Coalition for a Liveable Sudbury

Making connections. Working toward sustainability.

Official Plan Review
c/o Office of the City Clerk
City of Greater Sudbury
PO Box 5000, Stn. A
Sudbury, ON P3A 5P3

Written submission from Coalition for a Liveable Sudbury
February 5, 2013

Input to the Official Plan Review
Re: Water quality

General points

Greater Sudbury is a city of lakes

Greater Sudbury is a city of lakes. Lake water quality is a top priority and concern for residents. Protecting the health of our lakes and watersheds for now and the future is a responsibility that demands the precautionary principle, as well as management practices that protect and improve water quality. It is important to properly assess impacts and err on the side of caution to ensure that we can continue to enjoy our lakes, and have safe drinking water.

Local solutions for local conditions

A long history of mining and smelting has resulted in soil contamination and erosion into receiving water bodies. In addition to the usual impacts, development in Sudbury also results in increased toxic metal levels and decreased biodiversity in receiving water (10). The natural assets (dense vegetation cover that protects the soil from rain and runoff and further reduces erosion by strengthening the soil with roots, extensive wetlands that reduce flow rates and allow nutrients and contaminants to settle before reaching lakes) that buffer contaminant movement and help make "normal protection" for storm water management adequate have been lost. Sudbury is an industrial city with much enhanced sensitivity to nutrients and other contaminant inputs. These conditions mean we need more stringent standards than most cities. We also need to continue to revegetate and to increase the area of vegetated and permeable surfaces in our watersheds, even with development. The results of the Sudbury Soil Study showed that Sudbury soils are still heavily contaminated with metals, lack the necessary organic matter to stimulate rich

vegetation cover and so still have excessive amounts of erosion of nutrient rich soil particles (plus contaminants) into our lakes (13).

Planning for climate change

Climate impacts include higher temperatures, more extreme weather events, lower water levels, and lower average wind speeds. More extreme weather events and heavy rainfalls will result in flooding, increased stress on stormwater infrastructure, and higher levels of contaminants and phosphorus entering water. Higher temperatures, reduced wind speeds, reduced water levels, and increased contaminant loads will result in increased risks to water quality such as blue-green algae blooms, e-coli, and toxic metal contamination.
The Official Plan must plan for these future conditions which will require us to be even more protective of water quality and flooding hazards.

Protecting water quality through better stormwater management

Traditional stormwater management focuses on piping water off-site. Modern storm water management takes a more holistic approach, grounded in watershed planning. To maintain healthy lakes and protect residents from flooding, Greater Sudbury needs to update its approach to stormwater management to current best practices.

Here are two salient quotes from stormwater management guidelines from the Ontario Ministry of the Environment, and the E.P.A:

"Historically, the goal of stormwater planning has been to prevent localized flooding by moving large amounts of water offsite as quickly as possible. However, experience has shown that traditional stormwater management has many limitations.
Expensive, ever-expanding storm sewer systems strain municipal budgets. Fast moving stormwater discharges cause downstream flooding, erode stream banks, and contribute to water quality violations. Bacteria and other pathogens carried in stormwater contaminate coastal waters, often requiring beach closures. Rainwater diverted or otherwise unable to soak into the soil cannot recharge aquifers. ... Stormwater that collects in detention basins or flows over impervious surfaces is often much warmer than the streams into which it flows. This is a problem because a temperature increase of just one or two degrees can stress fish and other aquatic organisms." (9)

"In most watersheds or subwatersheds, there is a limit to which urban development and growth can proceed without causing irreparable damage to natural systems which support the watershed ecosystem.."
"**New approaches are needed, based on a holistic watershed approach that includes conservation of wetlands and green spaces, low impact development standards, minimizing cut and fill, and green infrastructure**." (1)

The gold standard

Lake Simcoe is considered the gold standard in policies protective of water quality. Refer to reference 8 for this detailed example of best practices.

Making informed decisions

Healthy watersheds mean healthy lakes. Good decisions require good information. Watershed studies provide that information – without them we are taking a gamble on the health of our lakes. The Ontario Ministry of the Environment, in their stormwater management design guidelines, includes watershed studies as an essential part of stormwater management (see Appendix A).

"**Urban development without watershed/subwatershed planning is discouraged** because of the difficulty in addressing many environmental impacts at a plan of subdivision or site plan level. Where guidance from a watershed/subwatershed plan is not available, approvals may be delayed due to incomplete information.."(1)

Recommendation: A watershed study and subwatershed study should be required as a part of a complete development application, for any proposed development greater than 3 lots (i.e. large enough to require a plan of subdivision).

Recommendation: Development decisions should take into account all available information. For example, if wetland assessments or other relevant studies have been completed, these should act as policy triggers to ensure protective policies come into effect when they are needed.

Recommendation: Require an EIS for any proposed development that may impact a waterbody at capacity or with a recognized environmental constraint.
Any development within 300m will be deemed to have a potential impact (Seguin OP 2007)

Program: systematic data collection, analysis, and public annual reporting of lake water quality and lake health for Greater Sudbury's lakes.

Vegetative buffers

The most important thing we can do to keep our lakes healthy is to maintain the wetlands and natural shoreline vegetation that filter out contaminants before they end up in the water.

"Throughout the Precambrian Shield soil cover is typically thin and fractured bedrock is common. For lakes in this environment, irrespective of whether or not they are at capacity for shoreline development, **MOE and MNR recommends a minimum of 30 metre setback or a 30 metre nondevelopment zone from water bodies**. **If natural heritage features are identified on or adjacent to a lot then additional appropriate setbacks or restrictive development zones might be required.**."

Recommendation: Require a minimum shoreline vegetative buffer of 30m.
Larger vegetative buffers should be encouraged, or set through site plans, where possible
Requirements for vegetative buffers should be extended as needed according to slope

(add an additional 0.5m/1% slope, for slopes greater than 15%), and soil characteristics. (3)

Program: identify waterways and shorelines in need of restoration and create restoration plans. Consult and partner with Junction Creek Stewardship Committee, Living with Lakes, Lake Stewardship Committees, and other community experts.

Maintaining wetlands and green space

As stated above, maintaining wetlands and natural vegetative cover is vital to water quality. Local conditions makes this even more fundamental in Greater Sudbury. Recent studies have shown the heightened importance of wetlands in Greater Sudbury (11,12). Historical devegetation is another reason that maintaining remaining and restored vegetation is of heightened importance to local water quality. Natural areas are part of holistic stormwater management, and the natural services they provide cannot be fully replaced by man-made solutions.

"Community scale solution (for storm water management).. includes (an) open space system" (1)

"LID management strategies such as environmental site design, porous pavement, and filtration/infiltration practices provide important hydrologic benefits but do not replace the ecological value of greenspace." (4)

Recommendation: Require a 120m buffer for sensitive wetlands, a 120m buffer for unevaluated wetlands > 2ha, and a 30m buffer for unevaluated wetlands <2ha, as consistent with O. Reg. 156/06 (6)

Recommendation: Require a watershed study to carefully assess the impact on water quality and quantity of any proposed development in known water recharge areas. Where development is considered appropriate, carefully consider appropriate use, and require a landscape plan to minimize vegetation loss.

Recommendation: Prohibit the removal or placing of fill in flood plain areas and wetlands. Increase set backs to flood plain areas, recognizing that larger storm events will be more frequent.

It is important to reiterate again that water quality is intrinsically linked with wider ecological health. Therefore, in recognition that protecting green spaces is also key to protecting water quality, support is given to the recommendations of the Green Space Advisory Panel. Support is also given to any policies protective of wetlands or enhancing wetland health and function.

Using low impact development standards

Low impact development absorbs rainwater where it falls, reducing run-off. This means less risk of flooding, less contaminants entering our lakes and waterways, and less maintenance costs and stress on our storm water systems

"LID is widely recognized as a highly effective strategy for the protection of water quality and watershed health."
"LID principles include:
• Resource conservation (watershed and site)
• Minimize cut and fill and reduce effective impervious cover (site level)
• Strategic timing and decentralization of runoff (watershed and site level)
• Integrated management practices (site level)
(4)

".. LID devices .. are much more effective at controlling sediments and the range of other associated contaminants from non-point source pollution." Low Impact Development techniques removed greater than 90% of suspended solids, compared to 50-65% for conventional storm water treatments such as retention ponds. (5)

Low Impact Development standards have also been shown to have economic benefits:
"• Whole project cost savings for new development by reduction of drainage infrastructure
• Land development savings from a reduced amount of disturbance
• Higher property values of 12 to 16 percent
• Reduction in home cooling by 33 to 50 percent from the use of natural vegetation and reduced pavement area."
"In the vast majority of cases .. implementing well-chosen LID practices saves money for developers, property owners, and communities while also protecting and restoring water quality"(4)

Please refer to the Low Impact Development Stormwater Management Planning and Design Guide 2010, developed by the Credit Valley Conservation and the Toronto and Region Conservation Authority, and intended to be used in conjunction with the MOE's Stormwater Management Planning and Design Manual
http://www.sustainabletechnologies.ca/Portals/_Rainbow/Documents/LID%20SWM%20Guide%20-%20v1.0_2010_1_no%20appendices.pdf

Recommendation: Require Low Impact Development standards in urban watersheds, for all shoreline developments, and for any development greater than 3 lots.

Requiring more protective storm water management standards

What goes down the storm drains goes into our water. Stringent stormwater treatment standards are needed to remove more contaminants before they get into our lakes.

"Normal protection" is insufficient with our local conditions that mean enhanced sensitivity to nutrients and other contaminant inputs.

"Urban stormwater runoff may contain elevated levels of suspended solids, nutrients, bacteria, heavy metals, oil and grease, and pesticides, as well as sodium and chloride from roadsalt."
"Good planning which has regard for the need for stormwater management at the outset, combined with a recognition of the ecological attributes and functions of the watershed, provides the fundamental basis for achieving stormwater quality and quantity improvement efficiently and cost effectively."

"The levels of protection correspond to the following 'long-term average suspended solids removals' which refer to the removal by the SWM facility of suspended solids from the site runoff for the entire range of rainfall events on that site for a long period of time, at least 10 years. The use of a long-term average is to account for the variability in characteristics of rainfall events.

- Enhanced protection corresponds to the end-of-pipe storage volumes required for the long-term average removal of 80% of suspended solids.
- Normal protection corresponds to the end-of-pipe storage volumes required for the long-term average removal of 70% of suspended solids.
- Basic protection corresponds to the end-of-pipe storage volumes required for the long-term average removal of 60% of suspended solids."

"The results of performance studies indicate a fair consistency for most end-of-pipe SWMP types (typically 60-80% suspended solids (SS) removal and 40-50% total phosphorus (TP) removal);" (1)

Enhanced Protection will remove 80% of suspended solids, compared with 70% under Normal Protection, and will thus remove more phosphorus from stormwater. An Enhanced Level wetland, wet pond or hybrid pond has the potential to remove 80% of phosphorus (7). Local conditions dictate that Greater Sudbury should be using the most stringent stormwater management standards possible.

Recommendation: At a mimimum, Enhanced Protection stormwater management standards (as specified by the MOE's "Stormwater Management Planning and Design Manual 2003", Chapter 3) should be required, and consideration should be given to requiring more stringent and updated standards (e.g. see ref. 8).

Recommendation: Upgrade stormwater management standards with on-going repairs, prioritizing the Ramsey Lake Issue Contributing Area, and other vulnerable areas.

Best practices for shoreline development

Residents with shoreline lots have a special responsibility to protect water quality, as well as special enjoyment of a healthy lake or waterway.

"Cottagers and lake residents are encouraged to provide as great a setback as possible to minimize the impact of development on lakes."
Best practices for shoreline development include: maintaining a minimum 30m vegetative shoreline buffer, maintaining vegetative cover on the property, water conservation, and good septic system operation and maintenance. (2)

Recommendation: all shoreline development be subject to site plan control, to ensure implementation of best practices.

Consider raising the minimum lot size for rural waterfront lots (currently 0.8ha, as compared with 2ha for other rural lots).

A lake capacity study is currently being undertaken for Greater Sudbury as part of the Official Plan Review. We look forward to responding to this study.
The most precautionary interpretation of 'capacity' should be used. The goal should be to stay **below** capacity leaving a reasonable buffer for variation and taking into account the anticipated impacts of climate change. Average behaviour should be modelled versus best practices that may or may not be followed by shoreline residents. Modelling should be grounded in actual data measuring lake health (including biological indicators).

Minimizing the impacts of sewage treatment

The Greater Sudbury Watershed Alliance recommends tertiary treatment of sewage, and mandatory septic re-inspections every 3 years to minimize the impact of sewage treatment on water quality. They also emphasize that when assessing impacts, **cumulative** impacts of treatment facilities must be assessed.

Best management practices during development (site alteration and building).

The recommendations above outline measures that will reduce the long term impacts of development on water quality. It is also important to reduce impacts **during** development through stringent erosion and sediment control practices.

Recommendation: adopt requirements for best practices for erosion and sediment control in conjunction with N.D.C.A. (For an example of current best practices, see ref. 14)

The City should lead by example with its own practices, and should engage and reward the construction industry for meeting and exceeding these standards.

1. "Stormwater Management Planning and Design Manual". 2003. Ontario Ministry of the Environment http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/std01_079721.pdf

2. "Lakeshore Capacity Assessment Handbook: Protecting Water Quality in Inland Lakes on Ontario's Precambrian Shield". 2010. Ministry of the Environment, Ministry of Natural Resources, Ministry of Municipal Affairs and Housing http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/std01_079878.pdf

3. "Shoreline Vegetative Buffers". 2003. Prepared by the District of Muskoka Planning and Economic Department. http://muskoka.fileprosite.com/content/pdfstorage/242E1CAE790B44909DA3DE98C8D79462-ShorelineVegetationBuffers.pdf

4. "FORGING THE LINK: Linking the Economic Benefits of Low Impact Development and Community Decisions". 2011. This study was conducted by the University of New Hampshire Stormwater Center, the Virginia Commonwealth University, and Antioch University New England. http://www.unh.edu/unhsc/sites/unh.edu.unhsc/files/docs/FTL_Resource%20Manual_LR.pdf

5. UNHSC, Houle, J., Roseen, R., and Ballestero, T. (2010). "UNH Stormwater Center 2009 Annual Report." University of New Hampshire Stormwater Center, Cooperative Institute for Coastal and Estuarine Environmental Technology, Durham, NH.

6. O.Reg. 156/06 (Conservations Authorities Act) http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_060156_e.htm

7. "LSRCA Technical Guidelines for Stormwater Management Submissions" 2010. Lake Simcoe Region Conservation Authority. http://www.lsrca.on.ca/pdf/swm_guidelines.pdf

8. Lake Simcoe and its Watershed - Report to The Minister of the Environment Prepared by the Lake Simcoe Science Advisory Committee. 2008. http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/stdprod_078249.pdf

9. "Low Impact Development (LID) and Other Green Design Strategies" U.S. Environmental Protection Agency on-line fact sheet. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=124

10. Jennifer Davidson, and John M. Gunn. (2012). Effects of Land Cover Disturbance on Stream Invertebrate Diversity and Metal Concentrations in a Small Urban Industrial Watershed. Human and Ecological Risk Assessment, 18: 1078-1095.

11. Erik J. Szkokan-Emilson , Brian E. Wesolek , and John M. Gunn (2011). Terrestrial organic matter as subsidies that aid in the recovery of macroinvertebrates in industrially damaged lakes. Ecological Applications, 21(6): 2082–2093

12. Brian E. Wesolek, Erik J. Szkokan-Emilson, and John M. Gunn (2010). Assessment of Littoral Benthic Invertebrate Communities at the Land–Water Interface in Lakes Recovering from Severe Acid- and Metal-Damage. Human and Ecological Risk Assessment, 16: 536–559

13. Sudbury Soils Study. Summary of Volume III: Ecological Risk Assessment. 2009. Prepared by SARA group.
http://www.sudburysoilsstudy.com/EN/media/Volume_III/Volume_III_SummaryReport/SARA_ERA_Summary_Report_ENG_Final.pdf

14. "Stormwater Pollution Prevention Plans for Construction Activities". U.S. Environmental Protection Agency website
http://cfpub.epa.gov/npdes/stormwater/swppp.cfm

Appendix A: Excerpt from MOE Stormwater Design Guidelines outlining the process of stormwater management from watershed study down to subdivision plans. (1)

"The intent of watershed and subwatershed plans is to prepare goal-oriented strategic plans which will allow urban development to occur while protecting the natural ecosystem functions. Watershed-wide policies or management programs are proposed which are mainly oriented towards conservation and preservation such as agricultural restrictions, buffer strips, salt management, topsoil preservation, wildlife linkages, wetland preservation, natural areas preservation, and forest preservation. Watershed and subwatershed plans look at the cumulative effect of development and do not go down to the level of detail needed for design. The subwatershed plan evaluates the integrated effect of land use scenarios (development, terrestrial linkages preservation, stream buffer preservation, environmentally sensitive/significant area preservation), and urban SWMPs on objectives related to water balance, stream erosion, water quality, temperature, baseflow, flooding, fisheries habitat and aquatic life. For example, a subwatershed plan may set tributary-based targets for peak flows, baseflow and water quality and specify the aggregate levels of stormwater control. Decisions made at the subwatershed plan have direct bearing on the type of development and acceptable SWMP types and performance level at the stormwater management plan level. The results will govern SWMP selection and design for urban development.

An environmental management plan summarizes the findings of the previous plans and is done on a tributary subcatchment boundary or Secondary Plan boundary or a portion thereof. The smaller scale analysis done for an EMP allows for more refined and specific deliverables than a subwatershed plan. EMPs should be of sufficient detail such that all remaining environmental and/or SWM work may be completed as conditions of the Draft or Site Plan stage. Preliminary SWM designs are done at this stage.

The more detailed SWM plan is prepared at the urban subdivision level to meet the conditions and targets set at the Draft or Site Plan stage. The SWM plan is carried out under private proponency and submitted to the review agencies for comment and approval. The SWM planning is integrated with environmental site planning which includes subdivision planning, site planning and engineering, landscape design, architectural and building design, and local street design. It includes the detailed design of SWMPs

Subdivision/site planning extends the ecosystem approach from watershed planning to the actual layout of the development. Site planning techniques refer to the layout of development and development standards imposed by the local municipalities. It is a fundamental determinant of the overall change in the hydrologic cycle for a given development. The way a development is planned, and the specific design criteria adopted by the planner or engineer, can have a great impact on the level of success achieved by the stormwater management measures which are implemented."