

Soil & Water Conservation Society of Metro Halifax ('SWCSMH')

(a volunteer scientific stakeholder-group)

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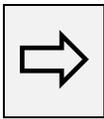
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Ref.: WAB0015 (total= 6 pages)
To: Chairman Dr. Wayne Stobo and Members,
Halifax/Halifax County Watershed Advisory Board (WAB), HRM
From: S. M. Mandaville (Professional Lake Manage.), Chairman & Exec. Director
Date: June 23, 00
Subject: **Pollutant Export (specifically TP, total phosphorus) from onsite septic systems via ground water on decadal time scales- justification of the 100-metre setback from LAKES for NEW SUBDIVISIONS only (not for existing lots)!!**

This submission applies to all areas, both private and publicly financed subdivisions. The NSDoE regulations for siting of onsite systems in NO WAY address the long term phosphorus contribution via groundwater and via preferential underground pathways, and the said NSDoE regulations have absolutely no relevance to Limnology (i.e., lake science).



In the following, we will try our level best to explain and justify the one-hundred metre (100-m) setback for onsite systems from lakes as a starter, and thus answer Mr. Walter Regan's question during our June 00 WAB meeting in a somewhat summary manner. To give credit to the group that Mr. Regan represents on our WAB, namely the Sackville Rivers Association, they had indeed promoted a firm 100-metre buffer along the Sackville Rivers (their submission to the Plan Review Committee, Halifax County, d/January 11, 1989).

100-m is an approximation and follows the precautionary principle taking the 'middle-of-the-road' approach.

- ◆ In some progressive areas, for e.g., the Muskoka-Haliburton District of Ontario, around some lakes, they are requiring a whopping 400-ft wide lots. This has the effect of drastically reducing the 'density' of onsite septic systems around lakes. But this will greatly increase the per lot road development and associated costs.

- ◆ But asking for a 100-metre setback (as opposed to 100-150 feet as presently required on an average) will most probably not increase the road costs since the lots will be deeper, not wider. The original acquisition-costs of raw undeveloped bulk land are rarely high, hence this may be a good compromise if we, i.e., the WAB is seriously interested in protecting lakes from the aspect of **CULTURAL EUTROPHICATION** for decades to come.
- ◆ Further, the setbacks of 100-m will only be required from our sensitive freshwater lakes and not necessarily from streams!

- ◆ **Majority of our lakes are quite sensitive to additions of even small amounts of phosphorus since most of them are Ultra-Oligotrophic to low Mesotrophic. Contrary to general perception, the more oligotrophic (or pristine) a lake is, the more sensitive it is to even small incremental additions of nutrients, especially phosphorus. Eutrophic lakes being 'robust' can actually take more pollutants, especially phosphorus.**
- ◆ **While phosphorus is a nutrient and is a necessary component of all living systems, nevertheless, excess amounts result in undesirable algal blooms, negative impacts on diversity and richness of benthic macroinvertebrates, oxygen depletion in the bottom waters of lakes that stratify, shifts in fish from cold-water to warm-water species, and in some cases may result in toxic algal blooms.**

Kindly note the following rationale in summary only:--

1. Bob Kortmann (1988) cites the following in a leading paper: “The down-gradient septic leachate plume of one system should not intersect any other system leaching plume for a distance of 500 feet.”

(The author, Dr. Robert Kortmann is a well known scientist in Limnology and the Ontario Ministry of the Environment scientists recommended his work to us during the early 1990s. Dr. Kortmann has a plethora of `original` publications in peer reviewed Limnology journals like the NALMS (North American Lake Management Society) Journal/Lake Line. NALMS represents many practical limnologists as well as acts as a scientific conduit to the general public.)

2. Mr. Geoff Howell, a senior biologist and an associate of Dr. Joe Kerekes PhD of the OECD (Organisation for Economic Co-Operation and Development) repute at Environment Canada Atlantic carried out GIS computer modelling of land use around certain rivers in parts of Atlantic Canada. He found that land use within 100-metres around streams accounted for the great proportion of nitrogen, and to a lesser extent, of phosphorus in the receiving streams. There was convincing statistical evidence that 100-metres around watercourses was the most sensitive zone.
 - 2.1. The aforementioned findings of Geoff Howell were indeed alluded to in several parts of the Phase-2 Shubenacadie Headwaters Study by Vaughan Engineering *et al* (1993). Indeed, we understand it was promoted by Environment Canada’s representative (Doug Bliss?) on the HRM Task Force of the time.
3. As we stated on the previous page, 100-meter setback is a “rule of thumb”. In reality, lot larger setbacks or greatly reduced onsite septic densities may be needed if we want to protect lakes on decadal time scales!
4. We are herewith enclosing a copy of the first two pages of a Report from the Ontario Ministry of the Environment (1997) where they allude to chronic phosphorus export problems from onsite systems.

References:

- Kortmann, R.W. 1988. Septic systems and how they affect lakes (or all you never knew about septic tanks and the environment). *Lake Line*. N. Am. Lake Manage. Soc. 8(6):8-11,18-19.
- Ontario Ministry of Environment and Energy. 1997. Nutrient abatement in domestic septic systems. A report to the Ontario Municipal Board by Science & Technology Branch, MOEE, January 1997. 14p.
- Sackville River Association. 1989. Submission to the Plan Review Committee for the Municipality of the County of Halifax. 3p.
- Vaughan Engineering Associates Limited *et al.* 1993. Shubenacadie Lakes Planning/Pollution Control Study. Prepared for County of Halifax Shubenacadie Lakes Planning/Pollution Control Task Force. 131p,appendices.

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