Day One - Track One
Wednesday, March 22nd, 2017
2:00 p.m. – 2:30 p.m.

Establishing Appropriate LID BMP Volume Control Targets to Effectively Address Subwatershed Objectives – How Much is Enough?

Presenters: Daron Abbey, Matrix Solutions Inc.
Ron Scheckenberger, Amec Foster Wheeler

Biographies

Daron Abbey has over 18 years of experience in water resource system characterization and management. He has been a technical lead for multi-disciplinary and multi-stakeholder projects including subwatershed studies and environmental servicing and impact studies. His strong understanding of natural systems and the application of integrated numerical modelling has led to practical refinements of land use and storm water management plans using area-specific management strategies that consider system dynamics, planning objectives and environmental considerations.

Ron Scheckenberger has over 33 years of experience in contemporary storm water management. He has led a number of large scale land use planning initiatives across Southern Ontario assessing the impacts of proposed urban land use change on the environment, and developing integrated management strategies. He has consistently worked alongside municipalities, regulators, land developers and the public to establish plans which are practical, balanced and innovative. His projects have guided the development for over 500,000 residents and 100,000 workers across the Province.

Abstract

Low Impact Development Best Management Practices (LID BMPs) are part of overall contemporary integrated stormwater management strategies to reduce run-off, enhance erosion control and manage water quality, groundwater discharge volumes and stream temperatures that support terrestrial and aquatic habitat.

LID BMP Guidelines often specify a generic volume control target (e.g. 90th percentile event) requiring lot level implementation of infiltration, water reuse, evapotranspiration, and filtration strategies whose performance is not directly linked to the spatial and temporal dynamics or function of the water budget components other than run-off and if implemented have the potential to result in groundwater mounding, reductions in groundwater discharge and increased temperature in receivers.

In the north Markham Future Urban Area Subwatershed Study an integrated surface-groundwater model was developed to represent the surface water and groundwater systems processes and dynamics using the data traditionally collected to support subwatershed management and development plans.

Area-specific volume control targets are being developed based on the system characteristics represented in the integrated model to assess the effectiveness of different levels of infiltration-based LID BMPs. The results provide spatial and temporal understanding of variability in infiltration capacity, run-off, impacts on depth to water, and groundwater discharge to sensitive receivers such as Redside Dace habitat.

The study demonstrates that system-based area-specific volume control targets are achievable that maximize volume control opportunities while minimizing potential environmental impacts associated with lot level management and related development form and infrastructure.

Learning Objectives

1. Generic volume control targets may mitigate potential increased run-off and erosion but may result in other impacts e.g. groundwater mounding;
2. Area-specific volume control targets can be used to balance run-off and erosion objectives and potential negative environmental impacts; and
3. Area-based volume control components can be optimized by representing the system in an integrated surface water-groundwater model.