

Darlene Conway, P. Eng.
291 Duncairn Avenue
Ottawa, Ontario K1Z 7H1

August 29, 2010

By e-mail to: minister.moe@ontario.ca

The Honourable John Wilkinson
Minister of the Environment - MINISTER'S OFFICE
Ferguson Block, 11th Flr
77 Wellesley St W
Toronto ON M7A2T5

Minister Wilkinson:

**Re: City of Ottawa Kanata West and Carp River Restoration Class EA
Notices of Completion: Part II Order Request**

I am writing to request that you issue an Order under section 16 of the Ontario *Environmental Assessment Act (EAA)* regarding the Class Environmental assessments (Class EAs) completed in support of the Carp River Restoration Plan (CRRP) and six other projects subject to the previous Minister's Order of July 21, 2008.

I have been involved with the planning of this project since late 2007, briefly (and indirectly) as an employee of the City of Ottawa and currently as a private citizen and professional engineer. Further details of my involvement with these projects are provided in the attached Appendix A.

Subsequent to my initial review of the documentation posted on July 30, 2010, I provided preliminary comments to the City on August 11, 2010. A response was provided on August 23, 2010, to which I further responded on August 24, 2010 (see complete e-mail thread in Attachment 1, Appendix C). As the response did not adequately address my concerns, I have found it necessary to proceed with this request for an Order under Section 16.

I have reviewed in detail the Class EA documents posted for public review and have serious concerns regarding the viability of the proposed Carp River Restoration Plan (CRRP), associated stormwater management criteria and the proposed implementation plan to support interim development. Based upon experience gained from over twenty years of professional engineering practice, it is my opinion that the CRRP, as currently conceived, is fundamentally

flawed in its proposed design and implementation. This is by virtue of its failure to meet the requirements and criteria of virtually every policy, guideline, and standard practice developed over the last 30 years in this province to guide the management of stormwater and floodplains. These guidelines have been developed to ensure that public health and safety is protected from increased risk, that the development approvals process is streamlined through the provision of consistent and defensible targets developed on a watershed basis, and that the overall public interest is served by ensuring that the long term operation and maintenance costs associated with both infrastructure and natural receivers of drainage are minimized. By this failure to meet standard and conventional requirements, this ostensible flood and erosion control project, if ultimately implemented, would result in excessive peak flow, velocity and flood level increases in and downstream of the study area, including at the Highway 417 crossings of the Carp River – in a watershed that has been plagued with flooding problems for the last decade and a half.

Supporting details regarding these concerns are provided in the attached Appendices B and C. In the interest of making plain the fundamental failings of the CRRP and associated stormwater management projects I document there each policy/guideline/practice and how the proposed CRRP does not comply.

I also have concerns regarding additional modeling errors and a number of technical assumptions made in support of the CRRP. These concerns are summarized below with further detailed support provided in Appendices B and C:

i) As noted above, the proposed CRRP and associated stormwater works are shown to result in excessive peak flow increases (ranging from 25 to almost 100%). This stems from reliance on an outdated SWM criterion derived from the 2005 Carp River Watershed/Subwatershed Study, the findings of which are based upon (now) obsolete modeling that, unlike the current analysis, showed only marginal increases in peak flows when quantity control was not provided. Further, the Watershed/Subwatershed Study itself recommended that the modeling be completely redone - which it has been, over the last 5 years - but with very different results that indicate unacceptable impacts. The SWM quantity control criterion should be revisited.

ii) The assignment of inconsistent and unsupported Manning's 'n' (roughness) values in the future condition modeling has the effect of masking the excessive peak flow increases that result from inadequate SWM controls by overly "smoothing" the restored river corridor, notwithstanding the fact that the CRRP calls for increased riparian vegetation over 70% of the reach. The use of an excessively low 'n' value of 0.001 for pond and pool surfaces has a significant lowering effect on flood levels but has been recommended with no supporting reference from the literature (Manning's 'n' values are empirically determined). Beyond the

use of this excessively low 'n' value, such an approach will necessitate perpetual maintenance of almost 50% of the restored corridor to maintain the design "smoothness," otherwise flood levels will rise considerably. The posted documentation does not acknowledge or evaluate this aspect of the CRRP, including its financial implications.

iii) The "worst case scenario," developed via the Third Party Review and comprising the requirement to provide additional storage volumes, is not an adequate safeguard that would allow interim development to safely proceed. It essentially applied the modified rational method to the whole of the 5000 hectare Carp River upper watershed (to Richardson Side Road), treating this area as a large bathtub or pond with a maximum release rate of 40cms. This approach is volume-based and cannot provide insight into water level increases at specific locations in the corridor which are influenced by more than the total volume in the corridor (peak flows, timing, etc.). This insight can only be provided by detailed hydraulic modeling. The design of infrastructure - whether built before or after the model is calibrated - depends on this level of detail.

It is troubling that hundreds of thousands of dollars have been spent on detailed hydraulic modeling that clearly shows unacceptable impacts, and yet a brief, simplified exercise (also derived from an uncalibrated model) is deemed sufficient to assuage all uncertainties in the interim. The lack of calibrated and validated modeling does not justify such an approach.

iv) The Third Party Review asserts that with respect to post-development flood levels, allowing for a 10 cm increase over existing conditions on the basis of "model tolerance" is acceptable. This recommendation confuses calibration matters, model accuracy in the absolute sense, and the role of modeling as a tool to assess the relative impacts of change in the watershed (e.g., urbanization, floodplain filling, etc.). It also fails to acknowledge the necessity of avoiding cumulative impacts, as long established by decisions of the Ontario Mining and Lands Commissioner. Appeals to fill or construct a dwelling in the floodplain have been denied on the basis of as little as 0.2, 1.0 and 5.0 cm of flood level increase. Accordingly, allowing for a 10cm increase in flood level on the basis of "model tolerance" appears to be a rationalization of avoiding the need to properly mitigate excessive peak flow increases.

v) Based upon hard copy modeling results provided by the City on August 23, 2010, there are evident errors in the model that result in negative flows and impossibly high peak flows and flood levels in some locations. It is surprising that such obvious errors were not caught until after the re-posting of the Class EAs. Unfortunately, this reflects a troubling pattern with this project's modeling that brings into question whether the most recent results have been

adequately reviewed and approved by qualified professional engineers or checked by the engineer of record.

As a professional engineer, I find it puzzling that such unsupported technical assumptions, additional model errors, and disregard for long-established policies and guidelines are being tolerated. I agree that it is not the responsibility of agency/approval engineers to overly scrutinize modeling – and adherence to these established guidelines, criteria and standard practices generally precludes the need for detailed review of the actual modeling files. Guidelines generally represent minimum requirements. When these are not met, it is incumbent upon the proponent/designer to justify any exceptions, but that has not been done here. In many cases, these failings have not been transparently documented, or even acknowledged.

Finally, the planning process for these projects has failed to meet fundamental requirements of the MEA Class EA, undermining the conclusions of the posted Class EAs. Specifically:

- The proponents have failed to consider all reasonable alternatives with respect to stormwater management and the CRRP. As noted above, the recommended SWM quantity control criterion is demonstrably inadequate to prevent increased flooding and the flood levels documented depend on a “smoothened” restored corridor that will require considerable perpetual maintenance. To meet the requirements of the Class EA, this option must be evaluated against all reasonable alternatives, with the provision of sufficient stormwater controls to meet pre-development peak flows, velocities, and flood levels being one of them.
- There has been a marked lack of transparency in the posted documentation. In the supporting studies prepared for the original 2006 Kanata West/CRRP Class EAs (CH2MHill, 2005 and 2006), the documentation of modeling results was clear and comprehensive, including: Manning’s ‘n’ values in all locations; pre- and post-development peak flows, flood levels and velocities at all sections for the 2 to 100 year events; expansion and contraction coefficients; pre-and post-development riparian storage volumes and travel times. In contrast, The Third Party Review (2009) and Widening Alternatives report (2010) supporting the July 2010 re-posting only document 100 year flood levels. Full and transparent reporting of input parameters and output is essential to facilitate the review and understanding of model results. These items are a standard requirement of documentation for projects of this nature.
- There has been a failure to acknowledge a change in the environmental setting and avoid the piecemealing of projects: On July 24, 2009, a year before the Kanata West

Class EAs were re-posted, a significant rainfall event resulted in hundreds of homes in the Glen Cairn and other Kanata/Stittsville neighbourhoods experiencing basement flooding. In response to that event, the City of Ottawa undertook the Glen Cairn Flooding Investigation (GCFI), the completion of which is imminent (early fall 2010).

The need to undertake the GCFI represents a fundamental change in the environmental setting of the CRRP that the City has not considered or accommodated in the project planning before re-posting the Class EAs. The need to lower high operating levels in the Glen Cairn pond (a key contributor to the flooding) could have implications for the CRRP: can the release rate from the pond be increased? Is lowering the Carp River by extending the restoration plan further downstream a feasible option? As noted above, the Kanata West Class EAs have not considered or evaluated the alternative SWM control option of ensuring pre-development peak flows are not exceeded. Apart from fulfilling a basic requirement of the Class EA (i.e., consider all feasible alternatives), this should be considered in light of the GCFI and the need to lower operating levels in the Glen Cairn pond, possibly by increasing the existing release rate. If allowing several hundred hectares of greenfield development to discharge uncontrolled beyond the 10 year event can be considered a feasible alternative, then surely examining the potential to increase release rates from a facility that serves an existing community plagued with flooding (in combination with increased SWM controls for Kanata West) must be considered a feasible alternative to evaluate as well.

Seeking approval of the CRRP EA in advance of the completion of the GCFI, a mere few months away, prejudices the evaluation of these and other potential alternatives. To address the change in environmental setting and avoid the piecemealing of fundamentally related projects, the GCFI and Kanata West/CRRP Class EAs should be coordinated (while accepting and accommodating the constraint of providing a solution for Glen Cairn residents as quickly as possible).

Additional details regarding my concerns with the planning process are provided in Appendix B.

Finally, the fundamental shortcomings of the CRRP and approach to interim development can be summarized very briefly:

- A relaxed SWM criterion (10 year control only) is justified on the basis of an obsolete modeling exercise. Applying this criterion to the updated modeling supporting the CRRP/Kanata West results in excessive increases in peak flows, velocities, and flood levels.

- The inadequate SWM criterion is not revisited. Instead, some 50% of the CRRP – intended to provide a naturalized, fully vegetated corridor – is “smoothened” by the use of an unsupported parameter and the provision of large grassed/manicured areas that will require regular maintenance in perpetuity.
- For interim development (up to some 500 hectares), conventional 2 to 100 year SWM controls are proposed, notwithstanding the concern that for the future condition (a few more hundred hectares), this could result in *higher* peak flows, this being the justification to maintain 10 year controls only for the CRRP design. Further, interim peak flow targets are to be determined on a site-specific basis for with each individual development application. Planning on a subwatershed basis is a provincial interest and a requirement of the Official Plan, but apparently not a requirement for 500 hectares of interim development.
- .Finally, the uncertainty associated with the uncalibrated modeling is to be addressed by the provision of additional storage based upon a very simplified exercise that cannot provide insight into flood level, peak flow, and velocity impacts at specific locations in the corridor - notwithstanding that detailed hydraulic modeling that has been under preparation for the last half decade shows significant, unacceptable impacts for the future condition and a watershed-based analysis to support interim development (at the same level of detail as provided for the future condition) does not exist.
- All of this will be reconciled when the model is calibrated.

In my opinion, this approach provides the very least in the interim while hoping for the very best upon calibration with no scientific evidence to support that position and in the face of a restoration plan that results in unacceptable impacts. Calibration may change this to some degree but it will not cause these impacts to disappear.

Based upon the foregoing summary of concerns and attached detailed supporting information, I submit that it is premature, inadvisable and inconsistent with the *EA Act* to proceed with the CRRP, associated undertakings and implementation plan for interim development as currently conceived.

That being said, my intent in submitting this request is not to delay interim development but to ensure that it proceeds in conformity with conventional requirements. Some proportion of the approved development lands could proceed in the interim without unacceptable impacts on public health and safety or significant cumulative effects that could not be reversed (should that be found necessary) by the remaining proportion of development put on hold until calibrated modeling can confirm the design of the CRRP and required stormwater management works.

Application of the “worst case scenario” and a premature Class EA approval of the CRRP is not the means to achieve this. In this regard, the Notice of Completion for the CRRP/Kanata West Class EAs should be withdrawn and the following steps taken to allow some interim development to proceed while the significant shortcomings of the CRRP are addressed:

- i) There should be an immediate preparation of a watershed-based cumulative impact analysis that will inform a revised interim development plan. This analysis would determine the acceptable proportion of interim development that can proceed over the next 3 to 5 years based upon the determination of watershed-based targets that ensure existing peak flows, flood levels and velocities are not exceeded within the unrestored Carp River.
- ii) The CRRP should be integrated with the GCFI.
- iii) Within the next 3 to 5 years, complete calibration/validation of the hydrologic/hydraulic modeling and update the CRRP and permanent stormwater management undertakings such that all required guidelines and criteria are achieved and unacceptable impacts upstream and downstream of the restoration are avoided or fully mitigated.
- iv) Provide Class EA postings for interim and ultimate works as required.

Proceeding in this fashion would provide an efficient means of allowing a proportion of the long-delayed development to proceed in the interim that is consistent with provincial policies, guidelines and the *EA Act* while uncertainty associated with the modeling is resolved. More simply, such an approach does not depend on or require the Class EA approval of a flood and erosion control project that would increase flooding and erosion.

Respectfully submitted,

Darlene Conway, P. Eng.

cc: Don Herweyer, City of Ottawa via e-mail: Don.Herweyer@ottawa.ca
Michael Green, Kanata West Land Owners Group via e-mail: mjgreen@dmel.on.ca