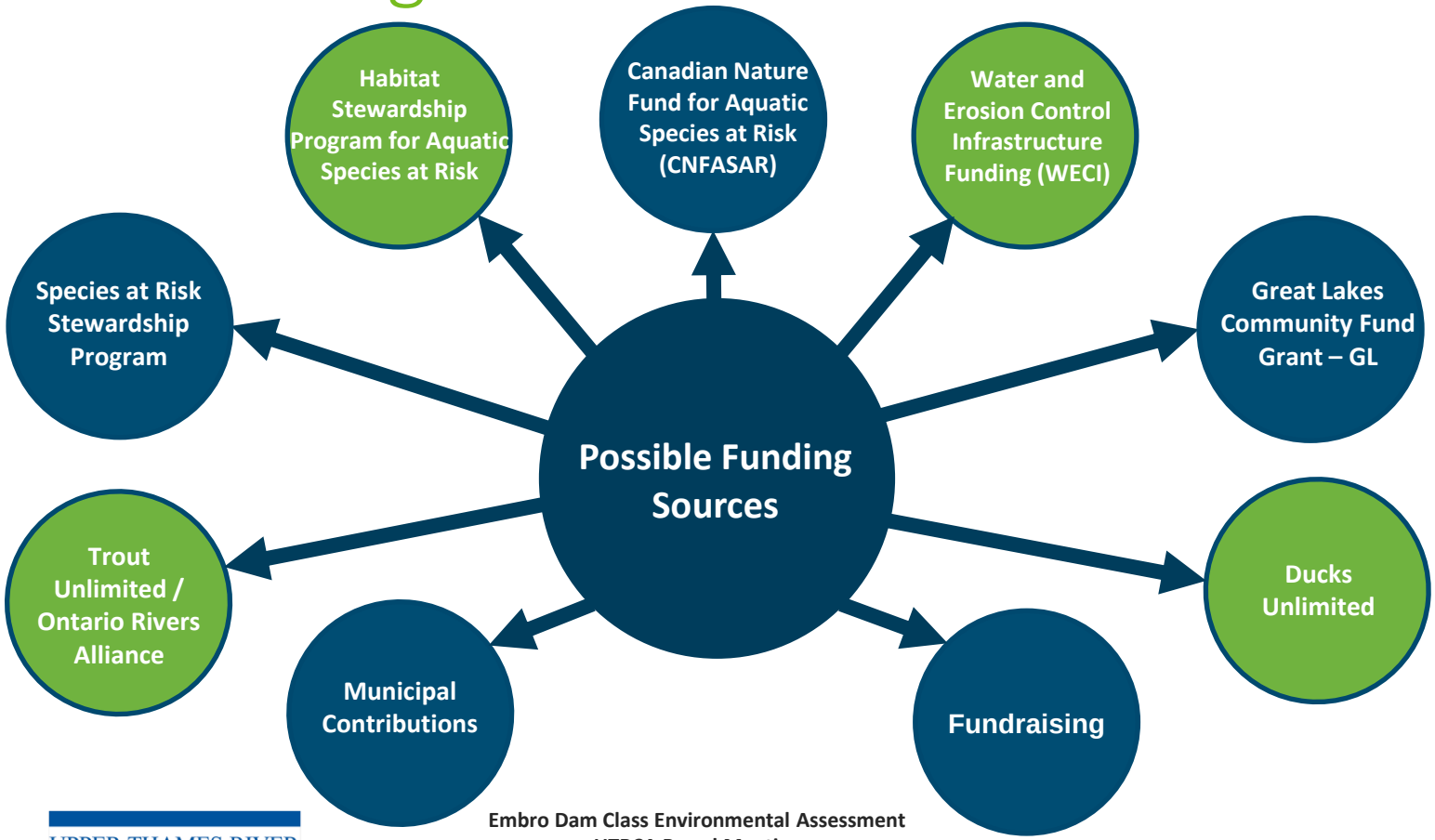
- Wetland
- Trail and Park amenities
- Monitoring (UTRCA)

Note: for comparison, dam maintenance is projected to cost $200,000 over the next 4 – 5 years, if Alternative 2 is selected.

Monitoring/Adaptive Management

- Ensure disturbed areas/exposed sediments are stabilized/planted
- Water wells
- Monitor new (in pond)/existing (upstream/downstream) watercourses:
  - Sections, profile
  - Recovery of aquatic habitat and fish populations (diversity, species)
- Invasive species management (e.g., phragmites)
- Longer-term planning

Possible Funding Sources



Next Steps

- Update Project Plan
- Finish and File EA
- Additional Studies
- Detailed Design
- Obtain Funding
- Construction
- Monitoring

QUESTIONS?

Contact Us

Scott Robertson, P.Eng.
Senior Water Resource Engineer
srobertson@matrix-solutions.com
226.753.6411

Jeff Prince, P.Eng.
Principal, Water Resource Engineer
jprince@matrix-solutions.com
226.339.5605

Mariëtte Pushkar, M.Sc., P.Geo
Principal, Fluvial Geomorphologist
mpushkar@matrix-solutions.com
226.220.3835

matrix-solutions.com

Matrix Solutions Inc.
A Montrose Environmental Company