



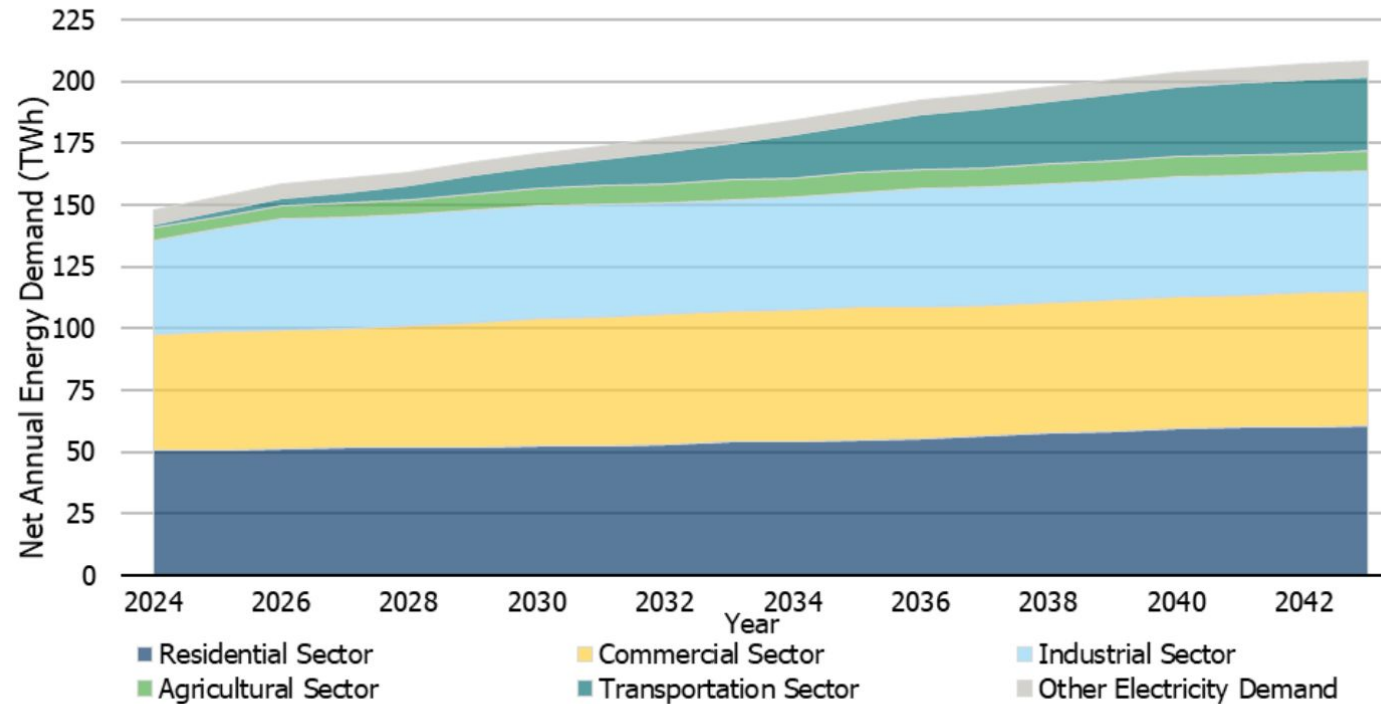
Save Georgian Bay is a grassroots organisation committed to stopping TC Energy's proposal for a pumped storage plant on the Niagara Escarpment and in the waters of Georgian Bay.

MARCH 18, 2024

HOW DID WE GET HERE?

Image Source: <https://justenergy.com/blog/energy-storage-how-it-works-home-and-grid/>

Figure 1 | Annual Energy Demand



Strong and steady growth through the end of the 2030s

- Industrial sector development (mining, steel, EV battery and hydrogen production)
- Agricultural sector greenhouse construction
- Transportation sector electrification

Source: IESO Annual Planning Outlook, Ontario's electricity system needs: 2024-2043. December 2022



ONTARIO'S ENERGY DEMANDS

THE CASE FOR STORAGE

**ENERGY
STORAGE**

Image Source:
<https://www.oeb.ca/newsroom/2022/enabling-storage-ontarios-electricity-system>



The most popular type of battery is lithium-ion. Batteries conserve energy until it is needed, which makes them a reliable and flexible source of electricity supply.

Batteries



Thermal energy storage draws electricity from the grid when demand is low and uses it to heat water, which is stored in large tanks. When needed, the water can be released to supply heat or hot water.

Thermal



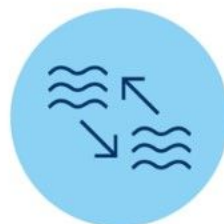
Flywheels are large, heavy wheels that draw energy from the grid to spin at high speeds. When needed, this kinetic energy can be harnessed to drive a generator to produce electricity.

Flywheels



Compressed air uses off-peak energy to pump air into a containment area, such as an underground cavern, that can be released on demand to drive a turbine to generate electricity.

Compressed Air



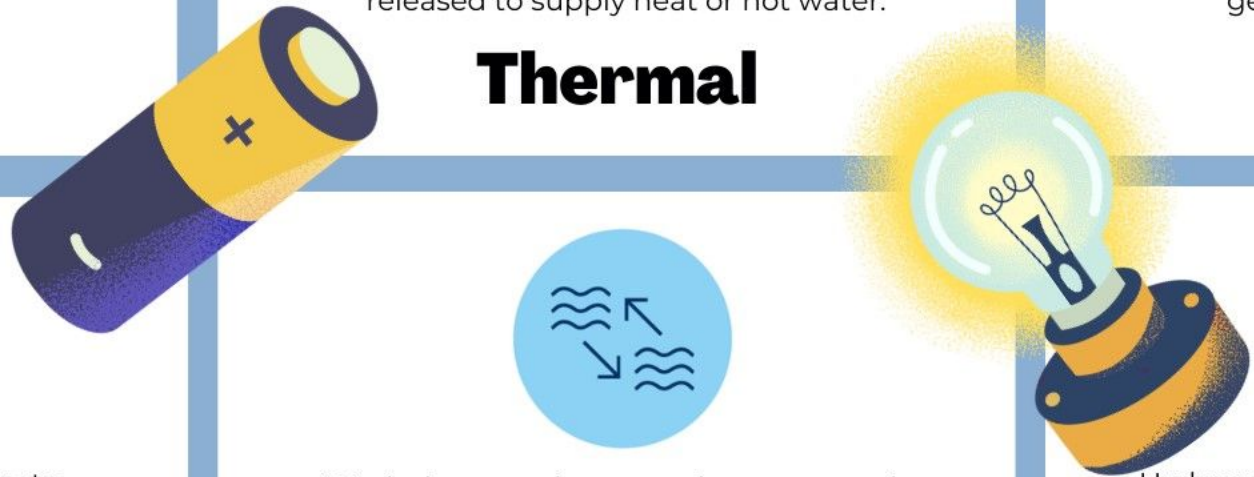
Works by pumping water into a reservoir during low-demand, low-cost hours to be held until needed. When demand increases, the water is released, flows through a turbine and produces electricity.

Pumped Hydro



Hydrogen is a clean fuel that can be produced during periods of low cost and demand, and stored in tanks for use during periods of high cost and demand. It is burned to generate electricity or used to power fuel cells in electric vehicles.

Hydrogen

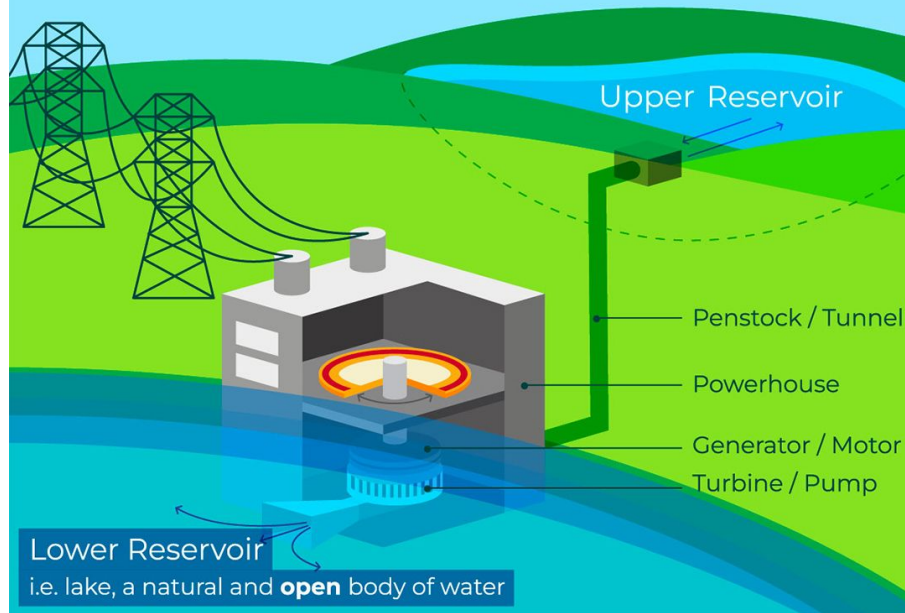


TYPES OF ENERGY STORAGE

OPEN-LOOP PUMPED STORAGE HYDROPOWER

Projects that **are** continuously connected to a naturally flowing water feature

Diagram is not to scale



CLOSED-LOOP PUMPED STORAGE HYDROPOWER

Projects that **are not** continuously connected to a naturally flowing water feature

Diagram is not to scale

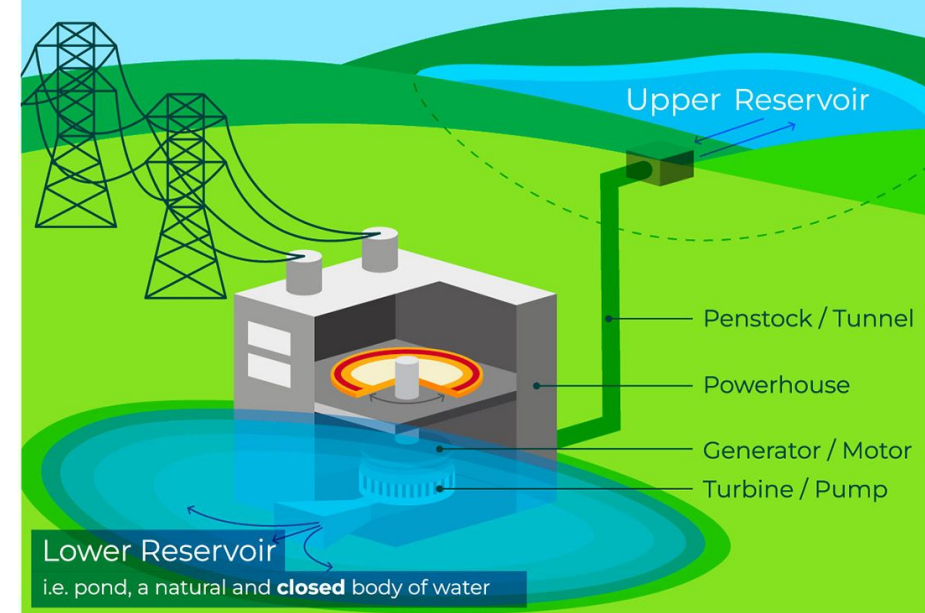


Image Source: <https://www.ontario.ca/page/powering-ontarios-growth>



WHAT IS PUMPED STORAGE?

Save Georgian Bay supports grid decarbonization, recognizing the crucial role of energy storage in that endeavour.

We advocate for more efficient and more cost-effective alternatives that will not negatively impact the environment. It is crucial to balance the need for sustainable energy solutions with the preservation of our natural environment.



Image Source:
<https://cib-bic.ca/en/projects/clean-power/oneida-energy-storage/>



A BALANCING ACT

The scale of this operation raises serious concerns about the potential environmental impact on water, land, and wildlife, jeopardizing the entire fragile ecosystem of the Georgian Bay basin

- open-loop pumped storage facility
- 375-acre reservoir carved out of the Niagara Escarpment
- 4.8-kilometer perimeter dam, 20 metres in height
- massive tunnels excavated deep into the Niagara Escarpment and beneath the lakebed of Georgian Bay
- pump 23 billion litres (9,200 Olympic-sized swimming pools!) of Georgian Bay water daily
- 50 kilometres of high-voltage underwater cables stretching to Wasaga Beach



WHAT IS PROPOSED FOR MEAFORD?



Ludington Michigan Pumped Storage Plant



THE MODEL FOR MEAFORD

1 No Economic Benefit

It lacks a viable business case; Ontario's Independent Electricity System Operator (IESO) twice found that the proposed project fails to provide a net benefit for electricity customers.

It just doesn't add up.

2 Environmental Impacts

It poses significant environmental impacts and threatens fragile ecosystems on the Niagara Escarpment and in the waters of Georgian Bay.

Not worth the risk.



WHY WE'RE OPPOSED

- Projected to cost more than \$7 billion yet create only 20 permanent long-term jobs
- Provide no net economic value to Ontario electricity customers, according to reports in 2021 and 2023 from the Independent Electricity System Operator (IESO)
- Sole-sourced unsolicited bid that, if agreed to would result in a long-term fixed-rate agreement for TC Energy
- Ontario taxpayers are even paying for TC Energy's pre-development costs!



NO ECONOMIC BENEFIT



Image Source: <https://cib-bic.ca/en/projects/clean-power/oneida-energy-storage/>

Eight 250 MW battery storage projects are underway in Ontario, one of which (Oneida – Canadian Battery Energy Storage) is under construction and due to be completed by 2025. The other seven were sent out for tender in 2023.

This alternative to pumped storage has the advantage of a much shorter construction period and is ~87% efficient, vs pumped storage at ~67% efficient.

The capital cost for building pumped storage would be roughly double the capital cost for an equivalent battery storage.



NO ECONOMIC BENEFIT

- 375-acre reservoir carved out of the Niagara Escarpment
- Put at risk as many as 20 Species at Risk
- Disturbance of Existing Contamination
- Fish Kill
- Turbidity
- Disturbed Sediment
- Increase in water temperature
- Magnetic fields

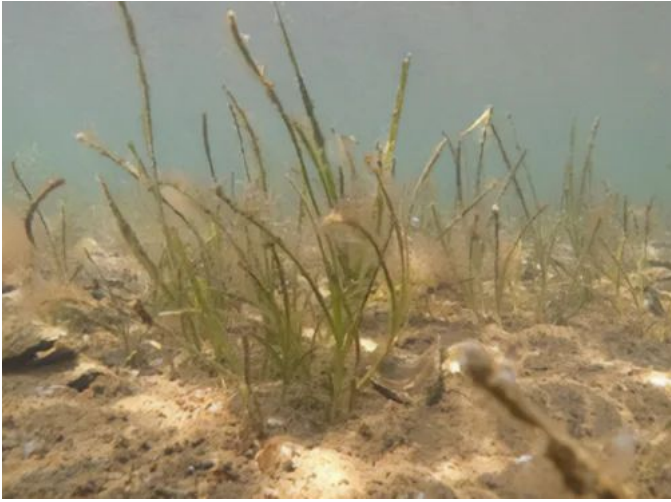


ENVIRONMENTAL IMPACTS



Georgian Bay, known for crystal clear turquoise waters, is home to over 30,000 islands, making it the largest fresh water archipelago in the world.

The region supports a diverse range of ecosystems, including forests, wetlands, and coastal habitats which provide important habitats for wildlife.



If water becomes too turbid, it loses the ability to support aquatic plants and animals

- Clogging fish gills, causing labored breathing or death.
- Degrading fish habitats, like spawning beds.
- Resistance to fish diseases is reduced.
- Modifying natural fish movement and migrations.
- Reducing fish growth and successful development.
- It reduces the amount of food and oxygen available.
- It affects the efficiency of methods to catch fish.

Source: Atlas Scientific (<https://atlas-scientific.com/blog/why-is-turbidity-important/>)



TURBIDITY

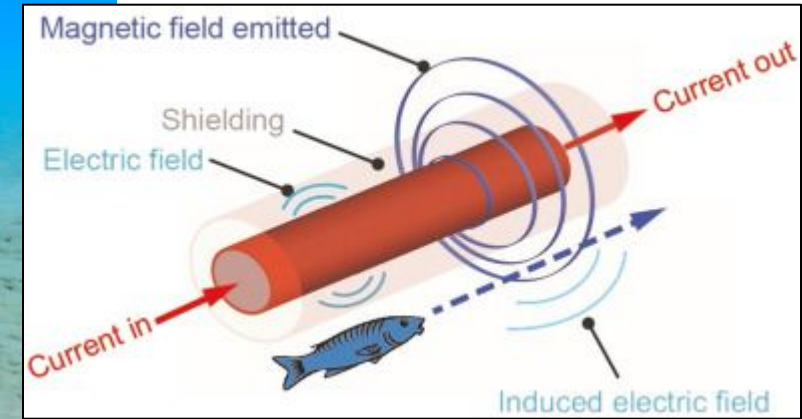
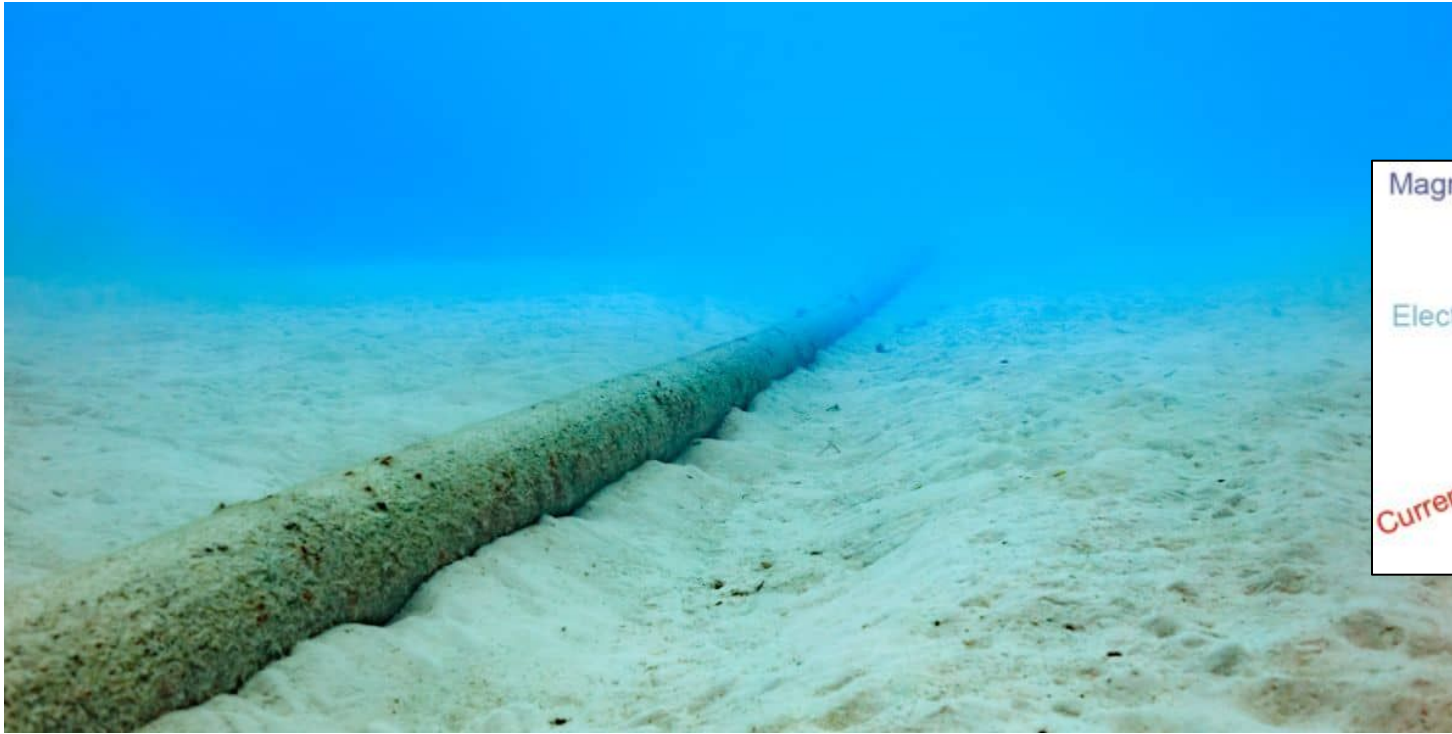


Image Source: Science Direct
(sciencedirect.com)

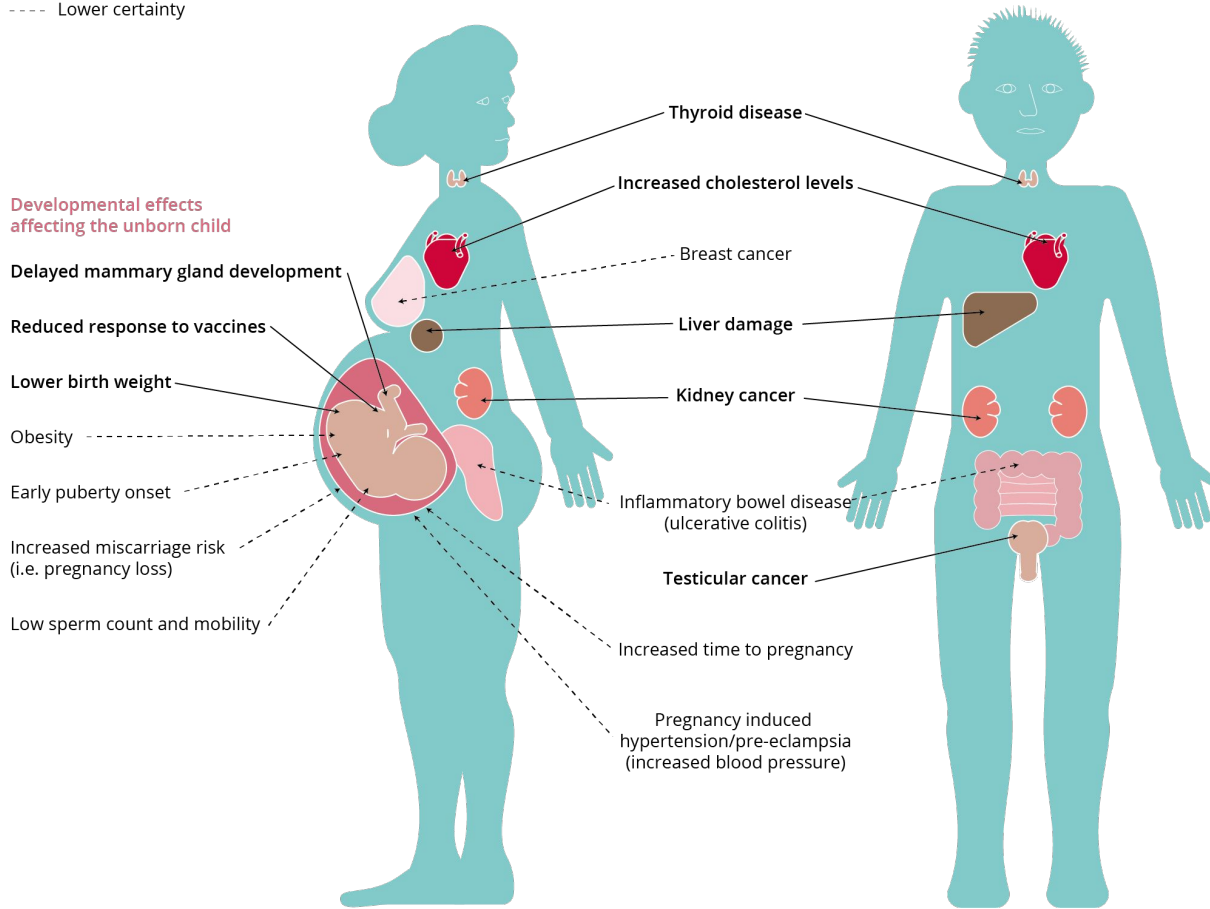
Image Source: SINAY Maritime Data Solution (sinay.ai)

- 50 kilometres of high-voltage underwater cables stretching to Wasaga Beach
- Disrupt lakebed sediment and potentially impact the local marine environment and water quality
- Emission of magnetic field



HIGH-VOLTAGE CABLES

— High certainty
- - - Lower certainty



Effects of PFAS on human health

Disrupting the soil at the training centre, heavily contaminated from years of military activity, could spread heavy metals and toxins into Georgian Bay.

This contamination could harm marine animals and pose risks to individuals and municipalities drawing water from the bay for personal and agricultural use.

Source: European Environment Agency

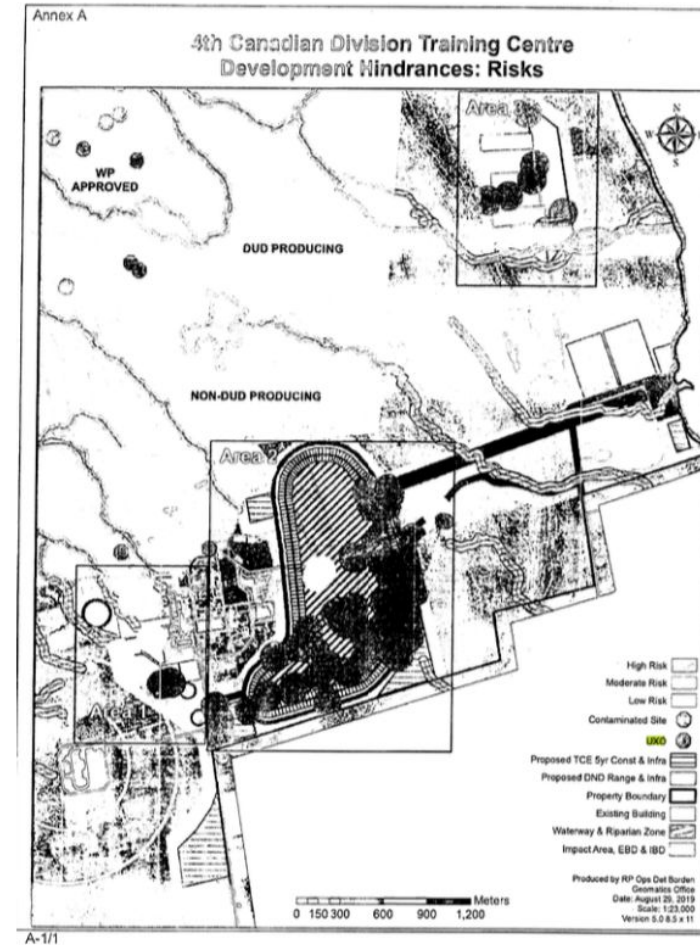
<https://www.eea.europa.eu/publications/emerging-chemical-risks-in-europe>



CONTAMINANT DISTURBANCE

TC Energy claims that they have sited the reservoir to avoid the unexploded ordinance.


This Department of National Defence document that overlays the reservoir with unexploded ordinance.



A0627983_11-001043



CONTAMINANT DISTURBANCE



The Niagara Escarpment, known for its biodiversity, supports a diverse range of ecosystems including forests, wetlands and limestone barrens. It provides habitat for a variety of plant and animal species, some of which are rare or endangered.



Tri-coloured Bat

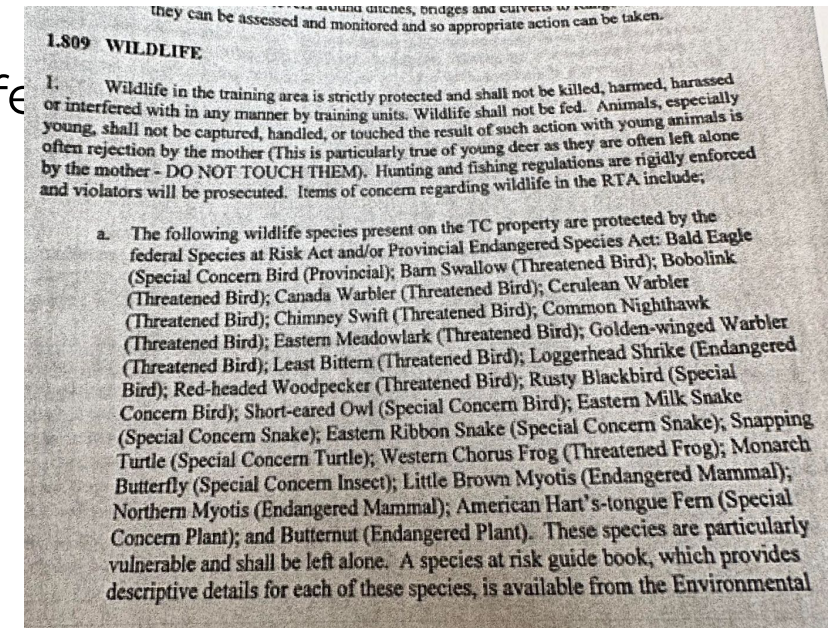


Butternut Tree



Western Chorus Frog

- Project could devastate approximately 10% of the wildlife at the training centre.
- Habitat for the 20 Species at Risk residing in the proposed project site could be destroyed or compromised.



SPECIES AT RISK

“According to the National Energy Board, 17 of the 39 major pipeline accidents in Canada (from 1992 to 2014) were on pipelines owned by TransCanada or its subsidiary NGTL.”

Source: The Polaris Institute Profile of TransCanada Energy



Image Source:
<https://www.canadianmetalworking.com/canadianmetalworking/news/metalworking/transcanada-plans-2-7-billion-nova-pipeline-expansions>



TC ENERGY'S RECORD

“Georgian Bay Association is concerned about the risks posed by this proposed project to water quality throughout Georgian Bay, aquatic biota, and the habitat of species-at-risk - plus the irreversible harm to the Niagara Escarpment.”

- *Rupert Kindersley,*
Executive Director, Georgian Bay Association



SUPPORT FROM AROUND THE BAY





The fate of Georgian Bay's delicate ecosystem hangs in the balance, highlighting the importance of informed and responsible decision-making to secure a sustainable future for generations to come.