

HALIFAX

Bedford West Water Quality Status Update

Spring & Summer 2017

April 9, 2018

Presentation Overview

1. Water Quality Monitoring in Bedford West
2. Monitoring Event Reporting
(Spring & Summer 2017 Monitoring Results)
3. Assessment Process Status Update

1. Water Quality Monitoring Overview

- Water Quality Monitoring is required due to provisions of the Bedford West Secondary Planning Strategy, Policy BW-3
- Policy BW-3 requires that the monitoring program:
 - track the eutrophication process
 - Specify how long it will last
 - Specify physical & chemical water quality indicators, location & frequency of testing
 - Establish indicator threshold levels, and conformance with Regional Council policy directives

1. Monitoring Overview – cont'd

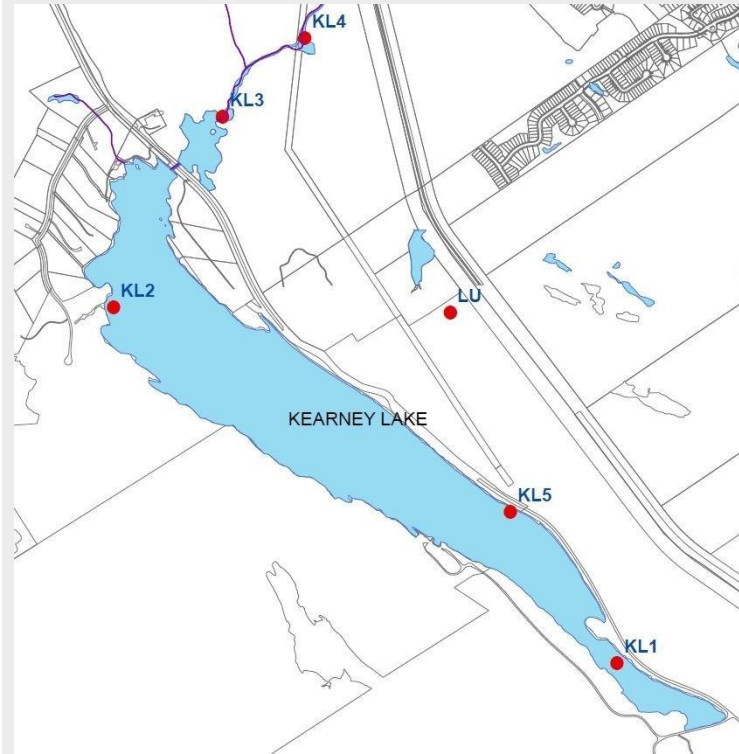
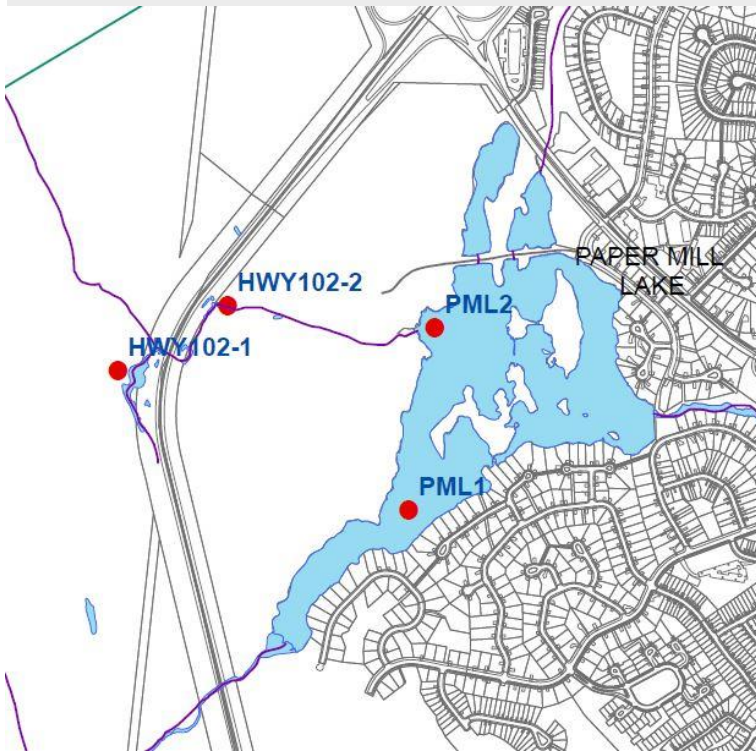
- Each DA has adopted similar monitoring provisions.
- The key eutrophic threshold indicator specified for each is 10 micrograms per Litre ($\mu\text{g/L}$) of Total Phosphorus

Trophic State	TP Concentration ($\mu\text{g/L}$)
Ultra-oligotrophic	<4
Oligotrophic	4-10
Mesotrophic	10-20
Meso-eutrophic	20-35
Eutrophic	35-100
Hypereutrophic	>100

1. Monitoring Overview – cont'd

- Water quality monitoring based on the Policy and Development Agreements began in 2009
- Samples are taken from each station 3 times annually – spring, summer, & fall
- Program now uses 11 sampling stations, located at outlets to the lakes or points further upstream

1. Monitoring Overview – cont'd



2. Monitoring Event Reporting

- SNC Lavalin collected samples from all stations in spring (June 8) and summer (August 15) 2017
- On both occasions, TP concentrations exceeded the established threshold (10µg/L) at 8 of 11 stations

	KL1	KL2	KL3	KL4	KL5	HWY 102-1	HWY 102-2	LSD	LU	PML 1	PML 2
Spring	10	<u>12</u>	6	<u>20</u>	10	<u>17</u>	<u>13</u>	<u>102</u>	<u>24</u>	<u>41</u>	<u>18</u>
Summer	10	<u>28</u>	9	8	<u>12</u>	<u>52</u>	<u>42</u>	<u>59</u>	<u>27</u>	<u>36</u>	<u>13</u>

3. Assessment Process Update

- Bedford West SPS Policy SW-5 states:

“In the event that water quality threshold levels ... for Paper Mill Lake or Kearney Lake are reached, the Municipality shall undertake an assessment and determine an appropriate course of action respecting watershed management and future land use development in the area”
- The Policy requires that the assessment considers CCME guidelines, and that water quality thresholds and any assessment reports be made available to the public

3. Assessment Process Update

- From Summer 2013 through Fall 2014, most Total Phosphorus (TP) results exceeded the threshold level, often by significant margins
- Between 2012 and 2014, approximately 75% of all water samples exceeded the TP threshold
- Staff initiated an assessment process in July 2015

Phase 1:

- Discuss & report findings with the developer
- Conduct detailed assessment of existing data to identify trends in TP measurements
- Conducted by CBCL, completed October 2015

3. Assessment Process Update – cont'd

Phase 1 cont'd

- CBCL's report concluded that:
 - TP results were increasing in both lakes;
 - TP levels measured in both lakes between 2009 & 2014 were increasingly varied compared to previous monitoring period; and
 - Abnormally high TP measurements are found in the period 2013-2014

3. Assessment Process Update – cont'd

Phase 2: Investigate cause(s) of high TP measurements considering all significant land uses and activities that have occurred in the Paper Mill Lake Watershed since inception of monitoring program

- Conducted by Dalhousie University's Centre for Water Resource Studies (CWRS), completed Fall 2016
- CWRS presented results to NWCC in November 2016

3. Assessment Process Update – cont'd

Phase 2 cont'd. - CWRS Recommendations:

1. Chlorophyll a should be a trophic lake indicator for both lakes
2. Resume deep station sampling with appropriate sampling frequency
3. Individual developments should not be regulated based on trophic state indicators in a lake
4. Undertake targeted study to validate
 1. Phosphorus export coefficients
 2. BMP treatment performance

3. Assessment Process Update – cont'd

Phase 3:

Determine a course of action respecting watershed management and future land use development in the area.

- Initiated January 2017
- Three largest sources of TP to both lakes are
 - Upstream sources (primarily forests),
 - Septic systems, &
 - Stormwater runoff from residential land uses

3. Assessment Process Update – cont'd

Current status:

- The process for amending applicable Development Agreements is long, complex, and not currently resourced
- Although TP levels were elevated, they have since stabilized
- TP elevation was not driven by subdivision development activities
- Water quality and watershed assessment project, through which Bedford West TP issues may otherwise have been addressed, was not funded for 2018-19

3. Assessment Process Update – cont'd

Future considerations

- Staff will apply Phase 2 recommendations to policy requirements for future developments
- Review policies, practices, and regulations to ensure they effectively protect water quality
- Staff will continue to seek funding for the water quality and watershed assessment project, through internal and external sources

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Thank You