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MEA/MOECC Liaison Group - Report to MEA Board regarding Low Impact Development Manual Comments - June 19, 2017

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References to City of Ottawa LID Stakeholder Review Group

Background

The following report is intended to bring to the attention of the members of MEA, the proposed Low Impact Development (LID) Stormwater Management Guidance Manual.

MOECC has maintained a large policy Stakeholder Review Group which includes several organizations including the Cities of London and Kitchener, and MEA. MEA wishes to thank MOECC for their continuing efforts in public consultation and for the involvement of MEA members who have contributed personally to the stakeholder group.

This report has two purposes. It is meant to bring to all members attention the contents of the proposed MOECC LID Stormwater Management Guidance Manual. Members are encouraged to review available documentation and comment on the EBR when the guidance manaul is posted in the near future. The second purpose is to reflect some of the high level and varied opinions of the broad MEA community. The report does not necessarily reflect personal opinions of the respective contributors or their municipalities for all of the content. The report does try to highlight both the objectives of the policy, as well as potential concerns raised by members with some aspects of the proposed LID guidance document. In completing this report, it is acknowledged that the document contains information from other sources. Specific permission to use this information has not been sought, due to tight timelines.

It is understood that the LID guidance document is meant to complement the MOECC Stormwater Management Design and Planning Manual, issued March 2003, by providing a policy framework for low impact development to provide further guidance and direction in the implementation of the “treatment train” approach identified in the 2003 manual. The proposed LID Guidance document is not intended to be used as a detailed design manual. The Toronto and Region Conservation and Credit Valley Conservation authorities have produced good design reference documents.

Introduction of LID policies will have operations and capital budget impacts to consider, and may require amendments to the Planning Act and municipal policies for monitoring drainage on private property. The broad application of LID processes will certainly impact master drainage plans and require updated design criteria.

The final version of the guidance manual must be sufficiently flexible to match the broad variances in municipalities related to: growth rates, ability to fund improvements, and local site conditions across Ontario and regional objectives.

Recommendations

It is recommended that the MEA Board and its individual members closely monitor the continuing advancement of the MOECC LID Development Manual and maintain direct constructive dialogue with the MOECC stormwater policy group; and when appropriate, provide comments on related EBR postings.

(The MEA-MOECC Liaison Committee, augmented by any stormwater professionals as recommended by the MEA Board, would be pleased to represent MEA with further dialogue on this topic with appropriate MOECC officials.)

Policy Background

From MOECC presentation documents:

> "The natural hydrologic cycle should be maintained to the greatest extent possible. The Ministry's existing acts, regulations, policies, and guidelines emphasize the need for this approach to stormwater management.
>
> "Going forward, the Ministry expects that stormwater management plans will reflect the findings of the watershed, sub watershed, and environmental management plans, and will employ LID in order to maintain the natural hydrologic cycle to the greatest extent possible."

Stormwater Management Overview

The objective of storm water management has been designed to mitigate urbanization impacts pertaining to flooding, erosion, water quality, and water balance (in groundwater recharge and discharge).

Typical stormwater management tools used today are source/LID best management practices (BMP's), conveyance, and end of pipe structures. Stormwater retention (without infiltration) ponds that release to a receiver body of surface water are considered a method of last resort for managing stormwater. However, they are typically (not always) proposed as the only solution in new development, with relatively little consideration or effort given to source or conveyance controls upstream, unless dictated by a local subwatershed study.

The water quality objective is 80% removal of suspended solids (TSS).

LID BMPs address the potential impacts of erosion, water quality, aquatic habitat, groundwater recharge/discharge, and temperature.

Some examples of LID methods are: rainwater harvesting, green roofs, roof downspout disconnection, bioretention, vegetated filter strips, permeable pavement, enhanced grass swales, dry swales, infiltration galleries, and perforated pipe systems.

Key Policy Factors Included in the Proposed LID Development Manual

Guidance on Targets for Runoff Volume Control will apply to new development and urban reconstruction, manual is recommending that 90% of total rainfall volume should be controlled and returned to natural pathways. Runoff Volume Control Target RVCt generally means that approximately the first 25mm+ of precipitation has to be retained on site. The RVCt value varies slightly across the province according to rainfall patterns, but does not consider the significant variability in hydrologic and hydrogeologic conditions, the diverse range water system stresses, or environmental sensitivities. As such, the proposed targets are neither risk nor need-based, unlike other Ontario water management targets.

The proposed minimum Runoff Volume Control Target (RVCt) for Ontario represents a significant shift in the practice of stormwater management for municipalities: from mere encouragement to reduce runoff volume increases resulting from urbanization, to a **mandatory performance target for all development subject to *Planning Act* approvals, as well as municipal road rehabilitation works.**

The RVCt is to be applied to new development, redevelopment, reurbanization, and residential intensification; "linear projects" that include all right-of-way (ROW) projects (new roads, widenings, and reconstruction), rail lines and transit infrastructure.

The LID Guidance Manual includes a mandatory control hierarchy which requires that the RVCt be met by prioritizing stormwater management methods as follows:

1. **retention**: runoff volume is to be reduced via infiltration, evapotranspiration, and/or re-use, with this volume being defined by the existing condition water balance on the site;
2. **detention and release**: runoff volume not eliminated is to be treated via filtration approaches, e.g., filtering through bioretention (LID) features with slowed release to the storm sewer system;
3. **other detention and release**: remaining proportion of the RVCt volume to be detained and treated, e.g., storage of runoff for sedimentation in end-of-pipe facilities.

- Designs must anticipate and mitigate potential negative impacts on groundwater;

- Designs must anticipate and accommodate the effects of climate change;

- Designs must utilize appropriate approaches and modelling tools to evaluate performance;

- The guidance manual establishes a consistent mandatory pre-development runoff coefficient of 0.15 for new development, 0.3 for existing urban areas and the existing impervious condition for linear projects;

- Return precipitation volume to the natural hydrological pathways;

- Minimum volume targets, superseded by volume targets as developed through watershed, sub-watershed, master drainage plans, Environmental Impact Statements, and/or other specific studies;

- Targets to be achieved to the maximum extent possible (MEP), defined as the maximum achievable volume control, beyond the water balance requirement, using all known available and reasonable resources, including the methods as described within the manual, given the site restriction.

Recommended Components of the LID Development Manual to Monitor

The most critical component for municipalities are the necessary administrative processes and funding envelopes required to successfully implement proposed LID targets. The guideline suggests that nearly all municipal linear reconstruction projects and all new development will be required to provide volume controls. The focus of these comments are the challenges we foresee for municipal projects. We offer the following high-level comments:

1. **Timing of ECA approvals:** It is our understanding based on the draft manual that approvals for most LID systems would trigger a Direct Submission to the MOECC. We are concerned with possible scheduling delays due to the current wait times of six to nine months. These additional efforts would be burdened by the need to develop options to "relocate project elements" (i.e., change fundamental design) and "document and explore alternative innovative alternatives" for sites with restrictions, lengthening current wait times. Simple Transfer of Review approvals for voluntary reconstruction of municipal infrastructure would now require full Direct Submissions due to LID components.

2. **Monitoring LID systems:** Monitoring LIDs on an individual project basis is expensive and time consuming. We support implementation of watershed, subwatershed, and catchment level monitoring identified in Section 10.2. We believe this will better reflect the health of watercourses over the long-term.

3. **Additional public funding requirements:** Meeting the volume control targets on existing rights-of-way will significantly increase engineering and construction costs for linear redevelopment projects. Many municipalities are experiencing significant financial infrastructure gaps and have highly constrained funding to provide their current level of service. Since the proposed requirements will require an expansion of the current level of service, the additional costs will result in either higher taxes, user fees, or an increased infrastructure gap. Representatives of two municipalities who have reviewed the LID guidance document extensively, suggest that the cost of

ongoing municipal capital lineal assets maintenance and replacement programs to the proposed RCVt levels are unaffordable, increasing municipal taxes by even 80-90% or stormwater utility fees by 10 to 25 times. The policy framework should ensure that costs comparisons promoting any stormwater management option carefully consider the lifecycle cost factors, as most municipalities will have little experience with the long term fiscal impacts of LID. It should also consider adverse impact of LID on existing infrastructure systems, including: (i) wastewater infiltration with increased flood risks, treatment costs, and by-passes; (ii) accelerated corrosion of ferrous components of water distribution systems; and (iii) drinking water source contamination risk for allowable infiltration in WHPA-A vulnerability zones and Issue Contributing Areas (ICA).

It has been suggested that the resurfacing of roads not been included as a requirement to reach RCVt targets as there is little physical flexibility within municipal rights-of-way, nor is there always funding available to achieve the desired results. The guidance document now reflects this as a linear development exemption, without addressing other practical limitations for sites with restrictions. For example, flood-prone wastewater system areas are now added as a constraint; however, the proponent is directed to either meet 75% of the target with no practical options for reuse of evaporation on a roadway, or to achieve the Maximum Extent Possible (MEP).

Identifying trails and sidewalks separately as "linear projects" is problematic as the impact of these elements is either very limited (when they drain to adjacent pervious surfaces) or should already be accounted for in full ROW reconstruction projects.

4. **Direct Discharge to Watercourses or Wetlands:** The document proposes that all stormwater works which discharge to a watercourse cannot qualify for reduced volume targets or to meet Maximum Extent Possible. This is problematic. The exemptions should equally apply to lands discharging to a watercourse, as valid constraints will exist.

5. **Operations and Maintenance:** The long-term operational and monitoring costs for LID infrastructure is of primary concern for municipalities. For LIDs on public property, it should be noted that the operational and maintenance costs related to LID represent an increased service level and will require additional operating dollars to be borne by municipal constituents. With respect to LIDs on private property, for various legal reasons, it is not appropriate for municipalities to maintain LIDs on private property. Climatic conditions vary significantly across the Province and there is a concern regarding the effectiveness of LID methods under winter conditions.

   The use of LID infrastructure should not have to be implemented where there is already an existing sanitary sewer I and I (inflow and groundwater infiltration) problem, nor should impractical alternatives be prescribed to achieve 75% control with a limited set of available LID options (i.e., no infiltration) at unlimited cost (per guidance Sections 3.3.3.5.1 and 3.3.3.5.2)

   The LID guidance document promotes widespread recharge of stormwater into groundwater systems. In existing municipal roadway settings, runoff reuse

opportunities are practically limited such that recharge of runoff using infiltration LID measures would be required. Impacts of such recharge in partially separated wastewater servicing areas include increased extraneous flow stresses, surcharge potential, and sewer back-up risk, as well as migration of 'fines' in conjunction with pipe infiltration contributing to settling and structural failure of existing sewers.

Watermain corrosion increases with recharge of chlorides from LIDs, reducing service life and increasing the risk of breaks. LID infrastructure should not have to be implemented in areas with cast or ductile iron watermains or risk of source or distribution system contamination.

6. Model Selection Framework:

- **Consulting and Municipal Capacity**

  It is our experience that there few consulting firms qualified to complete hydrologic/hydraulic modelling especially outside of the broad GTA area. Municipalities are highly concerned with the capacity of the consulting community to provide detailed groundwater modelling and the knowledge and ability for municipal staff to review this work. Given current available resources of consultants and municipalities, we foresee there will be a number of technical and resourcing challenges to conducting a modelling effort beyond a Class B. We are therefore concerned about timelines for approvals by the MOECC, given the increased level of complexity.

- **Level of Analysis prior to Implementation**
  Class C and D models are complex and require adequate data about the aquifer and groundwater level data. The timelines/cost required to gather data to populate groundwater models may be onerous. We question the value and benefits to completing these highly complex models when groundwater modelling tends to be unpredictable and may be difficult to establish baseline information.

  The policy framework needs to be flexible and to allow levels to make their own decisions on whether to employ LID methods that would add more groundwater to the area without the need for expensive evaluations.

- **Model selection process**
  Introducing the model selection process is going to create significant debate amongst consultants, municipalities, and conservation authorities with respect to the necessary level of effort for each project. If one of the important criteria to conduct a Class B model is a maximum area of 250 ha, it will hinder subwatershed-wide analysis as all parties will wish to stay within the Class B modelling category where all other criteria may not be met.

7. Stormwater Management as a Municipal Priority

- **Administration Concerns**

For a variety of reasons there is widespread variance in the levels of administrative and funding effort applied to stormwater management across the Province. There are likely many factors involved, including: rural vs. urban, stagnant growth vs. rapid growth, proximity of stormwater works to ultimate stormwater receiver, source of potable water (groundwater vs. surface water supply), and local hydrology and hydrogeology.

Smaller municipalities may not be spending much effort in this area, and likely lack both the financial resources to establish the base data and the technical staff resources required to manage ongoing stormwater LID programs either for retrofits or for new development. In contrast, approximately eight municipalities have established stormwater "utilities". In theory, all costs and revenues related to stormwater management are tracked and maintained separately from other municipal operations. These "utility" type structures promote the availability of dedicated funds for the financing of stormwater projects. Some municipalities are moving rapidly on this policy. The City of Kitchener recently completed its Integrated Stormwater Management Master Plan, which is well aligned with the anticipated MOECC LID Guidelines; and the City is currently in execution mode, applying the new standards to development applications as well as linear infrastructure projects and municipal facilities.

Many municipalities in Ontario such as Odessa and Carleton Place have localized communities that experience very high groundwater tables and basement flooding is a major concern. These communities will have limited interest in employing any processes that increase groundwater levels. How would these municipalities protect themselves from liability due to flooding claims?

8. **Municipal Class EA:** The Municipal Class EA is an established, MOECC-approved process whereby municipal projects as defined in the MCEA document, can be planned, designed, constructed, operated, maintained, rehabilitated, and retired without having to obtain project specific approval under the EA Act.
The MCEA process follows logical defined steps of identifying and providing a series of solutions for a specific identified problem(s) and opportunities. The proponent must have due regard to the need to protect the environment and minimize environmental effects. It is important that the EA process not be overlooked.

   The LID Manual needs to be fully compatible with the approved MCEA process and ensure that such LID criteria, such as the proposed RVCt mandatory control hierarchy and the use of LID itself, are evaluated fully along with other potential alternatives and local project specific constraints or identified local problems, such as high water tables and or sewer I and I. Such an approach would allow municipalities to respond to specific local risk-based needs, e.g., watershed-specific baseflow stresses requiring water balance remediation.

   The City of Kitchener recently completed their Integrated Stormwater Management Master Plan (ISWM-MP). The ISWM-MP was completed in accordance with the

requirements for Master Plans under Section 4, Approach #2 of the MCEA document, which is an approved process under the Ontario Environmental Assessment Act. The ISWM-MP completed the required 30-day public review period on July 10, 2016, at which point the ISWM-MP was considered final. Completing this study as a Schedule B Environmental Assessment allows the City to proceed with the detailed design and construction of individual elements of the works subject to completion of the 30 day review. Further citizen engagement will be conducted for individual elements of the work to help shape and refine the detailed design phases. It further identifies any Schedule C projects for future studies.

9. **Transition Period:** Municipalities will need a transition period that will provide sufficient time to incorporate this significant shift in their operations, for both new development and capital programs. Similarly, if municipalities are to have greater control post-development, there will need to be improved mechanisms for ongoing monitoring and control of stormwater management on private properties, which require amendments to Planning Act-authorized development approvals and municipal bylaws.

   There have been valid points raised that some provincial planning policies, such as those that are promoting urban intensification, are difficult to manage and actually contradict the objectives of the LID manual. Municipalities are being asked to manage a higher RCVt component over properties that are increasingly less pervious. These types of issues require serious, high-level coordination.

10. **Climate Change:** Municipalities and CAs are expected to implement federal and provincial policies related to climate change including greenhouse gas reduction, and possible/unknown changes in temperature and precipitation patterns. Municipalities and CAs will be challenged to implement senior government policy for the following reasons:

    - There are no specific federal or provincial policies or targets for municipalities to follow, beyond a high-level action plan. Without more direction, essentially local politics will dictate the level of adaptation for each municipality, which will lead to varying levels of protection across the province.
    - Downscaling of Global Circulation Models and updating local IDF curves is noted as one option for municipalities to adapt to climate change. We note that smaller municipalities will struggle for resources to update IDF curves and larger municipalities will struggle to justify selection of a GCM. We suggest the province select a GCM to ensure consistency between municipalities and assist smaller municipalities to adapt.
    - The four-step climate change adaptation process is subjective. We are unsure of the value of adding this activity to municipal or planning applications without more direction from senior government.

11. **Watershed and Master Planning:** Municipalities and CAs have invested heavily in local technical studies to develop diverse and integrated water management strategies and targets to address local needs. These may achieve receiving water quality goals through CSO control, and water quantity management goals for in-

stream erosion mitigation, baseflow maintenance, natural heritage features preservation, and source quantity management. The level of technical analysis can far exceed that of the simple rainfall statistical analysis offered in the LID guidance manual. And the resulting LID targets from local technical studies can diverge considerably from the generic targets in the manual, sometimes less than 20% of those in the manual (e.g., Toronto Wet Weather Flow Management 5 mm target, North Markham Subwatershed Studies 4-10 mm varying by subwatershed). The LID guidance statistical rainfall approach that omits events less than 2 mm events results in an automatic 40% LID overdesign for (e.g., Toronto Wet Weather Guidelines show that 90% of rainfall is captured at 20 mm as opposed to 27-28 mm in the LID guidance). Local analysis is needed to set local LID targets, just as local source protection policies have been set based on local needs and relying on local technical studies, with level of analysis and mitigation commensurate with risks on in consideration of cost.

Conclusions

The goals identified by the MOECC of simple administration and flexibility in responding to site specific conditions are extremely important towards the successful implementation of LIDs.

Municipalities will face significant challenges to meet the LID policy objectives in existing urban environments, for linear projects as well as redevelopment work with existing infrastructure as opposed to greenfield projects. These challenges must be recognized. The success of the LID guidance manual will depend on the ability of the policy framework to be adaptable.