Embro Dam
Class Environmental Assessment

Public Information Centre #3

Upper Thames River Conservation Authority
Embro Zorra Community Centre
October 17, 2016 7:00 p.m. to 9:00 p.m.

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Class Environmental Assessment Process and Problem Statement

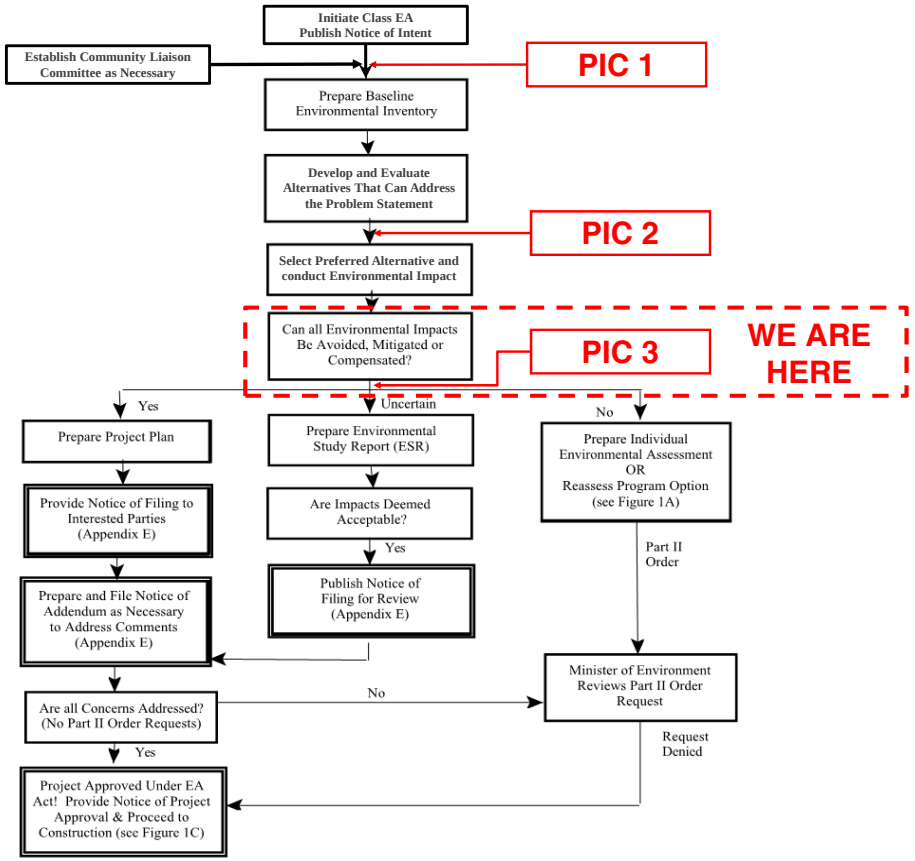
Problem Statement

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*

A Class Environmental Assessment has been 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.

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



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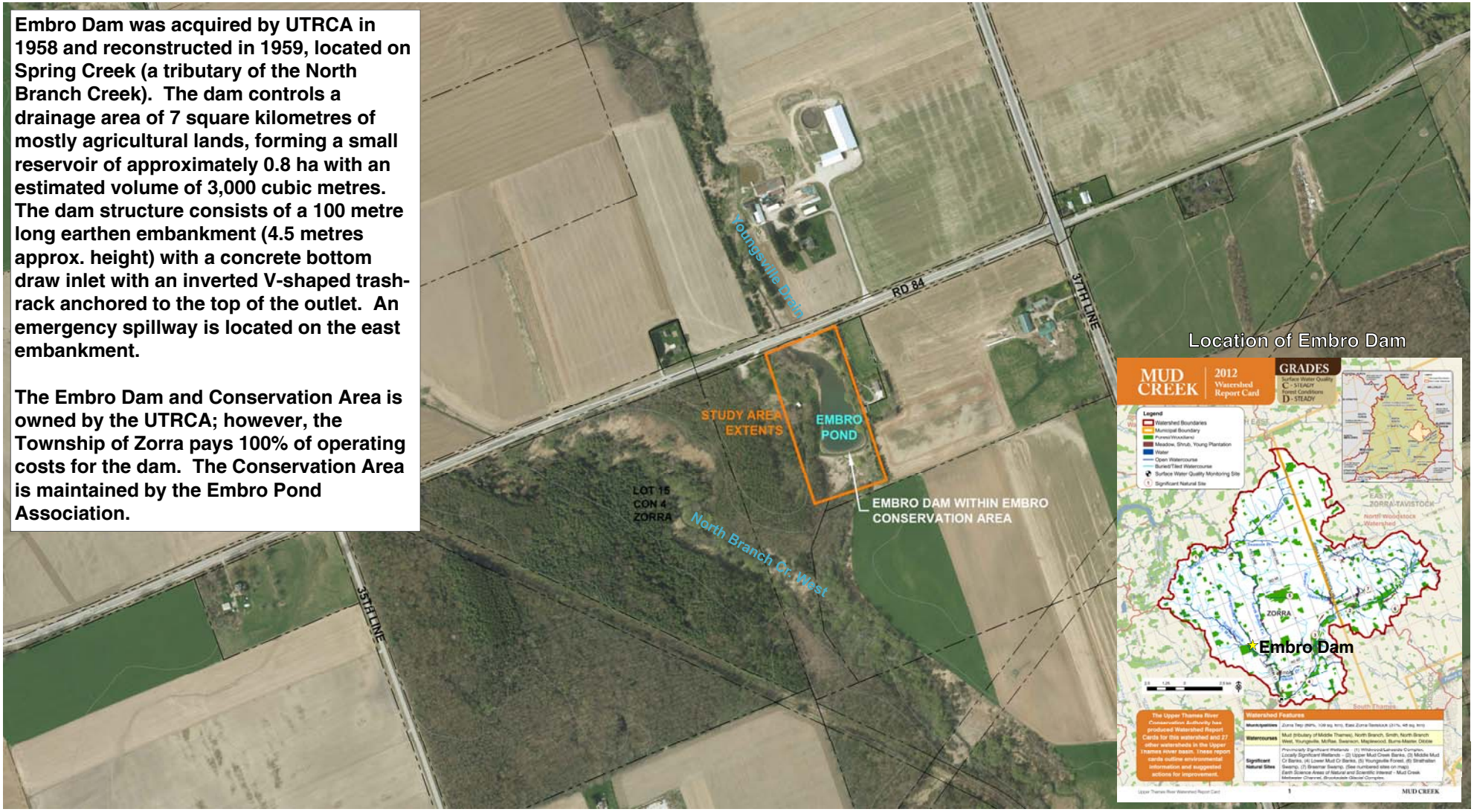
Embro Dam Study Area

Embro 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 Embro 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 Embro Pond Association.



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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 today's (2016) cost

Alternative Evaluation

Criteria	Description	Alternative 1 Do Nothing	Alternative 2 Repair Dam	Alternative 3 Remove Dam and Construct a Natural Channel	Alternative 4 Remove Dam and Construct Offline Pond(s) or Wetland(s)	Alternative 5 Lower Dam Crest and Outlet and Naturalize New Pond Perimeter
TECHNICAL/ENGINEERING						
Dam Safety/Integrity	Effectiveness of the alternative to address dam safety requirements, reduce risk of failure	1	4	5	5	4
Protection of Properties	Effectiveness of the alternative in mitigating risk (flooding, failure) to adjacent properties	1	2	5	5	3
Constructability	Potential to construct the project using conventional, accepted construction and engineering practices	5	5	5	5	5
Implementability	Potential to implement the alternative, based on common accepted management practise	3	3	5	5	3
Approvability	Potential for regulatory agencies to grant approval for implementation	1	3	5	4	3
	TOTAL CATEGORY SCORE	11	17	25	24	18
	NORMALIZED CATEGORY SCORE (25% WEIGHTING)	11	17	25	24	18
	CATEGORY RANKING (1 most preferred; 5 least preferred)	5	4	1	2	3
NATURAL ENVIRONMENT						
Aquatic (Creek) Habitat Impacts/Enhancement	Effectiveness of the alternative to enhance fisheries resources; fish diversity, food source, and fish passage	1	1	5	5	1
Aquatic (Pond) habitat Impacts/Enhancements	Effectiveness of the alternative to enhance pond habitat (fish, fowl, wildlife) resources, diversity, food source	3	4	1	3	5
Terrestrial Habitat Impacts/Enhancement	Potential for impact and/or enhancement to connectivity and terrestrial habitat (amphibian, avian, mammal) due to implementation of the alternative	1	1	4	5	4
SAR Impacts/Enhancement	Potential for impact and/or enhancement to potential SAR in the project area	1	1	4	5	3
Geomorphology/Sediment Transport	Effectiveness of the alternative to promote dynamic stability of channel processes and mitigate sediment impacts	1	1	5	5	2
Groundwater Impacts/Enhancement	Potential for impact and/or enhancement to groundwater regimes in the project area (baseflow, recharge, water table, etc.)	3	4	4	3	3
Water Quality Impacts/Enhancement	Effectiveness of the alternative to improve water quality, temperature, TSS, phosphorous, nutrient uptake	1	2	5	4	3
	TOTAL CATEGORY SCORE	11	14	28	30	21
	NORMALIZED CATEGORY SCORE (25% WEIGHTING)	8	10	20	21	15
	CATEGORY RANKING (1 most preferred; 5 least preferred)	5	4	2	1	3
SOCIAL / CULTURAL ENVIRONMENT						
Impact to Private Property	Measure of the impact to adjacent private property (i.e., loss of property, access to property)	4	4	4	3	3
Impact to Public Access	Measure of impact to public access (e.g., trails, recreation - picnic, fish, boat)	3	4	3	3	4
Impact to Public Safety	Measure of the impact to public safety in the surrounding area resulting from the alternative	1	3	4	3	3
Impact to Cultural/Heritage Features	Potential impact to existing cultural and/or heritage features in the project area	5	5	1	1	4
Recreational Impacts/Enhancement	Measure of the impact to existing recreation and opportunities to enhance recreational activities in the project area	3	3	3	4	4
	TOTAL CATEGORY SCORE	16	19	15	14	18
	NORMALIZED CATEGORY SCORE (25% WEIGHTING)	16	19	15	14	18
	CATEGORY RANKING (1 most preferred; 5 least preferred)	3	1	4	5	2
ECONOMIC						
Construction Costs	Relative measure of the initial costs to install/construct the proposed works, including environmental mitigation, sediment management, etc.)	5	4	3	2	1
Maintenance/Future Costs	Relative measure of the ongoing maintenance costs following implementation (or continued maintenance)	1	3	4	4	3
Availability of Funding	Estimate of the availability for funding to implement the alternative	3	3	5	4	2
	TOTAL CATEGORY SCORE	9	10	12	10	6
	NORMALIZED CATEGORY SCORE (25% WEIGHTING)	15	17	20	17	10
	CATEGORY RANKING (1 most preferred; 5 least preferred)	4	2	1	2	5
	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

Preferred Alternative

Next Steps and Contact Information

Next Steps for our project team include:

- **Compile and review feedback from this Public Information Centre**
- **Update preferred alternative**
- **Complete and file project plan**

To provide feedback and comments to the project team, please send all correspondence to the project email address:

embro_dam@thamesriver.on.ca

For further information please contact:

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