

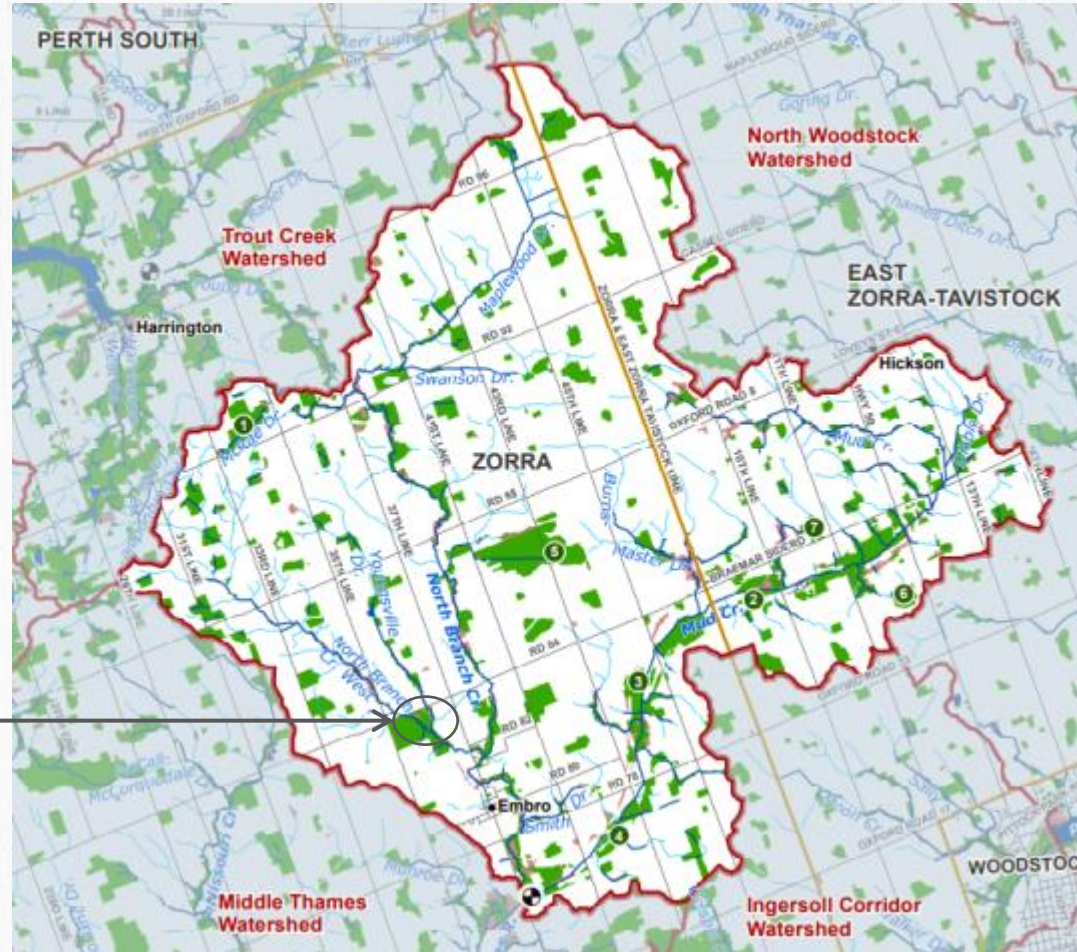


Emburo Dam Class Environmental Assessment 2022

Presentation 1 – Zorra Township Council

December 21st, 2022

Project Site Overview



Embro Conservation Area

Mud Creek Watershed

Embroid Dam Study Area

Embroid Dam was acquired by UTRCA in 1958 and reconstructed in 1959, located on Spring Creek (a tributary of the North Branch Creek). The dam controls a drainage area of 7 square kilometres of mostly agricultural lands, forming a small reservoir of approximately 0.8 ha with an estimated volume of 3,000 cubic metres. The dam structure consists of a 100 metre long earthen embankment (4.5 metres 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.

The Embroid Dam and Conservation Area is owned by the UTRCA; however, the Township of Zorra pays 100% of operating costs for the dam. The Conservation Area is maintained by the Embroid Pond Association.



Embro Dam and Area Description



The Embro Dam is approximately 100 m in length, 4.5 m in height and includes 1.1 m of freeboard. The entire dam is founded on overburden as opposed to bedrock or engineered soil.



The dam contains water year round and includes approximately 3.4 m of head acting across the dam.



Low earth fill embankment, a grassed, emergency spillway is located at the east end of the embankment. This spillway has a clear width of about 4.0 m and the inlet invert is 0.6 m below the crest of the dam.



The outlet of the dam includes a concrete bottom draw inlet structure covered with grated trashrack.



A 762 mm diameter (inner) concrete pipe conveys flow from the pond to a pool at the creek outlet.



The Embro Dam is located within the Embro Conservation Area, with recent restoration and improvement works undertaken by the Embro Pond Association.

Problem Statement: Why is a Class EA Necessary?

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

- **Acres International. July, 2007.** *Dam Safety Assessment Report for Embro Dam: Upstream and downstream embankment slopes do not meet stability acceptance criteria*
- **Naylor Engineering Associates. September 2008.** *Geotechnical Investigation Embro Dam Embankment Stability Assessment: The existing dam does not meet current standards and is not considered stable under existing conditions*

This is a continuation of a Class Environmental Assessment that was initiated in 2015 to evaluate a range of alternatives to address the identified issues in consideration of the environmental, social, economic, and technical aspects of the dam.

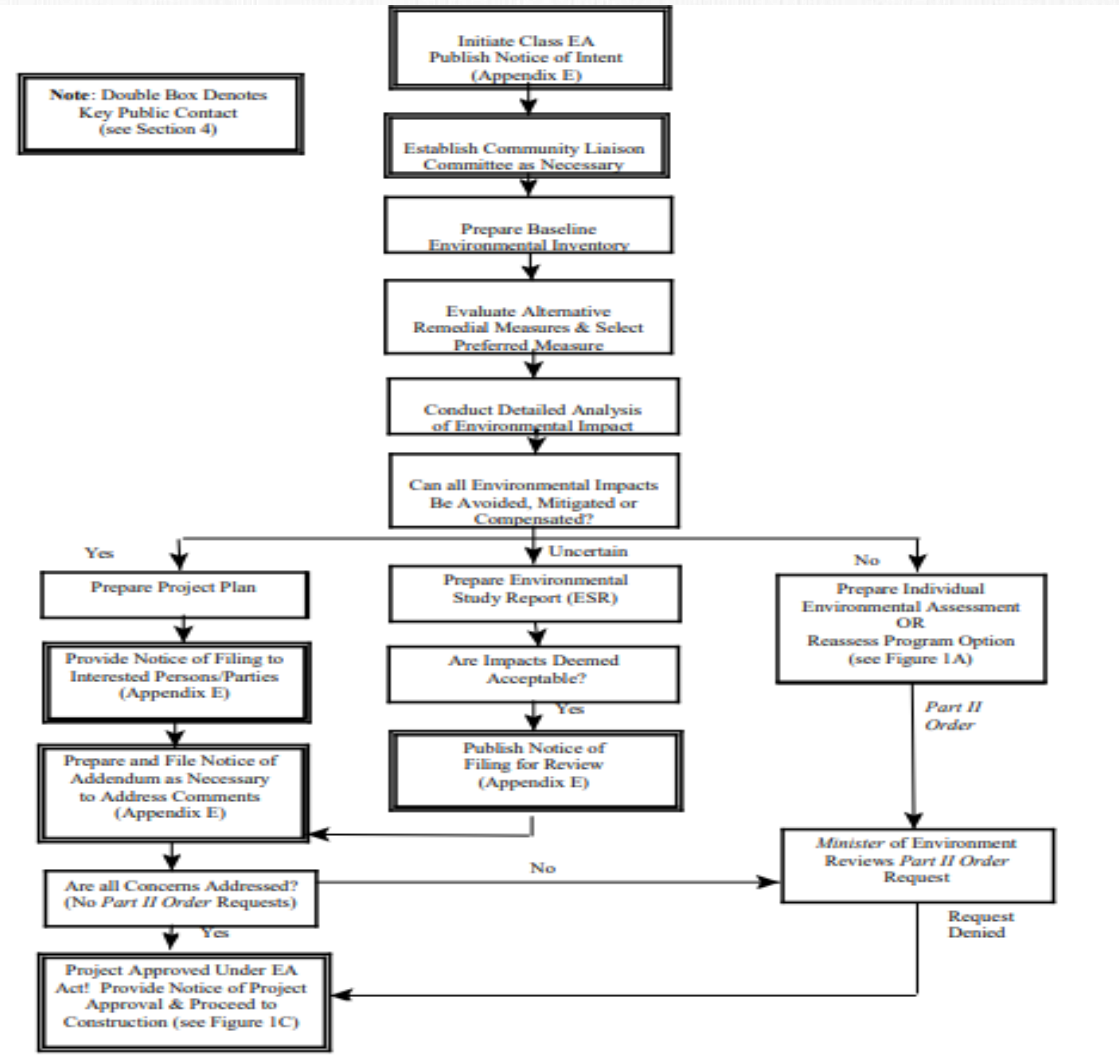
The project will continue under the Conservation Ontario Class Environmental Assessment for Remedial Flood and Erosion Control Projects Document (June, 2013).

Class Environmental Assessment Process and Problem Statement

Class EA Process for Conservation Ontario Class Environmental Assessment for Remedial Flood and Erosion Control Works

In a nutshell:

- Publish Notice of Intent to advise all affected about the study
- Undertake a program to collect background information and relevant data on the study area
- Prepare a characterization of the study area as it relates to the problem statement, this includes technical, social and cost factors
- Develop alternatives that could address the issues
- Evaluate alternatives against a criteria (technical, social and cost)
- Select the preferred alternative
- Prepare concept level plans to depict the preferred alternative
- Prepare the EA report (project plan) and file for 30 days



https://conservationontario.ca/fileadmin/pdf/conservation_authorities_section_planning_regulations/Class_EA_for_Remedial_Flood_and_Erosion_Control_ProjectsCA.pdf

Field Data Collection and Site Characterization

A range of technical, environmental, and social factors has been characterized at the study site to provide insight into the generation of potential alternatives for the dam, as well as the evaluation of those alternatives.

Topographic Survey	Aquatic Biology	Geotechnical Engineering and Hydrogeology	Civil Engineering (Dam Structure and Hazard Assessment)
Hydrology	Terrestrial Biology	Sediment Quality	Water Quality
Fluvial Geomorphology	Cultural/Social Environment	Archaeology	Sediment Survey

Alternative Evaluation Criteria

Criteria	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Technical/ Engineering	11	17	25	24	18
Natural Environment	8	10	20	21	15
Social/ Cultural Environment	16	19	15	14	18
Economic	15	17	20	17	10
OVERALL NORMALIZED CATEGORY SCORE (100% WEIGHTING)	50	63	80	76	61
PREFERRED OVERALL RANKING (1 = most preferred; 5 = least preferred)	5	3	1	2	4

1 – Do Nothing

2 – Repair Dam

3 – Remove Dam and construct Natural Channel

4 – Remove dam and construct offline pond / wetland

5 – Lower dam crest and outlet, naturalize pond

Preferred Alternative – Alternative 3 - Remove Dam and Construct Natural Channel



- Potential Enhancements (subject to funding)**
- New trail extensions
 - Lookout areas
 - Pedestrian bridge over creek
 - Educational signage of area history and restoration works
- Design Elements**
- Extended trail along west side
 - Establish naturalized watercourse with habitat features appropriate for target species
 - Incorporate terrestrial habitat enhancements (e.g., barn swallow nesting boxes or raptor poles, snake hibernaculum, woody debris piles)
 - Enhance vegetation diversity

EMBRO DAM CLASS ENVIRONMENTAL ASSESSMENT EVALUATION OUTCOME REMOVE DAM AND CONSTRUCT NATURAL CHANNEL UPPER THAMES RIVER CONSERVATION AUTHORITY ecosystem recovery inc. PROFESSIONAL ENGINEERS

Cost Estimates

Alternatives	Primary elements/ factors influencing costs	Initial Costs (1 to 5 years)	Operation and Maintenance
Alternative 1 Do nothing	Repairs to concrete structures, site restoration in the event of failure (assumed)	\$3,000 to \$15,000	\$1,500 to \$5,000 per year
Alternative 2 Repair dam	Improved dam embankment and outlet, construct emergency spillway, rock protection	\$150,000 to \$200,000	\$1,500 to \$20,000 per year. Dam retirement (75 yrs) costs \$80,000 ¹
Alternative 3 Remove dam and construct natural channel	Dam removal, channel construction, sediment removal, site restoration	\$250,000 to \$320,000	\$1,500 to \$3,000 per year
Alternative 4 Remove dam and construct offline pond / wetland	Dam removal, channel construction, sediment removal, offline pond construction, site restoration	\$350,000 to \$450,000	\$1,500 to \$5,000 per year
Alternative 5 Lower dam crest and outlet, naturalize pond	Dam crest reconstruction, replace outlet bottom draw structure, sediment removal	\$500,000 to \$600,000	\$3,000 to \$20,000 per year. Dam retirement (75 yrs) costs \$80,000 ¹

¹ dam retirement cost reflects 2016 cost

Cultural Heritage Evaluation Report, TMHC (2022)

- Intended to provided heritage evaluation of the subject site against the criteria set out by the Ontario Heritage Act (OHA), O. Reg 09/06.
- Current heritage status as “Natural Area or Park” on Oxford County Heritage Resources Inventory
 - No National Historic Sites, Ontario Heritage Trust-owned owned properties, conservation easements or Provincial Heritage Properties present on or adjacent to the subject site.
- Contains historical research and analysis: Indigenous settlement and treaties, early municipal settlement, and local property history.



Cultural Heritage Evaluation Report
Embros Conservation Area
843970 Road 84, Part Lot 15, Concession 4
Township of Zorra, Oxford County, Ontario

Prepared for:
Upper Thames River Conservation Authority
1424 Clarke Road
London, Ontario
N5V 5B9

Prepared by:
TMHC Inc.
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Project No: 2021-176
Revised Final: December 7, 2022

Cultural Heritage Evaluation Report, TMHC (2022)

Community Engagement

- UTRCA provided contents of Public Information Centres from 2015 Class EA to TMHC
- TMHC also contacted:
 - Township of Zorra,
 - Embro Pond Association,
 - Oxford County Archives,
 - Ontario Heritage Trust, &
 - Ontario Ministry of Tourism, Culture and Sport (Duties of the OHA are now under the Ontario Ministry of Citizenship and Multiculturalism).
- UTRCA will re-post the CHER report (revised on Dec 12, 2022 to reflect comments from MCM)
- Additional comments may be received through the ongoing EA consultation

Cultural Heritage Evaluation Report, TMHC (2022)

Evaluation

- Embro Dam was found to not meet the O.Reg 9/06 Criteria.
- Interpretive signage recommended.

2. The property has historical value or associative value because it:

Criterion	Summary of Response
i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community,	No; the Subject Site is not known to have direct associations with a theme, event, belief, person activity, organization or institution that is significant to a community. The current mill pond and dam are the result of alterations to the property that occurred after its industrial usage when the site was converted to a public-access Conservation Area. There are no visible remains that associate the property with its industrial past.
ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or	No; the property is not known to yield information that contributes to an understanding of a community or culture. There exists no visible remains that relate to the former industrial usage of this property.
iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community	No; the property is not known to demonstrate the work or ideas of an architect, builder, designer or theorist who is significant to a community.

Table 2: Historical or Associative Value

Page 30, Cultural Heritage Evaluation Report, TMHC, 2022

1. The property has design value or physical value because it:

Criterion	Summary of Response
i. is a rare, unique, representative or early example of a style, type, expression, material or construction method,	No; while the Subject Site is an example of a mid-20 th century adaptation of a former industrial site, it is not a significant example and many other such properties exist in Ontario. The pond in its current form, which is the result of this post-industrial expansion, is not indicative of the mill function that the property once served. The current dam is a modest example of a concrete pipe conduit and emergency spillway. No visible remains of the former mill exist.
ii. displays a high degree of craftsmanship or artistic merit, or	No; while the property is an example of a mid-20 th century conservation area, it does not demonstrate a high degree of craftsmanship or artistic merit relative to what is typical for this typology. Both the pond and dam, in their current state, are the result of alterations to the property that occurred when the property was established as a Conservation Area.
iii. demonstrates a high degree of technical or scientific achievement.	No; while the property is an example of a concrete pipe conduit dam, it does not demonstrate a high degree of technical or scientific achievement relative to what is typical for this typology.

Table 1: Design or Physical Value

Page 31, Cultural Heritage Evaluation Report, TMHC, 2022

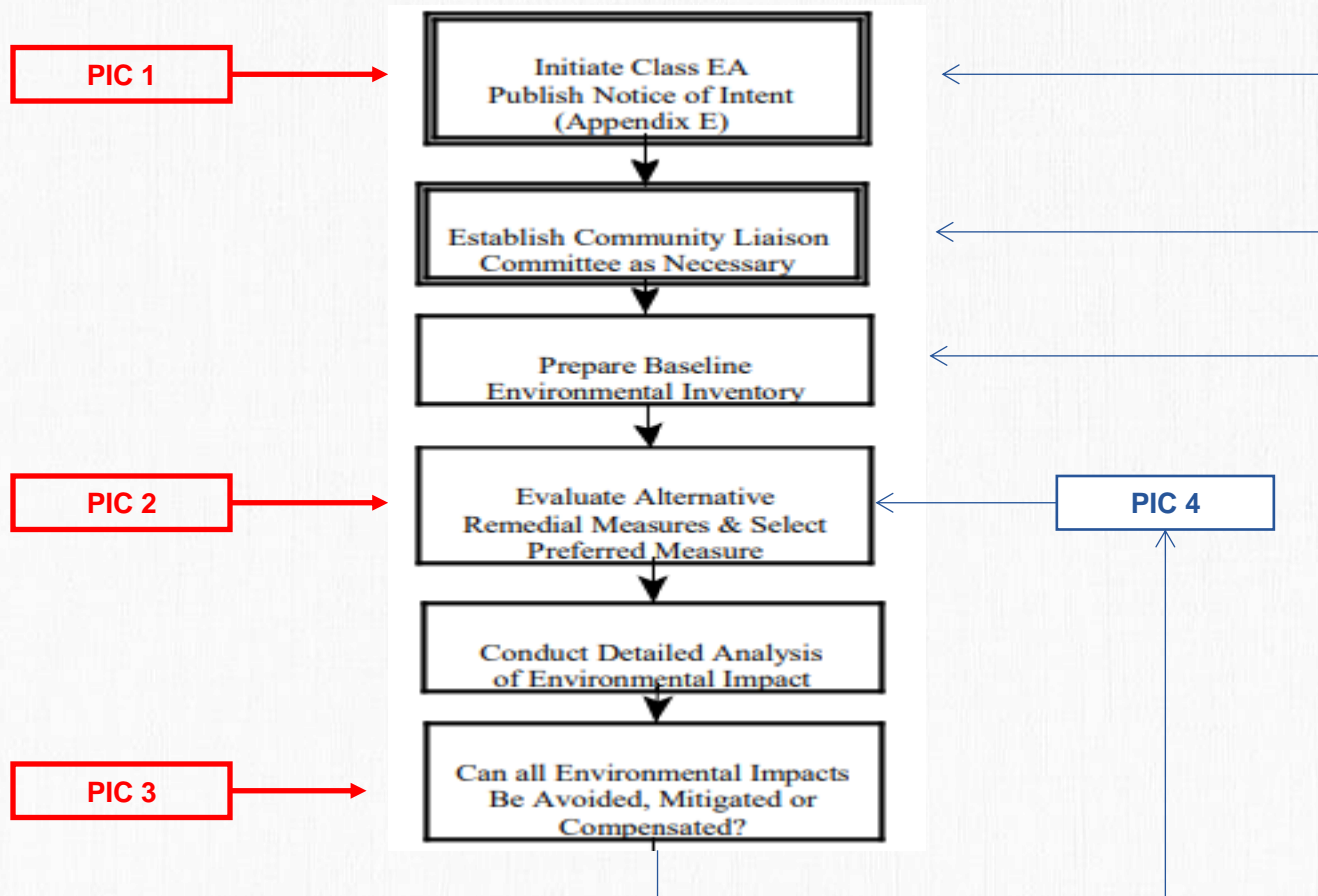
3. The property has contextual value because it:

Criterion	Summary of Response
i. is important in defining, maintaining or supporting the character of an area,	No; as part of a relatively modest conservation area in a rural setting, the property is not important in defining, maintaining, or supporting the character of the area. The current pond and dam are the result of a mid-20 th century adaptation of the property for recreational use as a Conservation Area that occurred well after its industrial usage.
ii. is physically, functionally, visually or historically linked to its surroundings, or	No; while, the property is integrated with the creek it conveys, it is not physically, functionally, visually, or historically linked to its surroundings such as it meets this criterion. The current form of the pond appears is detached from its historical usage as a mill pond since it was expanded significantly in the middle of the 20 th century. Similarly, the dam has been replaced, and the former mill – and resultant industrial function of the area – regardless of where it was located, is no longer present in any distinguishable form.
iii. is a landmark.	No; while the Subject Site is a draw to local visitors, it is part of a relatively modest Conservation Area in a rural setting. As such, the property is not a visual landmark, and it is not currently known or believed to meet this criterion as a community landmark.

Table 3: Contextual Value

Page 31, Cultural Heritage Evaluation Report, TMHC, 2022

Embryo Dam Class EA since 2015



- UTRCA issued the “Notice of Intent” on Nov 03, 2022.
- Request interest in the community Liaison committee.
- UTRCA provided information on the updated environmental conditions to its Consultant, Matrix Solutions Inc.
- **Currently**, Matrix is re-evaluating alternative remedial measures, including any new alternatives.
- Another Public Information Centre (PIC 4) will be held in January, 2023.

https://conservationontario.ca/fileadmin/pdf/conservation_authorities_section_planning_regulations/Class_EA_f_or_Remedial_Flood_and_Erosion_Control_ProjectsCA.pdf

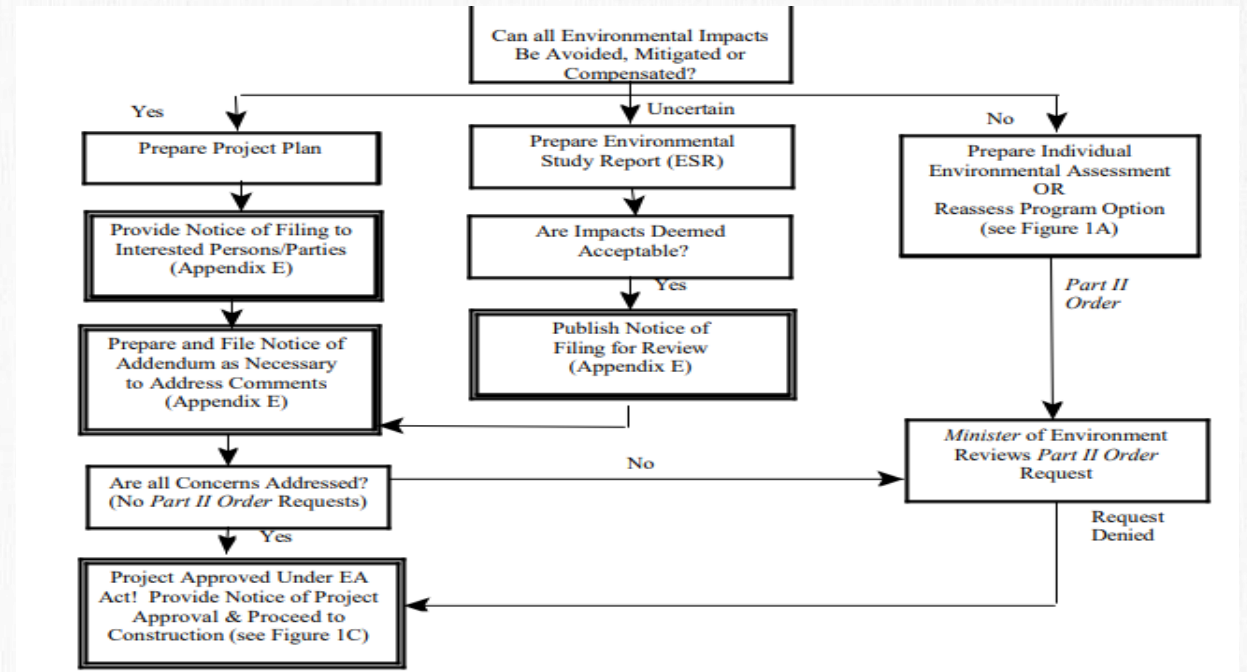
Embro Dam Class EA Continuation (2022- 2023)

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- **Currently**, Matrix is re-evaluating alternative remedial measures, including any new alternatives.
- Another Public Information Centre (PIC 4) will be held in January, 2023.

Embryo Dam Class EA Continuation (2022- 2023)

- **Next Steps:**

- A Public Information Centre will be held during January 2023 to present project updates and receive feedback.
- Another presentation to Zorra Township Council during February 2023 with the study updates.
- UTRCA board report during February 2023.
- Notice of filing during March 2023.
- 30-day comment period.



https://conservationontario.ca/fileadmin/pdf/conservation_authorities_section_planning_regulations/Class_EA_for_Remedial_Flood_and_Erosion_Control_ProjectsCA.pdf

Stakeholders

- UTRCA provided the “Notice of Intent” to the following stakeholders:
 - UTRCA; Conservation Ontario;
 - Ministry of Environment, Conservation, and Parks;
 - Ministry of Natural Resources and Forestry;
 - Ministry of Citizenship and Multiculturalism;
 - Ministry of Aboriginal Affairs;
 - Aboriginal Affairs and Northern Development Canada (AANDC); Fisheries and Oceans Canada;
 - Township of Zorra; Oxford County;
 - Métis Nations of Ontario;
 - First Nations;
 - Local groups: Embro Pond Association, Zorra Heritage Committee;
 - Others

Useful Links

- Class Environmental Assessment for Remedial Flood and Erosion Control Projects, Conservation Ontario (June, 2013). [https://conservationontario.ca/fileadmin/pdf/conservation_authorities_section_planning_regulations/Class EA for Remedial Flood and Erosion Control ProjectsCA.pdf](https://conservationontario.ca/fileadmin/pdf/conservation_authorities_section_planning_regulations/Class_EA_for_Remedial_Flood_and_Erosion_Control_ProjectsCA.pdf)
- UTRCA webpage for Embro Class Environmental Assessment: <https://thamesriver.on.ca/water-management/recreational-dams/classea-harrington-embro-dams/embro-dam-class-ea/>
- Cultural Heritage Evaluation Report, TMHC (2022) <https://thamesriver.on.ca/wp-content/uploads/Embro-Dam-CulturalHeritageEvalReport-12Dec2022-final.pdf>

Contact Information



To submit comments, request further information, or to join the project mailing list, please contact:

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