

# **APPENDIX J.5**

## **CONSERVATION HALTON**

# Memo

To: Rachel Whyte

From: Lisa Campbell

Date: 7/23/2014

Re: **Ninth Line EA, Halton Region**  
**Natural Heritage Assessment - Interim Report**

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With regard the above-noted project, we provide the following summary comments which reflect the work completed to date.

1) A review of the existing and historical data for the area was completed to provide context for the current field investigations. There are few significant natural heritage features documented historically and no features of provincial significance identified within the study reach. The small woodlot on the northwest corner of Ninth Line and Side Road 5 has been identified as EPA regionally due to an unidentified wetland feature. There is also a headwater channel of Sixteen Mile Creek (East Branch) that traverses beneath Ninth Line that has been classified as a cool water channel. There is very little existing data for either of these features.

2) Field site visits were completed on May 14, June 4 and July 16 to complete flora and fauna assessments and an evaluation of the headwater as per the project scope. Another field site visit is scheduled for August to enumerate and identify the street trees. The small woodlot feature will also be assessed (pending permission to access from the landowner) to evaluate any potential drainage issues or significant features and functions. To date, there is no indication of existing species at risk in the immediate area that would be impacted by the proposed road alterations.

3) A meeting was held with Conservation Halton on June 13, 2014 to discuss the project scope and ensure that there were no additional issues or concerns from the agency. Kim Barrett was interested in collecting additional data pertaining to the small woodlot discussed above if we are able to gain access to the property. Otherwise, they seemed to accept our approach. We stressed the importance of acknowledging that this project is proceeding as an EA, not a planning application,

therefore their original to follow the EIS guidelines was not applicable or suitable given the context of the proposed works. Samantha Mason was not at the meeting and had previously requested temperature monitoring of the channel which we agreed to at the detailed design stage if warranted based on preliminary research and proposed alterations to the road or culvert.

4) The channel assessment confirmed that the channel is dry with exception of two small pools at the upstream end of the culvert. Given the dry conditions, it is unlikely that there is significant base flow contributions in this area that would require any temperature monitoring and there is currently no viable fish habitat within the channel surrounding the road, with exception of any fish possibly stranded under the existing culvert. The channel does provide suitable amphibian breeding habitat based on the confirmed observations of the amphibians in the pools.

The above notes provide a brief summary of the existing natural heritage features and work completed to date. We will continue with the field investigations and provide additional updates as the project proceeds.

Should you require any additional information, please feel free to contact our office.

Regards,

Lisa Campbell, M.Sc., C.C.E.P.

## Paul Bond

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**From:** Paul Bond  
**Sent:** Wednesday, February 04, 2015 11:42 AM  
**To:** 'aselig@uemconsulting.com'  
**Cc:** 'lcampbell@lcaenvironmental.ca'; 'aalmuina@uemconsulting.com'  
**Subject:** PR2876 Ninth Line Transportation Corridor Improvements EA - Highway 407 to 10 Sideroad HH  
**Attachments:** Completed EA Check List February 4, 2015.doc

Hi Amanda,

As follow up to the November 2014 TAC Meeting No. 1, I am appending an electronic copy of our EA Checklist which we have completed for this EA (**only the boxes checked off apply**). This will assist you and your team with identifying background studies and technical work as part of this project. I also note that we had a good discussion with Lisa Campbell after the TAC Meeting.

I will forward a hard copy to you as with the mapping and Policy excerpts referenced in the check list.

Kind regards,

Paul.

**Paul Bond**  
**Environmental Planner**  
**Conservation Halton**

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## **PUBLIC INFRASTRUCTURE AND RECREATIONAL USES**

### **3.51 Public Infrastructure - Utilities, Trails and Transportation**

It is recognized that certain utilities and services such as watermain, storm and sanitary sewers, natural gas or oil pipelines, hydro and communication corridors, footpaths/trails and transportation links will, from time to time, be required to cross *hazardous lands*, *valleylands*, *wetlands* or *shorelines*. Such uses will be subject to the following criteria:

- a) The need for the project has been demonstrated and there is no reasonable alternative;
- b) The area of construction disturbance will be kept to a minimum;
- c) In order to protect and maintain the long term integrity of *valley* systems, new utility and transportation corridors will be required to locate outside of *valley* and stream corridors, including the regulated tableland area, wherever possible;
- d) With the exception of footpaths/trails, crossings of *wetlands* will only be permitted where supported by an Environmental Assessment or equivalent comprehensive study as deemed appropriate by Conservation Halton;
- e) Public use footpaths/trails (including boardwalks) may be considered in *wetlands* where proposed for educational and recreational purposes by a public agency. Depending on the extent of works and nature of *wetlands*, an Environmental Impact Study or Environmental Assessment may be required;
- f) All works must be constructed in such a manner as to prevent increases in flooding and velocities (for range of storm events) on upstream and downstream properties;
- g) The construction of pipe or service pipelines must maintain the predevelopment configuration of the *flood plain* and *valley* walls and minimize disturbance to existing vegetation. Directional drilling or boring should be utilized for all permanent flowing streams. In addition, storm sewer outfalls should be designed to provide adequate protection to *watercourse* embankments;
- h) Stream erosion hazards must be adequately addressed;
- i) Where structures are necessary within the *flood plain*, the structure should be designed so that overtopping or flanking can occur with a minimum amount of damage. Major bridges not designed to pass the *flooding hazard* limit conditions should have their approach ramp(s) designed as spillways. Smaller footbridges should be securely anchored such that they will not become an obstruction at downstream culverts;
- j) Storm sewer outfalls required to be constructed on *valley* walls greater than 6 metres in height will normally utilize a drop shaft and tunnel in order to protect the natural integrity of the *valley* wall;
- k) Habitat connectivity and wildlife movement must be incorporated into the planning, design and construction practices of all works. The design practices will maintain, and where possible improve or restore, key ecological linkages; and,
- l) Requirements of Section 3.19, 3.21, 3.38, 3.39, 3.41-3.50.
- m) Requirements of Policies 3.22 to 3.28, 3.31 to 3.37 for any buildings.

## Environmental Assessment Checklist HA

The following list identifies the areas of interest or concern that Conservation Halton may have with the subject EA:

### **Ontario Regulation 162/06**

- ☒ The study area contains wetlands and Conservation Halton regulates the wetlands and associated setbacks to these features. Ontario Regulation 162/06 requires that a Permit be obtained from Conservation Halton prior to development, interference with wetlands or alterations to shorelines and watercourses. A copy of Ontario Regulation 162/06 and the associated Policy document, *Policies and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document* can be found at [www.conservationhalton.ca](http://www.conservationhalton.ca). Please ensure that the EA contains sufficient information to allow Conservation Halton staff to determine whether a Permit could be issued at detailed design.
- ☒ The EA should identify areas where Permits pursuant to Ontario Regulation 162/06 will be required and include such Permits as future commitments in the ESR. Some details related to future Permits may not be deferred to detailed design. Please review the requirements of Policy 3.51 (Public Infrastructure – Utilities, Trails and Transportation) of Conservation Halton's *Policies and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document* (see enclosed).
- ☒ Please survey all drainage features, watercourse ditchlines, culverts, etc.
- ☒ Please plot all areas regulated by Conservation Halton on drawings. ARL mapping may be utilized if more detailed study is not required at this time, however, please ensure that drawings indicate that limits shown are an approximation of the regulated area. Staff has enclosed Approximate Regulation Limit (ARL) mapping for your information.
- ☒ A Data Request Form is required for all digital information requests. This form and additional information on data holdings can be found in the "GIS & Mapping" section of Conservation Halton's website: [www.conservationhalton.ca](http://www.conservationhalton.ca). Staff notes that the following modeling is available for the study area:
  - 16 Mile Creek Generic Regulations HEC-RAS Model (draft) for south tributary (crossing at approximately 400m north of Steeles Avenue).
- ☒ It is recommended that 'potential impacts to natural hazards' (flooding and/or erosion hazards) should be one of the evaluation criteria. At a minimum, a proposed alternative must have no negative impacts on flooding and erosion hazards in order for Conservation Halton to issue a future approval under Ontario Regulation 162/06. Opportunities to improve any deficiencies with respect to flooding and erosion should be investigated.
- ☒ The EA should assess all flood plain impacts associated with each alternative including consideration of any change in storage, velocity and up and down stream water levels for a variety of flow conditions.

- ☐ Please identify any potential areas of unstable bedrock, karst or unstable soils within the study area. These areas are regulated by Conservation Halton pursuant to Ontario Regulation 162/06.
- ☒ A hydrologic and/or hydraulic analysis is required for all culvert crossings in the Environmental Study Report.
- ☒ Please consider MTO's flooding criteria, guidelines and/or the municipal engineering standards for flooding along/over roads. At a minimum, safe access & egress as defined in the MNR's 2002 *Technical Guide: River & Stream Systems – Flooding Hazard Limit*, should be provided.
- ☒ If a roadway is considered by the Province or local municipality to be an Emergency Route then there should be no overtopping of the road with flood waters.
- ☐ A fluvial geomorphological assessment (*is required/may be required*) to assess erosion hazards in the Environmental Study Report. MNR guidelines should be followed.
- ☒ A fluvial geomorphological assessment is required to verify that crossing designs have adequately allowed for natural channel migration, fish/terrestrial passage, and sediment transport, as well as minimizes the risk to infrastructure.
- ☒ Please contact staff to arrange a site visit to stake the wetland(s) during the growing season (Approximately mid-May to October). An OLS must be present during this site visit.
- ☐ A geotechnical assessment of slope stability (*is required/may be required*) in the Environmental Study Report. MNR guidelines should be followed. Please consult staff before the geotechnical assessment is initiated to establish a Terms of Reference.
- ☐ A hydrologic evaluation (*is required/may be required*) to determine if there is an impact to the hydrological functions of the wetland as a result of the proposed works.
- ☐ A geotechnical and coastal engineering report (*is required/may be required*) to identify soil properties to determine the long term stable slope allowance associated with the Lake Ontario shoreline.
- ☐ A topographic survey (*is required/may be required*) to identify the lands impacted by the flooding hazard associated with (*Lake Ontario/Creek*).
- ☐ Other: \_\_\_\_\_

### **Natural Heritage**

While Conservation Halton recognizes that Environmental Assessments are not subject to and/or limited to the policies outlined in the Provincial Policy Statement (PPS), we do believe that the PPS provides Provincial direction on how natural resources should be managed in Ontario. Furthermore, it is useful for identifying some of the key natural heritage features, water resources, and natural hazards

that should be considered when evaluating any sort of development proposal. As such, some PPS related items have been outlined below, as we believe these items should be acknowledged and addressed as part of the EA study.

- ☒ When undertaking any fieldwork and/or when making recommendations related to natural heritage and/or natural hazards, staff recommend that reference be made to the following guidelines prepared by the Ministry of Natural Resources and Forestry (MNRF): *Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005, 2<sup>nd</sup> Edition, March 2010; Significant Wildlife Habitat Technical Guideline;* and, *Natural Hazards Technical Guide* and *Understanding Natural Hazards*.

- ☒ The study area may contain or pass between natural features. As per Policy 2.1.2 of the Provincial Policy Statement, the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and groundwater features. Where applicable, the use of ecopassages or other measures to facilitate wildlife movement should be evaluated.

- ☒ As noted above, the study area contains a number of regulated wetland features including the East Oakville Swamp Locally Significant Wetland. As per Policy 2.1.4 of the Provincial Policy Statement, development and site alteration shall not be permitted in significant wetlands or significant coastal wetlands.

- ☒ The study area may contain the habitat of Endangered or Threatened species. As per Policy 2.1.7 of the Provincial Policy Statement, development and site alteration shall not be permitted in the habitat of habitat of endangered species and threatened species, except in accordance with provincial and federal requirements. The provincial *Endangered Species Act* and/or federal *Species at Risk Act* may also apply. Please contact the Ministry of Natural Resources and Forestry (MNRF) at [esa.aurora@ontario.ca](mailto:esa.aurora@ontario.ca) for further information on *Endangered Species Act* requirements.

- ☐ The study area contains the (*name*) area of natural and scientific interest (ANSI). As per Policy 2.1.5 of the Provincial Policy Statement, development and site alteration shall not be permitted in an ANSI unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. Please contact the Ministry of Natural Resources and Forestry (MNRF) for further information on ANSI's.

- ☒ The study area may contain significant wildlife habitat. As per Policy 2.1.5 of the Provincial Policy Statement, development and site alteration shall not be permitted in significant wildlife habitat unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. Please refer to the Ministry of Natural Resource's *Significant Wildlife Habitat Technical Guidelines*.

- ☐ The study area contains a significant valleyland (*Bronte/Sixteen/Grindstone*). As per Policy 2.1.5 of the Provincial Policy Statement, development and site alteration shall not be permitted in significant valleylands unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.



☒ The study area contains several Candidate Significant Woodlands. As per Policy 2.1.5 of the Provincial Policy Statement, development and site alteration shall not be permitted in significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River) unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. Please contact the Region of Halton for further information on significant woodlands.

☒ Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in Policies 2.1.4, 2.1.5 and 2.1.6 of the Provincial Policy Statement unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions. The Ministry of Natural Resources' Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement 2005, Second Edition (2010) considers adjacent lands to be within 120 metres.

☐ The study area contains the (*name*) ESA. The Environmental Study Report must address impacts to the ESA. Please contact the (*Region of Halton/City of Hamilton/County of Wellington/City of Mississauga*) for further information on the ESA.

☒ Please use Ecological Land Classification to map natural and semi-natural features to vegetation type and identify protection/mitigation measures. ELC data sheets are required with the ESR submission (please include digital species spreadsheets).

☒ Please refer to Conservation Halton's *Environmental Impact Study Guidelines* for information on general study requirements, impact assessment and appropriate timing and protocols for surveys. These guidelines can be found at [www.conservationhalton.ca](http://www.conservationhalton.ca).

☒ Conservation Halton's *Landscape Guidelines* should be consulted at detailed design. These guidelines can be found at [www.conservationhalton.ca](http://www.conservationhalton.ca).

☒ Please provide a list of alignment alternative evaluation criteria for review and comment.

☒ Please consider the number of crossings of areas regulated by Conservation Halton as part of the alignment alternative evaluation criteria.

☒ Please note that impacts associated with alternatives may occur beyond the currently proposed study area (e.g. in proximity to adjacent wetland). We understand that additional natural heritage inventory and analysis will be undertaken as part of detail design and that Conservation Halton will have an opportunity to comment on the Terms of Reference for that work.

☒ All field data sheets are required for the completed surveys. These should be in both hard copy and digital format for review.

☒ At detailed design, a Tree Preservation Plan may be required.

☒ At detailed design, a restoration plan consisting of locally native, non-invasive species,

suitable for the site's conditions may be required. In addition, an edge management plan may be required.

☐ Other: \_\_\_\_\_

### **Fish Habitat**

☒ Please include fish habitat mapping as per MTO Protocol "Environmental Guide for Fish and Fish Habitat, 2006". Please include photo documentation of the study area with a key map indicating photo locations.

☐ As per Policy 2.1.6 of the Provincial Policy Statement, development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.

☒ Staff note that there is a local drainage feature/hydrologic connection within the study area. Please be advised that although this drainage feature is not regulated under Ontario Regulation 162/06, future development may be subject to review or approvals under the Fisheries Act.

☐ Staff note that a fisheries setback of (15/30) metres from the high water level applies for (coldwater/warmwater) creeks.

☐ Please note that Conservation Halton's Level II Agreement does not apply to Provincial projects. Please contact the Department of Fisheries and Oceans.

☐ Other: \_\_\_\_\_

### **Groundwater**

☒ Please identify groundwater recharge/discharge areas. Please identify recommended mitigation measures for groundwater impacts and if appropriate, any opportunities to improve infiltration.

☒ Please identify hydrological impacts.

☐ Please complete a water balance assessment to determine any infiltrative deficit. If a deficit is identified, all potential impacts should be identified and assessed.

☐ All proposed works should consider Policies 2.2.1 and 2.2.2 of the Provincial Policy Statement regarding water (*highlight specific policy elements where relevant*).

☐ Other: \_\_\_\_\_

### **Stormwater Management/Drainage**

- ☒ Please discuss quality/quantity/erosion controls within the Stormwater Management Section of the Environmental Study Report. Please examine the potential to combine SWM with adjacent development.
- ☒ As per MOE SWMP Manual and 16 Mile Creek Watershed Plan please be advised that the quality requirements are Enhanced/Level 1 treatment. Please discuss the mitigation of thermal impacts.
- ☒ As per MOE SWMP Manual and 16 Mile Creek Watershed Plan please be advised that the quantity requirements are post to pre development controls to the extent possible.
- ☒ As per MOE SWMP Manual and 16 Mile Creek Watershed Plan please be advised that the erosion control requirements are implemented to the extent possible.
- ☒ Please identify existing vs. proposed drainage areas. Every effort should be taken to maintain existing drainage divides. Any proposed diversions must be clearly identified and the potential impacts fully assessed as part of the project's evaluation.
- ☐ Other: \_\_\_\_\_

### **Other**

- ☒ Recommendations and requirements from the following Watershed/Subwatershed Studies should be followed:
  - Sixteen Mile Creek Watershed Plan (Ecoplans, 1995). Refer to recommendations in Table 8.9
- ☐ Conservation Halton owns (*name of landholding*) within the study area. Please identify any potential impacts to Conservation Halton landholdings (direct – adjacent to, and indirect – road closures, detours etc.). Any questions regarding Conservation Halton landholdings should be directed to (*name*).
- ☒ Is infrastructure proposed within existing easements/r-o-w or are there additional property requirements? Please assess the impacts of utility relocation (i.e. telephone poles, union gas, etc.) on natural heritage features, natural hazard areas and fish habitat. This should not be left to detailed design as the relocation can have a significant impact on natural heritage features.
- ☐ Please note that Conservation Halton staff do not screen on behalf of MNR for *Lakes and Rivers Improvement Act* implications. We recommend you contact the MNR to determine if this Act will apply to the proposed works.
- ☐ The Province and Crown Corporations do not require permits from Conservation Halton under Ontario Regulation 162/06. We do however appreciate any efforts that the Province and these Corporations can take to meet the requirements of our Regulation and to address areas of provincial interest.

☐ In order to allow sufficient time to review the Draft Environmental Study Report, staff would appreciate it if a review timeline of 4 weeks could be incorporated into the project schedule. We would like to request 3 (*change as required*) hard copies of the ESR for review.

☒ Please provide a figure with proposed works and/or alternatives overlaid on an airphoto.

Other: MANAGEMENT OF EXCESS SOIL – The ESR should include an initial estimate of the fill and soil volumes required/generated as part of the project and recommend the preparation of a soil and/or fill management plan in accordance with the document

☒ ‘Management of Excess Soil – A Guide for Best Management Practices’ as prepared by the Ministry of Environment and Climate Change, January 2014. The document can be downloaded via the following link: <http://www.ontario.ca/environment-and-energy/management-excess-soil-guide-best-management-practices>





- CH Landholdings
- Conservation Areas
  - Other Landholdings
- Road Network
- Highway
  - Arterial
  - Collector
  - Ramp
  - Street
- Railway
- 
- Municipal Boundaries (line)
- 
- ARL Watercourses
- Regulated Watercourse
  - Hydrologic Connection
- ARL (line)
- 
- Stable Top of Bank Hazard
- 
- Meander Belt Hazard
- 
- Floodplains (modelled)
- 
- Headwater Floodplains (estimated)
- 
- Ponds
- Not Regulated
  - Regulated
- Wetland Hazard
- 
- Stable Top of Bank Component
- 
- Dynamic Beach Hazard
- 
- 100yr Flood Hazard
- 
- Official CH Boundary
- 

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## Meeting Agenda

*Ninth Line (RR13) Transportation Corridor Improvements  
Highway 407 to 10 Side Road*

**Purpose:** Meeting with Conservation Halton  
**Date:** April 8, 2015  
**Time:** 1:00 PM – 3:30 PM  
**Place:** Halton Region Complex – Aldershot Room  
**Halton Region Project No.:** PR 2876  
**UEM Project No.:** 14-508

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1. Welcome & Introductions
2. Project Status Overview
3. Review of Conservation Halton Checklist
4. Discussion
5. Other Matters
6. Site Visit (if necessary)
7. Adjourn

## Amanda Selig

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**From:** Amanda Selig  
**Sent:** Wednesday, May 20, 2015 1:32 PM  
**To:** Paul Bond (pbond@hrca.on.ca); 'smatchett@hrca.on.ca'; 'handerson@hrca.on.ca'; 'Cory Harris'; Jakaitis, Alicia <Alicia.Jakaitis@halton.ca> (Alicia.Jakaitis@halton.ca); Reid, Jeffrey (Jeffrey.Reid@halton.ca); Monaghan, Patrick - Transportation Services <Patrick.Monaghan@halton.ca> (Patrick.Monaghan@halton.ca); Alvaro Almuina; Bruce Gall; 'lcampbell@lcaenvironmental.ca'  
**Subject:** Minutes - Meeting with Conservation Halton - Ninth Line Class EA  
**Attachments:** Ninth Line Class EA - CH Meeting Minutes FINAL - April 8, 2015.pdf

Hello all:

Please find attached a copy of the minutes from our meeting at the Halton Region Complex on April 8, 2015. Following the minutes is a revised version of the Project Team's responses to the Conservation Halton EA Checklist. If you have any questions or comments about these minutes please let me know.

Best regards,

**Amanda Selig, BES, EPT**

**Urban & Environmental Management Inc. (UEM)**

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# Meeting Minutes

*Ninth Line (RR13) Transportation Corridor Improvements  
Highway 407 to 10 Side Road*

*UEM Project No. 14-508  
Halton Region Project No. PR 2876*

<b>Subject:</b>	Meeting with Conservation Halton – Meeting No. 2		
<b>Date/Time:</b>	April 8, 2015 @ 1:00pm		
<b>Location:</b>	Halton Region Complex – Aldershot Room		
<b>Present:</b>	Alicia Jakaitis (AJ) Patrick Monaghan (PM) Jeffrey Reid (JR)	}	Halton Region
	Alvaro Almuina (AA) – Project Manager Amanda Selig (AS) Bruce Gall (BG) Lisa Campbell (LC)	}	UEM
	Paul Bond (PB) Sarah Matchett (SM) Holly Anderson (HA) Cory Harris (CH)	}	Conservation Halton
<b>Regrets:</b>	None		
<b>Distribution:</b>	All Present		

The following summarizes the meeting discussion and follow up items:

Items Discussed	Action by
<b>1. Welcome &amp; Introductions</b>	<b>N/A</b>
<b>2. Project Status Overview</b>  AA provided an overview of the preferred preliminary design alignment plotted on aerial photography. LC provided an overview of her team’s findings in the northwest woodlot. No species at risk were observed. The team has not been granted access to the other sections of the woodlot.  SM inquired about natural flow in urban cross-section area. AA explained that natural flow will likely be conveyed through surface drainage if grades allow or alternatively through a storm pipe system. Both the Project Team and CH agree that where possible, surface flow is preferred over encasing stormwater in underground pipes.  Meeting attendees discussed the main culvert crossing within the study area. The existing culvert was built in the early 1960s and the plan is to replace it with an open bottom culvert. The 42 m rural cross-section will be carried across the area where the culvert is located. Conservation Halton is interested in natural channel geomorphology and alignment. BG mentioned that the Project Team is aware that flow needs to be low velocity. The UEM Team will assess the alignment and hydrologics of the culvert. The effects of sediment loading on the geomorphology of the creek bed will be carried out during detailed design.	<b>Information</b>  <b>Information</b>  <b>Information</b>  <b>UEM</b>





# Meeting Minutes

*Ninth Line (RR13) Transportation Corridor Improvements  
Highway 407 to 10 Side Road*

Items Discussed	Action by
SM asked if the Region has plans to change this road to an urban cross-section. JR responded by explaining that the current preferred preliminary design fulfills the requirements of the existing TMP, which plans up to the year 2031.	Information
There is currently no servicing under the road, and there are no plans at present to provide underground servicing in the future.	Information
<p><b>3. Discussion</b></p> <p>The Project Team reviewed Conservation Halton's "Checklist" on an item by item basis. An updated response table is attached to these minutes.</p> <p>Other matters discussed are summarized below:</p> <ul style="list-style-type: none"> <li>Construction will likely start in late 2017 at the earliest. Detailed design work will take place in 2016.</li> <li>HA asked if wildlife collision evaluations have been done for the study area. AA explained that collisions were looked at during the traffic analysis. In addition, LC's team records roadside kill rates if encountered during a site visit.</li> <li>CH recommended a trapezoidal ditch over a v-shape ditch along Ninth Line to increase water infiltration rates to offset the increased impermeable surface area posed by the road widening.</li> <li>The Project Team agreed to include a summary of all EA commitments in the ESR to aid the review process.</li> </ul>	<p>Information</p> <p>Information</p> <p>Information</p> <p>Information</p>
<p><b>4. Other Matters</b></p> <p>AA requested that Conservation Halton provide more guidance on the width requirements for the new culvert. The following is a summary of key points made during the discussion:</p> <ul style="list-style-type: none"> <li>Consideration of the findings of hydrological and geomorphological analyses of the stream that flows through the culvert. Hydrological analysis to take place prior to filing of ESR. Geomorphological analysis to take place during detailed design. Conservation Halton noted that the system is entrenched at the location of the proposed culvert replacement and recommends planting to the west of the culvert (downstream) to manage sediment inputs from upstream.</li> <li>As a rule of thumb, Conservation Halton promotes the use of 3 times bankfull as a minimum requirement. In this case, it is likely that the width of the new culvert will be between 2 and 3 times bankfull width. If the width is less than 3 times bankfull, an explanation as to why this is proposed will be required. UEM to do more cross-section profiles of the stream and send top of bankfull</li> </ul>	<p>Information</p> <p>UEM</p>



## Meeting Minutes

*Ninth Line (RR13) Transportation Corridor Improvements  
Highway 407 to 10 Side Road*

Items Discussed	Action by
measurements to CH. Since the catchment is not changing, the design of the culvert will depend more on the input from the hybrid roadside ditches/stormsewers.	
<b>5. Adjourn</b>	

If there are any errors or omissions within these Minutes, please contact Amanda Selig to clarify at [aselig@uemconsulting.com](mailto:aselig@uemconsulting.com).

Encl. Table with Project Team Responses to Conservation Halton Requirements Checklist

The following list identifies the areas of interest or concern that Conservation Halton may have with the subject EA:

CH Comment	Project Team Response
<b><u>Ontario Regulation 162/06</u></b>	
<input checked="" type="checkbox"/> The study area contains wetlands and Conservation Halton regulates the wetlands and associated setbacks to these features. Ontario Regulation 162/06 requires that a Permit be obtained from Conservation Halton prior to development, interference with wetlands or alterations to shorelines and watercourses. A copy of Ontario Regulation 162/06 and the associated Policy document, <i>Policies and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document</i> can be found at <a href="http://www.conservationhalton.ca">www.conservationhalton.ca</a> . Please ensure that the EA contains sufficient information to allow Conservation Halton staff to determine whether a Permit could be issued at detailed design.	<p>Noted – the ESR will contain sufficient information to allow Conservation Halton staff to determine whether a Permit could be issued at detailed design.</p> <p>The preferred alternative will be updated to include Conservation Halton’s regulation limits.</p>
<input checked="" type="checkbox"/> The EA should identify areas where Permits pursuant to Ontario Regulation 162/06 will be required and include such Permits as future commitments in the ESR. Some details related to future Permits may not be deferred to detailed design. Please review the requirements of Policy 3.51 (Public Infrastructure – Utilities, Trails and Transportation) of Conservation Halton’s <i>Policies and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document</i> (see enclosed).	<p>Noted - the ESR will identify areas where permits pursuant to Ontario Regulation 162/06 will be required and include such Permits as future commitments.</p> <p>All commitments in the ESR will be summarized either as a separate chapter in the ESR or referred to in the executive summary.</p>
<input checked="" type="checkbox"/> Please survey all drainage features, watercourse ditchlines, culverts, etc.	<p>A topographic survey of the study corridor and adjacent area has been undertaken by the Region as part of this study. A more detailed survey will be undertaken during detailed design.</p>

CH Comment	Project Team Response
<input checked="" type="checkbox"/> Please plot all areas regulated by Conservation Halton on drawings. ARL mapping may be utilized if more detailed study is not required at this time, however, please ensure that drawings indicate that limits shown are an approximation of the regulated area. Staff has enclosed Approximate Regulation Limit (ARL) mapping for your information.	<p>Noted – the Project Team will incorporate Conservation Halton regulation limits in project maps of the study area, where applicable.</p> <p>The preferred alternative will be updated to include Conservation Halton’s regulation limits.</p>
<input checked="" type="checkbox"/> A Data Request Form is required for all digital information requests. This form and additional information on data holdings can be found in the “GIS & Mapping” section of Conservation Halton’s website: <a href="http://www.conservationhalton.ca">www.conservationhalton.ca</a> . Staff notes that the following modeling is available for the study area: <ul style="list-style-type: none"> <li>• 16 Mile Creek Generic Regulations HEC-RAS Model (draft) for south tributary (crossing at approximately 400m north of Steeles Avenue).</li> </ul>	<p>Noted.</p>
<input checked="" type="checkbox"/> It is recommended that ‘potential impacts to natural hazards’ (flooding and/or erosion hazards) should be one of the evaluation criteria. At a minimum, a proposed alternative must have no negative impacts on flooding and erosion hazards in order for Conservation Halton to issue a future approval under Ontario Regulation 162/06. Opportunities to improve any deficiencies with respect to flooding and erosion should be investigated.	<p>The Evaluation Criteria was provided at the TAC Meeting No. 1 in November 2014. It does contain a Criterion for Natural Hazards with the indicators being “potential for flooding, erosion, and snow drifts.”</p>
<input checked="" type="checkbox"/> The EA should assess all flood plain impacts associated with each alternative including consideration of any change in storage, velocity and up and down stream water levels for a variety of flow conditions.	<p>Upon discussion with Conservation Halton, this criterion does not apply to the project at present. This criterion would only apply if different types of culverts were being considered for the culvert replacement aspect of the project. The culvert replacement would be the same type as currently in place (open bottom) which is consistent with Halton practice and CH preferences.</p>
<input type="checkbox"/> Please identify any potential areas of unstable bedrock, karst or unstable soils within the study area. These areas are	

CH Comment	Project Team Response
<input type="checkbox"/> regulated by Conservation Halton pursuant to Ontario Regulation 162/06.	
<input checked="" type="checkbox"/> A hydrologic and/or hydraulic analysis is required for all culvert crossings in the Environmental Study Report.	<p>Noted. A Hydrologic Analysis was presented at the TAC No. 1 meeting in November 2014 and a copy of the mapping was provided to attendees as well as with the meeting minutes.</p> <p>The Project Team will conduct a more detailed hydrologic analysis of the culvert crossing area to determine the best alignment and required culvert width for the culvert replacement. Consideration will also be given to a “flat bottom” ditch design.</p>
<input checked="" type="checkbox"/> Please consider MTO’s flooding criteria, guidelines and/or the municipal engineering standards for flooding along/over roads. At a minimum, safe access & egress as defined in the MNR’s 2002 <i>Technical Guide: River &amp; Stream Systems – Flooding Hazard Limit</i> , should be provided.	<p>Noted.</p>
<input checked="" type="checkbox"/> If a roadway is considered by the Province or local municipality to be an Emergency Route then there should be no overtopping of the road with flood waters.	<p>Ninth Line is not an Emergency Detour Route (EDR). Regardless of whether or not Ninth Line is an Emergency Route, the Region will not allow overtopping of the road with flood waters.</p>
<input type="checkbox"/> A fluvial geomorphological assessment ( <i>is required/may be required</i> ) to assess erosion hazards in the Environmental Study Report. MNR guidelines should be followed.	
<input checked="" type="checkbox"/> A fluvial geomorphological assessment is required to verify that crossing designs have adequately allowed for natural channel migration, fish/terrestrial passage, and sediment transport, as well as minimizes the risk to infrastructure.	<p>A geomorphic assessment of the channel evaluated it for habitat potential only, which is appropriate for the type of channel in the study area. The Project Team will include a commitment in the ESR to conduct a full geomorphological assessment during the detailed design phase of the project. The geomorphologist will be required to analyze sediment loading in the roadside ditches from the adjacent agricultural fields. CH to acknowledge the full geomorphic assessment will be conducted during the detail design stage.</p>
<input checked="" type="checkbox"/> Please contact staff to arrange a site visit to stake the wetland(s) during the growing season (Approximately mid-	<p>Conservation Halton and Halton Region Staff completed a site visit of the study area on April 14, 2015.</p>

CH Comment	Project Team Response
<div></div> <p>May to October). An OLS must be present during this site visit.</p>	<p>Halton Region Staff will request permission to enter 8872 Ninth Line. Upon permission to enter approval, Halton Region and Conservation Halton Staff will visit 8872 Ninth Line during the “growing season” identify the approximate limit of the ultimate Ninth Line Right-of-way.</p>
<div><input type="checkbox"/></div> <p>A geotechnical assessment of slope stability (<i>is required/may be required</i>) in the Environmental Study Report. MNR guidelines should be followed. Please consult staff before the geotechnical assessment is initiated to establish a Terms of Reference.</p>	
<div><input checked="" type="checkbox"/></div> <p>A hydrologic evaluation (<i>is required/may be required</i>) to determine if there is an impact to the hydrological functions of the wetland as a result of the proposed works.</p>	<p>This requirement will be subject to the finding of the field visit to stake the wetland.</p>
<div><input type="checkbox"/></div> <p>A geotechnical and coastal engineering report (<i>is required/may be required</i>) to identify soil properties to determine the long term stable slope allowance associated with the Lake Ontario shoreline.</p>	
<div><input type="checkbox"/></div> <p>A topographic survey (<i>is required/may be required</i>) to identify the lands impacted by the flooding hazard associated with (<i>Lake Ontario/Creek</i>).</p>	
<div><input type="checkbox"/></div> <p>Other:</p>	
<p><b><u>Natural Heritage</u></b></p>	
<p>While Conservation Halton recognizes that Environmental Assessments are not subject to and/or limited to the policies outlined in the Provincial Policy Statement (PPS), we do believe that the PPS provides Provincial direction on how natural resources should be managed in Ontario. Furthermore, it is useful for identifying some of the key natural heritage features, water</p>	<p>Noted. However, some of the PPS policies (adjacent lands) does not apply under the EA regulations.</p>

CH Comment	Project Team Response
resources, and natural hazards that should be considered when evaluating any sort of development proposal. As such, some PPS related items have been outlined below, as we believe these items should be acknowledged and addressed as part of the EA study.	
<input checked="" type="checkbox"/> When undertaking any fieldwork and/or when making recommendations related to natural heritage and/or natural hazards, staff recommend that reference be made to the following guidelines prepared by the Ministry of Natural Resources and Forestry (MNR): <i>Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005, 2<sup>nd</sup> Edition, March 2010</i> ; <i>Significant Wildlife Habitat Technical Guideline</i> ; and, <i>Natural Hazards Technical Guide and Understanding Natural Hazards</i> .	The study team met with CH early in the study process to confirm our scope of work for the environmental assessment. The study has been undertaken in accordance with the outcome of that meeting.
<input checked="" type="checkbox"/> The study area may contain or pass between natural features. As per Policy 2.1.2 of the Provincial Policy Statement, the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and groundwater features. Where applicable, the use of ecopassages or other measures to facilitate wildlife movement should be evaluated.	Noted.
<input checked="" type="checkbox"/> As noted above, the study area contains a number of regulated wetland features including the East Oakville Swamp Locally Significant Wetland. As per Policy 2.1.4 of the Provincial Policy Statement, development and site alteration shall not be permitted in significant wetlands or significant coastal wetlands.	Noted.

CH Comment	Project Team Response
<input checked="" type="checkbox"/> The study area may contain the habitat of Endangered or Threatened species. As per Policy 2.1.7 of the Provincial Policy Statement, development and site alteration shall not be permitted in the habitat of endangered species and threatened species, except in accordance with provincial and federal requirements. The provincial <i>Endangered Species Act</i> and/or federal <i>Species at Risk Act</i> may also apply. Please contact the Ministry of Natural Resources and Forestry (MNRF) at <a href="mailto:esa.aurora@ontario.ca">esa.aurora@ontario.ca</a> for further information on <i>Endangered Species Act</i> requirements.	<p>Noted. Lisa Campbell will complete an additional roadside amphibian calling survey in the southwest quadrant of Ninth Line and 5 Side Road, in early Spring 2015.</p>
<input type="checkbox"/> The study area contains the ( <i>name</i> ) area of natural and scientific interest (ANSI). As per Policy 2.1.5 of the Provincial Policy Statement, development and site alteration shall not be permitted in an ANSI unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. Please contact the Ministry of Natural Resources and Forestry (MNRF) for further information on ANSI's.	
<input checked="" type="checkbox"/> The study area may contain significant wildlife habitat. As per Policy 2.1.5 of the Provincial Policy Statement, development and site alteration shall not be permitted in significant wildlife habitat unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. Please refer to the Ministry of Natural Resource's <i>Significant Wildlife Habitat Technical Guidelines</i> .	<p>Noted.</p>



CH Comment	Project Team Response
<input type="checkbox"/> The study area contains a significant valleyland ( <i>Bronte/Sixteen/Grindstone</i> ). As per Policy 2.1.5 of the Provincial Policy Statement, development and site alteration shall not be permitted in significant valleylands unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.	
<input checked="" type="checkbox"/> The study area contains several Candidate Significant Woodlands. As per Policy 2.1.5 of the Provincial Policy Statement, development and site alteration shall not be permitted in significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River) unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. Please contact the Region of Halton for further information on significant woodlands.	Noted. Ron Reinhold is a member of the TAC.
<input checked="" type="checkbox"/> Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in Policies 2.1.4, 2.1.5 and 2.1.6 of the Provincial Policy Statement unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions. The Ministry of Natural Resources' Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement 2005, Second Edition (2010) considers adjacent lands to be within 120 metres.	Noted.
<input type="checkbox"/> The study area contains the ( <i>name</i> ) ESA. The Environmental Study Report must address impacts to the ESA. Please contact the ( <i>Region of Halton/City of Hamilton/County of Wellington/City of Mississauga</i> ) for further information on the ESA.	

CH Comment	Project Team Response
<input checked="" type="checkbox"/> Please use Ecological Land Classification to map natural and semi-natural features to vegetation type and identify protection/mitigation measures. ELC data sheets are required with the ESR submission (please include digital species spreadsheets).	Lisa Campbell will address these requirements in the content of her submission for the ESR in the context of a “community survey”.
<input checked="" type="checkbox"/> Please refer to Conservation Halton’s <i>Environmental Impact Study Guidelines</i> for information on general study requirements, impact assessment and appropriate timing and protocols for surveys. These guidelines can be found at <a href="http://www.conservationhalton.ca">www.conservationhalton.ca</a> .	Noted. The study team met with CH at the outset of the study to review our work plan as it pertained to the natural environment assessment.
<input checked="" type="checkbox"/> Conservation Halton’s <i>Landscape Guidelines</i> should be consulted at detailed design. These guidelines can be found at <a href="http://www.conservationhalton.ca">www.conservationhalton.ca</a> .	Noted. The Project Team acknowledges that Conservation Halton and Halton Region a replacement policy to be followed during detail design.
<input checked="" type="checkbox"/> Please provide a list of alignment alternative evaluation criteria for review and comment.	This will be provided at the second TAC meeting.
<input checked="" type="checkbox"/> Please consider the number of crossings of areas regulated by Conservation Halton as part of the alignment alternative evaluation criteria.	Noted.
<input checked="" type="checkbox"/> Please note that impacts associated with alternatives may occur beyond the currently proposed study area (e.g. in proximity to adjacent wetland). We understand that additional natural heritage inventory and analysis will be undertaken as part of detail design and that Conservation Halton will have an opportunity to comment on the Terms of Reference for that work.	Noted. A commitment will be added to the ESR that Conservation Halton will have an opportunity to comment on the Terms of Reference for the natural heritage inventory conducted during detailed design.
<input checked="" type="checkbox"/> All field data sheets are required for the completed surveys. These should be in both hard copy and digital format for review.	The data will be provided in summary form.
<input checked="" type="checkbox"/> At detailed design, a Tree Preservation Plan may be required.	Noted. For Detailed Design stage.

CH Comment		Project Team Response
<input checked="" type="checkbox"/>	At detailed design, a restoration plan consisting of locally native, non-invasive species, suitable for the site's conditions may be required. In addition, an edge management plan may be required.	Noted.
<input type="checkbox"/>	Other: _____	

### **Fish Habitat**

CH Comment		Project Team Response
<input checked="" type="checkbox"/>	Please include fish habitat mapping as per MTO Protocol "Environmental Guide for Fish and Fish Habitat, 2006". Please include photo documentation of the study area with a key map indicating photo locations.	Noted. This detail will be provided in the ESR.
<input type="checkbox"/>	As per Policy 2.1.6 of the Provincial Policy Statement, development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.	
<input type="checkbox"/>	Staff note that there is a local drainage feature/hydrologic connection within the study area. Please be advised that although this drainage feature is not regulated under Ontario Regulation 162/06, future development may be subject to review or approvals under the Fisheries Act.	
<input type="checkbox"/>	Staff note that a fisheries setback of (15/30) metres from the high water level applies for (coldwater/warmwater) creeks.	
<input type="checkbox"/>	Please note that Conservation Halton's Level II Agreement does not apply to Provincial projects. Please contact the Department of Fisheries and Oceans.	

CH Comment		Project Team Response
<input type="checkbox"/>	Other: _____	

### Groundwater

CH Comment		Project Team Response
<input checked="" type="checkbox"/>	Please identify groundwater recharge/discharge areas. Please identify recommended mitigation measures for groundwater impacts and if appropriate, any opportunities to improve infiltration.	Noted.
<input checked="" type="checkbox"/>	Please identify hydrological impacts.	Noted.
<input type="checkbox"/>	Please complete a water balance assessment to determine any infiltrative deficit. If a deficit is identified, all potential impacts should be identified and assessed.	
<input type="checkbox"/>	All proposed works should consider Policies 2.2.1 and 2.2.2 of the Provincial Policy Statement regarding water ( <i>highlight specific policy elements where relevant</i> ).	
<input type="checkbox"/>	Other: _____	

### Stormwater Management/Drainage

CH Comment		Project Team Response
<input checked="" type="checkbox"/>	Please discuss quality/quantity/erosion controls within the Stormwater Management Section of the Environmental Study Report. Please examine the potential to combine SWM with adjacent development.	Stormwater management of the preferred preliminary design will be evaluated once feedback is received from meetings with individual property owners and Public Information Centre No. 2 and summarized in the ESR.

<b>CH Comment</b>		<b>Project Team Response</b>
<input checked="" type="checkbox"/>	As per MOE SWMP Manual and 16 Mile Creek Watershed Plan please be advised that the quality requirements are Enhanced/Level 1 treatment. Please discuss the mitigation of thermal impacts.	Noted.
<input checked="" type="checkbox"/>	As per MOE SWMP Manual and 16 Mile Creek Watershed Plan please be advised that the quantity requirements are post to pre development controls to the extent possible.	Noted.
<input checked="" type="checkbox"/>	As per MOE SWMP Manual and 16 Mile Creek Watershed Plan please be advised that the erosion control requirements are implemented to the extent possible.	Noted.
<input checked="" type="checkbox"/>	Please identify existing vs. proposed drainage areas. Every effort should be taken to maintain existing drainage divides. Any proposed diversions must be clearly identified and the potential impacts fully assessed as part of the project's evaluation.	Noted.
<input type="checkbox"/>	Other: _____	
<b><u>Other</u></b>		
<input checked="" type="checkbox"/>	Recommendations and requirements from the following Watershed/Subwatershed Studies should be followed: <ul style="list-style-type: none"> <li>Sixteen Mile Creek Watershed Plan (Ecoplans, 1995). Refer to recommendations in Table 8.9</li> </ul>	Noted.
<input type="checkbox"/>	Conservation Halton owns ( <i>name of landholding</i> ) within the study area. Please identify any potential impacts to Conservation Halton landholdings (direct – adjacent to, and indirect – road closures, detours etc.). Any questions regarding Conservation Halton landholdings should be directed to ( <i>name</i> ).	

CH Comment	Project Team Response
<input checked="" type="checkbox"/> Is infrastructure proposed within existing easements/r-o-w or are there additional property requirements? Please assess the impacts of utility relocation (i.e. telephone poles, union gas, etc.) on natural heritage features, natural hazard areas and fish habitat. This should not be left to detailed design as the relocation can have a significant impact on natural heritage features.	Noted.
<input type="checkbox"/> Please note that Conservation Halton staff do not screen on behalf of MNR for <i>Lakes and Rivers Improvement Act</i> implications. We recommend you contact the MNR to determine if this Act will apply to the proposed works.	
<input type="checkbox"/> The Province and Crown Corporations do not require permits from Conservation Halton under Ontario Regulation 162/06. We do however appreciate any efforts that the Province and these Corporations can take to meet the requirements of our Regulation and to address areas of provincial interest.	
<input type="checkbox"/> In order to allow sufficient time to review the Draft Environmental Study Report, staff would appreciate it if a review timeline of 4 weeks could be incorporated into the project schedule. We would like to request 3 ( <i>change as required</i> ) hard copies of the ESR for review.	
<input checked="" type="checkbox"/> Please provide a figure with proposed works and/or alternatives overlaid on an airphoto.	This figure was presented at the meeting with Conservation Halton on April 8, 2015.

CH Comment	Project Team Response
<div data-bbox="136 451 172 483" data-label="Image"></div> <p>Other: MANAGEMENT OF EXCESS SOIL – The ESR should include an initial estimate of the fill and soil volumes required/generated as part of the project and recommend the preparation of a soil and/or fill management plan in accordance with the document ‘Management of Excess Soil – A Guide for Best Management Practices’ as prepared by the Ministry of Environment and Climate Change, January 2014. The document can be downloaded via the following link: <a href="http://www.ontario.ca/environment-and-energy/management-excess-soil-guide-best-management-practices">http://www.ontario.ca/environment-and-energy/management-excess-soil-guide-best-management-practices</a></p>	<p>Noted. The ESR will specify if there will be a deficit or surplus of fill material during construction. Rough fill estimates will be completed to estimate construction costs.</p>
<p>Other:</p>	<p>For erosion and sediment control plans, Conservation Halton recommends that the Region retain a certified professional (either a qualified professional designated as a Certified Inspector of Sediment and Erosion Control (CISEC), Certified Professional in Erosion and Sediment Control (CPESC) or suitable equivalent) to create and implement the plans. This action item will be relevant to the tendering and construction phases of the project.</p>

## Amanda Selig

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**From:** Alvaro Almuina  
**Sent:** Wednesday, April 08, 2015 6:20 PM  
**To:** Bruce Gall; Lisa Campbell; Amanda Selig  
**Subject:** Fwd: ESC Certification Info

**Follow Up Flag:** Follow up  
**Flag Status:** Completed

**Categories:** Important

FYI

### Urban & Environmental Management Inc.

Alvaro L. Almuina, P.Eng., M.Eng.,PMP, DCE

T [\(905\) 212 – 9722](tel:9052129722) x 45 | C [\(416\) 578 – 4959](tel:4165784959)

E [aalmuina@uemconsulting.com](mailto:aalmuina@uemconsulting.com)

Sent from my iPhone

Begin forwarded message:

**From:** Cory Harris <[charris@hrca.on.ca](mailto:charris@hrca.on.ca)>  
**Date:** April 8, 2015 at 18:03:19 EDT  
**To:** "Alvaro Almuina (UEM)" <[aalmuina@uemconsulting.com](mailto:aalmuina@uemconsulting.com)>  
**Cc:** "Jeff Reid (RoH)" <[Jeffrey.Reid@halton.ca](mailto:Jeffrey.Reid@halton.ca)>, Paul Bond <[pbond@hrca.on.ca](mailto:pbond@hrca.on.ca)>, "Alicia Jakaitis (Region of Halton)" <[alicia.jakaitis@halton.ca](mailto:alicia.jakaitis@halton.ca)>  
**Subject:** ESC Certification Info

Hi Alvaro,

Further to our meeting of this afternoon regarding the Ninth Line EA, I've included some additional information for your use/reference.

Design, implementation and monitoring of Erosion and Sediment Control (ESC) measures should be completed by a qualified professional designated as a Certified Inspector of Sediment and Erosion Control (CISEC), Certified Professional in Erosion and Sediment Control (CPESC) or suitable equivalent.

The websites for each organization are listed below:

[www.cisecinc.org](http://www.cisecinc.org)

<http://www.cpesc.org/cc-default.asp>

During construction, ESC plans must be dynamic to adapt to site conditions and it is important that the supervisor and/or inspectors have a basic competence in understanding the various ESC BMPs and the confidence to modify the plan as required. Staff strongly encourage that the Region consider adding this requirement as an item in the projects tender document after the EA has been filed and approved. Perhaps this could be made a recommendation or commitment in the EA document.



As an FYI, training for CISEC designation is coming up in May in Toronto:

<https://www.thelivingcitycampus.com/workshop/certified-inspector-sediment-and-erosion-control-toronto-may-2015>

Hope that this helps.

Best regards,

Cory

**Cory Harris, P.Eng., CAN-CISEC**

Water Resources Engineer

**Conservation Halton**

2596 Britannia Road West, Burlington, ON L7P 0G3

905.336.1158 ext. 2232 | Fax 905.336.6684 | [charris@hrca.on.ca](mailto:charris@hrca.on.ca)

[conservationhalton.ca](http://conservationhalton.ca)

## Amanda Selig

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**From:** Sarah Matchett <smatchett@hrca.on.ca>  
**Sent:** Tuesday, May 26, 2015 3:50 PM  
**To:** Amanda Selig; Paul Bond; Holly Anderson; Cory Harris; Jakaitis, Alicia <Alicia.Jakaitis@halton.ca> (Alicia.Jakaitis@halton.ca); Reid, Jeffrey (Jeffrey.Reid@halton.ca); Monaghan, Patrick - Transportation Services <Patrick.Monaghan@halton.ca> (Patrick.Monaghan@halton.ca); Alvaro Almuina; Bruce Gall; 'lcampbell@lcaenvironmental.ca'  
**Subject:** RE: Minutes - Meeting with Conservation Halton - Ninth Line Class EA  
**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Amanda,

On behalf of Holly Anderson and I, here are a couple of clarifications on the meeting minutes:

### Under Project Status Overview:

- The minutes state: "SM inquired about natural flow in urban cross-section area. AA explained that natural flow will likely be conveyed through surface drainage if grades allow or alternatively through a storm pipe system." Where possible, we note that surface flow is preferred over encasing stormwater in pipes.
- The minutes state: "BG mentioned that the Project Team is aware that flow needs to be low velocity. The UEM Team will assess the alignment and hydrologics of the culvert." Lisa Cambell also mentioned that a great deal of sediment has come down the ditches into the culvert and altered the geometry of the creek bed, thus some realignment may be necessary.

### Under Discussion:

- We had inquired about the ultimate cross-section of the road and Jeff noted that the preferred preliminary design (42 m ROW, including ditches and 3m multi-use path) fulfills requirements of the existing TMP. Cory recommended a trapezoidal ditch over a v-shaped one, to increase infiltration and polishing of stormwater. This is important because the impermeable area will more than double with the widening of this road.
- We had also noted that a summary of EA commitments would help the detailed design review greatly. We will also work internally with the CH team that reviewed the EA to make this happen.

### Under Other Matters

- It was pointed out that the system is entrenched at the location of the proposed culvert replacement. Despite the fact that the widening will likely occur to the east only, we would encourage planting at the west (downstream) end of the culvert. It was noted that a fluvial geomorphologist will help at the detailed design phase to manage sediment inputs from upstream (agricultural inputs) and from the hybrid roadside ditches/stormsewers. Please advise whether this confirms the process adequately.
- We appreciate the discussion around the criteria for the design of the culvert and look forward to the cross-section and bankfull width measurements. To reiterate, since the catchment is not changing, the design will depend more on the input from the hybrid roadside ditches/stormsewers.
- Cory did indicate that a width somewhere between 2x and 3x bankfull is reasonable, but explanation of why less than 3x will be required.

Thank you for providing the opportunity to follow up on these meeting minutes. We are also in the process of going over our notes and handouts from the TAC meeting with Paul and Cory. We will follow up on that meeting under separate cover.

Regards,

**Sarah Matchett, M.Sc.**  
Aquatic Planning Ecologist

**Conservation Halton**  
2596 Britannia Road West, Burlington, ON L7P 0G3  
905.336.1158 ext. 2272 | Fax 905.336.7014 | [smatchett@hrca.on.ca](mailto:smatchett@hrca.on.ca)  
[conservationhalton.ca](http://conservationhalton.ca)

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**From:** Amanda Selig [mailto:ASelig@uemconsulting.com]  
**Sent:** May-20-15 1:35 PM  
**To:** Paul Bond; Sarah Matchett; Holly Anderson; Cory Harris; Jakaitis, Alicia <Alicia.Jakaitis@halton.ca> (Alicia.Jakaitis@halton.ca); Reid, Jeffrey (Jeffrey.Reid@halton.ca); Monaghan, Patrick - Transportation Services <Patrick.Monaghan@halton.ca> (Patrick.Monaghan@halton.ca); Alvaro Almuina; Bruce Gall; 'lcampbell@lcaenvironmental.ca'  
**Subject:** Minutes - Meeting with Conservation Halton - Ninth Line Class EA

Hello all:

Please find attached a copy of the minutes from our meeting at the Halton Region Complex on April 8, 2015. Following the minutes is a revised version of the Project Team's responses to the Conservation Halton EA Checklist. If you have any questions or comments about these minutes please let me know.

Best regards,

**Amanda Selig, BES, EPt**  
**Urban & Environmental Management Inc. (UEM)**  
4701 St. Clair Avenue, Suite 301  
Niagara Falls, Ontario, L2E 3S9  
T (905) 371 - 9764 x 230 | F (905) 371 - 9763  
e-mail: [aselig@uemconsulting.com](mailto:aselig@uemconsulting.com) | Website: [www.uemconsulting.com](http://www.uemconsulting.com)

## Amanda Selig

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**From:** Paul Bond <pbond@hrca.on.ca>  
**Sent:** Friday, July 03, 2015 2:41 PM  
**To:** Amanda Selig; Jakaitis, Alicia (Alicia.Jakaitis@halton.ca)  
**Cc:** Monaghan, Patrick - Transportation Services (Patrick.Monaghan@halton.ca)  
**Subject:** TAC Meeting #2 - CH follow up comments

Hi Amanda and Alicia,

I'm not sure if Sarah had forwarded these to you or not. If they have been, please disregard.

Sarah and Holly attended the May TAC meeting #2 in my absence and had some minor comments on the presentation noted below.

*Staff have prepared additional comments related to the materials provided at the May 12, 2015 TAC #2 meeting. Documents reviewed include UEM Slide deck presented at meeting (see attached) and the 'Recommended design option' cross-sections (standard and modified, see attached). Our comments are as follows below:*

- 1) Patrick Monaghan (Halton Region) has informed Conservation Halton staff that he has contacted the landowners regarding Permission to Enter (PTE) (via email May 15, 2015) to review the wetland feature within the woodland immediately west of Ninth Line. Conservation Halton staff are not aware if there has been a response yet to this request. Please continue to keep us informed.
- 2) Please clarify whether Multi-use Paths (MUPs) are being contemplated for both sides of Ninth Line through both the standard and modified cross-sections.
- 3) Staff note that the cross-section varies between 42m (standard cross-section) and 26.6m (modified cross-section) in several locations along the corridor mainly to avoid impacting residential properties. Staff request that condensing the cross-section adjacent to natural features and functions (e.g. woodland/wetland and watercourses) be contemplated prior to finalizing the design to minimize impact to these features and functions. Narrowing the width can be achieved in a number of ways including minimizing the width of boulevards, MUPs, and the painted median. Alvaro had a large-scale drawing displayed which showed in detail the proposed path of the road widening throughout the extent of the project. The modified version is required where the proximity of private property will require a condensed road cross-section and also where the road intersects Steeles Ave to the south and 10 Side Road to the north. The drawback would of course be a longer section of storm drainage enclosed in a pipe but staff estimate that the end justifies the means in this case.
- 4) Staff also question whether the ditches need to be as wide as proposed (5.7 m) in the standard cross-section. Ditches would be preferred rather than pipes, however the fact that the ditch is required between the road and the multi-use path means a wider impact to the Natural Heritage System and a longer culvert. *Cory, I would ultimately defer to you however, as I'm not sure what is required capacity-wise, given the trapezoidal geometry and the mix of storm pipe-to-ditch.*
- 5) The 3 m multi-use path proposed will be the responsibility of the Town of Halton Hills to construct at some future time. Staff note that the footprint of the ultimate path should be backfilled and restored appropriately until the path can be built. This will be most important within the natural heritage sections.

- 6) Staff note stormwater quality control is proposed through the maintenance of the existing rural ditches. Based on based on a combination of Ministry of Environment Guidelines, approved watershed and subwatershed studies, fish community data as well as larger system targets, Conservation Halton has set a stormwater quality protection standard of enhanced protection for any tributaries of Sixteen Mile Creek. This level of treatment corresponds to end-of-pipe storage volumes required for the long-term average removal of 80% of suspended solids. A degree of treatment is afforded by the open drainage ditches, but stormwater will be piped for fairly large stretches of the widened road. Please advise how this stormwater quality target may be addressed. Could LID measures be considered? *Cory, do you have any recollection of how this was handled at the EA stage? How do we usually deal with stormwater quality control in a rural context?*

**Paul Bond**  
**Environmental Planner**  
**Conservation Halton**

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January 27, 2016  
UEM Project No. 14-508

Paul Bond  
Environmental Planner/Team Lead  
Regional Infrastructure Team  
Conservation Halton  
2596 Britannia Road West  
Burlington ON L7P 0G3

Dear Mr. Bond:

**Re: Schedule 'C' Class Environmental Assessment Study – DRAFT Environmental Study Report  
Ninth Line (Regional Road 13) Transportation Corridor Improvements from Highway 407  
to 10 Side Road (Regional Road 10), Halton Hills, Regional Municipality of Halton  
Halton Region Project No. PR2876  
Response to Conservation Halton Comments on SWM Report**

Thank you for your letter of October 23, 2015 regarding UEM's Storm Water Management Report (SWM Report) prepared in support of the Class EA being undertaken for the Ninth Line corridor between Highway 407 ETR and 10 Side Road.

By way of chronology, Urban & Environmental Management Inc. (UEM) submitted the Draft SWM Report for the above noted project to Halton Region on September 11, 2015. The report was also submitted to Conservation Halton (CH) for review. On September 29, 2015 a meeting was held among Halton Region, CH and UEM to discuss CH's preliminary review of the SWM Report. Additional communication between Bruce Gall (UEM) and Cory Harris (CH) took place after the meeting for additional clarification on CH comments. Formal comments were received from CH per the above referenced letter.

Enclosed you will find our responses to the points raised in CH's letter and email correspondence for your consideration.

Should you have any questions or comments, please contact me at (905) 212-9722 extension 45 or by email at [aalmuina@uemconsulting.com](mailto:aalmuina@uemconsulting.com) or Bruce Gall at 1 (866) 840-9764 extension 226 ([bgall@uemconsulting.com](mailto:bgall@uemconsulting.com)).

Yours very truly,  
**URBAN & ENVIRONMENTAL MANAGEMENT INC.**



Alvaro L. Almuina, P.Eng.  
Project Manager



Bruce Gall, P.Eng.  
Project Engineer

c: A. Jakaitis, J. Reid, P. Monaghan

Encl. Response Table

<b>Conservation Halton Letter Oct 23, 2015</b>	<b>Cory Harris Telephone Comments Nov 2, 2015</b>	<b>UEM Response</b>
1. Section 2.0 indicates that other than snow drifts, there are no known natural hazards within the study area. Please note that there are in fact flooding and erosion hazards present as defined by the Conservation Authorities Act. Please revise the section to reflect this information.		The report has been updated to reflect information on flooding and erosion hazards in the study area.
2. Section 2.2 makes reference to the Trafalgar Moraine. This feature is located within North Oakville so this reference should be removed.		The reference to the Trafalgar Moraine has been removed from the report.
3. Section 2.3 a. This section makes reference to the creation of a surface model of the study area. Please provide additional information in this regard. What information is used to create the ground surface model?		Comments 3a and 3b refer to the surface model created by UEM and compares UEM drainage area calculations to CH calculated drainage areas. UEM has provided a description of how our surface model and drainage areas were developed (based on a Digital Terrain Model provided by the Region from First Base Solutions). UEM placed a data request to CH for their surface model and drainage areas for comparison and review. The discrepancy between drainage areas has been resolved.
b. Also the section indicates that the majority of the drainage within the study area is within roadside ditches. This is not entirely accurate as the southern culvert has a drainage area of approximately 190ha and the northern culvert has a drainage area of approximately 35ha. The northern 1125mm diameter culvert should be discussed in this section as well.		Information on the 1125mm culvert has been updated throughout the report.
c. Please provide the supporting information related to the estimation of the bankfull channel widths and	Cory Harris recommended UEM send out our Fluvial Geomorphologist to make rudimentary bankfull measurements and document the	UEM's fluvial geomorphologist visited the site to perform the required assessment and provided a summary of the site visit, a

<b>Conservation Halton Letter Oct 23, 2015</b>	<b>Cory Harris Telephone Comments Nov 2, 2015</b>	<b>UEM Response</b>
discussion relating to channel stability referenced in this section. This should be completed by a qualified fluvial geomorphologist using established protocols (OSAP, RGA, etc.). What are min/max and average bankfull widths for this reach? (Note: The Region has advised that draft wording for a commitment in the EA would be forwarded to address this, please advise).	calculation in a very short (about one page) memorandum. The memorandum should also make recommendations for further fluvial work that will be completed during detailed design that will be used to finalize the bankfull width requirement and culvert size.	preliminary bankfull width estimate, and recommendations for a detailed fluvial geomorphic assessment as part of detailed design.
d. This section indicates that the existing culvert is not creating a hydrologic pinch point. Please provide additional discussion in this regard.		Refers to a statement in the SWM Report that the existing culvert is not a hydraulic pinch point. Additional discussion has been provided as requested by CH.
e. Table 1 does not include the 1125mm diameter culvert indicated at Station 3+450 on Drawing 2 in Appendix A, discovered during our site walk in June. Please include this in your analyses and discussion.		The report has been updated to consistently refer to this culvert.
4. Section 2.4 'Rainfall' – please expand the discussion within this section to justify the use of the MTO IDF Curve info. How does this compare with the IDF curve for the Town of Halton Hills? Please also include discussion regarding the Regional Storm (Hurricane Hazel) for use with the modelling for the 3m box culvert.		UEM replaced the MTO rainfall data with Town of Halton Hills rainfall statistics and included discussion about the Regional Storm (Hurricane Hazel).
5. Section 3 – Please include the culvert at Station 3+450 in your discussion regarding improvements to road drainage. Item 3		Refer to Comment 3e regarding the culvert. This comment also refers to the hydraulic model held by CH that will need updating as



Conservation Halton Letter Oct 23, 2015	Cory Harris Telephone Comments Nov 2, 2015	UEM Response
should be clarified as the new larger culvert would need to be added to the existing hydraulic model to update flood plain mapping as part of the detailed design process. A data request can be made through Jeff Lee of our office ( <a href="mailto:jlee@hrca.on.ca">jlee@hrca.on.ca</a> ).		part of detailed design. This recommendation has been provided in the updated SWM Report.
6. Section 4.1 – staff are in general agreement with the approach to sizing the main crossing within the EA study area however it must be made clear that without detailed geomorphic analyses, the bankfull channel width cannot be confirmed with confidence and thus may have a considerable impact on culvert sizing and alignment discussions at detailed design. CH requirement is 3 X bankfull width. Geomorphic analysis must justify consideration of a lesser width. Please make this clear in the text of the EA document. Additionally, please confirm how existing flows have been calculated and provide supporting calculations.	Cory Harris has asked the UEM complete a flow calculation using Visual OttHYMO 2 (VO2) model to ensure the proposed culvert has sufficient hydraulic capacity. Cory Harris also recommended that UEM acquire the CH hydraulic model for this culvert and re-run the model using the updated flows and proposed culvert size to see impact on floodlines.	Refer to Comment 3c (per reference no. 3) regarding calculation of bankfull width. The recommendation for a culvert size of 2x bankfull has been changed to 3x bankfull as per CH recommendations.  Visual HYMO was used to calculate preliminary design flows for the main crossing. Rational method calculations were shown for initial flow calculations for the other culverts.  A data request was made to CH for the HEC-RAS model files for the site. UEM updated the model with design flows and examined impact of the propose culvert size on hydraulic capacity and flood limits.
7. Section 4.3 should be updated to include discussions regarding the existing 1125mm diameter culvert at Station 3+450.		See reply to Comment 3e (per reference no. 3) regarding the culvert.
8. Section 4.4 – Further discussion is required regarding the inability to use flat bottom ditches within the study area. This may be problematic in achieving		See reply to Comment 9a (per reference no. 9.)

Conservation Halton Letter Oct 23, 2015	Cory Harris Telephone Comments Nov 2, 2015	UEM Response
enhanced/Level 1 stormwater quality requirements.		
<p>9. Section 5.0 'Stormwater Management'</p> <p>a. This section promotes the use of flat bottom swales where possible while previous sections (and the report conclusions) indicate that the 42.0m ROW makes it unfeasible. Please provide additional clarity and discussion on the proposed position. The use of flat bottom swales should be focused strategically to those areas adjacent to culvert crossings for stormwater treatment/polishing.</p>		<p>Flat bottom trapezoidal swales are now used throughout the site wherever the Rural or Semi Rural cross sections are used.</p>
<p>b. Staff are very supportive of the options presented in this section to improve quality and quantity control. It is our view however that additional direction should be given within the EA to refine the concepts and demonstrate and promote feasibility of implementation so that it is not left entirely until the final design stage. Please provide additional discussion and analyses in this regard. Specific reference to various LLID BMPs is recommended to provide clarity in the text of the EA. Please note that CH staff re-affirm the expectation of enhanced/level 1 treatment as per the Sixteen Mile Creek Watershed Plan and the MOE SWMP Manual. Our concern is that deferral of</p>	<p>Cory Harris indicated that the Town is very receptive to Low Impact Development (LID) techniques.</p>	<p>Additional discussion and assessment was provided for placement quality/quantity control techniques and to further explore feasibility of proposed approach.</p>

Conservation Halton Letter Oct 23, 2015	Cory Harris Telephone Comments Nov 2, 2015	UEM Response
concepts and feasibility (as noted above) to the detail design stage may result in an unnecessary delay to the project.		
c. What is being proposed for erosion/extended detention control measures?		Discussion provided on options for erosion/extended detention control measure.
d. How is a treatment –train approach being used to achieve enhanced/Level 1 quality controls?		Additional discussion provided on the treatment-train approach and how it will achieve enhanced/Level 1 quality control. If an oil-grit separator is to be used, it will be part of a treatment train approach that include LID techniques were feasible.
10. Table 3 – the drainage areas proposed within the Table are substantially different that those produced by Conservation Halton's DEM and 0.5m contour base, particularly for discharge points 2 and 4. Staff have drainage area values of 35ha for point 3/culvert at Station 3+450 and 190ha for the main crossing. Further review and discussion on this issue is warranted. See image below. The consultant is encouraged to contact staff for additional discussion.		See response to 3a. (per reference no. 3)
11. Table 5 should be updated to include the recommended sizing for replacement of the existing 1125mm diameter culvert at Station 3+450. Sizing recommendations should be supported by initial calculations.		Table 5 was updated to reflect the known existing size of the culvert at 3+450 and update the proposed size increase. Calculations have been provided in the report that include Rational Method based flows for all the culvert crossings with the exception of the main culvert crossing where flows were calculated

Conservation Halton Letter Oct 23, 2015	Cory Harris Telephone Comments Nov 2, 2015	UEM Response
		using Visual HYMO.
12. Section 7.0 "Conclusions" should be revised in light of item 9 above.		The conclusions have been updated as requested.
13. The last bullet of section 7.0 was not supported with adequate discussion and analyses in the report. Staff require further discussion and analyses be added to the report in this regard.		This last bullet point in the conclusions was not supported by any calculations. This concept has been introduced earlier in the report and the conclusions modified accordingly.
14. In July of this year CH/Regional staff staked the relevant wetland boundary on the west side of Ninth Line south of 5 Side Road. As discussed at our September 19 <sup>th</sup> meeting, UEM will be including the graphic of the staked wetland boundary in the ESR document.		The ESR will be updated to show the staked wetland boundary.

## Amanda Selig

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**From:** Alvaro Almuina  
**Sent:** Wednesday, February 03, 2016 9:25 AM  
**To:** Lisa Campbell; Amanda Selig  
**Subject:** Ninth Line EA - Wetland at 5 Side Road boundary delineation  
**Attachments:** 9th line wetland boundary adjustment sketch HA July 17 2015.pdf; 9th Line Wetland boundary GPS points.pdf; PointLoc\_Notes.zip

Fyi.

### Alicia Jakaitis

Acting Senior Transportation Planner  
Transportation Planning | Infrastructure Planning & Policy  
Public Works, Halton Region  
(905) 825-6000 ext. 7556  
[alicia.jakaitis@halton.ca](mailto:alicia.jakaitis@halton.ca)

---

**From:** Richard Baxter [<mailto:rbaxter@hrca.on.ca>]  
**Sent:** Wednesday, February 03, 2016 9:21 AM  
**To:** [lcampbell@lcaenvironmental.ca](mailto:lcampbell@lcaenvironmental.ca)  
**Cc:** Paul Bond; Jakaitis, Alicia; Reid, Jeffrey  
**Subject:** Ninth Line EA - Wetland at 5 Side Road boundary delineation

Hi Lisa,

I just wanted to forward you wetland boundary information for the swamp at 5 Side Road from a site visit that CH and Halton Region staff had on June 3, 2015, in case you did not have this information. The GPS points indicate the easternmost limits of the wetland, and the sketch provided will fill in boundary details not covered by the points. I believe the boundary data was all that was collected by staff that day. If you have any questions you can get in touch with me.

Richard.

### Richard Baxter, BSc

Terrestrial Planning Ecologist

#### Conservation Halton

2596 Britannia Road West, Burlington, ON L7P 0G3  
905.336.1158 ext. 2292 | Fax 905.336.7014 | [rbaxter@hrca.on.ca](mailto:rbaxter@hrca.on.ca)  
[conservationhalton.ca](http://conservationhalton.ca)

## Amanda Selig

---

**From:** Amanda Selig  
**Sent:** Friday, February 19, 2016 10:12 AM  
**To:** Paul Bond (pbond@hrca.on.ca)  
**Cc:** Alvaro Almuina (aalmuina@uemconsulting.com); Jakaitis, Alicia  
<Alicia.Jakaitis@halton.ca> (Alicia.Jakaitis@halton.ca); Monaghan, Patrick -  
Transportation Services <Patrick.Monaghan@halton.ca> (Patrick.Monaghan@halton.ca)  
**Subject:** Follow-Up Item from Meeting Yesterday  
**Attachments:** LCA Report for Ninth Line Class EA (Revised, for discussion) (reduced file size).pdf

Hello Paul,

Please find attached the revised version of Lisa's Ninth Line report for you to circulate to your team.

Regards,

**Amanda Selig, BES, EMAGC, EPt**

**Urban & Environmental Management Inc. (UEM)**

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February 25, 2016

Alvaro Almuina, P.Eng.  
Urban & Environmental Management Inc.  
5100 Orbitor Drive, Suite 300  
Mississauga, ON  
L4W 4Z4

Dear Mr. Almuina:

**Re: Ninth Line Transportation Corridor Improvements (Region of Halton)  
Class EA – UEM Draft SWM Report, CH follow up comment post February 18,  
2016 meeting  
CH File: MPR 664 (Ninth Line Class EA)**

As follow up to our February 18th meeting to discuss the “updated” draft swm report (to be included in the pending draft ESR), CH staff offer the following comments.

1. *Section 4.1.1 – Hydrology and Hydraulic Assessment* – thank you for preparing and refining the models for the study area. Staff are satisfied with the approach taken and ask that digital copies of the models be provided for our records.
2. *Table 5 page 7 of 19* – staff note that the MTO criteria is a minimum standard and as such, recommend that the Region give consideration to ensuring that Ninth Line is flood free under Regional Storm conditions in the selection of the ultimate culvert for Discharge Point 4.
3. *Section 4.1.2 – Fluvial Geomorphic Assessment* – Staff are satisfied with the preliminary fluvial geomorphic assessment work that was completed as part of the study. We note that the bankfull geometry indicators are to be used with caution and we acknowledge that this information will be refined at detailed design.
4. In addition to the proposed modifications outlined in Section 4.1.3 (page 12), staff recommend that all efforts be made during detailed design to minimize the length of the culvert required. We note that wingwalls and potentially eliminating the 3 m multi-use path on one side, as discussed, may assist in this design consideration.

5. Staff suggest that the essence of the proposed modifications outlined in Section 4.1.3 be included in the Summary of Study Commitments, especially the following recommendations:
  - i. Three times bankfull goal
  - ii. Open-footed culvert with natural channel bottom and low flow channel
  - iii. Full geomorphological assessment during detailed design, including both up- and downstream of the main culvert crossing (No. 4) and the smaller culvert immediately south of Five Sideroad (No. 3).
6. *Section 4.2 – Culvert Crossings at Other Discharge Points – Table 8* – staff recommend that consideration be given to proposing a concrete box culvert, of equivalent or greater capacity, in place of the twin 1125mm diameter concrete culvert for Discharge Point 3. A box culvert will provide more effective flow and channel characteristics for the watercourse feature than the twin circular culverts.
7. *Section 4.2 continued* – Please provide additional discussion and clarification/rationale for the diversion of the 7.9 hectares in Area N2B to the south.
8. *Section 5.0 – Stormwater Management* – staff are supportive of the proposed approach and acknowledge that the specific options and best management practices will be refined at detailed design. Should the option of rock check dams within the trapezoidal ditches be carried forward, staff request that measures be put in place with the Town of Halton Hills to ensure that maintenance of these features are carried out in perpetuity to ensure their long-term performance. Additionally, staff recommend that discussions between the designing Landscape Architect and Engineer take place at the onset of the detailed design process to further refine LID options i.e. tree pits, bioretention areas within proposed landscape areas within the project limits. We also support the proposed oil-grit separator (OGS) at station 5+180, noting that maintenance of these features will be reduced if they are combined with LID techniques. Notwithstanding our support of the OGS unit at this location, please provide additional information regarding the proposed wet swale. We suggest that this strategy be discussed at a meeting with Town of Halton Hills staff prior to the detailed design process continuing.
9. *Figures 1 through 3* – staff recommend that existing and proposed culvert locations be clearly indicated on the figures in addition to including catchment limits within the drawing legend.
10. We are supportive of the recommendation to conduct an RGA for the section downstream of the main culvert crossing to its convergence with the East Branch of Sixteen Mile Creek, as noted on page 11. CH typically requires that new or replacement structures will facilitate appropriate bankfull flows, water depth, water velocities, and tractive forces. These parameters should be the same through the crossing as in upstream and downstream natural areas.
11. Culvert number 2 (station 3+056) may have to be abandoned due to conflict with the proposed storm sewer. Could the culvert be retained if a rural cross section was utilized



through this section instead? If the storm sewer cannot be avoided through this intersection, it will be even more important to include culvert number 2 in the full geomorphological assessment at the detailed design stage.

12. *Section 7.0 – Conclusions* – staff are supportive of the conclusions and request that the text from this section be more closely integrated with the text of the commitment table for clarity and consistency.
13. *Terrestrial comment re: Wildlife passage* – while recognizing that habitat features are limited in the study area, wildlife passage should be considered and measures could be implemented where warranted and feasible. For example the culvert immediately south of the swamp at 5 side road, there are records for snapping turtle and milksnake immediately west of the swamp, though connection is somewhat limited to features east of 9<sup>th</sup> line. Also the culvert 1 km north of Steeles Ave is part of a bit of a corridor along the watercourse.

### **Commitment Table**

Please include the following items in the commitment table:

- i. Submission of a refined hydrologic and hydraulic model;
- ii. Refinement of LID options between Landscape Architect and Engineer
- iii. Updated fluvial geomorphic assessment to refine bankfull width estimate and channel design for three times bankfull sizing for culverts in addition to providing guidance of treatment of creek through culvert structure and substrate sizing, mixing details, etc.
- iv. Wetland – that efforts be made to minimize impacts to the wetland through minimizing width of the ROW path adjacent to this feature (a narrower ROW past the swamp was discussed at the Sept 29, 2015 meeting).
- v. Trees – Provide a full inventory of trees that will be impacted and a preservation and compensation plan; edge management plan for the swamp/woodlot at 5 side road.
- vi. Wildlife exclusion protocol to be implemented during construction. CH staff can provide sample wording to include on detail design plans.
- vii. Implementation of the recommendations contained in the approved Natural Sciences Report prepared by LCA Environmental Consultants, February 2016
- viii. That appropriate permits be obtained from Conservation Halton for the crossing of all Regulated watercourses.

We trust the above is of assistance. If you require additional information please contact the undersigned at extension 2257.

Yours truly,



Paul Bond  
Environmental Planner/Team Lead  
Regional Infrastructure Team  
PB/

cc: Alicia Jakaitis and Jeff Reid, Region of Halton (via e-mail)  
Amanda Selig, UEM (via e-mail)  
Bruce Gall, UEM (via e-mail)

<b>Items Discussed</b>	<b>Action by</b>
<b>1. Welcome &amp; Introductions</b>	N/A
<p><b>2. Discussion of Conservation Halton's Comments on the Stormwater Management Report</b></p> <p>CH took the lead explaining the comments from Conservation Halton staff. The following topics were discussed:</p> <p><i>Concerns about water being taken away from the wetland – SM asked if there was a possibility of putting a rural cross-section in this section of road. AA explained that this would have negative impacts on grading and property owners on the northwest side of the intersection. Some ideas brainstormed to address this potential issue included:</i></p> <ul style="list-style-type: none"> <li>• Designing a reverse ditch at Outlet No. 3</li> <li>• Equalization culvert on 5 Side Road</li> <li>• Channelize some flow to go north to replenish the wetland</li> </ul> <p><i>Will the Town of Halton Hills actually maintain the stormwater management infrastructure (e.g. remove sediment once or twice a year from ditch check dams) – AJ and PM indicated that in these situations, the Town of Halton Hills staff would perform the maintenance work and Halton Region will cover the costs. Since the Region is responsible for paying for the required maintenance, it is unlikely that the Town will not carry out the work. Conservation Halton staff emphasized the</i></p>	<p><b>Information</b></p>      <p><b>Halton Region</b></p>



# Meeting Minutes

*Ninth Line (RR13) Transportation Corridor Improvements  
Highway 407 to 10 Side Road*

Items Discussed	Action by
importance maintaining stormwater management infrastructure within the Region's right-of-limits.	
<p><b>3. ESR Commitments Table</b></p> <p>Conservation Halton staff had the following comments on the commitments table provided in the Draft ESR:</p> <ul style="list-style-type: none"> <li>• The aborist must complete an Edge Management Plan for the woodlots to the west of Ninth Line in the vicinity of the 5 Side Road intersection.</li> <li>• Add text instructing the detailed design consultant to perform a detailed SWM analysis to confirm and refine options during detailed design.</li> <li>• Re-examine drainage boundaries, especially for Outlet No. 0</li> <li>• A more detailed fluvial geomorphic assessment should be performed during detailed design to confirm and refine the bankfull channel width and substrate sizing.</li> <li>• The ESR is recommending a 15 metre wide bridge for the main crossing at Discharge Outlet No. 4, however the possibility of using a 12 metre pre-cast box culvert will be explored during detailed design in consultation with Conservation Halton staff. The evaluation must consider wildlife passage and aim to minimize the length of the bridge/culvert.</li> <li>• The detailed design consultation will be responsible for developing the HEC-RAS model in more detail.</li> <li>• Conservation Halton to provide the detailed design consultant with standard clauses to be included in tender documents.</li> <li>• AS to number all commitments listed in the table.</li> </ul>	<b>UEM</b>
<p><b>4. Follow-Up Items</b></p> <ul style="list-style-type: none"> <li>• Conservation Halton staff to provide UEM with written comments, based on what was discussed at the meeting.</li> <li>• UEM to provide Conservation Halton with a Comment Response Table (table enclosed with these minutes). BG to investigate existing downstream drainage paths for Outlets No. 2 and No 3.</li> <li>• BG to explain in more detail why Discharge Outlet No. 2 is being abandoned.</li> </ul>	<b>Conservation Halton &amp; UEM</b>
<b>5. Adjourn (3:00pm)</b>	

If there are any errors or omissions within these Minutes, please contact Amanda Selig to clarify at [aselig@uemconsulting.com](mailto:aselig@uemconsulting.com).

Encl. UEM Response to Conservation Halton Letter dated February 25, 2016

Comment from Conservation Halton Letter Dated February 25, 2016	UEM Response
1. <i>Section 4.1.1 – Hydrology and Hydraulic Assessment</i> – CH Staff ask that digital copies of the models be provided for our records.	UEM will provide electronic versions of the models used in the analysis upon project completion.
2. <i>Table 5 (page 7 of 19)</i> – Staff note that the MTO criteria is a minimum standard and as such, recommend that the Region give consideration to ensuring that Ninth Line is flood free under Regional Storm conditions in the selection of the ultimate culvert for Discharge Point 4.	Comment noted. UEM will add this recommendation to the final SWM report in Appendix E of the ESR.
3. <i>Section 4.1.2 – Fluvial Geomorphic Assessment</i> – Staff are satisfied with the preliminary fluvial geomorphic assessment. CH notes that the bankfull geometry indicators are to be used with caution and that this information will be refined at detailed design.	Comment noted. UEM to reflect this point in the ESR Commitments Table in Section 7.6.
4. <i>Proposed Modifications Outlined in Section 4.1.3 (page 12)</i> – In addition to the proposed modifications outlined in Section 4.1.2, staff recommend that all efforts be made during detailed design to minimize the length of the culvert required. We note that wingwalls and eliminating the 3 metre multi-use path on one side, as discussed, may assist in this design consideration.  5. <i>Suggested Modifications to Summary of Study Commitments Table</i> – Staff suggest that the essence of the proposed modifications outline in Section 4.1.2 be included in the Summary of Study Commitments, especially the following recommendations: i. Three times bankfull goal ii. Open-footed culvert with natural channel bottom and low flow channel iii. Full geomorphological assessment during detailed design, including both up- and down-stream of the main culvert crossing (Discharge Outlet No. 4) and the smaller culvert immediately south of Five Side Road (Discharge Outlet No. 3)	Comment noted. UEM to reflect these points in the ESR Commitments Table in Section 7.6. Through the detailed design process, the final design length of all culverts will be determined in consultation with CH.  Items 5i, ii, iii will be included in the final ESR Commitments Table in Section 7.6.
6. <i>Section 4.2 – Culvert Crossings at Other Discharge Points (Table 8)</i> – Staff recommend that consideration be given to proposing a concrete box culvert, of equivalent or greater capacity, in place of the twin 1125mm diameter concrete culvert for Discharge Point No. 3. A box culvert will provide more effective flow and channel characteristics for the watercourse feature than the twin circular culverts.	The final ESR will be updated to reflect removal of the proposed twin culvert and replaced with 2250mm open bottom box culvert on the preliminary design plans.

Comment from Conservation Halton Letter Dated February 25, 2016	UEM Response
<p>7. <i>Section 4.2 Continued</i> – Please provide additional discussion and clarification/rationale for the diversion of the 7.9 hectares in Area N2B to the south.</p>	<p>The Project Team has subsequently met with Conservation Halton on April 19, 2016 and 21, 2016. The SWM Report and associated sections of the ESR will be updated accordingly to reflect the revisions to the SWM strategy at the intersection of Ninth Line at 5 Sideroad to mitigate the diversion of the 7.9 hectares in Area N2B</p> <p>The updated SWM strategy will be developed in consultation with Conservation Halton and the proposed modified flow route of Culvert 2 will be sent to Conservation Halton under a separate cover.</p>
<p>8. <i>Section 5.0 – Stormwater Management</i> – Should the option of rock check dams within the trapezoidal ditches be carried forward, staff request that measures be put in place with the Town of Halton Hills to ensure that maintenance of these features are carried out in perpetuity to ensure their long-term performance.</p> <p><i>Additionally, staff recommend that discussions between the designing Landscape Architect and Engineer take place at the onset of the detailed design process to further refine LID options (i.e. tree pits, bioretention areas within proposed landscape areas within the project limits).</i></p> <p><i>We also support the proposed oil-grit separator (OGS) at station 5+180, noting that maintenance of these features will be reduced if they are combined with LID techniques. Notwithstanding our support of the OGS unit at this location, please provide additional information regarding the proposed wet swale. We suggest that this strategy be discussed at a meeting with Town of Halton Hills staff prior to the detailed design process continuing.</i></p>	<p>Halton Region confirms that maintenance of all SWM infrastructure located within the Region's ROW will be maintained by the Region.</p> <p>Comment noted. The Commitment Table in Section 7.6 of the final ESR will be updated.</p> <p>UEM will add additional information regarding the recommendation for a wet swale in Section 4.1.3 of the SWM Report.</p> <p>Halton Hills staff will be consulted during the detailed design process.</p>
<p>9. <i>Figures 1 through 3</i> – Staff recommend that existing and proposed culvert locations be clearly indicated on the figures in addition to including catchment limits within the drawing legend.</p>	<p>UEM to revise these figures and include the figures in the front-end of the ESR, as well as in the ESR Appendix E.</p>

Comment from Conservation Halton Letter Dated February 25, 2016	UEM Response
<p>10. <i>Rapid Geomorphic Assessment for the Section Downstream of the Main Culvert Crossing to its Convergence with the East Branch of Sixteen Mile Creek (page 11)</i> – CH typically requires that new or replacement structures will facilitate appropriate bankfull flows, water depth, water velocities, and tractive forces. These parameters should be the same through the crossing as in upstream and downstream natural areas.</p>	<p>The reference to the Rapid Geomorphic Assessment in the SWM Report has been updated accordingly.</p>
<p>11. <i>Abandoning Culvert No. 2 (Station 3+056)</i> – Culvert No. 2 may have to be abandoned due to conflict with the proposed storm sewer. Could the culvert be retained if a rural cross-section was utilized through this section instead?</p> <p>If the storm sewer cannot be avoided through this intersection, it will be even more important to include Culvert No. 2 in the full geomorphological assessment at the detailed design stage.</p>	<p>The Project Team has subsequently met with Conservation Halton on April 19, 2016 and 21, 2016. The SWM Report and associated sections of the ESR will be updated accordingly to reflect the revisions to the SWM strategy at the intersection of Ninth Line at 5 Side Road to mitigate the diversion of the 7.9 hectares in Area N2B</p> <p>The updated SWM strategy will be developed in consultation with Conservation Halton and the proposed modified flow route of Culvert 2 will be sent to Conservation Halton under a separate cover.</p>
<p>12. <i>Section 7.0 – Conclusions</i> – Staff are supportive of the conclusions and request that the text from this section be more closely integrated with the text of the commitment table for clarity and consistency.</p>	<p>UEM to revise the wording of relevant sections of the Commitments Table in Section 7.6 the ESR.</p>
<p>13. <i>Terrestrial Comment RE: Wildlife Passage (Paraphrased)</i> – While recognizing that habitat features are limited in the study area, wildlife passage should be considered and measures could be implemented where warranted and feasible. For example, records indicate that snapping turtles and milksnake have been observed immediately west of the swamp, though connections to features east of Ninth Line are limited. Therefore wildlife passage at the culvert immediately south of the swamp at 5 Side Road and the culvert one kilometre north of Steeles Avenue should be considered as they are part of a small corridor along the watercourse.</p>	<p>The consideration of wildlife passage will be included in the Commitments Table.</p>

Comment from Conservation Halton Letter Dated February 25, 2016	UEM Response
<b>Commitment Table</b>	
<i>Please include the following items in the commitment table:</i>	Comment noted.
i. Submission of a refined hydrologic and hydraulic model	Refer to Commitment No. 1b
ii. Refinement of LID options between Landscape Architect and Engineer	Refer to Commitment No. 1d
iii. Update fluvial geomorphic assessment to refine bankfull width estimate and channel design for three times bankfull sizing for culverts in addition to providing guidance of treatment of creek through culvert structure and substrate sizing, mixing details, etc.	Refer to Commitment No. 1c
iv. Wetland – that efforts be made to minimize impacts to the wetland through minimizing width of the ROW path adjacent to this feature (a narrower ROW past the swamp was discussed at the September 29, 2015 meeting).	<p>A modified cross-section with a reduced right of way and urban cross section on the west side was developed and incorporated into the preliminary design in the vicinity of the 5 Side Road intersection and the wetland to mitigate impacts to the wetland, the woodlot and residential properties on the west side of Ninth Line. This issue is discussed in more detail in an updated Section 4.3 of the SWM Report.</p> <p>The ESR recommends that interim improvements for the 5 Side Road intersection involve widening to the east to avoid impacts on the wetland and utilities.</p> <p>Refer to Commitment No. 1f</p>
v. Trees – Provide a full inventory of trees that will be impacted and a preservation and compensation plan.	Refer to Commitment No. 1a
Edge Management Plan for the swamp/woodlot at 5 Side Road.	Refer to Commitment No. 1a
vi. Wildlife exclusion protocol to be implemented during construction. CH staff can provide sample wording to include on detail design plans.	Refer to Commitment No. 4e



Comment from Conservation Halton Letter Dated February 25, 2016	UEM Response
vii. Implementation of the recommendations contained in the approved Natural Sciences Report prepared by LCA Environmental Consultants, February 2016.	Refer to Commitment No. 1f
viii. That appropriate permits be obtained from Conservation Halton for the crossing of all Regulated watercourses.	Refer to Commitment No. 1e

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# Meeting Minutes

*Ninth Line (RR13) Transportation Corridor Improvements  
Highway 407 to 10 Side Road*

*UEM Project No. 14-508  
Halton Region Project No. PR 2876*

<b>Subject:</b>	Meeting with Conservation Halton – Meeting No. 5 (Conference Call)		
<b>Date/Time:</b>	April 19, 2016 @ 10:00am		
<b>Location:</b>	Conservation Halton Burlington Office		
<b>Present:</b>	Alicia Jakaitis (AJ)	Halton Region	
	Jeffery Reid (JR)		
	Patrick Monaghan (PM)		
	Paul Bond (PB)	Conservation Halton	
	Sarah Matchett (SM)		
	Richard Baxter (RB)		
	Cory Harris (CH)		
	Alvaro Almuina (AA) – Project Manager	UEM	
Amanda Selig (AS)			
Lisa Campbell (LC)	LCA Environmental Consultants		
<b>Regrets:</b>	None		
<b>Distribution:</b>	All Present		

The following summarizes the meeting discussion and follow up items:

Items Discussed	Action by
<b>1. Introductory Remarks</b> (overview of discussion format)	<b>N/A</b>
<b>2. Review of Conservation Halton Letter with Comments on LCA Natural Sciences Report (dated April 12, 2016)</b>  All 29 comments (Enclosure #1) were discussed individually, as summarized in the attached response table (Enclosure #2).	<b>N/A</b>
<b>3. Discussion of Alternative Design for the Area in the Vicinity of 5 Side Road</b>  CH explained that he had an alternative proposal for the design of Culvert No. 2 such that there was no diversion of existing flows and the water balance in the wetland is maintained. Discussions on this alternative resulted in a revised design at the intersection per the attached drawing (Sheet 11 of 22 and Sheet 22 of 22 – Enclosure #3).	<b>N/A</b>
<b>4. Follow-Up Items</b> <ul style="list-style-type: none"> <li>As described in the summary table (Enclosure #2).</li> </ul>	<b>Information</b>
<b>5. Adjourn (12:00pm)</b>	

If there are any errors or omissions within these Minutes, please contact Amanda Selig to clarify at [aselig@uemconsulting.com](mailto:aselig@uemconsulting.com).



## Meeting Minutes

*Ninth Line (RR13) Transportation Corridor Improvements  
Highway 407 to 10 Side Road*

- Encl.    1. Conservation Halton Letter dated April 12, 2016 summarizing comments on LCA Natural Sciences Report;  
          2. Response Table with an overview of the comments, discussion and follow-up items;  
          3. Modified drainage drawings at the intersection of Ninth Line and 5 Side Road.

April 12, 2016

Alvaro Almuina, P.Eng.  
Urban & Environmental Management Inc.  
5100 Orbitor Drive, Suite 300  
Mississauga, ON  
L4W 4Z4

Dear Mr. Almuina:

**Re: Ninth Line Transportation Corridor Improvements - Region of Halton PR2876  
“Draft for Discussion” Natural Sciences Report (LCA Environmental Consultants)  
CH File: MPR 664 - Ninth Line Class EA**

CH staff have reviewed the “Draft for Discussion” copy of the Natural Sciences Report dated February 2016 (received by CH February 19, 2016), prepared by *LCA Environmental Consultants* and offer the following comments. We anticipate further discussion with your team prior to the report being finalized for inclusion in the ESR.

*Aquatic Ecology:*

1. Further to section 2.2 (Aquatic Habitat and Fisheries), we note that the watercourse conveyed by the smaller culvert south of Five Sideroad (No. 3) has not been assessed. As this culvert will be replaced as a result of road improvements on Ninth Line, we request that additional sampling of this watercourse be conducted.
2. Staff request additional information about the OSAP protocols conducted, as described on pages 4-5. According to the OSAP manual, a sampling reach should represent at least one riffle-pool sequence, be at least 40 m long, and begin and end at a crossover point. Staff are unsure that the minimum 40 m reach will be within the monitoring node. The 40 m length optimizes the balance of variance and effort for a variety of parameters (fish community, instream habitat, and substrate). We recognize that private property occurs beyond 30 m upstream and downstream of the culvert, but suggest that since the footprint of the road is widening so greatly, additional sampling into the areas that will be affected should be conducted. (this can be conducted at any time).
3. Section 2.2.1 describes the aquatic habitat observed within the study area; however, it does not indicate the wetted width or bankfull width of the watercourse. Please provide

this information, along with the remaining OSAP parameters in a table format. If this information is not readily available from the field work, it could also be obtained through the detailed fluvial geomorphology survey that will be completed.

4. Further information regarding the fish community is requested for this crossing. While habitat assessments can be sufficient to generally characterize the likely fish community, particularly in combination with fish community information in the general area, this information may not be adequate to fully address the project requirements. In general, most investigations include fish community inventories unless the fish community is well documented. These data will help ensure that there is sufficient information about the fish community to assess the potential of the project to affect fish and their movement, support the assessment of impacts of the project and support the identification of appropriate mitigation measures.
5. As outlined in our EA checklist (provided February 4, 2015) and discussion at our April 8, 2015 meeting with UEM, fish habitat mapping as per MTO Protocol "Environmental Guide for Fish and Fish Habitat, 2006" was to be included in this EA. Clear documentation of the characteristics of the habitat is required to ensure that the potential impacts of a project can be comprehensively identified and addressed. It is essential for maps to be highly detailed as habitat mapping is an important tool used in various design stages to facilitate the determination of impacts as well as identifying areas for compensation and assisting in the development of fisheries compensation plans. Conditions of the banks should be noted, particularly undercut banks, overhanging grasses or shrubs, eroding areas, and heavily stabilized areas. Locations of fish observations should be specifically identified, such as those observed during the June 2014 site visit.
6. Further to the water temperature observed (13.9°C on 06/04/14 and 16.6°C on 07/16/2014), could you please confirm what the air temperature was during the June and July site visits? We note that low-impact development measures are proposed to manage stormwater on the new widened road and multi-use paths and thus would like to see as much pre-construction surface water temperature monitoring completed prior to impacts occurring. We propose that the detailed design of the road, right-of-way (ROW) and culverts should include thermal mitigation measures, such that no increases to the stream temperature occur as a result of the project. (ie: swales with infiltration components).
7. No benthic information was included in the report. Staff recommend that aquatic benthic invertebrate community assessment be undertaken within culverts number three and four, as well as upstream and downstream of these crossings, using the Ontario Benthic Biological Network (OBBN) protocol. This work needs to be undertaken in the last two weeks in April or in May and analysis of this data needs to be undertaken using the indices recommended by OBBN.
8. In addition, though the photographic records are appreciated, please include a key map indicating photo locations with the photo documentation of the study area. This will assist in cross-referencing with the report text.

9. What, if any, indications of groundwater contributions (recharge and/or discharge) to these watercourses (i.e. those traversing the study area at culverts number 3 and 4) are apparent? Clear documentation of the characteristics of the habitat is required to ensure that the potential impacts of a project can be comprehensively identified and addressed. This information is ultimately required to ensure a defensible determination as to the likelihood of the project impacting the ecological function of the watercourse. The documentation must describe dependencies as well (e.g. groundwater seeps). Please identify recommended mitigation measures for groundwater impacts and if appropriate, any opportunities to improve infiltration.
10. Staff note that the assessment of proposed road improvements provided in Section 3.0 does not consider impacts to the aquatic environment and should be revised. An assessment of the impacts the project may have on the species diversity, health, functionality and resilience of the watercourses must be completed. The assessment should include potential effects before, during and after construction as well as potential effects of processes (i.e. urbanization) that are made possible by the road improvements. Effects may include both direct on-site effects (e.g. elimination of habitat, restoration of existing features) and indirect effects (e.g. sediment transport downstream), as well as cumulative impacts. Methods and preferred measures that will avoid and/or mitigate negative impacts should be outlined. The recommendations should outline how the proposal will maintain or enhance the ecological functions of the natural area.
11. Staff recommend (for the Region to consider) that 2 years of post-implementation monitoring of the project be conducted. We suggest that the approach incorporate an adaptive management framework to assess the effectiveness of various aspects of the project (e.g. channel realignments, stormwater management approaches). All monitoring should follow an accepted protocol (e.g. EMAN, OSAP, etc.) and it is strongly recommended that the parameters sampled in a pre-construction state be reassessed.

#### Terrestrial Ecology:

12. *Table 1 Summary of Fieldwork Completed for this Report* is listed in the Table of Contents but does not appear in the report. Staff would ask that a field work table be included in Section 1.2 Fieldwork of the report detailing the dates and times of surveys performed, weather conditions during surveys, the purpose of the surveys, and the personnel completing the surveys. In addition, staff qualifications relating to the surveys being performed should be provided.
13. Section 2.3.1 refers to a lack of detailed vegetation data for woodlot features north of 10 Side Road. Staff note that Ninth Line north of 10 Side Road is outside of the Study Area and no woodlots are present within a kilometer to the north of 10 Side Road.
14. References to Halton Region Greenlands in Sections 2.3.1 and 2.5.2 are out of date as the Greenlands System has been replaced with the Natural Heritage System (NHS) in the current Regional Official Plan. The woodlots at the Ninth Line - 5 Side Road intersection

are mapped as *Key Features* in the NHS on Regional Official Plan Amendment 38 (ROPA 38) Map 1G. This updated terminology should be reflected in the text of the report.

15. Staff are of the opinion that ELC mapping is insufficient, covering only a very small portion of the Study Area (the Ninth Line – 5 Side Road intersection). Two natural or naturalized vegetation community patches have not been characterized, one on the east side of Ninth Line approximately 950 m north of Steeles Avenue and one on the east side of Ninth Line at the Steeles Avenue intersection (north side of Steeles Avenue). While it is acknowledged that the majority of the Study Area is under an intensive agricultural land use, this should still be characterized using ELC terminology and mapped for assessment, as certain agricultural land uses can provide Species at Risk habitat (e.g. Bobolink or Eastern Meadowlark using hayfields or pastures). A full land classification would also allow confirmation that the survey stations used provided adequate coverage of habitats.
16. ELC and wetland polygon mapping on Figure 2 should be reviewed more closely. While it appears that wetland boundaries have been adjusted somewhat from previous base mapping, the updated boundaries as mapped do not seem accurately represented based on the boundary verification field visit undertaken by Conservation Halton and Regional Staff on June 3, 2015. However, it also appears that the polygons are generally mapped incorrectly. The scale of the mapped vegetation community polygon shapefiles does not match the scale of the aerial imagery. This appears to be the major reason for the misaligned depiction of the polygon and wetland boundaries, but the accuracy will need to be confirmed once mapping has been fixed.
17. It is indicated in Section 1.1 that access was granted to the “*significant wooded area*”. Staff assume that this is the woodland feature at the Ninth Line - 5 Side Road intersection. However, it is not clear exactly where access was allowed for assessment. Was this on both the north and south side of 5 Side Road? It should be clearly indicated where ELC and wetland boundaries were established through fieldwork.
18. The ELC Figure (Figure 2) and the text descriptions of ELC communities present in Section 2.3.2 do not match. Figure 2 indicates that deciduous forest and deciduous swamp communities are present in the woodlots on the north and south side of 5 Side Road, west of Ninth Line. However, the text description of vegetation communities indicates that “*mixed forest ecosite with wetland inclusions is present*”, and judging by leaf off aerial imagery, the woodlots do appear to be mixed. Staff is of the opinion that the wetland communities present should not be described as *inclusions* as they are large enough to be considered standalone vegetation community polygons. The ELC for Southern Ontario: First Approximation and its Application manual gives a value of 0.5 ha or smaller as a guideline for mapping vegetation units as inclusions. In addition, staff are of the opinion that the detail provided in the description of communities is inadequate, only going to the Community Series level (i.e. Deciduous Forest, Deciduous Swamp) of classification on the mapping and no classification of the wetland community is given at all in the text. Vegetation communities should be classified to the Ecosite level at



minimum and to the vegetation type level if possible (i.e. if access to a vegetation community was granted and the community present fits a vegetation type classification). Conservation Halton's EIS Guidelines, available online at <http://www.conservationhalton.ca/policies-and-guidelines> can provide further direction on the level of detail required when describing the surrounding environment. Staff feel that an ELC table should be provided detailing specific community attributes (vegetation species and layers present, soil characteristics) to the vegetation type level as this would provide a more consistent approach to results presentation and easier comparison and assessment, as opposed to the written paragraphs provided. In addition, it is helpful to include areas of ELC communities on figures when considering impact assessment.

19. No date is given for the botanical/vegetation inventory, it is only indicated that it occurred in the fall. In addition, most of the herbaceous species presented look to be common to disturbed sites, and are often not identified to species. While the report acknowledges that surveys mainly occurred from roadside, a larger plant species list would be expected if access was granted to the woodlots at the Ninth Line – 5 Side Road intersection. Staff is of the opinion that further botanical survey work should occur during the late spring-early summer growing period (i.e. late May-early June), in particular within the natural vegetation communities present (including those not already classified, as indicated in Comment 6 above). In addition, more detail should be provided in the plant table in Appendix B; basic information that should be presented in the table includes the Provincial Conservation "SRank", Coefficient of Conservatism, Wetness Coefficient, Federal Species at Risk Act (SARA) and Provincial Endangered Species Act (ESA) status, etc.
20. It is stated in Section 2.3.2 of the report that "*there was no presence of salamanders in the forested area assessed on the northwest corner of the intersection*". Staff suggest that this wording should be changed to indicate that no salamanders were detected, as salamanders could be present but not detected even if targeted surveys were performed. It is assumed that no targeted salamander surveys were performed (e.g. cover board surveys using EMAN protocols or vernal pool surveys if warranted).
21. Section 2.4.1 Historical Data: Although identified as a *Species of Concern*, staff suggest that Snapping Turtle (*Chelydra serpentina*) should also be discussed as having potential for being in the area, and should be considered when developing mitigations. Conservation Halton has records for Snapping Turtle in the general vicinity, approximately 600 m to the west of Ninth Line, southwest of the swamp woodlots at 5 Side Road. As this is a mobile species and drainage features are present, it could potentially occur in the Study Area. Staff would ask that mitigations for snapping turtles be developed for implementation at the construction stage (e.g. development of a wildlife encounter protocol and exclusion methods during construction).
22. There appears to be a typographical error is present in Section 2.4. Both the Historical Data and Field Assessment sections are numbered 2.4.1.

23. The Significant Wildlife Habitat (SWH) discussion in Section 2.5.6 should be reviewed to provide additional clarity in identifying the potential for candidate SWH as described in the SWH Criteria Schedules for Ecoregions 6E and 7E to be present. Staff feel that the potential exists for Specialized Habitat for Wildlife in the form of Amphibian Breeding Habitat (woodland) in the woodlots at the 5 Side Road intersection. Amphibian habitat is not listed under Seasonal Concentration Areas in the Criteria Schedules, as is indicated in the report. It is difficult to determine if candidate SWH is or is not present as few details are provided. Results of amphibian breeding surveys do indicate that no breeding amphibians were observed during surveys using the Marsh Monitoring Protocol (Section, Page 10). Northern Leopard Frog (*Lithobates pipiens*) is listed as an incidental observation but no details are present on quantity or location. Without details provided on dates of surveys and field conditions during surveys it is not possible to assess the validity of the negative results. There appears to be a typographical error on Page 10 that indicates amphibian surveys were completed in 2005 (should likely read 2015).
24. Staff note that a tree inventory was completed along the Ninth Line ROW. As indicated in Section 4.0 Recommendations of the report, a tree preservation plan and compensation plan will be required at the detailed design stage of the project. At detailed design inventoried trees will be required to be mapped on construction drawings along with details of tree protection fencing, trees to be removed and planned location for compensation plantings. When the time comes for a tree compensation plan, replacement should adhere only to the Halton Region Tree Canopy Replacement Policy on Regionally Owned Lands as this is a Regional project. For the tree inventory that was completed, a table must be provided detailing species, diameter at breast height, health and condition for each individual tree; this table should be included on a construction drawing set.
25. The report indicates that only one survey visit was made for the breeding bird survey. Generally, breeding bird surveys require a minimum of two survey visits spaced a minimum of 6-10 days apart (depending on the specific protocol cited), both to confirm breeding status and detect early and late breeding species. As only one survey event occurred, the results of the bird inventory cannot be considered complete at this time. Staff require that a second later survey event (i.e. approximately 10 days later than June 4) be added to complete the breeding bird data set.
26. As species listed under Ontario's ESA were recorded in the Study Area, including Bobolink (*Dolichonyx oryzivorus*), Barn Swallow (*Hirundo rustica*), and Eastern Wood-pewee (*Contopus virens*), MNRF should be consulted.
27. Bird species SRanks should be included in the Appendix B Bird Table.
28. Icons used to illustrate avian and amphibian survey stations on Figure 3 could be differentiated more clearly using different colours and/or icons. As they are mapped, the colours are very similar and not easily apparent as to which icon is indicating which survey on the figure.

29. Staff defer comment on the Regionally Significant Woodlands to the Region. The following comments are offered as *advice only*.

Woodlot area to be removed in Section 3.0 is presented as a percentage of woodlot removed, but no size information for these woodlots is given in the report. To assess the impacts of woodlot removal and to allow for calculation of compensation required, the quantity of area lost in hectares will be required. Including the areas of each ELC community would allow for a more refined assessment of impact. A figure depicting area lost could also be provided. It has been staff's experience that depending on the area of woodlot to be removed, compensation requirements may be based on the number of individual trees removed or on the area of woodlot removed. Ultimately, impacts to Regionally Significant Woodlands and compensation requirements will need to be discussed with the Regional Forester.

**Summary:**

CH staff had anticipated an earlier opportunity to engage with the environmental consultant on the Natural Sciences report "draft for discussion". Our interest and commenting concerns relate to the adequate identification and assessment of the environmental impacts in order to identify the appropriate mitigation measures to be included in the ESR. We look forward to assisting in this respect and are available to discuss further, if necessary.

We trust the above is of assistance. If you require additional information please contact the undersigned at extension 2257.

Yours truly,



Paul Bond  
Environmental Planner/Team Lead  
Regional Infrastructure Team  
PB/

cc: Alicia Jakaitis and Jeff Reid, Region of Halton (via e-mail)

Comment from Conservation Halton Letter Dated April 12, 2016	Discussion & Points of Clarification	Action Item
<i>Aquatic Ecology Comments</i>		
Comment #1 (Discharge Outlet #3)	This culvert was not addressed in the Natural Sciences Report (NSR) because it was not identified as a natural channel in any of the preliminary discussions between CH and the project team.  CH wants more information on this culvert and whether it serves an ecological function.	Follow up investigations on the function of this culvert confirmed it is strictly for stormwater drainage and does not serve an ecological function.
Comment #2 (OSAP Protocols)	LCA applied the applicable OSAP protocols for the natural features that were actually present. Lisa Campbell can provide more detail on field work completed. In order to do a detailed assessment, the culvert alignment/orientation needs to be known. A detailed fluvial geomorphology assessment will be completed during detailed design, the results of which will determine the alignment of the new culverts.  CH requested additional sampling so that a comparison can be done between pre- and post-construction conditions.  There is currently only one reference to NSR recommendations in the ESR, therefore the recommendations put forth in the NSR need to be detailed.	A recommendation will be added to the NSR report (and subsequently to the ESR) that sampling be conducted during detailed design, prior to construction. The recommendation will make reference to the OSAP Protocol and OBBN.
Comment #3 (Additional information on aquatic habitat)	Comment #3 is similar to Comment #2. Refer to response to Comment #2.	Additional sampling will be completed during detailed design.
Comment #4 (Fish community information)	Comments #4 and #5 are similar to what was discussed for Comments #2 and #3.	The recommendation for additional sampling during detailed design will stipulate that the Detailed Design Consultant apply OSAP Protocols when conducting field work.
Comment #5 (Fish habitat mapping as per MTO Protocol)	Since the reconstruction of Ninth Line has been pushed back to 2020, Sarah Matchett indicated that it would be better to wait until the detailed design phase of the project to acquire additional field data. The sampling could be completed at the same time as the detailed fluvial geomorphology assessment.	

Comment from Conservation Halton Letter Dated April 12, 2016	Discussion & Points of Clarification	Action Item
Comment #6 (Temperature monitoring information)	Lisa Campbell has ambient temperatures recorded in her field notes. Sarah Matchett indicated that thermal mitigation may be required.	Lisa Campbell to add ambient temperatures to NSR.
Comment #7 (Benthic community assessment)	CH recommends that Halton Region consider undertaking an assessment of the benthic community during detailed design. Jeffery Reid indicated that this issue should be re-evaluated during detailed design, and this will be reflected in the ESR commitments table.	The commitments table in the ESR will be revised to ensure that the Detailed Design Consultant consults with CH to determine whether or not a benthic community assessment is required.
Comment #8 (Key map showing photograph locations)	LCA has this information and can generate a key map depicting where photographs were taken along the study corridor.	A key map showing the locations where photos were taken will be added to the NSR by Lisa Campbell.
Comment #9 (Groundwater – existing conditions and mitigation measures)	Alvaro and Lisa asked for clarification from CH on Comment #9. CH is unaware of any borehole information for this area. Therefore in the absence of the required information, open bottom culverts should be used.	No action required as long as the design incorporates open bottom culverts, which it currently does.
Comment #10 (Consideration of impacts to aquatic environment)	CH is requesting more detailed impacts and recommendations in the NSR. The road widening will require that natural channel design and realignment be considered. Alvaro indicated that channel treatment options were touched on in the SWM Report; this discussion will be reiterated in the NSR.	Lisa Campbell will revise Section 3.0 of the NSR to include: <ul style="list-style-type: none"> <li>• Criteria</li> <li>• Data needs</li> <li>• Mitigation measures/offsetting</li> </ul>
Comment #11 (Two years of post-implementation monitoring)	Paul Bond indicated that this comment was included as a recommendation for Halton Region's consideration only.	Comment noted.
<i>Terrestrial Ecology Comments</i>		
Comment #12 (Summary of field work)	This information is provided in Table 3-1 of the ESR. The table will be inserted in the NSR.	Lisa Campbell to insert a revised version of Table 3-1 in the NSR.

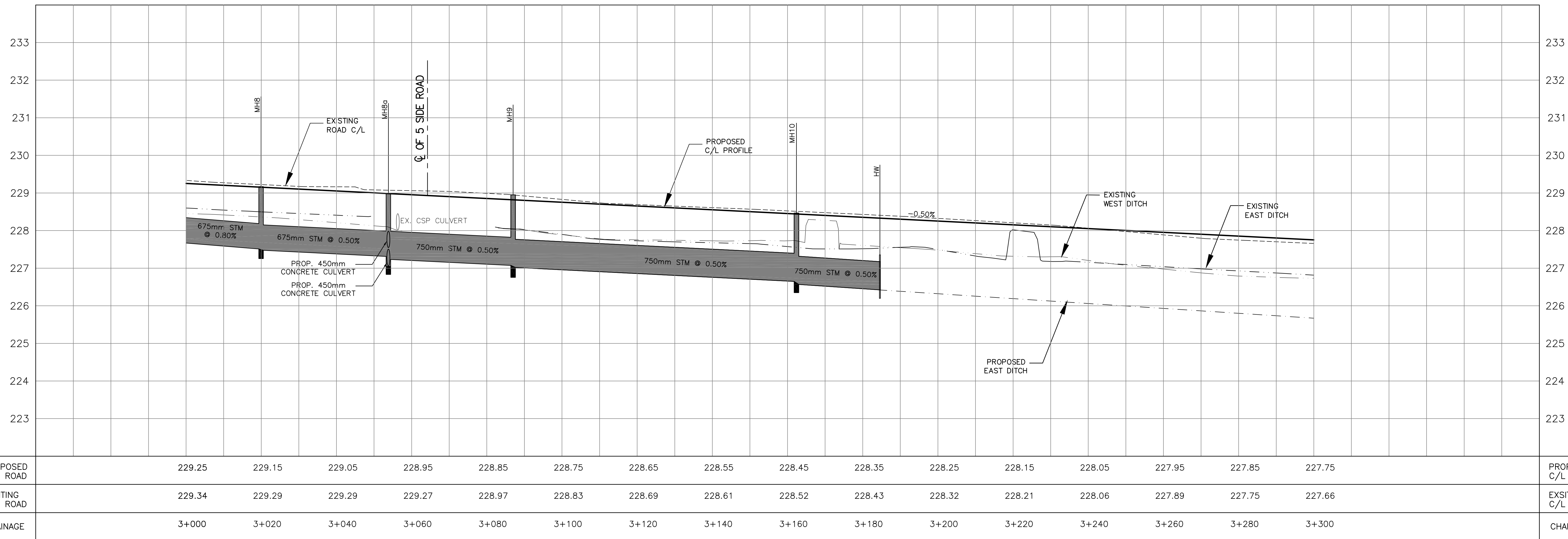
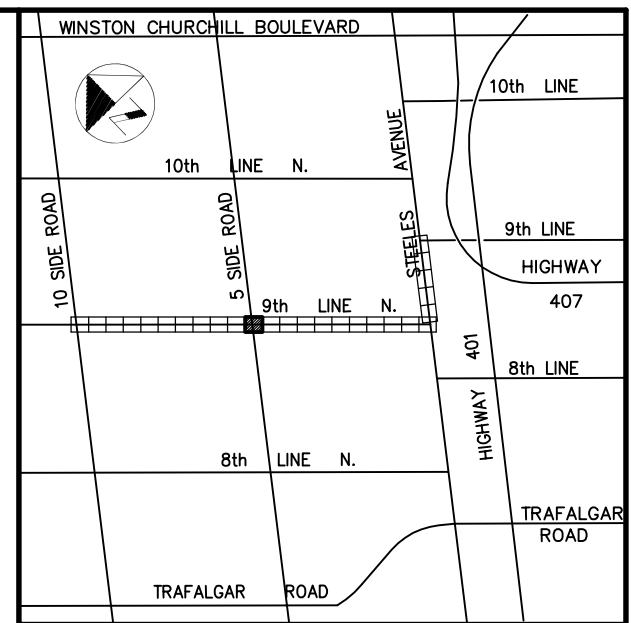
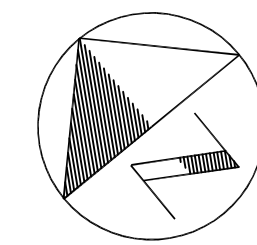
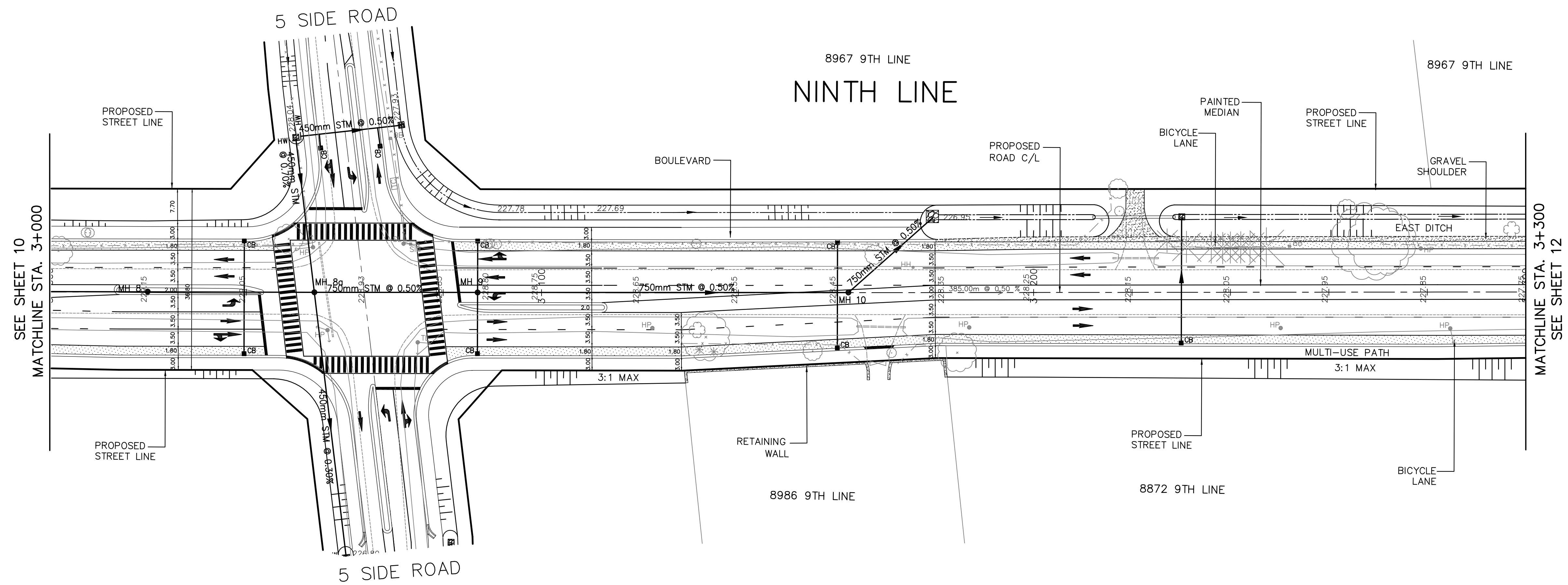
Comment from Conservation Halton Letter Dated April 12, 2016	Discussion & Points of Clarification	Action Item
Comment #13 (Possible typographical error, reference to woodlot north of 10 Side Road)	Comment noted. This text will be omitted from the NSR.	Lisa Campbell to remove this wording from the NSR.
Comment #14 (Greenlands System replaced with Natural Heritage System)	The terminology used in the NSR will be updated accordingly.	Lisa Campbell to replace Greenlands System terminology with NHS terminology in the NSR.
Comment #15 (ELC mapping)	<p>Due to limited access, LCA did not have enough information to describe vegetation communities to the Ecosite level.</p> <p>Richard Baxter indicated that LCA can acknowledge shortcoming of available data in the report text.</p> <p>The vegetation community in the vicinity of the Steeles Avenue intersection was not evaluated as part of the Ninth Line Class EA because: 1) the intersection was under construction when fieldwork was completed (therefore no access) and 2) this area would have been evaluated through the Steeles Avenue Class EA process.</p>	Lisa Campbell will review field notes from the roadside survey to attempt to determine the Ecosite category of each vegetation community (except for the Steeles Avenue area).
Comment #16 (Review polygons shown on Figure 2)	CH indicated that the shape of the polygons shown on Figure 2 appear to be correct, however the size of the polygons appear to be wrong.	UEM to review the scale used and revise Figure 2 accordingly.
Comment #17 (Clarification regarding access)	Richard Baxter asked if the boundaries of the woodlands were field verified. Due to access restrictions, the boundaries were not field verified. LCA only had access to the portion of the woodland south of 5 Side Road.	The boundaries were not field verified. No action required.
Comment #18 (Descriptions of ELC communities)	<p>It is the position of CH that the wetlands in the vicinity of the study area are stand-alone communities due to their size, no inclusions.</p> <p>Richard Baxter asked if a summary table could be provided.</p>	Lisa Campbell will revise the wording in the NSR accordingly and will provide a summary table.

Comment from Conservation Halton Letter Dated April 12, 2016	Discussion & Points of Clarification	Action Item
Comment #19 (Botanical/Vegetation Inventory)	The botanical/vegetation inventory occurred in the fall and was limited mostly to roadside observations.  It is the position of CH that additional botanical survey work be completed during the late spring/early summer growing period. CH requested that this be added as a commitment in the ESR.	The date that the botanical/vegetation inventory was conducted will be added to the NSR. Lisa Campbell will also add a recommendation for additional vegetation survey work in the NSR.  UEM will add a commitment to the commitment table in the ESR.
Comment #20 (Revise wording)	This comment simply involves a revision to the wording. Richard Baxter also recommended that this text be moved from the vegetation section of the NSR to the wildlife section.	Lisa Campbell will revise the wording and move the text accordingly.
Comment #21 (Consideration of snapping turtles)	CH can provide the Detailed Design Consultant with standard clauses to be added to tender documents with regard to mitigation measures if snapping turtles are encountered during construction.	UEM to make this point clear in the ESR commitments table (refer to Item 4E in Table 7-3 of the ESR).
Comment #22 (Typographical error)	Error with section numbering. The ' <i>Field Assessment</i> ' section should be numbered 2.4.2.	Section number will be updated by Lisa Campbell.
Comment #23 (Potential for candidate Significant Wildlife Habitat (SWH))	More details on the dates of amphibian surveys and field conditions must be added to the NSR.  There is a typographical error on page 10 (2005 should be changed to 2015).	Lisa Campbell will add the additional information and fix the typographical error.
Comment #24 (Tree Inventory)	It was agreed that this comment could be addressed during detailed design when the Tree Preservation Plan and Tree Replacement Plan are developed.	The Tree Preservation Plan requirement is already listed in the ESR commitments table (Item 1A).
Comment #25 (Breeding Bird Survey)	An Avian Specialist was on-site to conduct a detailed breeding bird survey on June 4, 2014. The avian specialist did not think that another detailed survey was warranted therefore a field verification to check	Lisa Campbell has added survey dates and other details to the NSR. Lisa provided additional information to



Comment from Conservation Halton Letter Dated April 12, 2016	Discussion & Points of Clarification	Action Item
	<p>for the 3 SAR identified was conducted by an LCA technician on June 13, 2014.</p> <p>CH asked to receive more details on the breeding bird investigation in order to determine if the survey completed by LCA is sufficient. If it is determined that another breeding bird survey is required, this work can be completed later in the season during detailed design according to Richard Baxter.</p>	<p>Richard Baxter via email on May 3, 2016.</p> <p>Richard Baxter will then determine if an additional comprehensive survey is required. If another survey is required, a commitment will be added to the ESR commitments table.</p>
Comment #26 (MNRF Consultation)	Comment noted. MNRF was provided with a copy of the Draft ESR and NSR. The Project Team did not receive any comments from MNRF.	The Project Team has already consulted MNRF, therefore no action required.
Comment #27 (Bird Species SRanks)	Lisa Campbell will add the SRanks to the table in Appendix B of the NSR.	Lisa Campbell will revise Appendix B of the NSR accordingly.
Comment #28 (Differentiate icons shown on Figure 3)	The icons for avian and amphibian survey stations in Figure 3 should be revised to make it easier to differentiate between the two.	Lisa Campbell will revise Figure 3 accordingly.
Comment #29 (Advice regarding Regionally Significant Woodlands and compensation requirements)	This comment was included as a recommendation for Halton Region's consideration only. Comment was noted by Halton Region staff.	Comment noted.

Z:\UEM\Projects\2014\500\14-508 Ninth Line Class EA\5. Consultation Activities\CH\Conference Calls (April 19 and 21, 2016)\Minute Enclosures\UEM Response Table to CH Letter dated April 12 2016 r2 04May16.docx



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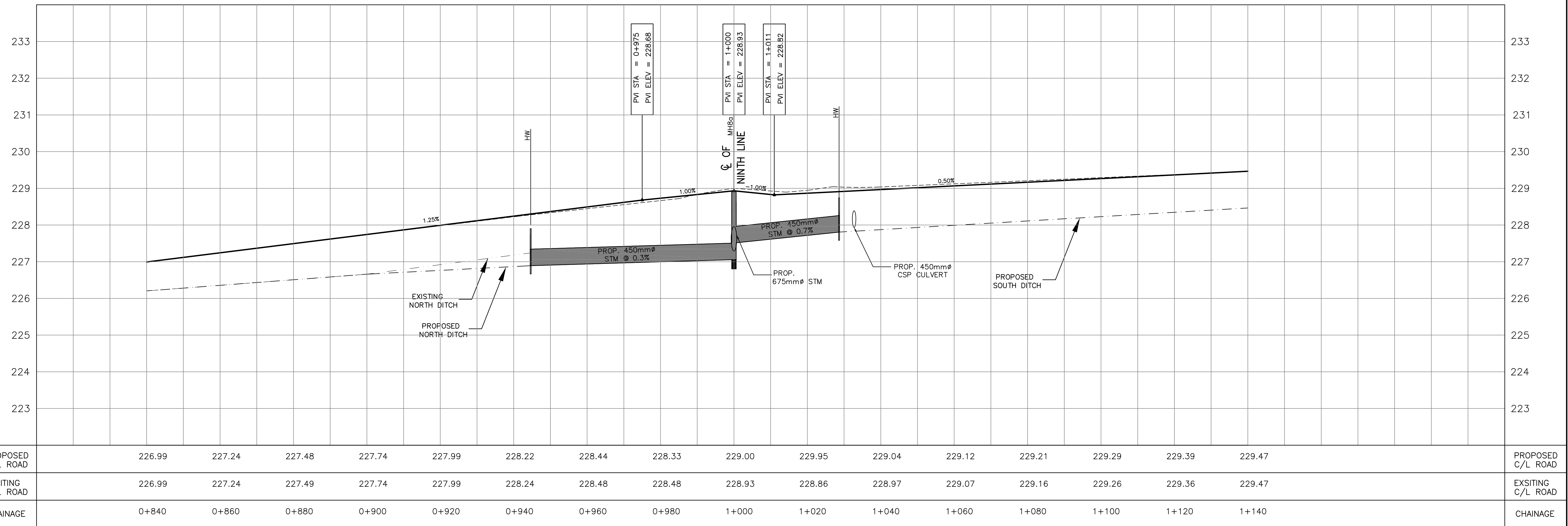
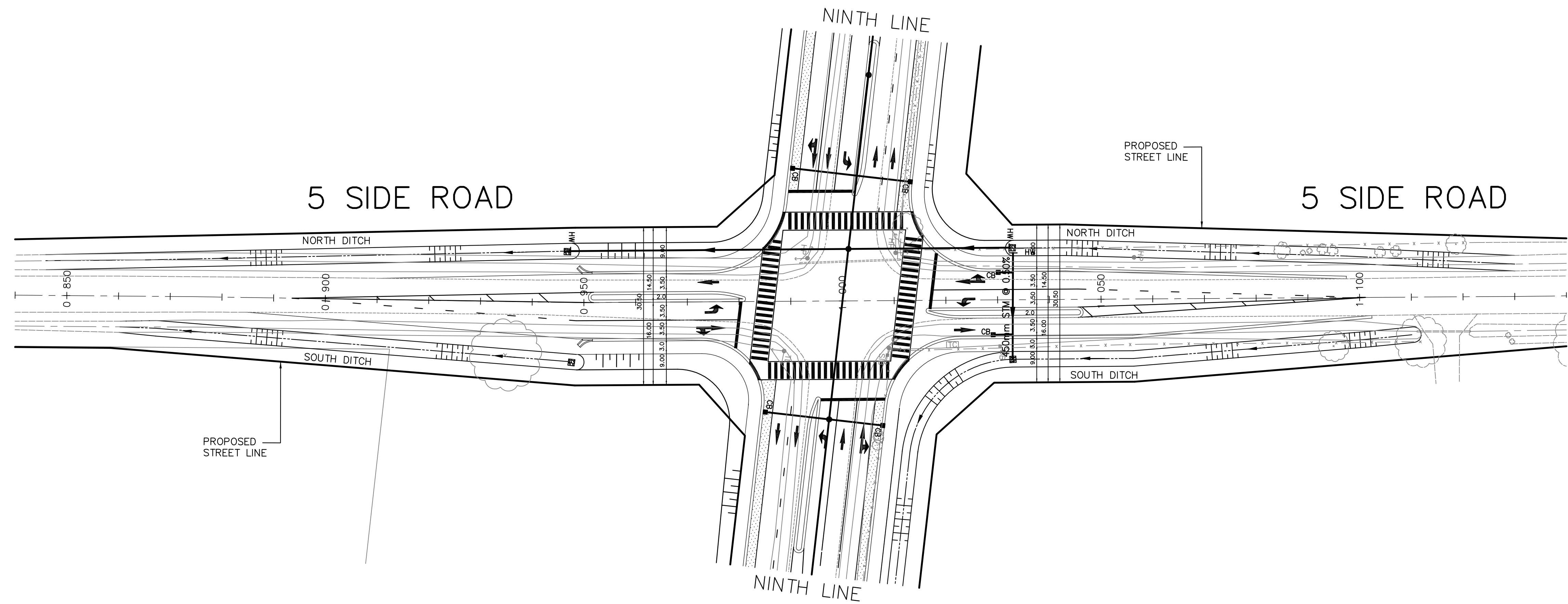
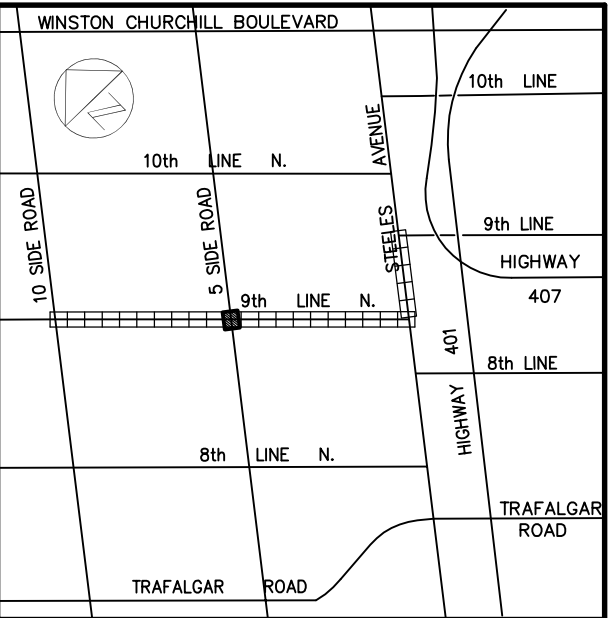
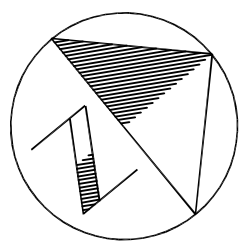
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DESIGNED BY Y.H.  
CHECKED BY Y.H.  
APPROVED BY A.A.  
SCALE  
Horiz. 1:500  
Vert. 1:50

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Client  
**Halton**  
REGION

Project  
**CLASS ENVIRONMENTAL ASSESSMENT STUDY**  
**NINTH LINE TRANSPORTATION CORRIDOR IMPROVEMENTS**  
**HIGHWAY 407 TO 10 SIDE ROAD**

Title  
**NINTH LINE**  
PLAN AND PROFILE  
3+000 TO STA. 3+300  
Date: April 2016  
Consultant's Project No. 14-508  
Regional File No. PR-2876  
Drawing No. SHEET 11 OF 22



Notes	DRAWN BY CADD		<div>Consultant</div> <div><div>UEM</div><div>URBAN &amp; ENVIRONMENTAL MANAGEMENT INC. PROFESSIONAL CONSULTING SERVICES</div><div>5100 Orbitor Drive, Suite 300, Mississauga, ON Canada L4W 4Z4</div><div>TEL : (905) 212-9722 FAX : (905) 212-9397</div></div>	<div>Client</div> <div><div>Halton</div><div>REGION</div></div>	<div>Project</div> <div>CLASS ENVIRONMENTAL ASSESSMENT STUDY</div> <div>NINTH LINE TRANSPORTATION CORRIDOR IMPROVEMENTS</div> <div>HIGHWAY 407 TO 10 SIDE ROAD</div>	Title 5 SIDE ROAD PLAN AND PROFILE STA. 0+840 TO STA. 1+140	
	Date: April 2016					Regional File No. PR-2876	
	Consultant's Project NQ 14-508					Drawing NQ SHEET 22 of 22	

## Amanda Selig

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**From:** Paul Bond <pbond@hrca.on.ca>  
**Sent:** Friday, April 29, 2016 10:45 AM  
**To:** Alvaro Almuina; Cory Harris; Jakaitis, Alicia (Alicia.Jakaitis@halton.ca); Monaghan, Patrick; Reid, Jeffrey  
**Cc:** Amanda Selig; Bruce Gall  
**Subject:** RE: PR2876 - Ninth Line Class EA - Culvert 2 - modified flow route

Hi Alvaro,

Cory has reviewed your revised design and I can confirm that we are comfortable with this approach. It's a reasonable compromise and will allow flows to continue to the west and not be diverted to a different catchment. We really appreciate your efforts in this respect.

**Alicia/Patrick** – I presume we will need some wording to add to the ESR to reference this re-design to bring it forward at the detail design stage? Please let me know how you would like to proceed.

Thanks,

Paul.

**Paul Bond**  
**Environmental Planner**  
**Conservation Halton**

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**From:** Alvaro Almuina [mailto:[aalmuina@uemconsulting.com](mailto:aalmuina@uemconsulting.com)]  
**Sent:** April-26-16 10:16 PM  
**To:** Paul Bond; Cory Harris; Sarah Matchett; Richard Baxter; Jakaitis, Alicia (Alicia.Jakaitis@halton.ca); Monaghan, Patrick; Reid, Jeffrey  
**Cc:** Amanda Selig; Bruce Gall; Lisa Campbell; Martin Molek  
**Subject:** PR2876 - Ninth Line Class EA - Culvert 2 - modified flow route

Hello,

Further to our discussions from last week, attached please find a revised design for "Culvert 2" at the intersection of Ninth Line and 5 Side Road. We kept Culvert 2 on the north side of the intersection and connected the storm sewer along Ninth Line at a "T" junction. The ditch at the storm outlet (on the northwest quadrant of the intersection) was lowered by 0.3m. The existing ditch is already deep and it's a short distance to regrade the ditch to match into existing elevations. We still need to insulate this culvert since the inlet and outlet sections of the pipe springlines will still be within the frost zone.

Our flow estimates resulted in a need to still kept a culvert on the east side of the intersection "Culvert 2a" as an overflow measure to minimize any downstream overflows along the north ditch.

Drawing P11.pdf shows the plan and profile along Ninth Line and drawing P22.pdf shows the plan and profile along 5 Side Road (please note the label “Proposed South Ditch” should read “Proposed **North** Ditch”).

Kindly provide any final comments by Friday, or sooner.

Kind regards,  
Alvaro

**Urban & Environmental Management Inc.**

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