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Item No. 12.1.3
Environment and Sustainability Standing Committee
December 7, 2017

TO: Chair and Members of Environment and Sustainability Standing Committee

Original signed

SUBMITTED BY:

Kelly Denty, Acting Director, Planning & Development

DATE: November 2, 2017

SUBJECT: **Halifax/Halifax Water Integrated Stormwater Management Policy
Draft Framework**

ORIGIN

On October 22, 2013, Regional Council passed the following motion:

MOVED by Councillor Johns, seconded by Councillor Nicoll, that Halifax Regional Council direct staff to:

1. Prepare, for Public Hearing, a consolidated Regional Lot Grading By-Law based on the objectives outlined in the September 11, 2013 staff report.
2. Develop a Memorandum of Understanding on Erosion and Sedimentation Control with Halifax Water, Nova Scotia Environment, Clean Nova Scotia and the Nova Scotia Homebuilding Association.
3. Continue to develop a Stormwater Management By-Law based on the objectives outlined in the September 11, 2013 staff report.
4. Develop a standardized Environment Section template for consideration of objectives outside the scope of the Lot Grading By-Law or Stormwater Management By-Law, for future secondary planning projects; and
5. Align the Streets By-Law to the Wastewater Rules and Regulations with respect to substances originating on private property, crossing the right-of-way and entering the storm system.

LEGISLATIVE AUTHORITY

See Attachment A.

RECOMMENDATION

It is recommended that the Environment and Sustainability Standing Committee recommend that Halifax Regional Council endorse the Policy Framework contained in the Committee Report dated December 7, 2017 entitled Halifax/Halifax Water Integrated Stormwater Management Policy, structured around the following themes:

1. Capital Investment Strategy
2. Ownership and Maintenance of Municipal Stormwater systems
3. Land Development Practices
4. Drainage on Private Property
5. Wetlands
6. Combined Sewers
7. Flood Resilient Design Standards

BACKGROUND

On February 26, 2013, Regional Council directed staff to develop an Integrated Stormwater Management Policy with the Halifax Regional Water Commission (Halifax Water), and in October 2013 a scope and overview of a stormwater management policy was presented to the Environment and Sustainability Standing Committee.

As detailed within an Information report to the Halifax Water Board on October 3, 2013, the Halifax Water Board and Halifax Water staff have formally acknowledged the direction from HRM Regional Council and are working proactively with HRM staff to advance the development of an Integrated Stormwater Management Policy.

In broad terms, the objectives of an integrated policy were described as developing policies that guide municipal and utility operations and governance when delivering stormwater management services, in a manner that meets both legislative requirements and community expectations relating to public safety and environmental stewardship.

Also in February 2013, the Environment and Sustainability Standing Committee approved five specific actions that aligned with the recommended scope of the Integrated Stormwater Management Policy. These actions are as follows:

- Develop a consolidated Lot Grading By-law that looks at the needs of the entire Region;
- Develop a Memorandum of Understanding with Nova Scotia Environment (NSE) relating to sedimentation and erosion control;
- Develop a Stormwater Management By-law;
- Develop a standardized environmental section template for secondary planning projects; and,
- Align the Streets By-law with the Halifax Water Schedule of Rates, Rules and Regulations.

DISCUSSION

The purpose of this report is to provide a common policy framework, along with Halifax Water, upon which to base a stormwater management policy, fully integrated into each organization's respective business plans.

If recommended by the Environment and Sustainability Standing Committee, the policy framework should be referred to Regional Council for their consideration.

Stormwater Definition and Problem Statement

General Stormwater Cycle

Stormwater is runoff water from groundwater discharge, surface water, rain or melting snow that flows across the landscape. Runoff flows off rooftops, paved areas, graveled areas, bare soil, and lawns. Runoff gathers in increasingly large amounts along streets, drains, open channels, stormwater systems, and eventually discharges untreated into nearby water bodies. However, in combined sewer systems, stormwater flows with sewage to a wastewater treatment facility.

In urban areas, stormwater management is especially important due to decreases in natural land cover and the expansion of impervious surfaces like rooftops, sidewalks and roadways. These surfaces exacerbate runoff because they change the permeability of the landscape—preventing rainwater from soaking in or infiltrating the soil. Some of the impacts of stormwater include flooding, sewer overflows and nonpoint source pollution.

Stormwater is managed using natural topography, watercourses and stormwater systems as well as best management practices, which include green infrastructure and low impact development. From inception with a rainfall or snowmelt event, stormwater flows through or across a variety of mediums prior to its destination in a natural watercourse or the ocean. These components include:

- Surface collection;
- Private property discharge;
- Overland flow;
- Public street flow;
- Piped and ditched flow;
- Major storm route flow; and,
- Natural watercourses.

Stormwater Problems

A properly designed and functioning stormwater system may include some or all the above components, conveys the runoff from all storm events without damage to property, harm to personal health, significant inconvenience to the public at large, or detrimental environmental effects.

However, the experience within Halifax has been that a variety of recent, and historical, storm events have caused damage and inconvenience to both public and private property. These storm events have caused problems that generally fall into the following categories:

- Private property flooding;
- Street flooding and icing in the street;
- Sewer backups;
- Excessive stormwater in the wastewater system; and,
- Degradation in receiving water quality.

From historical analysis of these typical problems by Halifax Water and Municipal staff, the root causes of the above noted stormwater flooding problems include:

- Poor site grading and lack of proper site drainage;
- Informal (no) major stormwater or overland flow routes;
- Poor street grading and drainage; and,
- Deficient stormwater systems.

One of the largest issues Halifax is currently facing is drainage and flooding problems that persist in areas that do not have a full and formal stormwater system that meets current standards. In these areas, the stormwater system may include open ditches, shallow storm sewers, or a structured stormwater system may not exist. In addition, many of these areas have no formal major storm route. Formal major storm routes are designed to convey stormwater from large rain events that exceed the design volume of piped systems, and direct stormwater over the street, through swales, large pipes or natural topography to avoid property damage or public harm and inconvenience.

Stormwater Quality

Stormwater pollution results when runoff picks up, carries and transports various pollutants (oil, grease, chemicals, dirt, sediment, nutrients, and pathogens). These pollutants can have a significant impact on downstream watersheds. Stormwater quality problems can be significantly reduced through the use of appropriate land development practices. The Municipality's proposed Stormwater Management and Erosion Control By-law, which is currently under development, will address some of the issues related to stormwater quality. In addition, Halifax Regional Plan policy adopted in 2014 stipulates that the Municipality fully supports a stormwater rate that provides incentives for retention of on-site stormwater. The Municipality and Halifax Water have subsequently reached a settlement agreement during the NSUARB stormwater Rate Hearing in February, 2017, where both parties agreed to develop joint design and construction standards that consider quality impacts. During the same Hearing, Halifax Water implemented a Credit system that provides financial incentives for retention of stormwater volumes.

Roles and Responsibilities

The overall responsibility for stormwater management is multi-jurisdictional. The federal, provincial and municipal governments along with Halifax Water and private property owners each have specific roles and responsibilities as stormwater moves through the stormwater cycle.

Province of Nova Scotia

The Province of Nova Scotia has jurisdiction for protection of water resources including natural watercourses (streams, rivers, lakes). The Province does not set discharge standards for stormwater quality (eg. – nitrogen, phosphorus, etc.) in the same manner as for wastewater. This is common across Canada – even though land based impacts can be extreme. For example, an assimilative capacity study carried out for the former Beechville/Lakeside/Timberlea Pollution Control Facility found that one of the greatest risks to water quality in the Nine Mile River was phosphorus from residential development around the headwater lakes. Although discharge standards are not established by the Province of Nova Scotia for stormwater, the installation of a public stormwater system falls under the Activities Designation Regulations, and the Province issues a Permit to Construct.

Halifax Water

Halifax Water is the municipal water, wastewater and stormwater utility serving the residents of Municipality. Halifax Water has authority to own and operate stormwater systems for the benefit of its customers within a defined service boundary (Attachment B). Halifax Water's stormwater system is comprised of catchbasins, pipes, manholes, roadside ditches, swales, culverts, stormwater holding tanks, ponds, and dams, which are

vested in or under the control of Halifax Water, that eventually discharge into a local brook, river, or formal major stormwater systems where they exist.

Halifax Regional Municipality

The Municipality is responsible for the regulation of land development activities, which includes siting of buildings, grading of land, and assessing impacts of overland flow that result from the development of land, as well as stormwater systems used for municipal purposes, such as municipal parkland or other municipal facilities. The Municipality also owns and maintains those elements of the minor drainage systems (pipes, ditches, culverts, etc.) that fall outside of Halifax Water's stormwater service boundary. In addition, the Municipality owns and maintains the public street system, which is part of the stormwater system, and often accommodates the major stormwater flow; as well as bridges over natural watercourses and drainage corridors.

Private property owners

Property owners are responsible for stormwater flow across their individual properties, across adjacent property boundaries as well as stormwater management systems located on their property. Private stormwater systems include rainwater leads, footing drains, private community systems, and slope protection within their privately-owned property. Private property owners must maintain drainage corridors and privately owned drainage infrastructure free of vegetation and debris to not block drainage flow routes or negatively interrupt drainage patterns.

Policy Framework

A stormwater policy should give specific regard to the following outcomes:

- Prevent loss of life and property damage due to major storms events;
- Efficient and effective work management processes, with a clear delineation of responsibilities between the Municipality and Halifax Water;
- Safe and convenient use of streets and other land areas before, during, and after storm events; and,
- Mitigate the long-term impacts of development on natural systems and downstream properties.

To address these outcomes, the Integrated Policy will be structured around four main issues or themes:

1. A capital investment strategy for stormwater infrastructure;
2. Ownership and maintenance of stormwater systems;
3. Land development practices; and,
4. Drainage on private properties.

1. Capital Investment Strategy

One of the stated purposes of the 2007 Transfer Agreement is "*To evolve the operation and administration of municipal wastewater services and municipal stormwater services towards a system whereby the general taxpayer of HRM does not subsidize the utility rate payer of HRWC, and the utility rate payer of HRWC does not subsidize the general taxpayer of HRM.*" Thus a capital investment strategy and funding for various types of capital projects must be consistent with the above provisions, in that funding is provided by the benefitting parties: The Municipality, Halifax Water, and/or private property owners.

An interim funding framework was developed and expired in 2015 to address several priority areas that required upgraded or new stormwater systems. Cow Bay Road, First Lake Drive, and Metropolitan Avenue stormwater system upgrades have been completed under the previous framework.

The demand for upgraded stormwater facilities is expected to far exceed the ability of either benefitting party to fund over the short to medium term. For this reason, clear priorities are needed regarding where to invest capital funds, which balances the needs of all benefitting parties. To this end, Halifax Water and the Municipality are jointly conducting a flood risk assessment of areas prone to flooding in Halifax, funded in part by the National Disaster Mitigation Program (NDMP).

2. Ownership and Maintenance of Municipal Stormwater Systems

Work completed to date addresses roles and responsibilities in relation to operations and maintenance of the stormwater system within the defined Halifax Water service boundary. The 2007 Transfer Agreement provided for the transfer of all existing municipal stormwater infrastructure within the street right of way or defined easements to Halifax Water. This infrastructure includes both “minor” piped systems (capacity for a maximum 1 in 5 year frequency storm event) and “major” systems (pipes, swales etc. with capacity for storm events greater than 1 in 5 year frequency). In 2013, a final version of the responsibilities guide (the “Merger Matrix”), and the work of a Special Technical Committee established under Section 37 of the Transfer Agreement subsequent to the final version of the Merger Matrix was completed.

Work management rules have been documented to reflect the responsibilities guide, and are constantly being reviewed and updated to ensure alignment with the 2007 Transfer Agreement between the Municipality and Halifax Water.

3. Land Development Practices

The Municipality is responsible for reviewing land development applications and approving subdivision grading and stormwater management plans. Halifax Water’s role is to review and approve the design of stormwater systems that will be owned and operated by Halifax Water. The Municipality and Halifax Water have agreed to work together to develop a quality program for stormwater which would include the development and administration of joint design and construction standards, and the possible development of a credit for water quality as part of best management practices as described in the stormwater credit program.

Policies relating to watershed planning, floodplain protection, coastal inundation, and development standards such as best management practices, wetland protection and riparian buffers are included in the Regional Plan and have recently been reviewed as part of the 5-year review of the Regional Plan. There are however regulatory gaps that exist which relate to development standards and approvals. The Municipality has policies aimed at predicting and minimizing land based impacts associated with land development, including water quality impacts. The Municipality employs a watershed based approach to planning, which recognizes that watersheds are the fundamental unit for understanding impacts on water resources, and that water, soil, vegetation, and habitat are all connected.

The Regional Plan requires watershed studies in advance of secondary planning, which establish background water quality, predict impacts of development on water quality, influence community design, and provide a framework to monitor impacts. The outcome of watershed-based studies, including land suitability analyses, influence community and site design. Community design features recognize slope avoidance, coastal zone mapping, protection of floodplains, riparian buffers, mapping and avoidance of wetlands and other natural features.

The permit to construct issued by the Province will typically mandate no net increase to both minor and major flows in most situations, set limits on suspended solids related to construction activities, and ensure that a “Responsible Management Entity” will own the stormwater system. If carried out at the subdivision stages of development, this approach encourages public retention ponds, and may discourage source control, overlooking best management practices installed during site development.

There is growing evidence to suggest that a stormwater by-law which regulates site design features promote control of stormwater at source is more effective than public infrastructure at protecting water resources.

The **Stormwater Management By-law** referenced in the background section of this report could require drainage plans and sedimentation and erosion control plans for a broader range of activities such as large site specific developments, stand-alone site improvements such as parking lot construction, as well as grade alterations and top soil removal.

4. Drainage on Private Property

Since the merger with Halifax Water in 2007, business processes respond to, and triage drainage complaints between the Municipality and Halifax Water. In addition, a service level agreement has been implemented to better define responsibilities and levels of service provided to residents when responding to drainage complaints. Property owners are responsible for stormwater flow across their individual properties, across adjacent property boundaries as well as stormwater management systems located on their property. However Halifax Water and the Municipality may provide advice when contacted regarding private drainage issues.

Emerging Issues

Wetlands

Wetlands are very effective at managing stormwater. However, natural Wetlands are considered private property if they are not abutting watercourses. This can be problematic in some situations, especially in mature urban or suburban environments where a wetland may extend across several properties.

Coordinated public policy decisions must be made to ensure that wetlands, where they exist, can be used effectively for stormwater management in all situations.

Combined Sewers

Development on combined sewers is becoming an issue as more and more development occurs in the Regional Centre. The majority of flow in a combined sewer is stormwater, and the Canadian Council of Ministers of the Environment (CCME) stipulate no net increase in overflows from development.

Developing in a mature urban environment that is already impacted is different than developing a greenfield site. For example, it has been estimated that the volume of stormwater from 1 acre of impervious land is equal to the domestic waste flow from 3,000 people. In some situations, separating the storm and sanitary sewers be advantageous, or low impact development can reduce stormwater flow from pre-development conditions.

Notwithstanding, current development standards have been developed with Greenfield development in mind, and significant policy decisions will be needed to address development in the Regional Centre. Emerging policy topics include how to deal with the major flow, what is an acceptable design storm on which to base capacity in a combined sewer, and what role can low impact development play in the urban centre.

Flood Resilient Design Standards

Climate Change is making it harder and harder to predict rainfall events based on historical records. The insurance industry, Federal Government, academic community, and municipalities across the country are engaged at different levels to develop standards and guidelines that introduce flood resilient measures into development standards and design guidelines.

FINANCIAL IMPLICATIONS

There are no financial implications of this report. The Policy Framework should allow for better long-term financial planning.

RISK CONSIDERATION

Adopting an integrated stormwater policy will protect property, and promote protection of the environment by decreasing stormwater run-off and increasing soil absorption of stormwater, and is supported by the Regional Plan.

COMMUNITY ENGAGEMENT

The proposed stormwater policy complies with the Regional Plan, and more detailed Community Engagement will be carried out during the formal adoption of by-laws enacted pursuant to regional plan policy.

ENVIRONMENTAL IMPLICATIONS

Adopting the approach to a stormwater policy outlined in this report will help reduce drainage complaints, protect property and protect water resources. The approach is also consistent with the Regional Plan policies relating to the municipal role in stormwater management.

ALTERNATIVES

The committee could refuse to endorse the policy framework. This is not recommended for the reasons outlined in the report.

ATTACHMENTS

Attachment A Legislative Authority
Attachment B Halifax Water Stormwater Service Boundary

A copy of this report can be obtained online at <http://www.halifax.ca/commcoun/index.php> then choose the appropriate Community Council and meeting date, or by contacting the Office of the Municipal Clerk at 902.490.4210, or Fax 902.490.4208.

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**Attachment A
(Legislative Authority)**

The Halifax Regional Municipality Charter states:

- 353 (1) The Council may make by-laws,
- (a) setting standards and requirements respecting stormwater management;
 - (b) requiring stormwater to be directed to or retained in areas specified in the by-laws;
 - (c) setting standards and requirements respecting the design, construction and installation of stormwater systems and related services and utilities;
 - (d) providing further criteria for the approval of stormwater systems that do not meet the standards and requirements set by by-law, but that are an improvement over an existing stormwater system;
 - (e) regulating the use and maintenance of municipal and private stormwater systems;
 - (f) providing for the protection of municipal and private stormwater systems;
 - (g) prescribing when connection of stormwater systems to a municipal stormwater system is required;
 - (h) providing for exemptions from the requirement to connect stormwater systems to a municipal stormwater system;
 - (i) prescribing the circumstances under which the engineer may undertake the work required to connect stormwater systems to a municipal stormwater system;
 - (j) regulating and setting standards for drainage;
 - (k) regulating and setting standards for grading, describing when the standards and requirements must be met, and exempting those classes of lots described in the by-law;
 - (l) prohibiting the issuance of any municipal permits or approvals if a by-law pursuant to this Part is not complied with and prescribing conditions under which, in such cases, the issuance of permits or approvals may be allowed, and any conditions that may be attached to them;
 - (m) regulating and setting standards with respect to the alteration, diversion, blocking or infilling of stormwater systems.
- (2) The Engineer may direct a person to comply with a by-law made pursuant to this Section and may direct restoration to the original condition if any work is done contrary to the by-law.
- (3) Where the Engineer undertakes the work required to connect stormwater systems to a municipal stormwater system pursuant to a by-law, the cost may be recovered from the owner of land that the stormwater system benefits and is a first lien on that land.

The Regional Plan states:

SU-7 HRM shall consider adopting a stormwater management and erosion control by-law with provisions made that may be area specific and may vary by type of development and, where required, be subject to approval by the Review Board. When considering adoption or amendments to the by-law, the following matters may be considered:

(a) the cost and effectiveness of methods to reduce increased stormwater flows caused by development with consideration given to problems associated with downstream flooding, stream bank erosion, groundwater contamination and inflow and infiltrations into wastewater systems;

(b) the potential for employing naturally occurring soils and native plant species in stormwater management plans;

(c) means to reduce site disturbance and impervious surfaces in new developments;

(d) methods of reducing sediments, nutrients and contaminants being discharged into watercourses; and

(e) the recommendations contained in a watershed study undertaken pursuant to policy E-23 of this Plan.

SU-8 HRM may consider regulatory and operational measures to reduce the quantity and improve the quality of stormwater entering public stormwater facilities and watercourses including, but not limited to, public education programs, animal waste control, spill prevention plans, removing illegal connections, enhanced street sweeping, reduction in road salts, land use restrictions and revisions of development standards. Any such measures may apply in whole or in part of HRM and may require approval of the Review Board.

SU-9 HRM may consider supporting retrofits to existing stormwater facilities where it has been determined that such retrofits could be expected to mitigate flooding or to improve the quality of stormwater entering watercourses.

SU-10 Where public stormwater collection infrastructure must undergo significant repair or replacement, HRM may consider supporting funding for daylighting of the watercourse involved with consideration given to:

(a) feasibility in relation to the surrounding environment, land use and ownership, adequacy of space, drainage and potential flooding issues, safety and other practical or engineering considerations as appropriate.

(b) replacement of culverts with bridges or a three-sided culvert rather than straight pipe is preferred wherever possible;

(c) the potential for legal and liability issues arising; and

(d) costs and the availability of funding.

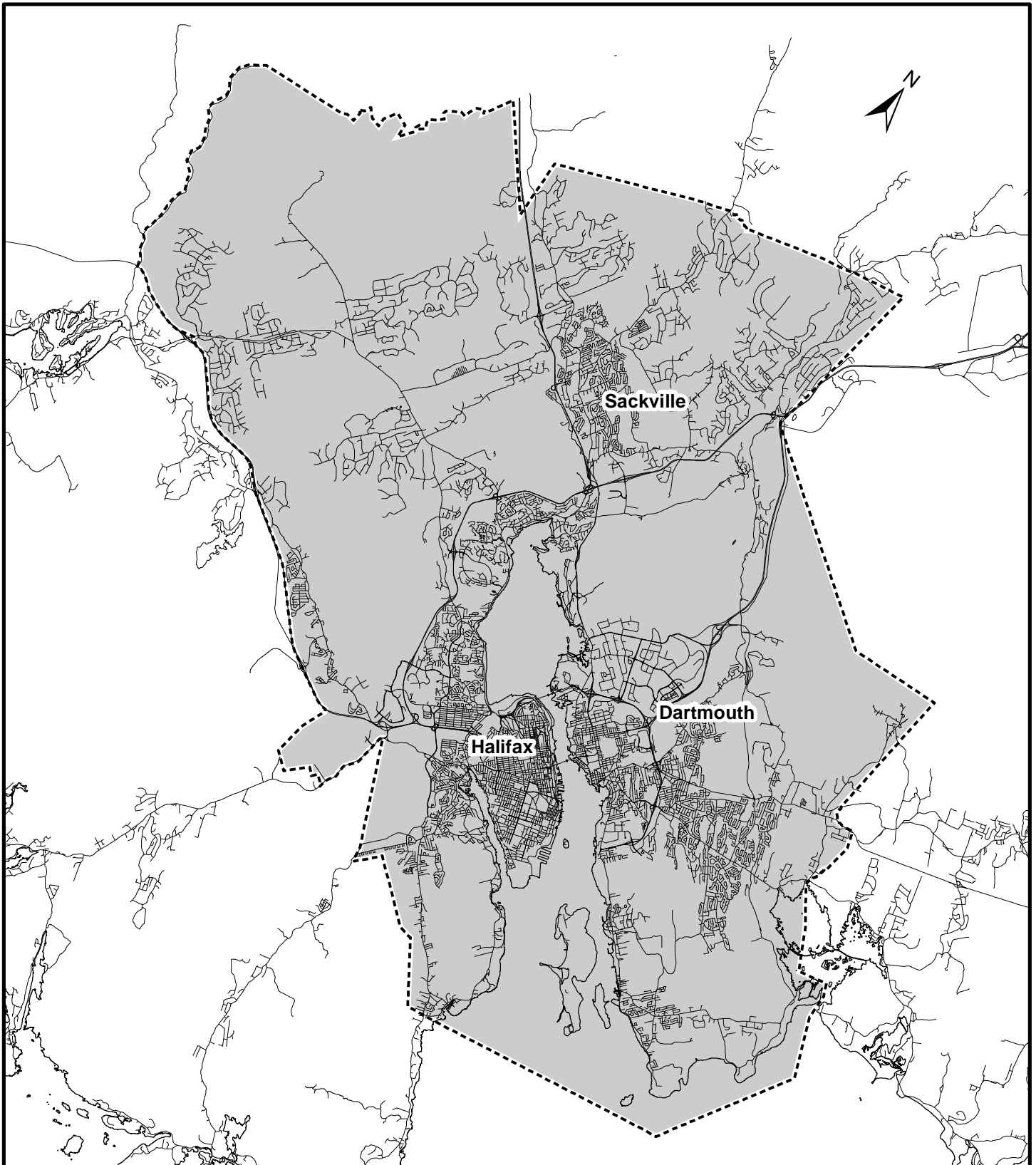
SU-11 In the event that the Province of Nova Scotia considers imposing standards on the quality of stormwater entering watercourses, HRM shall participate in consultations and shall consider amending any stormwater management by-law approved pursuant to Policy SU-7 to be consistent with or complement standards adopted by the Province of Nova Scotia.

SU-12 HRM shall support efforts by Halifax Water to create a rate structure for stormwater management services that provides incentives for the retention of on-site stormwater and may consider any amendments to municipal by-laws which would assist in facilitating these efforts.

Administrative Order One, *Procedures of the Council Administrative Order*, Schedule 5, Environmental and Sustainability Standing Committee Terms of Reference, clause 6(c)


6. The Environment and Sustainability Committee shall:

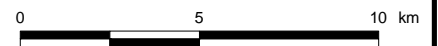
(c) perform other related activities in the area of Water Resource management as identified by the Standing Committee and approved by the Council.



Attachment B: Halifax Water Stormwater Service Boundary

HALIFAX

 Halifax Water Stormwater Service Boundary



The accuracy of any representation on this plan is not guaranteed.