

Tributary C Storm/Drainage & SW Management, Transportation & Sanitary Trunk Servicing Works EIS

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Theme #1 – Provincially Significant Wetland (PSW)

The upper (headwater) part of the wetland is subject to climatic fluctuations as noted in EIS on page 8. As such the current wetland boundary is based on conditions of one specific year (2010) which was a drier year than 2009 (when the site was also visited). There is no rationale given as to why the drier year's boundary was chosen and in fact no rationale given for breaking that part of the stream into two sections (C & D).

Recommendation 1: Section C and D need to be considered as one section, a section that has intermittent surface flows and which provides indirect habitat to fish. As a result the entire section needs to be considered as a functional part of the PSW, the PSW boundary moved to the upper end of Section C and the whole section needs to be provided the necessary protection in terms of buffers.

Recommendation 2: The PSW identified in this EIS be designated Open Space on Schedule A and PSW on Schedule B-1 of the City's Official Plan. This is consistent with the EIS recommendation on page 46.

Recommendation 3: The mapping and evaluation of the wetland be submitted to the MNR for its files and to update PSW mapping as per the recommendation in the EIS on page 46.

Recommendation 4: Any development within 120 m of the PSW requires a separate EIS as per the City's Official Plan section 15.5.1.ii

Recommendation 5: Any references in the EIS to Locally Significant Wetland (e.g. pages 51, 53) be changed to Provincially Significant Wetland.

Theme #2 – Environmentally Significant Area (ESA)

While the EIS has a set boundary, the biota found within the EIS study area has habitat requirements that reach well outside into adjacent vegetated patches including a plantation. Many of southwestern Ontario's frog, salamanders, and reptile species require terrestrial over-wintering and foraging habitat for successful lifecycle completion. A biphasic lifestyle makes these amphibious species doubly susceptible to urban developments. The combined threat of hydrological regime change and modification to the adjacent terrestrial habitat jeopardizes the amphibian populations in Trib "C" and the identified PSW. Defining and maintaining adequate terrestrial habitat is therefore crucial for the successful management of the species identified in the EIS.

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While EEPAC agrees that this area should definitely be protected as an ESA, evidence from this EIS and evidence from other research (Appendix 1) definitely points to the fact that the ESA boundaries as suggested are not adequate, where many species found within the ESA meet critical habitat needs outside of the ESA as currently defined.

Recommendation 6: Adjacent lands to the PSW must be considered if semi-aquatic species are to be effectively managed. The area of concern needs to be based on ecology and hydrology.

Recommendation 7: EEPAC strongly recommends that the amphibian survey be repeated, critical functioning (core) habitat for amphibian species be delineated, and that buffer dimensions be determined using BEACON 2012 methodology.

Recommendation 8: The ER lands be redesignated on the City's Official Plan Schedule A as Open Space, in the Z-1 zoning by law as OS5, and as ESA on Schedule B of the Official Plan as per the findings of this EIS (page 29). Just considering the area within EIS study boundaries, the ESA boundaries are as generally found on Figure 9 of the EIS with the exception of extending ESA boundary to the upper end of section C of Trib C (as discussed in recommendation 1)

Recommendation 9: Given the high significance of this area (as meta-corridor, groundwater recharge area, Thames River corridor, cold water creek, etc), consideration be given to adding Trib C ESA to Kains Woods ESA by adding plantation and adjacent significant corridor.

Recommendation 10: The unevaluated patches 07032 to 07035 be included in any future EIS prior to development to determine the significance of these patches.

Theme #3 – Cold Water Fishery

One adverse event could ruin the unique attributes of this watercourse. Hence the direct and indirect habitat should be treated as one, using the level of protection for the direct habitat as the minimum (i.e apply the precautionary principle when selecting Critical Function Zones and related buffers).

Recommendation 11: Sections C & D need to be treated as one, protected as PSW and ESA with the called for buffers. Any thermal buffer zones should be calculated from the edge of the ESA.

Recommendation 12: Given the disturbed nature of sections C & D, these critical areas need to be made the focus of revegetation (with area, climate change appropriate species favouring faster growing species). In addition section B needs to also be the focus of revegetation efforts to lessen thermal impact of proposed development.

Recommendation 13: Given the significance of this area and the high risk of disturbance (thermal, sediments, quantity), a qualified aquatic fishery biologist and hydrologist who have experience with cold water fisheries in urban environments be retained by the city to evaluate the engineering plans.

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Recommendation 14: A qualified aquatic fishery expert be asked as to the benefits or detriments of the artificial barriers and the ponds they have created. The EIS seems to suggest that they contribute to warming (page 37). However, it is also possible they provide cold water habitat due to ground water welling.

Recommendation 15: No in-water work be permitted except between July 16 to September 31.

Recommendation 16: The Conservation Authority determine if Fisheries Act authorizations are required.

Recommendation 17: The use of trees for shading and thermal buffering (first noted on page 33, then 41) is admirable, but native non-invasive trees take a long time to grow. Beacon report (p. 18) notes a study by DeWalle that found buffers of 12 m were sufficient as long as the buffer was sufficiently tall (above 30 m and dense). This would not be the case for many, many years adjacent to Tributary C. EEPAC supports the 79 m buffer (from the edge of the ESA!!) to protect the fishery and recommends enhanced plantings of fast growing, non-invasive native shade trees.

Recommendation 18: EEPAC is concerned that a `large storm event` (page 41) shortly after trees, shrubs and herbaceous plants are planted, could wash out substrate and make the plantings ineffective (as occurred in the Medway, north of the second bridge). Plantings must be done with stabilizing materials so that the chance of wash out before establishment is minimized.

Theme #4 – Significant Vegetation Communities within the study area

Recommendation 19: There is a reference to a Dry-Fresh Hickory Deciduous Forest Type (page 4). It should appear on Figure 6.

Theme #5 – Buffers, Critical Function Zone

As noted on page 17, “... the area exhibited high plant species diversity, ground water inputs and is an important feature within the landscape.” This is particularly true given the proposed future development including a school site and the location of the proposed lots as shown in EX 2 in the back of the report. **There is a need for buffering from adjacent land uses.** The lack of any additional buffer for the ESA (see EIS page 50) is disturbing as this recommendation of the EIS relies on the 79 m setback from the top of bank of Tributary C to the SWM facility. However, this setback is subject to a Part 2 order of the EA filed by the landowner. The MNR Natural Heritage Resource Manual is specific that the minimum buffer from a coldwater stream is 30 m (table 11-3, p. 106 of the Manual). The author appears to use Beacon for his defense of no additional buffer, however, Beacon’s methodology has not been used in the EIS. The EIS suggests no buffer is required due to Beacon’s work, however, on page 45 of its study, Beacon states:

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“Despite the growing body of available research that has been conducted on the effectiveness of wetland buffers, there continues to be confusion between CFZ and buffer functions, which confounds the determination of appropriate buffer widths. Nonetheless, the research conducted to date strongly supports the ability of vegetated buffers to provide a number of important functions in terms of protecting wetlands’ water quality and habitat functions, and potentially even mitigating some water quantity stressors.”

Recommendation 20: Greater buffering be applied to the ESA by using the Ecological Buffer Assessment Calculations found in the City’s Guidelines for Determining Setbacks and Ecological Buffers AND, as a test, the methodology presented in Beacon report, pages 93-105. This work must include the unevaluated patches 07032 to 07035 to determine their significance. The EIS is incomplete prior to the completion of this work.

Recommendation 21: EEPAC is unclear if the thermal buffer is adequate. There is no evidence cited based on other cold water fisheries that proposed stormwater management system will not negatively impact the coldwater stream. A thermal analysis by a third party hydrologist be required before this EIS is considered complete.

Theme #6 – EIS requirements prior to acceptance of the EIS

Recommendation 22: Prior to acceptance, the consultant be required to re-submit an amphibian survey as the one done for this study was hampered by weather (page 26). This will define a Critical Function Zone (CFZ) for amphibian habitat outside the wetland (and not limited to EIS study area), such as frog overwintering habitat or turtle nesting habitat. The CFZ should be incorporated into the “core” feature as per Beacon report cited on page 8. (see also Appendix re Amphibians)

Recommendation 23: A migratory bird survey in the fall be required and it should include the unevaluated patches.

Recommendation 24: The EIS include the location of bicycle lanes away from the ESA to avoid installing works along the sensitive Tributary C (page 35). It should be noted that there is a school block nearby to the east. Providing a paved attractant to a unique environment must be discouraged.

Theme #7 – Environmental Management Plan (EMP)

It is also incumbent that the program and baseline monitoring tasks, who completes these tasks, the frequency of data collection and reporting, and responsibility for confirming all tasks are complete before tendering, is established immediately upon approval of the EA by the Minister. Most importantly, it must be clear who is notified if there is an incident (page 7.4.9). The report says “The City.” The final Plan must be

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more specific than that with phone numbers available at the construction site. As well, any requirement for corrective measures must (not should as per page 60), be communicated to all parties and undertaken ASAP.

CONSTRUCTION

Recommendation 25: Photos of Special Concern and Endangered Species appear in the construction trailers with instructions for workers to alert the supervising ecologist if any are found during construction.

Recommendation 26: It appears that part of this section is copied from previous work as the numbering is not always consistent (e.g. p. 58 refers to Section 3.1 rather than 7.4). It also appears that Stage 1 – Construction Stage Monitoring (year 1) is missing from this section of the EIS. These pieces must be corrected before the EIS is deemed to be complete. For example, p. 57 recommends a photolog including photos of the SWM facility where the outflow is clearly visible. This appears in the Stage 0 section of the report. It is unlikely that Stage 1 monitoring consists of only sections 7.4.7, 7.4.8, and 7.4.9, and 7.10. These pieces must be corrected before the EIS is deemed to be complete.

Recommendation 27: Permanent Private System for stormwater management requires compliance and monitoring. There is very little in city practice in this area. The City should develop monitoring requirements for such systems. This work should be carried out by city staff in Stormwater Engineering and Environment and Parks Planning, with involvement of the local office of the Ministry of the Environment and the UTRCA. Consideration be given to contracting the UTRCA to do the monitoring.

Recommendation 28: The impact of dust on vegetation on the edges of natural heritage features can only be mitigated not eliminated and it is facile to say so (page 39). This line should be revised. Non chemical dust suppressants must be used (see recommendation 8.1 on page 53).

Recommendation 29: It is unclear as to why there is a recommendation (page 51) to put in riverstone in Section C of Tributary C as a means to facilitate filtration of sediments. Shouldn't that be part of the SWM facility requirements? Please add sufficient detail to explain the reason for this recommendation.

Recommendation 30: Construction mitigation (p. 52) should provide recommendations for how to deal with “flashy” rain events that may overwhelm conventional silt fencing. Silt fencing should exceed the Provincial Standard Specifications given the sensitivity of the area.

Recommendation 31: Surfaces susceptible to erosion (6.2 on p. 52) should be stabilized after construction through vegetated matting consisting of non invasive native species particular to this ecosite, and not simply reseeded or sodded.

Recommendation 32: Clean equipment protocol for construction equipment must be implemented at this site.

<http://www.ontarioinvasiveplants.ca/index.php/municipalities>

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Recommendation 33: More than periodic supervision is required for this project (9.2 on p. 53 and 7.10.2.1 on page 61). There must be daily inspection by a qualified ecologist retained by the city who reports to a Director at the City. This should include the inspection of erosion and sediment control measures. This Environmental Inspector must have the ability to stop all work if required to protect the Natural Heritage System. It should also be clarified what are the areas of intersection between the Environmental Inspector and the construction inspector (p. 61).

MONITORING

Recommendation 34: Construction documents should not be released for tender until all components of the EMP are established and the baseline monitoring data collected and analyzed. (section 7.4 page 56). It must be approved by all parties listed on p. 55 (MOE, MNR, City of London, UTRCA).

Recommendation 35: Data collection every two months for water quality makes for insufficient data points. (page 56). A water quality expert from Western needs to be sought for advice for best monitoring strategy.

Recommendation 36: It is unclear who will collect and report the water quality indicators. (p.56). This must be decided before construction documents are released for tender.

Recommendation 37: Given the sensitivity of Brook Trout to suspended sediment load, turbidity measurements should be included as part of the proposed water quality monitoring plan (Section 7.4.2. pg 56). Turbidity should be measured at multiple downstream sites, before, during, and after construction, and in addition to the proposed biannual sediment trap measurements.

Recommendation 38: It is unclear how spawning survey data will be collected, particularly at the outflow of the Tributary, as the EIS reports that landowner approval was not given for access to this reach of the Tributary. An explanation is needed.

Recommendation 39: Annual monitoring (p. 58) during Construction Stage monitoring – Year 1 is insufficient. More frequent monitoring and reporting should be required during this Stage. It was weekly for the construction of the Medway Sewer.

Recommendation 40: Long-term monitoring needs to be extended past the usual 2 year period. A ten year period is recommended.

CORRECTION & COMPENSATION

Recommendation 41: Corrective measures should be decided upon more frequently than annual monitoring reports. Hence our recommendation for more frequent monitoring.

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Recommendation 42: There is no reference to compensation if implementation and operation of SWM and other infrastructure result in net loss. At a minimum, this must be included in the EIS, including where and at whose cost.

Theme # 7 – Infrastructure within Natural Heritage System

Recommendation 43: EEPAC does not support infrastructure in components of the Natural Heritage System. The crossing of the tributary (figure 9 and 10) for sewer servicing should use directional drilling or place the sewer pipe under the road crossing to minimize the amount of construction.

Recommendation 44: EEPAC asks to review the Compensation and Restoration Plan developed during detailed design for the collector road alignment. (page 43)

Theme #7 – Storm Water Management

The EIS indicates (page 38) that the Interim Phase 1 Facility will be sized for flows up to the 2 year storm and that this facility will treat construction flows prior to discharge to the ultimate SWMF A. However, flows greater than the 2 year event would be managed on the surface of SWMF A. It appears that any 2 year flows prior to the construction of SWMF A will be untreated.

Recommendation 45: This sequence must be reviewed and treatment of greater than 2 year events be required prior to construction of SWMF A.

There is concern that development within the EA area could seriously disturb groundwater recharge (overall less recharge and much more recharge happening close to Trib C), increase surface water flow with a coincident increase in temperature of stream by the addition of preheated water from urban surfaces.

Due to these great concerns, there is real potential in testing site-based storage and infiltration of stormwater in this project. Instead of only relying on a centralized stormwater system, most water could be collected in swales within residential streets, and commercial developments. Only large events need to be collected into `sewers` and routed to SWMs.

Recommendation 46: City engineer should reconsider EA plan by incorporating in low impact stormwater management solutions as outlined in a guideline document titled LOW IMPACT DEVELOPMENT STORMWATER MANAGEMENT PLANNING AND DESIGN GUIDE that has been developed to augment the Ontario Ministry of the Environment's 2003 Stormwater Management Planning and Design Manual.

Appendix 1: Buffers, Critical function zone

A literature review of post-breeding migration for the amphibian species indicated in the EIS (Section 2.5, pg 24) emphasizes the inadequacy of the proposed 30m buffer:

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- Radiotelemetry data for *Bufo americanus* indicates that females disperse a minimum of 250 m away from spring breeding ponds and may travel up to 1000 meters into adjacent terrestrial habitat (Forester et al. 2006).

- In a classic study of anuran migration in Algonquin Park, R. S. Oldham demonstrated that Green frogs (*Rana clamitans*) migrate an average of 150 m from pre-season terrestrial habitat to aquatic breeding habitat (Oldham 1967).

- A 2007 study of post-breeding dispersal in Gray treefrogs (*Hyla versicolor*) indicates that after the breeding season ends adult males move on average 55m inland, while female adults move an average of 87 m inland (J.R. Johnson et al. 2007).

A 2003 review of 13 studies of non-breeding amphibian distribution found little biological evidence to support the application of the standard wetland buffer in the United States. They summarized their study with the following,

Our data clearly indicate that buffers of 15-30m, used to protect wetland species in many states, are inadequate for amphibians and reptiles (Semlitsch and Bodie, 2003).

T.A.G. Rittenhouse and R. D. Semlitsch in a 2007 review study entitled “Distribution of amphibians in terrestrial habitat surrounding wetlands” came to the same conclusion:

First, the area immediately and within the buffer zone typical for managing wetland water quality (30m, Castelle et al., 1994, Houlahan and Findley 2004) is not regularly used by adult amphibians outside of the breeding seasons and thus does not protect amphibians (Rittenhouse and Semlitsch, 2007).

Buffer of Wetland, from Beacon, page 35

The nature and intensity of the adjacent land uses can also play a role how well a wetland buffer can prevent encroachments into the wetland. Castelle *et al.* (1992) cite a study by Shisler *et al.* (1987) in which 100 wetland sites were assessed in terms of buffer width and direct human disturbances to wetlands (e.g., dumping of garbage and fill, vegetation damage and removal, trampling). They found that the intensity of adjacent land uses accounted for much of the variation, and recommended wetlands in lower intensity land uses (i.e., agriculture, low density residential, passive recreation) have buffers of 15 m to 30 m from wetlands, while wetlands within high density residential, commercial or industrial have buffers of at least 30 m.

Citations

Castelle, A.J., A. W. Johnson, and C. Connolly. 1994. Wetland and stream buffer size requirements: A review. *Journal of Environmental Quality* 23: 878-882.

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- Forester, D.C., J.W. Snodgrass, K. Marsalek, and Z. Lanham. 2006. Post-breeding dispersal and summer home range of female American toads (*Bufo americanus*). *Northeastern Naturalist* 13: 59-72.
- Houlahan, J.E. and C.S. Findlay. 2004. Estimating the “critical” distance at which adjacent land use degrades wetland water and sediment quality. *Landscape Ecology* 19: 677-690.
- Johnson, J.R., J.H. Knouft, and R.D. Semlitsch. 2007. Sex and seasonal differences in the spatial terrestrial distribution of gray treefrog (*Hyla versicolor*) populations. *Biological Conservation* 140: 250-258.
- Oldham, R.S. 1967. Orienting mechanisms of the green frog, *Rana clamitans*. *Ecology* 48: 477-491.
- Rittenhouse, T.A.G. and R.D. Semlitsch. 2007. Distribution of amphibians in terrestrial habitat surrounding wetlands. *Wetlands* 27: 153-161.
- Semlitsch, R.D. and J.R. Bodie. 2003. Biological criteria for buffer zones around wetlands and riparian habitats for amphibians and reptiles. *Conservation Biology* 17: 1219-1228.