St. Catharines

May 11, 2021

To: The Town of Pelham
sent via email to:
Holly Willford, Clerk at hwillford@pelham.ca
David Cribbs, CAO at dcribbs@pelham.ca
Jason Marr, Director of Public Works at jmarr@pelham.ca

Re: Fish Habitat Compensation Plan – Consent to Complete Works within Town of Pelham Boundaries
Our File 18.20.99

At its meeting held on May 10, 2021, St. Catharines City Council received a report which included information regarding a compensation plan to offset the damage to fish habitat due to City projects P20-132 Abbey Mews Shoreline Protection and P21-132 8-14 Shore Blvd Shoreline Protection; the full report is linked hereto as Report EFES-071-2021 and attached to this correspondence. As a result of shoreline protection work occurring within the boundaries of St. Catharines, Fisheries and Oceans Canada requires the City to implement a fish habitat compensation plan. As discussed within the report, potential project areas within the City of St. Catharines would not provide a sufficient amount of fish habitat compensation, and as such, it was necessary to consider potential project areas outside of the City of St. Catharines. Based on recommendations from consultants Shoreplan Engineering and Tarandus Associates Limited, and in consultation with the Niagara Peninsula Conservation Authority, Fisheries and Oceans Canada, the Ministry of Natural Resources and Forestry, and Trout Unlimited Canada, a preferred site was located within the Town of Pelham. Staff from the City of St. Catharines have initiated conversations with impacted property owners who seem amenable to the proposed project; however, detailed discussion and approvals are still required. As this project is located within the boundaries of the Town of Pelham, Council's motion in response to the report included the following:

> That staff be directed to contact the Town of Pelham to receive consent to complete work within Pelham's municipal boundaries.

The intent of this letter is to request consent to complete the work discussed within Report EFES-071-2021 within the Town of Pelham's municipal boundaries.

If you have any questions, please contact the Office of the City Clerk at extension 1524.

Bonnie Nistico-Dunk, City Clerk
Legal and Clerks Services, Office of the City Clerk
:ks

cc: Anthony Martuccio, Director of Engineering, Facilities and Environmental Services
Jocelyn St. Denis, Design and Construction Engineer

Corporate Report
City Council

Report from: Engineering, Facilities and Environmental Services, Engineering and Construction

Report Date: April 22, 2021

Meeting Date: May 10, 2021

Report Number: EFES-071-2021

File: 18.20.99

Subject: P21-132 8-14 Shore Boulevard Shoreline Protection Improvements Award of Tender, Budget Reallocation and P20-132 & P21-132 Fish Habitat Compensation Plan

Strategic Pillar:

This report aligns with the following St. Catharines Strategic Plan pillars: Environmental

Recommendation

That staff be directed to award the tender for P21-132 8-14 Shore Boulevard Shoreline Protection Improvements to Anthony's Excavating Central Inc. in the amount of $1,677,010.00 plus HST; and

That Council grant approval to reallocate $283,500 of funding from P17-129 Watercourse Rehabilitation, 2017; and

That Council grant approval to utilize $250,000 of funding from various past shoreline projects and from P17-129 Watercourse Rehabilitation, 2017 to complete the fish compensation plan in the Town of Pelham for P20-132 Abbey Mews (Considine Avenue to Christie Street) Shoreline Protection Restoration and P21-132 8-14 Shore Boulevard Shoreline Protection Improvements; and

That staff be directed to contact the Town of Pelham to receive consent to complete work within Pelham’s municipal boundaries; and

Further, that the City Solicitor be directed to prepare the necessary by-laws. FORTHWITH

Relationship to Strategic Plan

P21-132 8-14 Shore Boulevard Shoreline Protection Improvements supports the following:

Environmental Stewardship

Goal:

3.1 Develop a Climate Change Action Plan that will address, at a minimum:

- waterfront/shoreline protection and water course erosion
- identify capital investments to address climate change

Background

Over time, unprotected shorelines can experience erosion due to the continuous impact of the waves. This erosion can result in large amounts of lost soil, creating unstable slopes along the shoreline. This can in turn cause the slopes to fail and wash away, potentially impacting structures located adjacent to the shoreline, such as publicly owned roadways and infrastructure or privately owned homes.

In 2017, emergency shoreline works were completed to install temporary shoreline protection behind 10, 12 and 14 Shore Blvd. These works were necessary to protect the City owned lands from erosion occurring along the shoreline.

Shoreplan Engineering Ltd was retained in 2018 to complete a Shoreline Protection Review to evaluate the City owned shoreline and provide recommendations on the priority locations for shoreline protection. In 2020, following the high-water levels in 2019, Shoreplan Engineering completed an update to this report. The list of priority locations for shoreline protection did not change from the initial report. Since the completion of the 2018 report, staff have completed work in accordance with the priority locations listed in the report. Due to the significant work that the City has carried out in the last couple of years addressing shoreline protection, the work remaining at Shore Boulevard is now the highest priority section to be addressed.

Project P21-132 Shore Boulevard Shoreline Protection Improvements includes the installation of an armour stone revetment behind 8 to 14 Shore Boulevard, which consists of approximately 120 metres of shoreline, along with a section of retaining wall along the back of the revetment to provide additional slope stability where necessary (see Appendix 1 for a Key Plan).

The design and construction for shoreline protection includes receiving approval from all appropriate regulatory agencies including Fisheries and Oceans Canada (DFO). The armour stone revetment that is to be installed as part of the Shore Blvd project is the same design that was installed at the shoreline protection project that recently finished in the Abbey Mews area of Port Dalhousie. In order to build this type of protection, the revetment must be built out into the water, removing a portion of fish habitat within Lake Ontario. When a large area of fish habitat is impacted by a construction project, DFO requires the proponent of the works to provide compensation for the lost fish habitat. Due to the size of the Abbey Mews and 8-14 Shore Boulevard shoreline protection and

the area of fish habitat that was/will be lost, these projects both require the City to provide compensation. Typically, DFO requires the proponent to provide a compensation plan prior to them issuing a permit for the project; however, due to the Abbey Mews project being classified as emergency works because of the slope failure occurring at the end of Considine Avenue, the DFO issued a permit for the works with the condition of a compensation plan being submitted at a later date. In regards to the 8-14 Shore Boulevard shoreline protection project, the DFO is requiring a compensation plan prior to issuing a permit and construction commencing.

Report

Shoreline Protection Construction

The P21-132 Shore Boulevard Shoreline Protection Improvements tender closed on Thursday, April 15, 2021. Eight tenders were received and opened. One bid was disqualified due to not meeting all of the bid requirements. The remaining seven bids were checked for mathematical errors and two bids were found to have errors and were corrected. The tender prices are listed on Table 1 below:

Table 1

Tender Submitted By:	Tender Price Submitted	Corrected Tender Price	Corrected Tender Price (Incl. 1.76% HST)	Corrected Tender Price (Incl. 13% HST)
Anthony's Excavating Central Inc.	$1,677,010.00		$1,706,525.38	$1,895,021.30
CRL Campbell Construction & Drainage LTD	$1,690,300.00		$1,720,049.28	$1,910,039.00
Rankin Construction Inc.	$1,694,550.00		$1,724,374.08	$1,914,841.50
Oakridge Group Inc.	$1,727,032.13	$1,724,152.76	$1,754,497.85	$1,948,292.62
GU Contracting Inc.	$1,894,990.00	$1,895,000.00	$1,928,352.00	$2,141,350.00
2220742 Ontario Ltd o/a Bronte Construction	$2,125,198.06		$2,162,601.55	$2,401,473.81
560789 Ontario Limited o/a R&M Construction	$2,516,978.95		$2,561,277.78	$2,844,186.21

Staff recommend awarding the tender to the lowest bidder, Anthony's Excavating Central Inc., at its bid price of $1,677,010.00 plus HST.

The Ministry of Natural Resources and Forestry (MNRF) has spring and fall in-water work timing restrictions of March 30 to July 15 and September 15 to November 15,

respectively. To ensure that the project is able to be completed within the allotted time frame for in-water works, staff recommend awarding this tender as soon as possible to allow the contractor sufficient time to mobilize and be prepared to begin in-water works as soon as the spring restrictions end on July 15, pending permit issuance.
Based on the low tender of $1,677,010.00 plus HST by Anthony's Excavating Central Inc., staff prepared an updated total project cost estimate. Including engineering, contract administration, site inspection, non-refundable HST and other miscellaneous costs, the updated total project cost is estimated at $1,830,000. The 2021 Capital Budget included a budget allocation of $1,546,500 to complete the proposed works. The additional $283,500 required funding to complete this project can be provided with the reallocation of funds from P17-129 Watercourse Rehabilitation, 2017 to this project.

Details of approved and required funding for this project are listed in Table 2 below:

Table 2

	Budget / Program	**Account Name**	**Account Number**	**Budgeted Amount**
Existing Funding	Capital Budget – Shoreline Protection	P21-132 Shore Boulevard Shoreline Protection Improvements	470.295.000	$1,546,500
Total Existing Project Funding				**$1,546,500**
Additional Funding	Capital Budget – Watercourse	P17-129 Watercourse Rehabilitation, 2017	430.381.000	$283,500
Total Additional Funding from Existing Projects				**$283,500**
Total Project Funding				**$1,830,000**

Staff is recommending that this project proceed at this time for the following reasons:

- Shoreline protection is a key component in preventing potential for damage to public and private properties and infrastructure due to unstable shorelines and slopes;
- Due to Climate Change, high water levels are expected to become the norm, resulting in unprotected shorelines being at a higher risk of eroding; and
- It has been predicted that lake levels will remain low this year, creating favourable conditions for completing the full length of the shoreline protection. Not completing the full length of protection in 2021 could result in unfavourable conditions during construction since lake levels typically begin to rise in the spring and it is not possible to predict at this time whether 2022 will see high lake levels or not.

Climate change has become a key focus of all levels of government. The City continues to monitor applicable funding opportunities through higher levels of government that would assist the City to address the priority replacement / repair and adaptation of City infrastructure as a result of climate change. The City has not been eligible for previously identified funding opportunities to assist with the proposed shoreline works for various reasons, including but not limited to our larger population, smaller project budget, asset classes being funded and funding opportunities being focused on reducing greenhouse gas emissions, pollution and consumption. The City will continue to monitor future

funding opportunities and engage our local members of parliament for financial assistance with these types of projects.

Compensation Plan

Through the design consultants, Shoreplan Engineering, staff hired Tarandus Associates Limited, a biologist experienced with developing fish habitat compensation plans, to determine an appropriate project that would provide sufficient fish habitat compensation for the Abbey Mews project. Tarandus Associates reached out to various agencies, including Niagara Peninsula Conservation Authority (NPCA) and Trout Unlimited Canada to discuss potential projects which would provide sufficient compensation to offset the lost fish habitat. Priority was given to projects within the City's municipal boundaries; however, any projects that met this criteria did not provide a sufficient amount of fish habitat compensation. For this reason, projects outside of the City boundaries were reviewed, with priority given to projects which would directly benefit the City by being located upstream of the City's boundaries. A project was identified on Twelve Mile Creek, approximately 6.5 km south of the City limits, within the Town of Pelham. Upon discussions with the DFO, it was determined that this project would not only provide sufficient compensation for the Abbey Mews project, but would also provide it for the Shore Boulevard project as well. Tarandus Associates presented this project to NPCA and Ministry of Natural Resources and Forestry (MNRF) and both agencies provided their support for the project, as well.

The fish habitat compensation project involves the installation of a by-pass channel onto publicly accessible lands to divert around an existing pond located on private property. The pond was reportedly constructed to provide cooling water for an adjacent cannery. This pond has a dam which restricts the movement of fish in Twelve Mile Creek. Additionally, the pond is warming the water flowing downstream of it, which makes the downstream waters uninhabitable for cold-water fish. Completing this project would provide benefit throughout the Twelve Mile Creek watershed, which runs through the City, ultimately connecting to Lake Ontario. This project would directly and indirectly benefit the City since creek watersheds are continuous through various municipalities and any added benefits to a watershed will benefit all downstream areas of the watershed. See Appendix 2 for a letter from Trout Unlimited Canada further outlining the benefits of the completion of this project.

On March 31, 2021, the deadline for submitting the compensation plan, Tarandus Associates submitted a report outlining the proposed compensation plan to the DFO for their review (see Appendix 3 for the report).

Trout Unlimited Canada (TUC), a national not-for-profit organization, which was established in 1972 with the mission to conserve, protect and restore Canada's freshwater ecosystems and their coldwater resources, is in support of the project and has agreed to lead the project in consultation with the City. Staff is currently in discussions with TUC to develop an agreement with the agency.

In order for the City to receive approval from DFO for the completion of P21-132 8-14 Shore Boulevard Shoreline Protection, DFO requires commitment from the City to move forward with the project, as well as agreement for the work from the impacted property owners. Since the submission of the report, staff have been in discussions with the owner of the property which the pond is located on, as well as Nature Conservatory of Canada, which owns the property to the west of the pond, which the channel by-pass would cross onto. In very preliminary discussion, both property owners seem amendable to the proposed project; however, detailed discussion and approvals are still required. DFO also requires commitment and approval from Council for the proposed compensation plan and associated works.

Tarandus Associates provided a preliminary, high level cost estimate for the completion of the by-pass channel and including engineering, construction, post-construction monitoring, non-refundable HST and other miscellaneous costs. The total cost for the compensation plan is estimated to be $250,000.

Staff propose to utilize $215,000 from various shoreline accounts, including $81,300 from the account that funded the design and construction of P20-132 Abbey Mews (Considine Avenue to Christie Street) Shoreline Protection Restoration, to cover a portion of the required costs for the compensation plan. The additional $35,000 of required funding to complete this project can be provided with the reallocation of funds from P17-129 Watercourse Rehabilitation, 2017 to this project.

Details of approved funding for this project are listed in Table 3 below:

Table 3

	Budget / Program	**Account Name**	**Account Number**	**Available Funds**
Existing Funding	Capital Budget – Shoreline Protection	P20-132 2020 Shoreline Protection	470.293.000	$81,300
Total Existing Project Funding				**$81,300**
Additional Funding	Capital Budget – Shoreline Protection	ST10-19 2010 Shoreline Protection Program	470.289.000	$40,700
Additional Funding	Capital Budget – Shoreline Protection	P18-132 2018 Shoreline Protection	470.291.000	$19,100
Additional Funding	Capital Budget – Shoreline Protection	P19-132 2019 Shoreline Protection	470.292.000	$64,600
Additional Funding	Capital Budget – Shoreline Protection	ST20-010 City Wide Shoreline Protection Review	470.294.000	$9,300
Additional Funding	Capital Budget – Watercourse	P17-129 Watercourse Rehabilitation, 2017	430.381.000	$35,000
Total Additional Funding from Existing Projects				**$168,700**
Total Project Funding				**$250,000**

Financial Implications

Shoreline Protection Construction

Table 4 contains the costs and related budget amounts identified to complete Project P21-132 Shore Boulevard Shoreline Protection Improvements.

Table 4

Project Cost and Funding	
Tender cost (excluding HST)	$1,677,010
Other project costs	$ 152,990
Net total project costs	$1,830,000
Existing budget (details in Table 2)	$1,546,500
Additional budget required (details in Table 2)	$ 283,500

Staff recommend the project proceed as tendered. Retendering is unlikely to achieve lower prices. In addition, retendering will delay construction and completion of this project.

The City Treasurer confirms that the amounts shown in the table above are available for use towards Project P21-132 Shore Boulevard Shoreline Protection Improvements.

Compensation Plan

Table 5 contains the costs and related budget amounts identified to complete the compensation plan for the P20-132 Abbey Mews (Considine Avenue to Christie Street) Shoreline Protection Restoration and P21-132 8-14 Shore Boulevard Shoreline Protection Improvements projects.

Table 5

Project Cost and Funding	
Pre-Construction Costs	$ 75,000
Construction Costs	$100,000
Post-Construction Costs	$ 15,000
Other project costs	$ 60,000
Net total project costs	$250,000
Existing budget (details in Table 3)	$ 81,300
Additional budget required (details in Table 2)	$168,700

The City Treasurer confirms that the amounts shown in the table above are available for use towards the compensation plan.

Environmental Sustainability Implications

The completion of P21-132 Shore Boulevard Shoreline Protection Improvements will provide protection to City owned shoreline to reduce the potential of erosion due to rising lake levels, which will protect City owned land, as well as private properties. The completion of the compensation plan will allow the City to meet the requirements set out in their approval from DFO for the completion of construction for P20-132 Abbey Mews

(Considine Avenue to Christie Street) Shoreline Protection Restoration and P21-132 8-14 Shore Boulevard Shoreline Protection Improvements.

Prepared by
Jocelyn St Denis, P.Eng
Design and Construction Engineer

Submitted by
Christine Adams, P.Eng
Manager of Engineering and Construction

Approved by
Anthony Martuccio, P.Eng
Director of Engineering, Facilities and Environmental Services

Appendices

- Appendix 1 - Key Plan
- Appendix 2 - Letter of Support for the Cannery Pond Bypass Project Proposal from Trout Unlimited Canada
- Appendix 3 - Proposed Offsetting Concept For Abbey Mews and Shore Boulevard Shore-Protection Works, St Catharines

Key Plan


N
Project Limits
Westcliffe Park
Shore Blvd
Lake Street
Westgate Park Drive

City of St. Catharines
50 Church Street
St. Catharines, ON., L2R 7C2

April 27, 2021

RE: Letter of Support for the Cannery Pond Bypass Project Proposal

Dear City Council,

Trout Unlimited Canada (TUC) is a national not-for-profit organization that is science-based and volunteer-driven. Partners and volunteers are at the core of the numerous successful river restoration projects we implement every year. Our work protects and enhances water quality, water flow, and community health. TUC is proud of the critical role our organization has played in the protection of Canada's natural resources for almost 50 years.

We are writing to urge you to support the Cannery Pond Bypass Project within the Town of Fonthill as compensation works for the City.

Twelve Mile Creek has been the focus for TUC's Niagara Chapter. Volunteers and partners of this chapter have invested a significant amount of time, energy, and knowledge into the rehabilitation of the creek's structure, water quality and critical habitat. This award-winning group of people have elevated the health of this creek and, with the support of our professional staff, identified critical works necessary to realize ecosystem health and species protections. Twelve Mile Creek is a unique system because it is the only coldwater creek within the Niagara Peninsula, and is home to our only native riverine trout species - Brook Trout. These fish are highly sensitive to environmental degradation, and can only live in cold, clean water. Populations of native Brook Trout are being lost at an alarming rate due to habitat loss, competition, and climate change. For this reason, every opportunity to stabilize, grow or restore populations is vital for the survivorship of the species and the clean water resources they occupy.

The development of Canada relied upon damming rivers to help harness power or provide industrial services. Unfortunately, the development of dams had many consequences: water quality decreased; water temperatures rose; critical habitats were lost; sedimentation accumulated; and migration barriers were created. The installation of these dams caused a loss or elimination of many native freshwater fish communities, altered river channels, and changed river health (nutrient cycling and food webs).

The legacy of dams still exists in many rivers, such as the Cannery Pond in Twelve Mile Creek. These obsolete structures are creating environmental, economic, and public/private liabilities. Niagara Peninsula Conservation Authority's temperature sensors reveal the dramatic extent to which the pond adds heat and deteriorates the quality of the stream water.

Trout Unlimited Canada
519 763 0888 1 800 909 6040
Suite 304 100 Stone, 100 Stone Rd W, Guelph ON, N1G 5L3

Furthermore, climate variability exacerbates the impact of the dams by heating these already unnaturally warm rivers. Climate variability is causing more frequent floods, making dams a major environmental, public safety, and economic risk.

Restoring Twelve Mile Creek at the Cannery Pond can take many forms, but regardless of the details, the positive impacts are significant and these impacts will benefit the entire watershed downstream and all those who take the time to enjoy it. Removing or bypassing the pond would result in the single largest benefit to this system. A central tenet of ecology is that "everything is connected to everything else", and this concept applies to the prospect of remedial works in the headwaters of Twelve Mile Creek. The City of St. Catharines is connected in many ways to the uppermost reaches of the watershed in which is it located. These include transportation connections, cultural, economic, and recreational connections, as well as connections by natural-heritage features, particularly Twelve Mile Creek. The waters that emerge from the headwaters of Twelve Mile Creek are the same waters that flow through the City of St. Catharines and therefore improvements made in the headwaters of Twelve Mile Creek benefit the City of St. Catharines directly and indirectly.

Ecological Benefits: This project will improve water quality and sediment distribution, decrease the creek's water temperature, improve fish and wildlife passage throughout Twelve Mile Creek, including the section that passes through the City of St. Catharines. In addition, improved water quality and potential habitat creation will increase spawning (reproduction) rates, increasing the Brook Trout population for all those downstream.

Social Benefits: Many outdoor enthusiasts in the City of St. Catharines would benefit from improvements to a native fish population near the City. Increased native biodiversity will improve opportunities like wildlife viewing, hiking and education opportunities. Additionally, moving forward with this project demonstrates the City of St. Catharine's understanding of the importance of addressing natural resource issues that cross municipal boundaries.

Economic Benefits: The improved form and function of Twelve Mile Creek will improve climate resilience within the Twelve Mile Creek watershed, including the City of St. Catharines downstream. Improved resilience will help mitigate infrastructure damage from flooding events. Additionally, restoring trout populations can increase tourism and recreational opportunities. Indirectly, the improved quality of life because of a healthy, dynamic stream will result in indirect economic benefits to the community.

The benefits that will be gained from the implementation of this project within the headwaters of Twelve Mile Creek are cumulative and will be further enhanced by partner projects on tributaries and reaches downstream. TUC and its local Niagara Chapter are highly invested in this watershed and based on our expertise and knowledge, this project will provide the most significant environmental gains in this watershed.

We hope you approve this project and its significant benefits to the watershed, Brook Trout and residents of the region. We look forward to working with your team to realize this project's implementation.

Please do not hesitate to contact us if you have any questions or concerns.

Sincerely,

Kelly Mason
Manager of Project Development
kmason@tucanada.org

Tarandus Associates Limited

Environmental Consultants

18 Regan Road, Unit 24
Brampton Ontario
Canada L7A 1C2

Telephone: (905) 840-6563
Facsimile: (905) 840-6128

www.tarandus.ca

31 March, 2021

Draft

Proposed Offsetting Concept For Abbey Mews and Shore Boulevard Shore-Protection Works, St Catharines

(DFO Files 20-HCAA-00791 and 20-HCAA-03288)

Background

The City of St Catharines has received an Emergency Authorization from the Department of Fisheries and Oceans (DFO) to undertake shore-protection works along the City's Lake Ontario shoreline at a site known as Abbey Mews. Section 4.2 of the Authorization states:

4.2 Scale and description of offsetting measures:

*4.2.1 The Proponent shall develop and submit an offsetting and associated offsetting monitoring plan to DFO for approval no later than **March 31, 2021** that details offsetting measures that will be undertake to counterbalance the unavoidable impacts to fish and fish habitat. The offsetting plan must:*

4.2.1.1 Be developed in accordance with, the 'Fisheries Productivity Investment Policy: A Proponent's Guide to Offsetting'

4.2.1.2 Include a detailed offsetting monitoring plan to assess the implementation and effectiveness of the offsetting measures.

In Early March, 2021, the City was also informed by DFO that Fisheries Act Authorization would be required for proposed shoreline works at a nearby second location, 8 - 14 Shore Boulevard.

At Abbey Mews, the shore-protection works resulted in a loss of 1960 m^2 of aquatic habitat, and at Shore Road site, the proposed shore-protection design will result in a loss of 860m^2 of aquatic habitat for a combined total of 2,820 m^2.

Both sites are located in a high-wave-energy environment and habitat at both locations is virtually identical, consisting of substrates dominated by sand, no macrophytes, and virtually nothing in the way of structural fish habitat (cover, niche spaces, edge, etc). Ecological functions of the near-shore waters at both sites would include providing spawning and nursery habitat for some cyprinids. Larger fish, including sport fish, would probably also be expected to forage in the shallow waters from time to time, although no spawning habitat or other significant habitat for such fish exists at these locations. There are no records of aquatic species-at-risk at either shore-protection site.

In the publication *Fisheries Productivity Investment Policy: A Proponent's Guide to Offsetting* (2013), a hierarchy of measures for fisheries protection is given. From most preferred to least preferred, they are:

Avoidance Measures

Proponents are advised that all efforts should made to design projects and activities or adopt standards to prevent impacts from occurring. With appropriate design and planning, projects may be implemented in ways to avoid serious harm to fish during all phases of the project.

Avoidance measures may include:

- locating the project infrastructure in areas where no harm will occur;
- designing a project and employing measures so that no harm occurs; and
- timing certain activities to prevent interactions with fish at key life stages such as spawning or migration.

In the case of the St Catharines shore-protection works at Abbey Mews, serious harm was unavoidable, and 1,960 m^2 of fish habitat was destroyed. At the Shore Boulevard site, 860 m^2 of aquatic habitat will be unavoidably lost.

Mitigation Measures

When avoidance of serious harm to fish is not possible, then proponents must mitigate potential impacts through best available practices to reduce the extent, intensity and duration of impacts on fish. Mitigation measures should be implemented during all phases of the project.

Mitigation measures may include:

- locating project infrastructure and other physical disturbances where impacts are minimized;
- employing best practices that minimize harm when carrying out projects;
- undertaking measures to stabilize disturbed sites to minimize ongoing or downstream impacts; and
- timing certain activities to minimize interactions with fish and fish habitat.

At the site of the St Catharines Abbey Mews shoreline stabilization works on the Lake Ontario shoreline, a number of mitigation measures were implemented, but they were not sufficient to avoid the loss of 1,960 m^2 of fish habitat. At Shore Boulevard, similar mitigation measures will be used, but they will not be sufficient to avoid some loss of fish habitat.

Offsetting Measures

Because the shoreline works at Abbey Mews and the proposed works at Shore Boulevard result in the loss of 1,960 m^2 of fish habitat after the application of avoidance and mitigation measures, the City of St Catharines must develop a plan to undertake offsetting measures to counterbalance the unavoidable residual serious harm to fish. Offsetting measures, also known as offsets, are measures that are undertaken to counterbalance unavoidable serious harm to fish resulting from a project, with the goal of maintaining or improving fishery productivity.

Some flexibility in the selection of offsetting measures is typically permitted provided they are focussed on improving fisheries productivity. Offsets are most likely to balance losses when they benefit the specific fish populations and areas that are affected by a development project. ***When determining the location for offsetting, offsets that occur within the vicinity of the project or within the same watershed are preferable.***

Tarandus' Engagement

In mid March, 2021, Tarandus Associates limited was engaged by the City of St Catharines to prepare a compensation/offsetting plan concept in regards to the Abbey Mews shore-protection works. Subsequently, Tarandus was also asked to include the proposed Shore Boulevard works in the offset concept. The scope of work for this assignment consists of the following tasks:

1. Undertake discussions with relevant agencies regarding compensation/offsetting possibilities. Agencies to include the Department of Fisheries and Oceans (DFO), the Ontario Ministry of Natural Resources and Forestry (MNRF), the Niagara Peninsula Conservation Authority (NPCA), and Trout Unlimited (TU).

2. Identify one or more projects that would satisfy DFO requirements for compensation/offsetting. Select a preferred project, with alternatives if the preferred is not feasible.

3. Develop a compensation/offsetting plan for the preferred project, discuss with agencies with the aim of securing agreement in principal.

4. Prepare a justification/rationale, a workplan, a budget, and a timeline for implementation of the preferred compensation/offsetting concept.

5. Submit the compensation/offsetting concept to DFO for review and to obtain agreement in principal for the proposed works.

Alternative Habitat-Compensation Locations Considered

Tarandus initially consulted all parties noted in Task 1 above to discuss possible compensation sites close to the location of habitat loss on Lake Ontario. Two emerged for consideration - rehabilitation/restoration in Dick's Creek and a fishway to allow fish passage from Lake Ontario around the downstream-most damn and into the Twelve Mile Creek watershed.

After discussions, Dick's Creek was deleted from further consideration because it was felt that any rehabilitation efforts in the way of tree planting, refuse removal, etc. would not likely be sufficient to offset the loss of 2,820 m^2. of fish habitat. Similarly, the construction of a fishway at the mouth of Twelve Mile Creek was discarded because of concerns about the negative effects of allowing lamprey, rainbow trout, and other non-native fish into the Twelve Mile Creek watershed.

Possible habitat-compensation projects were also considered for the near-shore area of Lake Ontario at St Catharines. The reality is that the Lake Ontario shoreline is located in a high wave-energy environment, and any constructed-habitat works (reefs, spawning shoals etc) in that setting need to be designed to withstand storm activities. Large materials are usually required and such structures are often expensive. They are also frequently of dubious ecological functionality.

The NPCA, MNRF, and TU had no further suggestions for suitable habitat compensation/offsetting opportunities near Abbey Mews or within the City of St Catharines.

Rationale for Proposed Habitat-Offset Location in the Headwaters of Twelve Mile Creek

After much consultation and consideration, there appears that there are no suitable compensation site(s) near the Abbey Road and Shore Boulevard site or within the City boundary and that the offsetting works need to be undertaken elsewhere in the Twelve Mile Creek watershed. This proposed course of action is consistent with the aforementioned DFO policy that "*When determining the location for offsetting, offsets that occur within the vicinity of the project or within the same watershed are preferable*".

A central tenet of ecology is that "everything is connected to everything else", and this concept applies to the prospect of remedial or enhancement works in the headwaters of Twelve Mile Creek. The City of St Catharines is connected in many ways, directly and indirectly, to the uppermost reaches of the watershed in which it is located. These include transportation connections, cultural, economic and recreational connections, as well as connections by natural-heritage features, particularly Twelve Mile Creek. The waters that emerge from the headwaters of Twelve Mile Creek are exactly the same waters that flow through the City of St Catharines. It should therefore be evident that improvements made in the headwaters of Twelve Mile Creek benefit the City of St Catharines directly and indirectly. These benefits include improvements to water quality and ecological functionality associated with the watercourse. There are likely many anglers in the City of St Catharines that would also benefit from improvements to a cold-water fish population near the City.

With these considerations in mind, the focus was shifted to finding a potential compensation/offsetting location in the headwaters of Twelve Mile Creek. It should be noted that the headwaters of Twelve Mile Creek support the last remaining population of native brook trout on the Niagara Peninsula.

Proposed Offset Concept

After consultation with Trout Unlimited and other agencies, the habitat-compensation location that has emerged as the preferred candidate is Cannery Pond located in the St John's Branch of the Twelve Mile Creek watershed. It is situated a short distance northwest of the intersection of Pelham Street and Linden Avenue in the Town of Pelham, approximately 6.5 km southwest of the City of St Catharines (Figure 1).

The subject pond is on privately owned land has existed at site for many years. It was reportedly constructed to provide cooling water for an adjacent cannery (see Appendix I, Photos 1 - 4). It is an on-line pond; it has no control structure; and it has been accumulating sediments since it was first constructed. The dam is imposing a barrier to fish movement and the pond is warming the water flowing downstream from the dam, thereby impairing the quality of downstream habitat and making the downstream watercourse uninhabitable for cold-water fish such as brook trout.

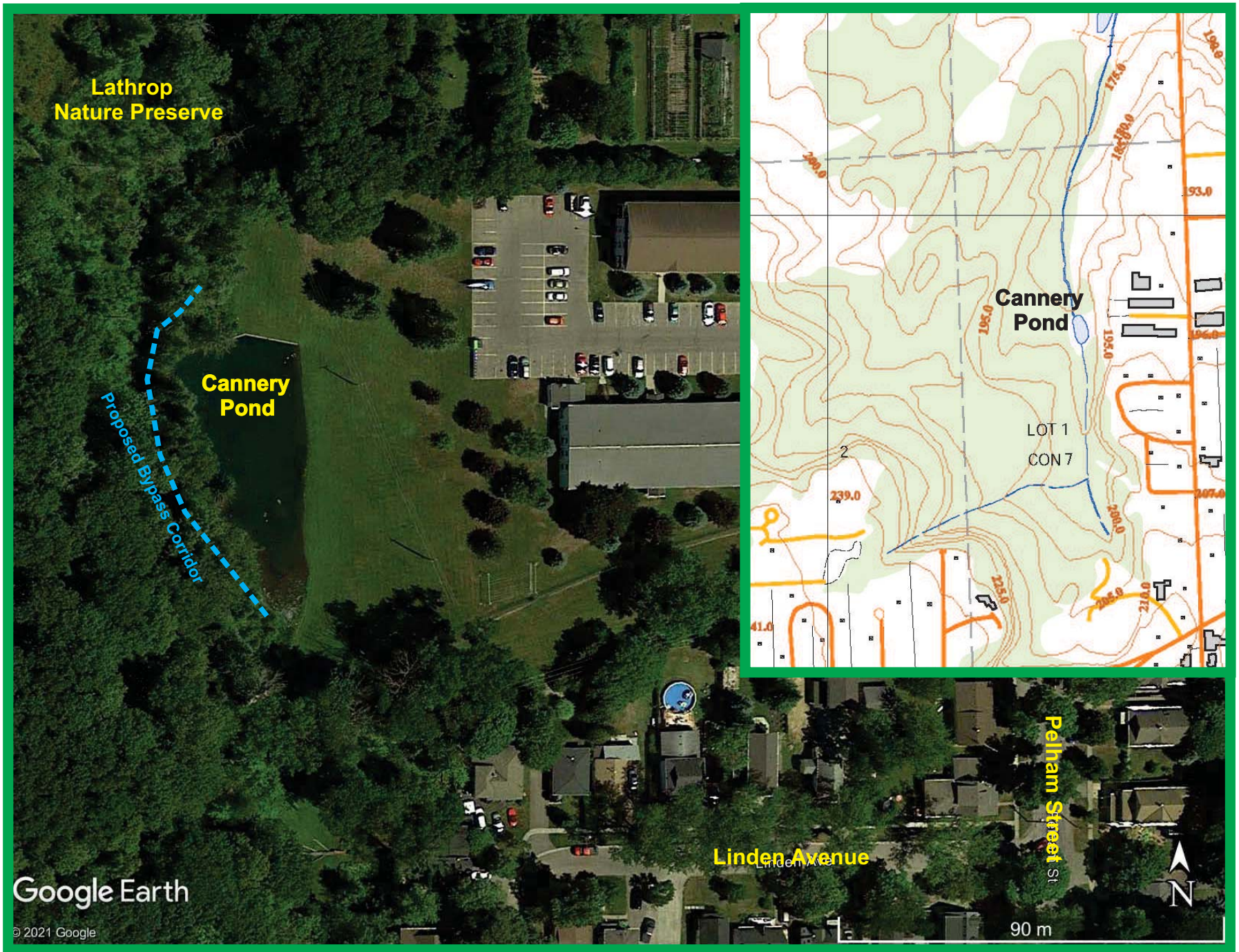


Figure 1: Cannery Pond and Possible Bypass Corridor

A survey completed by GEI, Savanta Division in 2019 indicated that the habitat upstream of Cannery pond appeared to be suitable fish habitat and temperatures were generally below 15ºC, no fish were found in the upstream reaches (Appendix II).

The subject pond is on privately owned land has existed at site for many years. It was reportedly constructed to provide cooling water for an adjacent cannery (see Addendum, Photos 1 - 4). It is an on-line pond; it has no control structure; and it has been accumulating sediments since it was first constructed. The dam is imposing a barrier to fish movement and the pond is warming the water flowing downstream from the dam, thereby impairing the quality of downstream habitat and making the downstream watercourse uninhabitable for cold-water fish such as brook trout.

Initially, the proposed remedial works were to remove the dam and restore the original channel. The owner, however, wants to retain the pond, so an alternative enhancement concept was developed - the construction of a bypass channel around the pond. This channel would be designed to convey water now flowing to the pond, to provide fish passage around the pond, and to provide water to the pond during high-flow events. The proposed bypass channel would be located to the west of Cannery Pond (Figure 1), largely on lands owned by the Nature Conservancy of Canada (NCC).

This concept has been discussed with DFO, the Niagara Peninsula Conservation Authority (NPCA) and with the Ontario Ministry of Natural Resources and Forestry (MNRF), all of which are believed to be supportive of the offset concept, subject to review of detailed plans. Discussions are currently underway with the NCC. Please see Appendix III - Correspondence Regarding Proposed Offset-Plan Concept.

The proposed offset plan is consistent with agency objectives, particularly the NPCA (Twelve Mile Creek Watershed Strategy; June, 2000) as well as those of relevant interest groups such as Trout Unlimited.

Tasks and Timeline

If approved by DFO and other agencies (NPCA and MNRF), it is expected that pre-construction work completed in 2021 would consist of:

2021

1. Procurement of agreement from the Nature Conservancy of Canada for the channel location;
2. A topographic survey of the site;
3. Soil sampling;
4. Detailed bypass-channel design; and
5. Acquisition of permits.

2022

6. Construction of the bypass channel

2023 - 2025

7. Post Construction Monitoring

Offsetting Plan Objectives

The objectives of the Offsetting Plan are:

1. To achieve water temperatures downstream of Cannery Pond which are supportive of cold-water fish species such a brook trout i.e. predominantly at or below 15^{o}C; and

2. To achieve fish passage past Cannery Pond.

Post Construction Monitoring

It is proposed that three years of post-construction monitoring be undertaken, consisting of

- monitoring of the upstream and downstream water temperatures from April to October with the use of dataloggers;
- an annual fish survey each year upstream and downstream from the Cannery Pond;
- confirmation of the continuing stability of the constructed bypass channel; and
- the preparation of an annual written report for submission to DFO and other agencies.

Costs

The preliminary estimated costs of the implementation of the proposed offset concept are as follows:

2021	Procurement of agreement from the NCC for the channel location	$5,000
	A topographic survey of the site	$10,000
	Soil sampling	$20,000
	Detailed bypass-channel design	$35,000
	Acquisition of permits	$5,000
2022	Construction of the bypass channel	$100,000
2023	Year 1 of post-construction monitoring	$5,000
2024	Year 2 of post-construction monitoring	$5,000
	Year 3 of post-construction monitoring	$5,000
	Contingency	$10,000
Total		$200,000

Appendix I

Cannery Creek Photos

Photo 1: Cannery Pond dam.

Photo 2: Spillway at Cannery Pond

Photo 3: View of pond from east.

Photo 4: View of pond from south.

Appendix II

Technical Memorandum

From GEI (Savanta Division)

Regarding

Cannery Pond Creek - Ecological Study Results

GEI Consultants
Savanta Division

TECHNICAL MEMORANDUM

To:	Don Speller, Tarandus Associates Ltd.	From:	Noel Boucher
Cc:	Liv Monck-Whipp, Nature Conservancy of Canada Brian Green, Trout Unlimited Canada		
File:	1902007	Date:	March 30, 2021

Re: Cannery Pond Creek – Ecological Study Results

GEI Consultants – Savanta Division (GEI) has been retained by the Nature Conservancy of Canada (NCC) to assist with the design and implementation of an ecological restoration project on their Lathrop Property, located in Pelham, Ontario (**Figure 1**, **Appendix A**). Specifically, the NCC is proposing to implement a project to decrease the influence of two man-made ponds on the property on downstream water temperatures in the headwaters of Twelve Mile Creek. GEI's scope of work on the project included the completion of baseline ecological studies at various locations on the property to identify existing ecological features and functions to assist in identifying restoration design concepts, opportunities and constraints. Fish community sampling, aquatic habitat assessment and water temperature assessment were completed as part of the baseline studies.

Although the watercourse upstream from Cannery Pond, which is being referred to as Cannery Pond Creek, is located outside the scope of the proposed restoration project, GEI completed baseline fish community sampling, habitat assessment and water temperature monitoring on the watercourse, given that the reaches upstream from the Cannery Pond appear to be relatively natural and could be used to compare to the reaches altered by the man-made ponds. Cannery Pond itself is located outside the NCC Lathrop Property, therefore, GEI did not have access to the pond or downstream watercourse reaches.

This Technical Memorandum summarizes the methodology and results of GEI's assessment on the Cannery Pond Creek.

1.0 SURVEY METHODS

1.1 Fish Community Survey

The fish community survey on Cannery Pond Creek was completed on July 5, 2019. The survey consisted of backpack electrofishing (using a Halltech HT-2000 backpack electrofishing unit) within a 54-m long reach located immediately upstream from the wooden pedestrian bridge. The bridge itself is located approximately 13 m upstream from Cannery Pond.

Sampling was completed in general accordance with the Ontario Stream Assessment Protocol (OSAP) single-pass survey methodology. Accordingly, all areas of the watercourse were sampled in an attempt to collect fish from the various habitat types within the reach. A total sampling effort was 833 shocking seconds was expended.

Conditions during the survey were deemed highly suitable to collect fish. Water was clear with good visibility to the bottom of the channel and depth was low (~25 cm maximum) with limited obstructions that would hinder the effectiveness of fish collection.

1.2 Aquatic Habitat Assessment

The Aquatic Habitat Assessment consisted of a visual survey of existing instream and riparian habitat conditions throughout the reach of the Cannery Creek Pond that was subject to fish community sampling. The assessment took note of any of the following features:

- Hydrology (e.g. flowing or standing water);
- General watercourse morphology (e.g. riffle, run, pools);
- Wetted width and depth (at time of survey);
- Bed and bank substrate;
- Instream habitat (e.g. woody debris, aquatic vegetation, undercut banks);
- Presence of obstructions to fish movement (e.g. culverts, debris dams);
- Evidence of groundwater inputs (e.g. seeps or springs, iron flocculation/staining); and
- Riparian habitat.

A general reconnaissance survey was completed on other portions of Cannery Pond Creek upstream from the detailed assessment location.

A photographic record of habitat conditions in the watercourse was collected during the assessment (see **Appendix B** for representative photos).

1.3 Water Temperature Assessment

Water temperature monitoring was completed at one location in Cannery Pond Creek using a Hobo Pendant temperature logger. The logger was installed on the stream bed within the deepest portion of the creek (approximately 25 cm) in a shaded location. The monitoring location was approximately 35 m upstream from Cannery Pond (**Figure 1**, **Appendix A**).

The temperature logger was installed on June 11, 2019 and was removed on November 11, 2019. The logger was set to record at 30 minute intervals during this time period. An air temperature logger was also installed on the Lathrop Property to monitor air temperatures throughout the observation period.

2.0 SURVEY RESULTS

The following sections provide a brief summary of the results of the aquatic surveys completed on Cannery Creek Pond.

*2.*1 Fish Community Survey

Despite the presence of habitat that appeared suitable for fish, no fish were captured within the reach of

Cannery Pond Creek surveyed on July 5, 2019.

Further to this, GEI has also completed incidental observations within the surveyed reach on multiple occasions in 2019 (e.g., during monthly water temperature logger download events and during other ecological surveys) and has never observed any fish in this reach.

Finally, no fish were visually observed in other portions of Cannery Pond Creek that were subject to the site reconnaissance survey on August 27, 2019, despite the appearance of aquatic habitat conditions that appeared suitable for fish, particularly within the 250-m long reach upstream from the Cannery Pond.

2.2 Aquatic Habitat Assessment

The results of the detailed aquatic habitat assessment completed within Cannery Pond Creek at the electrofishing survey station, as well as general observations throughout the upstream reach, are provided in the following sections. No access to Cannery Pond was available to GEI during the surveys.

2.2.1 Detailed Habitat Assessment

The 54-m long reach subjected to a detailed aquatic habitat assessment consisted of primarily run/flat habitat with several riffles and no deeper pools. Substrate is primarily sand, with gravel present in the faster flowing riffle sections and quicker runs, primarily within the thalweg of the stream. Wetted width and depth during the generally averaged 1.60 m and 0.14 m, respectively, while bankfull width and depth was generally around 2.0 m and 0.40 m, respectively. The maximum wetted width observed was approximately 2 in a sandy flat area. Some woody debris is present in the watercourse, with some partially buried woody pieces creating small, localized scour pools and velocity variations.

Riparian habitat was generally woody in the overstory, with a mix of shrubs and trees, although a portion of the left bank (looking upstream) consists of manicured lawn associated with the adjacent residential property.

2.2.2 Reconaissance Survey

The reconnaissance survey was completed on August 27, 2019 within the reach approximately 500 m upstream from the Cannery Pond. The watercourse generally runs within a defined valleyland (with adjacent top of slope heights of up to 20 m above the stream bed) and appears to originate from groundwater discharge, given that it is a permanently flowing watercourse. The feature is entirely located within a forested area.

The upstream most sections of the watercourse generally have higher gradients and consist of various cascade/riffle features with some cobble and gravel, although sand is the dominant substrate. In flatter areas along valley floor sections, the channel is incised by up to 1 m and morphology is primarily sand and gravel-based riffles and runs. Pool habitat is limited throughout the reach.

Wetted widths measured between 0.75 m in the upper end to around 3 m in the lower end of the reach. Numerous small headwater channels originate from adjacent valley areas. Wetlands are also present on

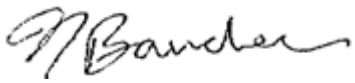
the valley floor and these appear to be providing groundwater discharge to the watercourse. Instream habitat features primarily consist of large woody debris (single fallen trees and debris tangles), some undercut banks and overhanging vegetation.

2.3 Water Temperature Assessment

Water temperature monitoring results are shown on **Figure 2** (**Appendix A**). Daily average temperatures through the summer months were generally less than 15°C. The absolute maximum temperature observed (19.57°C) was seen in early July 2019, when air temperatures exceeded 30°C.

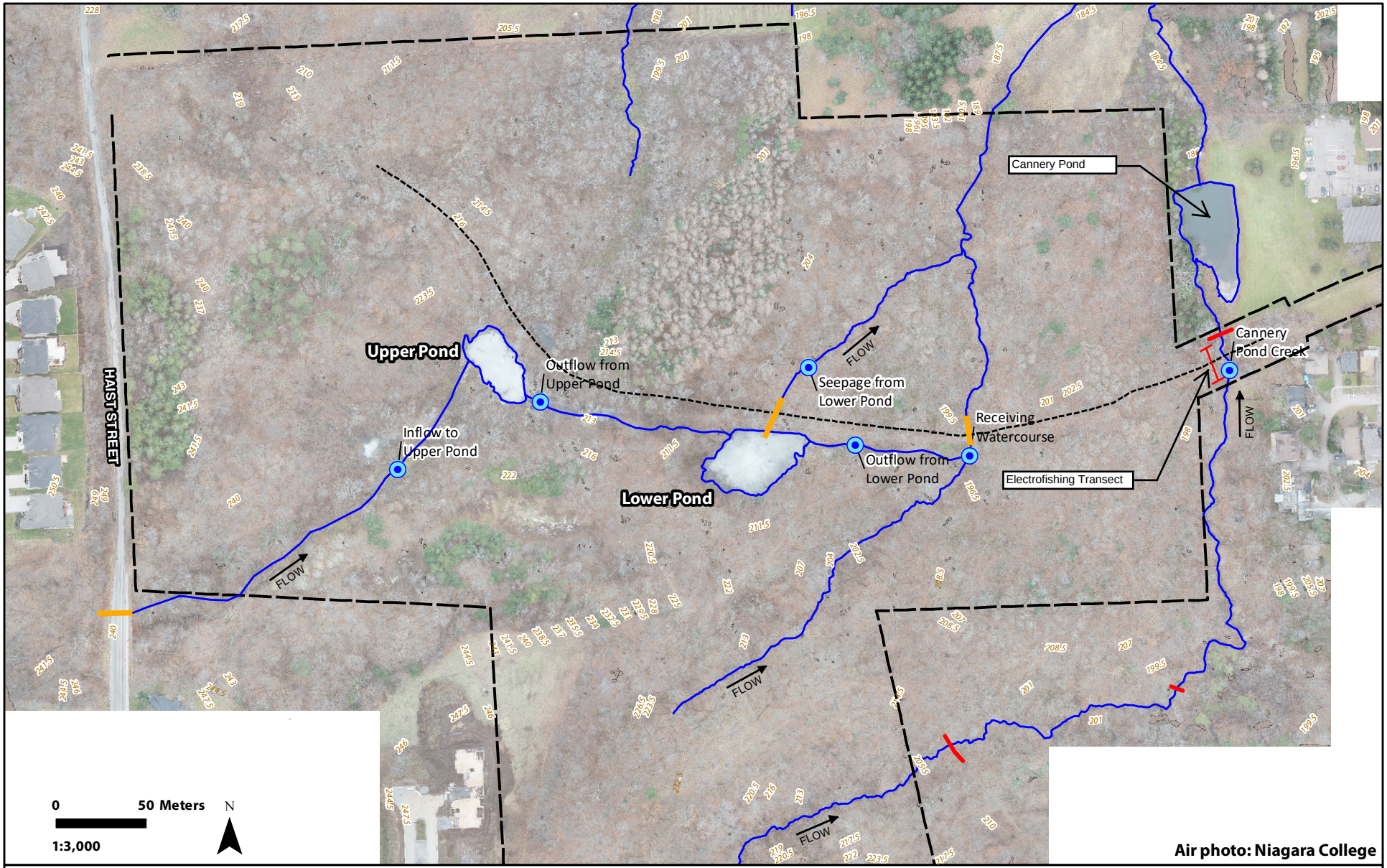
I trust this information is of assistance. Please do not hesitate to reach out the undersigned to discuss any aspect of this.

Yours truly,
GEI Consultants – Savanta Division



Noel Boucher
Senior Fisheries Biologist
289-929-6951
nboucher@savanta.ca

APPENDIX A - FIGURES



Lathrop Pond Removal

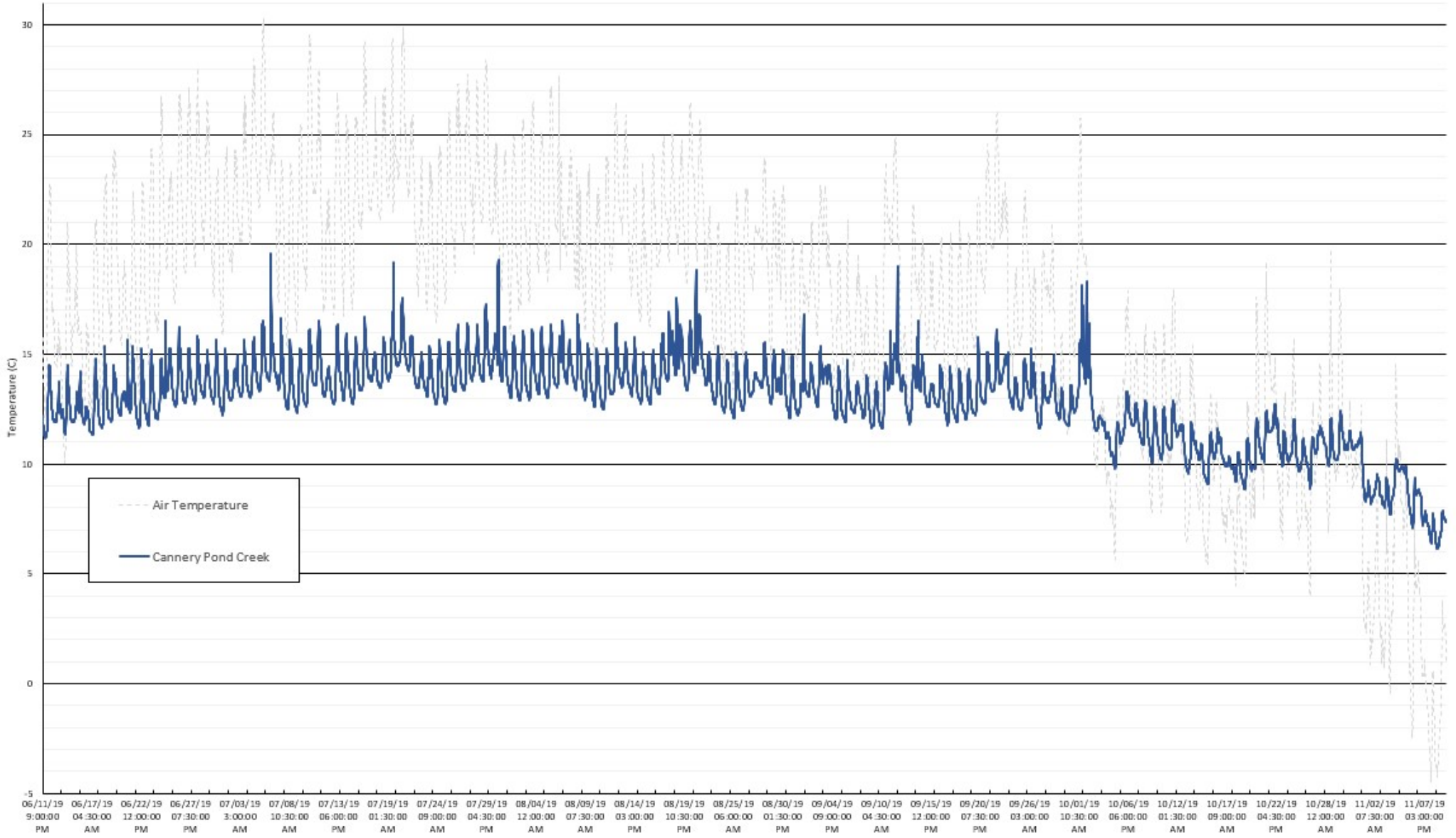
Figure 1
Watercourses and Water Temperature Monitoring Locations

Subject Lands
Berm
Bridge
Culvert
Watercourse
Water Temperature Monitoring Location

SAVANTA
A GEI Company

Path: S:\9266 - SAV 8200\gis\mxd\2019 04 08\Figure 1 Watercourses and Water Temp Monitoring Locations.mxd REVISED: July 9, 2019

Figure 2 - Cannery Pond Creek - Water Temperature (June 11 - November 11, 2019)



APPENDIX B - Cannery Pond Creek - Aquatic Habitat Photographs

Photo 1 – Cannery Pond Creek just upstream from pedestrian trail crossing

Photo 2 – Approximately 20 m upstream from pedestrian trail crossing

Photo 3 – Cannery Pond Creek approximately 200 m upstream from Cannery Pond

Photo 4 – Cannery Pond Creek at pedestrian trail crossing approximately 350 m upstream from Cannery Pond

Photo 5 – Cannery Pond Creek approximately 450 m upstream from Cannery Pond

Appendix III

Correspondence Regarding

Proposed Offset-Plan Concept

From: St.Denis, Jocelyn [mailto:jstdenis@stcatharines.ca]
To: dspeller@tarandus.ca
Sent: Tue, 30 Mar 2021 17:18:50 +0000
Subject: RE: Rationale for compensation/offsetting site

Don,

The City is planning to move forward with this by presenting it to Council as an extension of our permitting requirements for the project, since that is technically what it is. At this time, our plan is to present it to Council following the tendering of Shore Blvd (which is planned to go to tender tomorrow with a 2 week tender period) and therefore with the timeline requirements for presenting items at Council, it would be expected that it would go to Council in May. Please proceed as though there are no concerns with Council having issues with the project. We have the approval of Senior Staff and with the requirements from DFO, we need to submit the information. Should Council end up having issues with the compensation project, then we will deal with that at that time, but for now, we will proceed with it.

Thank you,

Jocelyn

Jocelyn St.Denis P.Eng.
Design & Construction Engineer
City of St Catharines

Email: jstdenis@stcatharines.ca

Tel: 905.688.5601 x1608

TTY:905.688.4TTY (4889)

Mail: PO Box 3012, 50 Church Street, St. Catharines, ON L2R 7C2

Trout Unlimited CANADA
NIAGARA CHAPTER

March 31, 2021

Mr. Don Speller
President, Tarandus Associates Ltd.

Subject: Pelham Cannery Pond Project in the Twelve Mile Creek Watershed

Don,

The Niagara Chapter of Trout Unlimited Canada fully endorses the proposed restoration project in the Twelve Mile Creek watershed at the Cannery Factory pond near the top of the headwaters. Data collected above and below this pond has shown that the current configuration of an online pond at this location is exerting a negative impact on the health of the watershed.

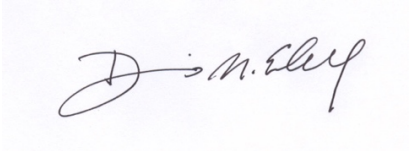
As you know Twelve Mile Creek is located within the Niagara Escarpment, a UNESCO) World Biosphere Reserve. It flows from Pelham through Thorold, St. Catharines and into Lake Ontario and has been identified as the Niagara region's most significant coldwater resource. As well it represents Niagara's only year-round coldwater stream to support a population of native Brook Trout.

The Niagara Chapter works to preserve and protect the Twelve Mile Creek watershed and restore the dwindling Brook Trout population, an indicator of a clear, clean and healthy freshwater system.

For the past ten years in partnership with Niagara College's environmental studies and with the NPCA, we have identified priority areas for restoration work. One of the areas of importance is the Cannery pond that in its current state contributes significant negative impacts on both temperature and water quality downstream. A bypass or dam reduction at the Cannery pond will go a long way toward restoring the health of the entire watershed ensuring healthy clean water flows from the headwaters into St. Catharines and beyond.

Should you need any additional information please contact me.

Sincerely,



Dennis Edell
President, Niagara Chapter, Trout Unlimited Canada

From: Denyes, David (MNRF) [mailto:David.Denyes@ontario.ca]
To: dspeller@tarandus.ca
Sent: Tue, 30 Mar 2021 20:07:12 +0000
Subject: RE: Proposed Bypass Channel at Cannery Pond

Hello Don,

From a fisheries perspective, I would be supportive of the concept of taking this pond offline using a bypass channel, subject to further review of future details and permit applications.

I look forward to discussing this proposal with you in greater detail in the future.

Best regards,

David

David Denyes

Management Biologist

Ministry of Natural Resources and Forestry

Vineland Field Office

4890 Victoria Avenue North

Vineland Station ON, L0R 2E0

Tel: (289) 241-6872

david.denyes@ontario.ca