HALIFAX

Water Quality Monitoring Program Development

Presentation to the Regional Watersheds Advisory Board

Consideration of Objectives and Priorities

July 11, 2019

Presentation Focus

- Purpose
- Program Development Overview
- Context: Why monitor water quality?
- Corporate water quality policy objectives
- Discussion:

Purpose

1. To obtain your recommendations for the objectives of the Water Quality Monitoring (WQM) Program Development, and

2. To obtain your input for the scope and content for a contract that Halifax intends to award to a consulting firm to support the completion of this project

Program Development Overview

- P&D's 2019-20 Business Plan committed to the development of a water quality monitoring program by no later than March 2021

Program Development Overview (cont'd)

Review initiated b/c:

- Ongoing calls for WQM by Council & community
- Former WQM program not assessed
- No current WQM policy or programming
- Existing / prior programs disconnected
- Opportunity to connect watershed management, water resource management, & WQM

Program Development Overview (cont'd)

Project scope not "fixed", but will consider:

- Municipality's policies, roles & interests in water quality
- Decision support: monitoring findings should be tied to municipal decision-making frameworks for watershed study program
- Supporting water resource management & watershed management
- Relationship with current WQM programming (beach monitoring, subdivision-based monitoring)
- Watershed-based planning (e.g., watershed studies policy and associated reports)
- Emerging concerns, e.g.
  - Nuisance plant growth
  - Harmful algae blooms
- Completed watershed assessments and program reviews
- Jurisdictional scan (other Cdn cities, provinces)

HALIFAX

Program Development Overview (cont'd)

Proposed program scope considerations (cont'd):

- Development of a framework for collaborative watershed management objectives (i.e., partnerships)
- Supporting implementation of other Plans and Strategies
  - Halifax Green Network Plan
  - Long Term Aquatic Strategy

Program Development Overview (cont'd)

Scope could include:

- Salt vulnerable areas
- Stormwater management
- Long-term lake changes (e.g., pH increase)
- Climate change considerations (e.g., temperature)
- Opportunities for related projects within program framework
  - E.g., watershed vulnerability to climate change
-

Context: Why monitor water quality

- WQM is the actual collection of info … to provide the data which may be used to define current conditions, establish trends, etc.
- WQ Assessment is the process of evaluation of nature of water re natural quality, human effects, and intended uses
- Logical sequence:

  i) Monitoring, ii) Assessment,

  iii) Management (plus feedback loop)

Source: Water Quality Assessments (“WQA”) – a Guide to Use of Biota, Sediments, and Water in Environmental Monitoring (UNEP et al.,1996)

HALIFAX

Context: Why monitor water quality (cont'd)

- Monitoring provides the information that permits rational decisions to be made on the following:
  - Describing water resources and identifying actual and emerging problems of water pollution
  - Formulating plans and setting priorities for water quality management
  - Developing and implementing water quality management programmes
  - Evaluating the effectiveness of management actions

– It is essential that the design, structure, implementation and interpretation of monitoring systems and data are conducted with reference to the final use of the information for specific purposes

– Types of Monitoring include: Multi-objective; Baseline monitoring; Operational Surveillance; Trend monitoring; Background monitoring; Preliminary survey; Emergency survey; Impact survey; Modelling survey; Early warning surveys

Source: Water Quality Monitoring- A Practical Guide to the Design and Implementation of Freshwater Quality Studies and Monitoring Programmes (UNEP et al., 1996)

HALIFAX

Context: Why Monitor Water Quality (cont'd)

10 basic rules for successful assessment programs:

1. Objectives must be defined first; programme to be adapted to them (not vice versa)
2. Type and nature of the water body must be fully understood
3. The appropriate media must be chosen
4. The variables, sample type, frequency, station location, must be chosen with respect to objectives
5. The equipment and facilities must be selected in relation to the objectives and not vice versa
6. A complete and operational data treatment scheme must be established
7. Aquatic environment monitoring must be coupled with hydrological monitoring
8. The analytical quality of data must be regularly checked
9. The data should be given to decision makers in interpreted form and assessed by experts with relevant recommendations for management action
10. The programme must be evaluated periodically, especially if the general situation or any particular influence on the environment is changed

HALIFAX

Context: Why monitor water quality (cont'd)

Canada-wide Framework for Water Quality Monitoring (CCME 2006)

- Every monitoring program should have a clear underlying purpose and supporting rationale, and the intended end use of resulting data should be identified

Example Objectives include:

- Provide assurance that surface & groundwater meet site specific water quality objectives set for its use
- To investigate the reasons why water at a specific location doesn't meet set objectives
- To establish a record of water quality to use as a basis for developing site-specific water quality objectives
- To determine long-term trends or track changes in water quality over time (which may be due to changes in land or water use)

HALIFAX

Context: Why monitor water quality (cont'd)

WQM Functional Plan (Stantec 2010):

- Recommend program to identify trends, identify problem areas, establish relationships between water quality monitoring and land development trends
- HRM needs to integrate considerations of stormwater management
- Climate change may impact hydrology and water quality in HRM watersheds
- Water quality process modelling should be developed and continuously applied

HALIFAX

Corporate Policy Objectives

Regional Plan Objectives (2014)

- *Protection of water … is a significant component of this Plan.*
- *This Plan will seek to achieve public health standards for body contact recreation and to maintain the existing trophic status of our lakes and waterways to the extent possible.*
- Policy E-24: Preparation of a WQM Protocol to provide guidance for WQM plans

Halifax Green Network Plan (2018)

- *"Coordinate efforts to manage water quality and quantity while expanding the Region's Green Network" (Obj. 4.1.3.5)*
- *(Investigate) Partnership opportunities regarding Water quality and quantity (Item 5.5.2)*

HALIFAX

Corporate Policy Objectives (cont'd)

- Watershed Studies (sample)

Study	WQM Objectives (NOT Policy Objectives)
Fall River - Shubenacadie Lakes (2010) – Jacques Whitford	- Set TP objectives for local lakes to upper limit of current trophic status - Ensure future sediment mass loads stay within 100% of baseline values
Musquodoboit Harbour (2007) – CBCL	- Allow primary contact (swimming) - Consider additional uses (fishing, shellfish gathering, boating, preservation of Ramsar site)
Birch Cove Lakes (2012) – AECOM	- Specific objectives for TP, Nitrate, Ammonia, TSS, Chloride, E. coli. - Included early warning alert value, and method to determine each.

HALIFAX

Discussion: Draft Program Objectives

- To develop a recommended municipal water quality monitoring program framework;
- To clarify the Municipality's role in watershed management
- To assess the Municipality's former water quality monitoring program and current monitoring activities for successes and failures, gap identification, efficiency and effectiveness;
- To determine the Municipality's policy objectives for water quality;
- To identify successes, shortcomings, and opportunities of the municipality's watershed studies program;
- To identify options for the Municipality's response for watercourses experiencing undesirable conditions;
- To identify and describe, in summary form, a summary of watershed management issues facing the municipality
- To identify potential partnership opportunities to pursue shared water quality interests

HALIFAX

Discussion & Questions