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# City of Toronto Wet Weather Flow Management Guidelines 2014 Update

TRIECA Conference

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Acting Director, Water Infrastructure Management  
Toronto Water





# Guiding Principles of the WWFM Plan

1. **Recognize** rainwater and snowmelt as a valuable resource. Manage rainwater where it falls, on the lots and streets of our City, before it enters a sewer
2. **Manage** wet weather flow on a watershed basis using an ecosystem approach
3. **Implement** a hierarchy of wet weather flow practices starting with "at source", then "conveyance", and finally "end-of-pipe" solutions
4. **Inform and educate** Toronto's communities about wet weather flow issues and involve the public in developing solutions

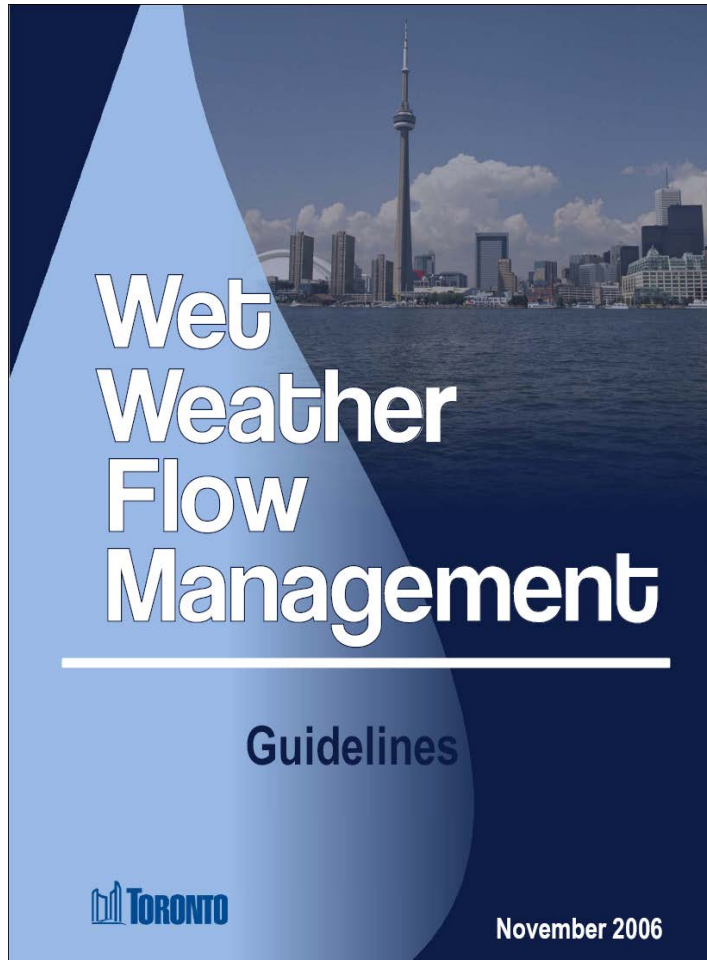
# Key Goals of the WWFM Plan

- Protect water quality in Toronto's watercourses and Lake Ontario
- Reduce basement flooding

# WWFM Plan (cont'd)

- Objectives related to:
  - Water quality
  - Water quantity
  - Natural areas and wildlife
  - Drainage systems
- The WWFMP identified measures and projects to be implemented over a 25-year timeframe to achieve the objectives
- Approved by Council in 2003

# About the WWFM Guidelines



- Practical aid for the preparation, review and approval of Storm Water Management Reports
- Sets performance objectives for site level SWM consistent with WWFM Policy
- Harmonize practices and design criteria of pre-amalgamation municipalities
- Not a manual of Best Management Practices
- Published in November 2006



# WWFM Guidelines (cont'd)

- Performance objectives with respect to:
  - Water balance
  - Water quality
  - Peak runoff and flood management
  - Erosion and soil control

# Water Balance Targets

- Maintain pre-development volume of overland runoff
- Maximum allowable is 50% of annual precipitation
- Minimum retention is 5 mm per event
- Implies infiltration, evapotranspiration, and rainfall harvesting

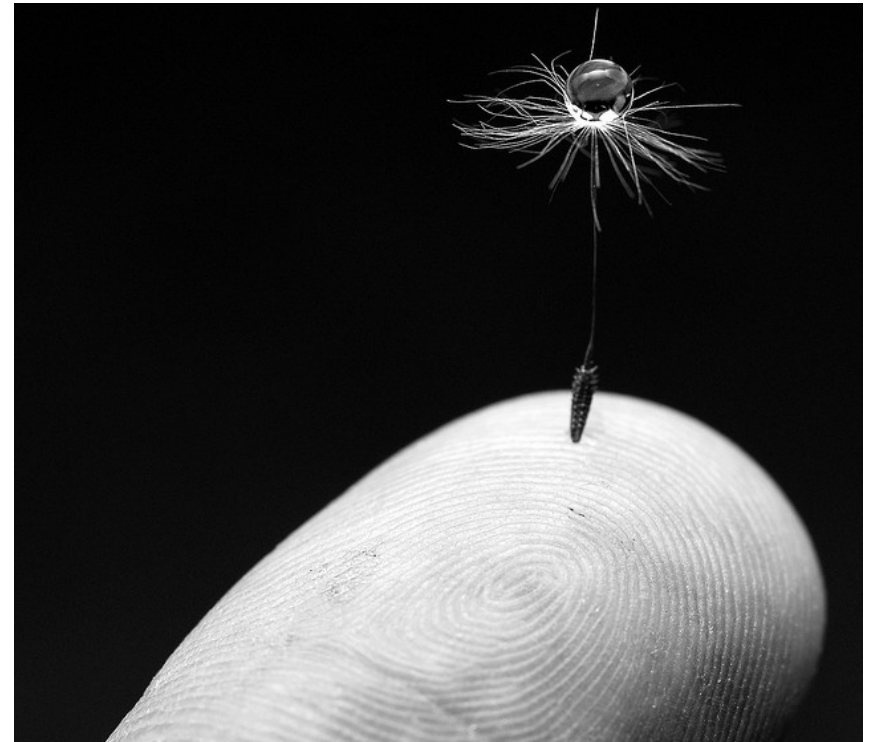


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# Water Quality Targets

- Remove 80% of Total Suspended Solids on an annual loading basis over entire site
- *E. coli* targets for direct discharges to Lake Ontario
  - <1000/100 mL (wet weather during summer)
  - <100 / 100 mL (dry weather during summer)

# Peak Flow and Erosion Control Targets



- Pre- to post-development flow criteria
- Adhere to TRCA Flood Flow Criteria Map
- Consultation in basement flooding study areas
- Where no overland flow, storage on site of 100-year storm
- Erosion control criteria where directly discharging to watercourse

# New Context

- Recall that focus of WWFM Plan is on *water quality*
- There is recognition that managing *quantity* may be more effective



# August 19, 2005







July 8, 2013

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# Basement Flooding Protection Plan (BFPP)

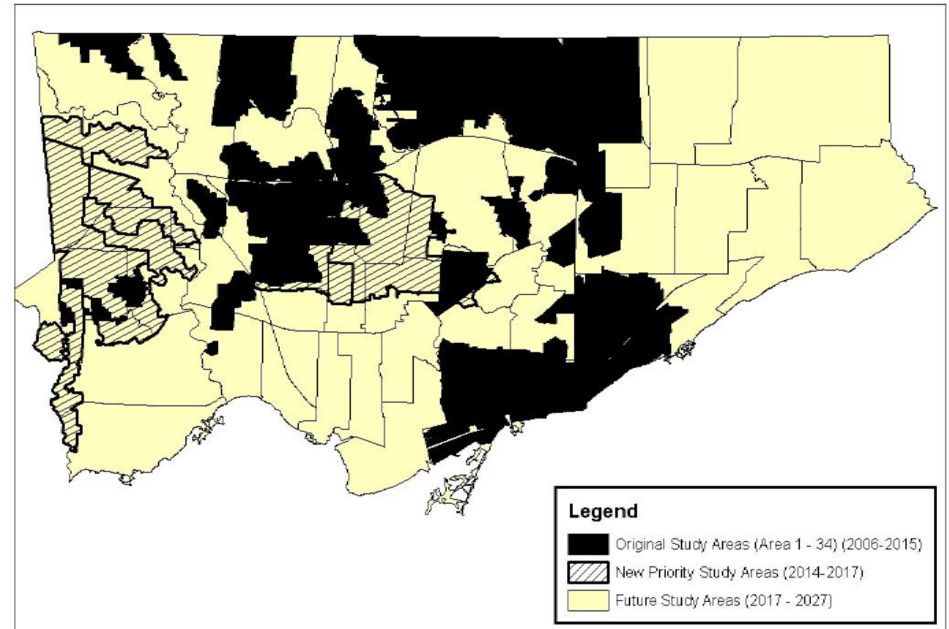
- Approved by Council in 2006
- Follows the Province of Ontario's Class EA process
- Enhanced service standards:
  - Max HGL of sanitary sewers must be below basement elevations during a storm event equivalent to May 2000
  - Max HGL of storm sewers must be below basement elevations during a 100-year design storm ("new development" standard)





# BFPP (cont'd)

- BFPP is being expanded from 34 priority study areas to the entire city
- The new study areas will be prioritized based on the density of flooding complaints across a variety of storm events exceeding the 25-year storm event
- Studies on seven new areas are expected to begin by early 2015

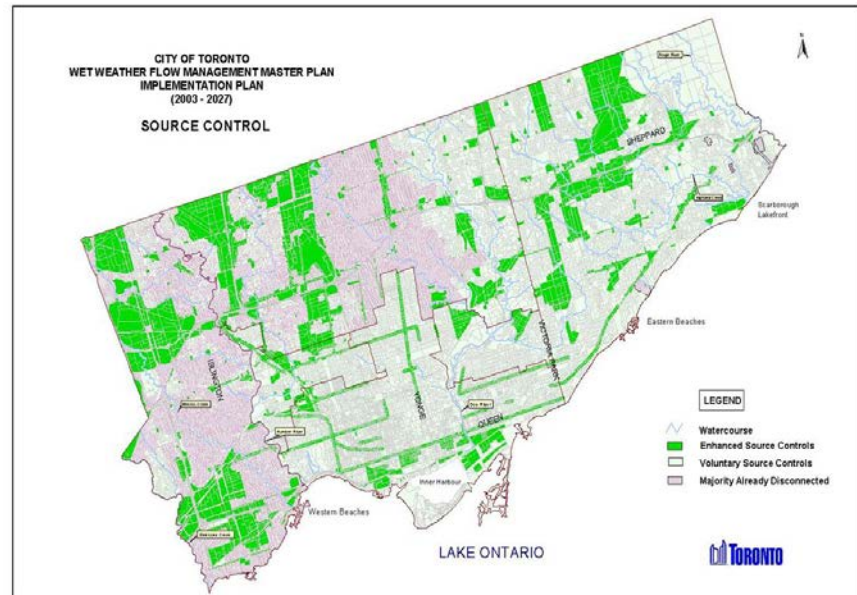


# Mandatory Downspout Disconnection

The bylaw comes into effect on:

- **November 20, 2011** for properties in the combined sewer area
- **December 3, 2013** for properties in basement flooding areas
- **December 3, 2016** for properties outside basement flooding and combined sewer service area

If disconnection is not technically feasible or would create a hazardous condition, owners can apply to the City for an exemption.



# City-Wide Zoning By-Law (569-2013)

- Enacted May 9, 2013
- Residential below grade garages (reverse-slope driveways) are no longer permitted
- Maximum lot coverage values are specified, including minimum values for front yard soft landscaping

TORONTO City Planning

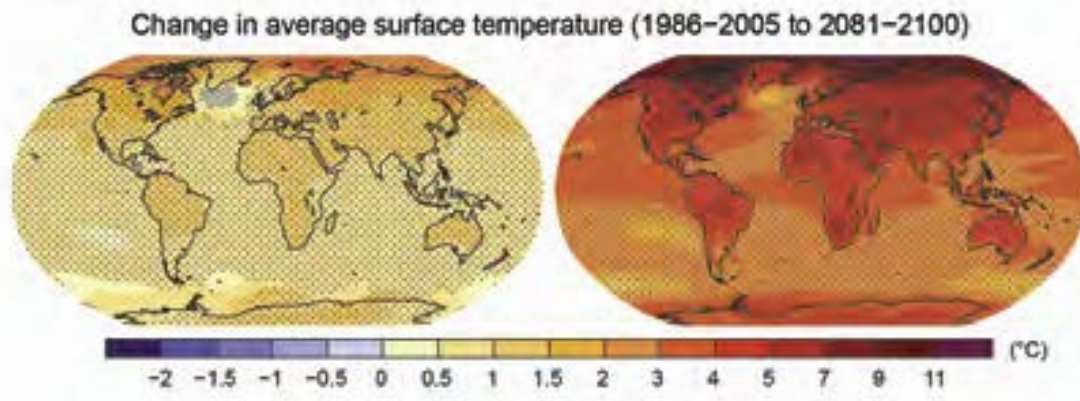
## Citywide Zoning By-law Residential Zones





# Climate Change

- The City commissioned a climate change study, released by SENES in 2011
- Accommodating extreme weather events will be a key priority for future iterations of the Guidelines
- Extreme rainfall events will be fewer in number but more extreme



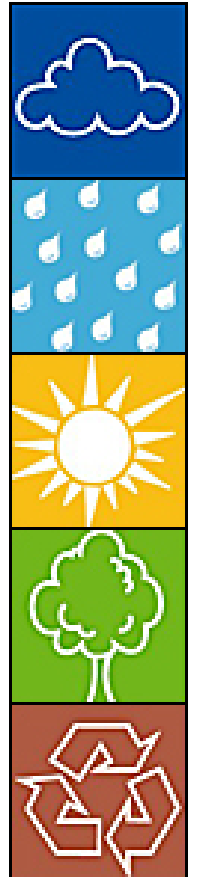
# Low Impact Development (LID)

- Principles:
  - Use hydrology as the basis for site design
  - Think small
  - Control stormwater at the source
  - Simple is safe
  - Landscape: more than just pretty plants



# Toronto Green Standard (TGS)

- The Toronto Green Standard (TGS) is a two-tier set of performance measures with supporting guidelines related to sustainable site and building design for new private and public development
- The TGS was derived from:
  - Existing Toronto Standard or Guideline (SWM Guideline)
  - Targets from existing programs (Better Buildings)
  - Third party standards (e.g., LEED)



# Eco-Roof Incentive Program



Photo by Gabriel Li // StudioGabe on Flickr, CC BY-NC-ND 2.0

- Established by the City in 2009
- Promotes the installation of green and cool roofs on Toronto's existing buildings and new buildings



# Other City Initiatives

- Complete Streets
- Green Streets
- Separate stormwater financing
- Resilient City...





# Objectives of the Update

- Provide new information and context
- Make the Guidelines more user-friendly for both applicants and reviewers (i.e., City staff)
  - Complete restructuring of the document
  - Clarify content (e.g., make sure important info is not buried in footnotes)
  - Edited to make it sound like one author
- Post the Guidelines online to facilitate access and future updates

# Key Guideline Updates – Short-Term

- Method for determining initial abstraction for water balance targets
  - Adjust 5 mm retention requirement?
  - Consumptive use of greywater?
  - Consultant assignment to establish quantitative justification

# Key Updates (cont'd)

- Calculating cash-in-lieu (\$/m<sup>3</sup>)
  - Current figure is \$1000/m<sup>3</sup> based on underground storage option
  - Planned to use Southam Construction Cost Index to calculate inflation, but it no longer exists
  - Recalculating figure using costs of new tanks plus associated costs

# Key Updates (cont'd)

- O&M of SWM facilities as part of SWM Report and on title
  - Verification and monitoring of SWM facilities is challenging
  - Working with Legal Services division to determine protocol

# Key Updates (cont'd)

- Linear infrastructure
  - Gap in existing Guidelines: no specific requirements for linear projects
  - Adapting requirements developed for Metrolinx projects



<http://www.thecrosstown.ca/news-media/whats-new/construction-updates>

# Key Updates (cont'd)

- Environmental Technology Verification for oil and grit separator (OGS) units
  - ETV is an emerging made-in-Canada solution
  - Used in City of Markham



# Key Updates (cont'd)



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- Erosion control during construction
  - Gap in existing Guidelines

# Long-Term Updates

- Climate change/resiliency
  - Updated design storm standards
  - Update other quantitative information (e.g., IDF curves)



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# Project Timeline

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Feedback from City staff											
Continue drafting update											
Release and consult on draft update											
Revise and release final update edition											
Train users on final updated edition											
Updated Guidelines come into effect											

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