

# Appendix B – Select Contextual Correspondence and Reference Material

*(Included selectively; not relied upon as technical evidence)*

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## Appendix B-1: Technical Correspondence on Subsurface Conditions and Contaminant Pathways

### **Document Included**

- Correspondence from Andy Metelka, Sound and Vibration Solutions Canada Inc.

### **Contextual Summary**

This correspondence discusses geophysical methods relevant to characterizing complex subsurface conditions at the Meaford site, including the identification of clay layers, shale, bedrock, and potential contaminant pathways using techniques such as ground-penetrating radar (GPR), electrical resistivity tomography (ERT), seismic methods, and targeted borehole sampling.

The correspondence is provided for context regarding possible approaches to site characterization in complex geology and does not constitute a formal study or analysis.

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**Figure 5.2 - Conditionality Table (60 Examples)**

1–20	21–40	41–60
1. Section 8 “TC Energy does not anticipate... however, this will be confirmed as the assessment of the Project progresses.”	21. Section 6.2 “Project components may be adjusted based on ongoing engineering...”	41. Section 6.1 “Project layout <b>may evolve</b> as design progresses.”
2. Section 8 “It is anticipated that releasing this water...”	22. Section 6.2 “Final design details will be determined...”	42. Section 6.1 “Specific locations <b>will be confirmed</b> during detailed design.”
3. Section 8 “Site-specific studies... may be a component...”	23. Section 6.2 “Infrastructure requirements are being refined...”	43. Section 6.1 “Facility dimensions <b>may vary</b> depending on engineering outcomes.”
4. Section 8 “...may be incorporated into the lighting design.”	24. Section 9 “Baseline data collection is ongoing...”	44. Section 6.1 “Final configuration <b>will depend on</b> technical requirements.”
5. Section 8 “...will be considered as part of the IA process.”	25. Section 9 “Additional studies may be required...”	45. Section 6.3 “Construction sequencing <b>may be modified</b> ...”
6. Section 9.6 “Modeling is currently underway...”	26. Section 9 “Results will be evaluated...”	46. Section 6.3 “Schedules <b>will be refined</b> as planning advances.”
7. Section 10.3 “The Project has the potential...”	27. Section 10 “Mitigation measures may be implemented...”	47. Section 6.3 “Methods <b>may be adapted</b> based on site conditions.”
8. Section 10.3 “Changes in wildlife mortality may occur...”	28. Section 10 “Effects will be assessed...”	48. Section 6.3 “Equipment selection <b>will depend on</b> availability and needs.”
9. Section 7 “Programs... are tailored and adapted...”	29. Section 10 “Design modifications may be considered...”	49. Section 9.5 “Hydrological conditions <b>may influence</b> project design.”
10. Section 10 “...if avoidance is not possible...”	30. Section 10 “Monitoring programs may be developed...”	50. Section 9.5 “Flow regimes <b>will be analyzed</b> ...”
11. Section 10 “This may include...”	31. Section 5 “Approvals may be required...”	51. Section 9.5 “Results <b>may indicate</b> the need for mitigation.”
12. Section 10 “Parameters may be refined...”	32. Section 5 “Project scope is subject to change...”	52. Section 10.2 “Species presence <b>will be confirmed</b> ...”
13. Section 9.4 “Water quality parameters <b>may vary</b> depending on seasonal conditions and operational factors.”	33. Section 5 “Timelines may be adjusted...”	53. Section 10.2 “Habitat conditions <b>may vary</b> ...”
14. Section 5 “This Class EA may be triggered...”	34. Section 12 “Temporary facilities may be located...”	54. Section 10.2 “Further surveys <b>may be conducted</b> ...”
15. Section 5 “Ownership... are still being determined.”	35. Section 12 “Construction areas will be finalized...”	55. Section 10.2 “Impacts <b>will be evaluated</b> ...”
16. Section 12 “TC Energy may acquire property(ies)...”	36. Section 6.2.7 “Access routes may vary...”	56. Section 11 “Socio-economic effects <b>may arise</b> ...”
17. Section 6.2.7 “Access requirements... being evaluated...”	37. Section 6.2.7 “Final access plans will be determined...”	57. Section 11 “ <b>Community responses will be considered</b> ...”
18. Section 6.2.7 “Evaluating the possibility...”	38. Section 6.2.9 “Alternative methods may be considered...”	58. Section 11 “Economic benefits <b>may include</b> ...”
19. Section 6.2.7 “Whether... being evaluated...”	39. Section 6.2.9 “Construction approach will depend on...”	59. Section 11 “Adverse effects <b>may occur</b> ...”
20. Section 6.2.9 “It is anticipated...”	40. Section 6.2.9 “Methodologies are under consideration.”	60. Section 11 “Mitigation strategies <b>will be developed</b> ...”

An Archaeological Reconnaissance of Canadian Forces Training Area  
Meaford.

In response to heritage conservation issues raised by a local resident, Paul Antone of Communications Canada arranged with the Department of National Defence to visit the Meaford base in the company of William Fox of the Ontario Ministry of Culture and Communications during August of 1990.

The investigators met with Captain S.E. [Stu] Syme at base headquarters on the morning of Sunday, August 26 and proceeded to Vail's Point in the company of Lieutenant Tiffany Shelly and Sergeant Sid Curtis. A first stop was made near the tip of the point, where a cursory surface survey through the bush revealed evidence of prehistoric and historic occupations [Photo 1:1]. The latter included a series of concrete pads and some collapsed brick chimneys along the S.W. facing crest of a raised [Algoma stage ?] strandline, probably related to a late nineteenth/early twentieth century Euro-Canadian settlement [archival research is advised]. A cut sheet copper fragment discovered adjacent to a fire-cracked rock [FCR] concentration on lower ground to the southwest may relate to the aforementioned occupation or earlier Native activities. Evidence of a prehistoric or early historic Native occupation included a retouched basalt spall and an Onondaga chert bipolar flake discovered on the strandline slope, as well as two bipolar battered quartz fragments and FCR adjacent to the historic building sites. This area has been registered as the Vail's Point site [BeHe-1].

Subsequent investigation of the modern campsite to the southwest produced no archaeological evidence [Photo 1:2], while a survey immediately to the south along a small unnamed creek disclosed scattered FCR exposed in a raised strandline [Algoma ?] terrace [Photo 1:3]. The FCR occurred at a depth of approximately 20 cm from surface along three meters of terrace slope east of the creek and west of an old borrow pit. Just east of the pit and north of an old road alignment a derelict log cabin was noted. The lower course of logs appear to be adze hewn and it is of a small size similar to existing log structures on Walpole Island and Six Nations. Just to the north and west, adjacent to the break in slope a broken medicine bottle and several FCR concentrations were noted. This area requires additional investigation prior to site registration.

Driving east next, the crew parked at Sucker Creek and walked north to Georgian Bay. The Algonquin and Nipissing strandlines were not easily accessible due to the deeply incised creek valley and steep slopes. Just south of the last bend before the lake an eroding southwest facing bank exposed a sand deposit and terrace which appear to represent the Algoma strandline [Photo 2:1]. A thin scatter of FCR was found eroding from a two meter section of bank [Slide 1]. Although more investigation is necessary, this and

the previous Vail's Point vicinity site may constitute small Late Archaic (c.1300 B.C.) creek mouth encampments.

Continuing down Sucker Creek, the crew arrived at Georgian Bay [Slide 2]. As expected, a Native campsite was discovered on a narrow terrace remnant on the east side [Slide 3]. A unilaterally notched sandstone pebble netsinker was recovered from the eroding bank and PCR was noted on the wooded terrace across a roughly 20 by 5 meter area. Another more recent artifact discovery [Slide 4] resulted in the registration name - the Shell site [BeHe-3].

Across the creek on the west side, PCR, lithics and ceramics were noted eroding from a black loam topsoil deposit [Slide 5]. The artifacts from the Sucker Creek site [BeHe-2] were recovered from eroded tree roots overhanging the bank and are listed below. This proto-historic/early historic Odawa campsite covers an area of at least 30 by 10 meters and was visible in the forest as a PCR scatter across a terrace and hollow immediately north of a higher cobble storm beach.

#### ARTIFACT INVENTORY

##### Ceramics

- 2 Damaged Huron Incised rim sherds
- 4 Plain neck sherds
- 1 Punctated shoulder sherd
- 50 Plain body sherds

##### Lithics

- 2 Collingwood chert flakes
- 1 Basalt flake
- 1 Basalt cobble hammerstone

The crew next walked back south to the vehicle, driving around Mountain Lake and past Cape Rich on the return to headquarters. At headquarters, all recovered artifacts from the Vail's Point, Sucker Creek and Shell sites were turned over to Capt. Syme for safe keeping prior to the departure of Mess. Antone and Fox.

In conclusion, the reconnaissance has indicated that the Department of National Defense lands contain a rich prehistoric and historic archaeological resource base. This should be fully inventoried prior to any further development planning and land disturbance on the training area property.

William A. Fox

Sept. 25/60

## Figure 5.2 - Conditionality Terms Table (60 Examples)

1–20	21–40	41–60
<p><b>1. Section 8</b> “TC Energy does not anticipate... however, this will be confirmed as the assessment of the Project progresses.”</p>	<p><b>21. Section 6.2</b> “Project components may be adjusted based on ongoing engineering...”</p>	<p><b>41. Section 6.1</b> “Project layout <b>may evolve</b> as design progresses.”</p>
<p><b>2. Section 8</b> “It is anticipated that releasing this water...”</p>	<p><b>22. Section 6.2</b> “Final design details will be determined...”</p>	<p><b>42. Section 6.1</b> “Specific locations <b>will be confirmed</b> during detailed design.”</p>
<p><b>3. Section 8</b> “Site-specific studies... may be a component...”</p>	<p><b>23. Section 6.2</b> “Infrastructure requirements are being refined...”</p>	<p><b>43. Section 6.1</b> “Facility dimensions <b>may vary</b> depending on engineering outcomes.”</p>
<p><b>4. Section 8</b> “...may be incorporated into the lighting design.”</p>	<p><b>24. Section 9</b> “Baseline data collection is ongoing...”</p>	<p><b>44. Section 6.1</b> “Final configuration <b>will depend on</b> technical requirements.”</p>
<p><b>5. Section 8</b> “...will be considered as part of the IA process.”</p>	<p><b>25. Section 9</b> “Additional studies may be required...”</p>	<p><b>45. Section 6.3</b> “Construction sequencing <b>may be modified...</b>”</p>
<p><b>6. Section 9.6</b> “Modeling is currently underway...”</p>	<p><b>26. Section 9</b> “Results will be evaluated...”</p>	<p><b>46. Section 6.3</b> “Schedules <b>will be refined</b> as planning advances.”</p>
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<p><b>11. Section 10</b> “This may include...”</p>	<p><b>31. Section 5</b> “Approvals may be required...”</p>	<p><b>51. Section 9.5</b> “Results <b>may indicate</b> the need for mitigation.”</p>
<p><b>12. Section 10</b> “Parameters may be refined...”</p>	<p><b>32. Section 5</b> “Project scope is subject to change...”</p>	<p><b>52. Section 10.2</b> “Species presence <b>will be confirmed...</b>”</p>
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<p><b>14. Section 5</b> “This Class EA may be triggered...”</p>	<p><b>34. Section 12</b> “Temporary facilities may be located...”</p>	<p><b>54. Section 10.2</b> “Further surveys <b>may be conducted...</b>”</p>
<p><b>15. Section 5</b> “Ownership... are still being determined.”</p>	<p><b>35. Section 12</b> “Construction areas will be finalized...”</p>	<p><b>55. Section 10.2</b> “Impacts <b>will be evaluated...</b>”</p>
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<p><b>17. Section 6.2.7</b> “Access requirements... being evaluated...”</p>	<p><b>37. Section 6.2.7</b> “Final access plans will be determined...”</p>	<p><b>57. Section 3.3.1</b> “. . .discussions with relevant parties progress.”</p>
<p><b>18. Section 6.2.7</b> “Evaluating the possibility...”</p>	<p><b>38. Section 6.2.9</b> “Alternative methods may be considered...”</p>	<p><b>58. Section 11</b> “Economic benefits <b>may include...</b>”</p>
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**11 December 2019**

**RECORD OF DISCUSSION**

**4th Canadian Division Training Centre Meaford – Site Development Plan (SDP) -  
Environmental Constraints Meeting**

**Held on 11 December 2019, Conference room in Bldg. M-153, 4th CDTC Meaford  
1300-1530 hrs**

Attendees:

(In person)

Stephanie Morris	ADM(IE), DGPR, DRPPP – Senior Planner
Dwayne James	ADM(IE), DGPR, DRPPP – Senior Planner
Capt Cloutier-Labonte	ADM(IE), RP Ops Det Meaford - OC
LCol Fearon	CA, 4th Canadian Division TC Meaford - OC
CWO Mayfield	CA, 4th Canadian Division TC Meaford
Dan Hoyt	CA, 4th Canadian Division TC Meaford – Range Control
Ted Keunecke	CA, 4th Canadian Division TC Meaford – Env O
Mark Wiercinski	CA, 4th Canadian Division TC Meaford - Biologist
Candice Zboch	DCC, Technical Specialist, Real Property Management
Deborah Durigon	CA, 4th Canadian Division – Environmental Coordinator
Stephanie San Miguel	CA, 4 CDSG - Environmental Coordinator

(Via teleconference)

Maj Price	CA, CADTC, HQ
Aubrie Carruthers	CA, CADTC, HQ
Maj Dean	ADM(IE), RP Ops (Ontario)
MWO Herbst	CA, 4 Cdn Div JTFC HQ
Scott Hamilton	ADM(IE), DGESM, DESM
Rachel McDonald	ADM(IE), DGESM, DESM
Veronic Pichard	CA, DLE
Karen Ralston	DCC, representing DLI

1. Stephanie Morris (SM) opened the meeting by welcoming the attendees and conducting a round table for participants to introduce themselves and identify which organization they represent. SM also provided a summary of the meetings intent, which was to discuss the environmental constraints / impacts associated with the site development concepts being developed as a result of the Trans Canada Energy (TCE) Pumped Storage Project and the requirement to develop a Site Development Plan (SDP).

s.21(1)(a)

s.21(1)(b)

2. SM indicated that the ADM(IE)'s understanding of the environmental risk areas previously identified by 4 CDTC and 4 Div (ref BN), are that this does not constitute the limits of the environmental risks/constraints at 4 CDTC, and that there would be further possible environmental risks / implications to any further concepts being explored, which would need further evaluation. SM then asked Mark Wiercinski (MW), the 4 CDTC Biologist, to provide a summary and context for the environmental risk map developed to ensure a comprehensive understanding of the mapping provided.

3. MW indicated that the assessment provided was to identify, at a high-level, the environmental risk that would pertain to future development of 4 CDTC. The mapping prepared included the TCE footprint and other known infrastructure movements based on previous concepts provided. MW also indicated that this assessment was based only on a preliminary examination for planning purposes, and that a full evaluation has not been conducted. Various maps and concepts were assessed against certain environmental factors such as species at risk and concerns to identify a conceptual map for planning purposes based on the areas identified in preliminary concept plans. MW also indicated that circles on the map represent individual species encountered on the site during the preliminary study period, and that in the proposed TCE reservoir location alone, 10 species at risk were identified, and at least 5 specific at risk in other locations were preliminarily assessed.

4. SM asked about the implications for moving DND related infrastructure concepts in the SDP to other locations on site, where environmental risk had not been identified on the preliminary mapping prepared. Scott Hamilton (SH) indicated that the issue surrounding species at risk is that any infrastructure project would be required to have a permit from the appropriate regulatory authorities, and that there is always the risk that such a project would not be able to obtain the required permit to proceed. SH indicated that all attempts should be made to avoid those species at risk early in the planning phases to avoid these areas, where possible. Additionally, since the TCE project would displace and require relocation of current operations already conducted on site, there is a significant risk that a permit would not be granted. SH indicated that Environment and Climate Change Canada (ECCC) would be reluctant to provide a permit in these types of circumstances. Rachel McDonald (RM) indicated that this permitting process would not be up to DND.

5. SM asked about the Section 83 clause and whether this would apply in this particular situation. RM indicated that Section 83 would not apply if we are moving infrastructure / redeveloping the site based on the TCE (third party) proposal. Karen Ralston (KR) asked whether the Minister of National Defence could request that Section 83 be applied in this situation. ]

SH also indicated that there have been recent examples of projects being stopped because of species at risk on DND properties. SH indicated that this is a large project proposal that would need to be evaluated based on its risks and merits from a Government of Canada perspective. SH indicated that this type

of preliminary evaluation of concerns was to make sure we identify these potential environmental risks to the TCE project proposal.

6. SM asked whether there are other site development options which would be considered to have a lower environmental risk. MW highlighted that a total of 30 species at risk have been identified at 4 CDTC and that there is a significant degree of environmental risk present throughout the site. As such, other siting options would carry essentially the same extent of high environmental risk as the initial concepts explored.

7. KR asked Maj Price if CADTC will be conducting an assessment of training at 4 CDTC, in order to determine if smaller ranges could be used. LCol Fearon indicated that the current ranges and templates are required for 4 CDTC. Maj Price also identified that one option would be to potentially use a Baffle Range, which would reduce the range templating. Dan Hoyt (DH) identified that even if a Baffle Range was used to reduce the range templating, the actual range footprint and related environmental impact would not be reduced. KR indicated that baffle ranges are not a good solution from a real property maintenance perspective and they have been examined for use on other sites.

8. Maj Price asked the group how we are currently managing the species at risk element at 4 CDTC now. Ted Keunecke (TK) and MW indicated that through education and communication and changes in habits, 4 CDTC is able to provide risk management measures in relation to SARA concerns. This is a component of the Section 83 exception.

9. Maj Price identified his concerns that DND would never be able to develop at 4 CDTC based on these concerns. RM indicated that this is not necessarily the case. Individual projects can still apply and receive a permit. Stephanie San Miguel (SSM) also identified that these project proposals would require an application to ECCC. Consideration for other projects would require another analysis outside the scope of this TCE proposal. Debra Durigan (DD) also indicated that the Section 83 exemption applies to public safety and national security priorities.

10. SM summarized that for SDP concept planning, there is some certainty that the entire 4 CDTC carries a high degree of environmental risk. SM asked whether the western section of the range would be a candidate for relocation of Alpha range, considering the high risk areas identified on the environmental risk map and initial range relocation option. DH indicated that relocation in this area would not be possible given the current limitation and risk that this range relocation would pose on the site. LCol Fearon also identified that the proposed Alpha range relocation previously identified is the preferred Course of Action (COA), and positioning a range on the western side of 4 CDTC would be too restrictive to operations and training conducted on the site. MW also indicated that there is also a high probability of species at risk on the western side of 4 CDTC as well. The current map does not illustrate this only because it was not identified as a concept on the initial Site Development Plan concept proposal.

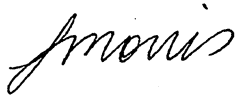
11. KR indicated that TCE would ultimately be responsible for the mitigation activities and that a Memorandum to Cabinet would be required to have this project

approved.

12. DD identified that there is a risk that TCE obtains a permit for this project even given the species at risk concerns, and that specific conditions could be placed on the project which would have implications for DND. SSM asked whether DND was willing to accept those currently unknown conditions that could potentially come with the project. RM identified that DND would have no control over those conditions and that the permit would be binding on TCE to carry out the imposed conditions. KR asked who would be the party assessing/determining the conditions and its impact. SH indicated that it would be other Government Departments involved in the impact assessment that would be reviewing this project as a whole.

13. SM concluded the meeting by thanking everyone for their participation and identified that she would be providing the SDP for review in January 2020. Finally, she acknowledged 4 CDTCs preferred COA with respect to the replacement of Alpha range.

The foregoing is considered to be a true and accurate recording of all items discussed. Should any discrepancies or inconsistencies be noted, please notify the undersigned in writing within five (5) working days of receiving the minutes. If no notifications are received and/or recorded, the minutes shall be deemed acceptable by all.



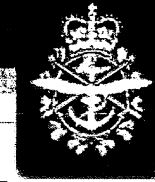
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**Stephanie Morris**  
**DRPPP, Senior Land**  
**Use Planner**

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16 December, 2019

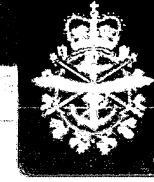
**Date**



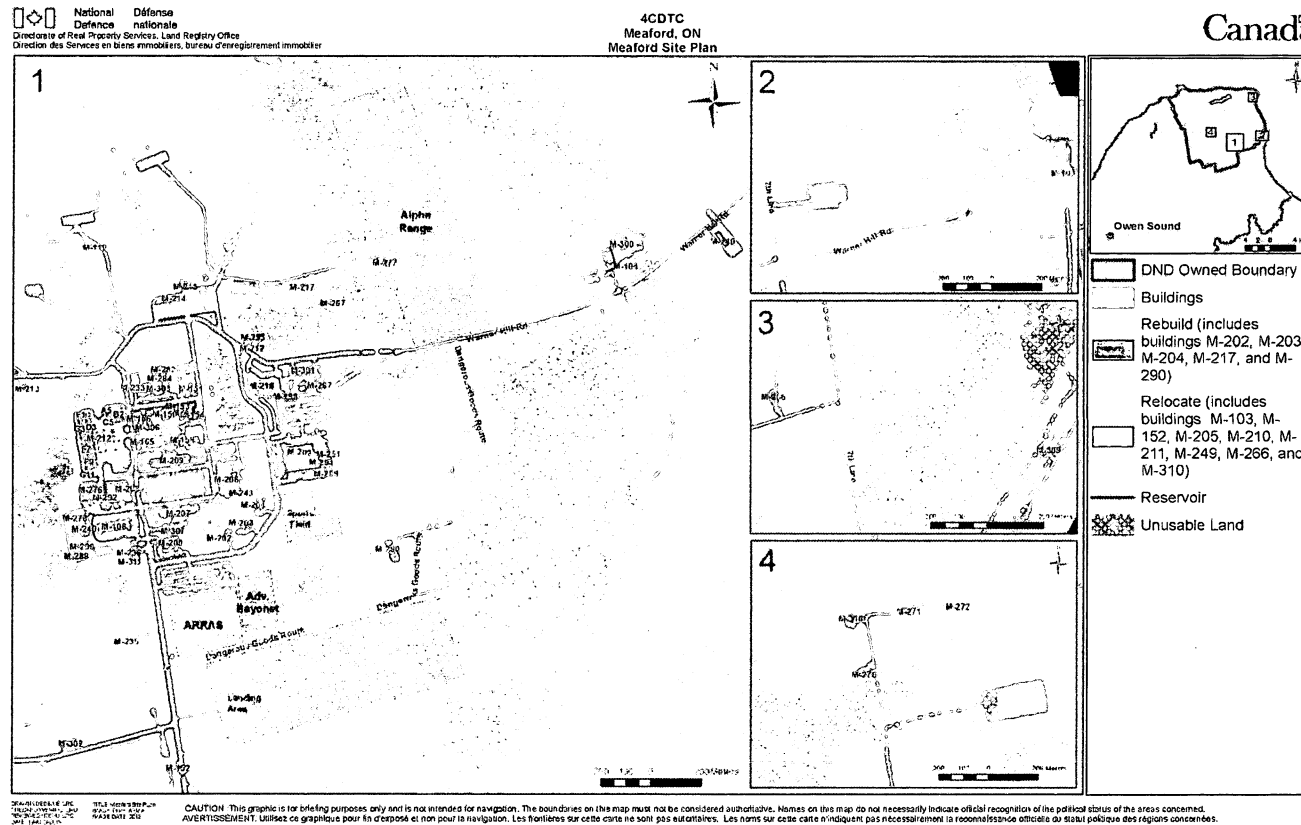
# MRPDP - Development Principles

- Future development in line with L1 future operations
- In line with principles established in Defence Portfolio 2030, Functional Planning Guidance 2018/19, and Draft Strategic RP Planning Paradigm 2050
- Include core best practice principles and custom principles that address local conditions and priorities including:
  - Preserving the integrity of the RTA to ensure Meaford is capable of remaining a centre for Regular Force and Reserve training for 4th Canadian Division
  - Ensuring development is in a compact form, maximizing the range of services and training facilities within walking distance of Base accommodations



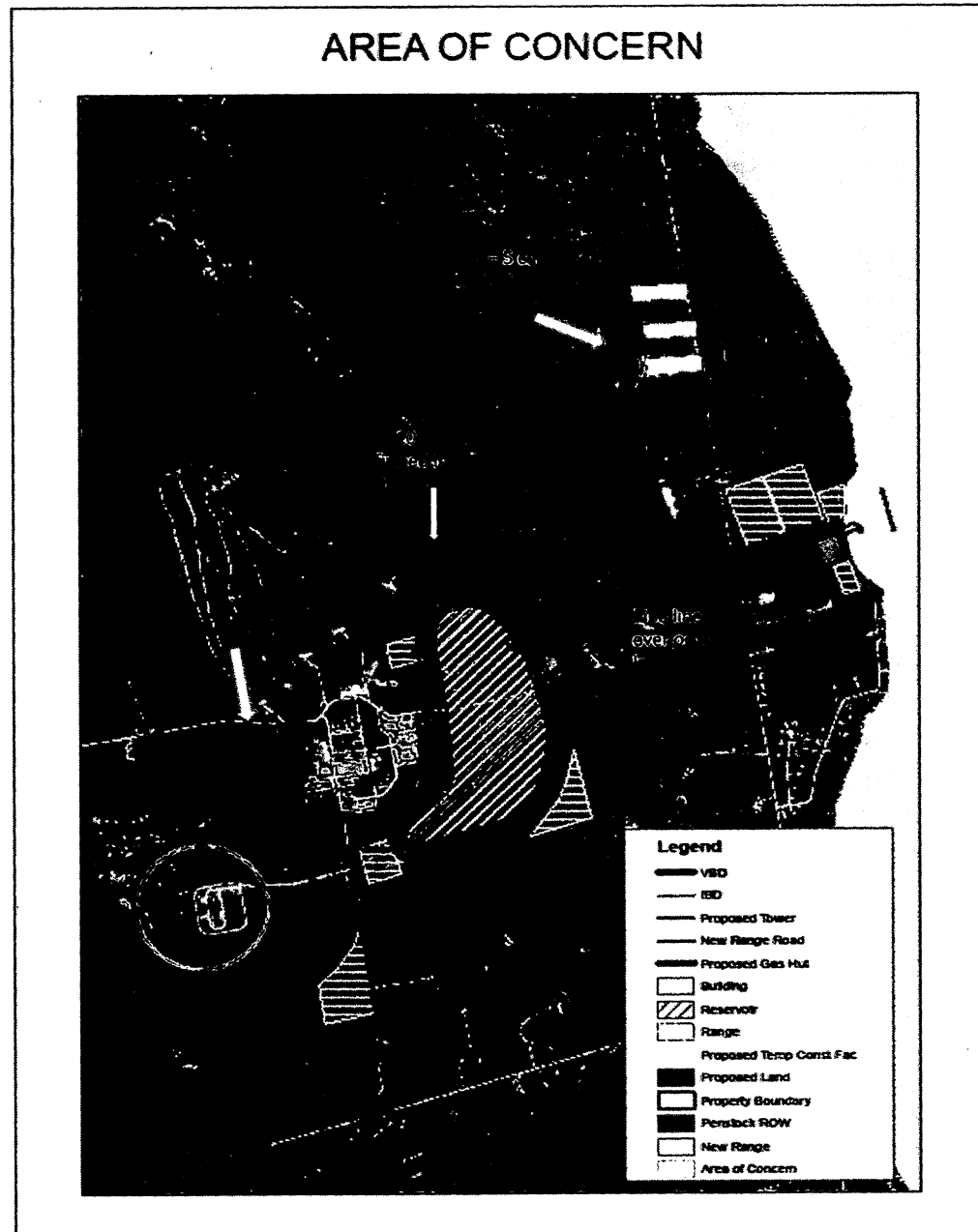


# SDP – PSP Impacted Infrastructure



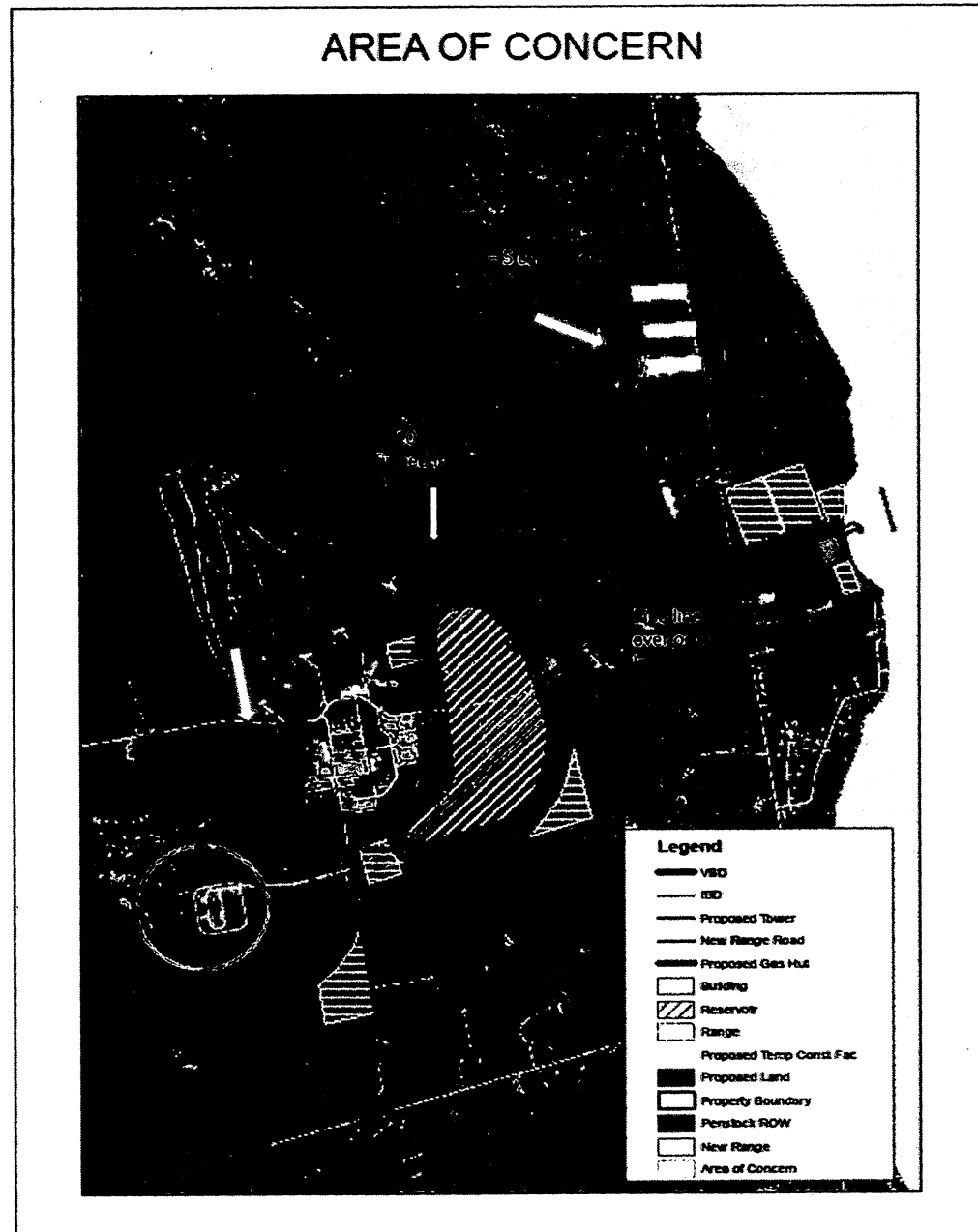
# Environment

Risk of  
not being able  
to relocate  
Army facilities  
due to SAR  
presence



# Environment

Risk of  
not being able  
to relocate  
Army facilities  
due to SAR  
presence



s.21(1)(a)

s.21(1)(b)

# Environment

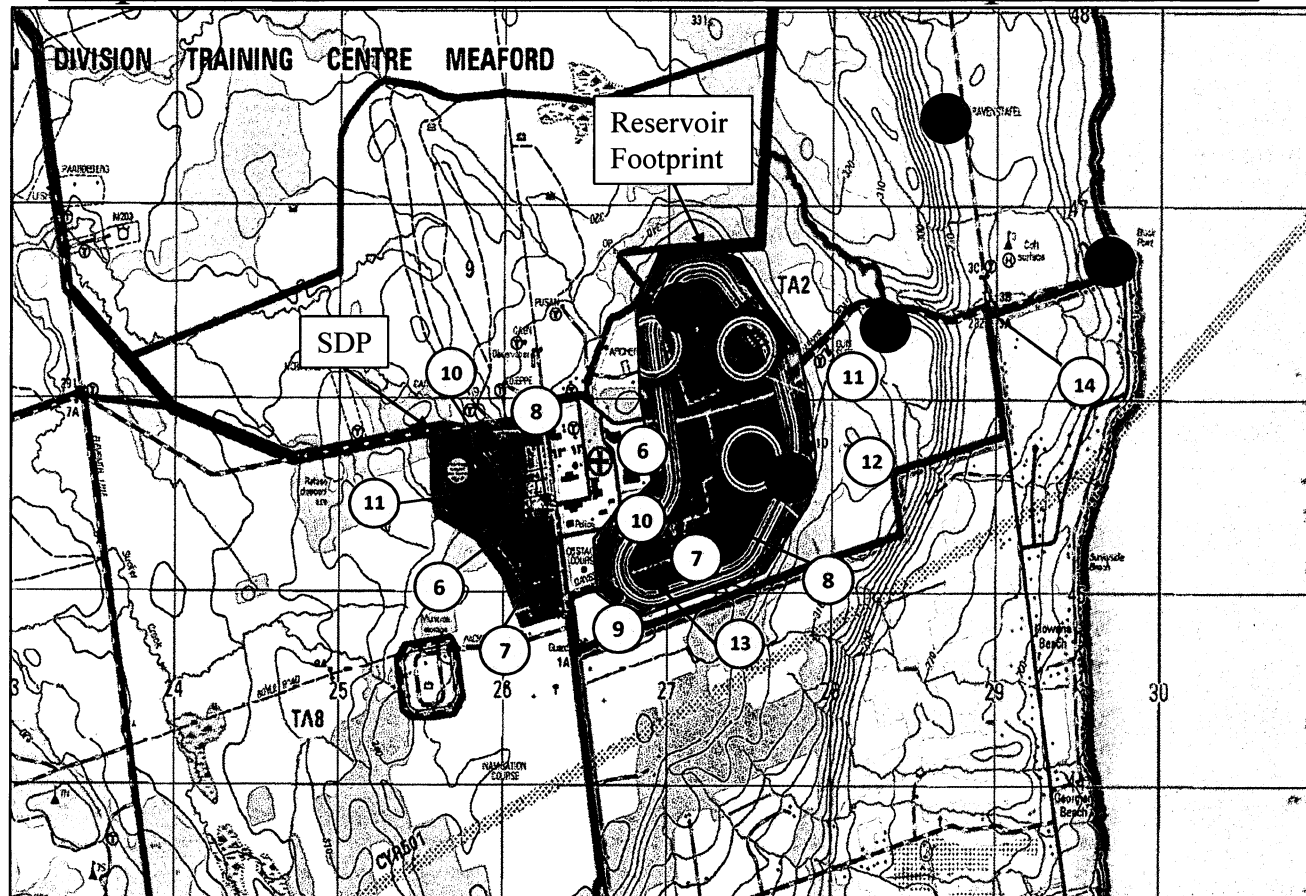
## Relinquishing decision-making: Risk of conflicting priorities

- The decision on whether to allocate DND-owned land to TCE is pivotal.
- If DND decides to relinquish its land, TCE would pursue a federal Impact Assessment (IA). The IA leaves the decision-making to the Minister of Environment and Climate Change on whether the project is in the best interest for Canadians.

*To note: Estimates are that the proposed project would destroy approx. 10% of 4 CDTC's wildlife that DND committed to protect (Defence Energy and Environment Strategy).*

# Impacted Infrastructure & Site Development Plan

- Impacted Infrastructure**
- ① Alpha Range 600m
  - ② \*NEW Gravenstaffel Rge 100m
  - ③ Pump House with Water Treatment Plant and Water Lines
  - ④ Warner Hill Rd
  - ⑤ Bell Mobility Tower
  - ⑥ M205 (Maintenance) M210 (Supply)
  - ⑦ Dangerous Goods Rte
  - ⑧ Rappel Tower
  - ⑨ Airfield
  - ⑩ Sports Field
  - ⑪ CEASS Bldg
  - ⑫ Training Area 1
  - ⑬ Running Trails
  - ⑭ 7<sup>th</sup> Line



- Site Development Plan**
- ⑥ M205 (Maintenance) M210 (Supply)
  - ⑦ Dangerous Goods Rte
  - ⑧ Rappel Tower
  - ⑩ Sports Field
  - ⑪ Live Fire Shoot House



## Impacts to 4 CDTC

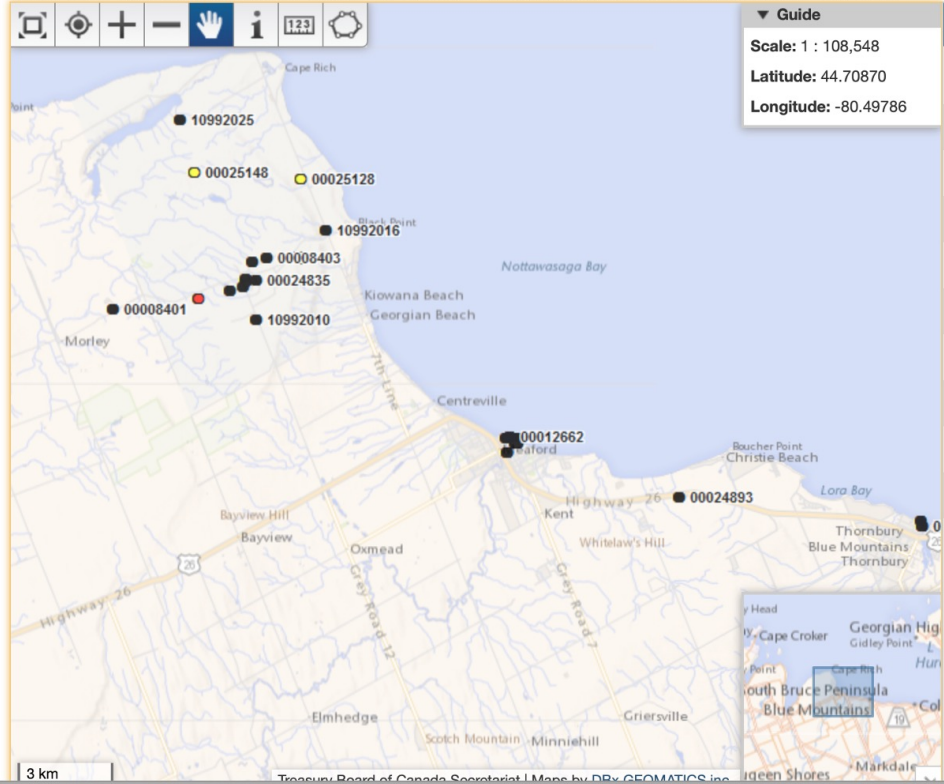
1. **Travel Time** – Increased transport time to proposed Alpha Range relocation, which is the most heavily used range.
2. **Disruption to Training** – Proximity of project during construction and final build will impact individual training throughout.
3. **Reputational Risk** – Base was originally expropriated from Meaford for national service, now the land for a private profit.
4. **Uncertainty to Infrastructure Replacement Timelines** – Any gap between loss of current infrastructure and construction/availability of new infrastructure will impact 4 CDTC operational output. Fragility in both the replacement plan and actual construction of new infrastructure.





## DFRP/FCSI - Map Navigator

Area: Grey, Lake Huron Content: 0 Federal Property, 0 Federal Building, 36 Federal Contaminated Sites



### Layers

- ● Contaminated Sites from active query
- ★ □ Federal Properties
- ★ □ Federal Buildings
- ● Federal Contaminated Sites

## Treasury Board of Canada Secretariat

Home > FCSI > Site 00025148

### Site 00025148 - Meaford Main Impact Area (MIA)

[Previous Site](#)

[Return to Query Results](#)

<b>Status</b>	Historical review completed. Initial testing underway.
<b>Site Status</b>	Suspected
<b>Classification</b>	

#### Site Details

<b>Reporting Organization</b>	<a href="#">National Defence</a>
<b>Reason for Involvement</b>	Federal Real Property
<b>Property Type</b>	Federal (DFRP Property Number <a href="#">10992</a> )

#### Site Location

[Locate this site on map](#)

<b>Latitude, Longitude</b>	44.695323, -80.676651
<b>Municipality</b>	Meaford, ON
<b>Federal Electoral District</b>	Bruce--Grey--Owen Sound

#### Site Management Strategy

- Care and Maintenance

#### Contaminant Details

##### Contamination Estimate

The following contaminated media may exist on the site:

Contaminant Type	Medium Type
Metal, metalloid, and organometallic	Groundwater
Metal, metalloid, and organometallic	Soil
Energetics	Groundwater
Energetics	Soil

### Population

This table contains the population estimates at distances around the site.

Radius	Population
1 km	20
5 km	736
10 km	3,994
25 km	65,920
50 km	282,194

### Financial/Annual Information

2023-2024

#### 2023-2024

<b>Reporting Organization</b>	National Defence
<b>Internal Identifier</b>	0280-C022
<b>Highest Step Completed</b>	<b>02</b> Historical Review
<b>Total Assessment Expenditure</b>	\$0.00
<b>Total Remediation Expenditure</b>	\$0.00
<b>Total Monitoring Expenditure</b>	\$0.00
<b>FCSAP Assessment Expenditure</b>	\$0.00
<b>FCSAP Remediation Expenditure</b>	\$0.00
<b>FCSAP Monitoring Expenditure</b>	\$0.00
<b>Actual Cubic Meters Remediated</b>	0 m <sup>3</sup>
<b>Actual Hectares Remediated</b>	0 ha
<b>Actual Tons Remediated</b>	0 t
<b>Closed</b>	No

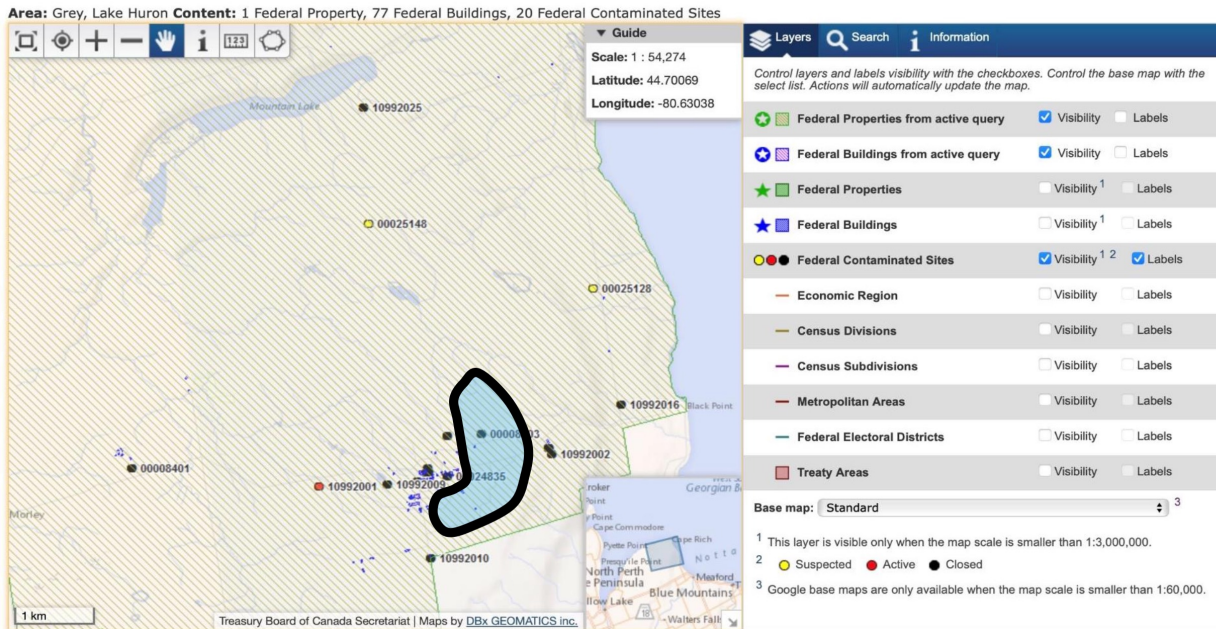
# 4CDTC Contaminated Sites

## List of Contaminated Sites on 4CDTC

<b>Site Name</b>	<b>Site Code</b>	<b>Location</b>	<b>Owner</b>
CATC Meaford Skeet Range	<a href="#">8403</a>	Meaford, ON	DND
Highway 26	<a href="#">24893</a>	Meaford, ON	DND
Building M-210 Former UST	<a href="#">24835</a>	Meaford, ON	DND
Meaford Main Impact Area (MIA)	<a href="#">25148</a>	Meaford, ON	DND
Asbestos Landfill	<a href="#">10992002</a>	Meaford, ON	DND
Maintenance Garage	<a href="#">10992003</a>	Meaford, ON	DND
Refueling Facility 1	<a href="#">10992004</a>	Meaford, ON	DND
Refuelling Facility 2	<a href="#">10992006</a>	Meaford, ON	DND
Garrison Area Refuelling Facility	<a href="#">10992007</a>	Meaford, ON	DND
Sewage Lagoons	<a href="#">10992009</a>	Meaford, ON	DND
Army Firehall #1	<a href="#">10992012</a>	Meaford, ON	DND
Tank Parking Area	<a href="#">10992013</a>	Meaford, ON	DND
Hangar #1	<a href="#">10992014</a>	Meaford, ON	DND
Roadways	<a href="#">10992016</a>	Meaford, ON	DND
Potential Herbicide Barrels Burial Site	<a href="#">10992025</a>	Meaford, ON	DND
Meaford - Area 3 Small Arms Range	<a href="#">25128</a>	Meaford, ON	DND
Former Tank Parking Area - Bivy 9	<a href="#">8401</a>	Meaford, ON	DND
Garrison Landfill; Closed	<a href="#">10992001</a>	Meaford, ON	DND
Airfield Mound	<a href="#">10992010</a>	Meaford, ON	DND
Transformer Storage	<a href="#">10992011</a>	Meaford, ON	DND

## TCE Slide from Presentation to Town of Blue Mountains June 24, 2024

### Proposed Project Location



The overlay of the reservoir was added for the purposes of this deputation and to identify the proposed general location of Project infrastructure.

John Mikkelsen's comment from Toronto Star, March 14, 2020: "The reservoir — 1.7 kilometres long, almost one kilometre wide, and 20 metres deep — would require relocating some military buildings and facilities, which TC Energy would pay for."

We ask:

- Where do the DND buildings move to?
- Where will workers reside?
- Where is construction equipment and material staged?
- Where will access roads be?
- Where do the penstocks run?
- Where are the intakes?
- What ground will be disturbed?
- Will earth be reused or removed?
- What is the total footprint for the project?

National Defense Sept 10, 2005

Mr. Miller, Ex-MP Grey Bruce of S

Mr. Speaker, On July 4, 2005 I wrote a letter to the Minister of National Defense informing him that a former employee of the Meaford Tank Range, in a sworn affidavit, reported that Agent Orange had been buried there in the late 1960's.

In his reply, just a mere two and a half months later, the Minister stated that he had no record of Agent Orange being buried at Meaford, of course there are no records, the employee who made the allegations made it <sup>very</sup> clear that the burial was to be hush, hush.

17,000 Acres  
 Will the Minister conduct a complete and thorough investigation into these allegations and will he do it now yes or no?

## HOUSE PUBLICATIONS

The **Debates** are the report—transcribed, edited, and corrected—of what is said in the House. The **Journals** are the official record of the decisions and other transactions of the House. The **Order Paper and Notice Paper** contains the listing of all items that may be brought forward on a particular sitting day, and notices for upcoming items.

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< September 30, 2005 >

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### 38TH PARLIAMENT, 1ST SESSION

EDITED HANSARD • NUMBER 129

CONTENTS

Friday, September 30, 2005

#### National Defence



**Mr. Larry Miller (Bruce—Grey—Owen Sound, CPC):** Mr. Speaker, on July 4 I wrote a letter to the Minister of National Defence informing him that a former employee of the Meaford tank range, in a sworn affidavit, reported that agent orange had been buried there in the late 1960s.

In his reply, just a mere two and a half months later, the minister stated that he had no record of agent orange being buried at Meaford. Of course there are no records. The employee who made the allegations made it very clear that the burial was to be hush-hush.

Will the minister conduct a complete and thorough investigation into these allegations and will he do it now, yes or no?



**Hon. Bill Graham (Minister of National Defence, Lib.):** Mr. Speaker, I thank the hon. member for his letter. As I said to him in my response, our investigation internally did not indicate any records showing any such event. I am now looking at ways in which we could work with the individual who made the comments in question to see whether we could get any further information.

I assure the hon. member that I have this matter still under hand and I will continue the investigation. I do not want anything to go possibly where we could not find out the existence of any substance that is difficult for us to deal with on our bases. I will continue all efforts and work with the hon. member and the person to whom he spoke to find that out.

\* \* \*

# Concerned Environmentalists speak out!

"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



"TC Energy's proposed pumped storage operation is a monster of an idea. It could destroy the entire aquatic ecosystem of Georgian Bay and threaten the sanctity of a UNESCO World Biosphere. This dangerous plan puts a huge body of water at risk. It must be stopped!"

- Maude Barlow, Author and co-founder of the Council of Canadians and the Blue Planet Project

"Instead of negotiating a sweetheart backroom deal with TC Energy, Todd Smith should be paying EV owners to send power back to the grid when it is needed."

- Jack Gibbons, Chair, Ontario Clean Air Alliance and Former Toronto Hydro Commissioner



**Ministry of Energy**

Office of the Minister

77 Grenville Street, 10<sup>th</sup> Floor  
Toronto ON M7A 2C1  
Tel.: 416-327-6758

**Ministère de l'Énergie**

Bureau du ministre

77, rue Grenville, 10<sup>e</sup> étage  
Toronto ON M7A 2C1  
Tél. : 416-327-6758



MC-994-2023-957

January 9, 2024

Ms Lesley Gallinger  
President and Chief Executive Officer  
Independent Electricity System Operator  
1600—120 Adelaide Street West  
Toronto ON M5H 1P1

Dear Ms Gallinger:

I would like to thank you and your team at the Independent Electricity System Operator (IESO) for your continued efforts on key policy initiatives that have been identified by our government as part of the *Powering Ontario's Growth* plan to meet the province's growing demand for electricity in the 2030s and beyond while transitioning to a clean electricity system.

As illustrated in the IESO's *Pathways to Decarbonization* study, Ontario's electricity system could need to double in capacity by 2050, in order to move the province towards a net-zero electricity grid. Long-duration energy storage could play an important role in meeting electricity system needs, including enabling greater integration of intermittent renewable generation and complementing future nuclear generation.

I would like to thank the IESO for your initial report back, dated September 29, 2023, containing an analysis of the two Pumped Storage (PS) proposals, namely, TC Energy and the Saugeen Ojibway Nation's (SON) Ontario PS project and Ontario Power Generation (OPG) and Northland Power's Marmora PS project, and the addendum dated November 30, 2023, containing an updated analysis for the Ontario PS Project based on revised information provided by the project's proponent.

In the report back, the IESO has noted that under currently proposed cost structures, the PS projects do not compare favourably to currently available alternatives, including battery storage or a portfolio of other non-emitting resources, and therefore neither PS project is able to provide net benefits to Ontario's electricity system or ratepayers. At the same time, the IESO acknowledged the potential benefit of these projects in enhancing the diversity of Ontario's supply mix, if completed in a timeline that would provide value to the system.

.../cont'd

As noted in the report back, the IESO's assessment did not include a valuation of other broader societal and economic benefits from these projects. There are also potential value and risk mitigation opportunities provided by domestically sourced and constructed projects, particularly in light of current geopolitical issues and ongoing supply chain uncertainties that may be associated with other energy storage technologies. To ensure a balanced valuation of these projects, I have asked my Ministry to work with proponents and other ministries as required to assess the broader societal and economic benefits of these PS projects.

I have also received a request from OPG and Northland Power for additional time to provide updated information for the IESO to conduct a revised analysis on the Marmora project. I would ask that the IESO continue engaging with the proponents until updated information is submitted to the IESO and the IESO is able to revise its analysis accordingly.

As a result, I am not prepared to make a final determination at this time on either project.

One area that I believe needs additional clarification with respect to the Ontario PS project is a better understanding of the wide range in capital costs presented in the current project estimates. While this is understandable given the early stage of pre-development on the project, I believe that it would be worthwhile for TCE to continue making progress on pre-development and further refine the cost estimate for the project.

With this in mind, I ask that TCE report back to the IESO and myself with a breakdown of the estimated costs of associated pre-development work on the project (e.g., a Class 3 estimate of capital costs prepared in accordance with AACE International standards, Impact Assessment process, additional engineering work, etc.) and a project schedule of this work.

In developing its cost estimates, I would ask that TCE further engage the Government of Canada on additional assistance that may be available to support pre-development work on the project to further reduce the cost. I anticipate that my Cabinet colleagues will expect significant federal involvement in cost sharing of pre-development costs associated with for the project.

Once these estimates and project schedule have been submitted, ENERGY and the IESO will conduct an assessment of the proposed costs and provide a recommendation to proceed with pre-development within 45 days of submission.

Following this review, I would ask that the IESO negotiate with TCE a commercial agreement to enable TCE to recover eligible, prudently incurred expenses associated with the completion of pre-development work on the project. I ask that the IESO report back to me on the outcome of those discussions within 60 days of the submission of the estimates. A final decision to fund pre-development costs associated with the project would be subject to a Cabinet approval and a future Ministerial directive to the IESO to execute the agreement with TCE.

.../cont'd

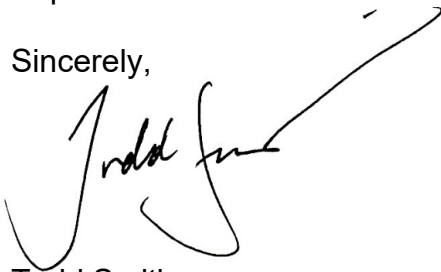
With respect to the appropriate revenue framework for these projects longer term, I am currently not prepared to make a final determination on this matter. In the meantime, I have asked Ministry officials to work with the Ontario Energy Board (OEB) and proponents on project cost recovery mechanisms for my consideration, with a report back by July 31, 2024.

I understand that the IESO is initiating a “Southern and Central Ontario” transmission planning study that will review the capability of the transmission system to support future generation connections and demand growth throughout the southwest to enable a decarbonized system. I would ask that the IESO also consider in its study how Ontario PS could be integrated into the transmission system, to ensure that recommendations are optimized and that the transmission plans developed not only enable the expansion of the Bruce Nuclear Generating Station, but also a wide variety of possible supply and demand outlooks for southern Ontario.

Finally, as I stated in my letter to the IESO on July 10, 2023, should the IESO identify a need for additional long-duration storage, I will consider launching a new competitive procurement for evaluating and possibly acquiring additional long-duration storage projects. I ask that the IESO continue consulting with long-duration storage proponents on a potential procurement for resources with long-lead times and lifespans.

I would like to thank the IESO and the proponents in advance for all the work required on this initiative and I look forward to receiving further information from all parties as requested.

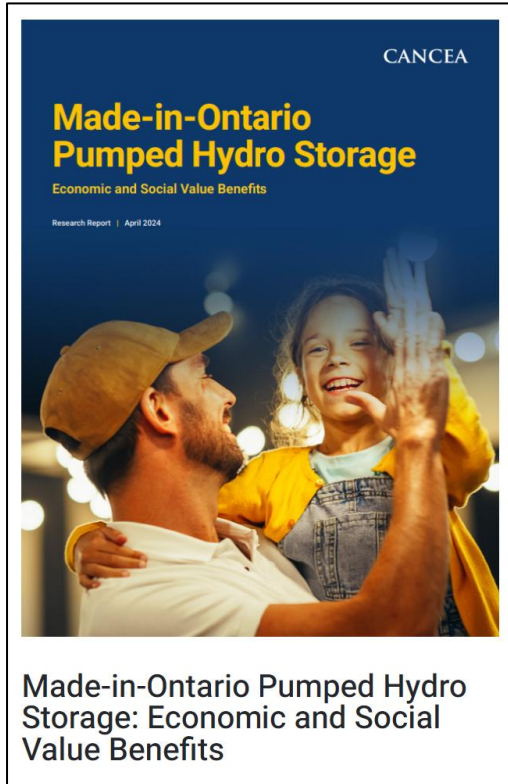
Sincerely,

A handwritten signature in black ink, appearing to read "Todd Smith", with a long, sweeping flourish extending upwards and to the right.

Todd Smith  
Minister

- c: François Poirier, President and Chief Executive Officer, TC Energy
- Annesley Wallace, Executive Vice-President, Strategy and Corporate Development and President, Power and Energy Solutions, TC Energy
- Chief Conrad Ritchie, Chippewas of Saugeen First Nation
- Chief Gregory Nadjiwon, Chippewas of Nawash Unceded First Nation
- Ken Hartwick, President and Chief Executive Officer, Ontario Power Generation
- Mike Crawley, President and Chief Executive Officer, Northland Power
- Susanna Zagar, Chief Executive Officer, Ontario Energy Board
- Jason Fitzsimmons, Deputy Minister of Energy

# CANCEA REPORT: *A Critical Analysis*



Commissioned by TC Energy, the Canadian Centre for Economic Analysis (CANCEA) was tasked with making the case for the proposed pumped storage project. This "funded research" is carefully crafted to influence its audience, relying on a model that allows for user-defined inputs, making the outcomes easily manipulated. The report presents data in ways that exaggerate the project's benefits, painting a much rosier picture than reality.

CANCEA intentionally overwhelms readers with complex numbers and jargon, creating an illusion of credibility and making it difficult to critically assess the information. Even TC Energy's Clarke Little has admitted to struggling to follow CANCEA's "voodoo math."

However, a closer look reveals the truth: this project will cost Ontario taxpayers far more than it will return, while creating very few meaningful jobs.

CANCEA's analysis neglects to fully explore the range of more economically viable alternatives to their client's proposed project. Moreover, it fails to address the environmental risks tied to open-loop pumped storage.

If CANCEA were to take a broader, more honest view, it would show that there are less expensive, more efficient, and more environmentally friendly solutions to meet Ontario's energy storage needs.

*"Made-in-Ontario Pumped Hydro Storage: Economic and Social Value Benefits" Canadian Centre for Economic Analysis (CANCEA)*

**This critical analysis offers a broader perspective on TC Energy's proposal. We aim to spark a more transparent, informed, and balanced discussion.**



# CANCEA REPORT: *Research or Storytelling?*



The screenshot shows a webpage with a dark blue header containing a globe icon and the text "Influence via our Specialized Reports" and "Evidence-based ways to achieving your objectives". Below the header, the same title "Influence via our Specialized Reports" is repeated. The main content area includes a paragraph about government and industry consulting practice, a sub-section titled "Introduction and application of our four-pillar approach" with a paragraph of text, a photograph of a man in a light blue shirt looking at a document, another sub-section titled "Goal identification and planning" with a paragraph of text, and a final paragraph about data-driven analysis.

**Influence via our Specialized Reports**

Evidence-based ways to achieving your objectives

**Influence via our Specialized Reports**

Our government and industry consulting practice will accompany you through a process of influence and change from start to finish. Our team provides a range of services based on your needs.

**Introduction and application of our four-pillar approach**

We have been very successful in making the case for change, with approximately \$17 billion unlocked in successful government and industry campaigns in Canada since 2002. With this success comes valuable insights as to what works and what doesn't. Our four-pillar approach is a framework derived from these experiences and we will be pleased to share this with you.



**Goal identification and planning**

Clients tend to have a strong understanding of what they'd like to achieve but are less clear on problem identification and how detailed, data-driven analysis can help them. With our knowledge of the complexity and participants of socio-economic systems, we are able to decompose a client's objectives into a detailed plan of how to make the case with evidence and analysis.

<https://www.cancea.ca/index.php/influence-via-our-specialized-reports/>

**The CANCEA report is not independent.** Rather it is an example of “funded research” commissioned by TC Energy and designed to make the case for their proposed project.

On their website, CANCEA says that they help clients set “goals” for research outcomes and develop a “detailed plan of how to make the case.” They describe their reports as designed result in “influence and change.”

CANCEA uses Agent-based Computational Modeling (ABM), which relies on design choices, such as assumptions about behaviors and interactions inside a computer simulation. These choices can introduce subjectivity and impact the simulation’s outcomes. It's important to question the biases in the programming of the model's behavioral rules.

**It would be appropriate to engage a truly independent third party to audit CANCEA’s report before relying on it.**

# CANCEA REPORT: *A Closer Look Tells a Different Story*

As you take a closer look at the CANCEA report, consider this:

- **A BIASED VIEW:** The report is an example of CANCEA’s “funded research” service they call “Influence via Our Specialized Reports.” They use Agent-based Computational Modeling (ABM), which relies on design choices that can introduce subjectivity and impact the simulation’s outcomes. **The report tells a good story and craftily makes the case for their client’s proposal, but does not reflect an independent view of the project.**
- **A NET LOSS FOR ONTARIANS:** CANCEA’s analysis relies on outdated capital cost assumptions that are off by \$1.2 billion. TC Energy initially estimated the project at \$2.3 billion, but the report raised the cost to \$5.8 billion. TC Energy now estimates \$7 billion, which would be funded with public dollars. Based on CANCEA’s estimated Ontario economic benefit of \$6.12 billion, Ontario taxpayers stand to lose \$880 million on this project. Ontario taxpayers have already spent \$285 million to cover TC Energy’s “pre-development” costs, a decision announced just before Premier Doug Ford called a snap election. **The only economic benefits go to TC Energy, not to Ontarians.**
- **EXAGGERATED JOB CREATION:** The report grossly overstates job creation. After converting “people-years” to jobs, we see that the project is anticipated to result in 740 jobs in Ontario and just 180 in Grey-Bruce-Simcoe. This includes part-time and temporary jobs as well as direct, indirect, and induced jobs. **And with TC Energy’s estimation of 32 permanent jobs, the project is not the job creator they would like you to believe it is.**
- **A FALSE COMPARISON:** The report is based on an unrealistic comparison to a “business-as-usual” economy. If this project doesn’t move forward, other energy storage projects would fill the gap, making those alternatives a more appropriate benchmark. Additionally, CANCEA compares the pumped storage project to an unrealistic, “stylized” battery storage model. Further, they fail to compare the project to other feasible energy storage options that could meet the province’s needs, while also costing less, offering speedier implementation, delivering better efficiency, and causing less adverse impact to the environment. **CANCEA’s selective comparison model is specifically engineered to exaggerate the benefits of their client’s proposal.**

**CANCEA’s report delivers impressive headlines but lacks the rigor and substance one would expect when making a \$7b decision for Ontarians.**



# CANCEA REPORT: A Look at “Total Net Benefits”

## Objectives

This study focuses on the economic and social value of the OPS investment, with social value being the well-being pillar of Environmental, Social and Governance (ESG) investment principles. Together, these components of value combine to measure the total benefits supported by the Project. Additionally, to fully understand the benefits of any infrastructure investment, both the contribution (the overall significance of the Project in the economy and society) and the net benefit (how the Project compares to business-as-usual growth) of an investment must be considered. These key concepts are explained below.

### OPS Contributions: The Gross Value Components of OPS



**Economic Contributions:** The economic contributions quantify the activity in Ontario and the increased capacity of its supply lines that result from OPS investments. This requires an understanding of the jobs and economic activity directly related to OPS construction and operations (direct contributions), the jobs and economic activity generated in the affected supply lines (indirect contributions) and the induced effects from the payment of wages which OPS will directly, or indirectly, support.



**Social Value Benefits:** The social value benefit quantifies the extent to which OPS will change the well-being of Ontarians. This captures all the positive and negative effects on the well-being of individuals against well-being in a business-as-usual baseline that would generate the same number of jobs as OPS would generate directly<sup>1</sup>. These changes in well-being are mapped to monetary equivalents using income changes that would result, all else equal, in the same changes in well-being for each unique individual in the analysis. This exercise requires an understanding of the people that OPS will impact through training, upskilling, increased Ontario supply capacity and the higher wages paid to higher-quality jobs.

### OPS Net Economic Benefit: The Net Economic Value Components of OPS



**Economic Net Benefits:** The net economic benefit of the project measures how much more valuable, in terms of the economic metrics analyzed, the OPS investment is over the business-as-usual baseline that would generate the same number of jobs as OPS would generate directly. This net benefit corresponds to the difference between OPS's gross economic contribution and the gross economic contribution of the baseline.

1 The motivation for this baseline scenario is that if an alternative investment were to have the same direct jobs impact, but the direct jobs reflected the general economy (rather than the specific jobs required for OPS) there will be differences in the overall economic contribution. In particular, when following the indirect and induced aspects in the 'business as usual' case, there might be different jobs required in the supply chain, and variation in the overall economic capacity of the province. The net result will reveal that even when starting with the same number of direct jobs, the effects of OPS on the supply chain and induced activity could be different to the 'business as usual case'.

2 Made-in-Ontario Pumped Hydro Storage: Economic and Social Value Benefits

The report looks at “total net benefits” supported by the project which include “economic contributions” and “social value benefits” *combined and then compare it to “business-as-usual.”*

**Economic contributions** (jobs and economic activity) are defined very broadly and include assumed benefits *well beyond the direct influence of the project.*

**Social Value Benefits** attempts to monetarily quantify the project’s impact on the well-being of Ontarians. They do that by estimating the change in individual income, all else being equal, that would result in the same change in well-being *and then include these values when calculating the project’s “contributions.”*

**This approach deliberately presents the project as more favorable than it truly is.**

“Made-in-Ontario Pumped Hydro Storage: Economic and Social Value Benefits” Canadian Centre for Economic Analysis (CANCEA)



# CANCEA REPORT: *Compared to Business-as-Usual?*

## Net Value of Ontario Pumped Hydro Storage to Ontario

To better understand the significance of OPS in the Ontario economy and society, it is useful to compare the effect of OPS relative to a business-as-usual baseline that would generate the same number of jobs as OPS would generate directly. In this case, the economic contribution of OPS was found to be 1.7 times higher than the contribution generated from Ontario's business-as-usual activity. That is, OPS is 1.7 times more beneficial than general investment in the Ontario economy. In addition, it benefits 20% more Ontarians.

Overall, OPS is expected to generate a total net value of \$3.4 billion over the next 50 years, which arises from a net economic contribution of \$2.9 billion relative to the general economy plus the social value contribution of \$450 million.

**OPS is 1.7 times more beneficial than an alternative investment in the Ontario economy**



5 Made-in-Ontario Pumped Hydro Storage: Economic and Social Value Benefits

CANCEA

*“Made-in-Ontario Pumped Hydro Storage: Economic and Social Value Benefits” Canadian Centre for Economic Analysis (CANCEA)*

The “net value” contributions of the proposed project are compared to “business-as-usual” or *not having any energy storage project*.

This is, of course, a false narrative. Ontario needs energy storage to support the transition to renewable energy sources. Should this project not go forward other energy storage projects would, *so the appropriate comparison should be to those alternatives*.

Because TC Energy submitted this project to the province as an unsolicited bid, *it has not gone through a transparent, competitive RFP process to prove its value relative to other options*.

**The IESO has twice rejected TC Energy’s proposed project based on lack of value to Ontarians relative to other energy storage options.**

**If considered in an open, transparent competitive process, other energy storage projects may prove to be more valuable to Ontarians than TC Energy’s unsolicited proposal.**

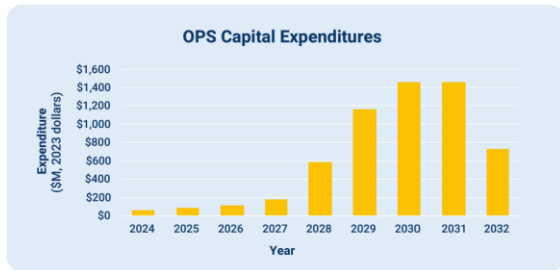


# CANCEA REPORT: *A Bad Deal For Ontarians*

## 1.4 Ontario Pumped Hydro Storage Investments and Operations

This report analyzes capital and operational investments proposed by TC Energy from 2024 to 2072. Capital investments, related to the preconstruction and construction phases of the project, span the 2024-2032 period. In total, the estimated capital investments amount to \$5.8 billion<sup>10</sup>, with 83% of this spending remaining in Canada. The majority of these investments occur during the construction phase from 2027 to 2032, as shown in Figure 1.

Figure 1 Estimated Capital expenditures (2023 dollars)



<sup>10</sup> Given ongoing refinements to the project, the final project costs could differ from the estimates used for this analysis.

“Made-in-Ontario Pumped Hydro Storage: Economic and Social Value Benefits” Canadian Centre for Economic Analysis (CANCEA)

CANCEA is using a capital cost assumption of \$5.8 billion, which is *out-of-date by \$1.2 billion*. TC Energy’s current capital cost estimate is \$7 billion – *that’s up from \$2.3 billion when it was first proposed*. How high will it ultimately be? Our experts think it could be as much as \$10 billion or more. Ontario taxpayers have already spent \$285 million to cover TC Energy’s “pre-development” costs.

If one follows the math through, the only net benefit goes to TC Energy, not to Ontarians.

Using the potentially problematic agent-based modeling, CANCEA determined that the project would contribute \$6.8 billion to the Canadian economy, with only 90% of that benefit staying in Ontario. The remaining 10% (\$680m) would essentially be a subsidy arrangement from Ontario to other provinces, leaving only \$6.12 billion into the Ontario economy.

**With \$7 billion in capital costs funded with public dollars, and only \$6.12 billion returning into the Ontario economy, Ontario taxpayers are left facing a *loss of \$880 million*.**



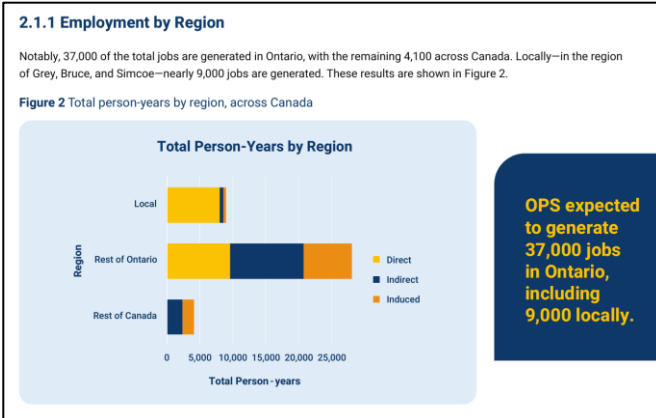
# CANCEA REPORT: *Misleading Job Numbers!*

Category	Total	Direct Components	Indirect Components	Induced Components
<b>Economic Contribution (GDP, 2023 dollars)</b>	<b>\$6.8 billion</b>	\$3.4 billion	\$2.0 billion	\$1.4 billion
Gross operating surplus* (2023 dollars)	\$2.9 billion	\$1.5 billion	\$0.8 billion	\$0.7 billion
Private investment (2023 dollars)	\$1.4 billion	\$0.7 billion	\$0.5 billion	\$0.2 billion
<b>Jobs (people-years)</b>	<b>41,200</b>	<b>17,600</b>	<b>14,100</b>	<b>9,400</b>
Labour income (2023 dollars)	\$3.9 billion	\$2.0 billion	\$1.3 billion	\$0.6 billion

\* Gross operating surpluses are approximately equal to business profits.

The majority of potential jobs from TC Energy’s project would be temporary. The company acknowledges there will only be **32 permanent positions**, most based in Toronto or Calgary.

CANCEA compares the project’s potential jobs to a “business-as-usual” scenario. However, if this pumped storage project did not proceed, other energy storage projects would, and they may create even more local jobs. **Without an open RFP process, we can’t know how really know how TC Energy’s proposal would compare to other proposals.**



CANCEA misleads by calculating jobs in “people-years,” which doesn’t reflect actual full-time job creation. **People-years are NOT jobs as is commonly understood.**

**“Jobs are measured in people-years, which correspond to the number of full-time employment equivalents over one year.”**

- CANCEA



# CANCEA REPORT: *People-Years Are Not Jobs!*

The “people-year” numbers provided must be divided by the 50 years of the project lifespan to get a sense of actual potential job creation.

A “people-year” of employment can represent the work of one person for a full year, or multiple people working for a shorter period of time.

**All of these examples are counted as “people-years” of employment in CANCEA’s report:**

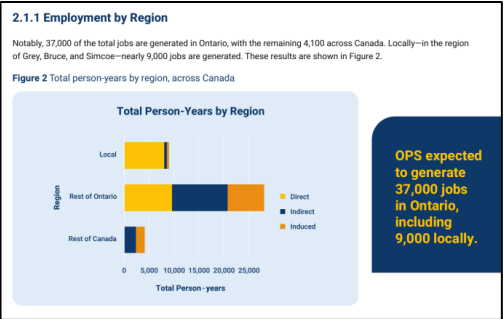
- *One person working full-time for a full year.*
- *Four people working for three months.*
- *Four people working 10 hours per week for a year.*

Category	Total	Direct Components	Indirect Components	Induced Components
<b>Economic Contribution (GDP, 2023 dollars)</b>	<b>\$6.8 billion</b>	\$3.4 billion	\$2.0 billion	\$1.4 billion
Gross operating surplus* (2023 dollars)	\$2.9 billion	\$1.5 billion	\$0.8 billion	\$0.7 billion
Private investment (2023 dollars)	\$1.4 billion	\$0.7 billion	\$0.5 billion	\$0.2 billion
<b>Jobs (people-years)</b>	<b>41,200</b>	17,600	14,100	9,400
Labour income (2023 dollars)	\$3.9 billion	\$2.0 billion	\$1.3 billion	\$0.6 billion

\* Gross operating surpluses are approximately equal to business profits.



Total	Direct Jobs	Indirect Jobs	Induced Jobs
825	352	282	188



**Only 740 jobs in Ontario**  
*(180 in Grey-Bruce-Simcoe, including part-time and temporary jobs)*

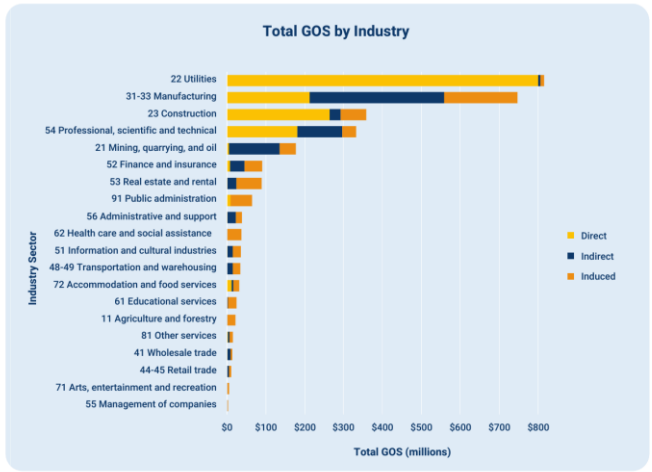
“Made-in-Ontario Pumped Hydro Storage: Economic and Social Value Benefits” Canadian Centre for Economic Analysis (CANCEA)



# CANCEA'S REPORT: *Misleading Utility Sector Benefits*

The results by industry are depicted in Figure 12. The bulk of benefits are concentrated in the utilities and manufacturing sectors, followed by construction and professional, scientific and technical services. The size of benefits received by the utilities sector is expected, given that this sector directly benefits from the added flexibility and reliability that pumped storage provides, and includes the operation of OPS itself. Moreover, OPS can lead to significant cost savings for utilities in terms of reduced need for peaking power plants, which are typically more expensive to run. By providing a more cost-effective way to manage peak loads, the utility sector can improve its overall efficiency and profitability.

Figure 12 Total Gross Operating Surplus by industry (2023 dollars)



“Made-in-Ontario Pumped Hydro Storage: Economic and Social Value Benefits” Canadian Centre for Economic Analysis (CANCEA)

CANCEA is showing the largest industry benefits going to the Utility sector and is described as that sector’s direct benefits from “the added flexibility and reliability that pumped storage provides” and the resulting “significant cost savings for utilities” due to reduced need for peak power plants.

CANCEA compares the project impact on the Utility sector to a “business-as-usual” scenario. However, if this energy storage project did not proceed, other energy storage projects would, and they may create even more improvements for the utility sector. **Without an open RFP process, we can’t know how TC Energy’s proposal would compare to other proposals.**

**These benefits are not unique to pumped storage and would be true for any energy storage projects.**



# CANCEA'S REPORT: *Misleading Comparison to BESS*

**Comparison of Ontario Pumped Hydro Storage to Battery Energy Storage System**

A primary alternative to pumped hydro storage is battery energy storage. While these technologies can provide similar utility to the electricity system, they can differ widely in their economic and social benefits. With this in mind, the economic and social benefits of the first 20 years of construction and operations of OPS are contrasted with those of a 20-year battery energy storage system (BESS) alternative. The exercise adopts a stylized BESS example that is of similar capacity and location to OPS. The total capital investment for this BESS example would be similar to OPS.

The net benefit of OPS relative to such a battery energy storage system is \$3.5 billion, encompassing \$3.2 billion and \$190 million, respectively, in net economic and social value contributions over the next 20 years. In terms of GDP and social value, the OPS contributions are 2.5 and 2.1 times higher than those of BESS, respectively.

**OPS is 2.5 times more economically beneficial than battery alternatives.**

**OPS is 2.1 times more beneficial to the well-being of Ontarians than battery alternatives.**

**Pumped Hydro Storage Relative to Battery Energy Storage System**

Relative to the first 20 years of OPS, an investment in the equivalent capacity battery storage system would result in:

- Fewer jobs for Ontarians:** While OPS generates 34,700 jobs for Ontarians, BESS generates only 10,500. This means that OPS generates 3.3 times more jobs than BESS.
- Greater reliance on foreign supply chains:** While 83% of the direct spending from OPS would remain in Canada, that figure is only 20% for BESS. This reliance on foreign, as opposed to local, supply chains, is reflected in the significantly lower economic and social benefits generated for Ontarians by BESS.
- Less economic value:** OPS generates 2.5 times more GDP than BESS over the 20 years analyzed. Similar differences are observed for all metrics analyzed, including GDP in rural regions, gross operating surpluses, private investments, and jobs.
- Less social value:** OPS generates 2.1 times more social value than BESS over the 20 years analyzed. Across all social metrics analyzed, including the number of affected Ontarians, households, and full-time jobs, OPS generates at least 3.2 times as many benefits as BESS.

**OPS generates more spending in Ontario, building important construction & manufacturing capacity.**

9 Made-in-Ontario Pumped Hydro Storage: Economic and Social Value Benefits CANCEA

CANCEA has compared the proposed TC Energy pumped storage proposal to one “stylized” battery storage alternative.

CANCEA do not explain what assumptions they have made in their “stylized” example, making it unclear whether their example is relevant and opening the question of whether it was purposefully designed to result in the desired outcome.

**The Independent Electricity System Operator (IESO), a truly independent expert, has rejected TC Energy’s proposal at least twice, citing a lack of value and net economic benefit to Ontario energy consumers.**

It is widely known that the cost of pumped hydro energy storage is remaining relatively stable or even increasing over time, while the costs of battery storage is rapidly declining due to technological advancements and economies of scale. And advancements in battery storage are also making them more appropriate than ever for providing long-duration energy storage.

*“Made-in-Ontario Pumped Hydro Storage: Economic and Social Value Benefits” Canadian Centre for Economic Analysis (CANCEA)*

**Open-loop pumped storage is exorbitantly expensive compared to alternative energy storage technologies.**



# CANCEA'S REPORT: *Taking a Broader Perspective*

**CANCEA fails to acknowledge that long-duration battery parks fair better than TC Energy's open-loop pumped storage proposal in other important ways too:**

- **Speed of Implementation:** TC Energy's open-loop project would take a decade to develop, much slower than alternative technologies, which are advancing rapidly.
- **Environmental Impact:** TC Energy's project requires an open body of water and significant elevation, making the Niagara Escarpment and Georgian Bay ideal, but this would damage the Escarpment and risk the Bay. Alternative technologies can be built on brownfield industrial sites, closer to the grid and energy demand.
- **Efficiency:** Open-loop pumped storage is only 68% efficient, while BESS and other alternatives are closer to 90% efficient. **With the demand for energy projected to increase so steeply, how can we afford to waste so much for so very long?**

## **PUMPED STORAGE WASTES MORE ENERGY THAN ALTERNATIVES**

### Pumped Storage:

471 MW per day x 365 days x 50 years = 8,595,750 MW lifetime waste

### Alternative Technologies:

111 MW per day x 365 days x 50 years = 2,025,750 MW lifetime waste

**CANCEA fails to consider the many alternative technologies available to meet Ontario's energy storage needs.**

While Battery Energy Storage Systems (BESS) is *one option*, newer technologies are proving very effective and offer significant advantages over TC Energy's proposed open loop pumped storage proposal. **Among the most promising options are gravity storage and newer battery technologies including redox flow, sodium ion, and liquid metal.**



# CANCEA REPORT: *A Closer Look Tells a Different Story*

The Canadian Centre for Economic Analysis (CANCEA) report was purchased by TC Energy to influence project decision-makers. This "funded research" is carefully crafted to overstate the project's benefits, painting a much rosier picture than reality.

By overwhelming readers with complex numbers and jargon, CANCEA creates an illusion of credibility, making it hard to critically assess the findings.

While the report delivers impressive headlines, a closer look at the report's "voodoo math" reveals the truth: **this project will cost Ontario taxpayers far more than it will deliver, while creating very few meaningful jobs.**

- **A BIASED VIEW:** The report tells a good story and craftily makes the case for their client's proposal, but does not reflect an independent view of the project.
- **A NET LOSS FOR ONTARIANS:** The only economic benefits go to TC Energy, not to Ontarians.
- **EXAGGERATED JOB CREATION:** The project is not the job creator they would like you to believe it is.
- **A FALSE COMPARISON:** CANCEA's selective comparison model is specifically engineered to exaggerate the benefits of their client's proposal.

**Save Georgian Bay is a non-profit grassroots organization committed to stopping TC Energy's proposal for an open-loop pumped storage plant in Meaford.**

*info@savegeorgianbay.ca | savegeorgianbay.ca*





## **TC ENERGY PUMP STORAGE PLANT**

### **Strategic Environmental Assessment**

Report prepared for:

Department of National Defence  
4<sup>th</sup> Canadian Division Training Base  
Meaford, Ontario

Report prepared by:

Save Georgian Bay  
[www.savegeorgianbay.ca](http://www.savegeorgianbay.ca)  
Meaford, Ontario

31 July 2020

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## 1.0 Introduction

TC Energy Corporation, formerly TransCanada Pipeline, (TC Energy) proposes to build a 1,000 megawatt (MW) hydroelectric pumped storage plant (the proposed project) on the shore of Georgian Bay on Department of National Defence (DND) land, at the 4<sup>th</sup> Canadian Division Training Base (the base), in Meaford, Ontario.

The following report is issued by Save Georgian Bay – a group of concerned residents of the Georgian Bay community, with a core membership centered in Meaford. Section 2.0 provides further information regarding our mission and membership.

The report is issued in response to the DND's request for public comment relating to TC Energy's proposed project. It is presented as a screening level environmental assessment to address the various environmental concerns associated with the proposed project as raised by the community.

It is recognized that the DND must adhere to directives on Environmental Stewardship, as further discussed in Section 3.0. These directives require that the DND consider the environment early in the planning process before any irrevocable decisions are made. Since neither the DND nor TC Energy has prepared or publicly released any form of environmental assessment, Save Georgian Bay has taken the liberty to do so.

The report provides a brief overview of the proposed project in Section 4.0, and a discussion of project rationale in Section 5.0. TC Energy publicly states that the project is needed to provide Ontario with needed electrical capacity, to reduce electricity costs and greenhouse gas emissions, to drive local economic benefits and growth, and to store excess baseload generation. In reality, corporate profit is believed to be the only rationale for the project.

TC Energy has proposed a pumped storage plant located on the DND base without considering alternatives, yet alternatives do in fact exist, as discussed in Section 6.0. A lot has happened in the energy sector since TC Energy started this process at least 5 years ago. Energy storage technologies and management strategies have progressed significantly over the past few years, and will continue to do so. Pumped storage is a produce from the 1960's. It is proven technology, but also proven to cause significant adverse environmental impacts.

TC Energy commissioned a study to evaluate the electricity production and consumption for the proposed project. Section 7.0 summarizes the main findings. The DND directive requires DND operations to reduce energy use. The proposed project will not help the DND achieve that objective. The proposed project will increase energy use since it is a net consumer of electricity.

The report challenges the claim of TC Energy that this project is “*One of Canada's largest climate change initiatives*”. The proposed project will not reduce carbon levels in earth’s atmosphere as claimed. In fact, it will likely increase carbon levels, as discussed in Section 8.0. Accordingly, it is recommended that the DND undertake a critical, independent expert review of TC Energy projected carbon savings before making any decision to advance this proposed project. Our research concludes a net increase in carbon emissions when all factors are taken into consideration. Furthermore, others have proposed viable alternatives that achieve the purpose of off-peak energy utilization, while reducing carbon emissions, and not harming the environment or posing a risk to human life.

Save Georgian Bay has engaged with the community to inform them of this project and to share our findings, as discussed in Section 9.0. The overwhelming message we receive from the community is one of opposition. They express concerns about how the proposed project will affect their community, and how it will impact the environment. We trust the DND have heard many of these concerns and will hear more as the comment period comes to a close.

The Municipality of Meaford issued a document to the DND, dated 1<sup>st</sup> June 2020, expressing their concerns regarding the potential impacts to the community. These concerns reflect many of the messages we hear from the community, as discussed in Section 10.0. Meaford’s Official Plan establishes an ‘*environment-first*’ philosophy in the municipality. This means that protecting significant natural heritage features and functions shall take precedence over development.

TC Energy’s proposed project has the potential to cause significant adverse environmental impacts to terrestrial and aquatic environments, as discussed in Section 11.0. TC Energy did not adopt a proactive approach towards the environment. Instead, they’ve taken a reactive approach – propose the simplest and cheapest option and then react to public pressure as it arises. They’ve changed their original conceptual design because, in their words, ‘*we listened*’. If the community has to tell a proponent that their design will kill fish, then the proponent has failed in their prime objective of protecting the public, the community and the environment.

The proposed project includes the construction of a reservoir on top of the Niagara Escarpment immediately adjacent to the administrative buildings and barracks on the DND base. A perimeter rock filled dam will hold 23 million cubic meters of water that will tower over the heads of several hundred families. As discussed in Section 12.0, failure of dams is rare, but when they occur, the consequences are catastrophic. It’s not a question of “*do dams fail?*”, although the record shows they do. It’s a question of “*what are the consequences if the dam does fail?*” Dams that fail within residential areas most likely cause fatalities.

The proposed project includes the construction of a new transmission corridor between Meaford and the connect point at Hydro One's Essa Transmission Station. Both overland and subsea options are being considered, as discussed in Section 13.0. The Municipality of Meaford has declared their preference for the subsea option considered all of the other impacts the municipality will experience as the host.

The DND's directive on environmental protection and stewardship requires the DND to meet or exceed the letter and spirit of all federal laws, including the *Impact Assessment Act*, the *Species at Risk Act*, and the *Fisheries Act*. The *Impact Assessment Act* declares an authority cannot proceed with a project on crown land that may cause a significant adverse environmental effect. The *Species at Risk Act* declares that a project cannot harm the habitat of threatened or endangered species. The *Fisheries Act* declares a project cannot cause mortality of fish or destroy fish habitat. Both the original and revised conceptual designs do not comply with the requirements of these Acts. The project has the potential to cause significant adverse environmental effects, cause death of fish, and destroy fish habitat. The DND, as per their directive, should therefore reject the proposed project outright.

In the event the DND is not prepared to reject the project at this time, DND must hold TC Energy to the highest standard of care possible. The importance of this expectation is presented throughout this Strategic Environmental Assessment. Section 14.0 includes information from a project review provided by Save Georgian Bay to the Mayor and Council of Meaford on 17<sup>th</sup> March 2020. These conditions were appended to the 1<sup>st</sup> June 2020 submission from the municipality to the DND. The expectation defined by Meaford Council was clear, if DND does not reject the proposal, then DND must require TC Energy to prove it can meet the requirements, commit to meeting the requirements, and follow through on that commitment. The sum of this report will demonstrate the damage this project would do to the environment, to the land, water and wildlife and to the community, and show that the proponent does not show the capability or will to effectively meet the standards, particularly in a first time effort to design and build a pumped storage facility.

## 2.0 Save Georgian Bay

Just over one year ago, in July of 2019, several Meaford residents learned about the proposed project – a massive power generation facility to be located at the end of a residential road, towards the northern end of the municipality of Meaford.

The proponent, TC Energy, claimed they selected an isolated area for their project. Little did they know, hundreds of families live in the area, the nearest of which resides within 100 meters from the site.

The base, also known as the Meaford Tank Range, is an 18,000-acre area, with Georgian Bay to the north and east. It is in the northern most geography of the municipality of Meaford.

After learning about the proposal, several of the residents met with TC Energy representatives Sara Beasley and John Mikkelsen. TC Energy identified, during the discussion and in their presentation information, that the conceptual design for their proposed project would be similar to the pump storage plant in Ludington, Michigan. Sara and John invited comment on the proposal. The discussion was educational, constructive and concluded with a resident providing a boat ride to view the area where TC Energy was proposing the project.

Following the meeting the residents collectively studied the proposal and the literature regarding the Ludington pumped storage plant. Several alarming elements of the Ludington plant were discovered:

- The plant had a record of an enormous fish kill from the draw of Lake Michigan water into its turbines.
- The release of water back into Lake Michigan created turbidity which affected the quality of water for a large area surrounding the plant.
- The operation of the plant changed the eco-system surrounding the plant.
- Large towers carrying high tension lines ran from the plant to connect into the Michigan power grid many miles away.
- The plant's operation on the shore for the intakes was apparent and loud even when you were hundreds of meters away from the plant.

These findings caused the residents to facilitate a meeting to discuss the project with many other local residents. Approximately 70 people attended the meeting on 31<sup>st</sup> August 2019. The initial group presented the information provided by TC Energy, and shared views and other information discovered about the Ludington plant and other pumped storage plants.

Participants in the meeting were asked if they had concerns about such a facility on the base. Over 90% of the participants expressed concerns. Since this affected many more people in Meaford and Georgian Bay, a group of residents agreed to join together and form a study group.

The group expanded as the word started to spread. It was soon evident, many people shared common concerns about TC Energy's proposed project. So the group incorporated as a non-profit organization, and called itself "Save Georgian Bay". The declared mission of the group was to:

- study the project and its implications for the land, water and communities around Georgian Bay; and
- share our findings with the broader community so that they were informed and able to comment on the project.

The Save Georgian Bay team is comprised of a large group of volunteers, many with unique and relevant expertise with large-scale industrial projects. The team includes specialists in the energy sector, engineering (electrical, civil, environmental), geology, archeology, wild-life, aquatic biology, communications, and media. Many members are long term full or part time residents of the community. This report details their concerns.

During the past year, Save Georgian Bay has:

- Provided over a dozen community information meetings about the proposal in the broader community, including Meaford, Thornbury, Leith and Collingwood.
- Organized hundreds of volunteers to share information about the project.
- Created web sites and social media to extend the information on the project.
- Organized several petitions, one of which on Change.org has gathered over 40,000 signatures opposing the project.
- Met with local elected municipal officials and staff in various jurisdictions about the project, in several surrounding municipalities. The Save Georgian Bay team members have also met with provincial and federal elected representatives.
- Prepared a research document sharing specific concerns about the impact of the project on the environment, community, ecosystem, wild-life, water and land. This document included standards and expectations should the project proceed. The Save Georgian Bay report was included in full in the Municipality of Meaford Report regarding TC Energy's proposal that was sent to the Department of National Defence for their review. The Meaford Council resolution stated their expectations

that DND confirm those standards would be met before granting permission for the proposal to proceed

- Collaborated with other environmentally conscious organizations who have also shared concerns about the project. These include:
  - Georgian Bay Association
  - Georgian Bay Forever
  - Ontario Clean Air Alliance
  - Kiowana Beach Association
  - Sunnyside Beach Association
  - All Nations Water Protectors Project

The proposed pumped storage project by TC Energy:

- Threatens to cause significant disruption and permanent changes to the existing natural habitat
- Will cause fish mortality, water turbidity, water and air pollution during the several years of construction phase and then during operation of the plant
- Will require the installation of high-tension power lines from Meaford to Essa Township
- Is not adequately justified as needed to support Ontario's energy needs over the next 40 years, does not contemplate changing energy demand and alternative methods to meet the demand profile, if a need were to exist
- Has inaccurately portrayed the reduction in global CO<sub>2</sub> emissions, claiming a 490,000 tonnes reduction per year, when in fact it could create a 1,000,000 tonnes increase in CO<sub>2</sub> released into the atmosphere
- Would contribute to long term damage to the relationship with community members, particularly those living below the proposed dam and reservoir. Further many community members who were touched by the expropriation of the tank range property in the 1940s are seeing this as a second expropriation
- Recognize this is the TCE's first PSP project, and that TCE has a record of pipeline breaks and poor environmental performance, contributing to deep concerns about the safety of people in proximity to the proposed location, and risks to the wildlife, water and lands of Georgian Bay.

This report from the Save Georgian Bay team will provide background on these various concerns and more, and show there are many better alternatives that should be considered in place of this TCE proposal.

## 3.0 DND Directives on Environmental Stewardship

### 3.1 DAOD 4003-0, Environmental Protection and Stewardship

The DND and the CAF are accountable for the impact that defence activities have on the environment. Defence Administrative Orders and Directives, DAOD 4003-0, defines these accountabilities. The intent of the policy is to ensure DND employees and CAF members respect the environment, exercise environmental stewardship, and protect public and non-public properties and assets held in trust.

As part of this objective, the DND and the CAF adopted a code of environmental stewardship that declares, amongst other requirements, that the DND and the CAF shall:

- integrate environmental concerns with other relevant concerns including those from operations, finance, safety, health and economic development in decision-making;
- meet or exceed the letter and spirit of all federal laws;
- acquire, manage and dispose of lands in a manner that is environmentally sound, including the protection of ecologically significant areas.

Their policy statement declares, amongst other requirements, that the DND and the CAF shall adhere to the code of environmental stewardship. The DND and CAF must therefore abide by the letter and spirit of federal laws, including:

- *Fisheries Act* – as discussed in Section 11.2.1, the proposed pumped storage plant will cause death of fish, and cause harmful alteration, disruption or destruction of fish habitat. TC Energy did not avoid these sensitive habitats nor design effective mitigations to minimize the potential effect. Therefore, they have not complied with the requirements of the Fisheries Act.
- *Species at Risk Act* – as discussed in Section 11.1.2 and Section 11.2.1, the areas proposed for development include habitats for several terrestrial and aquatic species at risk. TC Energy made no attempt to avoid these sensitive habitats. Instead, site selection was based purely on operational considerations without regard for species at risk.
- *Impact Assessment Act* – Article 82 declares that an authority cannot permit a project to be carried out on federal lands unless the authority determines that the project is not likely to cause a significant adverse environmental effect. The spirit of this article is to protect federal lands and waters from activities that may harm the environment and impact health, social or economic conditions. TC Energy's

proposed pumped storage plant will forever change the environment of Georgian Bay and the Niagara Escarpment within its vicinity.

### 3.2 Defence Energy and Environment Strategy (DEES)

The “*Defence Energy and Environment Strategy*” (DND, 2017) describes the role of the DND in energy and environmental management, with a vision to:

*“... become leaders in contributing to the sustainable development goals of Canada through the effective and innovative integration of energy and environmental considerations into activities supporting the Defence mandate”.*

The words below, taken from page 20 of DEES, shows great wisdom on the part of our DND:

*“Strategic environmental assessments are conducted early in the planning process before any irrevocable decisions are made in order to avoid, minimize or mitigate adverse effects and to promote actions that will have a positive effect on the environment”.*

These words reflect the environmental strategy of all forward-thinking government agencies and corporations. Environmental considerations come first. They inform the decision-making process “*before any irrevocable decisions are made*”.

Unfortunately, TC Energy does not follow such wisdom. They have been engaged with this project for at least 5-years yet haven’t started the environmental process. They have made decisions regarding the site location and conceptual design that will forever change the environment, yet they based these decisions on operational needs without consideration of environmental constraints.

Recently, TC Energy revised their conceptual design in reaction to environmental concerns expressed by the community, particularly Save Georgian Bay. But the revised design only introduces new environmental concerns that TC Energy continues to be unaware of.

Although the DEES requires a “*strategic environmental assessment...before any irrevocable decisions are made...*”, the DND has yet to prepare or publicly release such a report. The DND may not be the proponent, but they remain accountable for the environmental harms caused by TC Energy.

In the absence of such a report, Save Georgian Bay has taken the liberty of preparing a screening assessment to serve as a strategic environmental assessment to inform the DND’s decision.

## 4.0 Project Description

TC Energy proposes to develop the pumped storage plant at the existing Department of National Defence (DND) Canadian Force’s 4<sup>th</sup> Canadian Division Training Center north of Meaford, Ontario. The plant will generate 1,000 megawatts (MW) of electricity to Ontario’s electricity system.

A pumped storage plant involves pumping water from a low-lying reservoir during periods of low demand for electricity, typically at night, to a higher-elevation reservoir. When electricity demand is greater, and therefore more expensive, operators release water back to the lower reservoir through turbines that generate electricity, similar to hydropower from dams. TC Energy proposes Georgian Bay as the lower reservoir and a constructed reservoir on top of the Niagara Escarpment as the upper reservoir.

The sections below describe the conceptual design and site location. Section 13.0 discusses the transmission corridor.

### 4.1 Conceptual Design

#### 4.1.1 Original Concept

TC Energy originally modelled the conceptual design after a plant built in Ludington, Michigan. Figure 4-1 shows a drawing of the original design (left) along with an aerial photograph of the Ludington plant during construction (right).



Figure 4-1: Pumped Storage Plant – Original Conceptual Design

The original design included a constructed reservoir located on top of the Niagara Escarpment, a 1.7 km long penstock extended from the reservoir to the shoreline of Georgian Bay, and a massive intake structure located at the shoreline. Large rock wingwalls and offshore breakwalls (not shown) to protect the intake from waves.

The Ludington plant was approved for construction in the 1960's. After a 12-year court battle, the Ludington plant was required to construct a 2-kilometer net and to pay millions in compensation to mitigate for the impacts it caused. The plant still kills millions of fish each year because of the enormous volume of water that it draws from the lake.

TC Energy did not consider environmental impacts in their original design. The issues associated with the Ludington plant are well documented in court proceedings, published literature, and regulatory monitoring reports. It should have come as no surprise to TC Energy that their original design would kill fish. Further, the offshore breakwalls and intake structure were located on known spawning habitat for various species of fish. Place of these structures directly over such habitat would destroy them forever.

#### 4.1.2 Revised Concept

In view of the concerns expressed by the public, Save Georgian Bay in particular, TC Energy decided in May 2020 to revise their conceptual model. There is no certainty that this eliminates the original concept from further consideration. As such, we cautiously assume both concepts remain viable options.

Figure 4-2 shows the revised conceptual design for the pumped storage plant. Table 4-1 summarizes the design components (TC Energy, 2020). The revised concept still includes a constructed reservoir located on top of the Niagara Escarpment, but the intake structure has been relocated offshore and into deep water (greater than 20 m). The power station will be placed deep underground beneath the Niagara Escarpment, and two 11 m diameter underground tunnels will connect the power station to the offshore intakes.



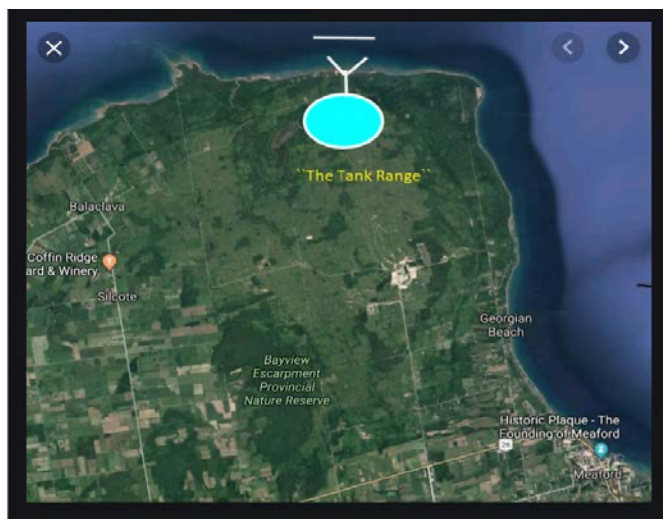
**Figure 4-2: Pumped Storage Plant – Revised Conceptual Design (May 2020)**

**Table 4-1 List of Design Components**

1.	Upper Reservoir: A new reservoir constructed adjacent to the Base administrative complex approximate surface area of 375 acres, depth of 20 meters.
2.	Upper Inlet/Outlet: Controls the flow of water in and out of the upper reservoir.
3.	Primary Spillway: Essentially a large funnel-shaped drain a failsafe in the unlikely event the upper reservoir is nearing capacity.
4.	Secondary Spillway: a back-up drain for the upper reservoir which acts as an additional failsafe to the Primary spillway engineered for a controlled release of flow.
5.	Access Tunnel: Provides personnel access to the powerhouse for construction, operations and maintenance.
6.	Maintenance Access: Contains an access shaft to the tailraces and a divider that can be used to isolate the tailraces.
7.	Lower Inlet/Outlet: A manifold used to divert water each port would be screened and raised off the lakebed to avoid aquatic habitat and organisms, reducing the potential impacts on fish and turbidity.
8.	Switchyard: The electrical connection between the pumped storage facility and the provincial electricity system.
9.	Offices & Control Room: Workplace for day-to-day operations and maintenance of the facility.
10.	Ring Road: A new roadway around the perimeter of the upper reservoir for safety and maintenance.
11.	Ventilation Shafts: Enables air circulation.

## 4.2 Site Location

It is our understanding that alternative locations within the base were considered by TC Energy and others before arriving at the current proposal. Figure 4-3 through Figure 4-5 illustrate three alternative locations, as described in the points below.



**Figure 4-3: Alternative Location #1 – North End of the Base**

- Alternative #1, North end of the base – We understand that at one time a proponent (perhaps not TC Energy) proposed the development of a pumped storage plant along the north end of the base near the clay banks. This location would likely interfere with DND training operations on the base. It would have similar environmental effects as other possible locations that involve Georgian Bay as the lower reservoir and the Niagara Escarpment as the location for the upper reservoir. However, from community and safety perspectives, this location has the advantage of being remote with no residents nearby. A failure of the reservoir in this location would cause the least damage and have the least potential for mortality of the three options considered.



Figure 4-4: Alternative Location #2 – East Side of the Base

- Alternative #2, East side of the base – In earlier depictions of the conceptual design, TC Energy showed the pumped storage plant positioned along the east side of the base, centered between the southeast corner of the base and Cape Rich. It is uncertain how this location would impact DND operations on the base. The potential environmental impacts would be comparable to the other locations considered. However, from community and safety perspectives, this location has the advantage of being remote with no residents nearby. A failure of the reservoir in this location would cause limited damage and potential mortality.
- Alternative #3, Southeast corner of the base – In the most recent depiction of the revised conceptual design, TC Energy shows the pumped storage plant positioned towards the southeast corner of the base. The reservoir would be positioned immediately adjacent to administrative buildings and barracks on the base, and displace training grounds, ranges and access roads. This location may cause the greatest potential disruption to DND training operations on the base. From an environmental perspective, the nearshore area is known spawning grounds for various fish species, so this location has the greatest potential to impact the environment. From community and safety perspectives, the site is directly adjacent

and above a residential area impacting approximately 300 homes. This location poses the greatest risk of property damage and mortality should the reservoir fail. Section 12.0 provides further details about dam safety.



**Figure 4-5: Alternative Location #3 – Southeast Corner of the Base**

Presumably TC Energy selected the site they did because of the elevation difference between the top of the escarpment and Georgian Bay. Presumably they did not consider anything else in their decision – DND operational needs, the environment, the community, or public safety.

Since the DND are the stewards of these lands, the DND will be held responsible for the decision of site selection. They must weigh the implications of this decision on their operational needs, as well as concerns for the environment, community and public safety.

## 5.0 Project Rationale

TC Energy claim their proposed pumped storage plant is required to:

- Provide needed capacity;
- Reduce electricity costs and greenhouse gas emissions;
- Drive local economic benefits and growth;
- Provide storage for Ontario's excess baseload generation.

TC Energy claims Ontario needs additional capacity considering the anticipated closure of the Pickering Nuclear Station in 2024. But the Pickering Nuclear Station provides baseload generation. It serves a different purpose than that intended for the proposed pumped storage plant. The proposed Darlington New Nuclear Station already has an approved Environmental Assessment and Site Preparation Licence. It represents a more viable option to replace the baseload generation from the Pickering Nuclear Station. Small Modular Reactors are also gaining recognition as a viable option for baseload generation. As a net consumer of electricity, the proposed pumped storage plant is not a viable option for baseload generation. That's not its intended purpose. The proposed project is a net consumer of electricity, and is intended to store energy during off-peak periods for release during on-peak periods.

TC Energy claims reduced electricity costs. They *boast* "...the net benefit to the ratepayer after paying for the cost of the facility is \$8.5 billion over the first 40 years of operation". Given a current population of 14.5 million people in Ontario, and a projected population of 18.8 million over the next 40 years, the potential savings to ratepayers is approximately \$11 per year per person. That's equivalent to the savings of replacing one incandescent bulb with an LED bulb.

TC Energy also claims reduced greenhouse gas emissions, although we can find no evidence to support this claim, as further discussed in Section 8.0.

TC Energy claims this project will drive local economic benefits and growth. Yet the Official Plan for the Municipality of Meaford clearly states "*environment first*". These words represent the voice of the constituents of Meaford. They mean that protecting the natural heritage and environment shall take precedent over development. This voice is also reflected in the 40,000 signatures on the petition opposing this project, as further discussed in Section 9.0.

TC Energy also claims this project provides storage for Ontario's excess baseload generation. But this is not the only option available to store baseload generation. It's just the only option that TC Energy considered. Section 6.0 reviews these various options.

The truth is, TC Energy has proposed the pumped storage plant to maximize profit. TC Energy owns a 48.4% interest in Bruce Power. The Bruce Nuclear Station provides baseload generation. During off-peak periods, Bruce Power earns less for the energy generated than they do during on-peak periods. The purpose of the proposed pumped storage plant is to store electricity during the off-peak period so that they can sell it during the on-peak period at a higher price. The proposed project will help TC Energy maximize their profit on their combined investment in Bruce Power and the proposed pumped storage plant.

Save Georgian Bay does not take issue with a private corporation seeking profit on their investment. But seeking corporate profit does not justify harming the pristine environment of Georgian Bay and the Niagara Escarpment, or putting a community at risk.

## 6.0 Alternatives

TC Energy decided to build a pumped storage plant near Meaford, based on three considerations:

- The site provided 150 m of elevation difference between the upper reservoir and Georgian Bay;
- The site is located within 100 km of the power grid; and
- The source of water (Georgian Bay) is available at no cost to TC Energy.

TC Energy has not provided any information to demonstrate they considered other locations or other alternatives. Instead, they react to comments and questions regarding potential alternatives.

The fact is, there are other alternatives that TC Energy could have considered. Perhaps when they started this process at least 5-years ago, some of these alternatives were less developed. But a lot has happened in the energy sector over the past 5-years, and more is yet to come.

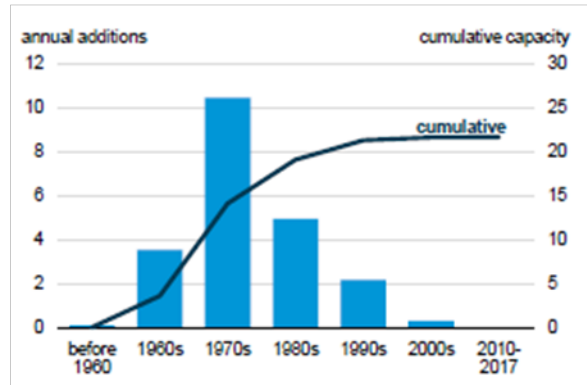
The following sections review several of the alternatives to what TC Energy has proposed. This is not meant as an exhaustive review of alternatives, but merely to demonstrate a wide range of alternatives exist that should have been evaluated in detail before proposing one option that could forever change Georgian Bay and the Niagara Escarpment.

### 6.1 Hydroelectric Pumped Storage

TC Energy propose the development of a pumped storage plant. This is a form of battery. Essentially, it will utilize electricity generated at off-peak times (generally at night) to pump water uphill from Georgian Bay to a constructed reservoir on top of the Niagara Escarpment. This converts electrical energy into potential energy, since the water is now stored at a higher elevation. During the on-peak times (generally during the day), the water stored in the reservoir is released through a series of turbines to generate electricity. The potential energy of water stored in the reservoir is converted to electrical energy. This process captures approximately 72% of the energy used to pump the water uphill, as discussed further in Section 7.0.

As shown in Figure 6-1, pumped storage plants were popular from the 1960s through 1980s. Few have been built since. The cause of the decline is unclear, although the timing

aligns with new environmental laws in the United States targeted at reducing fish kills associated with large water intakes, such as required for a pumped storage plant.



Source: U.S. Energy Information Administration, Form EIA-860M, *Preliminary Monthly Electric Generator Inventory*

**Figure 6-1: U.S. Hydroelectric Pumped Storage Capacity (1960 to 2017)**

There are two basic types of pumped storage plant – open-looped and closed-loop.

### 6.1.1 Open-Looped System

TC Energy has proposed an open-loop system. In an open-looped system, there is an ongoing hydrologic connection to a natural body of water, in this case, Georgian Bay. This type of pumped storage plant reduces capital cost since the lower reservoir already exist. However, this type of system maximizes the potential environmental harm since it causes an enormous cycling of water to and from the natural body of water. This cycling of water impacts the aquatic environment, as discussed in Section 11.2.

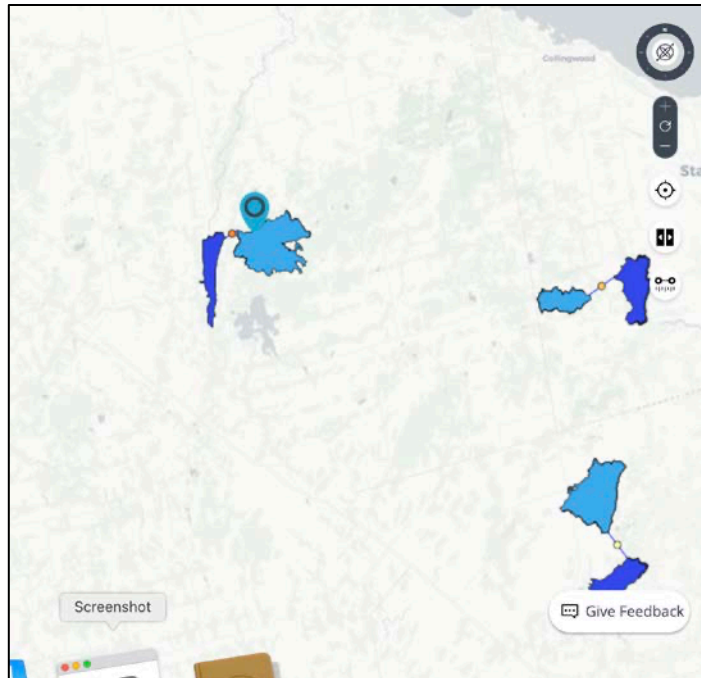
TC Energy did not consider the alternative.

### 6.1.2 Closed-Looped System

For a closed-loop system, the reservoirs are not connected to an outside body of water. Both upper and lower reservoirs are constructed.

Northland Power is constructing a closed-loop pumped storage plant in an abandoned open pit mine near Peterborough, Ontario. The Marmora Pumped Storage project will generate 400 MW of electricity over 5 hours. The plant repurposes the abandoned mine site without harming the natural environment.

The Australian Renewable Energy Agency provides a mapping application that identifies potential sites for closed-loop pumped storage plants. This application identifies three potential locations within proximity to Collingwood and Stayner, as shown in Figure 6-1. Granted, the capacities of these potential sites are less than 1,000 MW, but the point is, there are suitable locations for closed-loop systems that avoid the potential environmental harm caused by the open-looped system proposed by TC Energy.



**Figure 6-2: Identified Sites for Potential Closed-Loop Pumped Storage Plants**

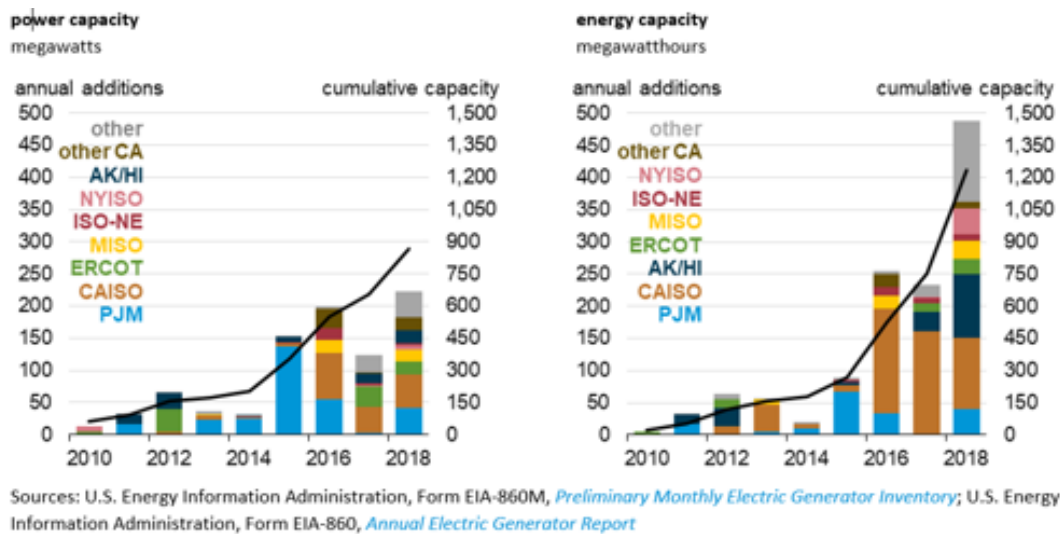
Save Georgian Bay recommends that the DND requires TC Energy to require a third-party expert to undertake a comprehensive assessment of alternative potential sites for the project, including, but not limited to, prospective sites identified by AREMI. The merits of such sites should be compared to the merits of the DND site. This report should assess the best alternative sites with the least environmental impacts relative to the DND site.

## 6.2 Battery Storage

Energy storage is the capture of energy produced at one time for use at a later time. A device that stores energy is commonly called a battery.

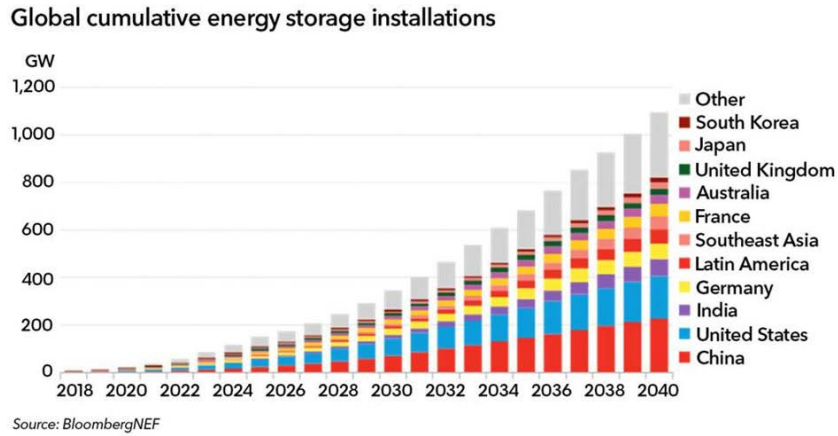
In 2010, large scale battery storage barely existed. Today, battery storage represents the future. The capacity continues to increase and the cost continues to decrease as the technology advances.

Figure 6-2 shows the change in storage capacity for large-scale batteries in the United States over the period 2010 to 2018 (EIA, 2020). In 2010, seven battery storage systems accounted for only 59 MW of power capacity. By 2015, 49 systems accounted for 351 MW of power capacity. The total number of operational battery storage systems has more than doubled to 125 for a total of 869 MW of installed power capacity by the end of 2018.



**Figure 6-3: U.S. Large-Scale Battery Storage Capacity (2010 to 2018)**

According to Bloomberg NED (2020), energy storage installations around the world will multiply exponentially, from a modest 9,000 MW in 2018 to 1,095,000 MW by 2040. Figure 6-3 shows their projections. This is made possible by the sharp decline in the cost of lithium-ion batteries. Bloomberg predicts a further halving of lithium-ion battery costs in the next decade.



**Figure 6-4: Global Cumulative Energy Storage Installations (2018 to 2040)**

In 2019, New York approved a 316 MW battery plant (Spector, 2019). The batteries would replace old combustion turbines at the Ravenswood plant in Long Island City, Queens, as shown in Figure 6-4. This project aligns with the goal of 1,500 MW of storage installed by 2025 and 3,000 MW by 2030 as part of the New York’s green energy program. This will coincide with the commissioning of TC Energy’s 1960’s design for a pumped storage plant.



**Figure 6-5: New York Approves 316 MW Battery Plant**

### **6.3 Other Forms of Energy Storage**

There are other ways of storing electrical energy. Energy comes in many forms, such as radiation, chemical, gravitational potential, thermal, kinetic. As such electrical energy can be stored in any of these forms of energy for later use. For example, a common house hold battery stores electrical energy as chemical energy for later conversion back to electrical energy.

Other examples of energy storage devices include; compressed air storage; chemical storage; flywheel energy storage; redox flow batteries; liquid metal batteries; sodium ion batteries; nickel-cadmium batteries; rail energy storage; superconducting magnetic energy storage; electrochemical capacitors; hydrogen fuel cells; thermal energy storage; gravity storage.

### **6.4 Alternative Solution from the OSPE**

The Ontario Society of Professional Engineers (OSPE) have published several research papers on Ontario's electrical system.

The overwhelming message in these reports is that electrical storage is not only expensive but it does not address Ontario's electrical needs, nor does it address climate change in Ontario in any meaningful way. Ontario should be incenting a wide range of sectors within the province, to switch from use of hydrocarbon fuels (such as natural gas) to using off peak, emission-free electricity in their processes instead of seeing this power exported to neighboring states or curtailed (wasted). Sectors in the manufacturing and heating business are examples of industries that would benefit from off peak, emission free electricity.

The OSPE identify that Ontario wastes a significant amount of surplus emission-free electricity. They see this as an opportunity for the province. The Government of Ontario can implement electricity price reform that will allow consumers to use this surplus to reduce their annual energy bill and, at the same time, reduce carbon emissions without imposing additional costs on the electricity system.

In 2016 and 2017 enough emission-free electricity for 840,000 and 1.1 million households respectively was curtailed (wasted) in Ontario.

This occurred because our low-emission electrical system produces a significant amount of surplus emission-free electricity, however, consumers are currently unable to purchase or use it to displace their fossil fuel use because of the high energy rate in our retail electricity price plans.

Ontario's current retail electricity price plans charge too much for energy use and too little for fixed system costs.

The OSPE made the following recommendations:

1. The Ministry of Energy, Northern Development and Mines should revise current legislation and regulations which prevent consumers from purchasing surplus emission-free electricity (interruptible electricity) at its wholesale market energy price.

When surplus emission-free electricity is available, the preferred order of energy use should be:

- a) Make surplus emission-free electricity available to all Ontario ratepayers for displacing fossil fuels, especially heating oil and propane used for thermal energy needs, and to industrial consumers to displace natural gas for the production of hydrogen gas.
  - b) Export the balance of the surplus electricity that cannot be used in Ontario.
  - c) Curtail any residual surplus amounts that cannot be used within Ontario or exported.
2. The Ministry of Energy, Northern Development and Mines, in collaboration with the Ontario Energy Board and Local Distribution Companies (LDCs), should deploy voluntary smart price plans for various consumer groups. These plans should include the following features:
    - a) Retail price components should align with the actual fixed and variable electricity system costs.
    - b) Retail prices should encourage peak power demand reduction via load shifting/levelling, conservation and energy efficiency.
    - c) Retail prices should encourage use of surplus emission-free electricity for fossil fuel displacement.
    - d) The design of these voluntary smart price plans should take into account the state of technological capability of the LDCs' metering and communication infrastructure.

The OSPE estimates that there will be sufficient surplus emission-free electricity in the long term to displace 36% of the fossil fuel use in 1.3 million homes.

The OSPE further estimates that the annual total energy bill savings that a typical fuel oil residential consumer can expect using OSPE's proposed Energy Plus Peak Demand Smart Price Plan would be approximately \$800/year with a carbon price of \$50/tonnes CO<sub>2</sub> and \$720/year with no carbon price.

Before considering electrical storage as part of any solution for Ontario's power, we must choose to reform the retail electricity price. If retail electrical price reform were to be implemented, then electrical storage would become less of a consideration and Ontario's climate change goals may be reachable.

If smart meters were introduced in Ontario, the grid operator could turn off appliances in your house that don't need to be running during peak power demand, often while we are at work thus relieving the pressure on the grid. Air conditioners, heat and water heating could be cycled on and off at times when we are not home.

Solar power generated in Ontario conveniently pushes power into the grid during daytime hours, exactly at the time it's needed most, so this emission free solar power does not need to be stored.

Electric cars are mostly charged at night. As the number of electric cars increases, the nighttime power currently wasted will be used to charge your car's battery.

## 7.0 Energy

Navigant (2020) prepared an economic analysis of the proposed pumped storage plant for TC Energy. Table 7-1 summarizes their estimates of electricity production and consumption over the period 2027 (assumed start-up year) to 2040.

**Table 7-1: Electricity Production (Generation) and Consumption (Pumping) Facility**

Year	Generation (GWh)	Pumping (GWh)	Year	Generation (GWh)	Pumping (GWh)
2027	1,290	1,788	2034	1,526	2,116
2028	1,349	1,870	2035	1,553	2,153
2029	1,319	1,829	2036	1,570	2,176
2030	1,422	1,971	2037	1,547	2,144
2031	1,360	1,886	2038	1,553	2,153
2032	1,446	2,004	2039	1,574	2,182
2033	1,501	2,081	2040	1,627	2,256

### 7.1 Electricity Production

According to Navigant, the pumped storage plant will produce 1,474 GWh of electricity per year, on average.

TC Energy states:

*“This facility would not use fuel in the generation of electricity.”*

This statement is misleading. The plant may not use fuel during the generation phase of the pump storage process, but it consumes electricity to pump water from Georgian Bay to the artificial reservoir located on top of the Niagara Escarpment. The generation of this electricity requires fuel; therefore, the overall operation of the plant requires fuel.

### 7.2 Electricity Consumption

To generate this amount of electricity, the pumped storage plant will consume 2,044 GWh of electricity per year, on average, to pump water uphill from Georgian Bay to the artificial reservoir located on top of the Niagara Escarpment.

Most of this electricity will come from nuclear, hydro, wind and natural gas. During 2019, approximately 63% of the total off-peak power in Ontario came from nuclear, and approximately 5% came from natural gas. The portion of power sourced from natural gas will generate approximately 58,000 tonnes of CO<sub>2</sub> per year.

TC Energy state that the pumped storage plant:

*“...would capture a third of the forecasted excess power that would otherwise be exported or wasted”.*

TC Energy considers these exports “*wasted electricity*”, but the Independent Electricity System Operator states:

*“...exports provide additional revenue that reduces costs that otherwise would have had to be paid for by Ontario consumers. In 2018, exports contributed about \$300 million towards meeting Ontario’s electricity system costs.”*

The Ontario Society of Professional Engineers has proposed a different strategy to address excess power. They did not recommend construction of a pumped storage facility. Instead, they recommend:

- *“...reducing residential and commercial rates by approximately 25%...”*, and
- establishing a market that *“...would allow businesses and residents to access surplus clean power at the wholesale market price – less than \$0.02 per kWh”.*

These recommendations would lower the average cost of energy to all consumers, and the proposed market would be accessible to all residents and businesses, not just TC Energy.

### **7.3 Net Loss of Electricity**

According to Navigant, the pumped storage plant will cause a net loss of 569 GWh of electricity, on average (the difference between electricity production and electricity consumption).

Assuming the average Ontario household uses approximately 9,500 kWh of electricity per year, this net loss of 569 GWh could serve the needs of approximately 60,000 households, or a large city with a population of 175,000 (assuming 2.9 people per household). It will use more electricity than Barrie, Guelph or 16 towns the size of Meaford.

## 8.0 Carbon Emissions

TC Energy claims this project is “*One of Canada's largest climate change initiatives*”. But this project will not reduce carbon levels in earth’s atmosphere. In fact, the project will likely cause carbon levels to increase. This is not a “*climate change initiative*” at all. It’s TC Energy’s attempt to greenwash a project that will cause significant adverse environmental impacts.

If the DND factors carbon emissions and energy into their decision, then then the DND needs to be absolutely certain they have complete and accurate information from which to base their decision. TC Energy tells only part of the story – the part that favours their position. They don’t tell the full story.

The sections below present our analysis of the proposed project in terms of carbon emission. Our research draws a very different conclusion from what TC Energy claim. The proposed project will not reduce carbon emission to earth’s atmosphere. In fact, it has the potential to increase carbon emissions. More so, others have proposed an alternative strategy that achieves the same benefit of off-peak energy utilization that reduces carbon emissions and does not harm the environment or pose a risk to human life.

### 8.1 TC Energy’s Total Corporate Carbon Emissions

TC Energy’s primary business involves the piping and burning of fossil fuels to the tune of 13,500,000 tonnes/year of CO<sub>2</sub> emissions (TC Energy , 2020). This equates to the emissions from 4,100,000 cars, equivalent to every car in Montreal, Toronto and Vancouver combined. TC Energy is not in the business of climate change. They are in the business of making money from the very thing that causes climate change.

### 8.2 TC Energy’s Claim

TC Energy claims this project will reduce CO<sub>2</sub> emissions by 490,000 tonnes/year (TC Energy, 2020; Navigant, 2020).

### 8.3 Reasons to Question TC Energy’s Claim

TC Energy’s claim regarding CO<sub>2</sub> emission reductions is questionable. It’s unlikely the pumped storage plant will reduce carbon emissions to earth’s atmosphere. In fact, it’s more

likely the pumped storage plant will cause an increase in carbon emissions to earth's atmosphere.

Navigant provided the estimate based on model predictions. Complexity of the model aside, the simple mathematics work out to:

$$490,000 \text{ tonnes/year} = 1,474 \text{ GWh/year} * 370 \text{ tonnes/GWh} * 90\% \text{ efficiency}$$

Where 490,000 tonnes/year is the estimated CO<sub>2</sub> emissions reduction; 1,474 GWh/year is the total annual electricity production; 370 tonnes/GWh is the CO<sub>2</sub> emission intensity for gas-fired generation (Navigant, 2020).

The 90% efficiency accounts for the fraction of consumed electricity sourced from gas-fired generation during the pumping phase of the cycle. The plant consumes 2,044 GWh/year of electricity to pump water uphill from Georgian Bay to the reservoir. Approximately 7% of this electricity is sourced from gas-fired generation, which emits 370 tonnes/GWh of CO<sub>2</sub>.

The level of emission reduction attributed to the pumped storage plant is almost equivalent (90%) to the CO<sub>2</sub> emissions from a 1,000 MW gas-fired generating station.

This implies the pumped storage plant could displace 1,000 MW of generation from Ontario's existing gas-fired plants. But TC Energy claims the project is necessary to meet Ontario's electricity capacity needs. Therefore, the pumped storage plant is not intended to displace existing capacity.

Instead, the pumped storage plant is intended to create new capacity.

If this new capacity comes from a 1,000 MW gas-fired plant, such as TC Energy is currently building in Nappanee, then the new capacity would cause CO<sub>2</sub> emissions to increase by approximately 490,000 tonnes/year. But since this new capacity may come from a pumped storage plant instead, it may emit less CO<sub>2</sub>. TC Energy is claiming credit for the full CO<sub>2</sub> reduction simply because they decided to build a pumped storage plant instead of a gas-fired plant. But in reality, the plant will not reduce CO<sub>2</sub> emissions, nor will it reduce carbon levels in earth's atmosphere.

But this does not tell the full story.

We've identified several means by which TC Energy's proposed pump storage plant could increase CO<sub>2</sub> emissions, and hence increase the carbon levels in earth's atmosphere.

- TC Energy will increase emissions of CO<sub>2</sub> during construction of the pump storage plant. At this time, we don't have a defensible estimate of these emissions, nor has TC Energy provided this information. Carr (2020) estimated emissions of

approximately 300,000 tonnes/year of CO<sub>2</sub> based on the original conceptual design. The emissions are expected to be higher with the revised conceptual design.

- TC Energy states they will “*capture a third of the forecasted excess power that would otherwise be exported*”. The Ontario Society of Professional Engineers recommend a different plan for this excess power (OSPE, 2016; OSPE, 2019). Their plan will lower the average cost of energy to all consumers, and reduce carbon emissions by 2,100,000 tonnes/year CO<sub>2</sub> for water and space heating alone. Greater reductions in carbon emissions are possible if this surplus electricity is used for charging of electric cars and production of hydrogen for fuel cells. TC Energy’s pumped storage plant will reduce the carbon reduction benefit of the Ontario Society of Professional Engineers’ plan by 438,000 tonnes/year of CO<sub>2</sub>.
- Recognizing that climate change is a global issue, we also need to consider what happens to the so called “*waste electricity*” that would no longer be exported to the United States if TC Energy proceeds. Most of the export goes to states that source 50% to 70% of their energy from coal and natural gas (IESO, 2020; USDE, 2015; USDE, 2016). They will have to increase generation to offset the loss of emission-free electricity from Ontario. This will increase CO<sub>2</sub> emissions by 700,000 to 1,400,000 tonnes/year depending on whether the energy was sourced from natural gas or coal.

TC Energy will not reduce CO<sub>2</sub> emissions as claimed. Instead, the evidence shows that TC Energy will increase CO<sub>2</sub> emissions both directly through construction and operation, and indirectly through the lost benefit of the Ontario Society of Professional Engineers plan and the addition generation of electricity required in the United States. This will increase CO<sub>2</sub> levels in earth’s atmosphere, and thereby compound the climate change issue.

## 8.4 Reduced Benefit of the OSPE Carbon Reduction Plan

TC Energy states they will “*capture a third of the forecasted excess power that would otherwise be exported*”.

The Ontario Society of Professional Engineers recommend a different plan (OSEP, 2016; OSPE, 2019). They did not recommend construction of a pumped storage facility. Instead, they recommend:

- “*...reducing residential and commercial rates by approximately 25%...*”, and
- establishing a market that “*...would allow businesses and residents to access surplus clean power at the wholesale market price – less than \$0.02 per KWh*”.

These recommendations would lower the average cost of energy to all consumers, and the proposed market would be accessible to all residents and businesses, not just TC Energy. The low cost of surplus clean electricity will displace the use of natural gas by consumers, thereby reducing carbon emissions by 2,100,000 tonnes CO<sub>2</sub> per year, as per Table 8-1.

**Table 8-1: CO<sub>2</sub> Emission Reductions from OSPE’s Plan**

Potential GHG Emission Reductions from Natural Gas Displacement By Surplus Emission-Free Electricity		
	Surplus Emission-Free Electricity Available TWh	Reduction if Natural Gas is Displaced tonnes CO <sub>2</sub>
2020-2035 Annual Average	9.8	2,100,000
2020-2035 Total	157.0	33,400,000

This reduction in carbon emissions is achievable if the 9,800 GWh/year of surplus emission-free electricity is used to displace natural gas for water and space heating alone. Greater reductions in carbon emissions are possible if this surplus electricity is used for charging of electric cars and production of hydrogen for fuel cells.

The Ontario Society of Professional Engineers’ plan truly represents “*One of Canada’s largest climate change initiatives*”. It will actually reduce CO<sub>2</sub> levels in earth’s atmosphere, and thereby help address climate change.

But TC Energy requires 2,044 GWh/year of this surplus electricity to pump water from Georgian Bay to the top of the Niagara Escarpment. This will reduce the carbon reduction benefit of the Ontario Society of Professional Engineers’ plan by 438,000 tonnes/year of CO<sub>2</sub>.

Not only is TC Energy not reducing CO<sub>2</sub> emissions as claimed, they are reducing the effectiveness of an alternative plan that actually provides a net reduction in CO<sub>2</sub> emissions.

## 8.5 Increase in Carbon Emissions in the United States

Recognizing that climate change is a global issue, we also need to consider what happens to the so called “*waste electricity*” that would no longer be exported to the United States if TC Energy proceeds.

TC Energy states that by reducing exports, they are “*...reducing greenhouse gas emissions*”. But reducing exports of emission-free electricity to the United States will actually increase CO<sub>2</sub> emissions and increase carbon levels in earth’s atmosphere.

In 2019, Ontario exported 9,566 GWh of emission-free electricity to Michigan, 520 GWh to Minnesota, and 6,318 GWh to New York. Michigan generates 49% of its energy from coal, Minnesota generates 44% of its energy from coal, and New York generates 44% from natural gas (IESO, 2020). Overall, these three states source 50% to 70% of their energy from coal and natural gas (IESO, 2020; USDE, 2015; USDE, 2016). Coal produces 1,000 tonnes of CO<sub>2</sub> per GWh of electricity plus an additional 0.15 tonne/MWh for production and transport of the coal. The CO<sub>2</sub> emissions from natural gas are less than half that of coal.

If these states cannot source emission-free electricity from Ontario, they will make up the difference from energy sourced from coal and natural gas. The generation of this additional electricity could emit 700,000 to 1,400,000 tonnes/year of CO<sub>2</sub>, depending on the fuel type. This will increase CO<sub>2</sub> levels in earth's atmosphere, and thereby compound the climate change issue.

## 9.0 Community Engagement

As discussed in Section 2.0, the declared mission of Save Georgian Bay is to: study the proposed project and its implications for the land, water and communities; and to share our findings with the broader community so that they are informed and able to comment on the proposed project.

The community had not been engaged on this \$3.3 billion proposal until the Save Georgian Bay team chose to take action. The Mayor of Meaford chose not to inform her constituents, even though she was aware of the proposed project as of 12<sup>th</sup> December 2018. The Mayor was asked by TC Energy to remain silent, and to not even inform the Deputy Mayor and Councilors. Councilors didn't learn of the proposed project until 17<sup>th</sup> June 2019, as we learned from documents obtained through a Freedom of Information request.

TC Energy had not engaged the broader public until their first community meeting on 11<sup>th</sup> December 2019, and only in reaction to our efforts to inform the public.

The DND declares they have a responsibility to consult with the public, yet the DND has still not held a public meeting as they stated they would. Their comment period opened on 27<sup>th</sup> May 2019, yet there was no education for the public to be aware of the project until Save Georgian Bay held their first community meeting at the Meaford community center on 12<sup>th</sup> October 2019.

Save Georgian Bay has taken our role with community engagement seriously. We have worked collaboratively with and through various groups of people affiliated by geographic proximity, special interest, or similar situations to address issues affecting the well-being of the broader community of Georgian Bay.

We have reached out to many communities within the southern Georgian Bay, including Meaford, Owen Sound, Thornbury, Collingwood and Wasaga Beach. We have reached out to other organizations, including Georgian Bay Association, Georgian Bay Forever, All Nations Water Protectors Project, FOTTSA and GBGLF. We have also reached out to First Nations.

Our methodology to engage the communities has been multi-faceted.

- Awareness: Interpersonal discussion (Verbal, nonverbal, written & visual), poster campaigns, flyer distribution, lawn signs and social media (Facebook/Instagram/Webpage) and petitions.
- Educate: Through public presentations, printed articles, pamphlets and radio spots and interviews.

- Collaborate: Engage with surrounding communities/committees, special interest groups, businesses, associations and indigenous leaders as well as municipalities/councils and elected officials.
- Action: Develop an action plan that promotes awareness of the compile concerns and goals and coordinate with resources.

The numbers show our progress to date:

3	The number of Council members who toured the “Impact Zone”
6	The number of community information sessions Save Georgian Bay held
11	The number of community demonstrations held (all peaceful)
115	The number of “SAY NO” Covid-19 face masks sold
425	The number of “SAY NO” yard signs distributed
865	The number of followers on Save Georgian Bay Facebook page
1,400	The number of people who signed the door-to-door paper petition
1,750	The average number of weekly posts to the Facebook page
1,966	The number of Save Georgian Bay Group members on Social Media
2,282	The number of people who signed the House of Common petition
4,500	The number of brochures distributed
21,000	The number of people from Canada who signed the change.org petition
40,000	The number of people who signed the change.org petition

We have held multiple meetings and written countless emails to the Mayor, Deputy Mayor, Councilors and staff of the municipality. We issued a report to the Mayor and Council that outlines 31 conditions that we believe essential to ensure TC Energy is held to the standard of care expected by the community. Our report was appended to the Municipalities 1<sup>st</sup> June 2020 submission to the DND.

We also held numerous meetings with Provincial and Federal government officials to share our concerns and to hear their perspective.

We reached out to First Nations on numerous occasions. Saugeen Ojibway Nation listened to our concerns but preferred to work within their own governance and community. We met with Metis Nation of Ontario Owen Sound chapter in December 2019 to present the proposal and to hear their concerns. We met with members of Beausoleil First Nations, Christian Island reached out to share their opposition and help spread awareness. Members of Chippewas of Nawash Unceded First Nations reached out to us to share their concerns. They shared their family history and how their lands were unfairly expropriated in 1942 to make way for the military training base.

The overwhelming message we receive from the community is one of opposition. They express concerns about how the proposed project will affect their community, and how it will impact the environment. We trust the DND have heard many of these concerns and will hear more as the comment period comes to a close.

We've heard from a few who support the proposed project, as we're sure the DND have as well. They are concerned about the economic future of their community. They see the prospect of jobs as being most important.

Save Georgian Bay accepts both points of view. Community, environment and economic growth are all essential for our community to prosper. Our point is merely that one is not favoured at the expense of all others. Environment should not be compromised in favour of economic growth, just as economic growth should not be compromised over environment. Both can be achieved.

This is the very reason why the DND's Defence Energy and Environment Strategy declares that "*strategic environmental assessments are conducted early in the planning process before any irrevocable decisions are made*". This ensures that all factors are considered – community, environment and economic – before a decision is made.

## 10.0 Community Impacts

The Municipality of Meaford (the municipality) issued a document to the DND, dated 1<sup>st</sup> June 2020. The document was prepared by Mr. Rob Armstrong, CAO/Director of Development Services and was ratified by the Council of the Municipality following a public review period. The community impacts described in this section draw from municipality's report.

### 10.1 Policy Direction

The municipality normally draws from the following documents: Provincial Policy Statement; other Provincial Policy (e.g., The Niagara Escarpment Plan); applicable land use designations of the County of Grey Official Plan; and the Municipality of Meaford's Official Plan (the Official Plan).

According to Section B2.8 of the Official Plan, the proposed project will reside on Federal Lands and under the jurisdiction of the Government of Canada. If these lands cease to be under the jurisdiction of the federal government, an Amendment to the Plan will be required to ensure the use of these lands is consistent with the vision, principles and policy framework contained in the Official Plan.

That said, the proposed project could have impacts on lands that are affected by the Official Plan, and therefore the proposed project should be evaluated in accordance with the goals and objectives and other policies of the Official Plan.

The municipality has a number of significant environmental and topographical features that contribute to the 'sense of place' felt by many of the residents within the community. These features include the Georgian Bay shoreline, the Niagara Escarpment, the Meaford Harbour, the Big Head River and its tributaries, the Bruce and Georgian trails and the large forest tracts, valleylands, smaller woodlots and wetland areas that support diverse wildlife and plant communities.

The protection of these attributes is a key underlying principle in this Official Plan and for this reason, the Official Plan establishes an '*environment-first*' philosophy in the municipality. This means that protecting significant natural heritage features and functions shall take precedence over development.

The various goals and objectives outlined in the Official Plan focus on the protection and enhancement of natural heritage features and functions; maintain and enhance the open space character of the rural area; and provide opportunities of economic development and job creation.

## 10.2 Socio-Economics

The Municipality of Meaford (2020) expresses concerns over the anticipated labor demands during construction. This will place a significant burden on the municipality, businesses and residents who seek contractors since the current labour market is already limited. Shortages of experienced and available construction companies is expected if this project proceeds.

The current state of housing within the municipality and larger region will not support the influx of workers into the area. There will be an interim need for housing in the vicinity of the proposed project.

The economic review completed for TC Energy by ERM (2020) has not been peer reviewed nor evaluated in terms of the Official Plan and other economic opportunities within the region. Further study is required to understand the potential impacts of the proposed project on other economic opportunities, such as tourism, recreational fishing, and other economic opportunities that align with the current objectives of the Official Plan.

The proposed project will have a significant adverse effect on municipal roads. In particular, the 7<sup>th</sup> Line provides direct access to the site, yet it is essentially a residential road used by the local residents for transport, biking, cycling and walking. It is not suited for transport of heavy industrial equipment or hauling large quantities of material to and from. The proposed project will also impact the intersection of the 7<sup>th</sup> Line and Highway 26, Grey Road 112, and the intersection of the base road and Highway 26.

## 10.3 Community Concerns

Many who studied and become familiar with TC Energy's history have found a company with a culture that has a disregard for the environment. TC Energy CEO Russ Girling wrote in the TransCanada Corporate Responsibility Report (2017) *"at TransCanada we have always strived to be a leader when it comes to safely delivering the energy millions of people rely on in an environmentally and socially responsible manner"*.

This written word is inconsistent with TC Energy's environmental history. From the Polaris Institute report titled *"Unplugging the Dirty Energy Economy"*, dated June 2015:

*"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. TransCanada-owned pipelines thus account for almost half of the serious breaches reported by the NEB on federally regulated pipelines in over two decades."*

Certainly, it would be easy to judge this volume of incidents as a casual disregard for the environment, however it could also be a bias in favor of mitigation, fixing problems when they occur. Or it could be that TC Energy does not have a quality management system which enables them to build in a way that meets the requirement of the system, of even the CEO of TC Energy. What is certain is that they are unable or unwilling or both, to meet the standard expressed in the words of Mr. Gilling: *“safely delivering the energy millions of people rely on in an environmentally and socially responsible manner”*.

Here are some news reports worth review:

- Keystone pipeline spill is biggest onshore crude spill in a decade. November 1 2019. Liz Klamon, Fox Business.

This report shared how the TC Energy managed and owned Keystone Pipeline had leaked 383,000 gallons of crude oil in North Dakota.

- Oil spill in North Dakota is Keystone pipeline's 2<sup>nd</sup> in 2 years.

“In November 2017, the Keystone pipeline ruptured near Amherst, S.D., spilling 407,000 gallons of oil, though initial estimates pegged the leak at 210,000 gallons”.

“The probable cause of that spill was a “fatigue crack” from mechanical damage during the pipeline’s construction, the National Transportation Safety Board concluded last year. A metal-tracked vehicle likely caused the crack, which grew over time until the pipeline ruptured.”

“It’s a valid question, two cracks on a fairly new pipeline — geez what’s going on?” said Richard Kuprewicz, president of Accufacts, a Washington state-based pipeline safety consulting firm.

- TransCanada dismissed whistleblower. Then their pipeline blew up. By Mike De Souza in Canada’s National Observer News | February 5<sup>th</sup> 2016.

A report on TC Energy’s disregard for the warning of an employee about a quality problem.

These reports indicate an ongoing problem. The inability or unwillingness to put in place a quality system that meets environmental and social expectations.

So, when the community is asked for their input on TC Energy’s proposed pumped storage plant, we are concerned. We don’t see a company we believe we can trust. We don’t believe their past warrants our trust.

Whereas TC Energy has built and managed thousands of miles of oil pipelines and still cannot build and manage their lines so that they do not leak or fail on a regular basis. Their performance is consistent, producing the results the Polaris Institute report describes, *“TransCanada-owned pipelines thus account for almost half of the serious breaches reported by the NEB on federally regulated pipelines in over two decades”*. Consistent poor performance.

TC Energy has never built a pumped storage plant. If they can't build leakproof crude oil pipelines after decades of experience, what expectation should the community and the DND have for their ability in a first effort, to build a leakproof 23 million cubic meter dam/reservoir? A reservoir that will tower over the heads of hundreds of families.

## 11.0 Environmental Impacts

The DND's "Defence Energy and Environmental Strategy" requires that "*strategic environmental assessments are conducted early in the planning process before any irrevocable decisions are made*".

To our knowledge, the DND has not prepared or publicly disclosed a *Strategic Environmental Assessment* to support the decision they are about to make. Considering the DND have been notified of this proposal since at least July 2016, such an assessment should have been prepared by now. DND policy requires its preparation "*early in the planning process and before any irrevocable decisions are made*".

In the absence of such a strategic environmental assessment from either the DND or TC Energy, Save Georgian Bay has undertaken the preparation of such an assessment.

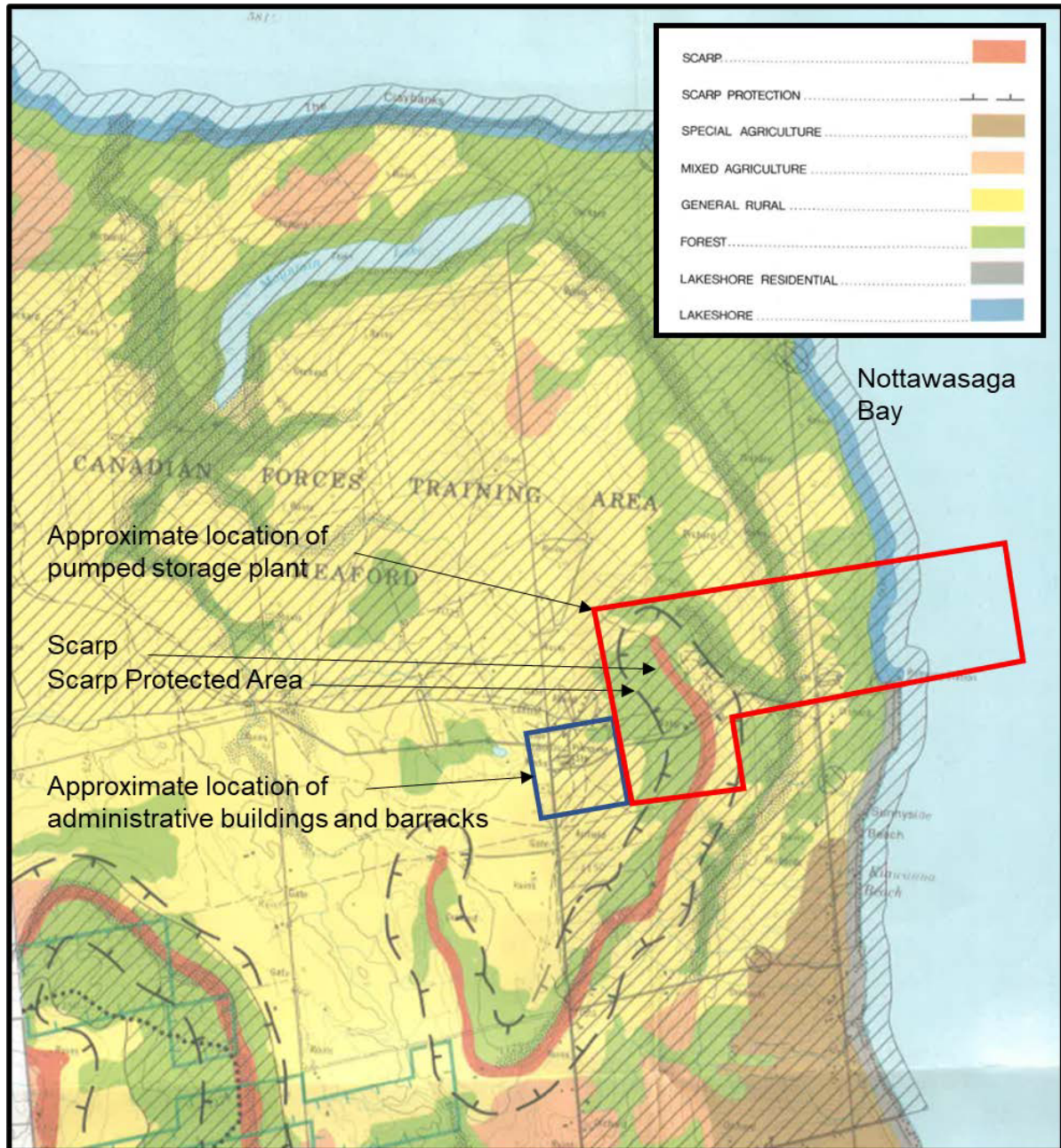
### 11.1 Terrestrial Environment

#### 11.1.1 Niagara Escarpment Plan

The site of the proposed project is not included within the Niagara Escarpment Plan, likely for the same reason that the Official Plan does not apply to Federal Lands. Background mapping for the initial Niagara Escarpment Plan for the 1970's does, however, indicate that the site traverses the escarpment, as shown in Figure 11-1. Further, the proposed reservoir would be located on top of the escarpment. According to Municipality of Meaford (2020), these locations became the Escarpment Natural designation which garnered the highest level of protection under the Niagara Escarpment Plan.

The objectives of the Escarpment Natural Designation are as follows:

1. To recognize, protect and where possible enhance the natural heritage and hydrological systems associated with the Niagara Escarpment Plan area.
2. To protect the most natural Escarpment features, valleylands, wetlands and related significant natural areas.
3. To conserve cultural heritage resources, including features and areas of interest to First Nations and Métis communities.
4. To encourage compatible recreation, conservation and educational activities.
5. To maintain and enhance the scenic resources and open landscape character of the Escarpment.



**Figure 11-1: Site Location Map Showing Relationship to the Niagara Escarpment**

Save Georgian Bay shares the concern stated by the Municipality of Meaford (2020) regarding the visual impact of the proposed project. We support the municipalities request for a peer reviewed Visual Impact Assessment in accordance with the NEC Visual Assessment Guidelines.

We do not accept the claim of TC Energy that the site is isolated, nor do we accept the artistic renderings of the site that TC Energy presents at community meetings and on their website. These claims and renderings are intended to deceive.

### **11.1.2 Species at Risk**

TC Energy's proposed project presents a serious threat to wildlife habitat. Considering the risk, the most common way to extinct a species is by eradicating or by disturbing their habitat.

In the Action Plan of the Federal Sustainable Development Strategy, the federal government has committed to protect wildlife species at risk and also the federal government has committed to implement the new Pan-Canadian approach to wildlife health.

According to the DEES, under protecting flora and fauna section, DND has specifically committed to protecting wildlife species on its working federal land and planning to protect wildlife and plants that are particularly at risk.

Permitting TC Energy's proposed project to go forward and protecting our local wildlife habitat at the same time are in conflict. We cannot have both! Either you are going to protect the wildlife or you are going to allow this project to happen.

We have personally witnessed the habitat of the following endangered species and species at risk located in the area of the proposed plant:

Butternut Tree, Red-headed Woodpecker, Little Brown Myotis Bat, Northern Long-Eared Myotis Bat, Western Chorus Frog, Eastern Meadowlark, Bobolink bird, Canadian Warbler, Wood trash and Monarch butterfly.



**Butternut Tree**



**Little Brown Myotis Bat**



**Northern Long-Eared Myotis Bat**



**Red-headed Woodpecker**



**Canada Warbler**



**Eastern Meadowlark**



**Bobolink**



**Western Chorus Frog**



**Monarch Butterfly**

## 11.2 Aquatic Environment

### 11.2.1 Species of interest

Preliminary investigations identify that at least 23 species utilize the aquatic environment of Georgian Bay within the vicinity of the Project. Several of these species are listed as threatened by COSEWIC.

TC Energy's proposed project will affect aquatic habitats within Georgian Bay. As with terrestrial environments, the most common way to extinct a species is by eradicating or by disturbing their habitat.

The original conceptual design for the proposed project included construction of a massive breakwall and wingwalls directly on known spawning habitat for Lake Whitefish, Trout and Carp. Such structures placed on top of such habitat destroys the habitat forever – it's that simple. The intake placement at the shoreline would entrain fish and anything or anyone else that happened to stray by. We know this from experience at the Ludington plant. That plant continues to kill millions of fish each year even after mitigation.

TC Energy reacted to our concerns and decided to revise their conceptual design. The revised concept removes the breakwalls and shoreline intake, and replaces them with eight offshore intakes. This shifts the focus from the nearshore aquatic environment to the offshore aquatic environment. The design remains a concept. We have no assurance TC Energy will not resume the original concept or propose something completely different yet again.

Moving to the offshore aquatic environment introduces a new concern – Cisco. Cisco are salmonid fish of the genus *Coregonus*. They were once plentiful within the Great Lakes but have declined in recent years with several species now extinct.

Table 11-1 summarizes the status of major forms of Cisco in Lake Huron/Georgian Bay (GLFC, 2016). Of the six major forms of Cisco within the basin, two are extinct, and three have introgressed into a hybrid swarm. These are considered to be extirpated/extinct, although elements of their morphology may persist.

Concerns regarding these species of interest are discussed below in the context of the Fisheries Act.

**Table 11-1: Status of Major Forms of Cisco in Lake Huron (Georgian Bay)**

Scientific name:	<i>C. artedi</i>	
Common name:	Cisco	
Status:	Extant	
Scientific name:	<i>C. hoyi</i>	
Common name:	Bloater	
Status:	Introgressed	
Scientific name:	<i>C. johanna</i>	
Common name:	Deepwater Cisco	
Status:	Extinct	
Scientific name:	<i>C. kiyi</i>	
Common name:	Kiyi	
Status:	Introgressed	
Scientific name:	<i>C. nigripinnis</i>	
Common name:	Blackfin Cisco	
Status:	Extinct	
Scientific name:	<i>C. zenithicus</i>	
Common name:	Shortjaw Cisco	
Status:	Introgressed	

### 11.2.2 The Fisheries Act

The Fisheries Act is one of Canada’s oldest, strongest and most important pieces of environmental legislation. It provides a framework for the proper management and control of fisheries, and the conservation and protection of fish and fish habitat, including by preventing pollution.

The Fisheries Act will form a significant part of the regulatory process associated with TC Energy’s proposed pump storage plant.

The Fisheries Act declares:

- A proponent shall not cause death of fish,
- A proponent shall not cause harmful alteration, disruption or destruction of fish habitat, and
- A proponent shall not discharge or cause the release of a deleterious substance.

The hierarchy of steps required to comply with the fish and fish habitat protections of the Fisheries Act include:

- Step #1 – Avoidance
- Step #2 – Mitigation
- Step #3 – Offset

A proponent should first avoid sensitive environmental features or resources. They then mitigate potential effects that remain after avoidance. Offsets apply only after every effort has been made to avoid and mitigate as a means to counterbalance the residual effect.

TC Energy's proposed pump storage plant, as proposed, does not comply with the Fisheries Act. They claim they will follow these three steps but we have not seen evidence of this. They have already made irrevocable decisions, such as site selection and conceptual design, that did not consider environmental constraints. Avoidance did not factor into their decision-making process. They claim mitigation will resolve all issues, but they have yet to demonstrate they understand the issues, let alone know how to mitigate them. More so, not all impacts can be mitigated. You can't mitigate actions that destroy sensitive fish habitat or further threaten endangered species.

The text below is not intended as an exhaustive discussion of the Fisheries Act, but rather to identify several of the important aspects of the Act relevant to TC Energy's proposal. The text should also not be interpreted as to imply fish and fish habitat are the only environmental consideration of relevance. TC Energy's proposal will cause many environmental issues, too many to list here.

### **11.2.3 Step #1 – Avoidance**

Avoidance means 'to keep away from'.

The Fisheries Act requires proponents to keep away from sensitive environmental features or resources. This is the first step in the environmental process.

It begins with site selection.

TC Energy selected the site based on three requirements: 150 m of elevation difference; source of free water; and located within 100 km of the power grid.

TC Energy did not consider environmental constraints in their site selection. Their first conceptual design placed large breakwalls directly over known spawning habitat for Lake Whitefish, Trout and Carp, and the shoreline intake design would repeat the mistakes made at a similar plant at Ludington, Michigan, that continues to cause fish mortality as documented in court transcripts and regulatory monitoring reports.

It was only after the community (via Save Georgian Bay) took issue that TC Energy decided to modify their conceptual design. TC Energy's primary responsibility should be to protect the public, the community and the environment. If the community tells them that their design will kill fish, then they failed in the primary responsibility because they should have known.

The revised conceptual design relocates the intake/outfall further offshore into deeper water. This resolves potential effects to the nearshore environment only to create new potential effects to the offshore environment. The intake/outfall structures are now located within rearing habitat for juvenile Lake Whitefish and habitat for Cisco.

A strategic environmental assessment should identify a long list of potential sites, and then conduct a screening evaluation of each based on potential environmental constraints. Sensitive aquatic habitat or the presence of an endangered species, such as Cisco, would be considered an environmental constraint.

Had TC Energy done this screening evaluation, they would have rejected this location due to the sensitivity of the aquatic environment. But now that they have invested years in the design and assessment of this site, they are committed. They made an irrevocable decision years ago without proper information, and now they will react to the issues and concerns as they arise.

Knowing that the site contains sensitive environmental features and resources, TC Energy should have avoided the site all-together. Rather than selecting a 'green-field' site, they could have selected a 'brown-field' site, such as an abandoned mine or quarry as others have done. They could also consider a closed-looped system with a lower reservoir placed in-land from the shoreline to avoid the aquatic environmental altogether. Alternatively, they could have selected a different technology to store electricity, or endorsed the strategy proposed by the OSPE as discussed in Section 6.0.

They claim the project is 'green', yet they will destroy a pristine 'green-field' site in the process.

The DND's directive on environmental protection and stewardship requires the DND to meet or exceed the letter and spirit of all federal laws, including the *Impact Assessment Act*, the *Species at Risk Act*, and the *Fisheries Act*. The *Impact Assessment Act* declares an authority cannot proceed with a project on crown land that may cause a significant adverse environmental effect. The *Species at Risk Act* declares that a project cannot harm the habitat of threatened or endangered species. The *Fisheries Act* declares a project cannot cause mortality of fish or destroy fish habitat. Both the original and revised conceptual designs do not comply with the requirements of these Acts. The project has the potential to cause significant adverse environmental effects, cause death of fish, and destroy fish habitat. The DND, as per their directive, should therefore reject the proposed project.

In the event the DND is not prepared to outright reject the project at this time, it is advised that DND require TC Energy to conduct appropriate investigations to properly and fully characterize the aquatic habitats and resources within the areas potentially affected by the project, and that the results of these studies be reviewed by independent experts. The selection of site and design should be based on the findings of these studies so as to avoid potential adverse environmental effects. Section 14.1 further discusses these requirements.

#### **11.2.4 Step #2 – Mitigate**

Mitigate means 'to make less severe, serious, or painful'.

Avoidance alone will not prevent harm to sensitive environmental features. So, the Fisheries Act requires the proponent to make less severe, serious or painful the potential harm. This is the second step in the environmental process taken after all efforts are made to avoid sensitive environmental features or resources.

For certain design features, mitigation may not be possible. You can't mitigate the loss of a species or the destruction of sensitive habitat. Cause and effect, these are forever.

For other design features, mitigation may lessen the severity of the effect, such as ear plugs can mitigate the potential effect of noise. For these design features, the proponent should first make every effort to avoid causing environmental harm. They then assess the potential harm, and identify how best to lessen the severity of the effect.

The proponent must consider Best Available Technology Economically Achievable (BATEA). BATEA is the technology approved by regulators to meet the current standard of care for a particular process. It is a moving target, since developing societal values and advancing techniques change what is currently regarded as 'best available' or 'economically achievable'. The standard of care from the 1960's does not achieve the standard of care in 2020.

The Department of Fisheries and Oceans (2019) approved the design of the intake for the Darlington New Nuclear Plant. In their case, the Department of Fisheries and Oceans

required the intake to be placed far offshore, in deep water, and away from biologically active areas. The intake design had to achieve an approach velocity of 6 cm/s so as to enable schooling fish to swim away from the intake. This design should define BATEA since it establishes precedent as the latest intake approved for construction by DFO.

The revised conceptual design proposed by TC Energy will achieve an approach velocity of 20 cm/s. Fish cannot swim away from such a high approach velocity. The target for mitigation should be an approach velocity closer to 6 cm/s, as required in DFO's recent approval at Darlington.

The nature of TC Energy's revised conceptual design also does not allow for the use of proper screening and fish return mechanisms to return entrained fish safely back to Georgian Bay. The screens shown on the conceptual drawing presumably prevent large objects from being entrained but not small objects or fish.

### **11.2.5 Step #3 – Offset**

Offset means *“a consideration or amount that diminishes or balances the effect of a contrary one”*.

Even with the most effective avoidance and mitigation, some fish mortality and loss of habitat are likely – referred to as the residual effect. So, the Fisheries Act requires the proponent to pay a consideration or amount that diminishes or balances the residual effect.

After all efforts to avoid and mitigate, the DFO determines the magnitude of residual effect and associated consideration or amount owed to offset the effect. The proponent then proposes how best to achieve the required offset.

An offset can take many forms. Ideally, the objective is to counterbalance the residual effect through rehabilitation or creation of fish habitat.

Offsets can be applied anywhere within the basin of the impacted water body. Ideally, the offset is applied within the affected area, but this is not required to achieve the objectives of the Fisheries Act.

Offsets aren't intended as a substitute for avoidance and mitigation – these come first and second. Offset comes third. DFO should enforce a high standard of care for avoidance and mitigation before any discussion of offsets.

TC Energy has been in discussion with Saugeen Ojibway Nation (SON) regarding a partnership agreement. Both parties refuse to share the details of their discussions. It is likely they discussed offsets that compensate for the residual effects of the project – and compensate SON for their potential loss. These offsets could be applied anywhere within

the traditional territorial waters claimed by SON, which extend from Goderich to Tobermory to Collingwood.

TC Energy should assess the residual effects and work with DFO, SON and the community of Meaford to determine appropriate offsets that ensure no net loss of fish stocks or fish habitat within the local area most affected by the project.

Given DND's relationship within the community of Meaford, it would be appropriate for the DND to advocate on behalf of the municipality that they have a role in deciding offsets and that these offsets apply to the local area most affected by the project. Section 14.1.2 further discusses offsets.

### **11.3 Surface Water Quality**

The proposed project has the potential to impact the pristine waters of Georgian Bay. Water quality impacts can occur during construction from deforestation, site clearing, movement of equipment and materials, and construction of the reservoir and associated dam. Water quality impacts can also occur during operations from the high velocities induced from the movement of water into and from the intake/outfall structure.

Local residents describe an incident at the DND base where construction activities resulted in the release of sediment to a creek. This relatively small construction project caused turbidity of the water in the creek and a sizable turbidity plume extending along the shoreline of Georgian Bay. It affected habitat within the creek and nearshore, and impacted the source waters for the residents along the shore who have shoreline wells.

If this small construction project caused such an effect, the potential impact from TC Energy's proposed project will be many times greater and will persist throughout the multi-year construction phase.

The constant ebb and flow of water from and to the plant has the potential of mobilizing the fine silts and clays that characterize the substrate. This will cause turbidity of the pristine waters affecting aquatic habitat, the quality of potable water, and impair the pristine nature Georgian Bay.

The storage of water within the reservoir also has the potential to alter the temperature of the water. Granted, the change in temperature may be small in absolute terms, but even a small change in temperature alters the density of water, and hence affects the mixing of the water when released back to the Bay.

Water quality can also be affected by the materials used to line the tunnels and reservoir, and operations of the power station, although further information is required to assess these potential effects.

As stated by the Municipality (2020), it is imperative that the proposed project not result in any impacts on water quality including turbidity issues affecting the pristine waters of Georgian Bay. The municipal intake for the Meaford Water System is located approximately 6.6 km south of the proposed outfall and this intake must not be impacted in anyway. Further, a large number of residents along the Nottawasaga Bay shoreline receive their water from shoreline wells. Unlike a Municipal Water Plant, which has advanced filtration, many homes only have basic UV filtration systems, which can be severely impacted by poor water quality and high turbidity.

Section C4 – Water Resource Management of the Official Plan identifies required studies in support of major applications with an outline of criteria that must be addressed including:

- how to maintain or enhance the natural hydrological characteristics of the water resource;
- how to minimize or eliminate the effect of the proposed use on the groundwater recharge function;
- how to minimize or eliminate the effect of the proposed use on the quality and quantity of drinking water in adjacent private and municipal wells;
- how to maintain or enhance sensitive groundwater recharge/discharge areas, aquifers and headwater areas;
- whether it is required to monitor water budgets for groundwater aquifers and surface water features;
- how to ensure that the quality of the watercourses affected by the development are maintained; and,
- how to ensure that there will be no negative impacts on the water quality of Georgian Bay.

As stewards of the lands and waters in their care, the DND will be held responsible for holding TC Energy to the highest standard of care. Both federal and provincial governments publish water quality criteria to which they hold proponents accountable to. We expect no less from the DND. Section 14.1.1 provides further details of these criteria.

## 11.4 Groundwater

TC Energy's revised conceptual design includes the excavation of a shaft and tunnels to convey water to and from Georgian Bay, and the excavation of a cavern deep below the Niagara Escarpment to house the generating station and other works.

The dewatering of these installations will cause a depression of the local and perhaps regional groundwater table. This would affect the hydrology within the local and perhaps regional watershed, causing creeks, ponds and wetlands to dry up. It may also reduce the capacity of wells within the affected area.

The DND should require TC Energy to undertake an investigation of the potential effects of their proposed project on groundwater resources. The results of this study should be reviewed by an appropriate independent expert.

## 11.5 Air Quality

TC Energy's proposed project has the potential to impact air quality during the construction phase in particular. Sources of air emissions include: cement processing plant, deforestation, site clearing, earth movement required to create the reservoir, earth movement required to construct the shaft and tunnels, and diesel exhaust from industrial equipment, trucks, bulldozers, etc. Air pollutants include sulfur dioxide, carbon dioxide, nitrogen oxides, ozone, lead and various forms of particulate matter. These pollutants are deemed harmful to human health, and have the potential to cause significant adverse environmental impacts.

Section D9.2.2 of Meaford's Official Plan notes that:

*Air quality can impact us as individuals (health effects), as a society (health care costs) and on a global scale (climate change), but there are many ways to improve and maintain air quality. It is a policy of the Municipality to:*

*a) ensure that municipal operations and facilities meet or exceed applicable Provincial regulations with respect to air quality and support incremental reduction of greenhouse gas emissions and air pollutants;*

In this regard, details are requested on how this will be addressed.

Particulate matter is of particular concern given the proposed on-site cement plant, and the massive amount of earth movement and hauling for excavation of the reservoir, shaft and tunnels. Particulate matter comprises two kinds of microscopic particles, mineral (silica and other minerals from rock processing), and hydrocarbon and soot from diesel exhaust of

industrial equipment. The particulate matter of interest in terms of health risks are those that are small, invisible to the naked eyes (much smaller than the human hair) are easily carried in wind currents, can remain airborne for long period of time, and can be carried up to 50 km and more depending of the size from the source.

These particles penetrate the delicate lining of the respiratory system following inhalation. The health effects of inhalation are well documented. Health risks are due to exposure over both the short term (hours, days) and long term (months, years). Short term exposure can result in coughing, shortness of breath, tightness in the chest and irritation of the eyes. Long term exposure can result in reduced lung function, and respiratory diseases such as asthma, chronic obstruction pulmonary disease (COPD), lung cancer, emphysema, and aggravation of existing lung disease. Long term exposure is also associated with increased risk of allergies, cardiovascular disease, autoimmune disease.

## **11.6 Light, Noise and Vibrations**

The proposed project will impact light and noise levels within the surrounding areas. Such impacts will occur during both construction and operations. The site for the project is located immediately adjacent to administrative buildings and barracks within the DND property, and near farms and private properties along the southern boundary. There is limited buffer between the project site and adjacent developments.

With regard to light, Section D9.2.5 of the Official Plan states the policy of the municipality in terms of responsible lighting practices. TC Energy states they have reconfigured their conceptual design to minimize impacts associated with light. These changes may address concerns during operations, but it is unclear how they will address concerns during construction unless they limit construction activities to daylight hours.

With regard to noise, construction and operations could impact the quiet enjoyment of resident's homes. Noise pollution, is any form of sound that disrupts a natural ecosystem or causes a person's property to become unusable or unpleasant. Noise can also have an adverse impact on human health, including loss of sleep, increased stress levels, and hearing loss in some cases.

Noise is considered as any unwanted sound that is clearly audible and of such volume so as to disturb the local residents. It could be caused by any number of sources, including deforestation, site clearing, earth movement, drilling, blasting, vehicles, heavy equipment.

It is acknowledged that DND operations on the base are already a source of noise. But this does not establish a benchmark for the proposed project to compare against. The noise

from the base is intermittent, and part of the character of the area, and the relationship between the DND and the community.

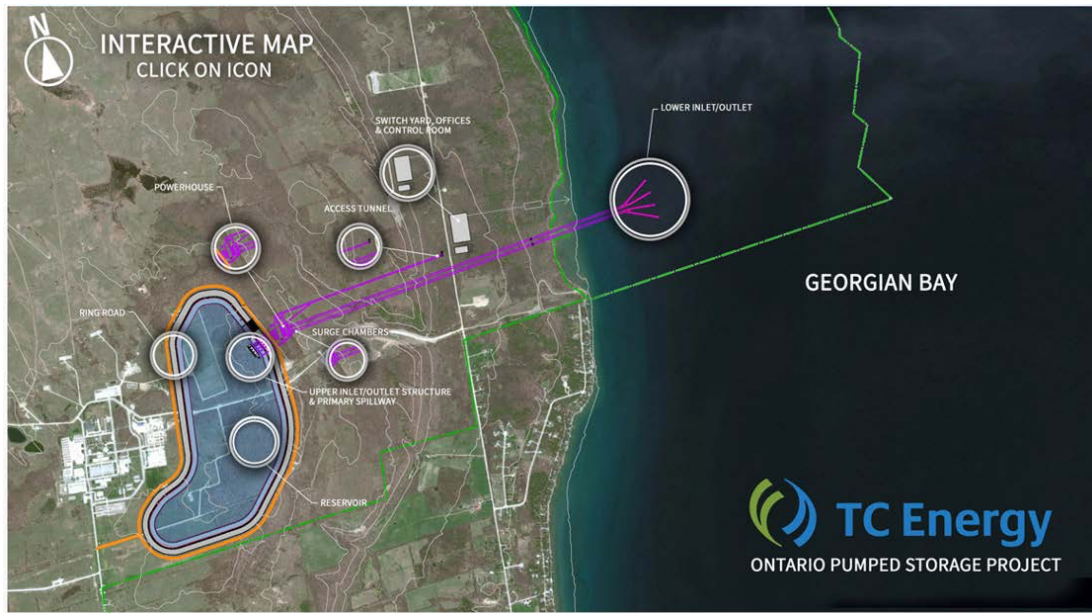
With regard to vibrations, the revised conceptual design involves considerable drilling, blasting and excavation to construct the reservoir, shaft, tunnels and below ground power station. These activities will create vibrations that could travel significant distances.

Further information on light, noise and vibration is required to evaluate these potential impacts.

## 12.0 Dam Safety

### 12.1 Conceptual Design

TC Energy proposes the construction of a new reservoir adjacent to the administrative complex for the base. The reservoir would have a surface area of 375 acres with a length, width and depth of 1,700 m, 900 m and 20 m, as shown in Figure 12-1.



**Figure 12-1: Conceptual Drawing of the Proposed New Reservoir**

As shown in Figure 12-2, TC Energy proposes to construct the reservoir above grade with a rock filled dam around the perimeter of the reservoir.



**Figure 12-2: Artist Conceptual Rendering of the Proposed New Reservoir**

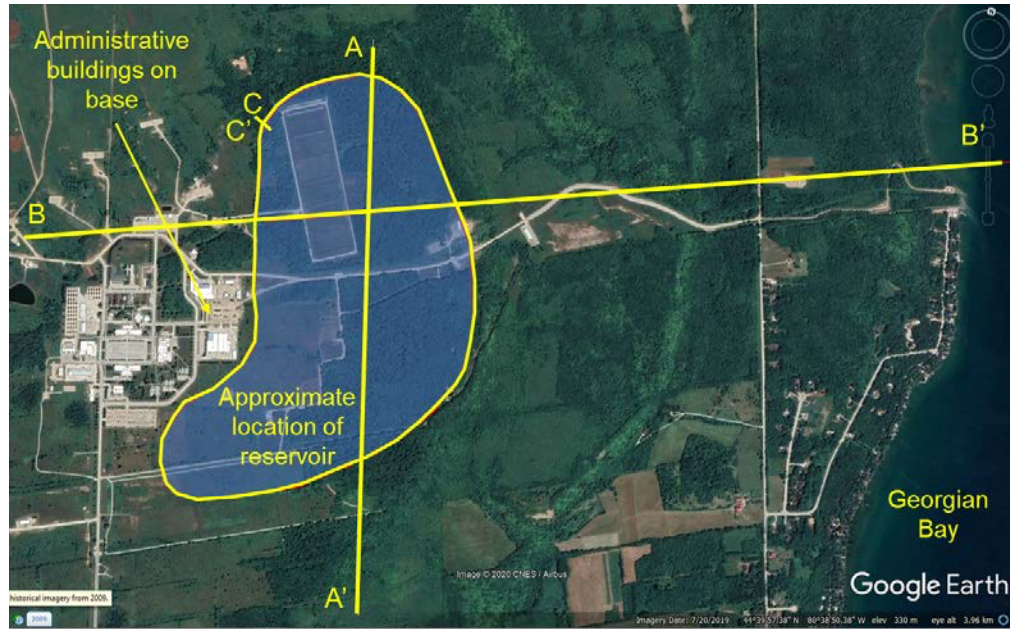
## 12.2 Elevation Profiles

The reservoir will be located on top of a segment of the Niagara Escarpment. As shown in Figure 12-3 and Figure 12-4, the elevation rises from approximately 176 m at the shoreline of Georgian Bay to approximately 350 m on the escarpment, and then slopes downward towards the base (Google, 2019).

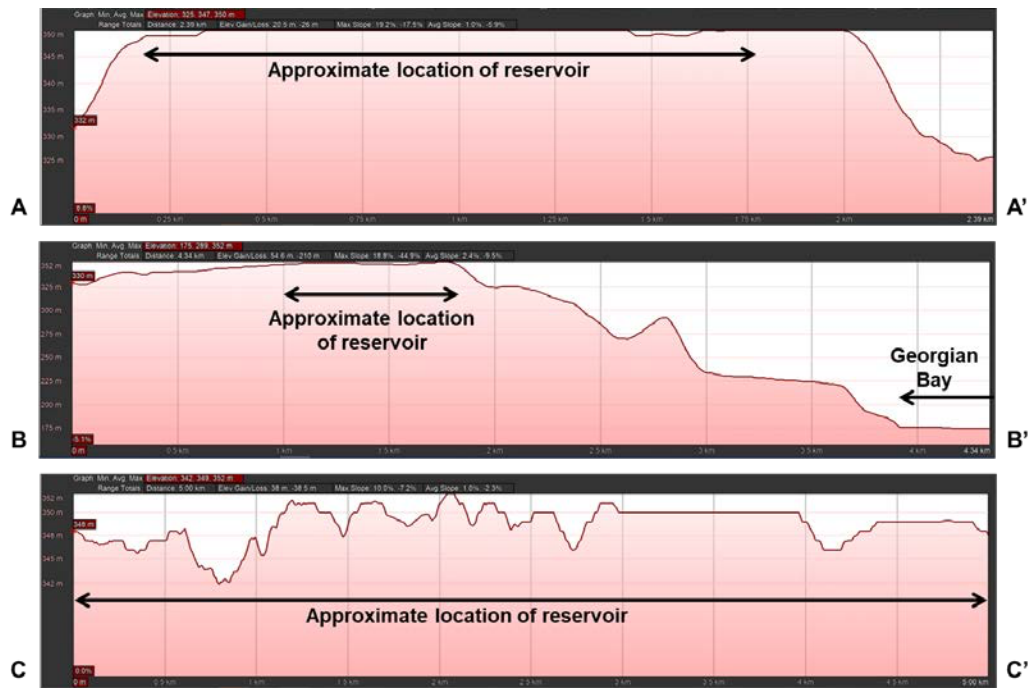
The northern, eastern and southern edges of the reservoir follow the edge of the escarpment. The existing ground elevation around the perimeter of the reservoir varies from approximately 342 m to 352m.

The crest elevation of the dam has not been specified by TC Energy. If TC Energy seek to maximize the elevation difference between the escarpment and Georgian Bay, they might place the reservoir on top of the escarpment without excavating into the escarpment (other than site clearing). This would place the crest elevation of the dam above 370 m, and would require the construction of a dam greater than 20 m height around the entire perimeter of the reservoir. In low lying areas, the dam height could be greater than 30 m.

Alternatively, they could reduce the crest elevation of the dam by excavating into the escarpment whereby placing the reservoir below grade. This would minimize, if not eliminate, the need for a constructed perimeter dam. In such case, the cap rock of the escarpment would serve as the perimeter dam.



**Figure 12-3: Artist Conceptual Rendering of the Proposed New Reservoir**



**Figure 12-4: Elevation Profiles Along, Across and Around the Reservoir**

### 12.3 Inundation Zone

Dam failures are rare, but when they occur, the failure is sudden, rapid, and cause an uncontrolled release of impounded water that causes immense damage and potential loss of life. It's not so much a question of *“do dams fail?”* History has shown that they do in fact fail for a variety of reasons, as discussed in Section 12.4. It's a question of *“what are the consequences if the dam does fail?”*

If the dam fails, the uncontrolled release of impounded water will cascade downgradient. The areas impacted by these waters is referred to as the inundation zone. (Those residing within the inundation zone referred to it as the *“Impact Zone”*).

The inundation zone for TC Energy's proposed reservoir will extend in all directions from the reservoir since the reservoir is located on a high point along the escarpment. As illustrated in Figure 12-5, the inundation zone will include operational areas of the base, including barracks and administrative buildings. Towards the east, the inundation zone will impact approximately 300 families that live downgradient from the reservoir.

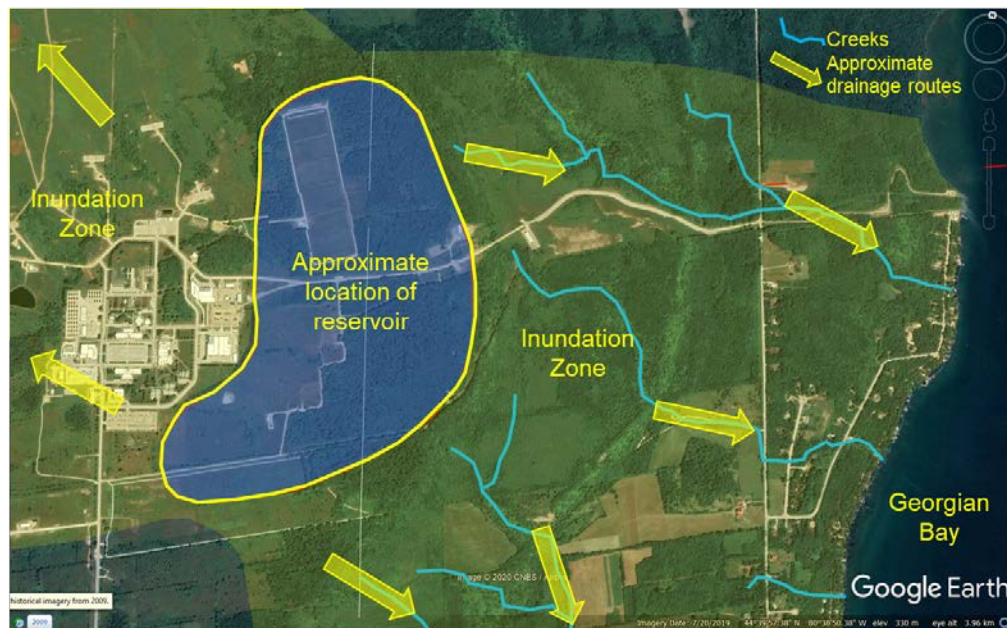


Figure 12-5: Inundation Zone

The areas impacted by a dam failure will depend on the location of the breach and on the natural drainage patterns within the watershed. Topographic maps from the Ontario Ministry of Natural Resources and Forestry show three drainage routes (creeks) towards the east

that would be the most likely flow path for a breach along the eastern face of the reservoir. These drainage routes pass through residential areas.

## 12.4 Dam Failures

Dams are considered “*installations containing dangerous forces*” under International humanitarian law due to the massive impact of a possible destruction of the civilian population and the environment.

Wikipedia identifies that more than 200 notable dam failures occurred worldwide between years 2000 and 2009. That equates to 20 notable dam failures each year, on average.

In 1975, the failure of the Banqiao Reservoir Dam in Henan Province, China, caused more casualties than any other dam failure in history. The disaster killed an estimated 171,000 people and 11 million people lost their homes.

Within the past year, three dams failed:

- The Edenville Dam failed on 19<sup>th</sup> May 2020 in Edenville, Michigan, USA, from heavy rainfalls that overtopped and breached the dam;
- The Sanford Dam failed on 19<sup>th</sup> May 2020 in Sanford, Michigan, USA, from large inflow from the failure of the Edenville Dam located immediately upstream;
- Tiwara Dam failed on 2<sup>nd</sup> July 2019 in Ratnagiri District, India, from heavy rains that overtopped and breached the dam.

The two most recent dam failures fortunately did not result in any reported fatalities, but they did cause significant flooding and associated property damage. The third most recent dam failure resulted in 23 fatalities.

Canada is not immune from Dam failures. Bruemmer (2019) reported on the evacuation of residents from the Grenville-sur-la-Rouge area near Montreal. In 2015, Quebec's auditor general report found only 10 per cent of the province's 5,900 dams fulfilled security obligations.

Table 12-1 lists major dam failures over the last 100 years. The list includes 92 major dam failures, with reported fatalities of 184,699 (most attributed to the Banqiao Reservoir Dam failure). Over the past 20 years, 45 major dam failures occurred, with reported fatalities of 1,062.

**Table 12-1: List of Major Dam Failures**

<b>Dam/Incident</b>	<b>Date</b>	<b>Country</b>	<b>Fatalities</b>
Sanford Dam	May 2020	United States	None reported
Edenville Dam	May 2020	United States	None reported
Tiware Dam	Jul 2019	India	23
Spencer Dam Failure	Mar 2019	United States	?
Brumadinho dam disaster	Jan 2019	Brazil	270
Sanford Dam, Patricia Lake	Sep 2018	United States	0
Swar Chaung Dam	Aug 2018	Myanmar	4
Xe-Pian Xe-Namnoy Dam	Jul 2018	Laos	36
Panjshir Valley dam	Jul 2018	Afghanistan	10
Patel Dam	May 2018	Kenya	47
Maple Lake	Oct 2017	United States	0
Mariana dam disaster	Nov 2015	Brazil	19
Mount Polley tailings dam failure	Aug 2014	Canada	0
Tokwe Mukorsi Dam	Feb 2014	Zimbabwe	0
Dakrong 3 Dam	Oct 2012	Vietnam	0
Köprü Dam	Feb 2012	Turkey	10
Ivanovo Dam	Feb 2012	Bulgaria	8
Campos dos Goytacazes dam	Jan 2012	Brazil	0
Fujinuma Dam	Mar 2011	Japan	8
Kenmare Resources tailings dam	Oct 2010	Mozambique	1
Ajka alumina plant accident	Oct 2010	Hungary	10
Niedow Dam	Aug 2010	Poland	1
Delhi Dam	Jul 2010	United States	0
Testalinda Dam	Jun 2010	Canada	0
Hope Mills Dam	Jun 2010	United States	0
Kyzyl-Agash Dam	Mar 2010	Kazakhstan	43
Sayano-Shushenskaya Dam	Aug 2009	Russia	75
Situ Gintung Dam	Mar 2009	Indonesia	98
Algodões Dam	May 2009	Brazil	7
Kingston Fossil Plant	Dec 2008	United States	0
Koshi Barrage	Aug 2008	Nepal	250
Lake Delton	Jun 2008	United States	0
Gusau Dam	Sep 2006	Nigeria	40
Campos Novos Dam	Jun 2006	Brazil	0
Ka Loko Dam	Mar 2006	United States	7
Taum Sauk reservoir	Dec 2005	United States	0
Shakidor Dam	Feb 2005	Pakistan	70
Camará Dam	Jun 2004	Brazil	3
Big Bay Dam	Mar 2004	United States	0
Ringdijk Groot-Mijdrecht [nl]	Aug 2003	Netherlands	0
Hope Mills Dam	May 2003	United States	0
Silver Lake Dam	May 2003	United States	0
Zeyzoun Dam	Jun 2002	Syria	22
Vodní nádrž Soběnov	2002	Czechia	0
Martin County coal slurry spill	Oct 2000	United States	0
Shihgang Dam	Sep 1999	Taiwan	0
Doñana disaster	Apr 1998	Spain	0
Virgen Dam	1998	Nicaragua	?
Opuha Dam	Feb 1997	New Zealand	0
Saguenay Flood	Jul 1996	Canada	10
Meadow Pond Dam	Mar 1996	United States	1
Merriespruit tailings dam	Feb 1994	South Africa	17
Peruća Dam detonation	Jan 1993	Croatia	0

Belci dam failiure	Jul 1991	Romania	25
Upriver Dam	May 1986	United States	0
Kantale Dam	Apr 1986	Sri Lanka	180
Val di Stava dam	Jul 1985	Italy	268
Tous Dam	Oct 1982	Spain	8
Lawn Lake Dam	Jul 1982	United States	3
Wadi Qattara Dam	1979	Libya	0
Machchu-2 Dam	Aug 1979	India	5,000
Kelly Barnes Dam	Nov 1977	United States	39
Laurel Run Dam	Jul 1977	United States	40
Teton Dam	Jun 1976	United States	11
Banqiao and Shimantan Dams	Aug 1975	China	171,000
Canyon Lake Dam	Jun 1972	United States	238
Buffalo Creek Flood	Feb 1972	United States	125
Certej dam failiure	Oct 1971	Romania	89
Sempor Dam	Nov 1967	Indonesia	138
Mina Plakalnitsa	May 1966	Bulgaria	107
Swift Dam	Jun 1964	United States	28
Spaulding Pond Dam	Mar 1963	United States	6
Vajont Dam	Oct 1963	Italy	2,000
Baldwin Hills Reservoir	Dec 1963	United States	5
Panshet Dam	Jul 1961	India	1,000
Kurenivka mudslide	Mar 1961	Ukrainian SSR	145
Malpasset dam	Dec 1959	France	423
Vega de Tera	Jan 1959	Spain	144
Taisho Lake Dam	1951	Japan	108
Tangiwai disaster	Dec 1953	New Zealand	151
Heiwa Lake Dam	1951	Japan	117
Xuriguera Dam	1944	Spain	8
Möhne Dam	May 1943	Germany	1,579
Edersee Dam	May 1943	Germany	70
Nant-y-Gro dam	1942	United Kingdom	0
Horonai Dam	1941	Japan	60
Secondary Dam of Sella Zerbino	1935	Kingdom of Italy	111
Granadillar Dam	1934	Spain	8
Castlewood Dam	1933	United States	2
St. Francis Dam	Mar 1928	United States	451+
Llyn Eigiau dam and Coedty reservoir	Nov 1925	United Kingdom	17
Gleno Dam	Dec 1923	Kingdom of Italy	356

## 12.5 Dam Failure at the Taum Sauk Pump Storage Plant

History has shown that the reservoirs for pump storage plants can fail. Take, for example, the 2005 failure of the upper reservoir for the Taum Sauk Pump Storage Plant.

The Taum Sauk Pump Storage Plant in Reynolds County, Missouri, was constructed by United Electric between 1960 and 1962. It was designed to provide generation during peak demand periods, the same as that of TC Energy's proposed project.

The upper reservoir for the plant is situated atop Proffit Mountain, and as such, it has no natural primary inflow of water. The upper reservoir receives all of its water through pumping from the lower reservoir via a 7,000-foot-long concrete and steel-lined tunnel that connects the two.

On 14<sup>th</sup> December 2005, a catastrophic failure of the upper reservoir dam occurred due to overtopping of the dam crest during the final minutes of one of its pumping cycles. As a result, the reservoir's 4,300 acre-feet volume of stored water breached in 25 minutes, traveling down Proffit Mountain toward the Black River with a peak discharge of 273,000 cubic feet per second.

This failure did not occur because of an extreme weather event. It failed because of equipment failure and human error.

## 12.6 Common Causes of Dam Failures

Common causes of dam failure (Afework et al., 2019) include:

1. Overtopping: Failures occur as a result of poor spillway design, leading to a reservoir filling too high with water, especially in times of failure include settling of the crest of the dam or spillway blockage. Overtopping of a dam is often a precursor of dam failure. National inadequate spillway design, debris blockage of spillways, or settlement of the dam crest account for approximately 34% of all U.S. dam.
2. Foundation Defects: These failures occur as a result of settling in the foundation of the dam, instability of slopes surrounding the dam, foundation. All of these failures result in structural instability and potential dam failure. They cause about 30% of all dam failures.
3. Cracking: Caused by movements like the natural settling of a dam.
4. Piping: Seepage through a dam is not properly filtered and soil particles continue to progress and form sink holes in the dam. These failures caused by seepage and erosion along hydraulic structures such as the spillways. As well, erosion as a result of animal burrows and cracks failures. Another 20% of U.S. dam failures have been caused by piping (internal erosion caused by seepage).
5. Conduit and valve failure: These failures occur as a result of problems with valves and conduits.
6. Use of Sub-standard Construction Materials: The use of improper construction materials is another primary cause of dam failures. During use the right construction

materials and in approved quantities. Inability to use quality construction materials often causes the dam to

7. Poor Maintenance: Dams require regular and frequent maintenance to ensure they are safe for the civilians living in the area and the safety demand that regular inspections and maintenance procedures are conducted by qualified professionals. The absence of such regular of the dams and therefore failure of the structure. The Val di Stava Dam in Italy collapsed in 1985 due to lack of proper maintenance. water due to massive sediment deposits. As a result, the dam failed due to inefficient drainage. The problem could have been identified was performed.
8. Design error: Design errors occur when essential factors are not incorporated into the design and construction of a dam. The Taum Sauk primarily due to a design flaw. The dam lacked a proper system for gauging the water level in its reservoirs, which resulted in an overflow 2007, and appropriate monitors were incorporated in the dam's structure to prevent future failure.

## 12.7 Community Concerns

Needless to say, members of the community who reside within the inundation zone are concerned about a dam holding 23 million cubic meters of water perched overhead. TC Energy has never built such a structure, and their track record of pipeline failures – a design element they should know best – does not provide them much comfort.

Several community members have approached their insurance companies to ask about coverage only to learn they cannot be insured for matters pertaining to TC Energy's proposed project. The details of these private communications between residents and their insurer have not been documented, although their questions to TC Energy are documented on TC Energy's web site.

As previously stated, it's not a question of *"do dams fail?"*, although the record shows they can fail. It's a question of *"what are the consequences if the dam does fail?"* Dams that fail within residential areas most likely cause fatalities.

That's a pretty good reason for people to be concerned.

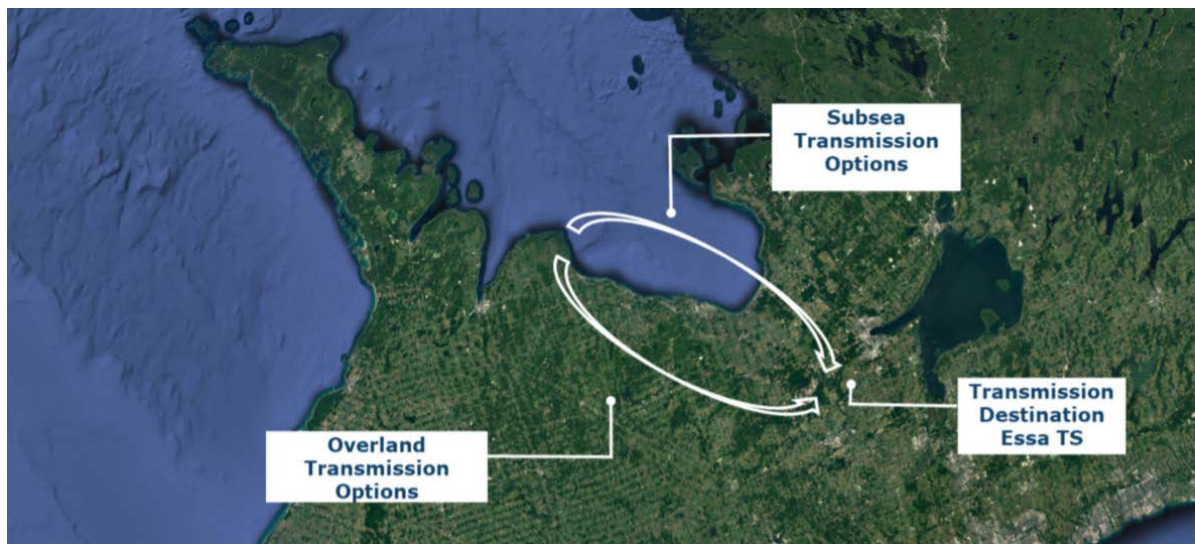
DND, as the responsible authority over the land it occupies, is accountable for the actions of TC Energy. Ideally, the DND will reject the project outright because any potential for loss of life is not a risk worth taking.

In the event DND does not outright reject the project, the DND should hold TC Energy to the highest standard of care possible, as further discussed in Section 14.4.

## 13.0 Transmission Corridor

TC Energy presents two alternative routes to connect the proposed project to Ontario's electricity grid, as shown in Figure 13-1. The first option consists of an overland transmission corridor from Meaford to the connect point at Hydro One's Essa Transmission Station. The second option involves the placement of a subsea transmission cable along the bottom of Georgian Bay from Meaford to Collingwood, and then a land-based transmission corridor from there to the connection point.

TC Energy has publicly stated they are considering the second option, the subsea cable, in response to community pressures, however, they have not ruled out the overland transmission option.



**Figure 13-1: Alternative Transmission**

Transmission lines carry large quantities of electricity from generating stations to the urban centres where the electricity is used. Transmission line voltages vary from 44,000 to over 765,000 volts. The higher the voltage, the more electricity the line can carry. Because they carry large quantities of electricity at a very high voltage transmission lines are not covered by an insulating sheath. Instead, the air around them provides insulation.

This transmission corridor, also called a right-of-way, maintains a safe distance between the high voltage lines and the surrounding structures and vegetation. This is especially important so that nothing can come close to cause an electrical arc and potential fire.

Transmission corridors can impact the environment in the following manners.

- Landscape – cause a visual deterioration of the skyline reducing its aesthetic appeal. In passing through populated areas this results in a loss of property values in the vicinity; and in less populated areas with a scenic, cultural or natural importance, this affects the tourism potential.
- Biodiversity – the main impact is avian collisions which is particularly significant in high risk areas such as wooded regions and bird migration corridors. It also includes disturbances of fish habitat at stream crossings.
- Land use – passing through agricultural lands may permanently reduce the area under cultivation and cause physical damage during construction and maintenance.
- Proximity effect – the “proximity effect” on human beings in the vicinity of transmission corridors encompasses a fear of the adverse health effects of electromagnetic fields, annoyance and noise. Many countries place restrictions on distance to human habitation as a precaution.
- Indirect emissions – energy losses during transmission cause indirect carbon emissions and air pollution in power generation plants which vary with the type of primary energy source. It is important to integrate these environmental impacts into the cost-benefit evaluation of hydroelectric projects in order to avoid decisions that may be biased towards less environment friendly solutions.

Either transmission option will disrupt countless private properties and destroy valuable farm and residential land.

One of the main goals of the Official Plan is to protect the rural landscape within the municipality. The overland option is contrary to this goal.

Save Georgian Bay shares the concern stated by the Municipality of Meaford (2020) regarding the transmission corridor. We support the municipalities preference for the subsea option through Collingwood.

## 14.0 Conditions

The following sections outline a series of conditions that Save Georgian Bay believe essential, as a minimum, to hold TC Energy to account. These conditions were issued to the Mayor and Council of Meaford by Save Georgian Bay on 17<sup>th</sup> March 2020, and subsequently appended to the 1<sup>st</sup> June 2020 submission from the municipalities to the DND.

### 14.1 Environment

#### 14.1.1 Water Quality

1. **Baseline water quality** – Currently the water quality of Georgian Bay within the vicinity of the Project site is considered pristine, and likely complies with water quality guidelines of the Canadian Council of Ministers of the Environment and the Provincial Water Quality Objectives. But available data are limited. Council requires TC Energy to implement and maintain a comprehensive surface water quality monitoring program starting immediately and spanning a minimum two-year period prior to submitting their impact assessment report. The monitoring program should provide sufficient spatial and temporal resolution to quantify the frequency and duration of clear flow periods from which background levels of turbidity and other water quality parameters will be defined. The monitoring program should also include such other parameters and meet such other requirements as stipulated by appropriate federal and provincial agencies. Data from this monitoring program will be made available to Council and the community on a quarterly basis through the monitoring period.
2. **Turbidity** – Turbidity has been identified as a water quality parameter of particular concern since: the waters of Georgian Bay are typically pristine with near zero turbidity; those living along the shoreline or within town source potable water from shore wells or from the bay; construction and operations will disturb the clay nearshore substrate causing turbidity; and construction activities on land will disturb soils causing turbidity. TC Energy claims “proper design and construction of the outlet and other project structures in Georgian Bay will result in a design that does not contribute to turbidity in Georgian Bay”. Yet TC Energy has not provided design details to support their claim, nor does TC Energy seem aware of local site conditions, as demonstrated during the three community meetings hosted by TC Energy in Meaford. Council requires TC Energy to submit a comprehensive assessment detailing: local site conditions, including borehole logs and appropriate geophysical investigations; loading rates of materials causing turbidity from all possible sources affected by the Project during site

preparation, construction, operation and decommissioning; design details, including mitigation strategy, monitoring plan, and response plan. This report is to be made available to Council and the community.

3. Water quality criteria – The Canadian Council of Ministers of the Environment and the Ontario Ministry of Environment, Conservation and Parks specify surface water quality objectives for the protection of aquatic life. Among other parameters, these objectives specify allowable limits for turbidity. Council requires TC Energy to comply with the applicable federal and provincial water quality objectives for all parameters. For clarity, the background level and natural state for turbidity shall be taken as the clear flow condition of calm winds, no waves and dry weather. In the event the federal or provincial authorities grant a mixing zone, this mixing zone shall be limited to 100 metres from the edge of the Project footprint, and must not result in toxic conditions or irreparable environmental damage including risk to ecosystem integrity and human health nor interfere with water supply, recreational or other water uses of the adjacent property owners.
4. Potable water – TC Energy's proposed project has the potential to impact the quantity, quality and safety of potable water for those communities along the shoreline or inland that source water from either shore wells or drilled wells. When asked about this potential concern at the 16th January 2020 community meeting hosted by TC Energy, representatives of TC Energy stated that TC Energy would construct a water supply main from Meaford to provide potable water to these communities. Council interprets such statements from TC Energy as commitments to the community, and thereby requires TC Energy to fulfil this commitment at no cost to the community.

#### **14.1.2 Fish Habitat**

5. Aquatic community characterization – Preliminary investigations identify that at least 23 species utilize the nearshore environment of Georgian Bay within the vicinity of the Project. Several of these species are listed as threatened by COSEWIC. But available data are limited. Council requires TC Energy to retain a third-party subject matter expert of Council's approval to undertake a comprehensive aquatic habitat and aquatic community monitoring program to characterize habitat and organisms prone to impingement and entrainment, and to support the optimization of siting of the intake/outfall, diffuser structures and other offshore structures. The monitoring program should focus on fish, ichthyoplankton, macrozooplankton and benthic invertebrates; extend from the shoreline out to 30 m depth; extend approximately 2 km along the Project site shoreline; and occur throughout the spring, summer and fall seasons. The monitoring program should also include such other requirements as stipulated by

appropriate federal and provincial agencies, and be approved by Council. Data and interpretive report from this monitoring program will be made available to Council and the community on a quarterly basis through the monitoring period.

6. Avoidance of sensitive habitat – TC Energy state they will avoid spawning and other sensitive aquatic habitat yet TC Energy has proposed a shore-based intake/outfall structure with offshore breakwalls located immediately within an area of known spawning habitat for Lake Whitefish, Lake Trout and Carp. Council requires TC Energy to locate the intake/outfall and diffuser structures beyond the nearshore habitat zone so as to avoid risk of adverse operational effects. Alternatively, Council requires TC Energy to consider an alternate location for the intake/outfall, or to redesign the plant as a closed loop system contained on land.
7. Mitigation of fish mortality – TC Energy states they will employ mitigation measures to further reduce the potential adverse environmental effects associated with the Project. For the case of the Ludington plant, mitigation was imposed following a 12-year legal challenge, and consisted of a 2 km long net during the open water seasons (April through November). This form of mitigation has limited effectiveness, causes incidental fish mortality, and poses a hazard to boaters. More appropriate mitigation measures include velocity caps or porous veneer structures to reduce the risk of impingement and entrainment. Council requires TC Energy to employ mitigation measures through means other than netting.
8. Fish habitat offsets – TC Energy suggests the use of fish habitat offsets to compensate for impacts associated with death of fish and destruction of fish habitat. As the community most impacted by the Project, Council requires TC Energy to apply fish habitat offsets within areas adjacent to the municipal boundaries of Meaford and in a form considered by Council as beneficial to the community of Meaford.

#### **14.1.3 Species at Risk**

9. Species at risk – Preliminary investigations identify that as many as 11 species listed as being at risk may utilize the lands and waters within the vicinity of the Project. But available data are limited. Council requires TC Energy to retain a third-party subject matter expert of Council's approval to undertake a comprehensive monitoring program to characterize habitat and flora and fauna within the area of influence. The monitoring program should start immediately, and include requirements as stipulated by appropriate federal and provincial agencies, and be approved by Council. Data and interpretive report from this monitoring program will be made available to Council and the community on a quarterly basis through the monitoring period.

10. Avoidance of habitat for species at risk – Council requires TC Energy to avoid all habitats associated with species at risk.

#### **14.1.4 Light and Noise**

11. Light and noise – TC Energy has acknowledged the plant will emit noise and light during construction and operations, yet they claimed during the 16th January 2020 community meeting hosted by TC Energy that local residents would not notice either. Given the nearest resident is located approximately 100 m from the proposed plant, Council requires TC Energy to provide evidence of how they intend to limit noise and light within such a proximus area during both construction and operations.

#### **14.1.5 Coastal Processes**

12. Shoreline erosion – The Project includes construction of offshore breakwalls that will impede the natural movement of sediments along the shoreline. Council requires TC Energy to retain a third-party subject matter expert of Council's approval to undertake a comprehensive assessment of coastal processes along the western shore of Nottawasaga Bay, including but not limited to, the potential effects on waves, alongshore currents, sediment transport, and potential erosion and accretion of sediments along the shoreline. This report will be made available to Council and the community. This report needs to project shoreline and current changes over the expected lifetime of the shoreline structures and impacts for the removal of those structures when the operating lifetime of the plant concludes.
13. Physical limnology – The Project as proposed draws and releases a large volume of water from and to the shores of Georgian Bay. This cycle of flows will alter the natural circulation patterns within Nottawasaga Bay and possibly throughout Georgian Bay. It could affect stratification, heat balances and ice formation over large areas, yet nothing is yet known about such potential significant adverse effects. Council requires TC Energy to retain a third-party subject matter expert of Council's approval to undertake a comprehensive assessment of the physical limnology of Georgian Bay and mathematical model predictions of the potential effects of construction, operations and decommissioning on circulation, stratification, heat balance, and ice formation. Further, Council requires TC Energy to take preventive measures to minimize potential disruption of the physical limnology of Georgian Bay.

## 14.2 Visual Impacts

14. Georgian Bay – TC Energy proposes the construction of an offshore breakwall and two wingwalls, plus a shore-based intake structure along the shore and nearshore of Georgian Bay. They show on their web site an artist rendering of what Georgian Bay will look like after the construction phase. This image is intended to deceive. The image shows from the perspective of someone on a boat in the middle of the bay. It does not show the proximity of these structures to the neighboring community. It does not convey the massive size of the structures, which will be amongst the largest man-made structures on Georgian Bay. Nor does it show what the facility will look like at night when all lights are on. Council requires TC Energy to provide a more representative image of what the site will look like, including its proximity to neighboring homes, and from the vantage point of a boater traveling along the waterfront, and under both night and day time conditions. Council also requires TC Energy to prepare a management plan for Council's approval of how they intend to minimize the visual impact of the Project during construction and operations.
15. Niagara Escarpment – TC Energy proposes to construct a 375-acre reservoir, 1.7 km long penstocks and other supporting infrastructure on the Niagara Escarpment and adjacent lands. The Escarpment is a UNESCO World Biosphere Reserve, and has the oldest forest ecosystem and trees in eastern North America. Many would argue these lands should be protect, yet, TC Energy intends to develop on these lands for their sole benefit. Council requires TC Energy to prepare a management plan for Council's approval of how they intend to minimize the disturbed area, and what options can be taken to avoid disturbance of the trees and forest ecosystem within area, such as the penstocks.
16. Transmission corridor – TC Energy proposed two possible routes to convey electricity to and from the grid – an overland option and an underwater option. The overland option may extend 80 to 100 km through forests, residential and agricultural lands, including parts of the Niagara Escarpment, Beaver Valley and a large portion of the township of Meaford. It will likely cause significant adverse effects to wildlife, terrestrial habitats and private properties. Council opposes this option and requires TC Energy to instead consider only the underwater option.
17. Public notification of transmission corridor – The public is largely unaware of the proposed transmission corridor. Council requires TC Energy to notify all municipalities, residents and business located within 2 kilometers of any prospective corridor so that those communities and stakeholders have an opportunity for input during the initial study phase of the feasibility of the project, with enough notice to fully participate in the DND comment period.

### 14.3 Economics

18. Economic evaluation – TC Energy declares the benefit to rate payers to be \$250 million per year (approximately \$17 per year per person), but they have not disclosed the full economic evaluation for the Project. TC Energy will provide a full pro forma projection, sharing the projection of costs and revenues, for review by Council and the community. For clarity, this shall include a projected regulatory return that TC Energy will earn on its estimated \$3.3 billion investment, as this return will ultimately be paid for by the people of Ontario. This analysis must include anticipated ratepayer and provincial cost recovery over the lifetime of the facility through decommissioning.
19. Community housing – TC Energy declared its intent to construct housing units for 800 workers who will be temporarily employed during the four-year construction phase of the Project. TC Energy has offered these housing units to the community of Meaford after completion of the construction phase. They have also promised the same units to First Nations and other municipalities in exchange for their support. As the community most affected by the Project, Council requires TC Energy to allocate no fewer than 75% of the housing units to be constructed within the municipal boundaries of Meaford and to be constructed in locations and of such quality agreeable to Council and consistent with local building codes and municipal master planning.
20. Property taxation – The close proximity of the Project to neighboring communities will devalue homes and properties, causing a reduction in tax revenues to the town of Meaford. Council requires TC Energy to provide funding to the township so they can conduct their own independent assessment of this potential economic impact. This study will be made public.

### 14.4 Risk Analysis

21. Dam break analysis – The Project includes the construction of a 20 m high concrete dam to contain 23 million cubic meters of water within a reservoir located on the upper levels of the Niagara Escarpment. While the exact details of the design are not yet known, it is presumed it will consist of dams, excavations and impervious liner. Considering the reservoir is to be located upgradient from where many families live, Council requires TC Energy to retain a third-party subject matter expert of Council's approval to undertake a comprehensive dam break analysis to assess the potential loss of life should an unforeseen catastrophic failure of the reservoir occur. This report will be made available to Council and the community.

22. Environmental Site Assessment – It is understood the DND site contains various contaminants from past (and possibly present) operations on site. These contaminants may include Agent Orange, PHC, BTEX, other organics, metals, although no information has been provided to confirm or deny its presence. Given the potential health effects of such contaminants, Council requires TC Energy to retain a third-party expert to undertake a comprehensive environmental site assessment, and depending on the nature of the contaminants found, undertake a comprehensive remediation of the site.
23. Risk analysis – TC Energy will prepare a complete risk analysis of the project and its operation, including public health and safety, environmental health and safety, threats of water or fluid leakage, severe weather or other environmental risks, threats to the eco-system and habitats, water quality and any other risk areas; inclusive of risks and anticipated prevention actions.

#### **14.5 Federal, Provincial Municipal Considerations**

24. Alternative site locations – TC Energy proposed the current site based on the following criteria: the site provides approximately 150 m of vertical elevation difference between the Niagara Escarpment and Georgian Bay, Georgian Bay provides a source of water at no cost to TC Energy, and the site is located within 100 km of the power grid. TC Energy did not take community or environment into consideration in their site selection, as demonstrated during the 11th December 2019 community meeting hosted by TC Energy. The Australian Renewable Energy Mapping Infrastructure (“AREMI”) has identified three prospective sites for pump storage plants within Southern Ontario, and other companies have identified abandoned mines and quarries for use as pump storage plants. Council requires TC Energy to retain a third-party expert of Council’s approval to undertake a comprehensive assessment of all potential sites, including, but not limited to, the three prospective sites identified by AREMI and abandoned mines and quarries, considering them individually and in the aggregate. This report will rationalize the best sites with least environmental impacts and most acceptance by the community.
25. Alternative designs – TC Energy proposed the current design based on the Ludington plant. The Ludington plant was approved for construction in the 1960’s, and is based on an open system that draws and releases water through a shore-based intake/outfall protected by armourstone breakwalls. The Ludington plant has since caused significant adverse environmental effects, including the destruction of fish habitat and the death of millions of fish per year. TC Energy has not considered alternative designs, as demonstrated during the community meetings hosted by TC Energy. Council requires TC Energy to retain a third-party expert of Council’s approval to undertake a comprehensive assessment of

all possible design alternatives, including, but not limited to, closed systems, offshore intakes, velocity caps, energy dissipation structures. This report will rationalize the best design with least environmental impact and most acceptance by the community.

26. Alternative technologies – TC Energy proposed a pump storage plant as their preferred technology for energy storage. They have not considered any other technology, as demonstrated during the community meetings hosted by TC Energy. Yet other companies have used other energy storage technologies elsewhere in Ontario and throughout North America. These other technologies provide the same or improved total life cycle potential for carbon output reduction as what TC Energy claims for the Project yet they can be constructed on brownfields, near urban centers, without need of new transmission corridors, without causing death of fish, destroying fish habitat or habitat for species at risk. Council requires TC Energy to retain a third-party expert of Council's approval to undertake a comprehensive assessment of all possible energy storage technologies and/or load balancing methods, including, but not limited to, lithium-ion batteries, compressed air storage, home energy storage units, pumped thermal storage. This report will rationalize the best technology with least environmental impacts and most acceptance by the community.
27. Agreements with Saugeen Ojibway Nation and other First Nations – TC Energy declared its intent to enter into a partnership with Saugeen Ojibway Nation (SON) and possibly other First Nations and/or Metis Nations with respect to this Project. In the spirit of full transparency, Council requires TC Energy to publicly disclose the terms, conditions and financial arrangements of such partnerships. In the event such partnerships exist and to avoid any possible perception of conflict of interest, Council further requires TC Energy award contracts for monitoring and assessments associated with this Project only to fully independent third-party entities.
28. Site decommissioning – TC Energy declared a 50-year life span for the Project. Council requires TC Energy to submit a comprehensive decommissioning plan for the site, including costing, to restore the site to its current condition. Council does not accept TC Energy's position that decommissioning will be addressed in the future at the end of the project life. TC Energy will establish a bond or other payment mechanism acceptable to Council to fully fund future decommissioning of the site.
29. Carbon emissions – TC Energy declares the Project will result in a reduction in carbon emissions during operations. Council requires TC Energy to provide a carbon balance projection report for the entire project life cycle, including

construction and decommissioning, as well as the carbon emissions from the US market in the future when our clean energy is no longer available to them.

30. Planning regulations – It is understood TC Energy intends to lease the land from the DND. Consideration will need to be made in consultation with Council as to whether these lands, once developed, become subject to Meaford planning regulations.
31. Third party review – TC Energy agrees to provide funding to Council and the town of Meaford for legal representation and expert technical review throughout the process starting immediately and extended through the first two years of operation following commissioning of the plant. The estimate for this funding is \$200,000 for 2020 and 2021 and will be adjusted as needed to meet unforeseen costs associated with the review.

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A Review of TC Energy's Open-Loop Pumped Storage Proposal:

## Why Take the Risk?



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## EXECUTIVE SUMMARY

Save Georgian Bay is a grassroots organization committed to stopping TC Energy's proposal for a pumped storage plant in Meaford, Ontario, which could cause irreparable harm both to the Niagara Escarpment and to the waters of Georgian Bay.

The dedicated Save Georgian Bay volunteers – made up of environmentalists, engineers, and concerned citizens – have been studying the project for 5 years. Our investigation has included:

- completion of an 80-page environmental strategic assessment;
- the review of over 2,000 pages of material from the Department of National Defense, Ontario's Independent Electricity System Operator (IESO), and the Municipality of Meaford received through the Access to Information Process (ATIP);
- the commissioning of a "Survey for Endangered Bats: Meaford Ontario" an acoustic survey of the local bat community on and around the military training base;
- consulting with environmentalists, engineers, scientists, lawyers, and other experts;
- liaising with municipal, provincial, and federal leaders; and
- engaging with concerned citizens.

Save Georgian Bay supports efforts to combat the climate change crisis with renewable energy sources and electricity storage solutions. However, our investigation has led us to the conclusion that TC Energy's proposed Pumped Storage Project in Meaford is not the best way to decarbonize the grid and that Ontario should pursue the *best, least environmentally damaging, and most cost-effective* energy storage solutions.

In this review *TC Energy's Open-Loop Pumped Storage Proposal: Why Take the Risk?* Save Georgian Bay will show that TC Energy's proposal would not effectively support Ontario's transition to renewable energy sources because it would:

1. **Take too long to build, and may not even be needed by the time construction is completed.** The need for energy storage will steadily reduce over time (and may not even be a permanent requirement). TC Energy's open-loop pumped storage project, which would not be online for about a decade, may not even be needed by then.
2. **Be built too far from energy demand centers and the grid,** therefore requiring new transmission lines.
3. **Waste more energy than alternative energy storage solutions.** Batteries are 90% efficient, while pumped storage is 70% efficient. The TC Energy proposed pumped storage plant would use 1,400 megawatts of energy created by hydro, nuclear, wind, and solar, and turn it into 1,000 megawatts while dumping 400,000 kilowatts of heat energy (the majority of which goes into Georgian Bay) every day for the lifetime of the project (currently estimated to be 50 to 100 years).



Of grave concern to Save Georgian Bay is the many environmental issues associated with TC Energy's open-loop pumped storage project. While some environmental risks can be reduced or lessened, they can not be eliminated. One major threat to the environment can not be mitigated at all: the permanent destruction of 500 acres of the Niagara Escarpment.

1. **The massive construction project would permanently destroy 500 acres of the Niagara Escarpment.** The flora and fauna of the Escarpment area that would be destroyed is habitat for 30 Species at Risk.
2. **The project poses a high risk of spreading the toxic chemicals that litter the project site.** Defence Department documents note that the waters of Georgian Bay would be threatened by the risk of run-off from the tank range when toxin-contaminated soils are disturbed during construction. The Federal Contaminated Sites registry shows lead, methyl mercury, selenium, polycyclic aromatic hydrocarbons (PAHs) and organo-metallic compounds containing arsenic and zinc - all threats to soil, water, marine life and human health - to be present on the site. The high risk of spreading toxins, including "forever chemicals" into the air, land, and water, poses, in our opinion, an unacceptable project risk - an opinion that is widely shared.
3. **The proposed project would actually increase, not decrease, CO2 emissions.** TC Energy's claims that their pumped storage proposal offers a "green" solution, and their repeated reference to "net-zero," are inappropriate and misleading. The analysis upon which they base their claims of CO2 reduction fails to consider the diversion of lost energy exports to U.S. jurisdictions.

It is important to note that we have reached out to TC Energy many times with questions and concerns. Unfortunately, we have not received answers. The lack of transparency and cooperation has created challenges, yet we remain committed to a diligent and objective review of the proposed project. On behalf of the members of Save Georgian Bay, over 43,000 people who have signed petitions opposing the project, and a growing chorus of environmental advocates who have spoken out against the proposals, we urge anyone interested in the risks this project poses to the environment to **insist that TC Energy provide proof that their proposed plant would cause "no harm."**

*Why would we take these risks, and cause this harm - for a project that's may not even be needed? Especially when long-duration battery storage offers a viable alternative that does not pose these risks?*

**Long-duration battery storage is a better solution.** Battery parks can be built precisely *when* storage is needed and can be online within a few years of being approved. Battery parks can be built specifically *where* they are needed - close to the demand source and to the grid, eliminating the need for new transmission lines. Long-duration battery storage also benefits from being more efficient, kinder to the Ontario environment, more effective at reducing carbon, and less expensive than the proposed open-loop pumped storage project. Battery technology is also scalable, upgradable, and recyclable - a much better option!

One may also be interested to know these facts about TC Energy's proposed pumped storage project:

- **No decision has been made by SON to participate in the project.** Although TC Energy has touted the proposed project as a "collaboration" with the Saugeen Ojibway Nation, in a March 26, 2024 video posted on the Saugeen Ojibway Nation Environmental Office Facebook, Chief Gregory Nadjiwon (Chippewas of Nawash Unceded First Nation) and Chief Conrad Ritchie (Chippewas of



Saugeen First Nation) share that more discussions with the SON community are required before a decision regarding their participation can be made.

- **Shared economic benefits with indigenous communities can come just as easily from more efficient and sustainable battery storage projects.** This past June the IESO approved 15 long-duration battery storage projects, nine of which boast at least 50% participation from indigenous communities.
- **The project will only provide 20-22 permanent jobs.**
- **Four Georgian Bay municipalities have voted against the proposal** – the Township of the Archipelago, the Town of Blue Mountains, the Township of Georgian Bay, and the Town of Parry Sound.
- **Three renowned and widely respected environmental advocates have denounced the project** – Rupert Kindersley (Executive Director of Georgian Bay Association), Maude Barlow (co-founder of the Council of Canadians and one of the world’s leading experts on freshwater issues), and Jack Gibbons (Chair of Ontario Clean Air Alliance and former Toronto Hydro Commissioner).

Long-duration battery storage would cost about half of what the TC Energy pumped storage project would likely cost. The price tag on this risky megaproject has already skyrocketed from \$2.2 billion in 2019 to \$4.5 billion last year, and TC Energy has now agreed to cap it at \$7 billion - however that would work! In comparison, the cost to build a long-duration battery park with the same storage capacity as TC Energy’s proposed open-loop pumped storage plant would be \$4B. And because there are fewer unknowns and the time to implement is shorter, those costs are more predictable. If approved, this project would burden Ontario electricity consumers for decades with the cost recovery of an unknown capital cost that is steadily increasing.

*Why take the risk?*



## ENERGY STORAGE IN ONTARIO

Ontario is faced with the challenge of managing the current (but as we will discuss later in this paper, temporary) imbalance between how much energy is demanded during the day vs at night. At the same time, Ontario is transitioning from natural gas generation to other forms of cleaner energy supply, such as wind and solar. These cleaner energy sources are not “on demand” - we can’t control when the sun will shine or when the wind will blow. And although the output from nuclear power plants is consistent and reliable, it is not flexible enough to quickly respond to changes in demand.

Therefore, Ontario needs a way of storing the energy when it’s produced and releasing it when it’s needed. Energy storage helps to balance this demand differential. There are many types of energy storage, including different battery technologies, gravity, and pumped storage among others. Regardless of the method, all storage technologies operate on the same general principle - charging up when electricity demand and costs are low and discharging when demand and prices are high. Where these storage solutions differ is their:

1. speed of implementation;
2. flexibility of location (where they can be built);
3. efficiency (the amount of energy that they use to operate);
4. environmental impact (amount of damage caused during construction and operation); and
5. relative economic burdens on Ontario.

The IESO points to long-duration battery storage parks as the current best and most cost-effective method. The 250 MW Oneida Energy Storage Project, co-owned by the Six Nations of the Grand River, is currently under construction on 10 acres in Ohsweken, Ontario.

In June 2023 the IESO awarded 15 new battery storage contracts, nine of which boast at least 50% participation from indigenous communities, that will deliver more than 880 MW of additional capacity from electricity storage facilities scheduled to be in service no later than 2026, representing a five-fold expansion of Ontario’s current battery storage capacity (*see chart below*).

The IESO plans continued expansion of energy storage capacity in the Province, completing Ontario’s overall procurement of approximately 2,500 MW of storage that will be online/in-service toward the end of the decade. (*Source: Resource Acquisition and Contracts - Long-Term 1 RFP and Expedited Process; <https://www.ieso.ca/en/Sector-Participants/Resource-Acquisition-and-Contracts/Long-Term-RFP-and-Expedited-Process>*)

It is important to note that the TCE pumped storage project would create 1,000 MW over 8 hours (8,000 MW/hr of power), whereas the equivalent size battery storage can only discharge over 4 hours, meaning that 2,000 MW of battery storage capacity would be needed to create 8,000 MW/hr of power.



## Expedited Long-Term RFP (E-LT1 RFP) – Final Results

### Storage Category Suppliers

Proponent	Qualified Applicant	Project Name	Nameplate Capacity (MW)	Summer Contract Capacity (MW)	Winter Contract Capacity (MW)	Fixed Capacity Payment (\$/MW Business Day)	Indigenous Participation	Zone – Location
<b>Storage Category 1</b>								
Hagersville Battery Storage Inc	Boralex Inc.	Hagersville Battery Energy Storage Park	300	285	285	\$786.25	Six Nations of The Grand River 50%	Southwest – Haldimand County
Napanee BESS Inc.	PORTLANDS ENERGY CENTRE L.P. (At risk revenue)	Napanee Energy Storage	265	250	250	\$896.92	No Indigenous Participation	East – Town of Greater Napanee
Tilbury Battery Storage Inc	Boralex Inc.	Tilbury Battery Storage	80	76	76	\$774.50	Walpole Island First Nation 50%	West – Municipality of Lakeshore
Walker BESS 4 Limited Partnership	Wahgoshig Solar FITS LP	Walker BESS 4	4,999	4,749	4,749	\$997.00	MoCreebec Eeyou 51%	West – City of Windsor
Walker BESS 4 Limited Partnership	Wahgoshig Solar FITS LP	Walker BESS 5	4,999	4,749	4,749	\$998.00	MoCreebec Eeyou 51%	West – City of Windsor
Walker BESS 4 Limited Partnership	Wahgoshig Solar FITS LP	Walker BESS 6	4,999	4,749	4,749	\$998.99	MoCreebec Eeyou 51%	West – City of Windsor
York (Battery) LP	Capital Power Corporation	York BESS	120	114	114	\$852.50	No Indigenous Participation	Essa – King Township
<b>Storage Category 1 Total</b>			<b>779.997</b>	<b>739.247</b>	<b>739.247</b>			
<b>Storage Category 2</b>								
1000234763 Ontario Inc	1000234763 Ontario Inc.	SFF 06	4.99	4.74	4.74	\$1,477.00	Caldwell First Nation, Mississaugas of Scugog Island and First Nation 50%	East – Township of Cramahe
1000234763 Ontario Inc	1000234763 Ontario Inc.	903	4.99	4.74	4.74	\$1,477.00	Caldwell First Nation, Mississaugas of Scugog Island and First Nation 50%	Essa – Township of Armour
1000234813 Ontario Inc	1000234813 Ontario Inc.	OZ-1	4.99	4.74	4.74	\$1,477.00	Caldwell First Nation, Mississaugas of Scugog Island and First Nation 50%	Bruce – Municipality of Arran-Elderslie
Arien Energy Storage 1 LP	Alectra Convergent Development LP	Arien Energy Storage 1	20	19	19	\$1,224.00	No Indigenous Participation	Southwest – City of Guelph
Goreway (Battery) LP1	Capital Power Corporation	Goreway BESS	50	47.5	47.5	\$1,007.00	No Indigenous Participation	Toronto – City of Brampton
Vaughan 1E Energy Storage 1 LP	Alectra Convergent Development LP	Vaughan 1E Energy Storage 1	20	19	19	\$1,186.00	No Indigenous Participation	Toronto – City of Vaughan
Vaughan 3 Energy Storage 1 LP	Alectra Convergent Development LP	Vaughan 3 Energy Storage 1	40	38	38	\$1,028.00	No Indigenous Participation	Toronto – City of Vaughan
Walker BESS 4 Limited Partnership	Wahgoshig Solar FITS LP	Almonte BESS	4,999	4,749	4,749	\$969.00	MoCreebec Eeyou 51%	East – Municipality of Mississippi Mills
<b>Storage Category 2 Total</b>			<b>149.969</b>	<b>142.469</b>	<b>142.469</b>			
<b>Storage Category 2 weighted average price</b>						<b>\$1,111.06</b>		
<b>Storage Total</b>			<b>929.966</b>	<b>881.716</b>	<b>881.716</b>			

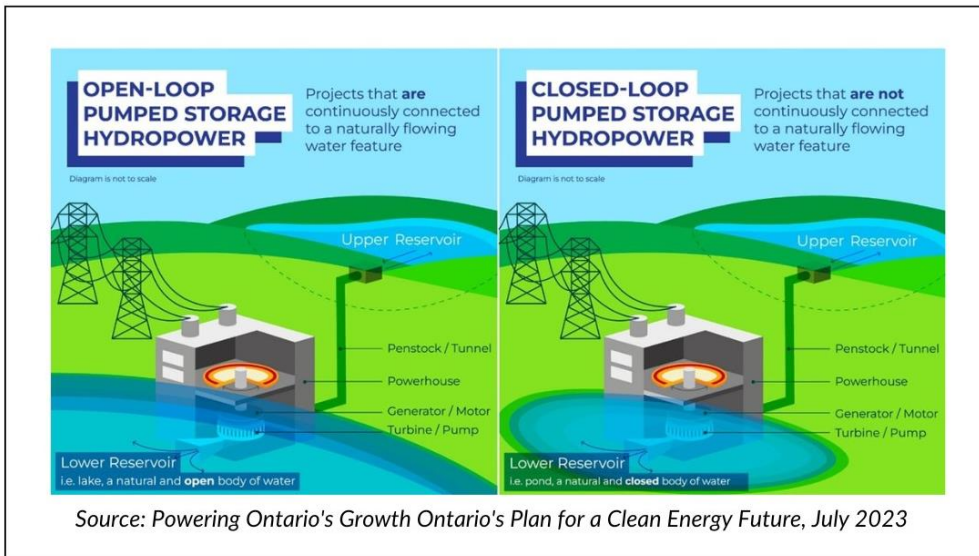
Expedited Long-Term RFP (E-LT1 RFP) – Selected Proponents | September 18, 2023 | Public

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Source: Expedited Long-Term RFP (E-LT1 RFP) Selected Proponents Final Results

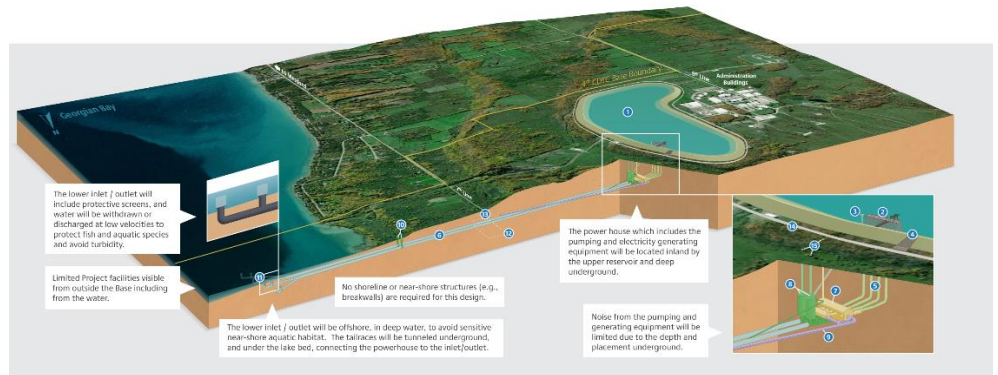


Pumped hydropower storage, an alternative to long-duration batteries, uses the force of gravity to generate electricity using water that has been previously pumped from a lower source to an upper reservoir. The water is pumped to the upper reservoir at times of low demand and low electricity prices. At times of high demand - and higher prices - the water is then released to drive a turbine in a powerhouse and supply electricity to the grid. The energy storage capacity of a pumped hydro facility depends on the size of its reservoir, while the amount of power generated is linked to the size of the turbine.



It is important to note that some pumped storage projects are closed-loop designs, recirculating the same water between a lower and upper reservoir (often former open-pit mines) not connected to a freshwater resource. This is the type of project currently under consideration in Marmora, Ontario, and is widely considered to be less environmentally damaging than open-loop projects.

TC Energy is proposing a 1,000 megawatt hydroelectric open-loop pumped storage facility to be built on the existing operational 4th Canadian Division Training Centre, situated north of Meaford, Ontario. Renderings fail to show the 300 homes located below the reservoir in the "impact zone."



Source: ontariopumpedstorage.com

To function, the facility must pump 23 billion litres of water (9,200 Olympic-sized swimming pools) 150 metres up the Escarpment by giant turbines, store it in a 375-acre reservoir (a hole the size of Toronto's High Park carved into the Escarpment), and flush it back down the escarpment and into Georgian Bay every day. 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.



The project has been pitched by TC Energy as “a reliable, powerful climate solution” and a major contribution to greening Ontario’s grid. But that’s not the whole story. By throwing around buzzwords like “green” and “net-zero” TC Energy hopes to distract from the very real shortcomings of their proposal. Open-loop pumped storage is so problematic – technically, environmentally, and economically – that there has not been a new one built in North America since Ludington Pumped Storage in the early 1970’s.

### The Ludington Open-loop Pumped Storage Example

TC Energy’s model for their original project design is the continent’s second-largest pumped storage plant in Ludington, Michigan. Opened in 1973, Ludington is classified a “high-hazard dam” whose failure would “cause significant damage to property and loss of life.” According to its emergency action plan, a full breach would flood property half a mile away to a depth of two feet within five minutes.

It took a 12-year lawsuit to stop Ludington’s turbines from killing 150 million fish a year. A 1994 settlement awarded \$5 million to a Great Lakes Fishery Trust and ordered the plant to install a two-kilometre net across its intake pipes to reduce that massive fish kill. Last year, a spokesman told The Narwhal that 91 percent of fish bigger than five inches are no longer sucked in, but had no comment on smaller fish.

Ludington’s spokesman also told The Narwhal that the reservoir dam suffered from “small leakages,” but claimed local farmers found them “helpful” to water their fields.

Now undergoing a \$500 million upgrade, Ludington’s owners are suing Toshiba for faulty work affecting shaft seals and five turbines.

Given those technical and environmental challenges, no new pumped storage plants have been built in North America since 2010. As one utility spokesman pointed out, “It doesn’t make financial sense.” Ontario’s Independent Electricity System Operator (IESO) agrees, twice ruling that TC Energy’s proposal has no net economic benefit.



Ludington during construction (left) and operational (right)



## ALTERNATIVE GRID SCALE ENERGY STORAGE TECHNOLOGIES

### Lithium-ion Batteries

- Global grid-scale battery storage currently dominated by lithium-ion
- Declining lithium-ion costs due to technological innovations and improved manufacturing capacity
- 80% - 90%+ round-trip efficiency

### Lithium-iron Phosphate (LFP) Batteries

- Don't decompose, heat up or collapse like lithium-ion and environmentally-friendly
- Low cost, longer lifecycle than lithium-ion, handle extreme temperatures, safer and lower toxicity
- Currently used in Tesla Model 3 EV's
- Tesla planning to manufacture LFP batteries in Sparks, Nevada for use in Megapack grid energy storage units
- High energy density with round-trip efficiency as much as 90%

### Sodium-ion Batteries

- Sodium cheap and sustainable alternative to lithium-ion
- Lower power density than lithium-ion
- 92% round-trip efficiency

### Sodium Solid-state Batteries

- New Huahui New Energy battery is high energy density sodium solid-state battery combined with polymer composites
- Close to energy density of current LFP batteries in Tesla Model 3 cars
- Low fire risk
- Toyota, ProLogium and Samsung commercializing own solid-state batteries by 2027
- Technology could have large future implementation in grid-scale energy storage

### Redox Flow Batteries (RFBs)

- Redox flow batteries replace solid electrodes with liquid electrolytic compounds such as vanadium, iron-chromium or zinc-bromine separated by membrane
- Can store large amounts of energy, which make them ideal for grid energy storage
- In 2024, TC Energy completing 81 MW (40 MWh) project in Alberta
- Over 70% round-trip efficiency

### Salgenx Saltwater Redox Flow Batteries

- Store grid-scale power and thermal energy (including cogeneration)
- Desalinates seawater and produces exfoliated graphene
- 4-6 hour flow battery charge rate can be discharged at any time
- Stored energy held almost indefinitely and batteries easily recyclable
- Lower energy density than lithium-ion
- 90% round-trip efficiency

### Liquid Metal Batteries

- Have minimal degradation and can last over 20 years
- Extremely reliable but also safe as no gases and no possibility of thermal runaway
- Composed of two molten metal alloys separated by an electrolyte
- Simple to manufacture but require high temperatures to keep metals in liquid state
- Sodium sulphur batteries being used for grid storage in Japan and USA
- Ambri battery uses antimony cathode, calcium alloy anode and calcium chloride salt electrolyte
- Over 80% round-trip efficiency

### Electric Vehicle (EV) Battery Storage

- Millions of EV's could provide large amount of energy storage
- Most EV's charged up at night during electrical grid off-peak hours
- EV's would then utilize excess energy during peak hours
- For cars unused during peak hours, owners could sell back excess power to grid

### Gravity Storage - Lifted Weight Storage (LWS)

- Uses surplus energy to lift solid weights vertically
- When extra energy needed, mass is lowered and pulley turns a generator
- Two projects (168 MWh) deployed since 2023 by Energy Vault in China
- More projects planned
- Up to 86% round-trip efficiency

### Gravity Storage - Rail Energy Storage

- Uses excess electrical energy to haul heavy train cars uphill during low energy demand
- Electrical energy released later using regenerative braking as cars roll downhill
- Utility-scale (50 MW) facility by Advanced Rail Energy Storage
- 86% round-trip efficiency

### Compressed Air Storage

- In 2019, Hydrostor built first CAES facility in world on deserted mine salt cavern near Goderich
- Uses excess grid electricity to produce compressed air stored in cavern
- Stored air released back to atmosphere through air turbine/generator
- Plant can generate 10 MW for about 5 hours at claimed half cost of similar capacity battery
- Can store energy for weeks and offers lowest levelized cost of storage for large-scale applications
- Round-trip efficiency about 67% and has service life of 50 years

### Hydrogen Production

- Excess electricity from grid used to produce "green" hydrogen by electrolysis
- Can be stored and used in fuel cells, engines, or gas turbines/generators
- Several companies working to develop hydrogen-powered cars
- Portable, high energy density fuel
- IESO currently funding hydrogen research

### Flywheel Storage

- Accelerates large mass rotor to high speed and maintains power as rotating energy
- Device shaped like cylinder and contains large rotor inside a vacuum
- Advanced designs have composite rotors suspended by magnetic bearings
- Reaches energy capacity more quickly than other forms of storage
- Long lifetime, requires little maintenance and can be placed almost anywhere
- Many flywheels connected together to create multi-MW storage facility
- Stepentown Flywheel Energy Storage Plant in New York has capacity of 20 MW
- Round-trip efficiency as high as 90%

### Thermal Storage

- Heat storage system uses liquid or solid medium
- Water, sand, rocks or molten salt heated or cooled to store collected energy
- Nevada Crescent Dunes project uses molten salt to store 1,100 MW of power
- Can store that energy for 40 years without degradation
- Round-trip efficiency of 72% - 80

## HOW DO OPEN-LOOP PUMPED STORAGE AND LONG-DURATION BATTERY PARKS COMPARE?

Open-loop Pumped Storage and Long-Duration Battery Park technology both use energy generated by gas, nuclear, wind, or solar to charge up when electricity demand is low and discharge energy back onto the grid when it's needed most. However, they differ on five important factors, and on all five, long-duration battery parks come out ahead of open-loop pumped storage.

	TC Energy's Open Loop Pumped Storage Proposal	Long-Duration Battery Parks
<b>Speed of Implementation</b>	<input type="checkbox"/> <ul style="list-style-type: none"> <li>- Long development and construction process. This project would not be online until between 2032 and 2035. By then energy storage will likely not be needed.</li> </ul>	<input checked="" type="checkbox"/> <ul style="list-style-type: none"> <li>- Can be added quickly when storage is needed the most. Battery parks have a swift 3-5 year implementation as evidenced by the Oneida project.</li> </ul>
<b>Flexibility of Location</b>	<input type="checkbox"/> <ul style="list-style-type: none"> <li>- Must be located on a large piece of elevated land adjacent to an open body of water, requiring long transmission lines to connect to the grid.</li> </ul>	<input checked="" type="checkbox"/> <ul style="list-style-type: none"> <li>- Can be built where storage is needed - close to the demand and close to the grid, eliminating the need for new transmission infrastructure.</li> </ul>
<b>Efficiency</b>	<input type="checkbox"/> <ul style="list-style-type: none"> <li>- 70% efficient; Energy to power 400,000 homes is wasted, 4 times less efficient than battery storage.</li> </ul>	<input checked="" type="checkbox"/> <ul style="list-style-type: none"> <li>- 90% efficient; Energy to power 100,000 homes is wasted, therefore saving Ontarians the energy to power 300,000 homes.</li> </ul>
<b>Environmental Impact</b>	<input type="checkbox"/> <ul style="list-style-type: none"> <li>- Unavoidable and permanent destruction of 500 acres of the Niagara Escarpment a UNESCO World Biosphere Reserve.</li> <li>- Inevitable spread of "forever" chemicals - many of which have no remediation solution - into the air, land, and water.</li> <li>- Destroy the flora and fauna of the Escarpment that are habitat for 30 Species at Risk.</li> <li>- Threaten the Bay's fish and the entire aquatic ecosystem on which residents depend.</li> </ul>	<input checked="" type="checkbox"/> <ul style="list-style-type: none"> <li>- Lithium-ion batteries have virtually no local environmental impact (although there are mining and disposal concerns).</li> <li>- Other battery technologies that are in use today don't post the environmental issues that lithium batteries do.</li> </ul>
<b>Economic Burden</b>	<input type="checkbox"/> <ul style="list-style-type: none"> <li>- Massive price tag (capped at \$7 billion), will burden Ontario electricity consumers for decades.</li> <li>- Bi-lateral deal made behind closed doors; no competitive process</li> <li>- Twice rejected by the IESO because the proposed project fails to deliver any net economic benefit to provincial ratepayers.</li> </ul>	<input checked="" type="checkbox"/> <ul style="list-style-type: none"> <li>- Batteries are also a more cost-effective solution and could also offer the opportunity for "shared benefits" with Saugeen Ojibway Nation.</li> </ul>

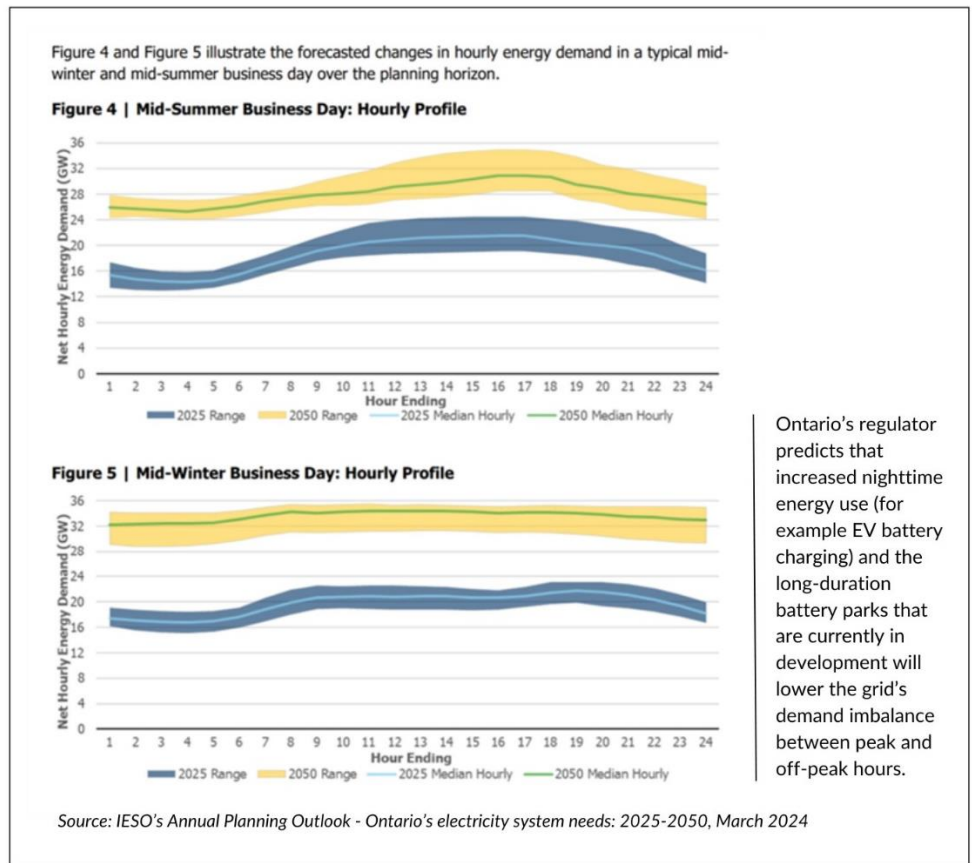


## 1. Speed of Implementation

Ontario is transitioning from natural gas generation to other forms of cleaner energy supply, such as wind and solar. Because these cleaner energy sources are not “on demand” - we can’t control when the sun will shine or when the wind will blow - Ontario is investing in battery park energy storage to capture power at night when demand is low and releasing it during the day when demand is high. Although they are among the fastest energy storage technologies to implement, battery park projects still take some time to develop. In the meantime, Ontario is building more gas plants that are intended to keep the system reliable during the transition and is also. So, the faster we can bring energy storage online, the less reliant we will be on gas plants during Ontario’s transition to non-emitting alternatives.

During this transition, Ontario faces the added challenge of managing the imbalance between how much energy is demanded during the day vs at night. TC Energy is promoting its pumped storage proposal as a solution to this storage need. If approved, TC Energy’s plant would not be online until 2032 (or perhaps even 2035 as recently mentioned by TC Energy’s John Mikkelsen). What will Ontario’s demand profile look like then?

Although the need for storage to balance high and low demand is a real issue today, the need for storage will steadily reduce over time and it may not be a permanent requirement. TC Energy’s pumped storage project, which would deliver storage about a decade from now, is therefore likely not needed. So, it makes no sense to build any very long-term project, especially one that is so inefficient, poses such major threats to the environment, and is an economic burden on Ontarians. Alternatively, a new battery park can be online within only a few years of being approved. This solution can deliver storage quickly when storage is needed the most.





## 2. Flexibility of Location

An open-loop pumped storage plant must be located on a large piece of elevated land (in this case the Niagara Escarpment) adjacent to an open body of water (in this case Georgian Bay). TC Energy has proposed its open-loop Pumped Storage Project on Defence Department lands straddling the Niagara Escarpment precisely because the site offers unfettered access to the public waters of Georgian Bay. This location also requires long transmission lines to connect to the grid. TC Energy’s pumped storage proposal requires a huge amount of land – about 500 acres for the reservoir, intakes, etc.

Eight battery storage stations – which would deliver the same energy storage capacity as TC Energy’s proposal - would require only about 100 acres of land. And they can be built *virtually anywhere* allowing them to be close to centres of high energy demand and close to the grid, eliminating the need for new transmission lines.

## 3. Efficiency

Batteries are more energy efficient than pumped storage. Batteries are 90% efficient, vs pumped storage at 70% efficient. That is a huge difference over 10, 20 or 50 years. *(Note: These efficiency calculations measure what is delivered to the grid vs power used after all factors, including AC/DC etc. conversions and transmission losses, are accounted for).* The TC Energy proposed pumped storage plant would use 1,400 megawatts of energy created by hydro, nuclear, wind, and solar, and turn it into 1,000 megawatts while dumping 400,000 kilowatts of heat energy (the majority of which goes into Georgian Bay) every day for the lifetime of the project (currently estimated to be 50 to 100 years).

**Efficiency Example:**

TC Energy reports the open-loop pumped storage plant would be able to power 1,000,000 homes for 8 hours. The energy to fill the reservoir with water so that it could produce that electricity would be enough to power 1,400,000 homes. This means the energy to power 400,000 homes is wasted.

IESO has contracted for 8 mega battery stations starting with the Oneida Battery Station. 8 of these stations equal the energy of the pumped storage plant proposed by TCE. They can power 1,000,000 homes for 8 hours. The energy to fill the batteries so that they can produce that electricity would be enough to power 1,100,000 homes. This means the energy to power 100,000 homes is wasted in this storage alternative.

In comparison to long-duration battery storage, the pumped storage plant would “waste” the energy to power 400,000 homes and the batteries would “waste” the energy to power 100,000 homes. Batteries therefore save Ontario the energy to power 300,000 homes. Therefore, if battery storage was used instead of open-loop pumped storage, utility costs to Ontarians would be lower.

	Open Loop Pumped Storage	8 Long-Duration Battery Parks
Energy output for 8 hours	1,000,000 homes	1,000,000 homes
Energy used to charge/fill	1,400,000 homes	1,100,000 homes
Energy “wasted”	400,000 homes	100,000 homes



#### 4. Environmental Impact

Save Georgian Bay's dedicated volunteers have been studying the project for 5 years. Our investigation has included:

- the review of over 2,000 pages of material from the Department of National Defense, Ontario's Independent Electricity System Operator (IESO), and the Municipality of Meaford received through the Access to Information Process (ATIP);
- the commissioning of a study of the bat species on the military training base;
- consulting with environmentalists, engineers, scientists, lawyers, and other experts;
- liaising with municipal, provincial, and federal leaders; and
- engaging with concerned citizens.

It is important to note that TC Energy has not provided their most recent plant designs for review or any proof of their claims that the project will do "no harm." The lack of transparency is alarming.

##### *Species at Risk:*

Through our work, we have learned that there are 30 Species at Risk (SAR) including chorus frogs and butternut trees, as well as endangered bats, that have habitats on the base. Experts warn that the construction and operation of the proposed plant could cause the loss and degradation of habitat with resulting detrimental effects such as disruption to migration and foraging habits.

Department of National Defence internal documents, obtained through a federal Access to Information Process (ATIP), reveal that there are up to 30 species at risk on the 4th Canadian Division Training Centre property, and up to 20 species at risk within the proposed project location. The department cautions that "the proposed project is estimated to devastate approximately 10% of the 4th Canadian Division Training Centre wildlife with direct effects alone."

TC Energy has not provided any proof for how the devastation of 500 acres of the Niagara Escarpment, a UNESCO World Biosphere Reserve, would not cause harm to these Species at Risk or to their habitat.





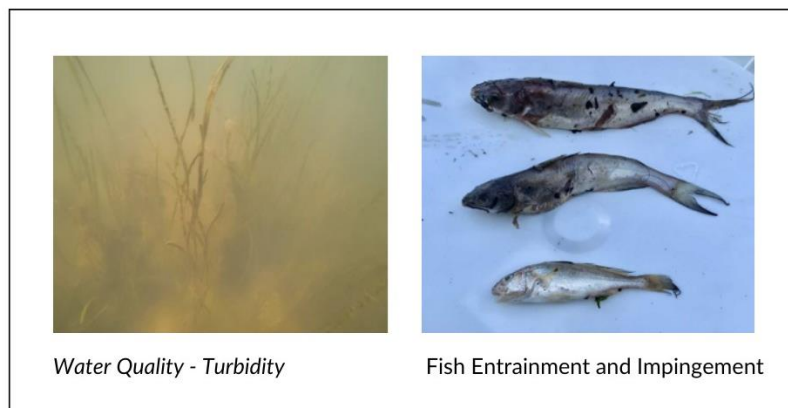
*Risk to Fish and Aquatic Habitat:*

Our analysis of the project indicates that the operation of the plant could cause turbidity and impact the water quality of Georgian Bay.

If water becomes too turbid, it loses the ability to support aquatic plants and animals. Specifically, turbidity leads to: clogging of fish gills causing labored breathing or death, degradation of fish habitats such as spawning beds, decreased resistance to fish diseases, modification of natural fish movement and migrations, reduction in fish growth and successful development, and reduction in the amount of food and oxygen available. It also affects the efficiency of methods to catch fish. (Source: Atlas Scientific (<https://atlas-scientific.com/blog/why-is-turbidity-important/>)).

Experts consulted by Save Georgian Bay warn that it is not possible to suck up and release that amount of water daily and not cause damaging turbidity. TC Energy has not shown any conclusive proof otherwise.

Our studies have also revealed that the operation of the plant could cause fish entrainment – fish being sucked into the turbines and injured or killed. TC Energy's original model for the Meaford project was the continent's second-largest pumped storage plant in Ludington, Michigan it took a 12-year lawsuit to stop the turbines from killing 150 million fish a year. A 1994 settlement awarded \$5 million to a Great Lakes Fishery Trust and ordered the plant to install a two-kilometre net across its intake pipes to reduce that massive fish kill. Last year, a spokesman told The Narwhal that 91 percent of fish bigger than five inches are no longer sucked in, but had no comment on smaller fish. TC Energy has not provided any conclusive proof about how they will protect fish - or how many fish and of what size will still get through their redesigned intake/outtake structures.



Water Quality - Turbidity

Fish Entrainment and Impingement



*Dam Failure:*

TC Energy's renderings of the project fail to show the approximately 300 existing homes, farms, and cottages that are below the Defence Department base on the Niagara Escarpment where TC Energy plans to excavate a 375-acre reservoir. The project has been inaccurately described as being located in a remote area. On the contrary, a failure of the dam would deluge those in the "impact zone" risking their lives and property. Some insurers have indicated to owners that their properties would not be eligible for flood insurance should the project be built.



TC Energy's original model for the Meaford project was the continent's second-largest pumped storage plant in Ludington, Michigan. Opened in 1973, Ludington is classified as a "high-hazard dam" whose failure would "cause significant damage to property and loss of life." According to its emergency action plan, a full breach would flood property half a mile away to a depth of two feet within five minutes.

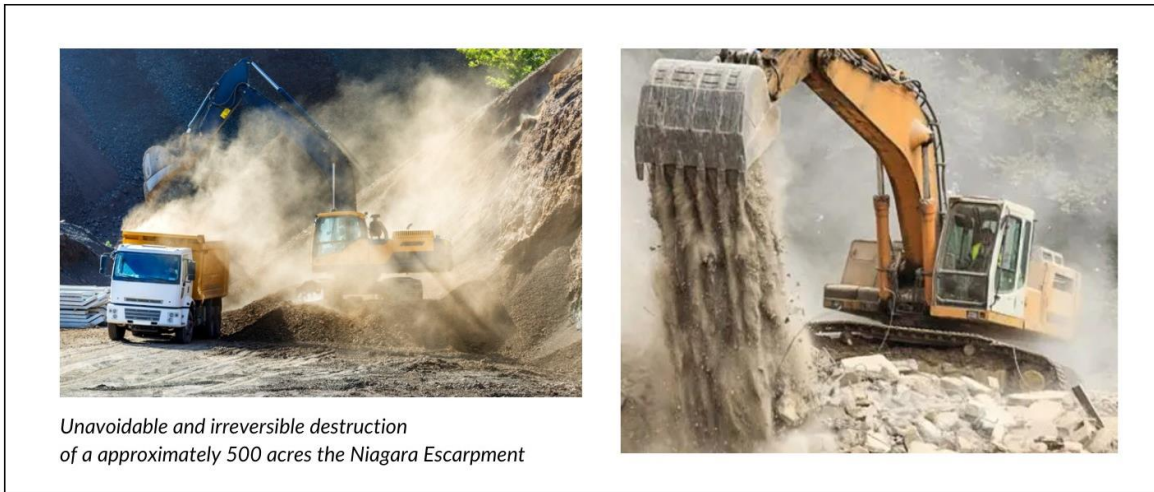
*Image: Ludington Pumped Storage Reservoir*

*Note: Ludington is far more remote than the proposed TC Energy plant, which would be situated above approximately 300 existing homes, farms, and cottages that would be within the "impact zone" of a dam failure.*



*Permanent Destruction of 500 Acres of the Niagara Escarpment:*

There is no getting around the fact that the construction of this project necessitates the permanent destruction of 500 acres this UNESCO World Biosphere Reserve. TC Energy has not provided any plans to lessen this environmental damage – and in fact there is no possible way to do so. This environmental harm is inevitable and irrefutable. No design changes, risk management, or environmental stewardship can change this.



*High Risk of the Spread of Toxins, Including “Forever Chemicals” Into the Air, Land, and Water:*

As the Department of National Defence has documented, vast tracts of the 19,000-acre base are littered with unexploded ordnance (UXOs) and toxic chemicals from weapons training over more than 80 years. The dangers of those contaminants are clear, both to members of the military and police forces currently training there, as well as to the surrounding civilian population.

On a Defence Department map of the range provided to Meaford's council in 2021, three sites are considered so contaminated that they are off-limits to military personnel today. One is labeled “White Phosphorous” - a highly toxic substance used in smoke grenades, tracer shells, and mortars that ignites on contact with oxygen and can cause severe burns and total organ failure.

Three areas of the Defence Department base on the Niagara Escarpment where TC Energy plans to build the plant are considered so contaminated that they are off-limits to military personnel today.

The Defence Department base on the Niagara Escarpment where TC Energy plans to build the plant are shown on the Federal Contaminated Sites Inventory. Among the other chemicals of concern listed on a Treasury Board Review of Federal Contaminated Sites: methyl mercury, nitrogen oxides, Poly-cyclic Aromatic Hydrocarbons (PAHs) and organo-metallic compounds containing lead and arsenic – all threats to human health, aquatic life, soil and water.





There may be many other toxins as well. A chemical solvent called trichloroethylene (TCE) was commonly used as a degreasing agent until the 1990s on military bases across North America. More recent outcries have been raised by firefighters exposed to the potential carcinogens of Polyfluoroalkyl Substances (PFAS), also known as 'forever chemicals' because they don't break down in the environment or human bodies. The military is considered one of the largest users of PFAS, commonly found in firefighting foam during training exercises and emergencies.

The existence of those toxins on the base is worrisome enough, but scientists warn that they would become all the more dangerous if and when the soil is disturbed by TC Energy's massive construction plans—specifically the excavation of its proposed 375-acre reservoir. Thanks to the many watercourses clearly visible on maps of the base, those toxins—once disturbed— risk draining into the aquifers and wells of the 300 homes, farms and cottages situated below the reservoir and even directly into Georgian Bay itself, the source of drinking water to thousands for miles around.

<p style="text-align: center;"><b>Environmental Concerns</b></p> <ul style="list-style-type: none"><li>• Contaminated soils – Disturbing the soil may release heavy metals and toxins into the environment.</li><li>• Species at Risk (special interest to endangered) &amp; Migratory Birds.</li><li>• Dept of Fisheries and Oceans (DFO) – possible effects on fish bearing streams and other aquatic life in Georgian Bay. Analysis required.</li><li>• Natural drainage from the impact area will be changed, increasing flow in other streams and increasing erosion affecting local community.</li></ul> <p style="text-align: right;">22</p> <p><b>ENVIRONMENTAL CONSIDERATIONS</b></p> <p>1. <b>Environmental Concerns.</b> The following are a list of environment considerations that have been identified are requiring further study given they have a direct impact to TCE's project.</p> <p>a. <b>Contaminated Soils.</b> Over the years, the impact area has been heavily used for various types of fires. The expended rounds have caused various types of contamination from heavy metals to other toxins. Disturbing the soil would expose more of these elements to the surrounding area (air, land and water) and if the soil were used as part of the reservoir walls, then the heavy metals and toxins could cause increased contamination of the water. Pollution of the water creates large concerns for marine animals' health and for any person drawing water from the bay for personal use.</p> <p>Source: Department of National Defense, received through the Access to Information Process (ATIP)</p>	<p>The Defence Department's own documents, obtained through an Access to Information Process (ATIP), indicate that "disturbing the soil may release heavy metals and toxins into the environment" and express concern for "marine animals' health and for any person drawing water from the bay for personal use."</p>
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## No Harm?

TC Energy claims it has redesigned the project to mitigate some environmental effects, but they have not provided those designs for review or offered any details as to how these risks will be lessened.

Experts agree that the construction and operation of TC Energy's pumped storage plant would cause irreversible harm to the Niagara Escarpment, a UN-designated World Biosphere Reserve, and threaten the water quality of Georgian Bay. Yet TC Energy continues to say the project will do "no harm."



Save Georgian Bay acknowledges that some environmental risks can be reduced or lessened with a thoroughly risk-managed construction process and thoughtful plant design. But these risks can only be reduced, not eliminated. Plus, one major threat to the environment can not be mitigated at all: the permanent destruction of 500 acres of the Niagara Escarpment. Further, the high risk of spreading toxins, including “forever chemicals” into the air, land, and water, poses, in our opinion, an unacceptable project risk - an opinion that is widely shared.

**Why would we take these risks, and cause this harm – for a project that’s not even needed?** - especially when there is a viable alternative that does not pose these risks? Save Georgian Bay urges anyone interested in the risks the project would cause to the environment to demand that TC Energy provide proof that their proposed plant would cause “no harm.”

## 5. Economic Burden

*Against the Advice of the Independent Electricity System Operator (IESO):*

According to the Independent Electricity System Operator’s website, “The IESO oversees and evolves Ontario’s electricity markets, driving competition to maintain affordability.” The IESO:

- Reviews and accepts bids from electricity suppliers, starting with the lowest-cost options, until Ontario’s energy needs are met;
- Sets and enforces rules that govern participation in Ontario’s electricity markets; and
- Fosters an open, dynamic, and sustainable marketplace that encourages new opportunities for emerging resources.”

After reviewing TC Energy’s unsolicited bid, the IESO concluded that “Based on the project’s long development timeline, it is not expected to contribute to meeting short or medium term needs.” (Source: *Letter from Minister of Energy to President and Chief Executive Officer Independent Electricity System Operator dated November 10, 2021 received through ATIP*)

Despite the IESO’s conclusion, Minister Smith persists in advancing the project through the evaluation process. The Minister of Energy writes to IESO, “I am asking the IESO to move these three PS projects to the second stage (i.e.: Gate 2) of the Unsolicited Project Proposals framework. I am aware, based on the analysis provided by the IESO, that the three PS projects are not forecast to provide sufficient value to Ontario’s electricity consumers.” (Source: *Letter from Minister of Energy to President and Chief Executive Officer Independent Electricity System Operator dated November 10, 2021*)

Why would this be pushed through against the IESO’s advice? Why would the Minister not favour meeting long-term needs through a competitive mechanism, rather than the sole-sourced approach? The perception here is that the IESO is being politically overridden to favour big business over value to taxpayers.



### Capital Costs:

The project's price tag is another cause for concern. As evidenced above, despite findings from Ontario's Independent Electricity System Operator (IESO) that the project does not economically compare favorably to existing non-emitting resources, Energy Minister Todd Smith is determined to push it forward, burdening Ontarians with significant financial and environmental costs. The price tag on this risky megaproject has already skyrocketed from \$2.2 billion in 2019 to \$4.5 billion last year, and TC Energy has now agreed to cap it at \$7 billion - however that would work!


There are so many complex and variable elements of this project – dealing with unexploded ordinance and toxic chemicals, construction of a large dam, etc. - that no one knows what this project would ultimately cost Ontarians.

A University of Oxford study showed that construction costs of large dams are on average +90% higher than their budgets at the time of approval, in real terms (without including the effects of inflation and debt servicing). (Source: "Should We Build Large Dams?" University of Oxford, March 2014).

Department of National Defence documents obtained through an Access to Information Process (ATIP) reveal the department's concerns that TC Energy "has limited to no experience working in an area with UXOs. Their current estimate states three years of consultation and planning and four years of construction. They have not factored in the UXO problem... UXO clearance could add years to construction."

- TransCanada has limited to no experience working in an area with UXOs. Their current estimate sees three years of consultation and planning and four years of construction. They have not factored in the UXO problem. ADM(IE) pers around the table stated that UXO clearance could add years to construction.
  - TransCanada states that they want to ensure their work doesn't impact training. This may change as the full scope of the UXO problem becomes known. This could be a

Source:  
Department of National Defense, received through the Access to Information Process (ATIP)



### SDP - Planning Assumptions

- The TCE proposed PSP will not adversely impact 4 CDTTC training and site operations. Construction of replacement infrastructure will be in advance of the decommissioning of impacted buildings, facilities or infrastructure
- If required, TCE will cover the costs of relocating any training or courses impacted during construction
- The siting of infrastructure in the SDP focuses on potential infrastructure impacted by the PSP. Current COA's provided by TCE are very early working versions
- The TCE site survey and preliminary studies will confirm all impacted infrastructure and may result in a change to the inclusion of the Maintenance and Supply facilities
- The SDP sets the direction for future development at 4CDTC and will require endorsement from stakeholders and will be signed by DGPR
- The SDP may be amended in the future depending on changes resulting from the TCE PSP site assessment

Source:  
Department of National Defense, received through the Access to Information Process (ATIP)

Adding to the project costs is the need to rebuild all 4th Canadian Division Training Centre infrastructure, estimated to be approximately 41 pieces of infrastructure. Why would Ontario ratepayers and tax-payers foot the bill for the rebuilding of federal defence department infrastructure?



Pumped Storage infrastructure is massive and complex; when things go wrong, the costs are astronomical. One example is the Snowy 2.0 project in Australia with chemical leaks, sinkholes, toxic gases, a stuck boring machine, and a skyrocketing budget from \$2b to \$12b (plus \$8b for the transmission lines). (Source: "A sinkhole, toxic gas and the \$2 billion mistake behind Snowy 2.0's blowout", ABC Australia, October 2023 and "Pushing water uphill: Snowy 2.0 was a bad idea from the start. Let's not make the same mistake again" The Conversation, October 2023)

TC Energy's Coastal Gas Link project is now expected to cost \$14.5 billion (up 134 percent from the original price in 2018 of \$6.2 billion). (Source: "Estimated cost of Coastal GasLink pipeline surges to \$14.5-billion" The Globe and Mail, February 2023) With no experience with pumped storage, why would TC Energy be expected to be able to come in on budget for this project?

When Save Georgian Bay met with Energy Minister Todd Smith in the fall of 2023, he reported that he did not know what the final cost of TC Energy's open-loop pumped storage project would be. If the Ontario government hands the company the long-term electricity contract it seeks, all provincial electricity ratepayers will be on the hook for underwriting the costs of this possible white elephant for years to come. Meanwhile, the IESO points out a more cost-effective alternative to TC Energy's proposal: long-duration battery storage parks such as the Oneida Energy Storage Project currently under construction on 10 acres in Ohsweken, Ontario, and co-owned by the neighboring Six Nations of the Grand River.

#### *Development Costs:*

In a January 9, 2024 letter to IESO president Lesley Gallinger, Minister Smith asked the agency to re-assess the proposal for at least the third time. The IESO has reiterated that the project lacks economic value for Ontario's electricity ratepayers. Despite this, the Minister has actively challenged the regulator's recommendations, tasking the agency with a request for yet another review. In an unusual move, he also set in motion a process for his government to reimburse TC Energy's pre-construction costs. This has led to growing concerns that Ontario taxpayers might end up shouldering the development costs for a proposal that was initiated by TC Energy, an Alberta-based company, and has never been subject to a public competition. (Source: Letter from Minister of Energy to President and Chief Executive Officer Independent Electricity System Operator dated January 9, 2024)

#### *A Bi-lateral Closed-Door Deal:*

TC Energy approached the Independent Electricity System Operator (IESO) and the Department of National Defence with an unsolicited proposal for this project. The proposal is being evaluated under the IESO's Unsolicited Proposal Process (UPP). This three-gate process was developed by the IESO to evaluate Unsolicited Proposals and evaluates a project *independently*, as opposed to *in relation to* other bids. This amounts to a non-competitive sole-sourced contract for energy. If approved, TC Energy would be *given* the project vs *winning* the project by competing with it on the open market.



The IESO has since abandoned the UPP in favour of a more typical RFP process for energy storage that seeks bids from the market. In a letter to the IESO dated July 10, 2023, the Minister of Energy writes, “The UPP was developed by ENERGY and IESO at a time when IESO’s Resource Adequacy Framework (RAF) was still under development, and there needed to be an alternative process to evaluate the costs and system benefits of the multiple large-scale energy projects that were being proposed at the time... Considering the success of the RAF, I believe that the UPP is no longer a necessary mechanism to evaluate energy project proposals...” (Source: Letter from Minister of Energy to President and CEO of IESO, July 10, 2023)

The IESO recommends that the province’s long-term energy storage needs be procured in an open competitive process. In a November 20, 2021 letter to the IESO, Minister Smith acknowledges that “Over the long-term, Ontario does have an enduring need for new incremental capacity resources, and the project could contribute to meeting this need; however, the IESO currently plans to address it through a competitive mechanism.” (Source: Letter from Minister of Energy to President and Chief Executive Officer Independent Electricity System Operator dated November 10, 2021 received through ATIP)

By advancing this project, the Minister of Energy is pushing a single source mega project that the IESO experts advise would be better addressed under a competitive RFP process. If approved, the project would essentially be a directed contract, bypassing competitive tendering.

#### *Opportunity for Shared Economic Benefits:*

TC Energy has touted its Meaford project as a “collaboration” with the Saugeen Ojibway Nation, which will bring “shared benefits.” “Shared benefits” are used by TC Energy as a way to promote their open-loop pumped storage project as a part of Ontario’s reconciliation with indigenous communities. But those shared economic benefits *can come just as easily* from more efficient and sustainable battery storage projects. This past June the IESO approved 15 long-duration battery storage projects, nine of which boast at least 50% participation from indigenous communities therefore also offering the opportunity for “shared benefits” that TC Energy is promising without inflicting such damage on the land and waters for generations to come. (Source: Expedited Long-Term RFP (E-LTD RFP) – Final Results)

#### *Carbon Credit Transfer*

Department of National Defence documents, obtained through a federal Access to Information Process request, show that TC Energy “have claimed that they have been willing to give DND the Greenhouse Gas Credits that will come with this project” and that “TCE has made the claim that [4th Canadian Division Training Centre] will be able to benefit directly from this project by drawing power directly from the site, which could be done at a reduced cost.”

At \$170 per tonne, 490,000 tonnes in credits is worth \$83.3 million annually throughout the project’s expected 50-year lifespan, which would amount to \$4.165 billion. It would appear that, if this transfer of carbon credits is made, Ontario would be giving away carbon credits worth over \$4b to the federal government – a benefit should stay in Ontario.



### *Federal Infrastructure Replacement Costs*

Department of National Defence documents, obtained through a federal Access to Information Process request, show that TC Energy has “agreed to replace (at their cost) all affected infrastructure on and off-site” and that TC Energy will be “responsible for covering all costs” including “any costs incurred from clearing unexploded ordinance” from the land and water. Costs include building (or re-building) up to 43 new pieces of infrastructure.

This is a massive federal military base upgrade, estimated to cost approximately \$250 million, ultimately paid for by Ontario taxpayers. Ontarians would essentially be footing the bill for replacing federal military infrastructure.

Upon consideration of all of these factors – capital costs, cost uncertainties, taxpayers on the hook for TC Energy’s project development costs, IESO’s rejection of the project, carbon credit transfer, federal infrastructure replacement, and TC Energy’s unsolicited approach to the Ontario government – it is clear that TC Energy’s open-loop pumped storage proposal is not in the best interests of Ontario’s taxpayers or rate payers.

*In addition* to being a better choice from an environmental and efficiency perspective, long-duration battery storage is also more cost-effective - *and* could also offer the opportunity for “shared benefits” with Saugeen Ojibway Nation.

The cost to build a long-duration battery park with the same storage capacity as TC Energy’s proposed open-loop pumped storage plant would be \$4B. And because there are fewer unknowns and the time to implement is shorter, those costs are more predictable. TC Energy’s proposed open-loop pumped storage plant would take at least 10 years to develop and build, and is likely to cost more than the current \$7 billion currently advised by TC Energy (probably closer to 15 years and over \$10 billion, given the historic cost and time overruns for projects of this size).

From all perspectives, it is clear that TC Energy’s proposed open-loop pumped storage plant would cost more to develop, build, refurbish, maintain, and decommission than long-duration battery storage. Why would Energy Minister Todd Smith push ahead with an environmentally damaging project that the IESO says offers no net economic benefit to ratepayers when more efficient and less expensive technologies are available?

Save Georgian Bay questions the project's political drivers, noting close ties between TC Energy's lobbyists and Ontario's political leaders. Rubicon Strategy is headed by Kory Teneycke who served as Premier Doug Ford’s Campaign Manager. Minister Smith’s Chief of Staff, David Donovan, came to the Minister’s office from Sussex Strategy whose executives, Chris Benedetti and Paul Pellegrini have close ties to both the Minister and the Premier.



## GREENWASHING

TC Energy attempts to greenwash the project by touting the production of emission-free power capacity and the reduction of the province's reliance on natural gas power production. All storage alternatives would have the same climate change impact TC Energy is claiming for their proposal: "Canada's Largest Climate Change Initiative." Their project is not unique in this respect.

But claims that their pumped storage proposal offers a "green" solution, and their repeated reference to "net-zero," is inappropriate and misleading. Save Georgian Bay's experts find that TC Energy's pumped storage project would increase CO2 emissions and that, comparatively, long-duration battery storage would add less CO2 into the atmosphere. TC Energy's commissioned "Economic Analysis of a Proposed Hydroelectric Pumped Storage Project in Ontario" Navigant dated January 2020) is incomplete, as it does not analyze the effect of these lost exports (over 4.3 million MW/hrs per year) to US states that currently produce a majority of their energy using coal and gas. TCE's conclusion that the operation of the proposed pumped storage plant would result in a reduction of CO2, relies on an incomplete analysis. When the diversion of lost energy exports to U.S. jurisdictions, and other factors identified by Save Georgian Bay, are considered, the pumped storage project will increase CO2 emissions. Currently, excess energy from the Bruce Nuclear Plant is exported to the United States. If some of this excess energy is diverted away from export to operate the pumped storage facility, these states would turn on their gas and coal plants, adding carbon to the environment. These emissions, and the 490,000 tonnes of carbon that would be introduced into the environment to construct the facility, undermine its purported environmental benefits. *(Source: Section 8.0 of the Strategic Environment Assessment prepared for DND by SGB offers a detailed analysis of how TC Energy's pumped storage project would increase CO2 emissions.)*

It is important to note that excess energy is currently diverted to the US to power up long-duration batteries, but the carbon emissions would be much less than pumped storage because batteries are approx. 1/3 more efficient than pumped storage. *All storage solutions provide carbon savings and of course, those that are easier to build and are more efficient do a better job leveraging the carbon reduction - Batteries would do a better job at carbon reduction.*

One also must consider the environmental concerns about this project beyond Carbon - adverse impacts to 30 Species at Risk, increased turbidity, fish entrainment, devastation to 500 acres of the Niagara Escarpment, and the spread of "forever chemicals," toxins and carcinogens into the environment - *"Green" isn't just about carbon!*

Strategic partnerships with high-profile conservation groups have allowed TransCanada to greenwash its image, providing a "green" veneer to an otherwise fundamentally dirty corporation. For example, in 2009, TransCanada committed up to \$11.4 million to the Nature Conservancy of Canada (NCC), making the NCC the recipient of the company's largest-ever community investment. The company has also partnered with Ducks Unlimited (DU) for over 15 years, and in 2013 contributed \$1 million to DU projects in Louisiana and Saskatchewan.



## TC ENERGY'S TRACK RECORD

### *TransCanada Pipelines Leak:*

TransCanada's gas and oil pipelines leak. TransCanada Pipelines has one of the worst safety records of any North American pipeline company. It's not a question of if the pipelines will leak, but rather when, where and how much the pipelines will leak. Since 2010, when TransCanada's first oil pipeline came into service, the company has reported 152 oil spills. According to the National Energy Board (NEB), 17 of the 39 major pipeline (gas and oil combined) accidents that have happened in Canada (between 1992 and 2014) occurred on pipelines owned by TransCanada and its subsidiary NOVA Gas Transmission Ltd. (NGTL). This is most likely a conservative number, as the NEB only discloses 'reportable' breaches and many pipeline incidents never even come to public attention.

In December 2022, its Keystone Pipeline spilled 13,000 barrels of tar sands crude into a Kansas creek, with clean-up costs of \$480 million (US). Investigators found the company had increased pressure in the pipeline above normally allowed stress rates, but TC Energy blamed the leak on shifting land and faulty construction.

TC Energy's proposed open-loop pumped storage project is especially risky since they have never built one. TC Energy's core competence is pipeline construction. If they can't build leakproof crude oil pipelines, after decades of experience, what expectation can we have that they have the ability to build a pumped storage plant safely?

### *Bad-Faith Engagement with First Nations:*

The following two cases illustrate TransCanada's bad-faith engagement with First Nations. The first example is related to how TransCanada consistently ignored requests for information and the concerns of the Lubicon Cree in the lead-up and during the construction of its North Central Corridor Pipeline in Alberta. The company claimed that "no objections were raised in extensive consultation with native communities." The Lubicon nation maintained that their concerns were not taken seriously and that their rights had been violated, while the government and TransCanada said that they had been adequately consulted. James Anaya, the former UN Special Rapporteur on the Rights of Indigenous Peoples, investigated this case and his report makes clear that from the perspective of the Lubicon Cree, their fundamental rights were violated.

The second example is related to TransCanada's Grand Rapids Pipeline and the Athabasca Chipewyan First Nation (ACFN). In July 2014, the Athabasca Chipewyan First Nation (ACFN) formally pulled out of the Alberta Energy Regulator (AER) hearings for the pipeline. Citing industry prejudice and impossible timelines, Chief Adam explained that the AER had refused to give them enough time to study new documents submitted by TransCanada. Previously, the company had submitted incomplete environmental, safety, spill contingency, and caribou protection plans. The Chief of the ACFN, Allan Adam, accused TransCanada of dealing with his community in bad faith, saying that instead of taking aboriginal concerns seriously, it was more focused on what it would cost to "buy us off."



*Aggressive Public Relations Strategies:*

In 2014, leaked PR strategy documents revealed that TransCanada had hired the world's largest PR firm, Edelman, to prepare its Energy East Campaign, including the use of controversial strategies to damage the reputation of opponents and adding "layers of difficulty for opponents, distracting them from their mission and causing them to redirect their resources." One example of these strategies includes a \$5 million (USD) Strategic Lawsuit Against Public Participation (SLAPP) against 19 activists and several environmental groups. The defendants, threatened with losing their homes and life's savings, agreed in 2013 to cease opposition to the Keystone XL pipeline.

*Sources: All information related to TC Energy's Track Record is sourced from the Polaris Institute's corporate profile of the TransCanada Corporation "Unplugging the Dirty Energy Economy" dated 2015.*



## OUR SUPPORTERS SPEAK OUT

Save Georgian Bay has shared our concerns about the proposed project with concerned citizens, media, and political leaders. We are heartened that we're not alone in our concerns, as evidenced by over 40,000 online / 3,300+ paper petition signatures opposing the project.

Rupert Kindersley, Executive Director of the Georgian Bay Association, is concerned about the environmental risks and why the project is still proceeding after being rejected twice by the IESO.

*"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. Given that the project does not have the support of the regulator, the Independent Electricity System Operator (who view it as a bad financial deal for Ontario and question whether it will even be needed by the time it is finished), and given the far less costly alternatives that can be put in place in 2-3 years rather than a decade, we believe that it is imperative that the Minister of Energy put this long-term energy storage requirement out to a public, competitive tender."*

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

Maude Barlow, one of the world's leading experts on freshwater issues calls for the project to be stopped.

*"TC Energy's proposed pumped storage operation is a monster of an idea. It could destroy the entire aquatic ecosystem of Georgian Bay and threaten the sanctity of a UNESCO World Biosphere. We in Canada have taken our fragile water heritage for granted and not properly cared for it. To provide energy that can more safely be supplied in other ways, this dangerous plan puts a huge body of water at risk. It must be stopped!"*

**- Maude Barlow, co-founder of the Council of Canadians and author of Blue Gold, Whose Water Is It Anyway? and Still Hopeful: Lessons from a Lifetime of Activism.**

Jack Gibbons, leading the Ontario Clean Alliance's charge to see Ontario move to 100% renewable electricity, has an interesting suggestion for Minister Smith.

*"The Ontario Clean Air Alliance is concerned that Ontario's Minister of Energy, Todd Smith, is promoting TC Energy's high-cost Meaford pumped storage project despite the fact that according to the Independent Electricity System Operator we have lower cost alternatives, including battery storage. By 2030 the storage capacity of our electric vehicles' (EVs) batteries will be more than 20 times larger than the proposed Meaford pumped storage project. Instead of negotiating a sweetheart, backroom deal with TC Energy, Minister Smith should direct our electric utilities to pay EV owners to provide power back to the grid when it is needed."*

**- Jack Gibbons, Chair, Ontario Clean Air Alliance and Former Toronto Hydro Commissioner**



Save Georgian Bay is also grateful for the opposition to the project voiced by several municipalities around Georgian Bay. On November 17th, the council of the Township of The Archipelago in Parry Sound District first passed a resolution “vehemently” opposing the project, denounced it as “a bad financial deal for Ontario,” and objected to the proposal based on its threat to the environment and the area’s vital tourism, sport, and commercial fishing industries. Then on December 18th, the Town of Blue Mountains, which includes Thornbury, also passed a similar resolution. The Township of Georgian Bay, and the Town of Parry Sound soon followed.

The support from these municipalities - some on the eastern shore of Georgian Bay nearly 90 kilometres away - refutes TC Energy’s claim that mounting criticism of the project is merely a case of NIMBYism. These resolutions demonstrate that there is widespread concern about this project beyond the immediate area and the opposition to Save Georgian Bay and rightly recognize the waters of Georgian Bay follow no municipal boundaries. The water touches all of us. Because of that, everyone on the Bay should have a say.

The actions of these four advocate municipalities stands in stark contrast to Meaford and Owen Sound, who have “conditionally” supported the project based on the promise of economic benefits. Leading up to Meaford’s October 2022 municipal election, Mayor Ross Kenter campaigned on a platform against TC Energy’s proposed project. Yet, in February 2023 five of Meaford’s seven councillors, including Mayor Kentner, voted to offer conditional support for the project. Mayor Kentner reported meeting with Minister Smith at the January 2023 Rural Ontario Municipal Association (ROMA) conference where the Minister urged approval of the project and warned that Meaford should accept the pumped storage plant to secure potential community benefits. TC Energy’s John Mikkelson said that the municipality could lose out on an economic bonanza from the Calgary-based pipeline corporation. “Benefits will come to Meaford if—and only if—the council votes for the project to proceed,” Mikkelson declared at the time.

Yet, as we know, this was a hollow threat. Local municipalities, including Meaford, have the authority to declare their community a “willing host” for a proposed project. If a municipality does not provide this approval, the project cannot proceed. The 2009 Green Energy Act initially bypassed municipal regulations, but the Ford government later reinstated local government input in 2018, requiring new energy projects to seek approval from local city councils. The Green Energy Repeal Act, 2018 gave powers back to municipalities regarding how land use for renewable energy is regulated and approved in Ontario, including restoring municipal siting authority under the Planning Act over new proposed projects.

In March of 2024, Owen Sound also offered its conditional support for the project, largely driven by the promise of economic benefits, including jobs. TC Energy claims its project will create 1,000 well-paying, unionized construction jobs. But those jobs are short-term construction jobs – only 20-22 of them are reported to be permanent jobs. A contractor for the Ludington Pumped Storage (TC Energy’s model for their proposal) says most of its construction workforce was short-term and came from out of town while creating pressure on local housing and schools. Energy Minister Todd Smith is touting TC Energy’s promise to create 1,000 well-paid unionized construction jobs on its pumped storage proposal for Meaford as one of the “societal and economic benefits” that the IESO has not factored in. \$7 billion dollars is a lot of money for 20 full-time jobs!



## CONCLUSION

In conclusion, the amalgamation of these issues underscores the questionable nature of this politically motivated project.

Although the need for storage to balance high and low demand is a real issue today, the need for storage will steadily reduce over time and it may not be a permanent requirement. TC Energy's pumped storage project, which would deliver storage in about a decade from now, is therefore likely not needed. So it makes no sense to build any very long-term project, especially one that is so inefficient, poses such major threats to the environment, and is an economic burden on Ontarians. Alternatively, a new battery park can be online within only a few years of being approved. This solution can deliver storage quickly when storage is needed the most.

The environmental case for long-duration battery storage over open-loop pumped storage is clear – and will only get more compelling over time. TC Energy's proposed project poses many environmental risks, some of which can be mitigated. TC Energy says that the Federal Impact Assessment process will address them and that Saugeen Ojibway Nation will ensure that the environment is protected. We would like them to explain how they will do this. There is no getting around the fact that this massive construction project would permanently destroy 500 acres of the Niagara Escarpment. And regardless of any impact assessment or risk mitigation, the high likelihood of spreading PFAS "forever chemicals" and other toxins into the environment is an unacceptable risk. Once the 500 acres of the Niagara Escarpment are destroyed, there is no repairing it. If toxins, many of which are carcinogens with no remediation solution, are spread into the environment they will be there forever. TC Energy says that their project will cause "no harm." We urge you to insist that TC Energy provide proof of this claim.

Long-duration battery storage has other benefits too. They can be built virtually anywhere allowing them to be close to centres of high energy demand and close to the grid, eliminating the need for new transmission lines. And in a head-to-head comparison of energy efficiency, carbon reduction, and costs to ratepayers and taxpayers, long-duration battery storage out-performs open-loop pumped storage.

Save Georgian Bay urges Minister Smith and the Ford Government to prioritize the Niagara Escarpment and Georgian Bay, and the financial interests of Ontario's taxpayers and ratepayers, over the clear corporate and political motivations driving TC Energy's open-loop pumped storage proposal. We ask the Minister of National Defence to protect the health and safety of Ontarians and not allow the disruption of soil at the base to release toxins, including "forever chemicals" into the air, land, and water. We urge every municipality around the Bay to examine the project and consider a resolution in opposition to TC Energy's proposal for an open-loop pumped storage facility due to the irreparable harm both to the Niagara Escarpment and to the waters of Georgian Bay.

**Why take the risk?**