



APPENDIX E

CLASS ENVIRONMENTAL ASSESSMENT UPDATE TECHNICAL MEMORANDUM

Memo

To: Kasia Piskorz and Paul Allen, Town of Oakville

From: Ron Scheckenberger, Steve Chipps and Matt Senior, Amec Foster Wheeler

Date: May 24, 2017

File: TP114001

Re: **Coronation Park Drainage Improvements Class Environmental Assessment
EA Update – Technical Memorandum, Town of Oakville**

1. Introduction

The Coronation Park Drainage Improvements Class EA was commenced in January 2014. The objective of the study was to assess various drainage improvements within the Coronation Park area. The study was intended to develop a comprehensive drainage improvements and implementation plan to address current drainage concerns specific to the management of flooding and erosion within the Coronation Park Community, generally located south of Rebecca Street and from the west side of Third Line to Fourteen Mile Creek in the east. This included the development of preferred solutions, to address existing drainage concerns, and identify potential storm water management solutions.

Amec Foster Wheeler completed the Final Report in February 2016. Hard copies of the report were provided to the Town of Oakville at that time, including additional copies for Conservation Halton. The EA was however not formally finalized at this time by the Town of Oakville.

An update to the EA have been completed to intercept the flows discharged from the Willowdown Road storm sewer to a private drainage channel between Willowdown Road and Sedgewick Crescent. The preferred solution was modified to include an extension of the proposed storm sewer system on Woodhaven Park Drive to the north and west to include Hixon Street and Willowdown Road, to the point where an existing 600 mm diameter municipal storm sewer discharges to the upstream limits of the private rear-yard channel.

This Technical Memorandum is intended to summarize these additional analyses and other outstanding matters as an EA update to the previously finalized report (February 2016). The combination of the final report and this EA update will represent the complete study documentation. A revised Notice of Update and Completion will be generated as part of this process.

Town of Oakville
Coronation Park EA Update
May 24, 2017

2. Detailed Assessment of Proposed Alternative

2.1. Description of Revised Alternative

Woodhaven Park Drive is a rural-type roadway (ditches with driveway culverts) which runs in a north-south direction between Sedgewick Crescent and Lakeshore Road (ref. Drawing 12 attached). As part of the Class EA report, three (3) sub-alternatives were recommended to be carried forward for this area:

- ▶ Alternative 2-6 (Culvert Replacements along Woodhaven Park Drive)
- ▶ Alternative 10-10 (New Storm Sewer along Woodhaven Park Drive to Existing Storm Sewer (Parking Lot at East End of Coronation Park))
- ▶ Alternative 8-10 (Roadway Drainage Improvements along Woodhaven Park Drive)

The upstream sections of roadway along Hixon Street and Willowdown Road are similar in nature; a rural-type roadway (ditches with driveway culverts). The proposed revised alternative would implement the same alternatives noted above (culvert replacements, new storm sewer, roadway drainage improvements) for an additional 400 m +/- section of roadway, in order to achieve the goal of diverting flow from the existing storm 600 mm diameter sewer outfall (located at 1399 Willowdown Road) away from private property, and into a newly constructed drainage system within the municipal right-of-way.

The layout of the revised alternative is presented in Drawing 12.

2.2. Preliminary Sizing and Costing

Methodology

Using the recommended sub-alternatives, preliminary sizing for the proposed storm sewer systems has been determined using PCSWMM. Sizing has been completed to Town of Oakville design standards, specifically conveyance of the 5-year storm event without surcharging. Simulated pipe sizes range in size from 600 mm diameter at the point of diversion of the existing storm sewer along Willowdown Road, to 975 mm diameter at the outlet to Lake Ontario. The estimated construction costs would therefore include works along not only Woodhaven Park Drive (and potentially Willowdown Road and Hixon Street), but also Lakeshore Road and within Coronation Park. Note that the storm sewer system could be extended further north along Woodhaven Park Drive (north of Hixon Street) to collect rear yard drainage from the additional lots downstream, however additional construction costs would be incurred, and have not been included in the current assessment.

Using the estimated surface grades, sub-standard pipe cover (i.e. less than 1.2 m) could be expected in the area immediately upstream of Lakeshore Road to Selgrove Crescent, however this would need to be confirmed as part of a future detailed design. Horizontal elliptical pipe could be used where feasible to increase ground cover, however this also typically results in more costly large diameter maintenance holes.

Costing has been conducted using the same approach employed in the Class EA Report (February 2017). For the purposes of estimating preliminary capital costs, the unit supply cost for storm sewers (2017 pricing for 100D concrete pipe) has been multiplied by 3 for the length of

Town of Oakville
 Coronation Park EA Update
 May 24, 2017

each storm sewer section. The multiplier is used to cover the costs of installation, restoration and related appurtenances (i.e. catchbasins and maintenance holes). Based on this approach, the following capital costs have been estimated (rounded up to the nearest \$10,000), for the two projects (Woodhaven Park and Lakeshore Road, and Willowdown Road and Hixon Street). In terms of timing, the work along Woodhaven Park Drive and Lakeshore Road would necessarily need to be completed first, to ensure a suitable drainage system outlet and a connection point for the potential upstream works.

Woodhaven Park Drive and Lakeshore Road

Based on the preceding approach, the following storm sewer requirements have been identified:

- ▶ 306 m of 600 mm diameter storm sewer @ \$520/m = \$160,000
- ▶ 128 m of 675 mm diameter storm sewer @ \$780/m = \$100,000
- ▶ 182 m of 900 mm diameter storm sewer @ \$1,440/m = \$270,000
- ▶ 69 m of 975 mm diameter storm sewer @ \$1,650/m = \$120,000
- ▶ **685 m of total storm sewer at an estimated cost of \$650,000**

Note that if the proposed storm sewer works were extended further along Woodhaven Park Drive (i.e. north of Hixon Street) additional costs would be incurred.

In addition to the foregoing, approximately 34 private driveway culverts would require replacement as part of these works, along with 2 roadway culverts (Alternative 2-6), assuming the entire length of Woodhaven Park Drive (to Hixon Street) is to be re-constructed. The same approach to the cost estimation for storm sewers has been employed, assuming all driveway culverts are 450 mm diameter units in order to be conservative. Roadway culverts have been all considered to be 600 mm diameter units in order to be conservative as well; these sizes would need to be assessed further as part of detailed design.

- ▶ 34 driveway culverts at 8 m length and 450 mm diameter @ \$310/m = \$90,000
- ▶ 2 roadway culverts at 20 m length and 600 mm diameter @ \$520/m = \$30,000
- ▶ **36 total culvert replacements at an estimated cost of \$120,000**

Lastly, ditch re-grading works (Alternative 8-10) would be required as part of the proposed works. This would involve the re-grading of approximately 500 m of roadside ditching (both sides), assuming the re-construction works were extended from Hixon Street to Lakeshore Road. Given the relatively simple sections involved with ditch grading, it has been assumed that a lower unitary cost of \$500/m would be appropriate (both sides). This results in a total estimated cost for ditch re-grading of \$250,000.

Accounting for all of the above-noted components, a total cost of **\$1,020,000** has been estimated for the overall construction works on Wood Haven Park Drive (Hixon Street to Lakeshore Road). Note this cost excludes any legal, property or design fees.

Willowdown Road and Hixon Street

The preceding approach has also been used to estimate the capital costs for proposed storm sewer construction on Willowdown Road and Hixon Street, to extend the storm sewer system to

Town of Oakville
 Coronation Park EA Update
 May 24, 2017

the point of the existing storm sewer outfall on Willowdown Road (100 m +/- east of Savannah Gate – 1399 Willowdown Road).

- ▶ 399 m of 600 mm diameter storm sewer @ \$520/m = \$210,000

Approximately 25 private driveway culverts would require replacement as part of these works, along with 1 roadway culvert (at Hixon Street). Using the same costing approach as previously presented results in the following:

- ▶ 25 driveway culverts at 8 m length and 450 mm diameter @ \$310/m = \$70,000
- ▶ 1 roadway culvert at 20 m length and 600 mm diameter @ \$520/m = \$20,000
- ▶ **26 total culvert replacements at an estimated cost of \$90,000**

Ditch re-grading has been again assumed at \$500/m (both sides); given the total estimated roadway length of 399 m, this results in a total estimated cost for ditch re-grading of **\$200,000**.

Accounting for all of the above-noted components, a total cost of **\$500,000** has been estimated for the overall construction works on Hixon Street and Willowdown Road.

Summary

A combined total cost estimate of \$1,520,000 therefore results if both projects were to be completed at the same time, excluding any legal, property or design fees.

The assumptions in the preceding costing methodology should also be considered when applying these budgetary estimates. It should be noted that additional costs [paving costs, design costs, design and field investigation costs associated with potential Low Impact Development Best Management Practices (LID BMPs) implementation, other infrastructure costs] may result, however the preceding is intended to address the primary costs associated with the proposed works.

2.3. Analysis of Revised Alternative

An updated assessment of the overall drainage system performance with all of the recommended measures in place (as shown in Drawing 12) has been conducted by modifying the previously developed hydrologic/hydraulic modelling (PCSWMM). Updated results have been generated for the areas of change; other results remain unchanged from the results presented previously in the February 2016 Class EA report and therefore have not been repeated as part of this EA Update.

A summary of the detailed results which compares the differences in minor system performance under both the 5-year and 100-year storm events, is presented in Table 2.1 for those areas where recommendations have been made (formerly Table 7.2 in the finalized Class EA report). Table 2.2 (formerly Table 7.3) compares the differences in the major system performance (roadways) for the 5-year and 100-year storm events. Revised graphical summaries are also presented in Drawings 13 and 14 (ref. attached). As evident, significant improvements to the drainage system performance are simulated with the recommended alternatives in-place.

Conduit	Location	Existing Diameter (mm)	Recommended Diameter (mm)	5 Year				100 Year			
				Existing		Recommended		Existing		Recommended	
				Q _{peak} / Q _{capacity}	Performance	Q _{peak} / Q _{capacity}	Performance	Q _{peak} / Q _{capacity}	Performance	Q _{peak} / Q _{capacity}	Performance
O_0200_400162	Woodhaven Park Drive – Open Channel Culvert (between Sedgewick and Hixon)	1500 x 700	1500 x 700	0.68	Unsurcharged	0.18	Unsurcharged	0.94	Surcharged	0.87	Surcharged
C7_2	Culvert beside 1307 Hixon Street	1000	1000	0.46	Unsurcharged	0.12	Unsurcharged	0.98	Surcharged	0.48	Unsurcharged
32 (C22, PR-C22)	Woodhaven Park Drive - Selgrove Crescent Culvert	450 (estimated)	450	0.27	Unsurcharged	0.23	Unsurcharged	0.85	Unsurcharged	0.55	Surcharged
96 (PROP-14)	Woodhaven Park Drive – Recommended storm sewer between Selgrove Crescent	N/A	675	N/A	N/A	0.83	Unsurcharged	N/A	N/A	1.19	Flooded
97 (PROP-15)	Woodhaven Park Drive – Recommended storm sewer between Selgrove Crescent	N/A	675	N/A	N/A	0.87	Unsurcharged	N/A	N/A	1.26	Flooded
33 (C68)	Culvert Crossing of Woodhaven Park Drive at Selgrove Crescent	675	675	0.29	Unsurcharged	0.19	Unsurcharged	0.61	Flooded	0.47	Flooded
34 (C10)	WWTP Property (accepting flow from Woodhaven Park Drive)	300 (estimated)	300 (estimated)	4.53	Surcharged	1.22	Unsurcharged	5.36	Surcharged	4.30	Surcharged
98 (PROP-16)	Woodhaven Park Drive – Recommended storm sewer between Selgrove Crescent and Lakeshore Road	N/A	900	N/A	N/A	0.68	Unsurcharged	N/A	N/A	1.04	Flooded
99 (PROP-17)	Woodhaven Park Drive – Recommended storm sewer between Selgrove Crescent and Lakeshore Road	N/A	900	N/A	N/A	0.68	Unsurcharged	N/A	N/A	1.15	Flooded
100 (PROP-06)	Lakeshore Road between Woodhaven Park Drive and Coronation Park Parking Lot	N/A	900	N/A	N/A	0.67	Unsurcharged	N/A	N/A	1.12	Surcharged
35 (O_0200_6233)	Crossing Lakeshore Road – accepting flow from Woodhaven Park Drive	600	900	0.68	Unsurcharged	0.69	Unsurcharged	1.80	Flooded	1.21	Surcharged
36 (O_0200_6232)	Parking Lot Storm Sewer at Eastern Limits of Coronation Park	600	975	0.58	Unsurcharged	0.82	Unsurcharged	1.38	Surcharged	1.41	Surcharged

Table 2.2 Revised Simulated Major System Performance (Roadways) at locations of interest with Recommended Alternatives in place										
Conduit	Location	Type	5 Year				100 Year			
			Existing		Recommended		Existing		Recommended	
			Maximum Average Depth (m)	Performance	Maximum Average Depth (m)	Performance	Maximum Average Depth (m)	Performance	Maximum Average Depth (m)	Performance
C28	Woodhaven Park Drive – West Ditch South of Selgrove Crescent Culvert	Rural	0.16	Within Ditch	0.01	Within Ditch	0.59	Exceeded Ditch	0.10	Within Ditch
C29	Woodhaven Park Drive – East Ditch South of Selgrove Crescent Culvert	Rural	0.14	Within Ditch	0.05	Within Ditch	0.68	Exceeded Ditch	0.16	Within Ditch

3. Updated Preferred Alternative Summary

An updated set of drainage system improvements have been recommended for the Woodhaven Park Drive and Hixon Street/Willowdown Road area, which will reduce drainage from public sources onto privately-owned lands. Based on this, an updated overall schedule and prioritization has been generated, including this revision to the preferred alternative.

The Town of Oakville has provided direction with respect to its schedule and prioritization for road reconstruction works. It is understood that the Town has previously allocated capital budget for the reconstruction of Westminster Drive (Recommended Alternatives 2-5, 10-8, and 8-9), as well as the eastern channel outlet in Coronation Park (Alternative 8-6), which should be completed first. Further, a Class Environmental Assessment for Lakeshore Road is currently underway (by Amec Foster Wheeler in conjunction with the Town of Oakville). This study will re-assess the various recommended alternatives for Lakeshore Road, including the proposed trunk storm sewer. As many of the recommended alternatives are impacted by the construction of the proposed trunk storm sewer along Lakeshore Road, many of the recommended alternatives may need to be delayed until the design and construction of this Alternative is completed.

The Phasing and Prioritization plan has therefore been established based on the following:

- ▶ Reducing potential surcharging and flooding impacts to both private and public property,
- ▶ Input received from the public,
- ▶ The Town of Oakville's currently proposed schedule of works.

Table 3.1 (ref. Table 8.1 in the previously finalized Class EA report) has placed each drainage improvement project in a prioritized sequence using a priority number and assigned a "Low" to "High" Priority Rating accordingly. The potential benefits and costs for each project have also been listed.

Previously estimated costs (as per the February 2016 Class EA report) have been conservatively increased by 10% to account for inflation (given the average change in storm sewer costs of 7% between 2014 and 2017 pricing lists), and rounded up to the nearest \$10,000.

Additional hydrologic/hydraulic modelling is expected to be required as part of the detailed design work for the recommended alternatives presented in Table 3.1. It is recommended that the integrated PCSWMM hydrologic/hydraulic modelling developed as part of the current study be used for this purpose, and updated and refined as required.

Table 3.1 Revised Overall Preferred Alternative Summary					
Priority	Location	Details of Proposed Works	Benefit	Notes	Preliminary Costs
High	Eastern Channel (Coronation Park)	<ul style="list-style-type: none"> ▶ 200 m of channel works ▶ 2 pedestrian bridge replacements ▶ Triple box culvert under existing parking lot ▶ LID/BMP measures where feasible ▶ Landscaping and plantings as required 	<ul style="list-style-type: none"> ▶ Safety conveys flows, allows for diversion of flood causing flows away from the western channel ▶ Minimize standing water and erosion within Coronation Park ▶ Aesthetic benefit to Coronation Park with suitable design ▶ Potentially an educational feature (landscaping, LID/BMP) ▶ Improved water quality and water balance (LID/BMP) 	<ul style="list-style-type: none"> ▶ Works could potentially be constructed in advance of Lakeshore Road, however design flows would be dependent on design of those works 	\$830,000 (not including design, LID/BMP measures, or landscaping)
High	Westminster Drive	<ul style="list-style-type: none"> ▶ 487 m of new storm sewer (300 to 675 mm diameter) ▶ Driveway and roadside culvert replacements (PVC - end treatments where feasible) ▶ Ditch re-grading and landscaping ▶ LID/BMP measures where feasible 	<ul style="list-style-type: none"> ▶ Reduction/elimination of standing water in ditches ▶ Reduction in ditch erosion ▶ Reduction in major system flooding ▶ Improved water quality and water balance (LID/BMP) 	<ul style="list-style-type: none"> ▶ Capital funding allocated already by Town ▶ Proposed construction in 2015 ▶ Interim outlet to eastern channel in Coronation Park required (future re-grading to accommodate Lakeshore Road trunk storm sewer) 	\$700,000 (not including design or LID/BMP measures)
High	Lakeshore Road	<ul style="list-style-type: none"> ▶ 582 m of new storm sewer (675 to 1350 mm equivalent diameter) ▶ Major system improvements (curb and gutter if feasible) ▶ LID/BMP measures where feasible 	<ul style="list-style-type: none"> ▶ Diversion of flows from western channel; associated reduction in flooding and risk to private property ▶ Reduction in erosion causing flows to western channel ▶ Improved major system conveyance to suitable outfall ▶ Improved water quality and water balance (LID/BMP) 	<ul style="list-style-type: none"> ▶ Detailed design dependent on outcomes from proposed Lakeshore Road Class EA (2016) ▶ Construction not likely until 2018 ▶ Proposed storm sewer will require eastern channel works to be in place to accommodate increased flows and deeper grades 	\$980,000 (not including design or LID/BMP measures)
High	Woodhaven Park Drive (Willowdown Road to Lakeshore Road) and Lakeshore Road (to outfall)	<ul style="list-style-type: none"> ▶ 1,084 m of new storm sewer (600 to 900 mm diameter) ▶ Driveway and roadside culvert replacements (PVC - end treatments where feasible) ▶ Ditch re-grading and landscaping ▶ LID/BMP measures where feasible 	<ul style="list-style-type: none"> ▶ Reduction/elimination of standing water in ditches ▶ Reduction in ditch erosion ▶ Reduction in major system flooding ▶ Diversion of public stormwater to public ROW (rather than private) ▶ Improved water quality and water balance (LID/BMP) 	<ul style="list-style-type: none"> ▶ Estimated costs includes a portion of works along Lakeshore Road as well as upgraded storm sewer outfall to Lake Ontario ▶ Could potentially construct storm sewer outfall upgrade as a separate project in advance of Lakeshore Road works ▶ Could potentially construct Woodhaven Park works prior to Lakeshore Road construction using existing outfall to WWTP property; however this is not recommended. 	\$1,520,000 (not including design or LID/BMP measures)
Medium	2033 Lakeshore Road	<ul style="list-style-type: none"> ▶ 60 m of channel improvements adjacent to 2033 Lakeshore Road West (downstream of Oakville Christian School) 	<ul style="list-style-type: none"> ▶ Reduction/elimination of standing water and erosion adjacent to property ▶ Potentially a reduction in major system flooding and improved flow conveyance 	<ul style="list-style-type: none"> ▶ Relatively low cost of construction. ▶ Dense existing vegetation; re-grading works will need to work around existing trees and consider landscaping works as required ▶ Town holds easement 	\$70,000 (not including design costs)
Medium	Pathway between Tracina Drive and Venetia Drive	<ul style="list-style-type: none"> ▶ 5 m of culvert replacement (twin 300 mm PVC with end treatments if feasible) ▶ Assumed connected channel works (5 m on both upstream and downstream ends) 	<ul style="list-style-type: none"> ▶ Reduction/elimination of standing water and erosion ▶ Improved flow conveyance and associated reduction in flood depths 	<ul style="list-style-type: none"> ▶ Relatively low cost of construction. ▶ Tight property limits (3 m wide pathway), and existing obstructions (fences for private residences) will make construction challenging ▶ Town holds easement over upstream portion of channel but not downstream; discussions with homeowners required 	\$30,000 (not including design costs)

Table 3.1 Revised Overall Preferred Alternative Summary					
Priority	Location	Details of Proposed Works	Benefit	Notes	Preliminary Costs
Low	Wales Crescent	<ul style="list-style-type: none"> ▶ 270 m of ditch re-grading ▶ Driveway culvert replacements as required (PVC with end treatments if feasible) ▶ LID/BMP measures where feasible 	<ul style="list-style-type: none"> ▶ Reduction/elimination of standing water and erosion ▶ Improved flow conveyance and associated reduction in flood depths ▶ Improved water quality and water balance (LID/BMP) 	<ul style="list-style-type: none"> ▶ Consider further assessment to reduce the extents of the required works (and reduce the associated costs) 	\$310,000 (not including design costs or LID/BMP measures)
Low	Sedgewick Forest	<ul style="list-style-type: none"> ▶ 180 m of channel works/re-grading ▶ LID/BMP measures where feasible 	<ul style="list-style-type: none"> ▶ Reduction/elimination of standing water and erosion ▶ Improved flow conveyance and associated reduction in flood depths ▶ Improved water quality and water balance (LID/BMP) 	<ul style="list-style-type: none"> ▶ Area of identified erosion within the ditch in vicinity of existing storm outfall should be addressed as part of the overall works 	\$200,000 (not including design costs or LID/BMP measures)
TOTAL COST					\$4,640,000

Coronation Park EA Update
May 15, 2017

4. Additional Comments and Correspondence from Conservation Halton

The final report (February 2016) includes comments received from Conservation Halton, including e-mailed comments (November 19, 2014) on the material for Public Information Centre #1, and more formal comments (December 12, 2014) regarding the material presented at Public Information Centre #2. These comments have been included as part of the Appendix to the current EA Update.

In addition, comments on the final report were also issued by Conservation Halton to the Town of Oakville (April 19, 2016 and May 16, 2016). These comments have also been included as part of the Appendix to the current EA Update.

A formal response to all of the provided comments by Conservation Halton has not been completed. To summarize, the focus of the comments has been listed as follows:

- ▶ A permit will be required from Conservation Halton for all works within its regulated area; this relates primarily to shoreline areas, thus the proposed works for the eastern channel in Coronation Park would require a permit.
- ▶ No armouring or man-made structures should be included as part of any channel works to prevent accumulation of material. This should be viewed as a natural process (shingle/barrier beaches). Notwithstanding, Town staff may need to periodically maintain these features (remove material) if the accumulation becomes substantial and impacts channel conveyance, and thus increases flood risk to the Town.
- ▶ Opportunities for natural channel design and suitable riparian plantings should be taken into account as part of the channel design works.
- ▶ The channel design should account for fluctuations in Lake Ontario water levels, including the currently unusually high levels.
- ▶ LID BMPs should be encouraged for upstream road reconstruction, particularly those where a rural/semi-urban cross-section is expected (i.e. ditching).
- ▶ Water quality designs for upstream roadway reconstruction should strive to achieve Level 1 (i.e. Enhanced - 80% average annual TSS removal) rather than Level 2 (i.e. Normal – 70% average annual TSS removal).

The above considerations should be taken into account as part of subsequent detailed design works, and Conservation Halton Permit Applications where applicable (i.e. Eastern Channel in Coronation Park).

5. Conclusions and Recommendations

The proposed EA update is intended to address the discharge of stormwater flows from the Willowdown Road storm sewer onto private property. The revised preferred alternative along Woodhaven Park Drive and Hixon Street and Willowdown Road should address this, through the extension of the proposed storm sewer system.

Following finalization of this EA Update, a revised Notice of Update and Completion will be generated and submitted to the Town of Oakville for circulation.

The preferred alternatives as described in Section 3 should be implemented as per the established priority, contingent on the availability of capital funding. The integrated PCSWMM

Town of Oakville
Coronation Park EA Update
May 24, 2017

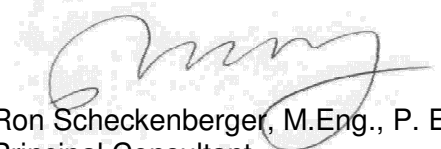
hydrologic/hydraulic modelling developed as part of this study should be further refined and updated as part of future studies, including the proposed Lakeshore Road Class EA and detailed design work for the recommended alternatives.

It is expected that comments and input from Conservation Halton will be addressed as part of individual detailed design permitting submissions, as required.


We trust the foregoing to be satisfactory. Please do not hesitate to contact us should you wish to discuss further.

Yours very truly,

Amec Foster Wheeler Environment & Infrastructure,
a division of Amec Foster Wheeler Americas Limited

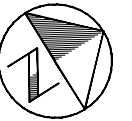
Per:  Ron Scheckenberger, M.Eng., P. Eng.
Principal Consultant

 Steve Chipps, P.Eng.
Project Engineer

 Matthew Senior, M.A.Sc., P.Eng.
Project Engineer

MJS/SC/RBS

/Attached Drawing 12: Preferred Drainage Alternatives
 Drawing 13: 5-Year Performance Summary (Minor System) with Recommended Alternatives
 Drawing 14: 100-Year Performance Summary (Major System) with Recommended Alternatives
 Appendix: Conservation Halton Correspondence



Path: P:\Work\TP114001\water\dwg\2017-05\DWG12_PrefDrAlt.dwg

Plotted By: j.soaresdasilva
Last Saved By: j.soaresdasilva
2017-05-17
2017-05-17

- LEGEND**
- STUDY AREA BOUNDARY
 - WATERCOURSE
 - EXISTING STORM SEWER AND PIPE DIAMETER (mm)
 - (600) RECOMMENDED STORM SEWER AND PIPE DIAMETER (mm)
 - PROPOSED NEW STORM SEWER\CULVERT
 - PROPOSED UPGRADED STORM SEWER\CULVERT
 - PROPOSED ROADWAY DRAINAGE IMPROVEMENTS
 - PROPOSED RE-GRADED OPEN CHANNEL

**CORONATION PARK
DRAINAGE ASSESSMENT
TOWN OF OAKVILLE**

**PREFERRED DRAINAGE
ALTERNATIVES**



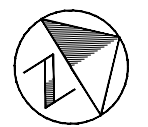
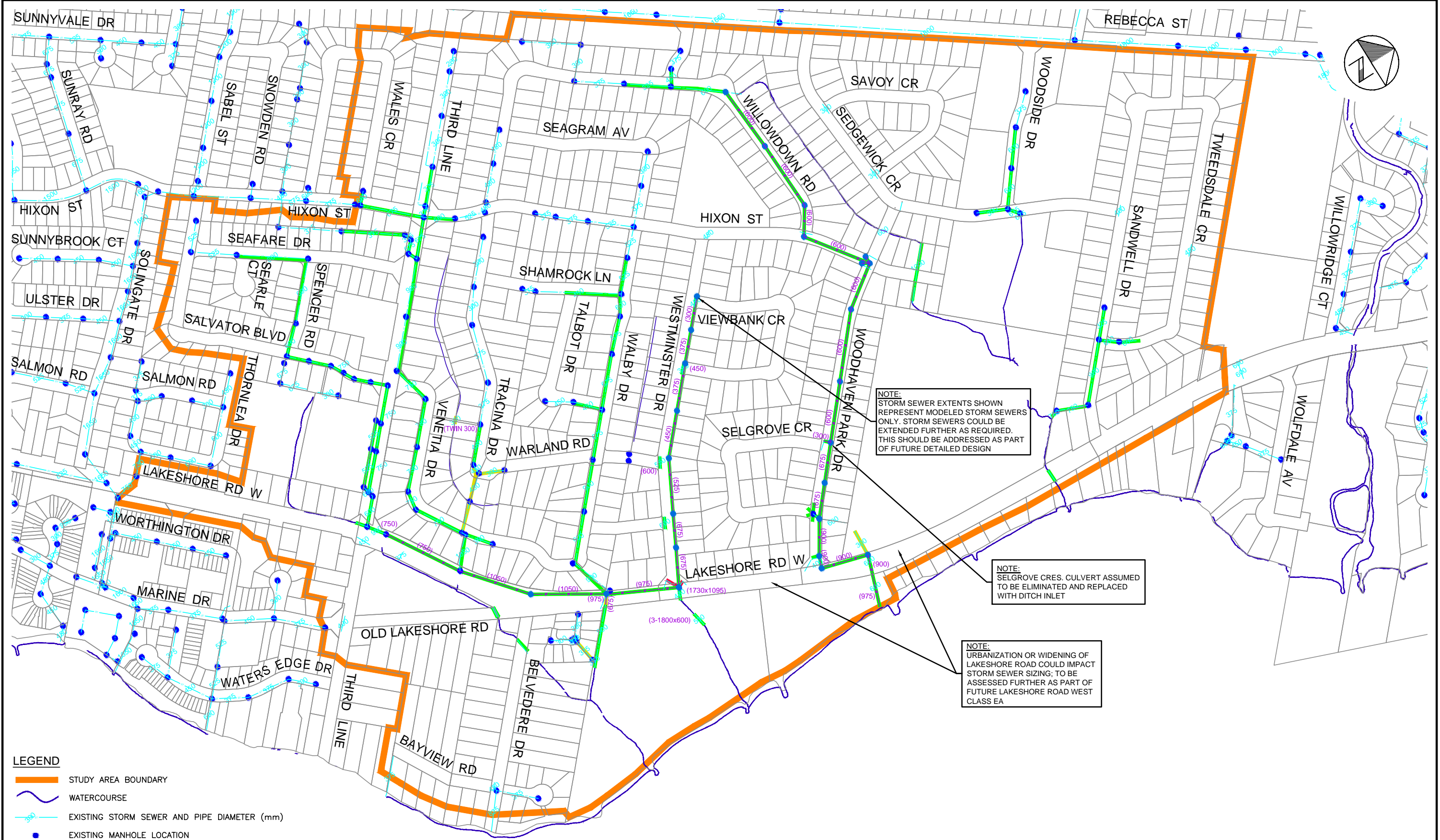
SCALE VALID ONLY FOR
24"x36" VERSION

Scale 1:3000
0 25 50 100

Consultant File No.
TP114001

Drawing No.
12

Plotted: 2017-05-17
 Last Saved: 2017-05-17
 Plotted By: j.soaresdasilva
 Last Saved By: j.soaresdasilva
 Path: P:\Work\TP114001\water\dwg\2017-05\DWG13_SyrPerf-min(WAT).dwg



NOTE:
 STORM SEWER EXTENTS SHOWN
 REPRESENT MODELED STORM SEWERS
 ONLY. STORM SEWERS COULD BE
 EXTENDED FURTHER AS REQUIRED.
 THIS SHOULD BE ADDRESSED AS PART
 OF FUTURE DETAILED DESIGN

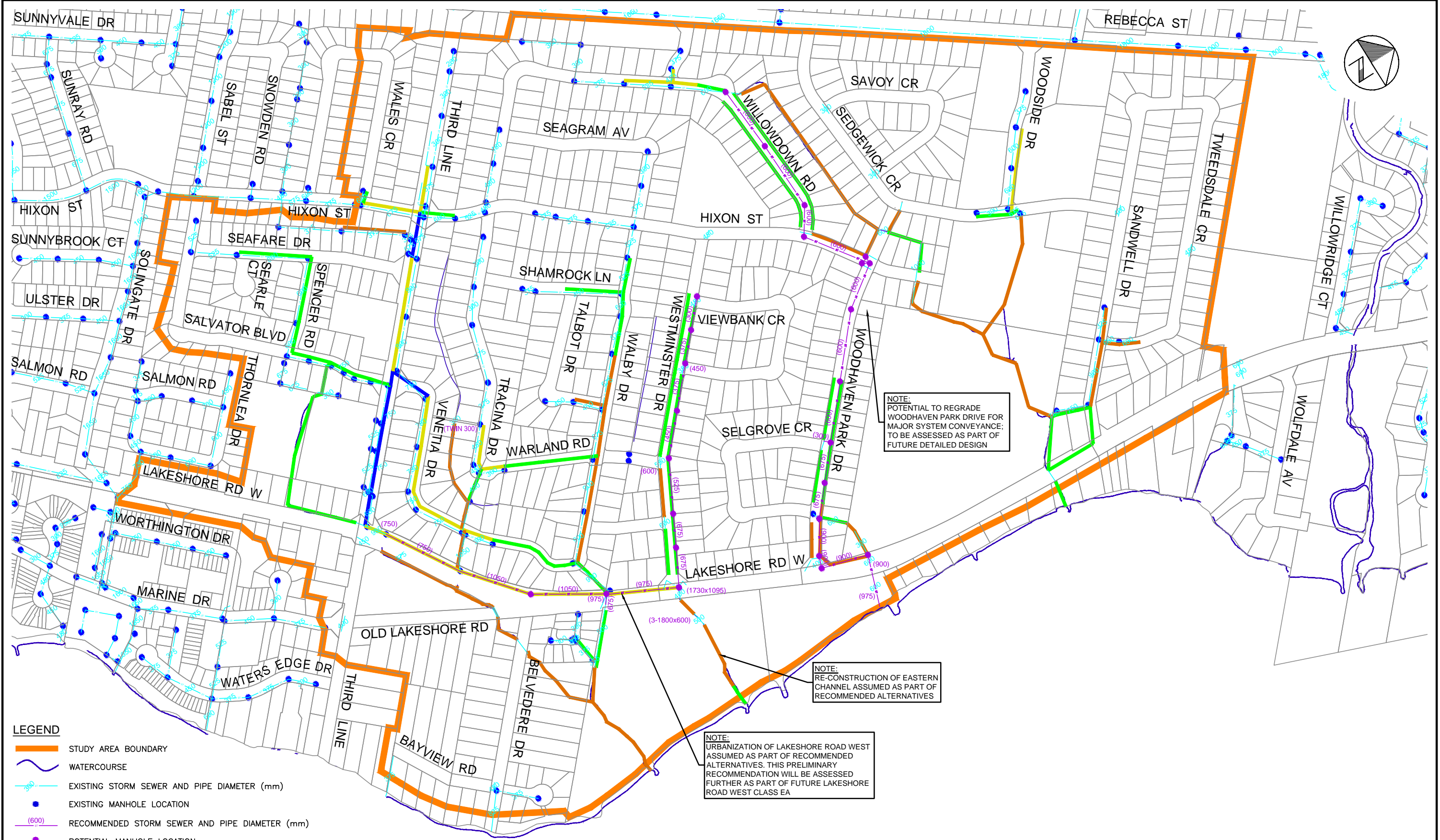
NOTE:
 SELGROVE CRES. CULVERT ASSUMED
 TO BE ELIMINATED AND REPLACED
 WITH DITCH INLET

NOTE:
 URBANIZATION OR WIDENING OF
 LAKESHORE ROAD COULD IMPACT
 STORM SEWER SIZING; TO BE
 ASSESSED FURTHER AS PART OF
 FUTURE LAKESHORE ROAD WEST
 CLASS EA

- LEGEND**
- STUDY AREA BOUNDARY
 - WATERCOURSE
 - EXISTING STORM SEWER AND PIPE DIAMETER (mm)
 - EXISTING MANHOLE LOCATION
 - (600) RECOMMENDED STORM SEWER AND PIPE DIAMETER (mm)
 - POTENTIAL MANHOLE LOCATION
 - STORM SEWER/CULVERT UNSURCHARGED
 - STORM SEWER/CULVERT SURCHARGED
 - STORM SEWER/CULVERT FLOODED

<p>CORONATION PARK DRAINAGE ASSESSMENT</p> <p>TOWN OF OAKVILLE</p>		<p>5 YEAR PERFORMANCE SUMMARY (MINOR SYSTEM) WITH RECOMMENDED ALTERNATIVES</p>			SCALE VALID ONLY FOR 24"x36" VERSION
		Scale 1:3000 			Consultant File No. TP114001
		Drawing No. 13			

Plotted By: j.isaacs@silva
 Last Saved By: j.isaacs@silva
 Path: P:\Work\TP114001\water\dwg\2017-05\DWG14_100yrPerf-maj(wat).dwg
 2017-05-17
 Last Saved: 2017-05-17




NOTE:
 POTENTIAL TO REGRADE
 WOODHAVEN PARK DRIVE FOR
 MAJOR SYSTEM CONVEYANCE;
 TO BE ASSESSED AS PART OF
 FUTURE DETAILED DESIGN

NOTE:
 RE-CONSTRUCTION OF EASTERN
 CHANNEL ASSUMED AS PART OF
 RECOMMENDED ALTERNATIVES

NOTE:
 URBANIZATION OF LAKESHORE ROAD WEST
 ASSUMED AS PART OF RECOMMENDED
 ALTERNATIVES. THIS PRELIMINARY
 RECOMMENDATION WILL BE ASSESSED
 FURTHER AS PART OF FUTURE LAKESHORE
 ROAD WEST CLASS EA

- LEGEND**
- STUDY AREA BOUNDARY
 - WATERCOURSE
 - EXISTING STORM SEWER AND PIPE DIAMETER (mm)
 - EXISTING MANHOLE LOCATION
 - (600) RECOMMENDED STORM SEWER AND PIPE DIAMETER (mm)
 - POTENTIAL MANHOLE LOCATION
 - FLOW WITHIN DITCH/CHANNEL
 - FLOW OUT OF DITCH/CHANNEL (RURAL-ABOVE ROAD CROWN)
 - FLOW BELOW ROAD CROWN (URBAN)
 - FLOW ABOVE ROAD CROWN (URBAN)

<p>CORONATION PARK DRAINAGE ASSESSMENT</p> <p>TOWN OF OAKVILLE</p>	<p>100 YEAR PERFORMANCE SUMMARY (MAJOR SYSTEM) WITH RECOMMENDED ALTERNATIVES</p>		<p>SCALE VALID ONLY FOR 24"x36" VERSION</p> <p>Scale 1:3000 0 25 50 100</p> <p>Consultant File No. TP114001</p> <p>Drawing No. 14</p>
--	--	---	---

Senior, Matt

From: Katie Jane Harris <kjharris@hrca.on.ca>
Sent: November-19-14 2:50 PM
To: Kasia Piskorz
Cc: Chipps, Steve
Subject: RE: Coronation Park EA Study - Coronation Park Drainage Improvements

Good Afternoon Kasia,

With regards to the PIC #1 information available on the Town of Oakville's website, while CH did provide initial comment on what issues we would be reviewing and what concerns we would have, staff did not have record of seeing the June 4, 2014 presentation slides.

At your suggestion, I printed off the PIC #1 information and offer the following. While I recognize we are well beyond the commenting deadline, I trust the Town will take the following comments into consideration.

Alternate 2 – Increase size of storm sewers and culverts

Any upgrades to existing infrastructure on watercourses that are regulated by Conservation Halton would require a Permit pursuant to Ontario Regulation 162/06.

Any upgrades to existing infrastructure on hydrologic connections would be reviewed by Conservation Halton under our MOU with the Region of Halton/Town of Oakville.

Alternate 7A – Flow Diversions

It states that the flow diversions would be considered for storm sewers only. Where diversions have been approved by CH in the past, the purpose of the diversion was generally to alleviate existing flooding conditions. Sufficient detail would be required to confirm diversions would not impact aquatic habitat or have the potential to cause greater flooding in the receiving infrastructure.

Alternate 7B and Alternate 8B – Modify grading on private property (7B) or public property (8B) to mitigate flooding

Any development, including grading, site alteration and/or the temporary or permanent placement of fill within a regulated area requires a Permit from Conservation Halton pursuant to Ontario Regulation 162/06. Staff note no alterations are permitted to regulated floodplains that may put the landowner or adjacent landowners at a greater risk of flooding. This applies to private and public lands.

Alternate 9 – Low Impact Development Best Management Practices (LID BMPs)

Conservation Halton is supportive of the implementation of LIDs however recommend they be located on public property to ensure their maintenance and functionality in perpetuity.

Alternate 10 – New Drainage System Outlets (New Storm Sewers)

Any new outlets to Lake Ontario will require a Permit from Conservation Halton pursuant to Ontario Regulation 162/06. Where existing hydrologic connections exist, staff are generally not supportive of piping as the features may be indirect fish habitat which is essential to fish habitat downstream.

Alternate 11 – Combinations

Staff agree that in addition to quantity control, combination approaches of filter strips, swales, and bioretention cells also provide beneficial treatment train approaches for quality control

Staff look forward to reviewing the PIC #2 display information once it is available.

Thank you for providing confirmation that CH will receive three copies of the EA once the document is ready.

Best Regards,
Katie Jane

Katie Jane Harris, B.E.S.
Environmental Planner

Conservation Halton
2596 Britannia Road West, Burlington, ON L7P 0G3
905.336.1158 ext. 2231 | Fax 905.336.7014 | kjharris@hrca.on.ca
conservationhalton.ca

Thank you for thinking about the environment before printing this e-mail. If you are not an intended recipient, you must not disclose, copy, or distribute its contents or use them in any way. Please advise the sender immediately and delete this e-mail.

From: Kasia Piskorz [mailto:kasia.piskorz@oakville.ca]
Sent: Monday, November 17, 2014 1:37 PM
To: Katie Jane Harris
Cc: Chipps, Steve (Steve.Chipps@amec.com)
Subject: RE: Coronation Park EA Study - Coronation Park Drainage Improvements

Hi Katie,
I can forward a copy of the PIC # 2 boards to you once they are finalized. The boards will also be available on the Town of Oakville website. If you would like to review the information presented at PIC #1 held June 2014 please refer to our website and search for Coronation Park Drainage.

We will make three copies available to you once the EA document is ready.

Thanks,

Kasia Piskorz,
Project Leader - Capital Projects
Engineering and Construction
Town of Oakville | 905-845-6601 ext.3533 | f: 905-338-4159 | www.oakville.ca



Vision: To be the most livable town in Canada

Please consider the environment before printing this email.

<http://www.oakville.ca/privacy.html>

Kasia Piskorz
Project Leader - Capital Projects
Engineering and Construction
Town of Oakville | 905-845-6601, ext.3533 | f: 905-338-4159 | www.oakville.ca

Vision: To be the most livable town in Canada
Please consider the environment before printing this email.

<http://www.oakville.ca/privacy.html>

From: Katie Jane Harris [<mailto:kjharris@hrca.on.ca>]
Sent: Thursday, November 13, 2014 10:32 AM
To: Kasia Piskorz
Cc: Chipps, Steve (Steve.Chipps@amec.com)
Subject: Coronation Park EA Study - Coronation Park Drainage Improvements

Good Morning,

Conservation Halton (CH) is in receipt of the Notice of Public Information Centre #2, to be held on November 26, 2014. I have attached CH's comments from the initial notice for reference.

Unfortunately, as the project manager on the file I am not going to be available the week of November 24th and was hoping that the Town could provide the information to be presented on the 26th to CH directly either by inter-office courier, email or by dropbox. That way I could circulate the information in advance of my absence and work towards having comments back to the Town by the 12th of December.

If the Town can provide hardcopies of the EA, it will make CH's review more efficient if we are provided three (3) copies of the EA document.

Thank you and Best Regards,
Katie Jane

Katie Jane Harris, B.E.S.
Environmental Planner

Conservation Halton
2596 Britannia Road West, Burlington, ON L7P 0G3
905.336.1158 ext. 2231 | Fax 905.336.7014 | kjharris@hrca.on.ca
conservationhalton.ca

Thank you for thinking about the environment before printing this e-mail. If you are not an intended recipient, you must not disclose, copy, or distribute its contents or use them in any way. Please advise the sender immediately and delete this e-mail.



Conservation
Halton

905.336.1158
Fax: 905.336.7014
2596 Britannia Road West
Burlington, Ontario L7P 0G3
conservationhalton.ca

Protecting the Natural
Environment from
Lake to Escarpment

December 12, 2014

Kasiz Piskorz
Town of Oakville
1225 Trafalgar Road
Oakville, ON
L6H 0H3

BY MAIL AND BY EMAIL

Dear Ms. Piskorz:

**Re: Coronation Park Drainage Improvements
Municipal Class Environmental Assessment Study
Notice of Study Commencement
Town of Oakville
Our File: MPR 662**

Staff have had an opportunity to review the discussion boards presented in the Public Information Centre #2 dated November 26, 2014, and in particular have utilized the 'Preferred Solution' slide (pg. 16) as our basis for review and offer the following comments.

Ontario Regulation 162/06

As per Conservation Halton's previous comments dated June 13, 2014 and November 19, 2014, the shoreline of Lake Ontario and its associated hazards are regulated pursuant to Ontario Regulation 162/06. Therefore any works within the regulation limit requires a Permit from Conservation Halton. The following comments relate to works that fall within our Regulatory limit.

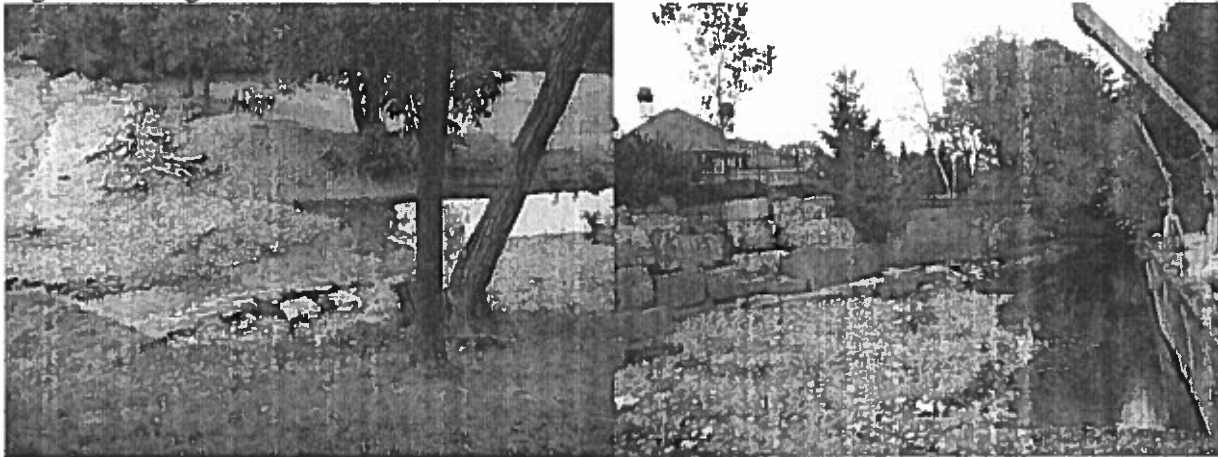
Measures Proposed at Lake Ontario Limit

Two existing outlets into the lake

- Staff request more information about the concerns related to 'blockage of watercourses at Lake Ontario due to material washing onshore'. Conservation Halton recommends that the connections with the lake remain protected by the existing and natural accumulation of the shingle/barrier beaches. These natural lacustrine features are an effective and environmentally friendly protection of the shoreline against erosion hazards and serve a number of ecological functions. Barrier beaches can be found throughout the Halton shoreline, as shown in the photos below (Figure 1). Any structural shoreline protection measures are usually not effective and may negatively impact natural coastal processes along

the shoreline. An annual maintenance plan should be developed to keep entrances open to sustain the flows.

Figure 1: Shingle/Barrier Beaches, Halton Lake Ontario Shoreline



- Watercourse/shoreline modification by humans via hardening measures such as concrete, armour stone, wood or steel walls and the removal of vegetation around lakes and stream banks negatively alter natural shoreline processes. Removal of vegetation decreases the stability of the bank and increases shoreline erosion. A goal of both the Oakville Harbour West Shore Master Plan and Tannery and Waterworks Parks EA (nearby similar Town initiatives) is to use a variety of plant materials that will provide diversity, and will be reminiscent of native plant material found along the water's edge. Part of CH's mandate is to promote restoration using native, non-rare plant species throughout its watershed, predominantly in areas regulated by our own regulation (Ontario Regulation 162/06). The opportunity to see this goal come to fruition within the Coronation Park Community is tremendous. Staff feel that restoration such as this has the potential to demonstrate our joint commitment to the natural environment to residents, tourists and other park users, and to educate the public and further the potential for shoreline naturalization. We look forward to working together to re-establish the flora of the shoreline and hydrologic features in this area.

Flooding

- Coronation Park has been prone to flooding from Lake Ontario; the appropriate Lake Ontario flood levels shall be considered into the design of park drainage system.
- The parking lot at the most north-easterly portion of the park has been susceptible to flooding in the past. It would be prudent to find out whether the flooding hazard had been eliminated during the reconstruction of the parking in the past.
- Coronation Park had been regraded over the years, and the recent construction of the Mid-Halton shaft has also impacted park grades. It is recommended that a topographic survey be undertaken and used in the next stages of the design.

CA/Halton MOU

The following comments are provided under our Memorandum of Understanding with the Region of Halton.

Wildlife Habitat Impacts/Mitigation

- Within Coronation Park staff note that works are proposed to re-grade and widen the channel. Staff recommend that this be an opportunity to improve wildlife habitat in the vicinity of the proposed works by considering improvement of habitat for migrating species, i.e. birds and butterflies.
- It is also recommended that additional measures to reduce open area for Canada Geese congregation be considered.

Vegetation Management

- Staff note that there appear to be proposed works located within Candidate Significant Woodland (i.e. “re-grade reverse sloped channel to provide positive drainage”). Staff request further detail on what is proposed and how impacts will be mitigated. Staff recommend that a vegetation inventory be completed to ensure no impact to Species at Risk.
- Staff note that the extent of tree removal necessary for the various alternatives should be considered. Given that the proposed tree removal is part of Town works, potentially occurring on Town-owned lands, staff recommend that the proponent adhere to their tree-cutting bylaws (applies to trees in both private and public ownership). Please also ensure that the tree replacement required for your works is in keeping with the Canopy Replacement Schedule outlined in the document. Species proposed for replacement should consist of locally native, non-invasive species suitable for the site’s conditions. Further, it is the opinion of staff that any drainage improvement approach that incorporates revegetation complements the ideals outlined in the Town of Oakville’s various strategic initiatives, especially the Livable Oakville Plan, one objective of which is to “to progressively increase the urban forest to achieve a canopy cover of 40% Town-wide beyond the life of this Plan”.
- Staff recommend that all planting in non-regulated areas of the site utilize species that are native and non-rare within Halton Region, as per CH Landscaping Guidelines (available at <http://www.conservationhalton.ca/planning-permits>).
- In addition, proposed plantings to be used adjacent to natural areas should consist of locally native, non-invasive species. Please refer to the Conservation Halton Landscaping and Tree Preservation Guidelines (link included above) for further landscaping procedures. Staff are available to assist with planting plans for disturbed riparian areas.

Lakes and Rivers Impacts

Hydrologic Connections

- Staff are supportive of any measures to improve aquatic habitat, such as re-grading the various channels as indicated in the Preferred Solution slide. Staff request more detail on the proposed re-grading and widening of the various hydrologic connections. Staff strongly

recommend utilizing a natural channel design approach, if these solutions are selected as these features serve a number of headwater functions that are important for maintaining the health of the downstream reaches of these watercourses and their confluence with Lake Ontario, immediately downstream. These functions include, but are not limited to:

- Flood conveyance and attenuation
- Removal of pollutants via filtration
- Recharge of subsurface aquifers via percolation
- Provision of allochthonous inputs downstream (e.g. invertebrates, twigs, leaves, dissolved nutrients and matter that can be used as cover by aquatic organisms)

Staff suggest that a wider arrangement be considered, with shallower slopes (3:1 slope or flatter). Staff propose the creation of riparian buffers – strips of land near the water that are preserved in their natural state or enhanced with the addition of native vegetation. They reduce sediment and excess nutrients (various chemicals including fertilizer and pesticides, bacteria, sediment, etc.) from entering lake. They protect the shore from wind, wave and ice action. They create cover, food and shade for plants and animals. They include leaving natural shorelines alone or enhancing with rooted plantings, seed mixes, aquatic plantings and live staking.

- Sediment and erosion control will be an important consideration for this project, given that the entire study area drains to Lake Ontario. To prevent mobilization of sediment, disturbed areas should be restored with a seed mix. The seed mix to be used adjacent to any drainage features and Lake Ontario should contain all locally native and non-rare species. Biodegradable erosion control blankets may be required until seeding is well established. Please refer to the Conservation Halton Landscaping and Tree Preservation Guidelines ([link above](#)) for seed mix guidelines.

Stormwater Management

Staff are very supportive of the low-impact development approach to stormwater management outlined in Alternative 9 and suggest that a meeting with Town staff and their consultants to explore the possibility of this methodology for the Coronation Park Community. Staff recommend that new stormwater outlets be considered a last-resort as a means of mitigating impacts of drainage deficiencies. Additional outlets are problematic due to thermal impacts, erosion and sedimentation concerns, as well as hydrologic impacts of enclosing additional flows within piped infrastructure. Examples of other stormwater management measures which could be implemented within the community include infiltration galleries/bioswales in parking areas, permeable paving, tree/shrub planting initiatives, rooftop control and reduction of impervious surfaces.

- Further, it is the opinion of staff that these stormwater management measures complement the ideals outlined in the Town of Oakville's various strategic initiatives, especially the Livable Oakville Plan, which outlines the Town's objectives for stormwater management in Section 10.10.
- According to the MOE (2003), if a single SWM feature is being used to treat stormwater runoff from an entire site (including roads and parking lots), pre-treatment is necessary to minimize the potential for suspended sediments. Pollution prevention through source controls should also be investigated (sanding/salting practices, public

education with respect to street/driveway sediments) in areas where an infiltration trench is proposed.

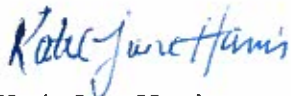
- In addition, given the resources required by municipalities to reactively deal with erosion in creek blocks that are adjacent to private property, staff strongly recommend that the Town investigate ways to augment stormwater management on public property to proactively manage erosion. Augmenting the treatment train approach as recommended here would help slow down water exiting the site, avoiding the Town's contribution to sedimentation in Lake Ontario.
- Staff understand that LID measures are often not possible or practical for many reasons. If this approach cannot be supported at this time, it is suggested that the Town invest in retrofitting existing stormwater management facilities, to ameliorate the re-routing of additional stormwater. This approach may be especially useful, given that the Town is pursuing the upgrading of the Oakville Water Purification Plant – which will require minimizing sediment contributions to Lake Ontario.

General Comments

Staff suggest that the images utilized to describe the 'do nothing' approach do not accurately represent conditions within the Coronation Park Community.

Staff trust the above is of assistance and look forward to further consultation. If you have any questions, please contact the undersigned at Extension 2231

Yours truly,



Katie Jane Harris
Environmental Planner
Conservation Halton, Watershed Planning Services

KJH/



905.336.1158
Fax: 905.336.7014
2596 Britannia Road West
Burlington, Ontario L7P 0G3
conservationhalton.ca

Protecting the Natural
Environment from
Lake to Escarpment

April 19, 2016

Kasiz Piskorz
Town of Oakville
1225 Trafalgar Road
Oakville, ON
L6H 0H3

BY MAIL AND BY EMAIL

Dear Ms. Piskorz:

**Re: Coronation Park Drainage Improvements
Municipal Class Environmental Assessment Study
Notice of Study Commencement
Town of Oakville
Our File: MPR 662**

Conservation Halton (CH) staff have reviewed the *Coronation Park Drainage Improvements Class EA – Final Report*, prepared by AMEC Foster Wheeler, dated February 2016. Please note that this letter does not include CH's coastal engineer's comments as they will be forthcoming under separate cover. The following comments use the section numbering employed in the EA document for ease of reference.

Section 4.1.9, Stormwater Quality Assessment, pg. 26: Please revise the last paragraph to indicate:

- Retrofit opportunities to provide water quality treatment within the Coronation Park area should be considered as part of the subsequent alternative assessment process.
- Conservation Halton supports MOECC Level 1 – Enhanced water quality or better for stormwater discharge to Lake Ontario (See Halton Region Report PPW64-08 - Lake Ontario Shoreline Algae Action Advisory Committee Recommendations - Implementation Plan, pg. 5, paragraph 6.)

New developments are required to meet MOECC Level 1 – Enhanced water quality standards not MOECC Level 2 – Normal. CH staff had understood the Town of Oakville was also in support of enhanced water quality due to the nearshore algae issues. The Lake Ontario Shoreline Algae Action Advisory Committee's 2008 final report recommends:

- *“define the near-shore waters of Lake Ontario (say to a depth of 10 m) an environmentally-sensitive area, and take every measure to protect the health of these waters especially when undertaking any new development.”*

- *“review and consider reducing the permitted nutrient discharges to Lake Ontario.”*
- *“local municipalities adopt and implement effective stormwater management policies and plans, to reflect current best practice in protecting nearshore waters of Lake Ontario from additional nutrient loading”*

Every effort should be made to achieve enhanced water quality such as implementing LIDs and best practices.

Section 4.1.11, Summary of Existing Drainage System Concerns, pg. 28: The open channel portion of the systems (Western and Eastern Channels) are currently providing ecological form and function even if they are classified as a drainage features.

In a natural system, which is how the open channel has been functioning, bankfull is typically defined by 2yr flow events not 5yr flow events because they access their floodplain. The floodplain is meant to handle larger flows. Please explain the concern that 5yr flows overtop the banks of the western and eastern creeks. Creating a vegetated floodplain would maintain form and function to the lake shore and these creeks as well as provide sedimentation reduction. The ecological and social benefit of maintaining natural areas and open channels such as these should be discussed and considered.

A fluvial geomorphologist should be included at the detailed design stage to implement natural channel design principles and maximize benefits to the environment and the public.

Section 4.1.11, Summary of Existing Drainage System Concerns, pg. 28: “Blockage of Lake Ontario drainage outlets due to material washing up on shore” was again identified as an area of concern and continues to lack information about the causes related to this area of concern. Staff would prefer that lakeshore beaches not be viewed or discussed as drainage system concerns since they are a beneficial natural aquatic feature. Staff reiterates that beaches are a natural lacustrine feature within Lake Ontario shorelines and serve a number of ecological functions. Lakeshore beaches can be found throughout the Halton shoreline, as shown in the photos below:



Section 5.2, Major System (Overland Drainage Systems), pg.33: Please clarify whether the Short-Listed strategy Combinations, considers combination of all identified long-list solutions, or only combinations of short list solutions. It is requested that LID BMP measures be included in the combination solution as this measure would have mutual benefits in combination with other short list solutions such as grading modifications within the road right of way and on public lands.

Section 6, Short Listed Alternative Assessment, Table 6.1, pg. 37: Conservation Halton staff recommends addressing impacts to terrestrial vegetation, aquatic system and water quality as separate rows in the evaluation criteria instead of a single environmental row. These are all separate considerations with distinct opportunities for potential impacts.

Section 6, Short Listed Alternative Assessment, Table 6.2, pg. 39: Alternatives for the West Channel are identified in this table. Please define the West Channel Area either with figures or within the report text.

Section 6, Short-listed Alternative Assessment – Table 6.2, West Channel Area, pg. 39:
Revisions for the environmental row:

- Alternative 7 would decrease allochthonous inputs to the lake and would also locally alter the local lakeshore with increased deposition.
- Alternative 9 would have significant benefits to water quality, groundwater recharge, and potentially terrestrial vegetation. CH staff LIDs could have beneficial impacts on social interests (public and private) as well since they often provide visual aesthetics which are known to increase real estate values and functional value of the park (See Table 6.3).
- Alternative 10 would have negative effects on both Eastern and Western Channel, decrease allochthonous inputs to the lake and would also locally alter the local lakeshore with increased deposition. Please use a value of one.
- Alternative 8 should be consistent with the value presented for Alternative 10 if they are to be used together.

Section 6, Short -listed Alternative Assessment - Table 6.3, Westminster Drive, pg. 40:
Revisions for the environmental row:

- Alternative 7 would decrease allochthonous inputs to the lake and would also locally alter the local lakeshore with increased deposition.
- Alternative 9 would have significant benefits to water quality, groundwater recharge, and potentially terrestrial vegetation.
- Alternative 10 would have negative effects on both Eastern and Western Channel, decrease allochthonous inputs to the lake and would also locally alter the local lakeshore with increased deposition. Please use a value of one.

- Alternative 8 there is the potential grading could negatively affect water quality (Salt, oil and sediment).

Section 6, Short-listed Alternative Assessment, Table 6.4, Woodhaven Park Drive, pg. 42:
Revisions for the environmental row:

- Alternative 7 would decrease allochthonous inputs to the lake and would also locally alter the local lakeshore with increased deposition.
- Alternative 9 would have significant benefits to water quality, groundwater recharge, and potentially terrestrial vegetation.
- Alternative 10 would have negative effects on both Eastern and Western Channel, decrease allochthonous inputs to the lake and would also locally alter the local lakeshore with increased deposition. Please use a value of one.
- Alternative 8 there is the potential grading could negatively affect water quality (Salt, oil and sediment).

Section 6, Short Listed Alternative Assessment, pg.39: Insufficient detail is presented in Table 6.2 and within the report to clarify why Minor Systems Alternative 11 Combinations would be least preferred from a functional perspective in the West Channel Area, while conversely be most preferred from a functional perspective in in the Westminster Drive and Woodhaven Park Areas discussed in Table 6.3 and 6.4?

Section 6, Short Listed Alternative Assessment, pg.40: Responses with respect to Minor System Alternative 10 and Major System Alternatives 2 and 8 under the Functional Evaluation Criteria appear to be contradictory. The Minor System discussion identifies potential for a new storm sewer system to address minor system concerns, however comments on the major system indicate the Town and residents prefer to maintain a rural road cross section, and implementation grading works within the existing ditches.

Section 6, Short Listed Alternative Selection, pg. 40: Minor System Alternative 10 discusses implementation of an urban drainage system under the Functional Evaluation Category, however the detrimental impact of transitioning from a rural to urban system is not evaluated with respect to water quality.

Section 6, Short Listed Alternative Selection, pg. 42: See *Section 6, pg. 40* comment above.

Section 7.1, West Channel Area: Any sub-alternatives that propose alteration to the Eastern or Western Channels should have consideration for the functions they provide to Lake Ontario. These include, but are not limited to; flood conveyance and attenuation, removal of pollutants via filtration, recharge of subsurface aquifers via percolation and provision of allochthonous inputs (e.g. invertebrates, twigs, leaves, dissolved nutrients and matter that can be used as cover by aquatic organisms). Natural channel design is recommended for environmental, health and aesthetic benefits.

Section 7.1.1, Assessment of Sub-Alternatives, pg. 49; Section 7.1.2, Preliminary Sizing and Costing, pg. 50; and Section 9.2, Recommendations, item iii, pg. 78: Please edit these sections. Refer to CH's comment on Section 4.1.11, pg. 28 for our position regarding lakeshore beaches and the recommendation to discuss them as a natural feature not as blockages. Conservation Halton understands that there is City infrastructure associated with the channel and that limited maintenance may be required but this has not been demonstrated in this EA therefore should not be included as a recommendation from this EA. Before proceeding with any additional maintenance or recommendation for maintenance an investigation of the natural processes occurring and the root causes of the perceived drainage issues associated with the channel mouth should be investigated and modelled. Once the root causes are determined then solutions should be investigated.

If a recommendation regarding the maintenance associated with lakeshore beaches continues to be included in this EA then the topic should be properly discussed and evaluated in the text. Staff recommend a coastal geomorphologist be consulted and that a proper investigation be conducted. This could be deferred to the detailed design stage but if that is the case the requirement for the investigation and assessment of options should be included in the final recommendations section.

Please note that if the proposed beach maintenance requires a permit the above mentioned additional analysis may be required by CH staff to determine the appropriateness of the proposed maintenance.

Staff are not aware of any conversation having occurred between CH staff and Amec Foster Wheeler regarding lakeshore beaches for this EA beyond our previous request that they expand on the perceived issues and discuss the environmental functions of the beaches. Please remove the statement or provide the context in which the conversation occurred.

Section 7.2.2, Preliminary Sizing and Costing, pg. 52: It is anticipated that the preferred improvement will either involve Alternative 2-5 in conjunction with Alternative 8-9 or a combination of all three identified alternatives. The costing information provided however, only addresses the costing for all three alternatives. If alternatives may feasibly be advanced independently or in unique combinations, the costing for each feasible alternative or alternative combination should be clarified.

Section 7.3.2, Preliminary Sizing and Costing, pg. 56: It is anticipated that the preferred improvement will either involve Alternative 2-6 in conjunction with Alternative 8-10 or a combination of all three identified alternatives. The costing information provided, however only addresses the costing for all three alternatives. If alternatives may feasibly be advanced independently or in unique combinations, the costing for each feasible alternative or alternative combination should be clarified.

Section 7.3.2, Preliminary Sizing and Costing, pg. 56: It is anticipated that the preferred improvement will either involve Alternative 2-6 in conjunction with Alternative 8-10 or a combination of all three identified alternatives. The costing information provided, however only addresses the costing for all three alternatives. If alternatives may feasibly be advanced

independently or in unique combinations, the costing for each feasible alternative or alternative combination should be clarified.

Section 7.7.1, Assessment of Sub-Alternatives, pg. 63: It appears that the proposed works will impact a candidate significant woodlot. Conservation Halton staff defer to the Region of Halton.

Section 8.0, Preferred Alternatives and Prioritization, pg. 74; Section 7.1.2, Preliminary Sizing and Costing, pg. 50; and Section 9.2, Recommendations, item iii, pg. 78: Conservation Halton staff expects that additional modelling may be required to support the ultimate channel designs for the Easter and Western Channels.

Section 9.2, Recommendations, pg. 78: In Section 7, it was recommended that incorporation of LID/BMP measures be assessed further in conjunction with detailed design. This recommendation should be carried forward to the Recommendations section of the report. As it appears the preferred design in many areas will incorporate a rural cross section with a storm sewer system, it is recommended that the potential for further conveyance BMPs such as inclusion of a perforated storm sewer be considered as part of the detailed design.

Drawing No. 15: While it is recognized that the “Eastern Channel” in Coronation Park is not a regulated water course, it is requested that natural channel design principles be applied to the detailed design of this feature. It is further requested that the design consider how channel planform and features may impact debris jamming associated with coastal processes.

Staff trust the above is of assistance. Comments from Conservation Halton’s coastal engineer will be forthcoming under a separate cover. If you have any questions, please contact the undersigned at Extension 2231

Yours truly,



Katie Jane Harris
Environmental Planner
Conservation Halton, Watershed Management Services

KJH/



905.336.1158
Fax: 905.336.7014
2596 Britannia Road West
Burlington, Ontario L7P 0G3
conservationhalton.ca

Protecting the Natural
Environment from
Lake to Escarpment

May 16, 2016

Kasia Piskorz
Town of Oakville
1225 Trafalgar Road
Oakville, ON
L6H 0H3

BY MAIL AND BY EMAIL

Dear Ms. Piskorz:

**Re: Coronation Park Drainage Improvements
Municipal Class Environmental Assessment Study
Notice of Study Commencement
Town of Oakville
Our File: MPR 662**

Conservation Halton (CH) staff provided partial comments in a letter dated April 19, 2016 pertaining to the *Coronation Park Drainage Improvements Class EA – Final Report*, prepared by AMEC Foster Wheeler, dated February 2016. At that time it was noted that additional comments from CH's coastal engineer would be forthcoming under separate cover. Please see the following comments.

Ontario Regulation 162/06

Upon review of the Final Report prepared by AMEC Foster Wheeler, it has been concluded that Conservation Halton's engineering comments provided in our letter dated December 12, 2014 have not been addressed. Please see our letter attached for your reference. It is also noted that CH's December 12, 2014 letter is not included in Appendix D under study documentation.

The Final EA document discusses alternatives that would involve a hardening of the cobble beach shoreline and drainage features. Impacts from hardening the shoreline and natural stream systems within Coronation Park could be significant and the resulting environmental impacts should be properly evaluated as part of the EA process. It is staff's opinion that this level of evaluation has not occurred.

Both shoreline works and streams within the shoreline hazard regulation limit will require Conservation Halton Permits. Early consultation and development of specific concepts and evaluation of their impacts should be part of the EA process. Adequately completing their evaluation now will facilitate a more efficient review and approval process for future Permits

required pursuant to Ontario Regulation 162/06. Deferring these issues to detailed design risks the adoption of preferred alternatives that may not be consistent with Conservation Halton's policies.

Staff trust the above is of assistance. If you have any questions, or would like to set up a meeting for further discussion, please contact the undersigned at Extension 2231

Yours truly,



Katie Jane Harris
Environmental Planner
Conservation Halton, Watershed Management Services

KJH/
Encl 1



Conservation
Halton

905.336.1158
Fax 905.336.7014
2596 Britannia Road West
Burlington, Ontario L7P 0G3
conservationhalton.ca

Protecting the Natural
Environment from
Lake to Escarpment

December 12, 2014

Kasiz Piskorz
Town of Oakville
1225 Trafalgar Road
Oakville, ON
L6H 0H3

BY MAIL AND BY EMAIL

Dear Ms. Piskorz:

**Re: Coronation Park Drainage Improvements
Municipal Class Environmental Assessment Study
Notice of Study Commencement
Town of Oakville
Our File: MPR 662**

Staff have had an opportunity to review the discussion boards presented in the Public Information Centre #2 dated November 26, 2014, and in particular have utilized the 'Preferred Solution' slide (pg. 16) as our basis for review and offer the following comments.

Ontario Regulation 162/06

As per Conservation Halton's previous comments dated June 13, 2014 and November 19, 2014, the shoreline of Lake Ontario and its associated hazards are regulated pursuant to Ontario Regulation 162/06. Therefore any works within the regulation limit requires a Permit from Conservation Halton. The following comments relate to works that fall within our Regulatory limit.

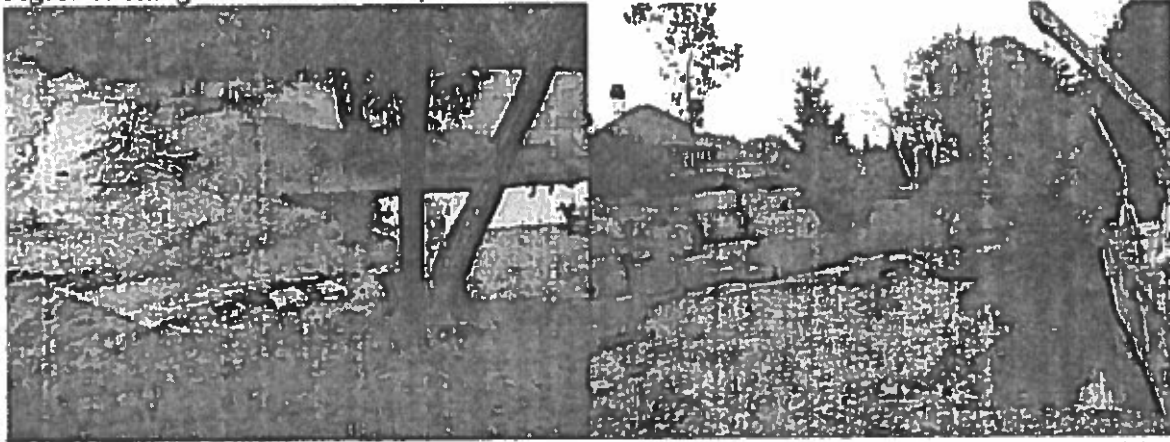
Measures Proposed at Lake Ontario Limit

Two existing outlets into the lake

- Staff request more information about the concerns related to 'blockage of watercourses at Lake Ontario due to material washing onshore'. Conservation Halton recommends that the connections with the lake remain protected by the existing and natural accumulation of the shingle/barrier beaches. These natural lacustrine features are an effective and environmentally friendly protection of the shoreline against erosion hazards and serve a number of ecological functions. Barrier beaches can be found throughout the Halton shoreline, as shown in the photos below (Figure 1). Any structural shoreline protection measures are usually not effective and may negatively impact natural coastal processes along

the shoreline. An annual maintenance plan should be developed to keep entrances open to sustain the flows.

Figure 1: Shingle/Barrier Beaches, Halton Lake Ontario Shoreline



- Watercourse/shoreline modification by humans via hardening measures such as concrete, armour stone, wood or steel walls and the removal of vegetation around lakes and stream banks negatively alter natural shoreline processes. Removal of vegetation decreases the stability of the bank and increases shoreline erosion. A goal of both the Oakville Harbour West Shore Master Plan and Tannery and Waterworks Parks EA (nearby similar Town initiatives) is to use a variety of plant materials that will provide diversity, and will be reminiscent of native plant material found along the water's edge. Part of CH's mandate is to promote restoration using native, non-rare plant species throughout its watershed, predominantly in areas regulated by our own regulation (Ontario Regulation 162/06). The opportunity to see this goal come to fruition within the Coronation Park Community is tremendous. Staff feel that restoration such as this has the potential to demonstrate our joint commitment to the natural environment to residents, tourists and other park users, and to educate the public and further the potential for shoreline naturalization. We look forward to working together to re-establish the flora of the shoreline and hydrologic features in this area.

Flooding

- Coronation Park has been prone to flooding from Lake Ontario; the appropriate Lake Ontario flood levels shall be considered into the design of park drainage system.
- The parking lot at the most north-easterly portion of the park has been susceptible to flooding in the past. It would be prudent to find out whether the flooding hazard had been eliminated during the reconstruction of the parking in the past.
- Coronation Park had been regraded over the years, and the recent construction of the Mid-Halton shaft has also impacted park grades. It is recommended that a topographic survey be undertaken and used in the next stages of the design.

CA/Halton MOU

The following comments are provided under our Memorandum of Understanding with the Region of Halton.

Wildlife Habitat Impacts/Mitigation

- Within Coronation Park staff note that works are proposed to re-grade and widen the channel. Staff recommend that this be an opportunity to improve wildlife habitat in the vicinity of the proposed works by considering improvement of habitat for migrating species, i.e. birds and butterflies.
- It is also recommended that additional measures to reduce open area for Canada Geese congregation be considered.

Vegetation Management

- Staff note that there appear to be proposed works located within Candidate Significant Woodland (i.e. “re-grade reverse sloped channel to provide positive drainage”). Staff request further detail on what is proposed and how impacts will be mitigated. Staff recommend that a vegetation inventory be completed to ensure no impact to Species at Risk.
- Staff note that the extent of tree removal necessary for the various alternatives should be considered. Given that the proposed tree removal is part of Town works, potentially occurring on Town-owned lands, staff recommend that the proponent adhere to their tree-cutting bylaws (applies to trees in both private and public ownership). Please also ensure that the tree replacement required for your works is in keeping with the Canopy Replacement Schedule outlined in the document. Species proposed for replacement should consist of locally native, non-invasive species suitable for the site’s conditions. Further, it is the opinion of staff that any drainage improvement approach that incorporates revegetation complements the ideals outlined in the Town of Oakville’s various strategic initiatives, especially the Livable Oakville Plan, one objective of which is to “to progressively increase the urban forest to achieve a canopy cover of 40% Town-wide beyond the life of this Plan”.
- Staff recommend that all planting in non-regulated areas of the site utilize species that are native and non-rare within Halton Region, as per CH Landscaping Guidelines (available at <http://www.conservationhalton.ca/planning-permits>).
- In addition, proposed plantings to be used adjacent to natural areas should consist of locally native, non-invasive species. Please refer to the Conservation Halton Landscaping and Tree Preservation Guidelines (link included above) for further landscaping procedures. Staff are available to assist with planting plans for disturbed riparian areas.

Lakes and Rivers Impacts

Hydrologic Connections

- Staff are supportive of any measures to improve aquatic habitat, such as re-grading the various channels as indicated in the Preferred Solution slide. Staff request more detail on the proposed re-grading and widening of the various hydrologic connections. Staff strongly

recommend utilizing a natural channel design approach, if these solutions are selected as these features serve a number of headwater functions that are important for maintaining the health of the downstream reaches of these watercourses and their confluence with Lake Ontario, immediately downstream. These functions include, but are not limited to:

- Flood conveyance and attenuation
- Removal of pollutants via filtration
- Recharge of subsurface aquifers via percolation
- Provision of allochthonous inputs downstream (e.g. invertebrates, twigs, leaves, dissolved nutrients and matter that can be used as cover by aquatic organisms)

Staff suggest that a wider arrangement be considered, with shallower slopes (3:1 slope or flatter). Staff propose the creation of riparian buffers – strips of land near the water that are preserved in their natural state or enhanced with the addition of native vegetation. They reduce sediment and excess nutrients (various chemicals including fertilizer and pesticides, bacteria, sediment, etc.) from entering lake. They protect the shore from wind, wave and ice action. They create cover, food and shade for plants and animals. They include leaving natural shorelines alone or enhancing with rooted plantings, seed mixes, aquatic plantings and live staking.

- Sediment and erosion control will be an important consideration for this project, given that the entire study area drains to Lake Ontario. To prevent mobilization of sediment, disturbed areas should be restored with a seed mix. The seed mix to be used adjacent to any drainage features and Lake Ontario should contain all locally native and non-rare species. Biodegradable erosion control blankets may be required until seeding is well established. Please refer to the Conservation Halton Landscaping and Tree Preservation Guidelines (link above) for seed mix guidelines.

Stormwater Management

Staff are very supportive of the low-impact development approach to stormwater management outlined in Alternative 9 and suggest that a meeting with Town staff and their consultants to explore the possibility of this methodology for the Coronation Park Community. Staff recommend that new stormwater outlets be considered a last-resort as a means or mitigating impacts of drainage deficiencies. Additional outlets are problematic due to thermal impacts, erosion and sedimentation concerns, as well as hydrologic impacts of enclosing additional flows within piped infrastructure. Examples of other stormwater management measures which could be implemented within the community include infiltration galleries/bioswales in parking areas, permeable paving, tree/shrub planting initiatives, rooftop control and reduction of impervious surfaces.

- Further, it is the opinion of staff that these stormwater management measures complement the ideals outlined in the Town of Oakville's various strategic initiatives, especially the Livable Oakville Plan, which outlines the Town's objectives for stormwater management in Section 10.10.
- According to the MOE (2003), if a single SWM feature is being used to treat stormwater runoff from an entire site (including roads and parking lots), pre-treatment is necessary to minimize the potential for suspended sediments. Pollution prevention through source controls should also be investigated (sanding/salting practices, public

education with respect to street/driveway sediments) in areas where an infiltration trench is proposed.

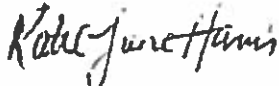
- In addition, given the resources required by municipalities to reactively deal with erosion in creek blocks that are adjacent to private property, staff strongly recommend that the Town investigate ways to augment stormwater management on public property to proactively manage erosion. Augmenting the treatment train approach as recommended here would help slow down water exiting the site, avoiding the Town's contribution to sedimentation in Lake Ontario.
- Staff understand that LID measures are often not possible or practical for many reasons. If this approach cannot be supported at this time, it is suggested that the Town invest in retrofitting existing stormwater management facilities, to ameliorate the re-routing of additional stormwater. This approach may be especially useful, given that the Town is pursuing the upgrading of the Oakville Water Purification Plant – which will require minimizing sediment contributions to Lake Ontario.

General Comments

Staff suggest that the images utilized to describe the 'do nothing' approach do not accurately represent conditions within the Coronation Park Community.

Staff trust the above is of assistance and look forward to further consultation. If you have any questions, please contact the undersigned at Extension 2231

Yours truly,



Katie Jane Harris
Environmental Planner
Conservation Halton, Watershed Planning Services

KJH/