

Policy Review of Municipal Stormwater Management in the Light of Climate Change – Summary Report

Executive Summary

In response to an Application for Review submitted under the Environmental Bill of Rights, 1993 (EBR) Part IV, the Ontario Ministry of the Environment (MOE) completed a review of the need for a new policy, Act or regulation to deal with municipal stormwater management systems in Ontario municipalities in light of climate change.

The MOE review, completed in March 2010, included policies, Acts, or regulations within its mandate of environmental protection, such as the Ontario Water Resources Act and the 2003 Stormwater Management Planning and Design Manual. Non-regulatory stormwater management options such as best management practices were also considered in this review. Legislation under other ministries' mandates such as the Planning Act, Municipal Act, 2001, or the Conservation Authorities Act and associated regulations and policies were not part of the review. In addition to the MOE internal review, a multi-agency Stormwater Management Working Group contributed extensively to the review.

The following are the key findings of the completed MOE policy review.

- *The MOE policy review recognizes that municipal stormwater management adaptation to climate change based on best available science is a priority for Ontario. Long term planning will strengthen protection of the environment with careful regard for water quality and quantity, as well as cumulative impacts, on watersheds and groundwater.*
- *The Ontario Water Resources Act (OWRA) and the Environmental Protection Act (EPA) are anticipated to provide a sufficient legislative framework for implementing adaptation to climate change for municipal stormwater management, through approvals, general prohibitions, orders, penalties and regulation making authority for environmental protection.*
- *The Minister of the Environment is carefully considering all recommendations of the Expert Panel on Climate Change Adaptation, appointed December, 2007, and notes that the recommendations of the Expert Panel specific to stormwater management policy development are consistent with the findings of the MOE policy review.*
- *A MOE policy framework is needed to support resilient municipal stormwater management systems and adaptation to climate change and other identified stressors, for new and existing developments.*
- *The 2003 Stormwater Management Planning and Design Manual requires updating to include additional best practices for climate change adaptation for municipal stormwater management.*
- *The MOE approvals process for municipal stormwater management requires review to include identifying measures to encourage source control best practices for municipal stormwater management.*
- *Data collection and information management systems are necessary to track the inventory, condition and performance of stormwater systems in order to assess Ontario's vulnerability to climate change and aid adaptive decision-making for infrastructure renewal.*

- *Programs such as public education, demonstration projects and incentives are necessary to support resilient systems for municipal stormwater management, in particular source control, to encourage climate change adaptation decisions.*
- *Several ministries are responsible for aspects of storm water management (e.g. MOE, Ministry of Municipal Affairs and Housing (MMAH), Ministry of Natural Resources (MNR), Ministry of Infrastructure (MOI) and Ministry of Transportation (MTO)). The MOE recommends that the ministries work together with municipalities and conservation authorities to seek solutions for resilient municipal stormwater management systems that are adaptive to climate change and to collaborate on new and existing municipal tools for source control stormwater management.*

Progress in stormwater management has been achieved by the MOE through the Lake Simcoe Protection Plan, Stormwater Protection Planning, the Canada Ontario Agreement Respecting the Great Lakes Basin, the Provincial Policy Statement and the Ontario Building Code. Recent examples include the following:

- Phosphorus and sediment control through requiring stormwater management plans in the Lake Simcoe Protection Act, 2008 and associated regulations.
- Comprehensive long term stormwater management planning by municipalities (Canada-Ontario Agreement (COA) funds):
 - Bay of Quinte Master Drainage Plan,
 - Bay of Quinte Pollution Prevention Control Planning, and
 - City of Toronto's Wet Weather Flow Master Plan Environment Assessment.
- The MOE has provided funding support for the following research projects:
 - Credit Valley Conservation (CVC) study on temperature control in stormwater pond discharge to receiving water bodies to protect fish habitat and the Toronto and Region Conservation Authority (TRCA) study on infiltration methods.
 - Development of the CVC and the TRCA Low Impact Development Stormwater Management Planning and Design Guide (2010) to provide guidance to municipalities and developers.
- Municipal initiative to develop public information on proper disposal of swimming pool water, avoiding stormwater discharge which contaminates local rivers and streams (COA funds).
- The MOE has worked with the Canadian Standards Association (CSA) on a training course for sustainable stormwater management and designing road and parking lot infiltration systems.
- MOE provided funding to TRCA for the website "Innovative Stormwater Management Practices" (www.iswm.ca) which lists examples of innovation.

The MOE proposes to continue to work with other ministries, municipalities and industry partners to update current policies and further develop tools to adapt stormwater management practice in light of climate change.

1. Purpose and Scope of the Policy Review

On February 26, 2008, the MOE committed to undertake a review of the need for a new policy, Act or regulation to deal with municipal stormwater management systems in Ontario municipalities in light of climate change.

The MOE review included policies, Acts, or regulations within its mandate of environmental protection, such as the Ontario Water Resources Act and the 2003 Stormwater Management Planning and Design Manual. Non-regulatory stormwater management options such as best management practices were also considered in this review. Legislation under other ministries' mandates such as the Planning Act, Municipal Act, 2001 or the Conservation Authorities Act and associated regulations and policies were not part of the review.

2. Review Process

In addition to the MOE internal review, a multi-agency Stormwater Management Working Group contributed extensively to the review as well as to the creation of a MOE background report. The group was comprised of over 20 agencies, including:

Provincial ministries: Environment, Municipal Affairs and Housing (MMAH), Natural Resources (MNR), Infrastructure (MOI), Transportation (MTO);

Federal agencies: Environment Canada (EC), Department of Fisheries and Oceans (DFO), Infrastructure Canada (INFC); and

Local agencies: Municipalities of London, Hamilton, Toronto, Richmond Hill, Peterborough, Ottawa, Barrie, Sudbury and Markham, Association of Municipalities of Ontario (AMO), Municipal Engineers Association (MEA, Mississauga representative), Conservation Ontario [Toronto and Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC) representatives].

The advice of climate change science experts, including the Expert Panel on Climate Change Adaptation, was additionally sought.

3. Summary of Findings

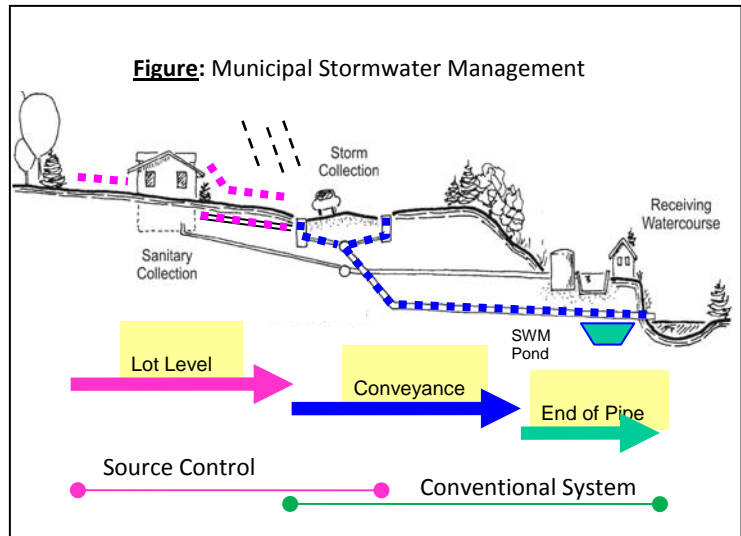
3.1 Background

Stormwater management is important to the health and well-being of the people of Ontario. Ninety-eight percent of Ontario's population lives in the drainage basin of the Great Lakes and St. Lawrence River. Most of this population is urban and lives close to the shoreline. The Great Lakes and St. Lawrence River are particularly vulnerable to both the pollution that enters the lakes through stormwater and other sources, and to the impacts of our changing climate.

Stormwater is rainwater, snowmelt, or other form of precipitation that has contacted the ground or any surface. Upon such contact, stormwater follows the principles of the **water cycle**, which include infiltration, evapotranspiration, run-off, storage in water bodies, and precipitation. Climate (and climate change) is intricately linked to the water cycle, in particular precipitation and evapotranspiration.

Stormwater management is complex. In Ontario, municipalities are responsible for **municipal stormwater management** (e.g. planning, design, establishment, operation and maintenance). Municipal stormwater management deals with the component of the urban surface run-off that is or would be collected by means of separate municipal storm sewers. Many ministries and agencies provide oversight for stormwater management and surface drainage. Municipal stormwater management is complex, partly due to the multi-functional purpose of the infrastructure system and the many different agencies involved. Climate change is an additional factor contributing to the complexity.

Municipal stormwater management includes the **conventional stormwater management systems** that are managed by municipalities and **source control** facilities and practices. Some source control facilities are managed by municipalities, such as those located on road rights of way, while other source control facilities may be located on private properties. The emphasis of the current MOE Stormwater Management Planning and Design Manual, 2003 (SWM Manual) is guidance on conventional stormwater management systems.



Conventional stormwater management systems refer to **conveyance** facilities (such as vegetated filter strips, roadside ditches, storm sewers and perforated pipe conveyance systems) and **end-of-pipe** facilities (e.g. ponds, oil grit separators, constructed wetlands).

Source control (pollution prevention) refers to managing stormwater at the **lot level** (private properties) or nearby in the neighbourhood, typically on the road right of way. Source control facilities use infiltration, reuse and evapotranspiration methods, as well as storage and treatment. Source control recognizes the importance of water conservation by reusing stormwater. Green Infrastructure (GI) or Low Impact Development (LID) place more emphasis on landscape or vegetation based methods (infiltration, evapotranspiration). Examples of lot level facilities include rain barrels, permeable pavement, soak-away pits, rooftop gardens, rainwater harvesting and reuse and infiltration.

To protect health and the environment, the scope of stormwater management must include the **quality of water** discharged to the environment. Contact with surfaces such as roads, landscape and buildings introduce contaminants into stormwater. In particular, the first flush of stormwater is considered potentially more contaminated. Some contaminants such as phosphorus, E. coli bacteria and other pathogens from municipal stormwater are discharged along with the sediment and are a major concern in places such as Lake Simcoe and the near shore of the Great Lakes. Reducing the suspended solids level removes those contaminants that exist in a solid form or adsorbed to the sediment particles. However, some fine suspended solids and dissolved matter are not treated by suspended solids removal. Sediment loadings during storm events, particularly high intensity storms, can damage fish and wildlife habitat. Guidance for managing suspended solids contamination is provided under the SWM Manual. As well, other concerns with stormwater quality include the presence of road salt or other de-icing agents in runoff and the warm temperature of stormwater pond discharges which can have impacts on the natural environment.

The urbanization of an area alters the local water balance, with potential alteration of the subsurface **groundwater level and flow**. Stormwater management requires sufficient understanding of the groundwater and surface water linkages prior to finalizing development. While there may not be immediate uses for the groundwater under some urban areas, the groundwater may be an important source of water downstream for drinking or other uses. As well, groundwater supports wetlands or stream baseflow, and their ecological functions.

Municipal stormwater management is also linked to other municipal infrastructure issues. In older neighbourhoods, stormwater may be collected in **combined sewers** which may lead to combined sewer overflows. Stormwater can also contribute to excessive **inflow and infiltration** into separate sanitary sewers which may contribute to sewage treatment plant by-pass. Since the 1970s, most new subdivisions have been designed with major drainage systems consisting of roads, spillways and park space to provide the pathway for overland flow in order to mitigate **urban flood hazard**. MNR and MMAH are currently leading a discussion on how the province can more effectively manage the urban flooding hazard through a multi-agency Urban Flooding Working Group.

The linkages of these systems to separate municipal stormwater management systems have been considered. Resilient systems for municipal stormwater management, with emphasis on source control, can be expected to provide co-benefits for combined sewer systems, sanitary sewer systems and major drainage systems for the overland flow.

The stormwater impacts that relate to water quality or quantity as described above are occurring today on some level. With the expected uncertainties and extremities of climate change, increasing urbanization, these problems can be expected to worsen in Ontario.

3.2 Climate Change Science Related to Stormwater Management

There was no doubt to the review team that the climate was changing. A 2004 federal report¹ made clear that “there is a strong consensus in the international scientific community that climate change is occurring”. A 2007 Ontario Action Plan² stated that “climate change is a crisis we caused together, and a responsibility we all share, together”. The recent 2009 Ontario Expert Panel on Climate Change Adaptation report³ to the Minister of the Environment further reinforces that climate change is occurring today. The challenge for municipal stormwater management is in understanding the evolving current climate change science that could assist in making informed adaptation decisions by municipalities, provincial ministries and others.

There is considerable science, research and modeling of the climate and climate change. The Expert Panel’s report indicated that the new projections for Ontario in 2050, based on average assumptions about green house gases, show an increase in annual average temperature of 2.5 degrees Celsius to 3.7 degrees Celsius compared to 1960-1990. Increase in annual average precipitation is generally expected, with a greater average increase in the spring. Some parts of Ontario, however, can expect less rain on average in the summer.

The impact of stormwater relates to individual rain or storm events rather than the annual or the seasonal arithmetic average event. For example, the volume of rainfall in a severe August 19, 2005 storm event in Toronto that washed out a road on Finch Avenue exceeded the prediction for the 1 in 100 year storm event as greater than 150 mm of rain fell over a 2-3 hour period over the northern part of the city⁴. This relatively short duration and localized storm event resulted in damages with estimated insurance claims of \$500 million across the region and \$50 million in damages to the City’s infrastructure⁵. An understanding of rainfall intensity, duration and frequency (IDF) over a relatively small area and short periods of time is required for stormwater management.

¹ Natural Resource Canada, Climate Change Impacts and Adaptation: A Canadian Perspective, 2004

² [Go Green: Ontario’s Action Plan on Climate Change, August 2007](#)

³ [Adapting to Climate Change in Ontario: Report of the Expert Panel on Climate Change Adaptation, November 2009](#)

⁴ City of Toronto, Presentation at the Innovative Stormwater Management Workshop, May 7, 2008

⁵ City of Toronto, Presentation at the Ontario Society of Professional Engineers Workshop, October 16, 2008

Several climate change experts presented to the working group on December 10, 2008 and February 10, 2009. The objective was to understand whether the current state of knowledge is presently useful on a practical level for stormwater management practitioners. Science experts from the following organizations presented:

- Environment Canada
- University of Toronto
- University of Western Ontario
- Toronto and Region Conservation Authority
- Consortium on Regional Climatology and Adaptation to Climate Change (OURANOS)

Environment Canada also prepared for the working group a comprehensive review of the scientific literature for stormwater climate change in 2009. The review provided a brief update on the state of science for climate change modeling. The presentations and discussions of the experts and the working group resulted in the following observations being made by the working group:

- Downscaled climate change model projections at a fine enough temporal and spatial scale to suit the needs of regional and localized stormwater management are not available.
- Ontario must begin adapting to climate change imminently, and should not wait for climate change models to evolve to the desired level.

Climate change science and modeling currently is not at a level of detail suitable for stormwater management where knowledge of the intensity, duration, frequency of storms and their locations and timing is required. However the economic, health and environmental risks dictate a need to be proactive in the management of stormwater.

- *The MOE policy review recognizes that municipal stormwater management adaptation to climate change based on best available science is a priority for Ontario. Long term planning will strengthen protection of the environment with careful regard for water quality and quantity, as well as cumulative impacts, on watersheds and groundwater.*

3.3 Current MOE Policy Framework for Municipal Stormwater Management

The policy review considered the scope and effectiveness of existing MOE policy and legislation in the management of stormwater in the light of climate change. The Ontario Water Resources Act (OWRA) and the Environmental Protection Act (EPA) provide a broad legislative authority for environmental protection across Ontario. Ontario does not have a regulation specifically for stormwater management. Under OWRA Section 53, stormwater infrastructure (a 'stormwater sewage works') requires a Certificate of Approval (C of A) for its establishment, alteration, extension and replacement. There are also exemptions from approvals for stormwater management facilities in Section 53 and also under Ontario Regulation 525/98.

Applications for a stormwater management C of A are considered by the MOE on a site specific basis. Applications may be guided by existing guidelines such as the SWM Manual, which provides design guidance for stormwater management facilities such as stormwater ponds. Additional guidance for storm sewers can be found in the Design Guidance for Sewage Works 2008. These documents provide design or technical guidance rather than policy direction.

The 2003 SWM Manual assists the applicants for a C of A to plan, design and operate stormwater management facilities and the MOE staff who are issuing the approval. The SWM Manual promotes a treatment train approach (lot level, conveyance, end of pipe), however, much of the guidance is on conveyance and end of pipe facilities. As well, guidance for water quality control is focused on suspended solids. The current SWM Manual is based on work from the 1990s and it does not address adaptation to climate change.

There is no policy guideline for stormwater comparable to Guideline F-5 for other municipal or industrial wastewater (sanitary sewage and combined sewer overflow). The Guideline B-1 Water Management (Blue Book) provides overall guidance for water management in Ontario. The application of the Guideline B-1 is determined on a site specific basis and may require a detailed site assessment. Water quality assessment has not always been included in assessing applications for approval for municipal stormwater management facilities. Instead, MOE approval for stormwater management facilities are based on the design guidance outlined in the SWM Manual.

OWRA Section 53 provides a broad, case by case, framework for approval of stormwater management facilities. Current approvals, however, often have no requirements for reporting on stormwater system inventory, condition or performance. Clear and consistent understanding of the current approval requirements of source control stormwater management facilities could remove real or perceived barriers. Explicit exemption from the approval process should be considered for certain predictable and low risk stormwater management situations.

The OWRA and the EPA were found to have broad authority and the flexibility to generally address climate change adaptation. Overall, the MOE technical manuals do not provide guidance explicitly for adaptation to climate change.

- *The Ontario Water Resources Act (OWRA) and the Environmental Protection Act (EPA) are anticipated to provide a sufficient legislative framework for implementing adaptation to climate change for municipal stormwater management, through approvals, general prohibitions, orders, penalties and regulation making authority for environmental protection.*
- *The 2003 Stormwater Management Planning and Design Manual requires updating to include additional best practices for climate change adaptation for municipal stormwater management.*
- *The MOE approvals process for municipal stormwater management requires review to include identifying measures to encourage source control best practices for municipal stormwater management.*

The Expert Panel on Climate Change Adaptation was appointed in December, 2007 to advise the government on how to prepare and plan for the impacts of climate change in areas such as public health, environment, infrastructure and economy. The Panel released their recommendations in a report⁶ to the Minister of the Environment in November 2009. One of the top recommendations from the Expert Panel is the development of a climate change adaptation strategy and action plan. There was one specific recommendation regarding stormwater management:

Building on the current review of stormwater management, the Ministry of the Environment should complete a comprehensive review of stormwater management throughout the province by the end of 2011 to ensure that provision has or is being made to take climate change risks into account, and in that review the ministry should also:

- *Assess the effectiveness of the approval process for stormwater facilities and examine the benefits of requiring municipal stormwater management master plans; and*
- *Update the Stormwater Management Design Manual to encourage adoption of innovative, multi-barrier stormwater management practices by municipalities.*

⁶ [Adapting to Climate Change in Ontario: Report of the Expert Panel on Climate Change Adaptation, November 2009](#)

As a result of the panel recommendation, the policy review considered the Municipal Engineers Association (MEA) Class Environmental Assessment process under the Environmental Assessment Act which provides an opportunity for integrated planning for municipal stormwater management, other infrastructure and growth.

- *The Minister of the Environment is carefully considering all recommendations of the Expert Panel on Climate Change Adaptation, appointed December 2007, and notes that the recommendations of the Expert Panel specific to stormwater management policy development are consistent with the findings of the MOE policy review.*

It is anticipated that the current legislative regime provides sufficient framework for adaptive management of stormwater in light of climate change. However, further support from the MOE is required to implement improvements to stormwater management effectively. As part of the overall policy development process, current guidance and approvals requirements could be revised to better support stormwater management in light of climate change.

3.4 MOE Stormwater Management Policy Framework for Resiliency and Adaptation

Overall, the municipalities need better tools to manage stormwater – and to build municipal stormwater systems that are resilient and adaptive to climate change to better protect the environment. Currently no province-wide inventory is available for municipal stormwater systems to gauge the size of the problem or to compare any achieved progress on system condition or vulnerability to climate change.

Resilient systems for municipal stormwater management are systems that strengthen the treatment train approach already established in the SWM Manual by building in resiliency to climate change. This would be accomplished by developing technical guidance for source control such as under the SWM Manual, but also by developing a MOE policy framework that could clarify and encourage municipalities and others to plan and act on resiliency for climate change.

A MOE policy vision for resilient systems for municipal stormwater management may include, for example, the following considerations:

- Include both source control (lot, neighbourhood) and conventional stormwater management.
- Reduce the generation of stormwater by building communities that interfere less with the natural water cycle.
- Reuse stormwater and recognize stormwater as a resource (e.g. for flushing toilets, landscape watering).
- Recycle the municipal stormwater back into the natural water cycle, with careful regard for water quality and quantity cumulative impacts on watersheds and groundwater.
- Include data collection and vulnerability assessment for the existing conventional stormwater management systems to assist in adaptation decisions by municipalities.
- Include long term planning for municipal stormwater management including a systematic approach to adaptation and assessment of the cumulative impacts on the watershed.
- Include tracking the progress of climate change adaptation, in particular source control, across the province as part of public education.

There would be environmental and possible fiscal benefits to municipalities through adopting this approach. Source control can be expected to reduce the volume of stormwater that will be directed from private properties to municipal stormwater management infrastructure. Source control can have water quality benefits related to stormwater by treating, managing or reusing stormwater on properties or nearby on road rights of way where rain falls.

Information is required on the inventory and status of conventional systems that extensively exist in many municipalities across Ontario today. Municipalities need to examine the vulnerability of their conventional stormwater management systems to climate change and how they can be improved to increase the resiliency and adaptation to the uncertainties and extremities of climate change.

While it may be possible in some cases for municipalities to manage much of the run-off from private properties (residential, businesses) by source control facilities on the road right of way, this may be very costly or not always possible to do so. Municipalities need the cooperation of the property owners in order to effectively manage stormwater at the source. The MOE believes that better results can be achieved for source control when individuals, businesses, ministries, agencies and others collaborate and cooperate. As such, policies, guidance, public education and incentives are preferred over prescriptive mandatory regulations and legislation.

- *A MOE policy framework is needed to support resilient municipal stormwater management systems and adaptation to climate change and other identified stressors for new and existing developments.*
- *Data collection and information management systems are necessary to track the inventory, condition and performance of stormwater systems in order to assess Ontario's vulnerability to climate change and aid adaptive decision-making for infrastructure renewal.*

Resilient systems for municipal stormwater management can be accomplished in Ontario through MOE collaboration with municipalities and industry in developing policy, technical guidance, and municipal tools, all of which will assist municipalities to make informed decisions about climate change adaptation for their stormwater management systems.

3.5 Public Education, Demonstration Projects and Incentives

Moving towards resilient systems for municipal stormwater management requires government policies and guidance. However, changing behaviour also requires public education, demonstrations and incentives.

Members of the public and businesses require information on stormwater management practices, what they can accomplish and how much they cost before informed decisions can be made. Some municipalities may also need information and seek assistance to develop and deliver on public education programs as they assess, plan and decide upon their adaptation actions. This could require technical studies (e.g. climate change vulnerability assessment for stormwater management infrastructure), as well as piloting and demonstrating the long term sustainability of newer innovative source control facilities. Financial incentives may be necessary to encourage decisions by home owners, businesses or the municipalities. Several municipalities have raised the potential role of stormwater (water) pricing as a means of encouraging source control for stormwater management by property owners.

- *Programs such as public education, demonstration projects and incentives are necessary to support resilient systems for municipal stormwater management, in particular source control, to encourage climate change adaptation decisions.*

To effectively deliver a stormwater management policy, all levels of government will need to engage in public outreach and education as well as an integrated approach to financing through infrastructure financing, pricing and incentives.

3.6 Stormwater Management is a Shared Responsibility

While MOE has the provincial lead on environmental protection, stormwater management is a shared responsibility including municipalities, the developers, the property owners (residents, businesses), conservation authorities, provincial ministries, federal departments, NGOs, and others.

Source control is an important element of municipal stormwater management; however, MOE has limited mandate or the oversight role for activities on private property. The implementation by municipalities (or by private property owners in partnership with municipalities) of source control stormwater management practices such as green roofs, cisterns, stormwater reuse for flushing toilets, permeable pavement may be assisted and encouraged through municipal planning, municipal infrastructure planning/assessment for climate change adaptation, the Building Code, infrastructure funding and major drainage system management (for overland flow). These activities can be facilitated under the leadership of Ministries of Municipal Affairs and Housing (MMAH), Natural Resources (MNR), Infrastructure (MOI), Transportation (MTO), the conservation authorities or others.

- *Several ministries are responsible for aspects of storm water management (e.g. MOE, MMAH, MNR, MOI and MTO). The MOE recommends that the ministries work together with municipalities and conservation authorities to seek solutions for resilient municipal stormwater management systems that are adaptive to climate change and to collaborate on new and existing municipal tools for source control stormwater management.*

A multi-ministry approach is anticipated to be necessary with broad-based consultation and partnership with the private sector, municipalities, other stakeholders and the public in developing and delivering improved stormwater management in the light of climate change.

4. Progress on Municipal Stormwater Management

MOE believes that stormwater management is multi-faceted with co-benefits in many ways for the environment, human health and safety and fiscal responsibilities of governments. A number of municipal stormwater management initiatives or initiatives with stormwater management linkage have been discussed, examined or implemented. These are some recent examples:

Lake Simcoe Protection Plan

The Lake Simcoe Protection Act, 2008 is an early example of what the MOE is already doing to improve stormwater management consistent with the recommendations of this review. The Lake Simcoe area municipalities, in collaboration with the conservation authority, are to prepare and implement comprehensive master plans in order to improve the management of stormwater for both existing and planned development. These master plans will include the characterization of existing environmental conditions, an evaluation of cumulative impacts of stormwater from existing and planned development, a determination of the effectiveness of existing stormwater works, as well as an examination of stormwater retrofit opportunities. The MOE has the ability to place stringent requirements on approvals for new stormwater works and to revise existing approvals if necessary.

Source Water Protection

Climate change has the potential to increase the frequency and intensity of storm events, increasing turbidity of water and concentrations of other parameters. This would mean that measures to manage stormwater as a component of source water protection for drinking water would be even more important as climate change impacts are increased. Stormwater that discharges to land or surface water is recognized as a drinking water threat under the Clean Water Act, 2006 (CWA) and will be identified as a significant drinking water threat in some vulnerable areas. Under the CWA, source protection committees will be required to write policies to ensure stormwater is managed appropriately in these areas so that it ceases to be a significant drinking water threat. Some climate change impacts on stormwater management will be inherently managed as we anticipate some improvements in stormwater management from the implementation of source protection plans to ensure the protection of drinking water. Under future rounds of planning, assessment reports are expected to require climate change impacts be considered in determining vulnerable areas and the risks to drinking water. As a result, climate change adaptation measures will be required in source protection plans, including measures for the management of stormwater.

Canada-Ontario Agreement Respecting the Great Lakes Basin (COA)

As the 2007 COA comes up for negotiation and renewal, more emphasis could be placed on source loadings on the Great Lakes, including stormwater. This policy review of stormwater management and climate change adaptation is assisting in the preparation of the COA renewal discussion with the federal government to ensure the preservation and care of our Great Lakes. The MOE is also supporting comprehensive long term stormwater management planning by municipalities, such as the City of Toronto's Wet Weather Flow Master Plan Environment Assessment.

Provincial Policy Statement (PPS)

The MOE will be a partner in the next PPS review led by MMAH. This may represent an opportunity to include discussion and consultation on municipal stormwater management in light of climate change.

Ontario Building Code

The MOE will be a partner in MMAH's development of the next edition of the Building Code. This represents an opportunity to enhance existing stormwater and water conservation measures.

Public Education and Training

The MOE is encouraging municipal initiatives for public education. As an example, MOE has funded under COA, a municipal initiative to develop public brochures for the proper disposal of the water from the thousands of residential swimming pools across Ontario as an alternative to discharge of the chlorinated or salt pool water to storm sewers that lead to local rivers and streams. The MOE has worked with Canadian Standards Association (CSA) on a best practices training course for sustainable stormwater management and designing road and parking lot infiltration systems.

Environmental Protection Best Practices

The MOE provided funding assistance to the Credit Valley Conservation (CVC) and the Toronto and Region Conservation Authority (TRCA) to develop the Low Impact Development Stormwater Management Planning and Design Guide (2010) which provides guidance to municipalities and developers. While this manual is intended for the areas of their jurisdiction, it may be beneficial to others. The MOE has funded CVC to study how the “warm” water stormwater ponds may be discharged to receiving water bodies while protecting fish habitat and TRCA to complete a review of infiltration methods for stormwater management.

MOE provided funding to TRCA for an Ontario “Innovative Stormwater Management Practices” website (www.iswm.ca). Municipalities and businesses can share and learn from examples of innovation.

The MOE has and will continue to promote and integrate best practices for municipal stormwater management in Ontario.