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Robert Thun, B.Sc., MCIP, RPP  
Senior Planner, Current Planning - West District  
Town of Oakville, Planning Services  
1225 Trafalgar Road  
Oakville ON L6H 0H3

Dear Mr. Thun,

**Subject: Bentall Kennedy (Canada) LP - Lazy Pat Farms  
3269 and 3271 Dundas Street West, Oakville  
Zoning By-law Amendment (Z.1333.01) and Draft Plan of Subdivision (24T-11001)  
EIR/FSS Comments**

We appreciate the comments on the above noted applications, in relation to the Environmental Implementation Report and Functional Servicing Study (EIR/FSS). These comments include the following:

- Town of Oakville, Development Engineering Department, September 16, 2011 (EIR/FSS);  
and
- Conservation Halton, September 6, 2011 (EIR/FSS).

MMM Group Limited (MMM) has had the opportunity to review these comments and we wish to offer the following responses to what we believe are the key issues. Further to the Conservation Halton (CH) email dated August 5, 2011 from Ms. Leah Smith, MMM has also undertaken additional investigations as requested by CH, which are presented herein. Attachment A provides a more detailed response to each of the comments in a tabular format, which is further supported by the appended technical memos:

- Technical Memorandum NH#1 – Reach 14W-14A Aquatic Habitat;
- Technical Memorandum HG#1 – Hydrogeological;
- Technical Memorandum – Corridor Width Delineation;
- Technical Memorandum – HEC-RAS Model River Reach Flood Flow Estimation;
- Technical Memorandum – Meander Belt Width Estimation;
- Technical Memorandum – Topographic Depression Volume Analysis; and
- Technical Memorandum – Stream Length and Drainage Density Requirements.

## Key Issues

The following summarizes what we believe are the key issues/comments and our response:

### 1. Pond (Reach 14W-14A) and Use as a Stormwater Management Facility

The comments suggest that the existing pond should be retained and the use of the pond as a SWM (Stormwater Management) pond is not supported. The proposed use of the pond as a SWM pond is strongly supported by science and policy, and represents the preferred land use planning solution for the redevelopment of the subject property. The draft MESP prepared by MMM in 2002, provided the basis and rationale for the use of the pond as a SWM pond, and informed the preparation of the North Oakville Creeks Subwatershed Study (NOCSS) and the North Oakville West Secondary Plan (NOWSP).

The ecological basis for the retention of the pond is principally fisheries based in terms of its perceived independent fish habitat function as well as its contribution to downstream habitat. The main items of contention in the CH comments include the thermal regime (water temperature), fish habitat and fish community of the pond. The remaining items including phytoplankton/zooplankton, sediment and organic material contribution, are generally deemed to merit some additional consideration in the assessment; however, not to the same level of detail as the thermal regime, fish species and habitat discussion. The supplemental data requested by CH as well as detailed assessment of the data and CH comments related to the pond are presented in the response table as well as Technical Memorandum NH#1.

The data collected in 2011 supports our opinion, as presented in the EIR, that the pond is functioning as warmwater habitat. Furthermore, this constructed feature appears to be sustained principally by surface water contributions rather than groundwater inputs that would assist in moderating temperatures. Given that the pond is sustained principally by surface water, its connection to downstream habitat is intermittent and limited to periods when surface water levels are elevated and thus the contributions are not consistent and largely cut off during low flow periods. Furthermore, when flow is conveyed to Reach 14W-14 it is as diffuse flow through dense cattail growth. This dense cattail growth would likely limit the transport of sediment, organic material (twigs, leaves, etc.) as well as potentially fish passage during certain times of the year.

The function of the pond as warmwater habitat in isolation is not necessarily an adverse condition. Yet when combined with the nature of Reach 14W-12 that is considered coolwater habitat, the contribution of the pond must be re-examined. Reach 14W-12 is an intermittent channel that has been classified as coolwater habitat based largely upon its ability to support Redside Dace, a Provincially Threatened Species. Given the intermittent nature of the receiving watercourse, with the fish community on the Lazy Pat lands sustained in refuge pool habitat during the summer period, the thermal effects of the pond periodically discharging warmwater into this reach is contrary to the management of Reach 14W-12 as coolwater habitat and more significantly Redside Dace habitat.

This opinion is supported by the Department of Fisheries and Oceans Canada (DFO's) Working Around Water? Factsheet Series (Ontario Edition). As stated in the EIR, the Fact Sheet states that

bypass ponds "... are also prone to dissolved oxygen and water quality problems, increases in water temperature, and sediment accumulation problems. Proposals for bypass ponds on coldwater streams are generally not approved due to the potential that downstream water temperatures may increase beyond levels that coldwater fish need to survive". The removal of pond habitat (i.e. by-pass, on-line) specifically those contributing to cool/coldwater habitats, is anticipated to improve water quality (i.e. water temperature) related to fish habitat. This would continue to suggest that the removal of this feature should be considered a benefit to fish and fish habitat rather than a detriment to the natural heritage system. We continue to inquire what specific features CH considers worthy of retention considering the apparent detrimental effects to downstream water temperature.

As a SWM pond, the facility would be ideally situated in a centralized location providing the greatest amount of treatment and control for the adjacent habitat, and its conversion provides the opportunity to address the negative impacts of the current pond. A SWM pond would also be subject to similar conditions that the pond is subjected to including warming during the summer. However, the ability to design the SWM pond with measures including bottom draw outlets, planting plans and outlet features would assist in mitigating these effects.

Hydrogeological data collected at monitors constructed at the pond and on the lands adjacent to the pond following the submission of the EIR/FSS report also reaffirms our conclusion that the pond is not being supported by groundwater inputs. As the measured water levels of the pond have always been at higher elevations than the groundwater elevations recorded at the monitors surrounding the pond, the pond is losing water into the ground rather than receiving groundwater inputs.

An onsite meeting was held on October 20, 2011 and attended by DFO, the Ministry of Natural Resources (MNR) and Conservation Halton (CH) to discuss the aquatic habitat on site. Specifically the development process as it relates to the review of the project under the *Fisheries Act* and *Endangered Species Act*. Minutes of the meeting were prepared and distributed to the attendees on November 7, 2011. During the meeting MMM identified the proposed development plan for the subject property including the incorporation of the pond (Reach 14W-14A) into a stormwater management facility. The MNR and DFO/CH were silent on their opinion of the pond feature in terms of its function as fish habitat and would comment once the supplemental data collected in 2011 had been reviewed, which is appended to this letter.

## **2. Consolidation/Relocation of Stream Corridors**

Overall, the proposed realignment will produce a slightly lower drainage density in subcatchment FM-1001. However, drainage densities for the subcatchment will remain above the target drainage density recommended in the NOCSS. A technical memorandum on stream length and drainage density requirements is attached discussing the drainage density calculations, overall hydraulic corridor modifications, related impacts and resulting overall improved aquatic habitat. These findings are consistent with other MMM Group proposals that have received approvals under the *Fisheries Act* and within other Conservation Authority jurisdictions.

During the same October 20, 2011 onsite meeting attended by DFO, MNR and CH, the proposed watercourse relocations were discussed as it relates to the review of the project under the *Fisheries*

Act and *Endangered Species Act*. This information is also summarized in the minutes of the meeting which were prepared and distributed to the attendees on November 7, 2011. Generally, the relocations were supported by MNR and DFO/CH (contingent on review of detail design submission) as the realigned reaches were viewed as improvements over the existing features. DFO indicated that given the habitat present in the watercourses to be relocated, and the preliminary assessment that adverse effects to fish habitat can be mitigated through design/construction that CH would take the lead for reviewing the projects under the *Fisheries Act* through their Level 2 agreement with DFO.

Of note was that the MNR indicated that following the relocation of Reach 14W-13 that would result in an extension of Redside Dace habitat, this reach would be subject to a wider setback (Red - High Constraint Stream Corridor setback) than that identified in NOCSS (Blue - Medium Constraint Stream Corridor setback). The MNR also mentioned that Reach 14W-16 was considered Redside Dace habitat and as such would require a wider setback (Red – High Constraint Stream Corridor setback) than currently identified in NOCSS.

CH has taken the position that the realignment does not meet the “drainage density” targets for this and as a result is not consistent with the NOCSS. In our professional opinion, the NOCSS recommended drainage densities have been maintained for the subwatershed, and are only slightly reduced from predevelopment conditions (as discussed in the technical memorandum). The proposed channel and habitat improvements are sufficient to mitigate the loss of channel length and is considered a net improvement to the overall aquatic habitat.

### **3. Reconfiguration of Avenue One and Avenue Two**

The proposed road alignments have been identified in order to minimize the number of watercourse crossings and the extent of the natural heritage area crossings in comparison to the conceptual road network identified in the NOWSP, particularly the Burnhamthorpe Road extension which has been shifted north to avoid crossing the existing High Constraint Stream Corridor.

The attached Figure - Factors Limiting Road Configuration, illustrates the proposed road configuration in relation to the conceptual road alignment identified in the NOWSP. The figure illustrates the existing and future constraints which impact the road configuration and alignment, including the existing natural heritage areas, High Constraint Stream Corridors, existing development and related facilities (i.e., GE Water Campus), and issues affecting the spacing of intersections, and fixed intersection locations.

The road network identified in the NOWSP does not provide a sufficient arterial road network to accommodate appropriate access to larger sized employment blocks. MMM has provided various comments to the Town in relation to the NOWSP road pattern. Based on past discussions with the Town it was recognized that the road network is conceptual and may be further refined, this is further supported by the policies of the NOWSP. The alignment of Avenue Two and additional stream crossing was proposed to provide sufficient access and support the larger employment block configuration. The alignment of Avenue Two, Avenue One, and Burnhamthorpe Road extension will be further reviewed in consultation with the Town and CH to minimize the number and extent of stream crossings while providing an efficient road pattern which supports the

development of the employment area, in addition to addressing landowner coordination issues related to the Avenue Two road location and alignment.

The alignment of Avenue One, was designed to minimize the length of required crossings and potential impacts to the Zenon Forest from that identified in the NOWSP, and minimize impacts to the existing GE Water Campus, while shifting the road north to provide sufficient access to the northern portion of the property and facilitate suitably sized employment blocks.

The road crossings will be prepared to minimize disruption to the streams, through appropriate construction practices. MNR also recommended during the on-site meeting (October 20, 2011) that the location of intersections also be reviewed to minimize encroachment into Redside Dace Habitat (Burnhamthorpe Road extension).

#### **4. Top of the Bank Assessment for Reach 14W-11A – SVH**

A slope stability analysis on reach 14W-11A was performed by Exp Services Inc. and examined two slope sections approximately 55m from each other. Each section was analysed under static and seismic conditions. The sections were found to possess sufficient safety factors against sliding and rotational failure to be considered stable under their own weight during static conditions. Under seismic conditions, safety factors were reduced to levels where a 1.25m offset from the physical top of bank was recommended to establish a stable top of slope. The offset distance to the stable top of slope is well within the offsets established to protect aquatic habitat under ESA regulations. Therefore, no adjustments to the development limits are recommended as a result of the slope stability analysis. A copy of the Exp Services Report is appended.

#### **5. Additional Geomorphic Field Surveys**

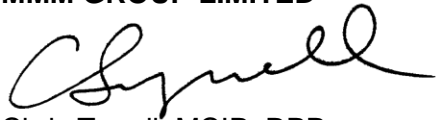
The project's subconsultant, Water's Edge, performed a field investigation of the indicated locations. The reaches in question could not be identified in the field and any connected hydraulic structures are buried, plugged or otherwise hydraulically inactive. Therefore, further geomorphic field surveys are premature until a channel alignment can be identified. We request a field investigation between CH staff and MMM/Water's Edge to identify the channel reaches in the field and to further scope the study requirements.

## Conclusion

We appreciate the opportunity to submit these comments and additional investigations and look forward to discussing these matters with you. Following your review, we wish to set-up a meeting to discuss these comments and our next steps moving forward, prior to preparing revised documents. Please contact me at 905.882.7303 to coordinate a meeting at your earliest convenience.

Yours very truly,

### MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Chris Tyrrell".

Chris Tyrrell, MCIP, RPP  
Manager, Planning & Environmental Design  
Partner

CC: Mike Reel, Bentall Kennedy (Canada) LP  
Rita Juliao, P. Eng., Town of Oakville, Development Engineering Department  
Leah Smith, Environmental Planner, Conservation Halton  
Doug Corbett, Region of Halton, Planning  
Stan Holiday, Region of Halton, Community Planning  
John Pisapio, Ontario Ministry of Natural Resources

### ATTACHMENT A - Response to Comments

The following table outlines each comment and provides our detailed response for your review and consideration, and is further supported by the appended technical memos.

Comment/Issue	MMM Response
<b>A1) Town of Oakville, Development Engineering Department, September 16, 2011 (EIR/FSS)</b>	
1. EIR/FSS should be completed for all of Subcatchment FM1001 with sufficient detail for FM1102 and FM1109.	The EIR/FSS has been prepared on this basis. Subcatchments FM 1102 and FM 1109 have been considered in the EIR/FSS along with FM 1001. Sufficient details consistent with the NOCSS requirements for subcatchments FM 1102 and FM 1001 are provided with respect to Stormwater Management. Only a small development area encroaches the existing subcatchment FM1109 in the southwest corner of the site, as such we have not provided a detailed analysis of subcatchment FM1109. Additional details for FM 1109 will be provided as planning details for this subcatchment become available.
2. Unit Flow Rates in relation to failed downstream channel.	Our stormwater management strategy has maintained allowable unit flow rates at each Dundas Street culvert per NOCSS recommendations. As the reason for the failure of the downstream channel has not been determined to date, and is not under the control of our client, reassessment of allowable flow rates at the project outlets is premature. In addition, regardless of the outcome of a study into the causes of the watercourse failure, our proposed strategy incorporates robust peak flow control, erosion control and fluvial geomorphological components (consistent with NOCSS recommendations) that maintain an effective flow regime at Dundas St. that is largely consistent with pre-development (i.e. undeveloped) conditions. Therefore, it is not anticipated that development on the subject property is likely to exacerbate the failure causes of the downstream channel.
3. Should consider future flows from west of Tremaine Road.	Our analysis is based on future conditions recommended by the <i>Tremaine and Dundas Secondary Plan Subwatershed Study, 2001</i> . The SWM Pond west of Tremaine Road shall be designed according to the erosion threshold values recommended by the above mentioned study. We will look into the interim conditions (no development west of Tremaine Road) in the revised report.
4. Erosion Control Analysis should support SWM strategy for Ponds 1 through 4. Request additional analysis.	During the site visit by Water's Edge, the tributaries W2 and W3 downstream of culvert FM-D2 and FM-D3 could not be identified. We will revisit these locations with the Town and CH to identify these reaches and update our Erosion Threshold Analysis to include them.



Comment/Issue	MMM Response
5. Erosion Threshold Analysis approach.	The Erosion Threshold analysis utilized is similar to the process used in several similar studies, and is recognized as an equivalent methodology to the one proposed in the NOCSS. It may be viewed as a more robust methodology as the long-term meteorological data for the nearest AES station does not necessarily contain storm events likely to demonstrate stream forces that exceed the erosion thresholds in a manner that facilitates predictive recommendations for the watercourses. The utilized methodology utilizes IDF curve information to definitively include sufficient stream power to arrive at recommendations for future anticipated storm flows. We recommend that the utilized methodology be reconsidered under the NOCSS requirements.
6. Require additional details to evaluate the location and size of SWM ponds.	Section 7 of EIR/FSS provides sufficient information on sizing SWM ponds considering water quality and quantity controls, and SWM pond block area, considering all design parameters recommended by MOE guidelines. We recommend that additional details of the SWM facilities be provided, once the location/sizing of the ponds has been generally agreed by the Town and CH, as this has a significant influence on the overall grading of the site. We suggest that such additional detail is premature, until the pond locations have been confirmed.
7. Request preliminary grading plan	Noted. A preliminary grading plan will be provided in accordance with the Town's Engineering Manual. However, we do need to have an agreement with the Town and CH with respect to SWM Pond location, road alignment and the natural heritage boundary. We suggest that such additional detail is premature, until the pond locations and road alignments have been confirmed.
8. Stormwater Drainage Plan should provide more details.	Noted. The stormwater management plan will be consistent with the grading plan and meet the requirements of the Town's Engineering Manual. However, we do need to have an agreement with the Town and Conservation Authority with respect to SWM Pond location, road alignment and the natural heritage boundary. We suggest that such additional detail is premature, until the pond locations and road alignments have been confirmed.
9. Label 14W-14A on Figure 2.1.	Noted.
10. Not supportive of replacement of 14W-14A with a SWM pond.	Although it is understood the NOCSS classifies this pond as a Medium Constraint stream, there is a concern/question related to its function as fish habitat as well as its contribution to downstream fish habitat. This is a human-made feature that has naturalized over time due to disuse as agricultural infrastructure rather than a conscious effort to create natural habitat. A detailed assessment of the pond as fish habitat is provided in <i>Technical Memorandum NH#1 – Reach 14W-14A Aquatic Habitat</i> under



Comment/Issue	MMM Response
	separate cover. This assessment addresses CH request for additional information principally associated with Reach 14W-14A indicating the ponds function as a warmwater feature discharging into coolwater habitat supporting Redside Dace habitat.
11. Update to provide a complete evaluation of stream 14W-14A (retain steam length).	Please refer to the attached Technical Memorandum – Stream Length and Drainage Density Requirements.
12. Provide more information on the condition of the existing pond.	A detailed assessment of the pond as fish habitat is provided in <i>Technical Memorandum NH#1 – Reach 14W-14A Aquatic Habitat</i> under separate cover. Generally the pond appears to be functioning as warmwater habitat with a poor connection to downstream habitat. This warmwater feature when hydraulically connected to Reach 14W-12 during the precipitation events contributes warmwater inputs into coolwater habitat supporting provincially regulated Redside Dace.
13. Stream reach 14W-14A and management recommendations to leave pond undisturbed.	<p>Noted. However, as mentioned in comment 10, this feature is an artificially created feature with a primarily agricultural focus rather than ecological. As a result, its construction and function do not entirely complement the function of the downstream fishery including Redside Dace habitat.</p> <p>It is expected that the existing vegetation conditions within the stream reach can be replicated or enhanced within the SWM pond block through landscape plantings comprised of locally sourced native species suited to site conditions and/or natural regeneration of wetland vegetation and succession of woody species. Report to be revised.</p>
14. SWM ponds (Appendix 7.2) and preliminary concerns.	See response 62 under Conservation Halton.
<b>A2) Conservation Halton, September 6, 2011 (EIR/FSS)</b>	
1. General – provide list and contacts of professional/technical staff.	A list identifying the technical staff involved in the preparation of the EIR/FSS will be provided.
2. Executive Summary	The Executive Summary will be updated to reflect the changes to the EIR/FSS from addressing the comments.
3. S.1.2 FSS study area to coincide with	Agreed.

Comment/Issue	MMM Response
Subject Property.	
4. S.2.1 High Constraint Corridor Areas	Bullet 2 – noted. Will revise text.
4. S.2.1 Medium Constraint Corridor Areas	<p>Bullet 2 – The consolidation of Medium Constraint (blue) Streams was mistakenly referenced as originating from NOCSS. This statement is made in the North Oakville West Secondary Plan (S. 8.4.7.1 e)):</p> <p><i>“These (Medium Constraint) watercourses may be deepened and/or relocated and consolidated with other watercourses provided that the watercourse feature, as well as the function of the watercourse, is maintained in accordance with the directions established in the North Oakville Creeks Subwatershed Study and Federal, Provincial and Conservation Authority regulations, and natural channel design is used.”</i></p> <p>The text will be revised to reference the NOWSP. We will revise the Report to address the other comments.</p>
5. S.2.2 Permitted Uses in the NHS.	<p>The farm pond in question (Reach 14W-14A) is a constructed feature that was created to service an agricultural purpose and has naturalized over time and its current state is due to lack of management as a farm pond rather than as active management as a fish/wildlife feature. Once again as we have requested in the past during our April 19, 2011 site meeting, please identify what specific functions of this feature you would like to have recreated in a relocated feature as it is our opinion that the some of the current functions of the pond including thermal impacts, are not beneficial to the downstream habitat.</p> <p>Consultation with the MNR is underway. MNR/CH/DFO met with MMM on-site on October 20, 2011. Comments related to the pond are deferred by CH/MNR/DFO until after submission of the responses to comments and further discussions between the agencies.</p>
6. S.3.2 Trail Planning must include layout and conceptual grading plans.	In the absence of the North Oakville West Trails Master Plan, we have not prepared more detailed layout and conceptual grading plans for the trails, at this time. We wish to discuss this matter further with the Town to better understand their proposed trail network for North Oakville West.
7. Figure 3.1 407 West Concept Plan – Reconfiguration of Avenue One and Two to minimize NHS crossings.	<p>The proposed road alignments have been identified in order to minimize the number of crossings and the extent of the natural heritage area crossings in comparison to the conceptual road network identified in the NOWSP, particularly the Burnhamthorpe Road extension which has been shifted north to avoid crossing the existing High Constraint Stream Corridor.</p> <p>The road network identified in the NOWSP does not provide a sufficient</p>

Comment/Issue	MMM Response
	<p>network to accommodate appropriate access to larger sized employment blocks, particularly to the north of the planning area. MMM has provided various comments to the Town in relation to the NOWSP road pattern. Based on past discussions with the Town it was recognized that the road network is conceptual and may be further refined, this is further supported by the policies of the NOWSP. The alignment of Avenue Two and additional stream crossing was proposed to provide sufficient access and support the larger employment block configuration. The alignment of Avenue Two, Avenue One and the Burnhamthorpe Road extension will be further reviewed in consultation with the Town and CH to minimize the number and extent of stream crossings while providing an efficient road pattern which supports the development of the employment area, in addition to addressing landowner coordination issues related to the Avenue Two road location and alignment.</p> <p>The alignment of Avenue One, was designed to minimize the length of required crossings from that identified in the NOWSP, and minimize impacts to the existing GE Facility, while shifting the road north to provide sufficient access to the northern portion of the property and facilitate suitably sized employment blocks.</p> <p>The road crossings will be prepared to minimize disruption to the streams, through appropriate spannings and bridge construction practices. MNR also recommended during the on-site meeting (October 20, 2011) that the location of intersections also be reviewed to minimize encroachment into Redside Dace Habitat (Burnhamthorpe Road extension).</p>
<p>8. S.4.4          (Hydrogeology and Geology) Impacts of proposed development.</p>	<p>Report should address impacts of re-aligning reaches 14W-14A (existing Pond) and 14W-16 (main channel after all upstream channels converge):</p> <p>The existing pond is not considered to provide ecological benefits to downstream reaches, and indeed may be detrimental to the downstream habitat. As explained in the accompanying <i>Technical Memorandum HG#1 - Hydrogeology</i>, from a hydrogeological perspective, the pond does not receive groundwater inputs and so replacing it with a SWM pond will not result in a loss of cool water inputs to the natural system.</p> <p>Regarding the Main Channel, please refer to Section 4.4.4.6/Figure 4.9 of the report where there is discussion about there being very little effect to changes in groundwater contributions to this reach, and following development there is potential for a positive effect during the summer months by addition of water via infiltration swales to be located at the edges of the valley features (bottom page 4-35 - top of page 4.36).</p> <p>Bedrock groundwater levels are also not expected to be affected by</p>

Comment/Issue	MMM Response
	<p>development so the small bedrock groundwater contributions to the watercourse are expected to continue following development.</p> <p>We will add a section discussing the potential hydrogeological impacts to the proposed re-aligned watercourses.</p>
<p>9. S. 4.4.2 Climate and Water Surplus</p>	<p>The climate station used in our study (Oakville Gerard) is located approximately 7 km southeast of the subject property, whereas the Hamilton Royal Botanical Garden (HRBG) station is located about 17 km southwest from the site, along the edge of Hamilton Harbour. Oakville Gerard is located closer to the site, and furthermore this weather station is also not located immediately adjacent to the lake (thereby experiencing less climatic lake effect potential). MMM considers data from this weather station to be more representative of climatic conditions at the bclMC site.</p>
<p>10. S.4.4.3 Inputs to Water Balance</p>	<p>We will re-examine the interpretation of the soil classification but do note that clay component of the soils was significant and so any upward revision of the soil factor will likely result in a factor closer to 0.1 rather than 0.2 as suggested. Additional discussion is presented in the accompanying <i>Technical Memorandum HG#1 - Hydrogeology</i>.</p>
<p>11. S.4.4.4 and Appendix 4.7 Water Balance</p>	<p>This question was posed to Environment Canada as this is where the data originated and the reason provided by Environment Canada for the discrepancy is as follows. The values provided in the tables used for the water balance analysis are based on averages over a 17-year period (1990-2006). If the soil moisture reaches 400 mm (forested areas in the example cited by HRCA) it cannot increase anymore. For some months during the 17-year period, the November soil moisture was already at 400 mm, but the overall average soil moisture is calculated at less than 400 mm. Therefore, some years the full value of RAIN + MELT - AE (also calculated as 17-year averages) could not be added since the soil was already saturated.</p>
<p>12. S.4.4.4.2 Post-Development Water Balances</p>	<p>1<sup>st</sup> and 2<sup>nd</sup> bullets: Best efforts for infiltration at each lot will be extremely limited and likely non-effective, except at lots bordering upon non-disturbed natural environment areas – those lots would have opportunity to direct a portion of “clean” roof runoff to infiltration swales cut into undisturbed native soils and use surficial fracturing/weathered zones to convey water into ground and towards watercourse (as already proposed in report). For interior lots infiltration potential will be extremely limited since lots constructed in areas with cut as unweathered silt/clay soils will be encountered at ground surface (i.e., the more permeable weathered zone will be removed), and in areas with fill, where heavily compacted silt/clay soils will be present at surface.</p> <p>Future landowners of these lots may wish to incorporate water features into</p>

Comment/Issue	MMM Response
	<p>their landscape plans (designed to promote infiltration) but we have been working on the premise that lot coverage will be 90% impervious, leaving very little “green” space for such initiatives, given the nature of the proposed land uses (large employment buildings with extensive surface parking areas).</p> <p>It has also been our experience with other projects that infiltration swales within the meander belt plus 30 m setback are considered by the MNR to be suitable mitigation measures applicable to Redside Dace habitat. Future consultation with the MNR will include this item.</p>
<p>13. S.4.4.4.6            Discussion of Potential for Base Flow Reductions to Watercourses</p>	<p>Mitigation of reductions in infiltration to the groundwater system will be limited to the periphery of the natural environment areas where native soils will remain undisturbed (e.g., the watercourses) and will maintain their pre-existing secondary permeability characteristics (with flow through fractures). The interior lands of the site will either be cut or filled (engineered fill) following site grading and these unweathered and heavily compacted clay-rich soils will be poor choices for constructing mitigation measures.</p> <p>While the water balance analysis indicated a 49% reduction in groundwater infiltration at the site, this is on an overall watershed basis reduced to an 18% reduction. As discussed in the EIR/FSS the streams are recognized as being predominantly runoff driven rather than maintained by groundwater base flow and the streams are “dry” roughly 4 to 5 months of the year (no base flow) during the summer months. The proposed mitigation measures (infiltration swales) are calculated to add water to the shallow system during these 4 to 5 months compared to the pre-development condition, and as also stated in the EIR/FSS, the limited groundwater contributions to the watercourses from the bedrock system are not anticipated to be affected by the developments.</p> <p>Additional discussion is provided in the accompanying <i>Technical Memorandum HG#1 - Hydrogeology</i>.</p>
<p>14. S.4.4.4.7            Dewatering Potential</p>	<p>Comment noted.</p>
<p>15. S.4.4 On-site Monitoring Locations</p>	<p>Data for MP-04 is found with other mini-piezometer data on Table SWL-2 – we note this mini-piezometer was destroyed over the winter of 2009-2010 and was not replaced.</p>
<p>16. S.5.0 Natural Heritage (general)</p>	<p>Bullet 1 – Noted            Bullet 2 – Noted, will consider the recommendation.</p>

Comment/Issue	MMM Response
17. S.5.1.3 Agency Consultation	Noted, will revise.
18. S. 5.2.1.5 Hydrologic Features A and B	We will update Figure 5.1 to reflect all these features.
19. S.5.2.3 HRCA Regulation 162/06 and Wetland Policy	Noted.
20. S. 5.3.3.1 Species at Risk	<p>An on-site meeting was held on October 20, 2011 with Fisheries and Oceans Canada (DFO), the Ministry of Natural Resources (MNR) and Conservation Halton (CH) in attendance. The purpose of the meeting was to discuss the watercourses on site as it relates to the review of the project under the <i>Fisheries Act</i> and <i>Endangered Species Act</i>. Minutes of the meeting were prepared and distributed to the attendees on November 7, 2011.</p> <p>During the meeting MMM identified the proposed development plan for the subject property including the realignment of Reaches 14W-16 and 14W-13 as well as incorporation of the pond (Reach 14W-14A) into a stormwater management facility. The proposed watercourse realignments were generally supported by MNR and DFO/CH (contingent on review of detail design submission) while comment on the conversion of the farm pond (Reach 14W-14A) by MNR/DFO/HC was withheld until such time that the additional requested information was submitted and reviewed.</p> <p>A detailed assessment of the pond as fish habitat is provided in <i>Technical Memorandum NH#1 – Reach 14W-14A Aquatic Habitat</i> under separate cover.</p>
21. S.5.3.3.3 Regionally Rare/ Uncommon Species	<p>The Halton Natural Areas Inventory (2006) was consulted. Based on the rankings provided therein applied to the plant list for the property: Five (5) species considered uncommon (HU) in Halton Region were observed – Coontail (<i>Ceratophyllum demersum</i>), Eastern Red Cedar (<i>Juniperus virginiana</i>), Fringed Sedge (<i>Carex crinita</i>), Torrey's Rush (<i>Juncus torreyi</i>), and Narrow-leaved Spring Beauty (<i>Claytonia virginica</i>). One (1) species considered rare (HR) in Halton Region was observed: Swamp White Oak (<i>Quercus bicolor</i>). One species with a rank of H? (more information needed) was observed: Common Evening-primrose (<i>Oenothera biennis</i>). Two species that were not listed in the inventory were observed: Northern Wild-raisin (<i>Viburnum cassinoides</i>) and Corn-marigold (<i>Chrysanthemum segetum</i>). The Halton Natural Areas Inventory ranks will be added to the revised EIR document and plant list. We will revise the report.</p>
22. S.5.3.4.4 Aquatic Habitat Reach 14W-11A, 14W-11, 14W-13, 14W-14	<p>The opportunity to walk these watercourses was available during the September 23, 2010, April 19, 2011 and August 4, 2011 site meetings attended by Leah Smith and Samantha Mason (September 23, 2010 and April 19, 2011 only). The most recent opportunity to observe the watercourses on site was during the October 20, 2011 site meeting attended</p>



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	by DFO, MNR and CH.
23. S.5.3.4.4 Aquatic Reach 14W-14	<p>During the October 20, 2011 site meeting the proposed watercourse realignments were generally supported by MNR and DFO/CH (contingent on review of detail design submission) while comment on the conversion of the farm pond (Reach 14W-14A) was withheld until such time that the additional requested information was submitted and reviewed.</p> <p>A detailed assessment of the pond as fish habitat is provided in <i>Technical Memorandum NH#1 – Reach 14W-14A Aquatic Habitat</i> under separate cover.</p>
24. S.5.3.4.4 Aquatic Reach 14W-14A	Monitoring has been undertaken with the detailed assessment of the pond as fish habitat is provided in <i>Technical Memorandum NH#1 – Reach 14W-14A Aquatic Habitat</i> under separate cover.
25. S.5.3.4.4 Aquatic Reach 14W-16	Similar to Reach 14W-14A, this is a constructed feature that may be subject to <i>Fisheries Act</i> but has marginal function as fish habitat, considering it is a stocked pond (Largemouth Bass) and functions similarly to 14W-14A. In the event that there is a need to remove this feature it is anticipated that the removal of this pond will require a review under the <i>Fisheries Act</i> and standard mitigation measures including a fish removal will be required if the pond is removed.
26. S.5.3.4.4 Aquatic Reach 14W-12	<p>Our assessment is consistent with the NOCSS Characterization Report that states “<i>On the second branch of Fourteen Mile Creek West, 14W-12 was the only reach observed to have a defined channel. This definition occurred immediately upstream of Dundas Street and evolved into a poorly defined swale at the upstream extent of the reach. Channel disturbances consisted of the Dundas Street crossing, concrete revetments and farm crossings. Surrounding land use was agricultural and livestock were noted as having access to the stream. The primary geomorphic processes influencing this reach were aggradation and widening. Fallen and leaning trees, exposed tree roots, poorly formed bars, siltation in pools and riffles and accretion on point bars were noted at the site.</i></p> <p><i>The remaining reaches (excluding 14W-1, 1a, 2, 3, 4, 6, 7, 9, 9a, 10 discussed in previous paragraphs) on Fourteen Mile Creek were poorly defined vegetated swales. The majority of these reaches showed signs of straightening and agricultural influences. In general, substrate consisted of silt and sand with some clay. Riparian vegetation consisted of scrubland and agriculture.</i>” (NOCSS Characterization Report p. 4W-105)</p> <p>We will revise the text to state that this is a constructed feature associated with the constructed pond and its trapezoidal valley does contain a narrow incised channel downstream of the cattail growth originating at the pond (Reach 14W-14A) inlet/outlet.</p>

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	<p>The comments regarding the concrete revetment are noted, and will be considered in the recommendation.</p>
<p>27. S.5.3.4.4            Aquatic Reach            14W-12A</p>	<p>We agree with the potential habitat as seasonal fish habitat as indicated by our habitat assessment of “...it appears to provide negligible direct fish habitat” (EIR p.5-32). We will revise the text to add the following “...it appears to provide <b>marginal</b> direct <b>seasonal</b> fish habitat”</p> <p>We continue to disagree with its classification as High-Constraint habitat associated with Reach 14W-12 as it is an artificially created feature constructed to combine flow from 14W-13 and 14W-14 as well as overflow from the pond (14W-14A) it is not directly affected by Reach 14W-16 that has contributed to the form and function of the remainder of Reach 14W-12.</p>
<p>28. S.5.3.5.1            Vegetation            Approach</p>	<p>The modified ELC approach completed for the study delineates and classifies communities smaller than 0.5 ha to fully document small natural features, and uses additional feature names not specified in the ELC to better describe cultural landscape features (e.g. ‘tree cluster’, ‘pasture’). It also acknowledges that it is often possible to classify and delineate communities to the most detailed level of the ELC classification system (Ecotype) without a full soils analysis. At the subject property, plant species composition and site characteristics facilitated clear distinction between the ‘dry-fresh’ and ‘fresh-moist’ forest ecotypes and the various wetland and cultural ecotypes, therefore it was only necessary to determine if wetland soils were mineral or organic to classify all communities present to Ecotype. Considering CH request for additional soils data, soils documentation within the ELC communities will be undertaken in the Spring of 2012.</p> <p>All species are not necessarily listed on the submitted ELC data sheets. Please refer to the plant list provided in the EIR for the complete list. That list identifies a total of 120 vascular plant species on the subject property and was developed through three season botanical inventory over a two year period and was conducted by qualified field botanists. This does not include 6 species identified during field visits in 2011 (after submission of the EIR) which will be included in the revised EIR plant list. The relatively low diversity reflects the high level of disturbance and ongoing agricultural activities on the site, and based on our experience is typical of similarly disturbed agricultural sites in Southern Ontario.</p>
<p>29. S.5.3.7            Hydrogeology</p>	<p>The pond (Feature 14W-14A) is losing water to the ground and is not maintained by groundwater inputs. Refer to our response 8 (S.4.4) in this letter and the accompanying <i>Technical Memorandum HG#1 - Hydrogeology</i>.</p> <p>Monitoring data collected to date from these new monitoring wells (July to</p>

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	<p>January 2012) indicates that the shallow groundwater levels at these monitors are at or below the approximate channel bed elevation of Reach 14W-16 at its closest approach to these monitors. These findings do not contradict anything previously reported in the EIR/FSS for as noted in Section 4.3.3. of the EIR/FSS report, the watercourses receive most of their groundwater contributions during the late fall to late spring through horizontal flow in the upper fractured zone of the till soils as well as limited contributions from the shale bedrock. We do not believe that constructing additional monitors in the vicinity of Reach 14W-16 will provide any additional interpretive information not already available from the boreholes and monitoring wells already in place across the site.</p>
<p>30. S.5.9.2 Fish Habitat Compensation Concepts, Removal of Reach 14W-14A (Pond)</p>	<p>Once again we would like to emphasize that this is an agricultural pond that has naturalized over time due to a lack of management as agricultural infrastructure rather than a conscious decision to manage it as fish and wildlife habitat. There appears to be an undue amount of emphasis placed on a constructed feature that is less than 55 years old and functions as a source for warmwater inputs into a coolwater system. Notwithstanding the NOCSS classification of this feature, it is our opinion that there is an undue amount of significance placed upon a farm pond that was constructed to facilitate agricultural operations and not enhance the natural heritage system. The detailed assessments of this feature are well beyond the typical data required for other similar studies in the GTA. We trust the supplemental information is sufficient to address HC comments related to the function of the pond and its significance. A detailed assessment of the pond as fish habitat is provided in <i>Technical Memorandum NH#1 – Reach 14W-14A Aquatic Habitat</i> under separate cover. Below is a brief summary of the data provided in the aforementioned memorandum:</p> <p><i>Self-sustaining Coolwater Fish Population</i> – The fish community present is a combination of warmwater and coolwater species with the coolwater species tolerant to temperatures associated with warmwater habitat. Considering the tolerance of the coolwater species present, the presence of warmwater species including largemouth bass and brown bullhead and the water temperature data, the pond appears to function as warmwater habitat and as a result the community more appropriately referred to as warmwater.</p> <p><i>Self-sustaining Phytoplankton/Zooplankton Populations</i> – phytoplankton and zooplankton are likely present in this pond; however, considering the poor connectivity to downstream habitat as well as the relatively small size of the pond its contributions to downstream habitat are likely limited. Furthermore, considering the proposed construction of a SWM pond, the function will likely be replicated in a similar manner.</p> <p><i>Sediment Source</i> – Agreed that bedload (sediment) is an important resource; however, the pond does not function as a source of sediment. Rather it is a sink where sediment settles out of the water column as water is</p>

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	<p>stored in the pond.</p> <p><i>Organic Material Source</i> – Similar to the zooplankton/phytoplankton discussion, the poor connectivity to downstream habitat as well as its relatively small size limit its contributions. Furthermore, the proposed restoration of the valley lands will replicate the function in question.</p> <p><i>Function as a Headwater Wetland</i> – The main functions of interest that are provided by a headwater wetland as identified by HC include: fish community, water quality, water quantity, wildlife habitat and flood regulation. In the pond the fish community consists of a (presumed) stocked top predator (largemouth bass) with a potentially detrimental relationship with Redside Dace downstream, the water (warmwater) inputs during the summer period are likely detrimental to the downstream Redside Dace population, water quantity and flood regulation will be addressed through the SWM facilities and wildlife habitat is minimal considering the relatively small size.</p> <p><i>Littoral and Pelagic Habitat</i> – <i>It is questionable that this feature provides pelagic habitat and the mere nature of having an open water feature such as a pond would provide some type of littoral habitat. This would also mean that all other open water features on the landscape (i.e. SWM ponds, farm ponds, etc.) would also provide this habitat and would presumably be reviewed in a similar manner.</i></p> <p><i>Water Temperature Data</i> – Water temperature data indicates that the pond (with the exception of a small deep area) functions as warmwater habitat. Considering the manner in which the pond is connected to downstream habitat it only discharges water when the surface water elevation reaches a certain elevation. During the summer when water levels reach this point, the warmest water (from the surface) is discharged downstream to coolwater Redside Dace habitat.</p> <p>As we have requested in our March 1, 2011 response to CH January 20, 2011 comments and during the subsequent April 19, 2011 and October 20, 2011 site meetings, please identify what specific functions of this feature CH would like to have recreated in a relocated feature as it is our opinion that current function of the pond including thermal impacts, are not beneficial to the downstream habitat. The results of data collected to date related to the pond (14W-14A) are included in Technical Memorandum NH#1 – Reach 14W-14A Aquatic Habitat.</p>
<p>31. S.5.9.2 Fish Habitat Compensation Concepts (14W-11)</p>	<p>Nothing has been proposed in Reach 14W-11 as the channel is located within the Unit 5a, Dry-Fresh Oak-Hickory Deciduous Forest, FOD2-2, a provincially uncommon community (S3S4, Bakowsky 1996/NHIC 2010). As a result, encroachment into this feature to facilitate enhancement works</p>

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	<p>along the channel would likely necessitate impacts to this vegetation community (i.e. machinery/equipment, staff, etc). We will examine other, less intrusive, measures that could be proposed in this reach and update the report.</p>
<p>32. Table 5.10            Summary of            Potential Impacts to            Aquatic Resources</p>	<p>Bullet 1 – Noted. Report will be revised to reflect that Reach 14W-11 is “<i>High Constraint Requiring Rehabilitation</i>”.</p> <p>Bullet 2 – Recommendation noted.</p> <p>Bullet 3 – We will examine this relationship and provide the requested clarification. MNR consultation underway with MNR providing comments related to the road alignment during the October 20, 2011 site meeting.</p> <p>Residual Effects – Noted that an open bottom culvert preferred to a box culvert.</p>
<p>33. Table 5.12            Summary of the            Potential Impacts to            Wildlife</p>	<p>The EIR will be revised to recommend that “Living the Green Life – Oakville’s Guide to Environmental Stewardship” be distributed to property owners/tenants as part of the mitigation strategy for wildlife.</p>
<p>34. Figure 5.2 EIR            Vegetation            Communities</p>	<p>The FOD2-2 community and associated floodplain marsh will be retained in full and protected with setbacks as described in the EIR. A meeting with Town and CH staff will be arranged to discuss the area. The EIR will be revised to include a more detailed recommendation on how the feature will be accommodated within the proposed development plan.</p>
<p>35. S.5.9.5            Monitoring</p>	<p>A comprehensive natural heritage monitoring plan will be developed for the subject property in accordance with the NOCSS and will include pre, during and post-development monitoring of vegetation, amphibians, birds and benthic invertebrates at select locations. A monitoring study Terms of Reference including a figure identifying proposed monitoring locations will be developed and submitted to CH and the Town of Oakville, and the agreed upon monitoring plan will be appended to the revised EIR.</p> <p>We will provide a monitoring plan to assess the performance of SWM facilities and watershed according to NOCSS.</p>
<p>36. S.5.10            Conclusions and            Recommendations</p>	<p>Infiltration of stormwater to support baseflow seepage to the Redside Dace community is not possible without the use of porous soils. The suggested methods are effective at abstracting storm runoff volume from controlled discharges to the watercourses, but have a negative effect on baseflow maintenance by diverting volume to evapotranspiration. The suggested approaches are classified as “at-source” SWM controls which will be explored and implemented at subsequent design stages.</p>

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37. S. 6.3.1.1 Meander Belt Widths	Please refer to the attached Technical Memorandum – Meander Belt Width Estimation.
38. S.6.3.2 Regulatory Floodplain	<p>We will provide a digital copy of all hydraulic models.</p> <p>We have developed the hydraulic models for all red and blue streams within the study area. We have not provided existing floodplain mapping to the blue reach 14W-14 to be relocated. We will include the existing floodplain mapping to the blue stream 14W-14 to be relocated.</p> <p>As we have mentioned in Section 6.3.2 of the EIR/FSS Report, the regulatory floodplain for the rehabilitation reaches and diversion reaches will be delineated during the detailed design stage when we have more information. We also have mentioned that diversion channels and rehabilitation channels will be designed such that the floodplain is within the proposed corridor widths.</p> <p>We will produce the floodplain mapping in a scale of 1:1000.</p> <p>Road crossings also will be included during the detailed design stage when we have more information.</p>
39. S.6.3.3 Top of Bank	<p>A Top of bank analysis for reach 14W-12 has been carried out by Exp Consultants. A copy of the Report is attached. The analysis concludes that the long-term stable top of bank in general coincides with physical top of bank, except one area where 1.5 m setback from the top of bank is required. The top of bank and the 1.5m setback remain well within the development offsets for the meander belt on this high constraint stream</p> <p>Similarly, a 30 m setback from the limit of meander belt is provided for Reach 14W-11. This setback envelope includes the physical top of bank and the riparian woodlot. Therefore, a geotechnical analysis to establish stable top of bank location is not required as per CH comments.</p>
40. S.6.3.5 Setback and Buffer Requirements	Setback and buffer requirements are provided as per NOCSS recommendations and according to Figures 6.3.15a, 6.3.15b and 6.3.15c of NOCSS. Section 6.3 of the EIR/FSS report discusses each of setback and buffer requirements. A Technical Memorandum: Corridor Width Delineation is provided.
41. S.6.3.6 Hydrologic Feature A	Storage capacity of the Hydrological Feature 'A' located within Reach 14W-14 is 21 m <sup>3</sup> based on the detailed topographic surveying carried out by the MMM in 2011. This flood storage capacity will be provided within the realigned channel 14W-21 in the form of online wetlands. Please refer comment 1 in the main letter regarding the replacement of existing pond with



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	a SWM pond.
42. S.6.3.7 Corridor Widths	The corridor widths have been updated taking account of the CH comments. Updated table is attached.
43. Figure 6.3 Corridor Delineation	Corridor delineation on detailed topographic mapping is provided in Figure 6.3 in 1:5000 scale. For the high constraint streams or Redside Dace habitat streams, 30 m setback is provided from the meander belt. Attached Technical Memorandum: Corridor Width delineation provides details of corridor width delineation.
44. S.6.4.1 Conceptual Natural Channel Design – Design Criteria	. In the Section 6.4.1 Design Criteria, we have listed all applicable natural channel design criteria and one of them is “a step /pool system is required to provide fish passage for steeper channels.” We have designed diversion/rehabilitation channels with riffle/pool system as step/pool system is not applicable for the study area stream diversions/rehabilitations.
45. S.6.4.3 Proposed Channel Morphology	<p>The proposed channel diversion/rehabilitation design parameters are selected based on the guidelines provided in “Adaptive Management of Stream Corridors in Ontario”. Specifically, Section G1. Natural Channel Systems: An Approach to Management and Design and Section G2. Morphologic Relationships of Rural Watercourses in Southern Ontario and Selected Field Methods in Fluvial Geomorphology.</p> <p>The proposed channel hydraulic geometry, width, depth, slope, velocity and friction, has been designed based on fluvial-geomorphologic principles. These hydraulic geometric values are functionally related to equilibrium state of the channel and selected to achieve a stable condition in which it is capable of transporting a bankfull water and a certain amount of sediment.</p>
46. S.6.4.4 Road Crossings	<p>Avenue Two – Request it be located further west to avoid additional creek crossing in proximity to the Burnhamthorpe Road intersection, or require adequate justification. Refer to Comment No. 7.</p> <p>Avenue One – Noted. The alignment of Avenue One, was designed to minimize the length of required crossings (east of the subject property), and minimize impact on the existing GE Water Campus by shifting the road south in this location, from that identified in the NOWSP. On the subject property, the road was shifted north to provide sufficient access to the northern portion of the property and facilitate suitably sized employment blocks, while eliminating the need for additional and inefficient local roads.</p> <p>Although the Burnhamthorpe Road extension encroaches into the environmental setback including Redside Dace habitat, the proposed road alignments have been designed to minimize the number of crossings in comparison to the conceptual road network identified in the NOWSP. In</p>

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	<p>particular the Burnhamthorpe Road extension has been shifted north to avoid crossing the existing High Constraint Stream Corridor identified in NOCSS. The MNR is being consulted due to the encroachment into Redside Dace habitat.</p> <p>The alignment of Avenue Two, Avenue One, and Burnhamthorpe Road extension will be further reviewed in consultation with the Town and CH to minimize the number and extent of stream crossings while providing an efficient road pattern which supports the development of the employment area, in addition to addressing landowner coordination issues related to the Avenue Two road location and alignment.</p> <p>Once road crossings locations are finalized, we will carry out detailed hydraulic analysis. At this preliminary stage, preliminary culvert sizing will be provided.</p>
47. Figures 6.4A to 6.4D Alignment and Planform Drawings	The road alignments on these Figures will be updated accordingly to reflect any proposed changes and further discussions with the Town, CH, MNR and DFO.
48. Figure 6.4A Fourteen Mile Creek Natural Channel Design and Planform Key Plan	<p>The proposed meandering channel 14W-16 will carry more flows in post-development conditions due to Reaches 14W-14 and 14W-13 diversion. Therefore sedimentation is not an issue due to flattening of slope. Moreover, the proposed channel hydraulic geometry, width, depth, slope, velocity and friction, has been designed based on fluvial-geomorphologic principles. These hydraulic geometric values are functionally related to equilibrium state of the channel and selected to achieve a stable condition in which it is capable of transporting a bankfull water and a certain amount of sediment.. For stream length requirements, Refer the Technical Memorandum: Stream Lengths and Density Requirements.</p>
49. Figure 6.4E Diversion Channel 14W-23 Alignment and Planform	<p>Diversion channel 14W-23 will be straightened out to avoid tight angles and associated erosion problems. The revised channel alignment is provided. The proposed corridor width consists of meander belt width, 6 m erosion buffer and 7.5 m setback as per NOCSS recommendations. The proposed bend will also be stabilized using riprap and natural vegetation to prevent the erosion along the bend transition.</p>
50. Figure 6.5 Channel Corridor Section Typical for 14W-22	We will incorporate a 3 m erosion allowance into the floodplain. The revised channel cross-section is provided.
51. S.6.4.5 Hydraulic Analysis	We will include all road crossings in the hydraulic analysis once the crossing locations are finalized.

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	<p>We will update the Manning's n in the hydraulic analysis to account for future vegetation.</p> <p>We will provide a digital of the hydraulic model.</p> <p>Okay.</p>
<p>52. S.6.4.6            Maintenance and            Riparian Storage</p>	<p>We have not presented the floodplain analysis for the diverted Reaches 14W-14 and 14W-13, but we have carried out floodplain analysis for the Reaches 14W-14 and 14W-13 for riparian storage analysis.</p> <p>We will provide pre- and post-development flood storage-discharge conditions for each reach in the revised Report.</p> <p>A flood storage-discharge analysis will be carried out for the proposed realignment of Reach 14W-11a.</p> <p>Noted.</p> <p>We will redesign the Open Space Blocks in order to keep existing flood storage for all storm events within realigned channel.</p> <p>We will assess the human-made flood conditions due to the Dundas Street Culvert.</p> <p>We will provide flood storage volumes based on detailed grading information during the detailed design stage.</p>
<p>53. S.6.4.7 Stream            Length            Requirements</p>	<p>A Technical Memorandum – Stream Length and Drainage Density Requirements is attached to address these comments.</p>
<p>54. Appendix 6.1            Regional Floodplain            Analysis, 14 Mile            Creek</p>	<p>Digital copy of the hydraulic and hydrologic models and a hard copy of the input and output hydrologic files will be provided.</p>
<p>54.a) S.1.1            Regulatory            Floodplain</p>	<p>We will present floodplain mapping for all existing and future medium and high constraint streams.</p>
<p>54.b) S.1.1.12 Flood            Discharges</p>	<p>We confirm that the pre-development flows presented in the Table 6-1.1 of Appendix 6.1 are based updated drainage areas. Table 6-1.2 of Appendix 6.1 provides the post-development flow rates based on GAWSER hydrologic modeling and are less than pre-development flow rates.</p>
<p>54.c) S.1.1.1.3            Topographic Data</p>	<p>A detailed topographic mapping for the study area is completed by MMM on 2011. We will update hydraulic modeling with detailed topographic data.</p>

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54.d) S.1.1.2.2.2 Manning's Roughness	We will update the Manning's n for post-development condition hydraulic analysis to account for future vegetation conditions.
54.e) S.1.1.2.3 Reach Discharges	A Technical Memorandum: HEC-RAS Model River Reach Flood Flow Estimation is provided describing how the river reach flood flows were estimated is provided.
54.f) Figure 6-2.1 Hec-Ras Cross Sections	We will provide floodplain mapping on a detailed topographical survey map.
54.g) S.1.1.3 Results	We will provide floodplain mapping drawing SW1.
54.h) Other	We will include all proposed road crossings within the proposed conditions hydraulic model once the locations of the crossings are finalized.
55. S.7.4 Proposed Stormwater Management Approach	<p>Section 4.4.4.4 of EIR/FSS Report discusses the post-development water balance with mitigation. It is recommended that 13 mm/year (7,825 m<sup>3</sup>/year) of runoff need to be infiltrated through proposed mitigation measures. The proposed mitigation measures include infiltration swales to infiltrate roof runoff located at the edge of the buffers to the natural features.</p> <p>We will discuss areas that will not be diverted to end-of-pipe SWM facilities.</p> <p>We will discuss servicing and grading implications on the land located on the north side of Dundas Street between Avenue 2 and Block 2.</p>
56. S.7.4.1 Existing Drainage Boundaries	A detailed topography survey was carried out for the site and drainage boundaries are shown on a detailed topography mapping are provided in Figure 7.1 in 1:6000 scale. We have followed the drainage boundary provided in the NOCSS (Figure 5.1.1).
57. S.7.4.3 Preliminary Grading Plans and Post-Development Drainage Boundaries	<p>Bullet #1 - We will provide sufficient grading information and identify areas that directly drain to the Natural Heritage System.</p> <p>Bullet #2 - Both subcatchments 3070 and 3080 will direct the major flows to the right-of-ways which have been graded to direct the flows to Pond 3. The minor flows will be collected in the proposed storm sewer system and directed to Pond 3, there is currently sufficient cover to allow for the storm sewer to cross ovetop of the proposed culvert structure. It should be noted that the storm sewers and overland flow routes will need to be re-evaluated with any rearrangement of the road network or pond locations.</p> <p>Bullet #3 - We will identify areas directly drain to the Natural Heritage System during detailed design stage.</p>

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	<p>Bullet #4 - We will include the Dundas Street ROW within the post-development drainage boundary and will provide stormwater management controls for any future road widening.</p> <p>Bullet #5 - Agreed.</p> <p>Bullet #6 - We will update Table 7.3 to reflect interim conditions (i.e. no developments west of Tremaine Road).</p> <p>Bullet #7 and #8 - We will discuss potential impacts in watercourses to the proposed diversions and internal diversions between subcatchments.</p>
<p>58. S.7.5 Post-Development Hydrologic Analysis</p>	<p>Bullet #1 - We will consider two future conditions 1) interim conditions representing no developments west of Tremaine Road and 2) ultimate conditions representing developments west of Tremaine Road. The two scenarios, interim and ultimate conditions, will be taken in account for designing stormwater management facilities.</p> <p>Bullet #2 - Flow rates at the upstream end of the realigned 14W-14 are provided below:</p> <p>2 Yr – 0.94 m<sup>3</sup>/s            5 Yr – 1.50 m<sup>3</sup>/s            10 Yr – 1.83 m<sup>3</sup>/s            25 Yr – 2.34 m<sup>3</sup>/s            50 Yr – 2.68 m<sup>3</sup>/s            100 Yr – 3.02 m<sup>3</sup>/s            Regional Storm – 7.60 m<sup>3</sup>/s</p> <p>Flow rates at the upstream end of the rehabilitated reach 14W-16 are provided below:</p> <p>2 Yr – 2.22 m<sup>3</sup>/s            5 Yr – 3.56 m<sup>3</sup>/s            10 Yr – 4.32 m<sup>3</sup>/s            25 Yr – 5.49 m<sup>3</sup>/s            50 Yr – 6.34 m<sup>3</sup>/s            100 Yr – 7.14 m<sup>3</sup>/s            Regional Storm – 17.9 m<sup>3</sup>/s</p> <p>Bullet #3 - Okay.</p> <p>Bullet #4 - Post-development hydrologic modeling will be updated based on the comments from CH, Town and MNR.</p>

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59. S.7.6 Stormwater Management Facilities	<p>Bullet #1 - Refer to response 57.</p> <p>Bullet #2 - Figure 7.4 showing catchment boundaries for each proposed SWM ponds are provided.</p> <p>Bullet #3 - We will provide flow rates for the reaches in pre- and post-development condition.</p> <p>Bullet #4 - Pond # 1 and # 2 drainage areas are rounded to 30.9 ha and 15.5 ha respectively in the report. But we have used 30.88 ha and 15.45 ha in our pond release rate estimation. Pond will be designed according to MOE's preferred criteria where it is possible.</p> <p>Bullet #5 - We will provide preliminary grading plans for Pond # 2 and #3 once the pond locations are finalized.</p> <p>Bullet #6 – Noted.</p> <p>Bullet #7 - Detailed design of the SWM ponds will be provided once the pond locations are finalized.</p> <p>Bullet #8 - Noted.</p>
60. S.7.7 Erosion Control Analysis	See response 4 and 5 in relation to the Town of Oakville comments.
61. S.7.8 Topographic Depression Volumes	Topographic depression analysis has been revised and provided in the Technical Memorandum – Topographic Depression Volume Analysis
62. S.7.9 Downstream Impacts for Regional Storm	We will provide digital copies of hydrologic and hydraulic models as well as hard copy of the hydrologic input and output files for post development conditions. We will also provide hard copy of floodplain mapping at a scale that allows for a review of impacts. We will need to obtain topography mapping for downstream area to develop floodplain mapping.
63. Appendix 4.6 Groundwater and Surface Water Quality	The locations from where surface samples were obtained will be added to a figure in the updated EIR/FSS report.
64. Appendix 5.6 Water Temperature Monitoring Data	Noted. Will revise graphs.
65. Appendix 8.3, Figure A	Noted. We will revise.



<b>Comment/Issue</b>	<b>MMM Response</b>
66. Appendix 8.4	Refer to comments/response in relation to the ASP.
67. Deficiencies in the EIR/FSS	Recommendations are to be made on preferred crossing locations, and configurations, road design standards, and mitigative measures to minimize impact on the NHS. We will revise the report.
67.a) S.3.3.3 ToR Detailed Studies	<p>We will augment our revised report to address this and provide additional information on our investigations regarding the pond.</p> <p>As noted elsewhere, additional monitoring of the human made pond (14W-14A, Hydrologic Feature A) indicates that the pond is not receiving groundwater inputs and is losing water into the ground.</p>
67.b) S.3.3.3.3 Stream Modification/ Rehabilitation Measures (ToR)	The noted items will be addressed in the revised document.
67.c) Guidance for Development Activities in Redside Dace Protected Habitat (MNR Feb. 2011)	Noted. We will coordinate a meeting to discuss.