

Appendix A
Correspondence

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**Ninth Line Scope Subwatershed Study – Phase 1: Background Report Study Area Characterization (January 2015)
Response Matrix – June 13, 2016**

Comment Letter	Team Response	Status / Action
Conservation Halton – Barb Veale – April 21, 2015		
<u>Section 2.1 – Baseline Inventory</u>		
<p>1. Section 2.1.2 Background Information Review</p> <p>The consultant has provided a brief overview of the policy context for the natural heritage system within the Region of Peel and the City of Mississauga. The natural heritage systems as defined in the municipal planning documents also include natural hazard features regulated by the conservation authorities. Since both Conservation Halton (CH) and the Credit Valley Conservation (CVC) define natural hazard areas and follow Board-approved policies in the administration of Ontario Regulations 162/06 (Conservation Halton) and 160/06 (CVC), <u>CH staff recommend the addition of a new section within 2.1.2 which describes the nature and extent of the conservation authority regulatory context.</u> To this end, we offer the following wording:</p> <p>Ontario Regulations 162/06 and 160/06</p> <p>The majority of the study area for the Scoped Subwatershed Plan lies within the Sixteen Mile Creek watershed; a small portion of the study area, south of Eglinton Avenue, lies within the Sawmill Creek drainage area which joins the Credit River. As such, the study area is within the jurisdiction of two conservation authorities, the Halton Region Conservation Authority (Conservation Halton (CH)) and the Credit Valley Conservation Authority (Credit Valley Conservation (CVC)).</p> <p>In 2006, the Province of Ontario approved revised Ontario Regulations for the administration of the Conservation Authorities Act for all conservation authorities in Ontario. Ontario Regulation 162/06 and Ontario 160/06, the <i>Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation</i>, are administered by Conservation Halton and Credit Varney Conservation respectively.</p> <p>The <i>Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation</i> pertains to areas that are river or stream valleys, wetlands and other areas where development could interfere with the hydrologic function of a wetland, adjacent or close to the shoreline of the Great Lakes or inland lakes (Lake Ontario), and hazardous land. These areas are regulated by each conservation authority in accordance with their approved Ontario Regulation. The regulated area represents the greatest extent of the combined natural hazards plus a prescribed allowance as set out in the respective regulation.</p> <p>The regulation gives CH and CVC the mandate to prohibit or regulate development in regulated areas as well as the authority to prohibit or regulate alterations which would result in the straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or changing or interfering in any way with a wetland.</p> <p>The administration of the regulation is guided by Board-approved policies including Conservation Halton's <i>Policies and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning (August 11, 2011)</i> and Credit Valley Conservation's <i>Planning and Regulations Policies (April 2010)</i>. These policies complement the <i>Ontario Provincial Policy Statement, Section 3.0 Protecting Public Health and Safety</i> and the Official Plan policies of the Region of Peel and City of Mississauga. If it can be demonstrated to the satisfaction of conservation authority that the proposed work meets Board-approved policies and will not affect the control of flooding, erosion, dynamic beaches pollution, or the conservation of land, permission may be granted for the proposed work.</p>	<p>The requested text will be incorporated into the final report as a new subsection, as requested.</p>	<p>Will be included in final SWS</p>

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<p>2. Table 2.1.1 Summary of Field Surveys by NRSI Biologists in 2014, page 3: Page 21 indicates that an additional reptile survey was undertaken on August 29, 2014 however this is not included in Table 2.1.1. <u>Please confirm if a field visit was completed on the August 29, 2014 and revise the document accordingly.</u></p>	<p>A reptile area search was conducted on August 29, 2014. Table 2.1.1 will be updated accordingly</p>	<p>Will be included in final SWS</p>
<p>3. Section 2.1.4.3 Flora, p 18: A small cluster of Kentucky coffee trees were found on the site and it is indicated that they were planted and not naturally occurring. We question if efforts were made to confirm if there are any requirements under the <i>Endangered Species Act</i> for these trees? <u>It is our understanding that the <i>Endangered Species Act</i> does not differentiate between planted and natural trees, however that it is up to the Ministry of Natural Resources and Forestry (MNRF) District Offices to determine how to handle these situations.</u> If discussions have not occurred, we recommend that the MNRF be contacted for further direction and confirmation be included in the report.</p>	<p>Noted, NRSI will discuss this with the MNRF directly.</p>	<p>Outcome to be confirmed as part of Phase 2</p>
<p>4. Section 2.1.5.1 Reptile Surveys, page 21: Visual encounters for reptiles were carried out; however it has been CH staff's experience that more active searches for snakes should be completed, such as 2 cover board surveys or even just lifting larger debris. Staff question the appropriateness of "scanning the area with binoculars" for snakes. It is staff's opinion that this kind of cursory investigation will not yield robust results. Please confirm if additional actions were undertaken to search for snakes. If not, and given that there is suitable habitat present, we suggest that further study be undertaken to ensure that this group is adequately assessed.</p>	<p>Reptile area searches involved flipping over debris (rocks, wood, etc.), searching the foundation of buildings where possible, and scanning areas where access was difficult. Snake boards were not used and are outside of the scope based on the scoped subwatershed study.</p>	<p>Response is acceptable (CH to confirm)</p>
<p>5. Section 2.1.10 Significance and Sensitivity, page 32: In addition to background studies used, we also request that the study team review the "City of Mississauga- Ninth Line Corridor Review Developable Land Assumptions" (2013) which identified developable lands within the study area. This should be done in conjunction with a review of the goals of Scoped Subwatershed Study as stated in the Terms of Reference. From our review, it appears that there is conflicting information between the Phase I Characterization Report and the 2013 Developable Land Assumptions report. For example, the Developable Land Assumptions report indicates that the City will be retaining all features identified in the North South Environmental Report, which notes that all wetlands within the study area are significant. However the AMEC Foster Wheeler report suggests that there may be wetlands that can be removed to allow for development. One SWS goal is to "maintain, protect and, where feasible, restore and enhance all significant vegetation and habitat (i.e., features exhibiting important attributes and functions)." This section appears to contradict this goal. Furthermore, Conservation Halton regulates a number of the wetlands within the study area as per Ontario Regulation 162/06 and the policies associated with this regulation will need to be acknowledged and adhered to. <u>A statement recommending compensation within the creek corridor for removal of wetlands on a case-by-case basis is premature and should not be included in the Background Study, but rather discussed as part of Phase 2 as part of the Management Strategy approach.</u></p>	<p>The Developable Land Assumptions Report was not final and was based on available information at the time. The subwatershed study, with support and agreement from Conservation Halton, would ultimately provide the direction for management of natural features in keeping with the overall goals.</p> <p>Noted to be removed.</p>	<p>"Compensation" statement to be struck from Phase 1 report in final SWS and Phase 2 work to confirm management strategy</p>
<p>6. Section 2.1.10.1 Significant Wetlands, page 32: It does not appear that a wetland evaluation was completed as part of this study. The Terms of Reference (TOR) for the Scoped Subwatershed Study, Appendix A Suggested Data Collection Requirements under the Natural Heritage System indicates that unevaluated wetlands <u>will be</u> evaluated using the 3rd Edition Provincial Wetland Evaluation System. This is consistent with</p>	<p>Based on the size of individual wetland pockets, the total size of all wetlands, and proximity to any existing evaluated wetlands the Team will assess the ability for OWES evaluation. MNRF has been contacted but a response is pending. The context of undertaking detailed evaluation should be further discussed with CH given the emerging land use approach and management strategy.</p>	<p>Approach to be confirmed through dialogue with CH and, as-needed, further liaison with MNRF</p>

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<p>Conservation Halton's January 25, 2011 letter to the City of Mississauga, where it was indicated that "wetlands should be assessed as per the current Ontario Wetland Evaluation System (OWES) and complexing should be considered given the location of the previously evaluated wetlands in close proximity." CH staff would appreciate the opportunity for further discussion on this item. At this time, we note that this item remains outstanding and that further fieldwork and assessment may be required, particularly because the status and size of the wetlands determines the width of the adjacent areas regulated by the conservation authority as defined by Ontario Regulations 162/06 and 160/06.</p>		
<p>7. Section 2.1.10.3 Significant Wildlife Habitat, Animal Movement Corridors, page 36: CH staff agree that there is no significant "Amphibian Breeding Habitat (Wetland)" present within the study area and therefore this form of Significant Wildlife Habitat (SWH) is not present. However, we highlight PPS Policy 2.1.2, which speaks to maintaining, restoring and where possible enhancing the diversity and connectivity of natural features in the area while recognizing linkages between and among natural heritage features and areas. <u>Discussion regarding this aspect has not been included in the report and we recommend that a specific section on the wildlife linkage opportunities be included in the Characterization Report and that these linkage opportunities be considered during in Phase 2.</u></p>	<p>Noted. This will be included as part of the NHS work in Phase 2.</p>	<p>To be included in Phase 2 work</p>
<p>8. Section 2.1.10.4 Habitat of Endangered and Threatened Species, page 36: See CH Comment #3.</p>	<p>Noted, NRSI will discuss this with the MNRF.</p>	<p>Outcome to be confirmed as part of Phase 2</p>
<p>9. Section 2.1.11 Natural Heritage System, page 37: <u>We recommend that discussion be included regarding the adjacent lands to the natural features (see PPS policies 2.1.4, 2.1.5, and 2.1.6), as per Policy 2.1.8 of the PPS. Current Provincial direction in the Natural Heritage Reference Manual notes that adjacent lands should be considered to be 120m for features, except for Earth Science ANSIs, which receive 50m.</u></p>	<p>Noted; we will include a statement in the text wrt to 'adjacent lands are within 120m as per PPS policy 2.1.8</p>	<p>Will be included in final SWS</p>
<p>10. Section 2.1.11.1 Buffers, page 38: It is unclear why a 10m buffer is being proposed for woodlands. Scientific literature and other Provincial Plans, such as the Greenbelt Plan and Niagara Escarpment Plan, are currently demonstrating that woodland buffers should be more in the magnitude of 30m. More locally, the Region of Halton NHS policies also suggest a 30m buffer from woodlands. We recognize that these lands are no longer within the Region of Halton, however no basis or justification for this 10m buffer is provided. It is stated that "10m is a standard buffer", however more often current plans are recommending greater protection for these features. <u>We request justification on why this buffer size is proposed and given the proposed adjacent land uses, why a larger buffer would not be more suitable.</u> It should be noted that this study area is not restricted by existing development; therefore a great buffer distance should be achievable. Wetland buffers are also discussed within this section. It is stated that a 15m buffer is recommended for the wetlands retained as part of the Scoped Subwatershed Study, but again, justification for this buffer is not provided. Specific policy should be referred to and it should be noted that if any of these wetlands are greater than 2 hectares in size or prove to be Provincially Significant, a greater setback may be required in accordance with conservation authority regulations and policy. <u>Furthermore, CH staff is not supportive of the removal of any of the wetlands identified as "significant" by the North South Environmental report as the City previously noted that these would be retained. We also note</u></p>	<p>The extent of the buffer will be examined in Phase 2 of the study and will consider the composition of lands adjacent to it.</p> <p>As recommended by CH for wetlands, recommendations for buffer widths will be removed from the Characterization Report and addressed in Phase 2.</p>	<p>"Buffer" statements to be struck from Phase 1 report in final SWS and Phase 2 work to confirm management strategy</p>

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<p>that a wetland evaluation as detailed in the Terms of Reference using the Ontario Wetland Evaluation System (OWES) was not completed, therefore we are unable to confirm the required regulation limits for the wetlands. Once discussions and further study have been completed, staff will be in a better position to confirm these limits (see CH Comments 1 & 6). <u>Any recommendations for buffers from wetlands or removal of wetlands is premature and should not be included in the Background Study, but rather discussed with agencies as part of Phase 2.</u></p> <p>The Background Study also addresses watercourse buffers and recommends a minimum watercourse width based on riparian vegetation. Again, this statement is premature. Recommendations for buffer widths should also consider whether a watercourse is within a confined or unconfined valley and what the greatest hazard is. For example, the regulatory setback defined in Ontario Regulation 162.06 is 15m from the greater of the flooding or erosion hazard. <u>For this reason, recommendations for watercourse buffer widths are premature and should be not be included in the Background Study, but rather discussed with agencies as part of Phase 2.</u></p> <p>Finally, the last paragraph notes that "consideration will be given to the conservation of natural heritage features within the NHS." Again, this does not seem to be in keeping with the previous City document regarding developable land nor the goals of the Scoped Subwatershed Study. No justification is given for removal of these features, therefore it is concerning to staff that only "consideration" would be given to keeping these features. <u>We respectfully submit that these statements which speak to possible management strategies should be discussed as part of Phase 2.</u></p>	<p>Recommendations for watercourse buffers will be removed and addressed in Phase 2</p> <p>Noted</p>	
<p>11. Section 2.1.11.2 Enhancement and Compensation, page 39:</p> <p>Please refer to the above-noted issues regarding the removal of natural heritage features. CH staff remain concerned that given the City's previous position that natural heritage features should be retained, <u>the discussion on compensation as a mitigation strategy is premature and should be addressed in Phase 2.</u> Compensation can only be achieved if suitable areas are identified and available which can successfully support a relocated natural feature. <u>As an implementation principle, compensation should be considered a last resort as successful replacement cannot be guaranteed.</u></p>	<p>Noted</p>	<p>Phase 2 work to confirm management strategy</p>
<p><i>Section 2.3 — Hydrology</i></p>		
<p>12. Section 2.3.4 Summary of Findings, page 48:</p> <p>CH staff recommended that the hydrologic summary <u>include a discussion characterizing all of the existing stormwater management facilities within the Ninth Line Corridor.</u> This discussion should: 1) reference appropriate design reports, 2) detail the contributing drainage areas being treated, 3) identify the intended level of quantity, quality and erosion control being provided, 4) highlight the main components of the control structures and 5) summarize the stage discharge storage relationships for each facility.</p> <p>As per the Terms of Reference, refinement of the existing conditions hydrologic model was intended to be part of the Characterization Report. While CH staff does not object to refinement analysis for the hydrologic model being broken out separately through the detailed work required in support of the transitway, <u>we require that the existing model be refined prior to the assessment and development of management strategies in Phase 2.</u></p>	<p>An inventory of the existing stormwater management facilities will be included in the final report as requested, based upon a desktop review of the available information.</p> <p>Further to staff dialogue on this matter, an updated standalone hydrologic modeling development summary has been provided. The focus of this summary is on the parameterization and clarification of the modeling, rather than the SWM facilities which will be incorporated into the final report. The content of this standalone document will be re-integrated into the final SWS but is provided at this stage to document the modeling background for ongoing modeling work.</p>	<p>Standalone model report to be reviewed for confirmation of acceptance by CH.</p>
<p>13. Table 2.3.1, Comparison of Simulated Regional Storm Peak Flows From Original SWMHYMO Model and Imported VisualOTTHYMO Model (nets), page 51: Please include contributing drainage areas as part of this table.</p>	<p>Contributing drainage areas can be added to this table for the final reporting. In the standalone report this is Table 1, however the clarification on modeling parameters and schematics should assist on this point.</p>	<p>To be included in final report</p>

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<p>14. Table 2.3.2 Subcatchment Parameterization for Ninth Line Lands- Existing Land Use Conditions, page 52:</p> <p>It would be helpful to <u>expand this table to summarize land use conditions and assumptions for all catchments draining through the Ninth Line Corridor</u>, consistent with the catchment characteristics modeled in the hydrologic model (recognizing the complexity of the modelling completed to represent lands east of Ninth Line draining into the Osprey Marsh Stormwater Management Facility, Conservation Halton would not object to the table including a summarized lumped catchment for this area).</p>	<p>Further to staff dialogue on this matter, this table revision is not required given the provision of the standalone modeling report inclusive of a drainage plan and corresponding model schematic. (ref. e-mail Mayes-Veale/Ahmad, September 23, 2015)</p>	<p>Resolved through staff dialogue and submission of standalone model report</p>
<p>15. Table 2.3.2 Subcatchment Parameterization for Ninth Line Lands- Existing Land Use Conditions, page 52:</p> <p>Please clarify the distinguishing factors associated with catchments 12B and 9A that resulted in selection of higher CN values as compared to the remainder of the corridor. CH Staff also note that given the predominately clay soils within the catchment, the use of the Airport Equation to determine Time of Concentration is unexpected. <u>Please provide comment and justification.</u></p>	<p>As noted in the Phase 1 Report, as well as the letter report submitted to Conservation Halton for the assessment of Park 459 (ref. Farrell/Bishop-Ahmad, July 30, 2014), the curve numbers have been established using Chart 1.09 of the MTO Drainage Management Manual (Ministry of Transportation, 1997). The Curve Numbers for catchments 12B and 9A are slightly higher than the other catchments due to the presence of wet surfaces/ponds in the areas, as well as portions of Highway 407 which are within these catchments.</p> <p>With respect to the time of concentration, the MTO Drainage Management Manual (1997) suggests that in watersheds with runoff coefficients smaller than 0.4, the Airport Equation provides a better estimate of time of concentration. Given the predominantly rural land use within the study area, estimation of time of concentration using Airport Equation is considered appropriate.</p>	<p>Through staff dialogue, the CN values have been agreed upon however CH is to consider the Team's response for the Airport equation (ref. e-mail Mayes-Veale/Ahmad, September 23, 2015)</p>
<p>16. Table 2.3.3 — Simulated Peak Flow Rates for Return Period and Regional Storm Event Under Existing Landuse Conditions for the Ninth Line Corridor, page 53:</p> <p>CH staff note that simulated flows at Derry Road are significantly lower than expected, and believe that these flows do not include drainage from west of the 407 that enters the Ninth Line corridor between the railway and Derry Road. <u>Please review and update the table as necessary.</u></p>	<p>As noted in previous correspondence with Conservation Halton (ref. e-mail correspondence Farrell-Mayes, April 15, 2015), the results for Derry Road correspond to Node 196 in the model, rather than Node 185 as reported. The standalone modeling report has clarified this point.</p>	<p>Resolved through staff dialogue and submission of standalone model report</p>
<p>17. Table 2.3.3 — Simulated Peak Flow Rates for Return Period and Regional Storm Event Under Existing Landuse Conditions for the Ninth Line Corridor, page 53:</p> <p>CH staff note that the 'new' existing Regional Storm conditions identified in Table 2.3.3 differ significantly from Table 2.3.1. <u>Please update the tables for consistency.</u></p>	<p>As noted in the report, the results in Table 2.3.1 compare the flows from the imported VO2 model with the results from the original SWMHYMO model developed for the December 2004 Scoped Subwatershed Study. The results in Table 2.3.3 present the flows from the updated VO2 model, which includes refinements to the subcatchment discretization and additional channel routing elements, based upon the LiDAR mapping provided for use in the study. Consequently, the results in Table 2.3.3 would necessarily differ from those presented in Table 2.3.1.</p>	<p>Agreement reached through staff dialogue (ref. e-mail Mayes-Veale/Ahmad, September 23, 2015)</p>
<p>Section 2.4 - Hydraulics</p>		
<p>18. Section 2.4.4, Summary of Findings, page 58:</p> <p>The decrease in flood elevation documented to occur between the Derry Road and Britannia Road crossing in Table 2.4.1, does not appear to be justified simply by changes to the hydrologic model, as the changes documented in Table 2.3.1 identify a maximum flow reduction of 2.4% at Britannia Road, decreasing to 0.6% upstream of the Osprey Marsh. As per the comments provided in this letter, CH staff does not believe existing flows at all road crossings (particularly the Derry Road crossing) have been accurately identified. <u>Please review the hydrologic model and update the hydraulic analysis as required.</u></p>	<p>The hydraulic modelling will be updated to incorporate the simulated peak flows at the appropriate locations. Please note that the floodline mapping presented in the Phase 1 report reflects the floodline mapping developed for the December 2004 Scoped Subwatershed Study, and has not yet been updated to incorporate the flows from the revised hydrologic analysis.</p>	<p>To be included in Phase 2 work</p>
<p>19. Section 2.4.2, page 55 and Section 2.4.4, page 58:</p>		

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<p>The hydraulic modelling refinement summarized as part of the Characterization Report relied on base topographic information as per the 2004 hydraulic model, <u>despite having access to City of Mississauga 2013 data. Please clarify whether any analysis was completed to ensure currency and accuracy of 2004 data.</u> As outlined in the Terms of Reference, the Characterization Report was to contain an update of available existing conditions and hydraulic modelling as required. <u>CH Staff have no objection to a separate detailed study of the hydrology and hydraulics of the transitway proceeding separately provided this information and the refined existing conditions models are incorporated into Phase 2 of the Scoped Subwatershed Study (i.e., the refined hydrology and hydraulics evaluation should be used to represent baseline conditions as part of the impact assessment (see CH comment #12)).</u></p>	<p>Refinements to the hydraulic model geometry is well underway in support of the planning for the transitway, as well as the final baseline characterization.</p> <p>Transitway level of detail will be incorporated into final reporting including the next stage.</p>	<p>To be included in Phase 2 work</p>
<p>20. Section 2.5.4 Field Program - Detailed Field Survey, page 66:</p> <p><u>Please provide text giving the rationale for selecting reaches NL-10 and NL-4 for detailed study.</u> CH staff has two specific questions in this regard. Should additional areas be considered for detailed study given that NL-10 is influenced so heavily by the upstream Osprey Marsh Pond? Will other sites be investigated in detail at a later date to support establishment of erosion threshold for potential development upstream of the Osprey Marsh Pond?</p>	<p>Reaches NL-10 and NL-4 were selected based on the results of the rapid assessments which indicated that both reaches were considered 'Transitional', whereas most of the other reaches in the study area were classified as 'In Regime'. Additionally, reach NL-10 serves as a good representation of the Ninth Line Lands, while NL-4 is representative of the area downstream of the Ninth Line Lands.</p> <p>Sites upstream of the Osprey Marsh pond were not selected due to poor channel definition, often the channel was obscured by heavy vegetation, or altered through a channel design. These conditions were not representative of the overall study area and were also not ideal for the completion of an erosion threshold assessment.</p> <p>During the impact assessment, if the need arises for additional sites to guide SWM, they would be completed. This includes areas upstream of the Osprey Marsh, or any other sites which are deemed to be necessary.</p>	<p>On the understanding that the SWM strategy may necessitate further analysis which the team could assess at that time, CH will accept this rationale (ref. e-mail Mayes-Veale/Ahmad, September 23, 2015)</p>
<p>21. Section 2.5.5. Summary of Findings, page 67:</p> <p>As indicated in the Terms of Reference, the Characterization Report was to: 1) evaluate headwater drainage functions and drainage density, 2) document sediment sources to the watercourse, 3) determine the size of existing stream bed substrate, 4) define the erosion threshold, and 5) partially confirm the erosion threshold through simple field observations. <u>These items do not appear to have been addressed within the Characterization Report. It is strongly recommended that the erosion threshold be documented and established as part of the Characterization Report and accepted by the Technical Advisory Committee prior to the study's advancement to Phase 2, implementation assessment.</u></p>	<p>Detailed field work required to determine erosion thresholds was completed in the Characterization effort. Threshold analyses have been completed and will be applied in the Phase 2 Impact Assessment.</p> <p>It is worth noting that as part of the geomorphic component of this study all reaches were walked within the study area, which included an evaluation of HDF features, an assessment of sediment sources and trends in channel form and evolution (as through the RGA and RSAT values).</p>	<p>A standalone Geomorphic report has been provided for clarification, further to staff dialogue (ref. e-mail Mayes-Veale/Ahmad, September 23, 2015)</p>
<p>22. Section 3.0, Integrated Summary, page 77 and 78:</p> <p>CH staff believes that the integration of the information across disciplines and the possible interconnections among the various bio-physical characteristics should be better identified within this report. While an "integrated" perspective is identified as necessary to subsequent phases of the study, the integration of the actual information collected for the Characterization Report has not been done well. For example, how do the water quality parameters relate to the natural heritage findings on habitat? What are the known connections between the two components of the study? Do the findings make sense? Are there any findings that are not expected or difficult to explain? <u>Please confirm that an integrated assessment of the Phase 1 findings will be included in Phase 2 of the study.</u></p>	<p>A scoped integrated assessment of the characterization work will be provided for guidance and context as part of the Phase 2 report.</p>	<p>To be included in Phase 2 work</p>

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<p>Section 3.0, Integrated Summary, page 76 and 77:</p> <p>Specific Comments</p> <p>a. When considering the many integrated features and functions of a watercourse, <u>please ensure that both groundwater recharge and groundwater discharge functions are considered.</u></p> <p>b. <u>Please include a monthly water balance in the list of assessments</u> under subpoint 1, Wetland/Woodland Units.</p>	<p>The functional relationship of the groundwater system takes into account both recharge and discharge.</p> <p>The scoped subwatershed study work plan does not include a water balance for the wetland/woodland units.</p>	<p>Staff dialogue amongst the hydrogeologists has confirmed that no feature-based water balance will be undertaken however a Thornthwaite water balance will be undertaken in the Phase 2 work</p>
List of Drawings		
<p>23. Drawing WR1, Subcatchment Boundaries (as per Dillion 1996), no page number:</p> <p><u>Please refine Dwg. WR1. The reproduction quality is poor, and CH staff is unable to clearly identify subcatchment boundaries, catchment IDs, and drainage areas.</u></p>	<p>The hydrologic model development summary includes a clear subcatchment boundary map.</p>	<p>Resolved through submission of standalone model report</p>
<p>24. Drawing WR2, Subcatchment Boundaries (as per Dillon 2000 & Philips Engineering Ltd. 2004), no page number:</p> <p><u>Please add drainage areas to the catchment plan contained in Drawing WR2.</u></p>	<p>The hydrologic model development summary includes a clear subcatchment boundary map.</p>	<p>Resolved through submission of standalone model report</p>
<p>25. Drawing WR3, Subcatchment Boundaries for Ninth Line Lands and Node Location Plan, no page number:</p> <p><u>Please provide a copy of this figure as a full size, scaled engineering drawing, complete with labelled contours as part of the next submission.</u> Note — The figure should include:</p> <p>a. cross culvert locations, b. all catchments draining through the Ninth Line corridor, consistent with the hydrologic model and schematic (Note — a lumped catchment may be used for large external areas such as drainage to the Osprey Marsh SWM Facility), c. labelled stormwater management facilities within the corridor, and d. key nodes/hydrograph numbers.</p>	<p>The hydrologic model development summary includes a clear subcatchment boundary map.</p>	<p>Standalone model report responds to this. CH may comment on the need for any further clarification</p>
<p>26. Drawing WR4, Regional Flood Limits and HEC-RAS Cross Section Location Plan, no page number:</p> <p><u>CH staff requires this figure to be submitted as a full size, scaled engineering drawing, complete with labelled contours, and hydraulic cross sections complete with cross section ID and floodplain elevations.</u></p>	<p>An updated plan for the Regional Storm floodplain will be provided following the current/ongoing model refinements supporting the hydraulic analyses for the transitway.</p>	<p>To be included in Phase 2 work</p>
Appendix B		
<p>27. Appendix B, Hydrology/Hydraulics, Comparison of Regional Peak Flow Rates, Regional Event, no table number, no page number:</p> <p>The drainage areas included in this table are typically less than the drainage area identified through Conservation Halton's digital evaluation of the 2002 contour information. <u>Most notable is the</u></p>		

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<p><u>drainage difference at Derry Road</u> which, as per the Drawing WR1 would be 355 ha, but as per CH information is approximately 337 ha (assuming no drainage from areas east of Ninth Line south of the CPR track). In Appendix B, this area is identified as 143.5 ha. Other areas of lesser concern where further discussion/consideration might be appropriate include:</p> <ul style="list-style-type: none"> a. the CPR track north of Derry Road — as Conservation Halton's drainage area catchment to this point is 117 ha, including approximately 6 ha of land east of Ninth Line immediately north of the railway track, and b. The Britannia Road Crossing — as Conservation Halton's information identifies an upstream drainage area of 1,556 ha, as opposed to an upstream drainage area of 1,497 ha. <p>Appendix B: Given the upstream urbanization, higher unitary flow rates were anticipated under Regional Storm Conditions for lands upstream of the Osprey Marsh. Does the Regional Storm hydrology include storage and routing associated with stormwater management facilities? As per Section 2.3.4, page 53, routing from all stormwater management facilities was removed from the Regional Storm model.</p> <p>Appendix B: CH Staff require that a model schematic be provided to assist in the review of the hydrologic model as it relates to catchments tributary to the Ninth Line corridor (similar to comments above, a lumped catchment may be identified in the schematic for the flows contributing to the Osprey Marsh facility if desired). The catchment area Drawing WR3 should be consistent with the model schematic and hydrologic model. CH staff note that the current hydrologic model is not consistent with the catchment area Drawing WR3. The hydrologic model appears to include additional catchments draining into the Ninth Line Corridor outside of the Osprey Marsh Facility that are not represented and demonstrates differing catchment connectivity as compared to what is represented in Drawing WR3. <u>Therefore, CH staff will defer detailed comment on the hydrologic model until receipt of submission of the model schematic and updated catchment area plan.</u></p>	<p>As noted in our response to comment #16, as well as our previous correspondence with Conservation Halton (ref. e-mail correspondence Farrell-Mayes, April 15, 2015), the results for Derry Road correspond to Node 196 in the model, rather than Node 185 as reported. The standalone modeling report has clarified this point.</p> <p>Refinements to the current hydrologic model were localized to the Ninth Line Area, and did not include revisions to drainage areas which were established as part of the December 2004 Scoped Subwatershed Study as well as the 1996 Dillon study. Consequently, it would be anticipated that total contributing drainage areas would vary between the model and the measurements made by Conservation Halton, since the base mapping used to develop the respective catchments in the model differ from the mapping used by the Authority to measure contributing drainage area to locations.</p> <p>The hydrologic model development summary includes a clear subcatchment boundary map.</p>	<p>Standalone model report responds to this. CH may comment on the need for any further clarification</p>
<p>28. Appendix B, Hydraulic Modelling: <u>Additional cross sections are required upstream and downstream of bridge crossings in accordance with current hydraulic standards.</u> Of particular concern is the modelling of the 407 crossing given the transition of floodplain width does not appear to be appropriately captured within the model.</p>	<p>As noted previously, the cross-sections and geometry of the HEC-RAS model correspond to the currently approved HEC-RAS hydraulic model for the study area, which was approved by Conservation Halton for the December 2004 Ninth Line District Floodline Mapping. Nevertheless, additional sections will be added to the model as deemed appropriate, in order to improve upon the stability of the HEC-RAS model which will complement the effort currently underway for the Transitway.</p>	<p>To be included in Phase 2 work</p>
<p>29. Appendix B, Hydraulic Modelling: The hydraulic model is based on a known water surface at cross section 108, however the report provides no documentation to support this water surface elevation. <u>Please provide additional documentation, or extend the model further downstream, to ensure the model has stabilized prior to the railway spur line.</u></p>	<p>As noted in the Phase 1 report and the responses above, the HEC-RAS hydraulic model for the study area was developed for the December 2004 Ninth Line District Floodline Mapping and hence represents the currently approved hydraulic model for the study area. As noted in the December 2004 Scoped Subwatershed Study, the boundary condition for the Regional Storm water surface elevation at the downstream face of the CPR which was reported in the Sixteen Mile Creek Floodplain Mapping Study (ref. Proctor & Redfern, 1988) has been used to establish the boundary conditions for the Regional Storm event, and the boundary condition for the 100 year floodplain has been established using the HEC-RAS Normal Depth method (i.e. Slope-Area method for the HEC-2 methodology).</p>	<p>To be included in Phase 2 work</p>

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<p>30. Appendix B, Hydraulic Model: Levees should be incorporated into the following hydraulic cross sections to reflect active conveyance areas of the channel: 221, 231, 232, 235, 236, 237, 240, 250.</p>	<p>As noted in the above responses, the geometry data for the HEC-RAS model correspond to the hydraulic model currently approved by Conservation Halton. Nevertheless, requirements to incorporate levees into the cross-sections will be considered as part of the model refinements underway to support the Transitway.</p>	<p>To be included in Phase 2 work</p>
<p>31. Appendix B, Hydraulic Model: Additional documentation and discussion will be required to support selected main channel Manning's n values for select hydraulic cross sections including 206, 207, 222, 223, 228-233, 235, 244-249, 251-255, 257, 258.</p>	<p>The channel roughness coefficients within the HEC-RAS model (i.e. 0.045) have been retained from the currently approved model for the study area. Table 3-1 of the HEC-RAS Hydraulic Reference Manual (USACE CPD-69, January 2010) notes that this roughness coefficient is applicable to clean winding channels with some pools and shoals, and some weeds and stones, which is considered to characterize the watercourses through the study area.</p>	<p>To be included in Phase 2 work</p>
<p>Editorial and Formatting Comments</p>		
<p>Improvements to the readability of the document are recommended. The document is generally difficult to review, particularly because of the lack of consistency in labelling, page numbering and small font size in the appendices. This takes up precious review time and can be easily rectified. CH staff recommend that the report be carefully edited for the next version to ensure that <u>Figures, Maps, Drawings and Appendices are consistently numbered, legible and easy to find.</u> The following comments are offered for consideration:</p> <ul style="list-style-type: none"> The Characterization Report would benefit greatly if the introduction section was expanded to provide a better description of the study area along with the study area map, the land use map and the topography and drainage map as figures embedded in the section rather than hidden in the list of drawings at the back of the report. With no page numbers attached to these drawings and no reference to them in the text, the figures are very difficult to find and the reader has to flip through the report to find them. The divide between the two watersheds (Sixteen Mile Creek and Sawmill Creek) should be clearly demarcated on one of the maps (either the study area map or the topography and drainage map). It would also be helpful if an overview of the area and dimensions of the study area, its location within the City, the general land use of the area, and a general statement of the future plans for a provincial transitway were provided in the introduction. Currently, there are bits and pieces of information scattered throughout the text in different sections so it is difficult to get a clear understanding of the general nature and extent of the study area. Please check the numbers on the Tables (e.g., Table 2.1.713 on page 23 and 24, Table 2.1.1014 on page 31). Figure 2.53 on page 67 is impossible to decipher and should be more reproduced at a better resolution. The page numbering stops at page 82. While some of the Appendices are numbered, the numbering is not consistent and located in different parts of the page. All of the appendices should be paged consistently in order for the reader to find them. The pages should be numbered either consecutively, carrying on from page 82, or using the Appendix number as a prefix to the page number, for example A1, A2 and so on. There is no cover sheet for the drawings and no page numbers. It would be extremely helpful if page numbers were provided in the Table of Contents for <u>everything</u>. Many of the Drawings are indecipherable at the scale provided (e.g., Drawings WR1 — WR5 inclusive). 	<p>As noted above, the report submitted for review represents the draft Phase 1 report. The draft report will be reviewed and revised as appropriate to apply a consistent numbering and referencing system for tables, drawings, and figures, which will then form the initial chapters in the final report.</p> <p>The study area characterization is provided in the subsections for each technical discipline, as various features and characteristics are of interest to specific disciplines but of little relevance to others. Amec Foster Wheeler will take Conservation Halton's suggestions into consideration for the next version of the reporting.</p> <p>A consistent approach for numbering tables will be applied for the final reporting.</p> <p>The size of Figure 2.5.3 will be increased for the final reporting to be more legible.</p> <p>Consideration will be given to numbering the pages of the appendices. Please note that due to the different content and format of the material in each appendix, it may not be feasible to number the pages of all appendices.</p> <p>Full-scale drawings will be provided with the final report.</p>	<p>The City and Study Team will work together toward improved readability (ref e-mail Ahmad-Veale/Marzo, August 12, 2015)</p>

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<ul style="list-style-type: none"> The land use map is provided without context, it is missing the key reference points including Ninth Line, the 407, and a simple overlay of the watercourses (which is hidden in the open space greenbelt use). The font sizes used in some of the tables in the Appendices are too small for comfortable reading when the report is printed (which is the preferred method of CH for plan review). For example, the Comparison of Unitary Peak Flow Rates — Regional Event requires a magnifying glass to decipher! The computer printouts are also difficult to find and review. A glossary of acronyms at the beginning of the report would be extremely helpful. <p>All references should include author and year (see page 40 as an example of where references are incomplete (bullets 1, 2 (should include years that the water well records cover), and 10 (ecological reports are not referenced)).</p>	<p>Points of reference will be included in the final reporting.</p> <p>To the extent possible, the font size of the unitary peak flow comparisons will be increased for the final reporting.</p> <p>A list of acronyms will be included in the final report. Please note, however, that the acronyms used in the report are standard throughout the industry, and defined after first use where specific to the study area or referencing previous study.</p> <p>A standard referencing system will be applied for the final report.</p>	
Conservation Halton – Barb Veale – May 19, 2015		
Section 2.1 Natural Environment Existing Conditions		
<p>32. Section 2.1.3.2 Aquatic Habitat, page 7:</p> <p>The report states that no on-line SWM ponds were surveyed due to access and equipment restrictions? If possible, CH recommends that fish community sampling be carried out where access is available. We understand that the SWM ponds are managed by Hwy. 7 ETR. If so, it is requested that access be arranged to allow for fish community sampling.</p>	<p>The large online pond, south of Britannia Road was surveyed on June 3, 2014.</p>	<p>Work has been undertaken, as requested, and results to be included in final report</p>
<p>33. Section 2.1.3.2 Aquatic Habitat, page 7:</p> <p>This section should include a detailed description of the methodology used to collect aquatic habitat data. Field sheets associated with this data collection should be included as an appendix. Also, maps showing where the aquatic habitat sampling locations are should be included in the characterization report, with data collection sites clearly labelled.</p>	<p>Maps and field forms will be added to the report under Appendix A.</p> <p>The report text will be updated to include additional information on aquatic habitat survey methods</p>	<p>Will be included in final SWS</p>
<p>34. Section 2.1.33 Fish Community, page 14:</p> <p>A comprehensive description of the methodology used to collect the fish community results and a map showing locations of fish community sampling should be included. Please ensure site naming codes are consistent among all disciplines where site sampling locations overlap.</p>	<p>The report text will be updated to include additional information on fish community methods</p>	<p>Will be included in final SWS</p>
<p>35. Table 2.1.4, page 16 - Fish Species Observed within Ninth Line Lands Subject Lands:</p> <p>Please reconfigure this table so that it also shows at which monitoring locations fish were observed</p>	<p>Noted. Report to be updated</p>	<p>Will be included in final SWS</p>
<p>36. Section 2.1.11.1 Buffers, page 38:</p> <p>Please note that setbacks of 30 metres from the bankfull width of warm water sport fish communities and cool water fish communities are required by Conservation Halton.</p>	<p>Noted.</p>	<p>Acknowledged</p>
Section 2.2 Hydrogeology		
<p>37. Section 2.2.4, Page 42 —</p> <p>a. First paragraph — The following statement requires a reference "The increase in flow may be largely due to discharging of a former stream (now subsurface) originating under the Lisgar subdivision..."</p> <p>b. There is reference to the Lisgar Basement Study (AMEC 2013) throughout the report. Would it be possible for Conservation Halton to receive a copy of this report?</p>	<p>a. This interpretation is based on discussion in the Lisgar District Basement Water Infiltration Study.</p> <p>b. The report remains under solicitor privilege; it will be made available as soon as the City solicitor allows it to be released.</p>	<p>Will be included in final SWS</p>

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c. In the second last line of Bedrock Geology the drawing should be referenced as GW6 unless comment #1 is addressed.	c. Agreed	
38. Section 2.2.4, Page 43: Reference is made to AMEC 2011, AMEC 2014a, AMEC 2014b, however, these documents are not listed in Section 5 References.	References will be added.	Will be included in final SWS
39. Section 2.2.4, Page 44: The first line is missing a word that provides clarity ...up to 6 metres depth but... Also, the second sentence of the third full paragraph is missing a wordin the absence of extensive... And the second last line of the fourth full paragraph is missing a word ... appear to be some...	Agreed	Will be included in final SWS
40. Section 2.2.4, Page 44: Last paragraph — The report notes that additional field work is being considered. Please let Conservation Halton know if additional field work is being carried out and, if already complete, the results.	Field work has been completed and results can be shared in subsequent reports.	Will be included in Phase 2/3 reporting
41. Section 2.2.4, Page 45 — Preliminary Groundwater Budget Analysis: The water budget presented in this report needs to be detailed and easy to follow. It will be used by others for comparison purposes for other pre-construction and post-construction water budgets for property development. We offer the following comments: a. This section provides a Water Budget Analysis and not a Groundwater Budget Analysis, thus a title change is warranted. b. There are inconsistencies between the text and the spreadsheet in Appendix E. In the text potential infiltration is "I" but on the spreadsheet "I" is annual thermal index, AET is used in text and UAE on spreadsheet, etc. We suggest that using RO instead of URO is appropriate and the same for UAE, UI, US, and UR. The lands are already partially developed so calling these terms "undeveloped" is not accurate. There is a need for consistency in the assessment and write-up. c. "a" on the spreadsheet is not defined, nor is the formula provided in which it is used. It would help others using the Characterization Report to include a definition such as - a is an empirically determined exponent used for computing monthly potential evapotranspiration in the following equation $e=1.6(10T/l)^0$ d. Pearson Airport weather station was used for data. The P seems a little low for the area based on other local reports. Is there another station in the area which would have been more representative? e. The AET seems low at 45%. This study calculates 350.6 mm/yr while the North Oakville East study area used 500 mm/yr. For this reason, this calculation should be reviewed and re-evaluated.	Staff dialogue amongst the hydrogeologists has confirmed that a Thornthwaite water balance will be undertaken in the Phase 2 work Textual revisions suggested by Conservation Halton will be incorporated into the final reporting.	A revised Thornthwaite water balance will be undertaken in the Phase 2 work where the necessary text revisions will be incorporated
Section 2.5 Stream Morphology		
42. Section 2.2.3 Stream Morphology and Erosion, page 58: A number of relevant items listed under within the terms of reference have not been addressed in the scoped SWS. Some of these items include: Bullets a), c), d), e), 1), g), h), i), j), k), 1), m), n), o), p), q), r) and s). These items should be completed and included in the next version of the scoped SWS. Stream morphology monitoring downstream of the study area as required through the Terms	a) <i>Complete rapid field assessments while walking the entire subwatershed drainage network to the downstream confluence with the east branch, and documenting areas sensitive to erosion and any significant field conditions. Photographs of significant features will be required. A more detailed analysis of key sites will be required.</i> - Rapid field assessments were completed for the entire study	

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<p>of Reference does not appear to have been undertaken.</p>	<p>area and an additional four reaches downstream of the study area. This included documentation of key characteristics and features.</p> <p>c) <i>Analyze downstream trends in channel morphology and factors affecting stream stability, including any historic changes in flow regime</i> - An evaluation of overall stream stability was completed through the use of the RGA metric. Also, the spatial trends in channel form/evolution were also evaluated. The extensive degree of channel alteration complicated the interpretation of the findings. The linkage with the flow regime will occur through an integration exercise in Phase 2.</p> <p>d) <i>Evaluate drainage network (density) on a sub-catchment basis, including an evaluation of channel functions, such as supply, movement and storage of sediment.</i> - Channel functions were evaluated (supply, movement, and storage) as part of the assessment, not explicitly but implicitly as part of the RGA/RSATs</p> <p>e) <i>Document location and nature of sediment sources</i> - This was completed through the stream walks. The study area and the nature of the channels and on-line ponds resulted in no external sediment sources. Any sediment that is readily supplied and conveyed is produced from within the channel itself.</p> <p>g) <i>Complete sensitivity analysis of headwater channel systems</i> –Overall channel sensitivity of the HDF features was derived through the RGA/RSAT results.</p> <p>h) <i>Ensure linkages (relating channel form/stability measures to biological integrity measures) between fisheries, stream morphology, and other disciplines are maintained</i> - This will be addressed in Phase 2 and Phase 3 assessments.</p> <p>i) <i>Measurements of channel and bank characteristics and bankfull flow conditions should be carried out using standard protocols and known field indicators of the bankfull stage. Please include bankfull channel widths and depths.</i> – These dimensions were measured throughout the study area as part of the RGA/RSAT assessments and then were more rigorously documented in the detailed field assessments. A table has been compiled of the bankfull measurements from the RSAT assessment and will be included in the next submission.</p> <p>j) <i>Surficial channel bed materials should be sampled and analyzed using a modified pebble count method; where surficial materials are too fine for a pebble count, bulk samples should be collected and analyzed using standard sieve and hydrometer techniques.</i> – Substrates were visually assessment for all reaches through the RSAT approach. At the detailed sites, the OMAFRA textural assessment was completed to characterize the substrate.</p> <p>k) <i>Sub-pavement materials should be characterized using bulk samples and standard sieve and hydrometer techniques</i> - The sub-pavement was visually assessed at the detailed sites. There was not enough differentiation between the pavement and sub-pavement to warrant any further characterization.</p> <p>l) <i>An evaluation of the bank vegetation, rooting depths, materials, percentage of cover and in situ shear stress for both banks at each detailed site</i> – This was completed as part of the detailed assessments and is included in the detailed geomorphological field data summaries located in Appendix C</p>	<p>A standalone Geomorphic report has been provided for clarification, further to staff dialogue (ref. e-mail Mayes-Veale/Ahmad, September 23, 2015)</p>

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	<p>m) <i>A level survey encompassing the detailed site should then be conducted to provide an idea of the local energy gradient present in the reach – This has been completed and reported in the Phase 1: Background Report January 2015.</i></p> <p>n) <i>Installation of a monitoring site with permanent monument pins which can be revisited and re-measured for historical changes in the cross-sectional area of the channel. Each cross-section is monument for future use. – A monitoring station was established for reach NL-10 and reported in the Phase 1: Background Report January 2015</i></p> <p>o) <i>Detailed cross-section surveys using level surveys and monument pins should be used for measurement of cross-section change. The detail of the survey should be fine enough to track changes (erosion, aggradation) and the sections should be close enough to track form. This method is preferred over the erosion pin method due to the limitations of erosion pins and the potential disturbance caused by the installation of the pins.</i> This level of detail was completed at the detailed sites; however the detailed cross-sections were not monumented for the purposes of future measurements to track changes. Monitoring was initiated as discussed in the Phase 1: Background Report January 2015. Additional monitoring sites may be added, as well as additional site visits.</p> <p>p) <i>Complete hydraulic and geomorphic analyses and empirical relations from collected field data. This would include, but is not limited to bankfull discharge, tractive force, permissible velocity, stream power, sediment transport, and hydraulic geometry relations.</i> The hydraulic analysis has been completed for the two detailed sites and will be provided as part of the next submission.</p> <p>q) <i>The Project Consultant will define erosion thresholds for the channel bed and banks based on scientifically defensible models and identify flow constraints, which may avoid or reduce future bank and bed erosion problems. Consideration must be given to both the duration of exceedance and cumulative shear impacts.</i> Erosion thresholds have been completed for the two detailed sites and will be provided as part of the next submission</p> <p>r) <i>Assess the cumulative headwater functions through assessing sediment budgets, linkage with local hydrology and connection to larger scale, including input from supporting disciplines (e.g., TSS data from water quality; flows from hydrology; spot flow data from hydrogeology; habitat input from fisheries).</i> Some of this assessment will not be feasible, based on site conditions. Other parts will be completed in Phase 2 as part of an integration/impact assessment.</p> <p>s) <i>Confirm calculated sediment transport and erosion calculations through field observations during high and low flow events. Where feasible observations of sediment transport should be validated through flow measurement and grab samples.</i> This may not be feasible given the low energy environment of the channels as well as limited sediment movement/supply. This will be verified through future site visits to the monitoring station(s).</p>	
<p>43. Section 2.5.2 Stream Morphology, Geology and Physiography, page 59: It is the understanding of Conservation Halton staff (pers. comm. with Brenda Axon, May 2015) that there is a high groundwater table elevation in the Ninth Line Scoped SWS study area. It is noted that the boundary of the South Slope Physiographic Region is located within the downstream</p>	<p>Clarification will be provided on the physiographic region in the southern most portion of the study area. The southern area is the Trafalgar Moraine. High groundwater levels in the study area are common on both the Peel Plain and the moraine.</p>	<p>To be clarified in Phase 2 work</p>

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<p>portion of the study area. Please indicate the percentage of the study area covered by the South Slope Physiographic region, which is characterized by ground moraines and irregular knolls and hollows. Please indicate whether the presence of this physiographic region within the study area and the proximity of the study area to this physiographic region are the reasons for the presence of a high groundwater table within the study area.</p>		
<p>44. Table 2.5.1 Summary of Rapid Assessment Results Indicating Channel Stability on A Reach Basis, page 64: Please provide a description of how the numbers in each of the columns relate to the column headings. For example, what does the number 0.29 say about the level of "Degradation" in the channel? Is 0.29 an indication of a lot of degradation or not very much degradation? Similarly, how does the number 22 describe the "Ecological Health Ranking" of the watercourse? Does the number 22 indicate that the watercourse exhibits good ecological health or is number 22 an indication that the watercourse exhibits fair or poor ecological health? Please provide a comprehensive description of how all the numbers in this table describe the facets of the RGA Summary and RSAT Summary in this table.</p>	<p>Additional details will be provided in a summary table and with additional text.</p>	<p>To be clarified in Phase 2 work</p>
<p>45. 2.5.4 Field Program, page 66: It is noted that watercourse reach NL-4 has an overall lack of channel gradient and a lack of variability in the bed morphology, diversity of bed structure and substrates. Please indicate whether there are opportunities to improve the diversity of aquatic habitats and overall channel functioning through the land development process.</p>	<p>Not likely as this is outside of the study area and surrounding properties limit the area available for channel alteration. However, if the opportunity arose, the gradient could be increased through channel realignment aimed at straightening the channel. Apart from being located outside the study area, the surrounding properties limit the area available for channel work. The reach also had multiple crossings that created backwater effects limiting proper flow conveyance. The crossings could be removed or updated with proper sizing to eliminate or reduce the backwater effects and improve flow conveyance. The reach was also receiving sediment inputs from surrounding land use, particularly just upstream of the reach. Land use practices could be altered/adjusted or sediment control techniques could be implemented to reduce impacts on the channel.</p>	<p>Response is acceptable (CH to confirm)</p>
<p>46. Figure 2.5.3 Longitudinal Profile for a) NL-10 and b) NL-4, page 67: Please provide each of these graphs in a full page size and in colour. They are difficult to read.</p>	<p>The longitudinal profiles were provided in colour in the original Phase 1 January 2015 report. They will be provided as full page size as part of the next submission.</p>	<p>To be provided in Phase 2 work</p>
<p>Section 2.6 Water Quality</p>		
<p>47. Table 2.6.1 Summary of Surface Water Quality Monitoring Grab Sampling Events, page 69: Please include one additional wet weather sampling event to complete the requirements set out in the Scoped SWS Terms of Reference.</p>	<p>To be summarized in subsequent reporting</p>	<p>Will be included in final SWS</p>
<p>48. Section 2.6.3 Field Work, page 69: A coloured map of the locations of water temperature monitoring stations within the study area is requested. Please ensure numbering of temperature monitoring stations is consistent with monitoring station numbering for other disciplines where monitoring stations overlap.</p>	<p>Water temperature monitoring has been conducted at the water quality monitoring stations shown on Drawing WR5. This will be clarified in the text as part of the final reporting. As noted in the Phase 1 report, the water quality monitoring program has been conducted in accordance with the supplemental Approved Work Plan which was developed and submitted subsequent to study initiation (ref. Farrell/Scheckenberger-Ahmad, May 28, 2014).</p>	<p>Will be included in final SWS</p>
<p>49. Table 2.6.1 Summary of Surface Water Quality Monitoring Grab Sampling Events, page 69: Please include one additional wet weather sampling event to complete the requirements set out in the Scoped SWS Terms of Reference.</p>	<p>See response to Comment #47 above.</p>	<p>Will be included in final SWS</p>

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<p>50. Section 2.6.3 Field Work: A coloured map of the locations of water temperature monitoring stations within the study area is requested to be added. Please ensure numbering of temperature monitoring stations is consistent with monitoring station numbering for other disciplines where monitoring stations overlap.</p>	<p>See response to Comment #48 above.</p>	<p>Will be included in final SWS</p>
<p>51. Section 2.6.4 Summary of Findings, page 72: Please number the bullet points in this section to making referencing easier. A coloured map showing the locations of all water quality monitoring locations is requested. Monitoring locations should be appropriately numbered and tied back to the analysis of the results.</p> <p>a. Please remove the first bullet point. It is not possible to make a statement such as this with only 2 dry weather samples.</p> <p>b. Second bullet point - Please indicate the nature of the "isolated urban land uses downstream of the railway" to provide the reader with an indication of what is causing the increasing zinc and Lead concentrations in the watercourse. Please note that it is Conservation Halton staff's understanding that major dumping of fill has occurred downstream of the railway (pers. Comm. with Brenda Axon, May 2015).</p>	<p>The bullets will be changed to numbers in the final reporting, as requested.</p> <p>The water quality monitoring locations are provided in Drawing WR5.</p> <p>The discussion provided is based upon the results of the monitoring program; it is also noted further in the section that one year of monitoring is likely insufficient to obtain a complete characterization, hence it is respectfully suggested that the discussion is appropriate and should remain.</p> <p>The isolated urban land uses are primarily residential. The potential influence of fill placement on the water quality results, as noted by Conservation Halton will also be noted; it is requested that the Authority advise of any further supporting evidence or documentation to support this hypothesis, in order that it can be appropriately incorporated into the report.</p>	<p>Will be included in final SWS</p>
<p>52. Section 2.6.4 Summary of Findings, page 72: The last paragraph makes reference to Table 2.6.0. This table is not present in the document. Please include it and make sure that textual reference to the table is provided before the table appears in the document.</p>	<p>The reference to 2.6.0 will be changed to 2.6.6 for the final report.</p>	<p>Will be included in final SWS</p>
<p>53. Section 2.6.4 Summary of Findings, page 73 - Preference is that comparison with water quality results be made with federal and provincial water quality rather than with water quality results for highly urbanized cities such as Toronto and Hamilton. The study area for the Ninth Line Scoped Subwatershed Study is not highly urbanized; the existing land use could be described as generally rural in character. As such, comparison of results obtained in the study area should not be made with watercourses having highly urbanized surrounding and upstream catchment areas. It is requested that a table be added which exhibits a comparison of water quality results from the study area to federal and provincial water quality standards.</p>	<p>The literature values used for comparison come from research completed for the City of Hamilton and the City of Toronto, and not specifically monitoring programs. To elaborate, the studies included research into monitoring data for various land uses, including agricultural land uses, and the results of the research were used to conduct mass balance modelling to characterize the water quality impacts resulting from the conversion of agricultural lands to urban land uses. The approach is consistent with the approved work plan.</p>	<p>Response is acceptable (CH to confirm)</p>
<p>54. Section 2.6.4 Summary of Findings, page 73: Please indicate what an "EMC" is in the last paragraph.</p>	<p>EMC refers to event mean concentration. This will be clarified for the final report.</p>	<p>Will be included in final SWS</p>
<p>55. Section 2.6.4 Summary of Findings, page 74 (last sentence in the second paragraph (above the continuous Water Temperature Monitoring Section): It is agreed that additional water quality monitoring would be helpful in providing meaningful results, which could help inform good decision making and adaptive management with regard to urbanization. It is recommended that bar graphs or other appropriate graphs be provided in colour that show the results of each monitoring parameter overlaid with applicable and relevant federal and provincial water quality standards such as the PWQO.</p>	<p>Comparisons to PWQO will be made as applicable for the final report.</p>	<p>Will be included in final SWS</p>
<p>56. Section 2.6.4 Summary of Findings, Continuous Water Temperature Monitoring, page 74: Please ensure this sub-heading is given a number. Numbering of ALL subheadings makes it easier to refer to and to locate sections within the document. Please ensure this subheading and all other subheadings are included in the Table of Contents for ease of reference.</p>	<p>Consideration will be given toward applying a different numbering system for headings, as suggested.</p>	<p>The City and Study Team will work together toward improved readability (ref e-mail Ahmad-Veale/Marzo, August 12, 2015)</p>

■ Comment Addressed by Response
 ■ Approach to Address Comment is Accepted
 ■ Require Confirmation that Comment has been Addressed
 ■ Further Action / Discussion is Required to Address Comment

**Ninth Line Scope Subwatershed Study – Phase 1: Background Report Study Area Characterization (January 2015)
Response Matrix – June 13, 2016**

Comment Letter	Team Response	Status / Action
<p>57. Section 2.6.4 Summary of Findings, Continuous Water Temperature Monitoring, page 74: Please provide more information on the baseflows that are causing the 5 degree Celsius temperature difference in the watercourse between the railway and Britannia Road. Where is this baseflow coming from? Where are the substrates/surficial geological features located that are supplying this groundwater to the watercourse? Where is the land area that is recharging this surficial geological feature? Given that the groundwater inputs to the creek are causing a fairly stable thermal condition, it is requested that more detailed information about the hydrogeological conditions be provided that will help explain why the cool/cold water thermal regime has been observed in the watercourse. The results of the water temperature monitoring program should be linked back to the information provided in the hydrogeology section.</p>	<p>The current data indicates that streamflow temperatures are increasing between the railway and Britannia Road and that the overall cooler temperatures may be attributable to the cooler weather conditions. There are no current indications of any significant baseflow contributions within the main branch of the study area which is generally consistent with the surficial geology. Further integration of insight can be reflected on through the Phase 2 work.</p>	<p>The City and Study Team will work together toward improved integration (ref e-mail Ahmad-Veale/Marzo, August 12, 2015)</p>
<p>58. Section 2.6.4 Summary of Findings, Continuous Water Temperature Monitoring, page 74: Please analyze the water temperature data using the Cindy Chu thermal nomograms. The watercourse reaches should be given a thermal classification based on this the analysis of the data collected using this methodology: http://www.trca.on.ca/dotAsset/124131.pdf</p>	<p>The watercourse reaches will be classified, as per the approved work plan.</p>	<p>Will be included in final SWS</p>
<p>59. Section 2.6.4 Summary of Findings: Conservation Halton staff support the intention of collecting an additional year of data to help inform the characterization of the study area. It is recommended that additional data be collected with respect to fish community and water quality as well.</p>	<p>In keeping with previous discussions between the City and CH, unfortunately budget limitation will restrict the collection of additional data</p>	<p>Response is acceptable (CH to confirm)</p>
<p>60. Section 3.0, Integrated Summary, Page 77: Please ensure that the integrated summary includes the reported potential groundwater discharge area at AHP-005 and its relation to development on the Ninth Line lands.</p>	<p>Additional discussion will be provided as to significance of potential groundwater discharge.</p>	<p>The City and Study Team will work together toward improved integration (ref e-mail Ahmad-Veale/Marzo, August 12, 2015)</p>
<p>61. Section 4.1, Next Steps, Page 77: Please ensure that Phase 2 report includes an assessment of groundwater levels in relation to basement and utility trench depths and any mitigation expected.</p>	<p>A general discussion will be presented on groundwater levels related to basements and utility trenches. Site specific monitoring of groundwater levels is not within the scope of this study.</p>	<p>To be addressed in Phase 2 work, in accordance with scope</p>
<p>62. Appendix C Stream Morphology: Please present photos in colour and in a more legible and clear format. Characterization of the channel reaches in the study area using parameters such as hydrogeological conditions, fish habitat, fish communities, water temperatures and fluvial geomorphology has not been undertaken and should be completed as part of the characterization document.</p>	<p>The photo appendix was provided in colour in the original Phase 1 January 2015 report.</p>	<p>A standalone Geomorphic report has been provided for clarification, further to staff dialogue (ref. e-mail Mayes-Veale/Ahmad, September 23, 2015)</p>
Other Comments		
<p>63. Please include a copy of the terms of reference for the scoped Subwatershed Study within the Scoped SWS document.</p>	<p>Pertinent documentation will accompany the SWS, as requested</p>	<p>Will be included in final SWS</p>
<p>64. For the next submission, CH staff would appreciate receiving four colour hard copies and one digital copy of the Characterization Report and subsequent report, if possible. This would facilitate the review of these documents significantly.</p>	<p>Hard copies of the final and Phase 2 report will be provided.</p>	<p>Response is acceptable (CH to confirm)</p>
<p>65. Comments specific to the Terms of Reference:</p>		

**Ninth Line Scope Subwatershed Study – Phase 1: Background Report Study Area Characterization (January 2015)
Response Matrix – June 13, 2016**

	Comment Letter	Team Response	Status / Action
	<p>a. Section 2.2.4 Aquatic Environment:</p> <ol style="list-style-type: none"> 1. An assessment of the benthic community has not been undertaken. We request that this be completed for the re-submission of this report. 2. Designation of thermal regimes for stream reaches in the study area has not been completed. <p>b. Section 2.3 Stage 1 Report — Subwatershed Characterization:</p> <ol style="list-style-type: none"> 1. The factors presented in Table 1 have not been clearly laid out in the scoped SWS for the purpose of evaluating watercourses. Please ensure this is undertaken in accordance with this table. 	<p>Further to staff dialogue, there has been agreement that unfortunately the benthic assessment will not be undertaken (ref e-mail Howatt-Ahmad/Veale/Mason, January 1, 2016).</p> <p>Noted. Thermal regime will be determined using the Cindy Chu et al. (2009) methodology and the report will be updated to include this information.</p> <p>As noted in the Phase 1 Report, an integrated evaluation of the existing natural systems within the study area will be established to characterize the terrestrial and aquatic systems within the study area over the course of the study, and premised on the input provided by the City and agency stakeholders. While we note that most of the factors included in Table 1 of the Terms of Reference are reflected directly or indirectly among the considerations listed in Section 3.0 of the Phase 1 Report, the full suite of factors listed in Table 1 of the Terms of Reference will be considered in the watercourse evaluation.</p>	<p>Will be included in final SWS (comments a.2 & b.1)</p>
66.	<p>Report Figures:</p> <p>To make it easier for the reader to find the figures referred to in the report it is suggested that they be numbered consecutively rather than having a different numbering system for the sections.</p>	Agreed	<p>(Comments 66-69):</p>
67.	<p>Figure GW2:</p> <p>It would be helpful to set the context if the road network was added to the figure.</p>	The graphics will be updated for the final reporting.	<p>The City and Study Team will work together toward improved readability (ref e-mail Ahmad-Veale/Marzo, August 12, 2015)</p>
68.	<p>Page 40:</p> <p>Two sections are numbered 2.2.1. In Scope Overview section, the last line is missing a wordexisting hydrogeologic reports and a limited...</p>	Agreed	
69.	<p>Page 41:</p> <p>Section 2.2.2 should be 2.2.3.</p> <ol style="list-style-type: none"> a. Figure GW7 should be referenced in "Field Work". b. Why is Section 2.2.4 second paragraph in bold text? <p>Drawing GW3 is referenced in Physiography Topography and Drainage and it would be useful to the reader to have the Lisgar Pond labelled on this figure.</p>	<p>Section numbers will be corrected.</p> <ol style="list-style-type: none"> a. Agreed b. Should not be bold text. <p>Will clarify reference to the Lisgar Pond.</p>	

November 3rd, 2016

Ministry of Natural Resources and Forestry
50 Bloomington Rd.
Aurora, ON L4G 0L8
Attn: Paul Heeney, District Manager - Aurora District

Re: City of Mississauga's Ninth Line Lands Project

Dear Paul,

This letter confirms that Ministry of Natural Resources and Forestry (MNRF) has been consulted on the above-captioned project and acknowledges that their involvement is not required. On the basis of this fact, the City is proceeding with completion of the required technical studies to support the Shaping Ninth Line land use project.

Sincerely,



Muneef Ahmad, P.Eng.
Water Resources Engineer

- cc. Jackie Burkart, Ministry of Natural Resources and Forestry
Frank Marzo, Policy Planner/Ninth Line Lands Project Manager – City of Mississauga
Barb Veale, Manager of Planning and Regulation Service – Conservation Halton
Matt Howatt, Environmental Planner – Conservation Halton
Jeremy Blair, Acting Manager of Environmental Services – City of Mississauga
Helen Noehammer, Director of Transp.&Infrastructure Planning – City of Mississauga
Andrew Whittemore, Director of Policy Planning – City of Mississauga
Ron Scheckenberger, AMEC Foster Wheeler

MEETING MINUTES

Meeting Date: October 18, 2016
Location: Natural Resource Solutions Inc.
Chair: Nyssa Hardie
Recorder: Kathryn Broadbelt, Nyssa Hardie

Present: David Stephenson (NRSI, Senior Biologist/Certified Arborist)
 Nyssa Hardie (NRSI, Stream Corridor and Environmental Analyst)
 Kathryn Broadbelt (NRSI, Planning Intern)
 Megan Eplett (MNRF)
 Lesley Maitch (Conservation Halton)
 Matt Howatt (Conservation Halton)

Background Information

- Creating a Secondary Plan
- Currently dealing with a land use plan
- Want to address Conservation Halton (CH) concerns about evaluating wetland
- Assess the presence of the transit-way and its impact on wetlands
- Want to create a better Natural Heritage System (NHS)

History

- Ponding associated with the construction of Highway 407, most are stormwater management facilities
- Need to deal with floodplain through Floodplain Protection Landform (FPL)
- 24ha of wetland, mostly marsh
- West of Highway 407, an existing wetland (Drumquin Wetland Complex) was evaluated last year and the analyzation was completed

Objective

- Through NHS, create a wetland of higher quality, and 2x the current area

ITEM	DESCRIPTION	ACTION
1. Wetland PSW Evaluation	<ul style="list-style-type: none"> ▪ Recommended by MNRF that we leave the wetlands unevaluated, and process what is remaining with Drumquin 	NRSI to leave wetlands unevaluated and process what is remaining with Drumquin.

ITEM	DESCRIPTION	ACTION
2. How do we deal with buffers?	<ul style="list-style-type: none"> ▪ The footprint of the berm is to be determined ▪ MNRF does not support the development of a berm to reduce the floodplain 	CH to look at this question internally.
3. 30m Buffer from Development Block GIS Map	<ul style="list-style-type: none"> ▪ GIS how much proposed wetland is 30m from the development block ▪ Suggestion that locations of the Secondary Plan are within 30m to create wetland boundary ▪ Will not build a wetland within 30m of the NHS ▪ Wetland proposed, but received 30m critical function zone protection, this could determine how the NHS is developed ▪ Possible solution is to make sure that the wetland areas we are creating have a buffer 	NRSI to create a GIS map.
4. Transit-way GIS Map	<ul style="list-style-type: none"> ▪ CH would like a transit-way plan overlaid on the ELC map 	NRSI to create a GIS map.
5. Ash Tree Concerns	<ul style="list-style-type: none"> ▪ In certain areas, it is ash tree dominated, but they are rapidly decreasing, have either agency (MNRF or CH) determined how to deal with them? There are many dead ash and limited understory (eg. Buckthorn) ▪ Through previous experience, MNRF suggest that you can still use them, this is just a wetland that is changing and the trees still provide positive aspects to the watershed ▪ Concerns about machinery removal were expressed, removal by hand would be preferred if possible ▪ Falling trees should be left for habitat if deemed safe ▪ CH agreed that hazard type trees to be removed, but deep in forest leave natural ▪ MNRF says do not replicate ash swamp 	
6. Three Themes	<ul style="list-style-type: none"> ▪ 1. Wetlands that are associated with ponds we are obligated to maintain as they are required for the floodplain ▪ 2. Wetlands associated with channel <ul style="list-style-type: none"> ▪ Channel work required (relocation) ▪ Riparian wetlands ▪ 3. Offline Wetland <ul style="list-style-type: none"> ▪ Woody dominated system 	

7. Kentucky Coffee Trees	<ul style="list-style-type: none"> ▪ Lesley Maitch and Matt Howatt left call ▪ Seemed to be far outside their range, not naturally occurring ▪ Determined that the coffee trees were planted, so there is no ESA protection ▪ This means that no health assessment is required ▪ MNRF is supportive of planting native local species 	NRSI to plant new trees that are native to the area.
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Additional Questions

- Is all wetland within the Secondary Plan accounted for?
 - Yes, the vegetation work and ELC work are complete
- How are the new wetlands to be created? Will there be a diversity of types?
 - Details not currently available
 - Objective is diversity of types, meadow marsh predominately (Wheat Canary Grass mainly)
- What is planned for development?
 - Predominately medium to high density residential, bookended by business employment, ball diamonds in park
- Is the wetland in the hydro corridor being removed?
 - The top end is cut by the transit-way
 - The watercourse is being moved next to Highway 407

Next Meeting – none scheduled
Chair:



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Burlington, Ontario L7P 0G3
conservationhalton.ca

Protecting the Natural
Environment from
Lake to Escarpment

October 28, 2016

Muneef Ahmad P.Eng
Water Resources Engineer, Environmental Services Section
Transportation & Works Department, Transportation & Infrastructure Planning Division
City of Mississauga
300 City Centre Drive
Mississauga, ON L5B 3C1

BY MAIL AND BY EMAIL

Dear Mr. Ahmad,

**Re: Proposed Flood Protection Landform Concept
Ninth Line Lands Scoped Subwatershed Study
CH File: MPR 433**

Conservation Halton (CH) staff has now had an opportunity to review the Flood Protection Landform (FPL) concept and gather input from the Ministry of Natural Resources and Forestry (MNR), City of Mississauga, Region of Peel and the Scoped Subwatershed Study (SSWS) consultant team.

As a key agency in the development, administration and review of subwatershed studies, we are committed to addressing floodplain management in a collective manner that benefits all of the SSWS stakeholders to the greatest extent possible while upholding CH's regulatory responsibilities under Ontario Regulation 162/06 and our delegated responsibility for comments relating to provincial interests under Sections 3.1.1-3.1.7 inclusive of the Provincial Policy Statement (PPS).

Any floodplain alteration must be carried out in accordance with Conservation Halton's regulatory policies, the PPS, and the MNR's *Natural Hazard Technical Guidelines* (2002). We confirmed our general support of the Phase 1 Study Area Characterization Update in our letter of September 23, 2016 and understand that clear direction regarding a floodplain management strategy is required to ensure coordination with the forthcoming Phase 2 Impact Assessment and Management Strategy of the SSWS.

The following key comments summarize CH staff's perspective on the proposed FPL concept. As indicated below, we are in agreement with the concept however, more detail is required.

Key Comments

1. Nature and Purpose of the Flood Protection Landform Concept

A central issue in CH staff's consideration of the FPL concept is determining the purpose and nature of this floodplain management strategy. We understand that its purpose as a SSWS management alternative is to remove existing undevelopable lands from the floodplain for development and to facilitate Ministry of Transportation planning objectives for a Transitway

corridor to service GO/Metrolinx and regional/local transit. This floodplain alteration could also fulfill an SSWS objective of improving the hydrologic and ecologic health and functionality of the watercourse and valley system. The existing watercourse and valley system was largely constructed as part of the implementation of Highway 407 and has been manipulated and impacted by agricultural and industrial practices throughout the Study Area in the past.

Based on a review of the concept plans depicting the FPL alignment and cross sections, the concept is similar in nature to a traditional “cut and fill” alteration consisting of a passive, open watercourse system. These types of floodplain management strategies have been implemented in other municipalities on many occasions in our watershed at the subwatershed study level. The conceptual area of fill would encompass a width of approximately 100 metres at a 2 percent grade. From this perspective, it represents a wholesale alteration of the floodplain and landscape in which the surface elevation feathers down or is completely filled in behind the top of bank that is created. This raising of grades over a large area to contain the floodplain within a redesigned channel will minimize risk and demonstrate that the control of flooding, erosion, conservation of land and pollution would be achieved. As a central component of the SSWS management strategy, the detailed design of this floodplain alteration would be required to demonstrate that upstream and downstream effects are addressed and that the proposal provides a net benefit to the Sixteen Mile Creek system through the completion of a comprehensive and holistic evaluation in the SSWS. From this perspective, the FPL concept represents a floodplain alteration in the context of a comprehensive SSWS rather than an isolated dyke, berm or active control structure.

2. *Detailed Design Considerations*

The detailed design of the proposed floodplain alteration would be required to meet Policy 3.19 - Alteration to Watercourses and Floodplains of Conservation Halton's *Policies for the Administration of Ontario Regulation 162/06 – Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*. Slope stability/geotechnical requirements will be crucial in evaluating and establishing design requirements. In addition, the proposed floodplain alteration will need to be considered in conjunction with the overall stormwater management plan for the subject and surrounding areas. Without this level of detail, CH staff are not in position to confirm our support of the proposed floodplain alteration beyond a conceptual level. Therefore, further technical discussion is required with the consultant team, including a geotechnical consultant, to determine design requirements and discuss feasibility of the proposed alteration further.

It is our understanding that the floodplain would be contained within a newly created valley system and CH would regulate 15 metres from the stable top of bank. As per Policy 3.2 Lands Adjacent to Watercourses, Valleylands, Hazardous Lands, Wetlands and Shorelines, all new development is prohibited within 15 metres of the stable top of bank of the Sixteen Mile Creek system.

3. *Scoped Subwatershed Study and Transitway Environmental Assessment*

Given the level of detailed design that will be required to ensure the proposed floodplain alteration meets regulatory and technical requirements, we question how this work will be integrated within the scope of ongoing SSWS and forthcoming Transitway EA. Given the significant amount of engineering work that is required to support the proposal, CH staff recommend that this work should be incorporated as early in the SSWS and Secondary Plan process as possible to ensure land use requirements are met. We would be pleased to discuss the

timing and scope of detailed design further with the City of Mississauga and SSWS consultant team.

We trust the above is of assistance and look forward to working with the SSWS stakeholders further in the Impact Assessment and Management Strategy phase. If you have any questions, please contact the undersigned at extension 2311.

Yours truly,



Matt Howatt
Environmental Planner
MH/

CC (By Email): Ron Scheckenberger, Amec Foster Wheeler
 Aaron Farrell, Amec Foster Wheeler
 Frank Marzo, City of Mississauga
 Barbara Veale, Conservation Halton
 Jackie Burkart, Ministry of Natural Resources and Forestry



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Protecting the Natural
Environment from
Lake to Escarpment

September 23, 2016

Muneef Ahmad
Water Resources Engineer, Environmental Services Section
Transportation & Works Department, Transportation & Infrastructure Planning Division
City of Mississauga
300 City Centre Drive
Mississauga, ON L5B 3C1

BY MAIL AND BY EMAIL

Dear Mr. Ahmad,

**Re: Phase 1: Background Report Study Area Characterization Response Matrix and Standalone Hydrology and Stream Morphology Reports
Ninth Line Scoped Subwatershed Study
CH File: MPR 433**

Conservation Halton (CH) staff has now had the opportunity to complete their review of:

- *Ninth Line Scoped Subwatershed Study – Phase 1: Background Report Study Area Characterization (January 2015, Response Matrix – June 13, 2016, prepared by City of Mississauga and Amec Foster Wheeler, dated June 13, 2016.*
- *Ninth Line Lands Scoped Subwatershed Study – Hydrologic Model Development Summary Memo prepared by Amec Foster Wheeler, dated May 20, 2016.*
- *Ninth Line Stream Morphology Interim Report, prepared by Parish Aquatic Services, dated June 2016.*

Overview and General Comments

- We are appreciative of the response to our comments of April 21 and May 19, 2015 and are in general agreement with the proposed status/action items of the response matrix. Each item in the updated version of the response matrix attached to our email correspondence includes the pertinent CH staff member name, review date and a note to refer to this cover letter for additional comments, if applicable.
- We discussed the Floodplain Protection Landform concept with the Ministry of Natural Resources and Forestry and will provide additional comments to you regarding the concept shortly.

- In regard to Comment 6 (Section 2.1.10.1, Significant Wetlands), the outstanding wetland evaluation remains a 'red' comment as further discussion is required between Conservation Halton, City of Mississauga, the Consultant Team and Ministry of Natural Resources and Forestry. Our position remains that wetlands should be assessed as per the current Ontario Wetland Evaluation System and complexing should be considered given the location of previously evaluated wetlands in proximity to the Study Area. An evaluation is needed to inform the proposed management strategies of the Scoped Subwatershed Study particularly because the status and size of the wetlands determines the width of the adjacent areas regulated by Conservation Halton as defined by Ontario Regulation 162/06 – Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.
- The following comments regarding the response matrix and standalone hydrology and stream morphology reports are provided for your consideration as we advance the Scoped Subwatershed Study process. We would be pleased to discuss these comments with staff of the City and Consultant Team further.

Specific Comments

Response Matrix

42. **Section 2.2.3, Stream Morphology and Erosion, page 58:** We request that the following be undertaken in the next submission:
- a. Confirm that the entire subwatershed drainage network was walked to the downstream confluence with the East Branch, as specified in the Terms of Reference, to ensure that all pertinent areas of active erosion and/or deposition can be documented, basic channel dimensions can be measured and an understanding of the active channel processes affecting all reaches can be gained.
 - d. Confirm that the drainage network was evaluated, as specified in the Terms of Reference, in addition to the completion of an evaluation of channel functions.
 - i. Include a summary of field data regarding channel and bank characteristics in addition to the table of the bankfull measurements from the RSAT assessment that will be included in the next submission, if feasible.
 - j. Provide discussion as to why the modified pebble count/standard sieve and hydrometer sampling and analysis techniques, specified in the Terms of Reference, were substituted with the OMAFRA textural assessment as these methods of assessment differ.
 - n. Provide discussion as to why each cross-section was not monumented for future use, as specified in the Terms of Reference, and only reach NL-10 is being monitored.

- r. Provide discussion regarding the site conditions that limit the feasibility of completing a full assessment of cumulative headwater functions, as specified in the Terms of Reference.

51. Section 2.6.2, Summary of Findings, page 72:

- a. A note should be included that the findings are only based on two dry weather points.
- b. We will look into this question and respond with any relevant evidence or documentation for the final Scoped Subwatershed Study.

53. Section 2.6.2, Summary of Findings, page 73 – Consider including provincial or federal standard values (e.g. the Canadian Water Quality Guidelines for the Protection of Aquatic Life) in an additional table column as we believe these values are a more useful benchmark for comparison to the study results than values from City of Hamilton or City of Toronto research.

Hydrologic Model Development Summary Memo

1. **Comparison of Unitary Peak Flow Rates – Regional Event Table** – Include discussion regarding the increase of 52.8 hectares of drainage area between the 2004 and 2014 model in the next submission.
2. **Unit Flow Rate Table** – Include an explanation as to why drainage areas for the provided locations differ between the 2-100 year table and the Regional event table in the next submission. For example, “Outlet to Sixteen Mile Creek” shows 2551.4 ha (2004 model) and 2574.7 ha (2014 model) within the 2-100 year table and 2549.2 ha (2004 model) and 2576.3 ha (2014 model) within the Regional event table.
3. **Drawing No. 1, Visual OTTHYMO Subcatchment Boundary Plan Existing Conditions** – The 2004 model was considered the most up to date model at the start of the study, however, the works for the online Regional control stormwater management pond as well as the outlet revisions for the online Osprey Marsh pond should be included within the model as these two facilities may have an impact on the flows within the Lisgar channel and ultimately the south end of the Study Area.

Stream Morphology Interim Report

4. **Appendix A** – To aid in interpretation, a legend / definition for the abbreviations of bank materials should be provided.
5. As stated above in Comment 42. n), further discussion to clarify why a monitoring station or erosion pins were not provided at channel reach NL-4, similar to what was provided for at NL-10, should be included.

Thank you for providing CH staff with an opportunity to review and comment on the response matrix and standalone reports prior to completion of the next Scoped Subwatershed Study submission. We look forward to continuing to work with the City of Mississauga and the Consultant Team. Additional comments regarding the Floodplain Protection Landform will be provided shortly.

We trust the above is of assistance. If you have any questions, please contact the undersigned at extension 2311.

Yours truly,



Matt Howatt
Environmental Planner
MH/

cc (by email): Ron Scheckenberger, Amec Foster Wheeler
 Aaron Farrell, Amec Foster Wheeler
 Frank Marzo, City of Mississauga
 Barbara Veale, Conservation Halton