

REPORT

COUNCIL MEETING

MEETING DATE: JUNE 22, 2020

FROM: Development Engineering Department

DATE: June 10, 2020

SUBJECT: Munn's Creek Erosion Mitigation Study

LOCATION: Munn's Creek between Culham Street and Upper Middle Road

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RECOMMENDATION:

1. That the Environmental Study Report project file and the preferred planning solutions for the stabilization and rehabilitation of Munn's Creek, Reaches 33 to 35 as outlined in the staff report from the department of Development Engineering dated June 10, 2020, be received; and
2. That the Notice of Completion for the Munn's Creek Erosion Mitigation Study, Reaches 33 to 35 environmental study project file be published commencing the mandatory public review period (45 days commencing - Sept 1, 2020 to Oct 15, 2020).

KEY FACTS:

The following are key points for consideration with respect to this report:

- Munn's Creek between Culham Street and Upper Middle Road was identified in the 2015 Erosion Inventory and Assessment Study report as a priority erosion site and was later raised to the highest priority site for erosion mitigation in an update to the Erosion Inventory and Assessment Study in 2017 when it became evident that there had been further deterioration and risk to public and private property.
- The engineering planning and review process to remediate the creek must follow a Municipal Class Environmental Assessment (EA) process (as a Schedule B undertaking).
- This study has been carried out in close association with the Munn's Creek Flood Mitigation Opportunities EA study which was completed in 2019.
- Based on the geomorphic, geotechnical and erosion hazard assessments, eight (8) erosion sites (Figure A) along Munn's Creek were identified and mitigation alternatives were investigated for each site.

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- Alternatives were assessed based on the following evaluation factors: physical and ecological environment; technical and engineering considerations; social and cultural considerations; and economic considerations.
- Based on this evaluation, alternatives were short-listed and discussed with staff from Conservation Halton and Region of Halton.
- An overview of the issues, alternatives, evaluation and preliminary preferred alternative solutions were presented at two Public Information Centers (PIC) on April 30, 2019 and March 12, 2020.
- The recommended erosion mitigation works are proposed to be undertaken at six (6) of the eight (8) erosion sites identified using a combination of hard engineering (armourstone), natural channel design principles, and soft bioengineering approaches.
- The recommendation for the first of the two (2) remaining erosion sites is continued monitoring by the town following some clean-up of debris in the channel.
- The recommendation for the second remaining erosion site is to allow erosion to continue in short-term, but to address erosion as part of the future Oakdale Park trail culvert/bridge replacement project as recommended in the associated flood EA study.
- The recommended solutions address the long term sustainability of the creek and considers such factors as creek confinement, habitat function and tableland uses.
- An Environmental Study Report has been compiled, documenting the selection of a preferred solution and preliminary design plans and is required under a Schedule B Class EA undertaking to be made available for a mandatory public review period (45 days commencing - Sept 1, 2020 to Oct 15, 2020).

BACKGROUND:

Reaches 33 to 35 of Munn's Creek flow from Upper Middle Road to Culham Street in central Oakville (Figure 1). Failure of revetment and bank erosion are prevalent throughout these reaches with the dominant channel processes being widening with down-cutting of the channel bed.

Reaches 33 to 35 of Munn's Creek was ranked 2nd priority under 'Reach Long Areas of Concern' in the 2015 Creek Inventory and Assessment Study which recommended the need for an Environmental Assessment to address erosion mitigation.

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In December of 2017, Munn's Creek was reassessed due to deteriorated conditions observed earlier that year. This resulted in a re-prioritization of erosion sites, making Munn's Creek the top priority reach.

Funding was included in the 2018 approved capital budget to move the Munn's Creek Erosion Mitigation Study forward through the environmental assessment process. Funding is currently available to proceed to the detailed design. Funding for construction was previously identified in the 2020 budget, but was recently deferred to 2021 as part of the COVID capital review exercise as it was acknowledged that construction was not in a position to proceed in Summer/Fall 2020. The project is on target to proceed with construction in 2021

The study and the development of a preferred improvement solutions have been completed in accordance with the Municipal Class Environmental Assessment (EA) process as a Schedule B undertaking. Public and technical review agencies were consulted as required through the EA planning process.

COMMENT/OPTIONS:

The Munn's Creek Erosion Mitigation Study was initiated and managed by the Development Engineering Department commencing in October 2018. The consulting firm of Aquafor Beech Limited was retained to carry out the study assignment.

The current conditions of the Munn's Creek system are related to historic urbanization within the watershed (pre-1980's) prior to the adoption of storm water management practices – which serve to mitigate such impacts. The creek has responded to the changes in its watershed through increased erosion along its channel length. If left unmanaged, this erosion can result in increased risk to public infrastructure (culvert, bridges, road embankments, trails and historic erosion protection measures already in place), and loss of private property.

An inventory of the study area was carried out to determine the root cause of the problem in order to better identify a solution. The following disciplines were included in the inventory: geology and soils, stream morphology, hydrology, hydraulics, hydrogeology, aquatic resources, terrestrial resources and a geotechnical review.

A total of eight (8) erosion sites with specific risks were identified. The eight (8) erosion sites locations are provided in Appendix A. The table below provides a summary of issues identified at each location. The total channel length of all erosion sites combined is approximately 710 metres.

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Erosion Site	Erosion Issue	Area at Risk
1	Narrow corridor, steep valley slopes, eroding banks, and failed gabion baskets and rip-rap in channel	Oakdale Park asphalt trail
2	Failed gabion baskets downstream of pedestrian bridge	Pedestrian bridge in Oakdale Park
3	Narrow corridor, steep vegetated slope (east bank) and bank erosion adjacent to trail (west banks)	Oakdale Park asphalt trail and adjacent private properties
4	Undermined gabion baskets (downstream east bank) and erosion of valley slope (upstream west bank)	Culvert (berm) and pedestrian trail connecting Oakdale Dr. and Onslow Ct.
5	Failed gabion baskets, armourstone, bank erosion (west bank), and steepened valley slope (east bank)	Private properties and pedestrian bridge
6	Erosion along private properties and fence lines in narrow corridor	Private properties and fence lines due to bank erosion
7	Steep bedrock valley wall and eroding bank (east bank), and steep vegetated valley slope (west bank)	Private property (Region of Halton Community Housing Complex)
8	Erosion of private properties and fence lines in narrow corridor	Private properties and fence lines due to bank erosion (encroachment of adjacent landowners into publicly owned lands).

Through the course of investigations, it was identified that encroachments by adjacent landowners into publicly owned creek corridor is causing further confinement of the creek channel and aggravating the erosion issue. Town Parks and Open Space staff have been notified and will be contacting landowners with encroachments and will determine a course of action to have encroachment removed in order to gain back public lands.

Site-specific constraints that influence the type of mitigation options available for the project have been identified, specifically: ownership of lands and access along the creek corridor, and existing vegetation.

Alternative solutions were assessed based on the following evaluation factors:

- Environmental/Physical considerations;
- Social considerations; and
- Economic considerations (short and long term).

The following alternative solutions were considered at each site:

- Alternative 1- Do nothing:
This alternative involves leaving the site as it is and allowing erosional processes to continue within the watercourse corridor.
- Alternative 2: Selective Works (Local Erosion Protection)
This alternative consists of localized channel bank and/or bed work to address erosion issues at the site.
- Alternative 3: Reach Scale Channel Engineering (Channel Realignment)
This alternative consists of a reach-scale approach (or near reach-scale) to address erosion issues at the site. Depending on constraints and risks, this alternative may vary with the degree of channel hardening to control erosion, including stable channel engineering; natural channel design (NCD); or alluvial channel design.
- Alternative 4: Removal of Risk (Assisted Natural Recovery)
This alternative consists of allowing erosion to continue and/or restoring natural stream processes, including natural erosion, by removing risks from the channel and corridor.

Based on this evaluation, alternatives were short-listed and discussed with staff from Conservation Halton and Region of Halton. Based on these discussions and public input, the following preferred alternative for each erosion sites are recommended. Preliminary plans for each sites are provided in Appendix B

Erosion Site 1 - Do Nothing Recommended to allow erosion to continue, but also to remove gabion baskets (without heavy machinery), fallen trees, and woody debris; monitor erosion progress and to relocate trail further away in future (>50 years), if necessary.

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Erosion Site 2 – **Selective Works Recommended** to repair and extend armourstone and bed works downstream (including grade control) with transition to bedrock-alluvial channel.

Erosion Site 3 – **Selective Works Recommended** to construct a low height armourstone retaining wall to protect the west bank along the asphalt trail within Oakdale Park.

Erosion Site 4 – **Do Nothing Recommended** to allow erosion to continue in short-term, but to address erosion as part of future Oakdale Park trail culvert/bridge replacement project.

Erosion Site 5 – **Selective Works Recommended** to construct an armourstone retaining wall and regrade/restore the slope on the east side; to restore opposite bank on the west side; and to install a larger span pedestrian bridge. Channel realignment to include grade control.

Erosion Site 6 – **Selective Works, Soft Engineering Approaches Recommended** to slow erosion, such as placement of flagstone structures locally along eroding banks without heavy machinery.

Erosion Site 7 – **Selective Works Recommended** to construct an armourstone retaining wall and regrade/restore the slope on the east side and to restore the opposite bank on the west side. Channel realignment to include grade control.

Erosion Site 8 – **Selective Works, Soft Engineering Approaches Recommended** to slow erosion, such as placement of flagstone structures locally along eroding banks without heavy machinery, and including removal of encroachment impacts from private landowners with riparian restoration and replacement of new fence lines where required.

In order to accommodate this solution, removal of some localized vegetation/trees along the bank areas will be required. These details will be further developed during the detailed design phase. The design phase will also include landscaping plans with details on trees, shrubs and/or groundcover requirements for compensating the above loss. This work will be planned in coordination with staff from the Town's Parks and Open Space department and Conservation Halton.

Town staff have begun engaging the property owners where temporary/permanent easement are required to allow the creek to be widened (Erosion Site 5 and 7). Conversations with the landowners have been positive in this respect.

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At several other sites "Permission to Enter" authorizations will be obtained in order to facilitate works along the boundaries between town owned and privately owned lands.

Development Engineering staff have discussed the various sites with Town Legal staff and will continue to work with Legal to obtain the necessary agreements/authorizations to carry out the recommended works.

An Environmental Study Report has been compiled documenting the selection of a recommended preferred solution and preliminary design plans. In accordance with a Schedule B undertaking, the project file must be made available for a mandatory 30-day public review period and staff are proposing extend the review period to 45 days commencing Sept 1, 2020 to Oct 15, 2020. In recognition of current COVID 19 restrictions the report will be made available on the town's website and special accommodations to view hard copies will be determined on an as needed basis. Should no Part II Board Orders be received by the Minister of Environment Conservation and Parks during the review period, the project will be deemed approved allowing it to proceed to detailed design and implementation. It should be noted that the Municipal Engineers Association (the author of the Class Environmental Assessment document that municipalities use to guide them through the Class EA process), in consultation with the Ontario Ministry of Environment, Conservation and Parks, has no objection to proper use of on-line public engagement to complete Class EA studies such as the Munn's Creek Erosion Mitigation Study.

Appendix B presents the consultant's executive summary report and preliminary design plans for this project.

Next steps include the detailed design of the preferred alternative, as well as permitting and/or agreement by Conservation Halton (CH) and Region of Halton and other impacted property owners. Construction of in-stream works within this reach is permitted by CH between July 1st and March 31st annually due to fisheries concerns.

Construction for this project is targeted for 2021 for in-stream work subject to approval of the environmental study report file and permit approvals.

CONSIDERATIONS:

(A) PUBLIC

Over 150 properties owners that are situated adjacent to the town-owned creek corridor between Upper Middle Road and Culham Street all have been notified of the study work and invited to the public information centre.

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An overview of the issues, alternatives, evaluation and preliminary preferred alternative solutions were presented at two Public Information Center (PIC) on April 30, 2019 and March 12, 2020.

While primarily positive comments were received by the public during and following these information meetings, there were some concerns regarding potential impacts to mature trees within the creek corridor. These concerns will continue to be considered during the detailed design process.

Stakeholders, as well as residents/landowners who expressed an interest in being updated of the progress of this project will be advised, via the formal Notice of Completion for the EA study, regarding the commencement of the 45-day public review period.

(B) FINANCIAL

The 2020 capital budget provided sufficient funds to complete the EA Study and to move forward with the detailed engineering design and construction.

The estimated construction cost for the creek erosion works is approximately 1.9 million dollars. Details are provided in the table below:

Erosion Site	Description of Works	Estimated Cost
1	Remove gabion wire and debris	\$50,000
2	Bed and bank erosion control	\$200,000
3	Bank erosion control (one side)	\$120,000
4	Do nothing – to be addressed in future recommendations of Flood Mitigation EA Study with the next 5 to 10 years.	-
5	Bed and bank erosion control (local) and pedestrian bridge upgrade	\$340,000
6	Bank erosion control	200,000
7	Bed and bank erosion control.	320,000
8A	Regrade and restore floodplain. Work to be completed separately once encroachments are removed. Timeframe to carry out this work is currently unavailable	\$230,000
8B	Bank erosion control (local)	\$180,000
	Total	\$1,640,000
	20% Contingency	\$328,000
	Total Construction Cost Estimate	\$1,968,000

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(C) IMPACT ON OTHER DEPARTMENTS & USERS

As this project moves into detailed design and forward to implementation, staff will work with both internal partners including staff from Parks and Open Space and Legal, and external parties such as Conservation Halton, Region of Halton and area stakeholders, to facilitate the design and construction of the recommended works.

(D) CORPORATE AND/OR DEPARTMENT STRATEGIC GOALS

This report addresses the corporate strategic goal to:

- enhance our natural environment
- have environmentally sustainable programs/services

(E) COMMUNITY SUSTAINABILITY

Erosion protection measures provide creek channel protection for both town infrastructure and parkland and private properties abutting the channel. This provides a benefit to the community through protection of table lands and park areas adjacent to the creek, as well as, preserving and protecting the aquatic and terrestrial habitat.

APPENDICES:

- Appendix A - Map of Study Area
- Appendix B - Munn's Creek Erosion Mitigation EA Study, Reaches 33 to 35, Executive Summary

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