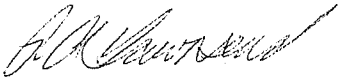


Harbour East Community Council
January 12, 2012

TO: Chair and Members of Harbour East Community Council

SUBMITTED BY: 
Phillip Townsend, Director, Planning & Infrastructure

DATE: December 19, 2011

SUBJECT: Russell Lake Water Quality

ORIGIN

- Dartmouth Municipal Planning Strategy
- 2011 Water Sampling Results from Stantec for Clayton Developments

RECOMMENDATION

It is recommended that Harbour East Community Council:

1. Forward a copy of this report to the Dartmouth Lakes Advisory Board and request a written report of recommended policy alternatives for the consideration of HECC to enhance the preservation of water quality, particularly at Russell Lake;
2. Following receipt of the referenced DLAB report, direct staff to hold a community consultation, entitled "Options for the Protection of Russell Lake", to review:
 - a. The recommended policy alternatives presented by DLAB;
 - b. Additional community or other stakeholder options or alternatives;
 - c. The historical and relevant data related to water quality;
3. Direct staff to prepare a recommendation report to HECC reviewing all the presented options and alternatives.

BACKGROUND



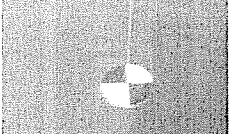


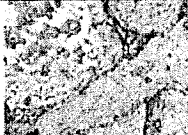


The Dartmouth Municipal Planning Strategy directs with policy ML-31:

Pursuant to policy ML-30, in the event the critical water quality threshold levels for Morris or Russell Lakes are reached, it shall be the intention of Council to immediately undertake a review of existing plan policies contained herein and determine an appropriate course of action respecting watershed management and future land use development in the area. Critical water quality thresholds shall be made available to the public.

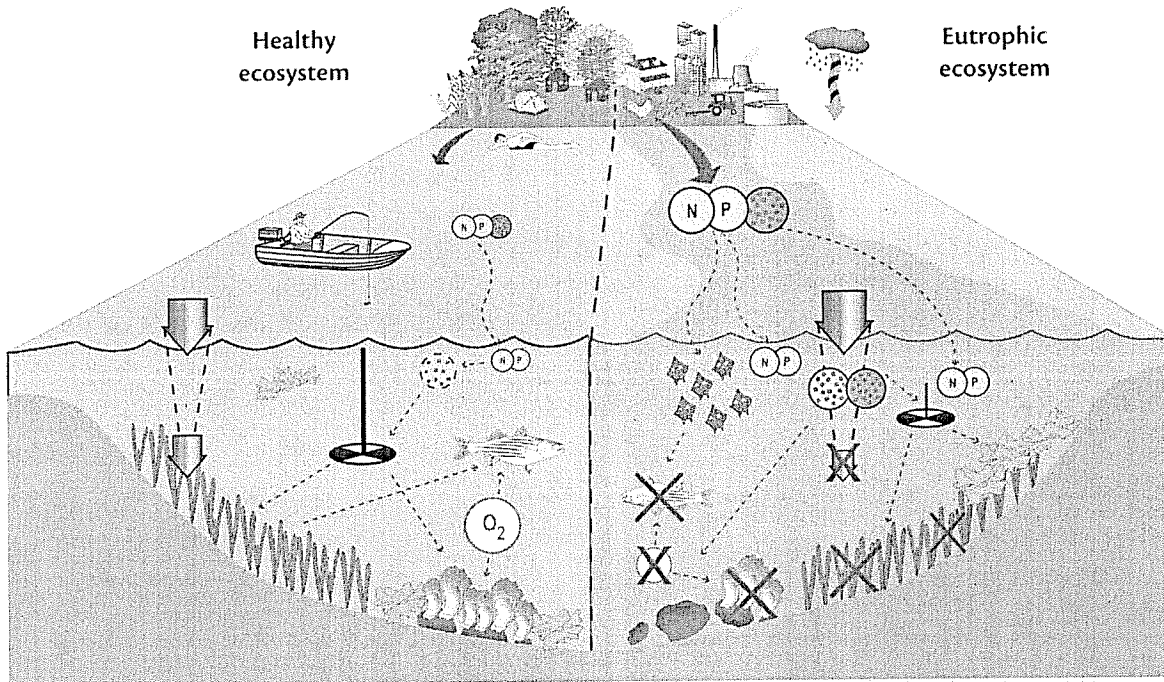
As per Attachment One, sampling during 2011 yielded results that exceeded the agreed TP threshold of 15 mg/L. Summarily, the 2011 results were: Marc (31); June (21); August (19); November (17).

DISCUSSION

Without pre-supposing the impacts of the increased phosphorus levels in Russell Lake, according to Environment Canada the levels of nutrients and their expected effects in lakes and rivers can be categorized and described as their trophic status. Below is a description of the various trophic states:

oligotrophic	0.004-0.010	Very Low nutrients and plant growth, high water clarity		
Mesotrophic	0.010-0.020	Moderate levels of nutrients and plant growth, reduced water clarity		
Mesoeutrophic	0.020-0.035	Moderate levels of nutrients and plant growth, reduced water clarity		
Eutrophic	0.035-0.100	High levels of nutrients and plant growth, low water clarity		
Hypereutrophic	>0.100	Very high levels of nutrients and plant growth, very limited water clarity		

A visual of the impacts of a eutrophic system is as follows, and the reasons that policy directs staff to review policy should the threshold level be exceeded:



In healthy ecosystems, nutrient inputs, specifically nitrogen and phosphorus (N, P), occur at a rate that stimulates a level of macroalgal and phytoplankton (chlorophyll *a*) growth in balance with grazer biota. A low level of chlorophyll *a* in the water column helps keep water clarity high, allowing light to penetrate deep enough to reach submerged aquatic vegetation. Low levels of phytoplankton and macroalgae result in dissolved oxygen levels most suitable for healthy fish and shellfish so that humans can enjoy the benefits that a coastal environment provides.

In a eutrophic ecosystem, increased sediment and nutrient loads from farming, urban development, water treatment plants, and industry, in combination with atmospheric nitrogen, help trigger both macroalgae and phytoplankton (chlorophyll *a*) blooms, exceeding the capacity of grazer control. These blooms can result in decreased water clarity, decreased light penetration, decreased dissolved oxygen, loss of submerged aquatic vegetation, nuisance/toxic algal blooms, and the contamination or die off of fish and shellfish.

The historical data for Russell Lake is as follows:

Sample Date	INLAKE STATION	NORTH INLET	SOUTH INLET	OUTLET	
2011 Annual Average	0.022				
09-Nov-11	0.017	0.027	0.030	0.013	
10-Aug-11	0.019	0.050	0.052	0.016	
23-Jun-11	0.021	0.027	0.070	0.017	
27-Mar-11	0.031	0.015	0.031	0.023	
2010 Annual Average	0.006				
03-Nov-10	0.005	0.006	0.045	0.007	
10-Aug-10	0.007	0.014	0.047	0.007	
23-Jun-10	0.008	0.008	0.046	0.014	
18-Mar-10	0.002	0.007	0.026	0.006	
2009 Annual Average	0.012	0.025	0.060	0.013	
29-Oct-09	0.003	0.007	0.027	0.006	
12-Aug-09	0.020	0.010	0.071	0.017	
03-Jun-09	0.012	0.011	0.110	0.011	
13-Apr-09	0.013	0.073	0.030	0.017	
2008 Annual Average	0.009	0.067	0.027	0.011	
01-Oct-08	--	--	--	--	
01-Aug-08	0.007	0.006	0.028	0.008	
01-Jun-08	0.012	0.015	0.036	0.015	
01-Mar-08	0.009	0.180	0.018	0.009	
2007 Annual Average	0.012	0.023	0.026	0.028	
01-Oct-07	0.014	0.012	0.044	0.012	
01-Aug-07	0.014	0.023	0.014	0.014	
01-Jun-07	0.007	0.056	0.010	0.073	
01-Apr-07	0.012	0.000	0.034	0.014	
01-Oct-06	0.011	0.010	0.053	0.010	
01/09/2006 (additional)	--	--	0.110	--	HECC established TP threshold August 3, 2006
01-Aug-06	0.020	0.180	0.080	< 0.020	
01-Jun-06	0.008	0.009	0.086	0.004	
01-Mar-06	0.015	0.008	0.031	0.010	
01-Nov-05	0.025	--	0.088	0.027	
01-Aug-05	0.012	0.022	0.043	0.016	
01-Jun-05	0.007	--	0.046	0.010	
01-Apr-05	0.000	0.029	0.042	0.007	

The 2011 results and related reports compel staff and the community to further examine the results, compare them with other trends and information, examine opportunities for water resource protection, and report back to Community Council with recommendations.

The recommended method will:

1. Ensure that subject matter expertise from DLAB is engaged;
2. The community is involved with reviewing options and alternatives; and
3. Council is provided a menu of options for water resource stewardship and a further examination of the impacts.

It should also be noted, as per the historical results, that TP levels have fluctuated up and down over time; so continued testing in 2012 may demonstrate that levels are within the threshold without any policy revisions or actions. As DLAB and the community are engaged, future results regarding Russell Lake will be of great interest.

BUDGET IMPLICATIONS

There are no impacts to the 2011/2012 Operating or Capital Budget. Costs for the referenced consultations can be captured within existing operating budgets. Costs for potential policy alternatives will be provided upon identification of those.

FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Project and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Project and Operating reserves, as well as any relevant legislation.

COMMUNITY ENGAGEMENT

This process will result in Community Engagement related to water quality and protection of.

ALTERNATIVES

None identified.

ATTACHMENTS

Attachment One: Stantec Report

A copy of this report can be obtained online at <http://www.halifax.ca/commcoun/cc.html> then choose the appropriate Community Council and meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Richard MacLellan, Manager, Energy and Environment, 490-6056
