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Report: EEAC-13-016

REGION OF WATERLOO

PLANNING, HOUSING, AND COMMUNITY SERVICES
Community Planning

TO: Chair John Jackson and Members of the Ecological and Environmental Advisory Committee

DATE: December 17, 2013 **FILE CODE:** D04-20058/DA

SUBJECT: PROPOSED HIGHLAND RIDGE WEST PLAN OF SUBDIVISION, CITY OF CAMBRIDGE, GILHOLM MARSH [E.S.P.A. 58] AND BARRIE'S LAKE [E.S.P.A. 57]

RECOMMENDATION:

THAT the Ecological and Environmental Advisory Committee advise Planning, Housing, and Community Services staff:

1. That prior to draft approval, the following be submitted to the satisfaction of the Region, City of Cambridge, the Township of North Dumfries, and Grand River Conservation Authority:

    a. a detailed stormwater management plan demonstrating that the volumes of groundwater discharge to Barrie's Lake [E.S.P.A. 57] and to the spring sustaining coldwater aquatic habitat within the Devil's Creek Swamp [E.S.P.A. 59] be maintained at current pre-development levels; and

    b. revisions to the draft plan (dated October 11, 2013) to create open space blocks for Northern Pin Oak significant wildlife habitat behind Lots 3-15 (Phase 1a), Lots 28-34 (Phase 2a), Block 1 (Phase 1b),Block 1 (Phase 2b) and Lots 10 – 24 and 29-33 (Phase 3) to contain the hedgerows up to one metre outside the dripline, and that said blocks be placed in appropriate open space zoning; and

2. That the following be considered as conditions of approval for the Highland Ridge West Plan of Subdivision 30T-13102:

    a. that, prior to registration, the final stormwater management plan be submitted to the Region as well as the City of Cambridge, Township of North Dumfries, and Grand River Conservation Authority for review;

    b. that prior to registration or any site grading or fill placement, erosion and sedimentation control measures and construction fencing acceptable to the City of Cambridge, Grand River Conservation Authority, and Region be installed along the boundary between Lots 1-17 (Phase 1a), Lots 28-40 (Phase 2a), Block 1 (Phase 1b), Block 1 (Phase 2b) and Lots 10 – 33 (Phase 3) on one hand and the recommended open space blocks containing the hedgerows and the woodland in E.S.P.A. 58 on the other hand in order to prevent deposition of sediment on the root zones of the trees, and that such fencing be maintained in good order until the adjoining lots are stabilised and landscaped;

    c. that no clearing of vegetation or significant site alteration along Freure Drive and

Street Two (Phases 1a, 2a, and 3) or Block 1 (Phase 1b) or Block 1 (Phase 2b) occur during the breeding bird season (May 1 – July 31) in compliance with the **Migratory Birds Convention Act** unless it can be ascertained by a qualified expert that no birds covered by the Act are observed to be breeding in or adjacent to the affected areas;

d. that prior to the issuance of building permits for the adjoining lots, permanent fencing to the satisfaction of the Region and City of Cambridge be erected along the rear of Block 1 (Phase 1b), Block 1 (Phase 2b) and Lots 11-29 (Phase 3) on the west side of the common property boundary;

e. that prior to the issuance of building permits for the adjoining lots, permanent fencing to the satisfaction of the City of Cambridge, Canadian Pacific Railway, and Region be erected along the rear of Lots 1-17 (Phase 1a), 28-40 (Phase 2a), and Lots 29-33 (Phase 3) on the north side of the common property line, and that said fencing be co-ordinated with any noise attenuation barriers required along the railway track;

f. that prior to the issuance of building permits for Phase 3, a robust lockable gate satisfactory to the City of Cambridge, Region, and Township of North Dumfries be installed at the western end of Block 56 (Phase 3) to prevent unauthorised vehicular entry into the Ecological Restoration Area and Ecological Conservation Area of the Conservation Easement

g. that immediately following the installation of the permanent fencing, signage to the satisfaction of City of Cambridge and Region be affixed to the fencing identifying the area beyond as environmentally sensitive;

h. that prior to registration of Phase 1b, Phase 2b, and 3, the Owner remove from the hedgerow along the rear of the respective lots and blocks undesirable species of trees and shrubs such as Manitoba Maple, Buckthorn, Tartarian Honeysuckle, and Wild Grape, and that the stumps of the plants be treated to prevent re-growth to the satisfaction of the City of Cambridge and Region;

i. that the grading and filling required to prepare the natural kettle feature occupying the general area of Lots 16-26, 37-45 and the associated length of Street Two in Phase 3 be carried out in such a manner as to ensure the viability of the large Red Oak tree identified as Tree 446 in the tree Management Plan, and that the European Buckthorn identified as Tree 452 be removed;

j. that prior to registration of Phase 1a or Phase 2a, the populations of Regionally significant Lindley's or Ciliolate Aster (*Aster ciliolatus*) be located and transplanted to appropriate habitats within the Ecological Restoration Area or Ecological Conservation Area at appropriate times of year for transplanting.

k. that prior to registration of Phase 1a or Phase 2a, the remnant kettle feature be searched for native tree saplings and other native herbaceous species which can be transplanted to gaps in the western hedgerow, to create a northward extension of the western hedgerow behind Lots 23-29 (Phase 3) or to undisturbed areas within the Ecological Restoration Area, to the satisfaction of the City of Cambridge and Region;

l. that outdoor lighting installed on residential units to be constructed on Lots 1-17 (Phase 1a), Lots 28-40 (Phase 2a), Lots 29-33 (Phase 3), Block 1 (Phase 1b), Block 1 (Phase 2b), and Lots 11-29 (Phase 3) be installed so as not to shine into Gilholm

Marsh E.S.P.A., Barrie's Lake E.S.P.A., and the Ecological Restoration Area; and

m. that, prior to registration, the owner develop a brochure and other information tools for new home purchasers which provides information about the natural heritage features contiguous to the subdivision along with advice about how they can be good neighbours and stewards of these areas, and that the brochure be to the satisfaction of the City of Cambridge and the Region.

REPORT:

On June 24, 2008, E.E.A.C. considered report EEAC-08-010 dealing with the proposed Highland Ridge West Plan of Subdivision, and adopted Terms of Reference for a scoped Environmental Impact Statement (E.I.S.). The EIS had to address the following:

a. maintaining the quantity, quality, and distribution of groundwater flows sustaining wetlands in E.S.P.A. 57, and E.S.P.A. 58, and on groundwater discharge to Devil's Creek within E.S.P.A. 59;
b. potential thermal and channel erosion impacts of surface discharge from proposed subdivision to Devil's Creek; and
c. impacts on the features and functions of E.S.P.A. 57 and E.S.P.A. 58 likely to arise from the development of residential dwelling in close proximity to these sensitive areas.

The subject lands are located on the western boundary of the City of Cambridge generally between Blenheim Road and Cedar Street. They constitute the last portion of the Grand Ridge Estates Ltd. Lands to be developed as a residential subdivision. E.E.A.C. reviewed the subdivision application on the eastern portion of the Grand Ridge Estates property in the late 1980s. The present application comprises 161 single family homes, 120 townhouses, and a 0.99 hectare park.

The 14.4 hectare property is currently in agricultural use. To the east is the existing Grand Ridge Estates residential subdivision which is now being built out. To the north, the property abuts the C.P.R. line, and north of the railway is Barrie's Lake [E.S.P.A. 57]. To the south, the property borders an upland woodland owned by the City of Cambridge which forms part of Gilholm Marsh [E.S.P.A. 58]. This woodland forms the southernmost tip of the Blair-Bechtel-Cruickston Environmentally Sensitive Landscape. The western boundary of the Plan of Subdivision is the Cambridge-North Dumfries Township boundary. The southern half of this boundary is marked by a hedgerow containing a number of oak trees, including the Regionally significant Hill's or Northern Pin Oak (*Quercus ellipsoidalis*). At the northern end of the hedgerow is a natural kettle depression, one of several in the surrounding landscape on either side of the municipal boundary.

The sub-committee visited the site on October 23, 2013 with:

- David Freure, Grand Ridge Estates
- Brandon Flewwelling, Mark Zuzinjak, GSP Group Inc.
- Ian Robertson, Meritech
- Ryan Archer, Natural Resource Solutions Inc.,
- April Souwand, Yvette Rybensky, City of Cambridge
- Steve Stone, Township of North Dumfries
- Chris Gosselin, Tim Van Hinte, Sylvia Rafalski-Misch, Region of Waterloo

The sub-committee has reviewed the following studies submitted in support of the proposed

plan of subdivision:

- ***Hydrogeological Assessment Highland Ridge West Cambridge, ON*** (WESA, August, 2013)
- ***Preliminary Stormwater Management Report Highland Ridge West City of Cambridge*** (Meritech, August, 2013)
- ***Highland Ridge West Environmental Impact Statement*** (Natural Resource Solutions Inc., August, 2013)
- ***Grand Ridge Estates Limited Highland Ridge West Tree Management Plan & Report*** (GSP, August, 2013)
- Draft Plan of Subdivision (GSP Group, Dated October 11, 2013)
- Letter from Ian Robertson, Meritech, to Chris Gosselin, dated December 6, 2013, re: Response to E.E.A.C. sub-committee – infiltration, Highland Ridge West, City of Cambridge

In addition, the sub-committee also read a Conservation Easement dated August 5, 2008 between the Region and Tullis Estates, the former landowner of the parcel of land immediately west of the municipal boundary which contains most of the kettle wetlands in the Gilholm Marsh E.S.P.A. as well as an agricultural field between the wetland kettles and the municipal boundary. This Conservation Easement emerged from concern about the proposed excavation for aggregate production of the agricultural field immediately adjacent to designated residential land in the Urban Area. The aggregate application was the subject of report EEAC-07-001 dated January 30, 2007. The land subject to the easement was subsequently acquired by Grand Ridge Estates.

The Conservation Easement comprises two components: the Ecological Conservation Area containing the northern portions of Gilholm Marsh E.S.P.A. and the Ecological Restoration Area which is the agricultural field considered for aggregate extraction in 2006-07. Part of this area will be excavated to produce fill required to re-grade low-lying portions of the proposed subdivision to allow for gravity sanitary servicing. Following removal of the fill material, the resulting excavation and the surrounding part of the field will be restored to natural habitat compatible with the Gilholm Marsh E.S.P.A. The Conservation Easement allows the new excavations to be utilised for the infiltration of stormwater from the subdivision. The easement also sets out in considerable detail a framework for the ecological restoration and management of the subject lands.

The Conservation Easement is a binding legal agreement between the Region and the current landowner which is enforceable outside the normal requirements of the **Planning Act**. Moreover, it directs actions to be undertaken on lands outside the current Plan of Subdivision within the Township of North Dumfries. It will be implemented in co-ordination with the fulfillment of conditions of draft approval for this application. As the subdivision did not proceed as rapidly as was envisioned when the agreement was drafted in 2008, many of the deadlines in the agreement have been passed without the specified actions taking place. The sub-committee recommends that the deadlines be revised as necessary so that the site development and stewardship actions may commence.

After comparing the submitted studies to the Terms of Reference adopted by this committee five years ago, the sub-committee sought clarification from the engineering consultant to determine whether the preliminary stormwater management report satisfactorily addresses the original Terms of Reference. On December 6, 2013, Ian Robertson of Meritech sent staff the letter attached to this report.

1. Maintaining the quantity, quality, and distribution of groundwater flows sustaining

wetlands in E.S.P.A. 57, and E.S.P.A. 58, and on groundwater discharge to Devil's Creek within E.S.P.A. 59

The following text appeared in report EEAC-08-010, and the sub-committee is reproducing it to provide context for the comments that follow.

> ***The Devil's Creek Watershed Enhancement Program: Final Report*** (CH2M Gore and Storrie Ltd., 1997) identifies that the northern portion of the subject lands are located within the surface water catchment for Devil's Creek. In addition, the subject lands are mapped as lying wholly within the groundwater catchment area for Devil's Creek and are identified as having high groundwater recharge rates (approximately 200 mm/yr) (CH2M Gore and Storrie Ltd., 1997: Figure 4.5). Lands to the west of Devil's Creek are understood to recharge the creek and contribute to the coldwater aquatic habitat of its middle reaches. Near the railway track, a large high-volume spring was discovered in the early 1990s that effectively transforms the warmwater upper reach of the creek into the coldwater middle reach.
>
> Further, it is understood that groundwater recharging on the subject property flows to the kettle lakes(considered to be surface expressions of the local water table) and Provincially Significant Wetlands within E.S.P.A.s 57 and 58, indicating that there may be a groundwater 'divide' on the subject lands. For these reasons, the subject lands are considered "contiguous" to E.S.P.A. 57, E.S.P.A. 58 and E.S.P.A. 59 according to the definition in the Glossary of Terms (ROPP).

Figure 6 in the WESA hydrogeology report illustrates the shallow groundwater contours, and appears to corroborate the statement in the 2008 staff report. In this image, there appears to be a local high water table elevation point in the vicinity of the large natural depression located along the boundary between the Highland Ridge West lands and the existing Grand Ridge Estates subdivision. This feature provides what is termed depression-focused recharge. The contours of the groundwater mounding beneath the feature indicate that groundwater flows radially from this central point toward Barrie's Lake to the north, the Gilholm Marsh ponds to the southwest, and the Devil's Creek valley to the east. This depression is to be filled in to accommodate the development of residential lots and a park block. As the fill is to come from the lands to the west within the Ecological Restoration Area, it is expected that comparable soil permeability and infiltration rates will be maintained.

The Meritech stormwater management report proposes a stormwater management strategy that is summarised as "lot-level infiltration in rear yards of clean roof-water from the rear portions of roof area, and the conveyance of minor storm events (piped) and major storm events (overland flow) to one of two receivers: the existing Devil's Creek Pond about half a kilometre southeast of the development and a proposed depression immediately to the west…"(page 9). The recent follow up letter indicates that discussions with City staff appear to be changing the strategy to discharging run-off from larger precipitation events from the rear half of roofs and the backyards of the 35 lots abutting the proposed park block in an infiltration gallery to be constructed within the park. Run-off from small frequent events would continue to recharge through pervious surfaces on lots and blocks throughout the subdivision. .

Development has the potential to alter the existing water balance of an area. As the subject lands are understood to contribute groundwater flows to three contiguous E.S.P.A.s, the sub-committee is concerned that the **quantity, quality, and distribution** of these flows be maintained through the use of appropriate stormwater management techniques which have regard to the respective Gilhom Marsh, Barrie's Lake and Devil's Creek groundwater sub-catchments. On the developable area, infiltration will be distributed much as before due to lot

level measures and the reconfigured 1.6 hectare park block and abutting rear yards where infiltration galleries would be constructed in the location of the existing kettle that is to be removed. Nevertheless, this evenly distributed infiltration is only 82% of pre-development volumes. Overall, this apparent reduction will be over-compensated by substantial infiltration in the proposed new stormwater management facility within the Environmental Restoration Area such that there will be an overall 28% increase over pre-development rates. The sub-committee is not greatly concerned about the potential increase in groundwater flows to the Gilholm Marsh because the nature of the kettle ponds is such that they are the expression of the shallow water table, and any increase in groundwater infiltration in the constructed kettle infiltration facility will be dispersed over a relatively large area and will not likely result in any significant change in water levels.

The sub-committee is, however, concerned that the locus of the increased infiltration is proposed to shift from the area to be developed to the new stormwater management facility in the Ecological Restoration Area. The recent correspondence provides some additional clarity with respect to infiltration within the proposed subdivision, but still leaves us asking whether the net effect of the 18% reduction in infiltration in the subdivision proper will significantly reduce groundwater flows to Barrie's Lake and the spring sustaining the coldwater habitat in Devil's Creek. The sub-committee is of the opinion that that this needs to be clarified in the final stormwater management report, and cannot support draft approval until it can be demonstrated that there will be no significant alteration of groundwater flows to these two E.S.P.A.'s.

2. Potential thermal and channel erosion impacts of surface discharge from proposed subdivision to Devil's Creek

The northern portion of the subject property has been mapped within the surface watershed of Devil's Creek. Some surface flows from part of the subdivision will be directed to Devil's Creek Pond which forms the headwaters of the creek. The pond has been used as a stormwater management facility for decades. The pond is quite open and water warms up under the sun before discharging to upper Devil's Creek. The upper reach of Devil's Creek is a warm water creek. As the creek approaches the railway, a large groundwater spring discharges groundwater into it. This has the effect of cooling the water sufficiently to create coldwater habitat which sustains a resident trout population for some distance within E.S.P.A. 59 until the creek is again warmed by discharge from an open pond.

The response letter states that run-off from only a portion of site will be piped to the Devil's Creek Pond, and this will result in less volume going to the pond than earlier anticipated. Given the size of this input, the sub-committee is prepared to accept that its effect on the upper Devil's Creek system will be minimal.

Nevertheless, the sub-committee is still left with the question as to the potential thermal impact to the creek which could result if discharge from the cold spring is diminished. The response letter only addresses this matter in answer to our question about groundwater flows to E.S.P.A.'s 57 and 59. The sub-committee accepts the statement that infiltrated precipitation will cool as it flows toward Devil's Creek. Maintaining the volume of these flows toward the spring is critical.

3. Impacts on the features and functions of E.S.P.A. 57 and E.S.P.A. 58

The southwestern corner of the proposed Plan of Subdivision is located immediately contiguous to part of E.S.P.A. 58 The western limits abut the Ecological Restoration Area of the Conservation Easement. Following creation of the stormwater management facility, the area will be naturalised as meadow or savanna habitat. The owner may agree to maintain trails in the

area to continue the current unofficial low-impact recreational use. The development of the subdivision affords an opportunity to exclude the entry of motorised recreational vehicles from the subdivisions to the east. While the topography and C.P.R. tracks effectively prevent any risk of erosion and sedimentation from the proposed subdivision into Barrie's Lake E.S.P.A., the sub-committee is aware that the lake has experienced considerable trespass in recent years.

The sub-committee is recommending that erosion and sedimentation controls be established around the western and northern perimeters of the proposed subdivision to prevent sedimentation into E.S.P.A. 58, the Ecological Restoration Area, and the slope down to the railway where Regionally significant plants have been observed. We are also recommending that permanent fencing be installed around these limits to prevent casual intrusion into E.S.P.A.'s 57 and 58, the hedgerows containing Northern Pin Oak, and the Ecological Restoration Area.

4. Other matters

4.1 The Hedgerows

The western limit of Plan of Subdivision which is congruent with the Cambridge-North Dumfries municipal boundary is marked in part by a hedgerow. Along with the usual Manitoba Maples and Buckthorn, the hedgerow also contains Red Oak, Black Cherry, and Northern Pin or Hill's Oak (*Quercus ellipsoidalis*). The presence of the latter species makes it significant wildlife habitat, as defined by the Province. There is another hedgerow along the northern boundary of the property adjacent to the C.P.R. line which also contains Northern Pin Oak as well as other oak trees. Additional Regionally significant species are located on the slope down to the railway track.

The draft Plan of Subdivision dated October 11, 2013 shows lots extending to the northern and western limits of the Grand Ridge Estates property and entering the dripline of the hedgerows. The sub-committee recommends that the draft plan be revised to create open space blocks for Northern Pin Oak significant wildlife habitat behind Lots 3-15 (Phase 1a), Lots 28-34 (Phase 2a), Block 1 (Phase 1b),Block 1 (Phase 2b) and Lots 10 – 24 and 29-33 (Phase 3) sufficiently wide to contain the hedgerows up to one metre outside the dripline. This would afford them greater protection than if they are included on the rear portions of individual lots where they might be cut down by future homeowners or adversely affected by the landscaping of rear yards.

The sub-committee also recommends that protective fencing be installed to prevent sedimentation or the entry of construction equipment into the hedgerows or the recommended open space blocks. Appropriate signage should be affixed to this fencing to advise future homeowners of the significance of the hedgerows.

During the site visit, the sub-committee noticed that the hedgerows contain, in addition to the good quality oak, Black Cherry, and maple trees, a number of invasive non-indigenous species such Manitoba Maple, Common Buckthorn, and Tartarian Honeysuckle. Also, Wild Grape, though a native species, was observed to be climbing up into the tree crowns. Accordingly, the sub-committee recommends that these species be removed from the hedgerows before site preparation begins. To prevent the cut stumps from re-sprouting, it is also recommended that they be topically treated with an appropriate herbicide. There is also some Staghorn Sumac in the hedgerows. While sumac is a native species, the sub-committee notes that once the agricultural cultivation of the adjoining fields ceases, it may spread into future backyards or out into the Ecological Restoration Area which is to be restored to meadow and savanna-type habitat.

As mentioned above, there is a natural kettle depression at the northern end of the western hedgerow. Most of the feature is located within Phase 3 of the Plan of Subdivision and occupies the general area of Lots 16-26, 37-45 and the associated length of Street Two. In order to create the lots and street, it will be necessary to fill in the depression within the City and out into the township to some extent. This would entail the removal of trees which would be buried too deeply to survive. One of these is a larger Black Cherry. The sub-committee is most concerned, however, with the potential removal of a good quality 700 mm diameter Red Oak identified as Tree 446 in the Tree Management Plan. The note for this individual states "Protect as grading permits." The sub-committee is of the opinion that this tree warrants saving and that filling the depression should be carried out in such a manner as to ensure the continued viability of the tree either through modified grading and filling or by using a low retaining wall to prevent excessive fill from being deposited on the root zone. We also note that Tree 452 a short distance to the north within the depression is a European Buckthorn which is also noted as "Protect as grading permits." The sub-committee is of the opinion that Buckthorn should be entirely removed from the hedgerow so as to minimise its potential to re-colonise it or spread out into the Ecological Restoration Area.

4.2 Breeding Birds

The E.I.S. has noted a number of breeding birds on and contiguous to the site in the E.S.P.A.'s and in the residual kettle feature in the centre of the property. The sub-committee recommends that no clearing of vegetation or significant site alteration along Freure Drive (Phases 1a, 2a, and 3) or Block 1 (Phase 1b) or Block 1 (Phase 2b) occur during the breeding bird season (May 1 – July 31) in compliance with the **Migratory Birds Convention Act** unless it can be ascertained by a qualified expert that no birds covered by the Act are observed to be breeding in or adjacent to the affected areas.

4.3 Plant Salvage

The remains of a natural kettle feature are located along the boundary between the existing Grand Ridge Estates subdivision and the proposed Highland Ridge West plan. This feature is not part of the Greenlands Network, and will not be retained. Nevertheless, the applicant's consultants have observed the presence of Lindley's or Ciliolate Aster (*Aster ciliolatus*) in the area, and have recommended that the plants be transplanted to appropriate habitats within the Ecological Restoration Area or Ecological Conservation Area. The sub-committee concurs with this recommendation. The feature also contains a variety of native trees of various sizes. The consultants also recommend that consideration be given to salvaging some of the smaller trees and re-locating them. The sub-committee recommends that they be transplanted to gaps in the western hedgerow resulting from the removal of trees and shrubs identified for removal. It is also recommended that they be planted in the Ecological Restoration Area behind Lots 23-29 (Phase 3) and around the stormwater management Block 57 to extend the western hedgerow. The young trees could also be transplanted to other locations within the Ecological Restoration Area consistent with the terms of the Conservation Easement.

4.4 Lighting

Awareness of the environmental impacts of light pollution has increased in recent years. The sub-committee is concerned that lighting installed on the rear of houses contiguous to E.S.P.A.'s 57 and 58 and the Ecological Restoration Area could adversely affect ecological processes within these areas. It is accordingly recommended that outdoor lighting installed on residential units to be constructed on Lots 1-17 (Phase 1a), Lots 28-40 (Phase 2a), Lots 29-33 (Phase 3), Block 1 (Phase 1b), Block 1 (Phase 2b), and Lots 11-29 (Phase 3) be designed so as not to shine into either E.S.P.A. or the Ecological Restoration Area.

Area Municipal Consultation/Coordination: *

City of Cambridge and Township of North Dumfries staff attended the October 23, 2013 site visit. The sub-committee's report has been shared with Cambridge and Township of North Dumfries staff.

CORPORATE STRATEGIC PLAN:

The review of the recommended E.I.S. for the subject application will help achieve Strategic Objective 1.5 of the ***Region of Waterloo Strategic Focus 2011-2014*** to "restore and preserve green space, agricultural land, and sensitive environmental areas.

FINANCIAL IMPLICATIONS:

The usual fee for the review of a scoped Environmental Impact Statement will apply.

OTHER DEPARTMENT CONSULTATIONS/CONCURRENCE:

Transportation and Environmental Services staff are also providing comments on this application.

ATTACHMENTS

A General Location of Proposed Highland Ridge West Plan of Subdivision
B Proposed Draft Plan
C Letter from Ian Robertson, Meritech, to Chris Gosselin, dated December 6, 2013, re: Response to E.E.A.C. sub-committee – infiltration, Highland Ridge West, City of Cambridge

Respectfully submitted,

Ted Creese
John Jackson
Greg Michalenko
Claudette Millar
Highland Ridge West Sub-committee

Attachment A. General Location of Proposed Highland Ridge West Plan of Subdivision

Attachment B. Proposed Draft Plan

Attachment C. Letter from Ian Robertson, Meritech, to Chris Gosselin, dated December 6, 2013 re: Response to EEAC sub-committee – infiltration, Highland Ridge West, City of Cambridge

MERITECH

December 6, 2013

Regional Municipality of Waterloo
Planning, Housing, and Community Services Department
150 Frederick Street
Kitchener, ON N2G 4J3

Attention: Mr. Chris Gosselin, M.C.I.P., R.P.P.
Manager of Environmental Planning

Dear Mr. Gosselin,

Re: Response to E.E.A.C. sub-committee - infiltration
Highland Ridge West
City of Cambridge

In response to the questions from the E.E.A.C. sub-committee as per the attached email, we provide additional explanation concerning the proposed infiltration measures across the development. We trust that the attached adequately addresses the questions raised, and have consulted with the project team's hydrogeologist in order to ensure the response we have prepared correctly reflects the hydrogeology report.

We reference the following reports:

- Hydrogeological Assessment, WESA, August 2013
- Preliminary Stormwater Management Report, Meritech, August 2013
- Hydrogeology Study Report, Cambridge West Community MESP, LVM, November 2013

This letter is intended to further demonstrate that appropriate infiltration features have been provided such that one of the main objectives of the stormwater management plan, maintenance of existing infiltration across the site, is met.

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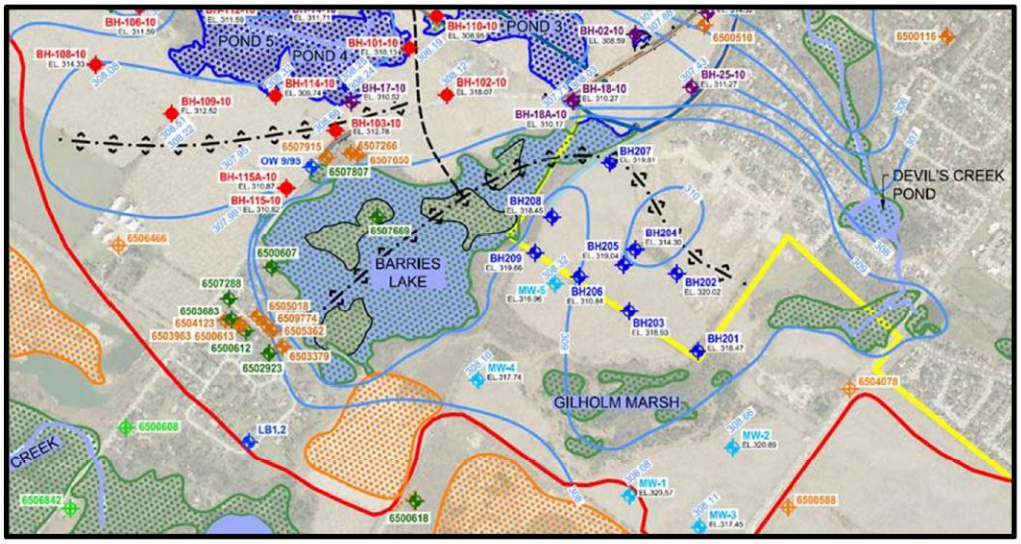
Pre-development Infiltration

In order to best match pre-development infiltration conditions the amount of infiltration (annually and in larger storm events) as well as the location that infiltration occurs needs to be taken into account.

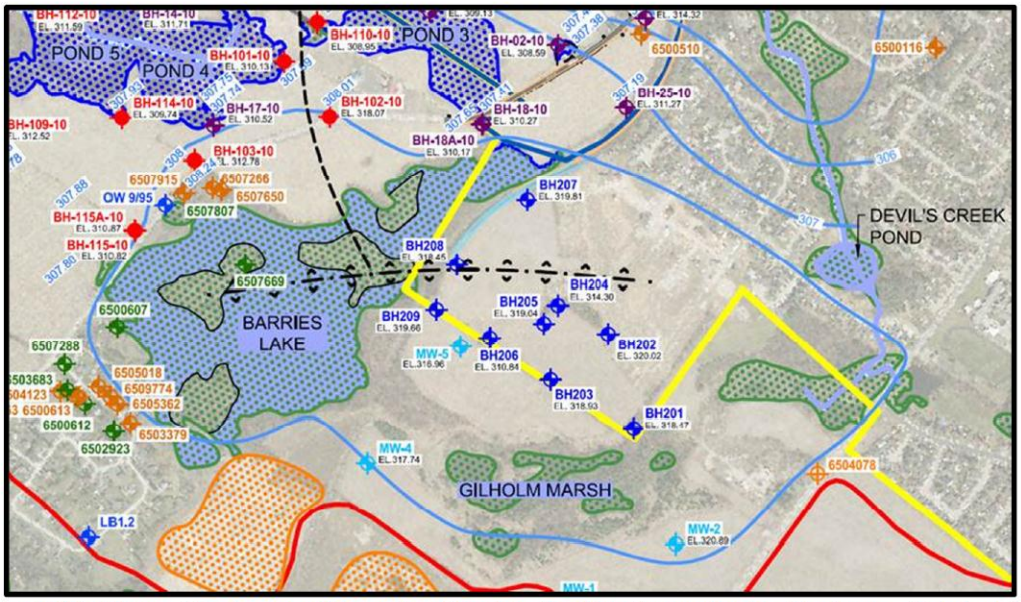
Table 3 of the WESA hydrog report shows that the pre-development infiltration rate is taken as 280 mm/year across the site. The MOE Stormwater Management Planning and Design Manual (2003) states that 90% of daily rainfall amounts are less than 20 mm, which is less than the estimated storage under agricultural conditions ("initial abstraction") for the surficial soils. As a result, in the majority of storm events it is anticipated that runoff would likely not occur and infiltration will occur relatively uniformly across the site. This is supported in WESA's report, which presents an estimated annual runoff depth of 93.4 mm/year, about 10% of annual

rainfall. Thus, for the majority of the year infiltration is distributed relatively uniformly across the site. In spring conditions, snowmelt and heavy rain events result in runoff being directed to low lying areas of the property. The resulting infiltration results in localized groundwater mounding, as shown both on Figure 6 of the WESA report (July 2008) and in Figure 10 of the LVM report (April 2013).



From LVM, Figure 10, Seasonal High Overburden Aquifer Groundwater Contours, April 2013

The LVM report also shows the seasonal low groundwater contours (October 2012). The approximated location of the groundwater divide has shifted, but the principle direction of groundwater (radiating outwards) is consistent.

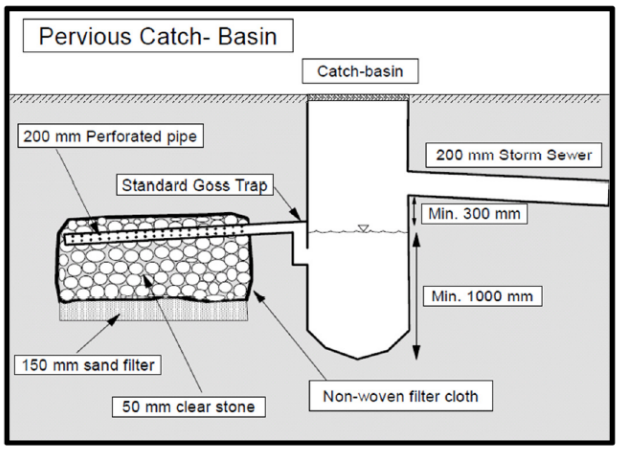


From LVM, Figure 11, Seasonal Low Overburden Aquifer Groundwater Contours, October 2012

Post-development Infiltration

In post-development conditions, building coverage is assumed to be 35%, with half of the roof areas being directed to soak away pits. As described on page 13 of the WESA report, it is assumed that all annual precipitation (983.4 mm/yr) on the roof area would be infiltrated. The other component to infiltration on each lot is a post-development rate of 224 mm/year for pervious areas (taken as 50% of the lot area). Thus, the aggregate post-development infiltration rate on each lot is 284 mm/year, which matches the pre-development depth.

It is worth noting that recently the project team met with the City of Cambridge to discuss the location of infiltration measures on the site. The City appears is in favour of an infiltration gallery in the park block, which would collect roof runoff from all the lots backing onto the park and infiltrate in one location such as near the intersection of Salisbury Avenue and Street One, very close to the location of the existing kettle. The collection capacity of this facility would be sized for surface drainage from rear half of roofs and backyards. Runoff would be directed to pervious catchbasins tied to the infiltration gallery. In this way, runoff can both be pre-treated and cooled prior to infiltration.



The park block would be graded so that runoff in larger storm events would be directed to this infiltration gallery to mimic existing conditions. The end result is that a point infiltration source from about 1.6 hectares of contributing area would assist not only in ensuring the pre-development infiltration rate is maintained, but in ensuring that the groundwater mounding currently taking place would continue. As a result of these proposed infiltration measures, the infiltration volume and location of the same across the site will closely mimic existing conditions. In addition to this suggestion, the City of Cambridge has been presented with other options that could supplement infiltration spatially across the site.

The E.E.A.C. comments mention that the total infiltration from the property is estimated to increase by 28%, "due largely to the stormwater management facility in the Ecological Restoration Area". The 28% increase shown on Table 3 of WESA's report is an increase in the sum of infiltration and runoff from the site, regardless of receiver. As this table was developed to support discussion on salt application volumes the pre-development conditions also show a 13,515 m^3/year runoff volume.

Table 3 shows that the pre-development infiltration volume is 40,516 m^3/year. Post-development infiltration on the developable area itself from pervious areas and in infiltration galleries totals about 33,200 m^3/year, which is 82% of the pre-development infiltration volume.

The additional infiltration that takes place in the ecological restoration area can be estimated by examining the runoff that is directed to the ecological restoration area – a total of about 34,100 m^3/year. Thus, on an annual basis there is expected to be an increase in infiltration from pre-development conditions.

Thermal Considerations

The approach to infiltration allows for roofwater discharge to be directed to grade in a number of areas, prior to infiltration. This assists with pre-treatment, and ensures that runoff is cooled prior to infiltration.

Piped Flows to Devil's Creek SWM Facility

Meritech's stormwater management report dated August 2013 includes a section entitled "Allowable Flow Volumes to Devil's Creek SWM Facility". Historical reports referenced in the report show that piped runoff from the proposed development in the 5-year storm event was designed to be directed to the Devil's Creek facility. Since the writing of these reports, the area has been developed and the City has updated their rainfall parameters. The result is that the remaining capacity in the existing storm sewer system is being utilized, and a portion of the site is proposed to be piped to the existing system to meet the intent of the original design.

Thus, the proposed SWM design results in lower peak flows in all design storm events than the Devil's Creek SWM facility was originally designed to receive, such that the available capacity of existing sewers is used.

Conclusion

We trust that this letter adequately addresses the sub-committee's questions and that you are able to support the application. If you have any questions please contact the undersigned.

Yours very truly,

MERITECH ENGINEERING

ris Tegeratz EIT on behalf of
Ian Robertson, P.Eng.
Director of Engineering

CHT/
Enclosures (EEAC Comments)

cc Mr. Rafique Turk, City of Cambridge
Mr. Mike Duchene, WESA
Mr. Brandon Flewwelling, GSP

From: Chris Gosselin [mailto:CGosselin@regionofwaterloo.ca]
Sent: November 29, 2013 4:50 PM
To: Brandon Flewwelling
Cc: Tim Van Hinte; Sylvia Rafalski-Misch
Subject: Highland Ridge West

Hi Brandon,
I am working with the E.E.A.C. sub-committee to review the Highland Ridge West application. During our review of the supporting studies, we have come to the conclusion that the stormwater management report may not adequately address the Terms of Reference for this application adopted by E.E.A.C. in 2008. I attach a copy for your information. There are two items where we seek clarification in order to be able to consider supporting this application.

1. Maintaining the quantity, quality, and distribution of groundwater flows sustaining wetlands in ESPA 57, and ESPA 58, and on groundwater discharge to Devil's Creek within ESPA 59

Please refer to this section in report EEAC-08-010. Figure 6 in the WESA hydrogeology report illustrates the shallow groundwater contours, and appears to corroborate the statement in the 2008 staff report to the effect that shallow groundwater flows radially from the site toward Barrie's Lake, Gilholm Marsh, and Devil's Creek. In this image, there appears to be a local high water table elevation point in the vicinity of the large natural depression in the centre of the Grand Ridge Estates lands. The contours indicate that groundwater flow from this central point is toward Barrie's Lake to the north, the Gilholm Marsh ponds to the southwest, and the Devil's Creek valley to the east.

The Meritech stormwater management report proposes "lot-level infiltration in rear yards of clean roof-water from the rear portions of roof area, and the conveyance of minor storm events (piped) and major storm events (overland flow) to one of two receivers: the existing Devil's Creek Pond about half a kilometre southeast of the development and a proposed depression immediately to the west…"(page 9). In addition, rear yard run-off along the northern perimeter of the subdivision adjacent to the railway will be allowed to infiltrate. Given the fact that total infiltration from the property is estimated to increase by 28% due largely to the stormwater management facility in the Ecological Restoration Area, we need to know whether the proposed stormwater management strategy will maintain groundwater flows to Barrie's Lake and the big spring sustaining the coldwater section of Devil's Creek and not unduly divert infiltrated groundwater toward Gilholm Marsh. We are less concerned about the potential impact of an increase on Gilholm than a potential reduction of groundwater flows to Barrie's Lake and the Devil's Creek spring. We recognise that there could be some difficulty in assessing how pre- and post-groundwater recharge is apportioned among the three groundwater catchments, but the hydrogeological impacts are a central part of our review.

2. Potential thermal and channel erosion impacts of surface discharge from proposed subdivision to Devil's Creek

As noted in Report EEAC-08-010, the northern portion of the property has been mapped within the surface watershed of Devil's Creek. If the stormwater management system proposes to discharge additional stormwater to the creek, an analysis is required to assess the potential impact on the thermal regime of this watercourse. If warm water is discharged, it has the potential to counteract the cold water being discharged from the railway spring and reduce the coldwater habitat in the middle reaches

of the creek which sustain a resident trout population. Further, if infiltration to the groundwater catchment sustaining the spring is reduced through diversion, as noted above, the potential impact to the coldwater habitat could be aggravated.

We would appreciate a prompt response to enable us to complete a report in time for the December 17th E.E.A.C. meeting.

Thanks, Chris

Christopher Gosselin, M.C.I.P., R.P.P.,
Manager of Environmental Planning,
Planning, Housing, and Community Services Department,
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NEIL E. TAYLOR
1016 WILSON AVENUE
KITCHENER, ONTARIO
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TEL. (519) 893-6469

November 21st, 2013

(Via e-mail)

Without Prejudice

Attention: Christopher Gosslin,
Manager of Environmental Planning,
Planning, Housing, and Community Services Department, Regional Municipality of Waterloo
Kitchener, Ontario,
N2G 4J3.

Re. South Kitchener Transportation Corridor, and
River Road Extension Class EA

Dear Mr. Gosslin:

At the Public Consultation Centre, October 1, 2013, I understood you to say that that the boundaries of ESPA # 27 (Hidden Valley) remain the same in spite of recommendations made by EEAC some 10 years ago. In this regard, I seek answers to the following questions.

1. Why have the boundaries not been officially designated appropriate to the recommendations?
2. When will the proper boundaries be officially become official?
3. Do the boundaries include within them 100% of the Provincially Significant Wetlands (PSWs)?
4. Do the boundaries include within them the Regulated Area for the Jefferson Salamander?

On a different subject, but on a related topic, I am concerned with Species At Risk in the same area. As you are aware, at the PUBLIC CONSULTATION CENTRE #2, January 19, 2005, Regional Staff presented to the public a panel which contained the following information.

Key Natural Heritage Conclusions:

1. no fish habitat in creeks
2. 25 vegetation communities / 344 plant types
3. 111 bird species / 28 mammal species / 17 reptile & amphibian species
4. **no vulnerable, threatened or endangered species found**
5. outstanding woodland quality
6. many signs of human intrusion

As you are also aware, I challenged points # 2 and 3. In fact, I asserted that this was misinformation. The gross errors that I found in the **Natural Heritage Study**, LGL Ltd., August 2005, prompted further studies re. Jefferson Salamander in 2007. This species, as I had already believed to be there was confirmed.