Brief of Experts

Submitted on Behalf of

Friends of Muskoka

November 2017

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ATTACHMENT A

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MEMORANDUM

To: C. Lyons, Goodmans LLP
From: Elizabeth Howson, Macaulay Shiomi Howson Ltd.
Re: Muskoka Official Plan Draft October 5, 2017 – Review of Resort Development policies
Date: November 21, 2017

As requested, I have now carried out a review of Section D6, Resort Development of the above-noted draft of the District of Muskoka Official Plan dated October 5, 2017, together with certain related policies such as Part A, Future of Muskoka: Long Term Vision and Section L14 Interpretation. In addition, I have reviewed the following background documents as they pertain to resort development:

- Watson & Associates Economists Ltd. The District of Muskoka Growth Strategy 2013 Phase 1 Update, October 16, 2013 (Watson); and,
- PKF Hospitality and Tourism Business Advisors, Muskoka Resort and Tourism Official Plan Policy Review Recommendations Report, July 2013 (PKF).

My review focused on:

- the basis/principles on which the draft policies have been developed;
- the amount of "resort-related residential uses" permitted; and,
- the approach to the evaluation of new resort development and redevelopment.

My review and conclusions are as follows:

The focus of D6 reflects the directions in the PKF report which is primarily concerned with protecting the economic viability of resort development-given the trends that will impact the tourism industry "what is needed for the successful development and redevelopment of resorts in Muskoka?"[1]. In keeping with that focus, the report concludes that:

"The definition of a resort should remain broad, so as to encourage all product types, and all forms of tenure, and/or to allow for the development community to respond to current and future trends in development."[2]

Further, it is suggested that:

[1] PKF Consulting Inc. Muskoka Resort and Tourism Official Plan Policy Review Recommendations Report, July 2013, page 3.

[2] PKF Consulting Inc. op. cit., page 22.

"...new alternative ownership or condominium resort units will likely generate stronger impacts than new cottage units on a per unit basis. This combined with a greater level of density at alternative ownership or condominium resort developments, as opposed to cottage development, suggests strong potential for additional economic impact."

However that focus and the directions which flow from the report do not align with the description of the accommodations industry and resort development in Muskoka in the report. These findings and directions are presented against a backdrop of an accommodations industry which is "cyclical and vulnerable to economic and travel fluctuations"[3] - where there are a number of factors which make the future precarious including:

"The difficulty in obtaining funding in today's investment environment, combined with extremely low profit levels at resorts in Ontario, indicates that existing assets will have difficulty in generating the necessary capital required for upgrades. Furthermore, new developments based on traditional debt/equity financing off cashflow cannot currently be supported.....As such, development models that generate alternative sources of funds through the sale of units are required for new development." [4]

Further, the number of resorts in Muskoka is not growing but declining[5] and there are limited commercial waterfront properties available for development.[6]

The direction to prop up a vulnerable sector of the tourism industry, many components of which are located outside of settlement areas, with what is essentially residential development does not, in my opinion, reflect the policies in the Provincial Policy Statement, 2014 (PPS) which direct residential development to settlement areas. Further the focus on economic development does not reflect an appropriate balance with the need to give consideration to environmental or other planning considerations as directed by the PPS.

In particular, the PPS in Section 1.1, Managing and Directing Land Use to Achieve Efficient and Resilient Development and Land Use Patterns states that:

"1.1.3.1 Settlement areas shall be the focus of growth and development, and their vitality and regeneration shall be promoted."

Further, the policies of Section 1.1 promote efficient, sustainable development and land use patterns which avoid causing environmental or public health concerns including:

"1.1.1 Healthy, liveable and safe communities are sustained by:
- a) promoting efficient development and land use patterns which sustain the financial well-being of the Province and municipalities over the long term.....
- c) avoiding development and land use patterns which may cause environmental or public health and safety concerns;
- d) avoiding development and land use patterns which would prevent the efficient expansion of settlement areas in those areas which are adjacent or close to settlement areas;

[3] PDK Consulting Inc., ibid., page 9.
[4] PDK Consulting Inc., ibid., page 9.
[5] PDK Consulting Inc. "As of year-end 2011 there were an estimated 87 resorts....operating in the District....This represents an 84% decline in resort establishments over the 50+ year period.", page 10.
[6] PDK Consulting Inc., idid., page 8.

e) promoting cost-effective development patterns and standards to minimize land consumption and servicing costs;"

"1.1.3.2 Land use patterns within settlement areas shall be based on:
a) densities and a mix of land uses which:
1. efficiently use land and resources;
2. are appropriate for, and efficiently use, the infrastructure and public service facilities which are planned or available, and avoid the need for their unjustified and/or uneconomical expansions;"

Further, the PPS specifically with respect to Rural Areas, while permitting and in fact promoting recreational and tourism opportunities (Sections1.1.5.2, 1.1.5.3), continues the theme of efficient, sustainable development and provides that:

"1.1.4.1 Healthy, integrated and viable rural areas should be supported by.....
e) using rural infrastructure and public service facilities efficiently;
f) promoting diversification of the economic base and employment opportunities through goods and services, including value-added products and the sustainable management or use of resources;
g) providing opportunities for sustainable and diversified tourism, including leveraging historical, cultural, and natural assets;
h) conserving biodiversity and considering the ecological benefits provided by nature....."

"1.1.5.1 When directing development on rural lands, a planning authority shall apply the relevant policies of Section 1: Building Strong Healthy Communities, as well as the policies of Section 2: Wise Use and Management of Resources and Section 3: Protecting Public Health and Safety.

"1.1.5.4 Development that is compatible with the rural landscape and can be sustained by rural service levels should be promoted.
1.1.5.5. Development shall be appropriate to the infrastructure which is planned or available, and avoid the need for the unjustified and/or uneconomical expansion of this infrastructure."

In the context of resort businesses which are not thriving and a policy regime which discourages development and land use patterns which are not efficient, sustainable development and which avoid causing environmental or public health concerns, why provide for the potential for 50% of resort development to consist of residential units which do not generate a turnover of occupants? Does not such permission, given the enhanced density permissions for resort development, effectively have the potential to create a new residential node or even a level of development which could be deemed a new settlement area? Further, given the uncertainty of resort development does it not lead to the potential that if the resort fails the remaining 50% can be redeveloped as an expansion of that existing node/settlement area? A node/settlement which is generally not part of an existing settlement nor perhaps located in an area which can be appropriately serviced? Further, a node/settlement area which may create environmental or public health concerns.

From this perspective, it appears that the current proposed policy approach for resorts is not consistent with the current economics of resort development or with the PPS. It also does not fully implement the Guiding Principles proposed for the Official Plan, in particular that "growth

ad settlement patterns in all land use designations will be sustainable by making efficient use of land, energy and infrastructure, minimizing waste and providing for climate change mitigation, adaptation and resiliency" (Section A2 c)).
A revised policy approach is necessary in my opinion. A policy approach for new resorts and the redevelopment of existing resorts which requires, among other matters such as a comprehensive development plan:

- a development which is clearly designed to be predominately commercial in character (i.e. resort units which generate a turnover of rooms at all times);
- a strong demonstration of the long term commercial viability of the resort which will not jeopardize the planned function of existing resort development through the submission of market and economic assessments;
- a detailed plan to ensure that any new development is sustainable including an examination of the potential environmental impacts in the short and long term; and,
- a detailed monitoring program which includes a process to mitigate negative environmental impacts which are identified through the monitoring program.

It is my opinion, that this shift in the focus should be pursued through changes throughout the policies for resorts including D6.1 Objectives which establishes the framework for review, as well as the specific policies, to achieve a more balanced approach. In addition, consideration should be given to a requirement for a comprehensive study of resorts to develop a more finely tuned approach to these facilities one which looks both comprehensively at this resource, and also takes into consideration the individual attributes of the various facilities to develop a strategy for supporting the long-term health of this key economic sector.

ATTACHMENT B

North-South Environmental Inc.
Specialists in Sustainable Landscape Planning

22 November 2017

Catherine Lyons
Goodmans LLP
Bay Adelaide Centre
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Cc Laurie Thomson (by email)

Dear Catherine,

Re: Preliminary comments on the proposed Official Plan for the District of Muskoka (October 5, 2017 draft)

North-South Environmental Inc. (NSE) was retained on October 10, 2017 to provide comments on the proposed Official Plan for the District of Muskoka (MOP). Specifically, we were asked to comment on the adequacy of the proposed policies to protect valued natural heritage resources. Our review thus focused on the policies related to natural heritage, including the actual natural heritage policies, as well as policies in other sections of the MOP that require (or should require) demonstration of the protection of natural heritage features.

The proposed MOP is currently draft and thus our comments are preliminary and may be updated and refined through future discussion of the MOP or updated drafts of the MOP.

We note that as our review focuses on natural heritage aspects of the MOP, it does not include consideration of all the other aspects of the Plan related to development, economic well-being, housing etc. We are aware that the Plan must be read in its entirety in order to achieve a balance among policies that address competing issues. None-the-less, there are guiding policies in the MOP that suggest that priority should be afforded policies that will protect natural features, as they are essential to Muskoka's unique sense of place and to preserve economic well-being for this and future generations.

High Level "Direction" Policies in the MOP

The MOP includes a Vision (s. A1) and Guiding Principles (s. A2) that provide high level guidance for planning in the District. As noted in Pt1, s. 9c), "*The vision, guiding principles, objectives and policy directions are not tests that need to be met or applied to individual properties or applications necessarily, rather they should be considered when making policy decisions.*" In our experience, this kind of guidance in an official plan is very important and can be used to assist in the interpretation of operational policies, as they can indicate the overall intent of the policy document. While the Vision acknowledges the need for

sustainable growth, it contains references that recognize the uniqueness of Muskoka and the importance of its "character".

"*... it is a goal of this Plan to: Protect the quality of the cultural and natural environments of the District of Muskoka and accommodate sustainable growth by facilitating development that supports healthy communities and recognizes the character of Muskoka.*"

and

"*... this Plan is intended to support managed growth and respond to opportunities and constraints, which are specific to the Muskoka context.*"

Given that the character of Muskoka is inextricably linked to its natural environment, in particular its lakes and shorelines, the protection of these features must be a priority. Also, as discussed below, the District's economic well-being is dependent on the preservation of its natural character, and strong natural heritage policies are needed to ensure that the Vision of meeting the needs of future generations can be met:

"*... sustainability is defined as integrating environmental, economic and social needs of the present, without compromising the ability of future generations to meet their needs.*"

The guidance in the MOP particularly recognizes the need to protect its water resources:

"a*) The natural environment, especially water, is Muskoka's key asset and it will be protected for the values it provides including support for diverse ecosystems and a vibrant economy*" (pt 2, s. A2, Guiding Principles)

In our opinion, the strongest commitment to achieving long term sustainability in Muskoka is provided in Policy Direction B:

"*A clean and healthy environment and a strong economy are inextricably linked in Muskoka. The environment is made up of more than 6000 lakes with a vast rural area made up of large forested areas. These elements combine to create the sense of place that is unique to Muskoka and is known around the world. On the economic side, Muskoka is a premier destination for vacationers that generates millions of dollars annually and it is one of the choice locations in Ontario for permanent and seasonal residents that are attracted to the natural environment. With this in mind, the MOP shall establish as a first principle, that development activity be undertaken in a manner that conserves and enhances the features, functions, and interconnections of the natural environment that sustains what is Muskoka for future generations".* (Pt2, s. A3, Policy Direction B)

Collectively, these high-level guidance directions at the beginning of the MOP provide a foundation for providing strong operational polices that will place a priority on the protection of the natural features that characterize Muskoka, make it unique, and on which its long term economic well-being depends. However, as we discuss below, the operational

polices do not reflect this emphasis and leaves doubt as to when the Vision and Guiding Principles are being met.

The argument could be raised that in order to achieve the balance that is referred to in several guiding policies in the MOP, that there should not be a priority given to the environmental policies. However, in considering this, it is critical to understand that in many cases the valued natural features that comprise the Muskoka environment cannot be replaced or restored once they are degraded. Some habitats may be re-created, and it is possible to restore the quality of lakes, but only at great expense, and only if the root cause of the degradation is removed. If that root cause is over-development, then it will be virtually impossible to reverse. A much sounder approach is to protect Muskoka's valued natural resources from the outset. For this reason, they should be accorded priority when seeking a balance among competing interests. This is reflected in the wording of Policy Direction B, but as noted below, is not consistent with some of the other policy directions in the MOP.

Need to go Beyond the Policies of the Provincial Policy Statement (PPS)

In our opinion, there is justification for providing greater protection for natural heritage features than afforded by the PPS. The PPS, s. 4.9, notes that it only provides minimum standards and that the PPS does not prevent planning authorities from going beyond the minimum standards providing it does not conflict with other PPS policies.

The MOP recognizes that Muskoka is unique from a natural heritage perspective:

"*The environment is made up of more than 6000 lakes with a vast rural area made up of large forested areas. These elements combine to create the sense of place that is unique to Muskoka and is known around the world.*" (Policy Direction B).

The MOP also recognizes that the economic well-being of the District is strongly reliant on the preservation and protection if the natural environment:

"There was also general agreement that the MOP should allow for the establishment of flexible approaches and responses to changes in the economy and changing trends in general to stimulate economic development and renewal <u>while recognizing the intrinsic connection between the economy and the natural environment of Muskoka</u>."(MOP, Pt 1, page 4, our underscore); and

"The natural environment, especially water, is Muskoka's key asset and it will be protected for the values it provides including support for diverse ecosystems and a vibrant economy;" (Pt 2, s. A3, Guiding Principles a).

Apart from conservation reasons, it is thus appropriate that the MOP go beyond the minimum protection provided through the PPS, because of the relationship between Muskoka's unique natural environment and its economic well-being.

At present, the MOP may not meet some requirements of the PPS (as discussed below), and does not appear to go beyond the minimum protection requirements of the PPS.

Need to Embrace the Precautionary Principle

The ecological relationships among plants, wildlife (including fish) and the physical environment that sustains them are incompletely understood. Although the impacts associated with direct displacement of habitat is easy to quantify, the size thresholds for various habitats needed to sustain viable populations of area-demanding species in the long term is not as well understood. The impacts associated with the mere proximity of human beings on such species are even less-well known. The species that are area-demanding and/or have special habitat requirements (e.g., deer, wolves, lake trout, etc.) contribute significantly to the uniqueness and character that the MOP seeks to recognize and protect.

The MOP states in the Purpose of the Plan:

"*b) Implement the Provincial Policy Statement at the District level in a manner that is intended to reflect the District of Muskoka context to the greatest extent possible while being consistent with the Provincial Policy Statement (2014) in a manner which ensures that the implementation of provincial policies is outcome oriented and evidence based;*" (MOP Pt 2, s3; our underscore);

and in the Policy Directions:

"b*) Implement the Provincial Policy Statement at the District level using a ``made in Muskoka`` approach that recognizes the unique opportunities and challenges in the District provided that the results are outcome oriented and evidence based;*" (MOP Pt 2, A3, Policy Direction A; our underscore)

In our opinion, from a natural heritage perspective, this wording in the Purpose and Policy Direction A of the MOP is inappropriate and is not consistent with placing a priority on the protection of key natural features as articulated in Policy Direction B. It is often difficult and sometimes impossible for protection measures implemented through natural heritage policies to be either "outcome oriented" or strictly "evidence based". The text presents the underscored terms as tests to be met in implementing the PPS. They are not only too restrictive, but may preclude conformity with the PPS, which does not place such qualifications on the implementation of natural heritage policies.

Also, we do not understand the need for the phrase, "*... to the greatest extent possible...*" in the context of a statement of purpose. Implementation of the PPS with regard for Muskoka's unique context should not be qualified of limited.

Given the importance of maintaining viable populations of species essential to the District's biological diversity, and given the uncertainty of predicting the impacts of extensive

development on the species that help define the District's character, it would be more appropriate to adopt the Precautionary Principle[1]. A precautionary approach would put an emphasis on protecting the natural character of the District, consistent with the direction provided in the Vision and Policy Direction B.

Issue with Conformity with the PPS

Adequacy of Environmental Impact Study (EIS) Requirements

In our opinion, F1.4 does not provide adequate guidance on what should be included in an EIS. For example, cumulative impact seems important enough to warrant its own section, but there is no requirement to address it in an EIS, just "encouragement". There is inadequate guidance on extent of inventory or site characterization, consultation, analysis of impacts, mitigation, statement of net impacts, etc. We suggest that there should be a section, even if an appendix, that provides the content of an EIS. An important part of this should be a requirement for pre-consultation with relevant agencies to agree on the scope and content of each EIS.

Definition of Adjacent Lands

In our opinion, the PPS policies addressing development on lands adjacent to natural features are not sufficiently addressed in the MOP. Section F1.3.1 e), addresses development on adjacent lands (we note that the reference to section 1.2 should probably be 1.3). However, section 1.3.3 a) defines the limits of adjacent lands through reference to Table 10. The PPS does not provide limits to adjacent lands. For the purpose of the natural heritage policies, the PPS defines them as "*lands ... where it is likely that development or site alteration would have a negative impact on the feature or area.*" (PPS s 6.0, Definition of Adjacent Lands b)). Although it notes that the extent of lands may be based on municipal approaches, they must achieve the same objectives as the PPS. The Natural Heritage Reference Manual (NHRM) provides the Province' recommendations for implementing the PPS, but it is important to understand it is not a policy document. The NHRM recommends widths for adjacent lands (NHRM Table 4-2, pg. 42), but notes in the accompanying text that in some cases the recommended widths may need to be increased, particularly in the case of SWH (NHRM s. 4.4.2, pg. 43 and s. 9. 4, pg. 89). Table 10 in the MOP does not allow this flexibility and thus constrains the area in which the negative impact test is applied. In our opinion, this does not achieve PPS objectives and is thus does not conform to the PPS. Lastly, NHRM recommends a 300m adjacent land width for "at capacity" Lake Trout Lakes. This is not reflected in Table 10 in the MOP.

[1] The **precautionary principle** (or **precautionary approach**) generally defines actions on issues considered to be uncertain, for instance applied in assessing risk management.[1] The principle is used by policy makers to justify discretionary decisions in situations where there is the possibility of harm from making a certain decision (e.g. taking a particular course of action) when extensive scientific knowledge on the matter is lacking. The principle implies that there is a social responsibility to protect the public from exposure to harm, when scientific investigation has found a plausible risk. These protections can be relaxed only if further scientific findings emerge that provide sound evidence that no harm will result. (https://en.wikipedia.org/wiki/Precautionary_principle)

Strengthening the Natural Heritage Policies

Consistent with placing a high priority on the protection of natural heritage, it is appropriate to have strong, clearly worded environmental policies. The following comments would assist in achieving this.

Areas of Natural and Scientific Interest (ANSIs)

Section F 1.2.4 on ANSIs would benefit from revision. The Province does not address "regionally Significant" and "locally significant" ANSIs as used in section F.1.2.4. We suggest these should be defined in the OP or the terms should be removed. Generally, c) is so weak as to be useless. Either give direction to the area municipalities or leave it out entirely.

Significant Wildlife Habitat

F1.2.3.1 b) notes that comprehensive identification of Significant Wildlife Habitat (SWH) is not feasible. We agree this is true in many cases but the word "generally" should be inserted as to not preclude the instances where it may be feasible. Notwithstanding the difficulty of completing a comprehensive District-wide evaluation, SWH still needs to be evaluated, not just to conform with the PPS, but also to respond to the policy directions in the MOP. To this end the MOP should indicate how SWH will be identified and assessed. This could be done within the policy(s) that address the content of an EIS, or within EIS Guidelines, as discussed below. We note that although NHRM identifies the identification of SWH ultimately as a municipal responsibility, it explicitly notes that municipalities can require the identification of SWH as part of development applications, and encourages to municipalities to outline expectations, as we suggest above (NHRM s.9.3, last para). In our opinion, given the difficulty of this evaluation, it is appropriate that the opinion of qualified professionals be allowed greater weight than other EIS analyses, however, that opinion still needs to be supported by a thorough discussion that provides a rationale for the professional opinion. This can all be elaborated on the guidelines for preparing an EIS.

We suggest that there is no value in listing current SC species in an appendix as noted in F1.2.3.1c), since the list of SAR is periodically updated and a SAR screening procedure is an essential task of all EIS reports.

In order to strengthen the environmental policies to make them more consistent with the guiding policies of the MOP, we suggest that in sections F1.2.3.1 d) and e) the words "should" and "may" need to be replaced by "will" and "shall". The sections should be refined to reflect what the municipality should require with respect to that assessment of SWH as discussed above.

Muskoka Heritage Areas and Sites

The Muskoka Heritage Areas and Sites is described in F1.2.7. We note that some of these Areas and Sites, may also be provincially significant features and would thus be subject to the relevant polices of the MOP that responds to the PPS. For other areas, F.1.2.7e) notes the District "may" require a "site assessment" to demonstrate there is no negative impact to the feature or its functions.

The Muskoka Heritage Areas and Sites were identified through a rigorous program that identified areas that are important to the Muskoka context and contribute to the uniqueness identified in the guiding policies of the MOP. As such, it is appropriate to accord them a high priority for protection. One step in achieving this would be remove the discretionary need for an evaluation and require one. Moreover, it is unclear what constitutes a "site assessment". In our opinion and EIS is the appropriate reporting requirement and they should be undertaken in the same manner as if these areas were provincially significant.

Development of Muskoka Natural Heritage System (NHS)

Although and NHS is not required by the PPS (they are only required in Ecoregions 6E and 7E), a systems approach to protecting natural heritage is recognized as the best way to ensure that natural features and their functions are sustained in the long term. Again, given the importance of Muskoka's natural features to its heritage and economy, it is appropriate that the MOP commit the District to the development of a Natural Heritage System. We note in F1.2.7a) that the Muskoka Heritage Areas and Sites are recognized as the potential basis for a Natural Heritage System.

Need to Integrate Consideration of Climate Change with Natural Heritage Policies

The MOP recognizes climate change in the context of healthy living and sustainability Section B in the MOP) but fails to make the link between climate change and the associated functions of natural heritage features (e.g., the role of forests in the carbon cycle, contributing to air quality and mitigating temperature). Section B18.9 b) viii) notes the "*Identification of natural heritage features that have become more sensitive to development pressures due to climate change*"; and d) notes one possible result of implementing the "climate change lens" to applications is "*Retention of natural vegetation*". However, none of this is linked to the EIS requirements, so the process by which the policies of section B get documented and are actually integrated into the design and review of development applications is not apparent. Section B should include reference to the EIS process as a mechanism that would include consideration of climate change in the evaluation of the significance and value of natural heritage features.

The objectives of section B include, "*f) Ensure that development and land use patterns that* [sic] *consider the impacts of climate change.*" The integration of climate change into the EIS process is necessary to 1) provide a comprehensive evaluation of natural heritage features that includes all their attributes for the purpose of determining if development should proceed (per objective B f); and 2) if it is determined development can proceed, to what extent and in what form.

Clarification on Where an EIS is Required

Section F1.4 says that that, "*Where the policies of this plan require an Environmental Impact Study (EIS)* ..." it shall be prepared in accordance with section F1.4. Similarly, F1.3.3b) uses the wording "*Where an EIS is required* ...". This wording places an onus on specifically noting when an EIS is required to fulfil certain policies. There may be a number of places where the MOP would benefit from specifically identifying when an EIS is required (e.g., in sections: B14.1, B14.2, D6.6, D6.7b), appropriate sub-sections in K and L), however, at least

s. F1.3.1b) should explicitly identify that the test of no negative impact should be achieved through completion of an EIS and reference the EIS policies of the MOP (F1.4). This goes hand-in-hand with strengthening the EIS requirements (see below) so that the District can ensure that the studies to evaluate whether there are negative impacts are undertaken with sufficient rigor and using appropriate methods and protocols. In general, cross-referencing with the environmental policies (section F) wherever there is a requirement to demonstrate no negative impact to environmental features would strengthen and clarify the intent of the environmental policies.

Environmental Impact Study (EIS) Requirements

An EIS is an important document for decision makers when an application has the potential to impact natural heritage. Given the special importance of preserving the natural environment in Muskoka, this is especially important for Muskoka planning staff, local municipalities and other stakeholders. It is our opinion that the MOP should articulate a high level of rigor for the preparation of an EIS. In our opinion, section F1.4 does not provide adequate guidance on the purpose and content of an EIS. For example, cumulative impact seems important enough to warrant its own section, but there is no requirement to address it in an EIS, just "encouragement". There is inadequate guidance on extent of inventory or site characterization, consultation, analysis of impacts, mitigation, statement of net impacts, etc. We suggest that there should be a section in the MOP, even if an appendix, that provides the content of an EIS. Many municipalities have produces "EIS Guidelines" accompanied by official plan policies that require adherence to the Guidelines. An important part of this should be a requirement for pre-consultation with relevant agencies to agree on the scope and content of each EIS. This also provided planning staff with the ability and authority to waive some aspects of an EIS, where appropriate.

An important aspect of the direction of an EIS is conveying in the purpose that it is an objective study to thoroughly characterize the environment that may be affected by a proposed undertaking, predict and identify the impacts that may result from the proposed undertaking (before and after mitigation). It should also provide a policy conformity section that evaluates whether the appropriate policy tests are met. Based on these analyses, the EIS should recommend whether a proposal undertaking should proceed from a natural heritage perspective.

In several places the MOP does not convey this purpose:

- F1.4.1 c) which is part of the Purpose, states that an EIS should, "Make an informed decision…". In our opinion, the EIS just presents one aspect of an application and should only recommend.

- In F1.4.2 a) the policy wording pre-determines the outcome of the EIS. The EIS should be an objective, science-based analysis to determine **if** there is any negative impact. It should guide development planning to avoid impacts and mitigate them when unavoidable. Its purpose should not be to demonstrate that there will no negative impact.

Lake System Health Policy Update

Section F2.6 in the MOP has a note to insert the text from former OPA 45, which is provided in Appendix IV of the October draft of the MOP. Appendix IV is a long discourse on Lake Health and a large part of it focuses on the phosphorus-based modelling that has been undertaken for many years in Muskoka lakes. We are not commenting on the modelling or water chemistry aspects of the MOP. Notwithstanding this, maintenance of the quality of the Muskoka lakes, with respect to chemistry and natural heritage aspects, is critical to achieving the Vision and Purpose of the MOP. At present, the relationship between the natural heritage aspects of the Lake System Health Policy Update and the rest of the natural heritage policies in Section F is unclear, as there is overlap, but a lack of cross-refencing. We suggest that it is insufficient to simply copy the entirety of Appendix IV into section F as proposed, and that the policies need to be integrated.

For example, App IV, F.20 notes that there is a long-term shift in focus to include a wider variety of indicators that address multiple stressors is anticipated. Shoreline development is identified as an environmental stressor (sub-section on Recreational Water Quality, para. 3), and will include the effects of vegetation removal and shoreline alteration which will affect natural heritage features such as wetlands and fish habitat. These factors need to be integrated and the relationship between an EIS that evaluates impacts to natural heritage features and the attributes included in the Lake System Health Policy clarified.

Also, where setbacks are required in the policies in App IV (e.g., s. F.27, F28), there should be caveats and cross-referencing that makes it clear that development is also subject to the natural heritage protection policies.

We trust that the foregoing will assist you in providing positive input to the proposed Muskoka Official Plan. We would be pleased to discuss any of the above with you.

Yours very truly,

Mirek Sharp,
Principal, North-South Environmental Inc.

ATTACHMENT C

Memo

To: Catherine Lyons, Goodmans LLP

From: Gertrud Nürnberg, Freshwater Research

CC: Laurie Thomson

Date: 2017-11-22

Re: *District of Muskoka Draft Official Plan - "Water Quality" Provisions, Official Plan Amendment 45 (here cited as DRAFT):* Shortfalls and proposed improvements

Recommendations pertaining to lake monitoring by the District Municipality of Muskoka (DMM):

The approach for insuring acceptable water quality in Muskoka lakes recommended by Hutchinson Environmental Sciences LTD (HES 2016, p.8, *Recommended Approach*; also described in DRAFT p. 183) includes:

> "2. Use of the District monitoring program to track phosphorus on DMM lakes and classify them according to measured changes and observed quality,"
>
> And 3. Implementation of enhanced planning requirements and Best Management Practices for individual lakes based on observed water quality concerns or 'triggers' based on the District's monitoring program. These would include implementation of "causation studies" on individual lakes and focussed use of the existing model in response to the monitoring triggers." (HES p. 8).

While the past DMM monitoring program may have been sufficient as a routine monitoring effort to collect baseline data, its recommended use to inform regulations and decisions about the vulnerability of individual lakes increases the importance for comprehensive and sufficient monitoring data. Especially in view of limnological changes in lakes due to climatic change, the current monitoring program lacks comprehensiveness and rigour.

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At least four Muskoka lakes have confirmed toxic cyanobacterial blooms according to HES and p. 190 in Appendix IV of DRAFT. But more Muskoka lakes are known to have repeated cyanobacteria blooms besides these four (e.g., Brandy Lake *in* Persaud AD, Paterson AM, Dillon PJ, Winter JG, Palmer M, Somers KM. 2015. Forecasting cyanobacteria dominance in Canadian temperate lakes. Journal of Environmental Management. 151:343–352). A more thorough determination of lakes "where a phosphorus indicator has been confirmed in accordance with the policies of section F2.6" (p. 190 in DRAFT) that includes the scientific peer-reviewed literature, is recommended. Two of the lakes were investigated by independent studies and sediment derived phosphorus as internal loading was identified as the potential most important contributor and cause (Persaud et al 2015). Other scientific research has shown and there is consensus that internal P loading from the sediments in the summer and fall can trigger and sustain potentially toxic cyanobacterial blooms. Predicted climate changes including warmer summers with increased storm events increase the potential of internal loading and cyanobacteria blooms.

Internal phosphorus loading has been determined in several Muskoka lakes besides those mentioned above, and the high potential for increased hypoxia because of morphometrical and geochemical characteristics has been described in peer-reviewed and laymen literature (e.g., Nürnberg 2007, attached).

To detect incidences of internal loading, monitoring the water column dissolved oxygen (DO) and total phosphorus (TP) concentration at several depths are necessary, including several discrete samples in the thermally stratified lower water column. Decreasing DO to hypoxic levels (below oxygen saturation, <2 mg/L DO) towards the bottom sediment simultaneously with TP concentration increases are some, of many indicators. Such conditions become prevalent in the late summer and fall (Sep-Nov, depending on lake depth and surface area).

The current monitoring program provides information only for the mixed upper water layer (epilimnion) and usually covers the period from May through August. Hence most tell-tale signs of internal P loading are missed.

The possibility of internal P loading should be determined for all Muskoka lakes. Suggestions on how to accomplish such an increased program include theoretical and previously monitored information. Using morphometric and other information available on the lakes, the theoretical potential can be evaluated and the most vulnerable lakes

identified. Such lakes should then be monitored with respect to DO decreases and TP increases during the summer and fall in the bottom water and phytoplankton biomass and identification.

A critical and real threat to Muskoka waters is the increased potential of toxic cyanobacteria and their blooms. It seems that phosphorus is the key factor, in conjunction with climate change related temperature increases that enhance conditions when internal P loading can occur. In addition and as done in the MOECC Lake Partner Program, it would be appropriate to monitor Secchi disk transparency as a general indicator of lake water quality as it is perceived by the lake user. Further, other parameters should be included in a monitoring program to address issues of drinking water safety and recreational water uses including contact sports and swimming.

Further Recommended changes directly pertaining to the DRAFT text:

F.18 The District of Muskoka will, in collaboration with the Area Municipalities and other stakeholders, undertake constraints analyses for waterbodies in Muskoka **as resources permit**. (Bold formatting added by GN)

"As resources permit" is a weak, non-committal statement.

F.19. "The identified water quality indicators are as follows:
a) A long-term statistically significant increasing trend in total phosphorus concentration demonstrated by at least five (5) sample measurements starting in 2001 or thereabouts;
b) A long-term total phosphorus concentration of greater than 20 µg/L demonstrated by the average of five (5) most recent spring overturn phosphorus sample measurements taken within the last ten (10) years"

In reference to F.19a): It is not clear whether individual or averages of certain periods are used. I suggest a similar wording as in point b). "… demonstrated by the average of five (5) most recent growing period (May-Oct) or, lacking that, spring overturn phosphorus measurements taken within the last ten (10) years"

In reference to F. 19b): The water indicator threshold of 20 µg/L is too high and not cautious enough. Winter et al. (Winter JG, DeSellas AM, Fletcher R, Heintsch L, Morley A, Nakamoto, L. Utsumi K. 2011. Algal blooms in Ontario, Canada: Increases in reports since 1994. Lake Reserv Manage. 27:107–114) determined that the median TP concentration for lakes with cyanobacterial blooms captured by the MOECC Lake Partner Program was 15 µg/L, with 26% of the lakes experiencing such blooms at TP concentration below 10 µg/L.

F.22. The District of Muskoka will monitor waterbodies on an **annual basis** for the presence of the identified water quality indicators. Notwithstanding Section F.19, the District of Muskoka will also monitor waterbodies for **linear short-term increases** in total phosphorus as identified through the most recent three total phosphorus samples. Should a waterbody demonstrate such a trend, water quality sampling frequency **may** be increased. (Bold formatting added by GN)

In reference to F.22: It is not clear what "an annual basis" of monitoring implies, whether all lakes in all watersheds will be monitored every year. I suggest clarification of the period and the frequency, e.g., the "growing" period, or months May-Sep, every x years, besides suggested extended monitoring for lakes with potential internal load, as described above.

It is also not clear what "linear short-term increases in total phosphorus" imply. Are such increases based on individual samples throughout one growing period, or on annual averages. Further, the follow-up is not mandatory as stated "sampling frequency may be increased".

F.28 d. Redevelopment on an existing lot or replacement of a leaching bed is proposed where a setback is further reduced and a net improvement over the existing situation is achieved through the implementation of onsite phosphorus management and impact mitigation measures; or

Here and elsewhere, it is not clear who decides whether a "net Improvement" will be achieved. This is not a limnological suggestion, but a more general point.

Comments with respect to **Causation Study Policies:**

As mentioned above, all available information (not just that from the DMM monitoring), including studies by researchers and the Ontario Ministry of the Environment and Climate Change (MOECC), should be used in determining the "waterbodies listed in Appendix E".

F.38: A waterbody will be removed from Appendix E once **one or more** of the water quality indicators identified in Section F.19 is confirmed not to be present for three consecutive years ...

"...once one or more" should be replaced by "all" water quality indicators should show improvement ,,,

F.39: A waterbody-wide Causation Studies will be undertaken by the District of Muskoka to determine the cause

I suggest the addition of monitoring suggestions that are specific to the determination of internal phosphorus load as described above.

Comments directly to HES 2016:

HES 2016, p 9: "We recommend that a suite of stricter "Enhanced" BMPs be adopted and enforced on any lake in which a water quality trigger has been met in recognition that lakes in which total phosphorus concentrations exceed 20 µg/L or are increasing, or in which a cyanobacterial bloom has been documented may be particularly sensitive to development."

BMPs are the main management tool to combat and neutralize negative influences encountered by anthropogenic development including external P inputs. I propose that in addition to the "normal" BMPs, also several of the BMPs that are suggested by HES as "enhanced" and only applicable to lakes with TP concentration exceeding 20 µg/L, be routinely used (HES, p. 10). These are:

Site-Specific Soils Investigation
Septic Abatement Technologies or Full Servicing
Slope Dependent Setback

Attachment:

Nürnberg GK. 2007. Internal phosphorus loading in Ontario Cottage Country or "The Devil is in the Sediments." Canadian Society of Environmental Biologists, Newsletter. 64 (4):11–12.

Internal Phosphorus Loading in Ontario Cottage Country or The Devil is in the Sediments

Revised from an article published in the Federation of Ontario Cottages Association's (FOCA) Lake Stewardship Newsletter
Gertrud Nürnberg, Ph.D., Freshwater Research, 3421 Hwy 117, Baysville, Ontario P0B 1A0 gkn@fwr.on.ca ***www.fwr.on.ca***

By now, everyone in Cottage Country (starting about 150 km north of Toronto on the Canadian Shield) has heard about phosphorus (P), the nutrient that makes the water green because it makes algae grow. Eutrophication, or the overabundance of nutrients in waters, is the single most important cause for the deterioration of the water quality in our lakes and rivers, unless they are acid-stressed. "Acid" lakes, which are very clear and have a pH below 6 or so, are not in danger of turning green, because they have other problems, like toxicity caused by heavy metals and acidity.

To keep eutrophication at bay, shoreline residents have been striving to reduce phosphorus inputs into their lakes. They have been instructed to use phosphate-free soaps and detergents, to not wash hair in the shallows or cars at the beach, and to keep the shoreline as natural as possible minimizing the need for fertilization. (Shoreline buffer zones are better than grass at adsorbing phosphorus in the runoff water after rain or snow melt and don't need to be fertilized.) Thus, ideally, the external input of phosphorus to a lake is kept to a minimum.

Of course, it was not always so. The early settlers of the cottage country did not know about eutrophication. Their outhouses and sinks drained, "conveniently," right into the stream. The potato and tomato fields needed a lot of manure on this poor soil, livestock drank right from the creeks (defecating at the same time), and the towns discharged any collected wastes right into the bay of the next lake. Much of these early inputs into the waterways were flushed downstream, but a proportion was retained at slow flowing and shallow locations and remains there now, a time bomb ready to be released.

What is the trigger? The trigger is anoxia, which means complete oxygen depletion. As long as the water directly over the sediments still contains oxygen (at least 1 to 2 ppb), phosphorus stays bound in the sediments. However, when oxygen is used up completely, the chemistry of the sediments changes, phosphorus is no longer bound to the sediments, and large amounts of phosphorus may be released into the overlaying water. This water eventually mixes with surface water, so that algae up in the sunlit water can thrive. The water becomes green. Phosphorus released from the sediments is called "internal phosphorus loading."

Internal P loading is a complicated process. While fertilization of bottom sediments in lakes and rivers is the prerequisite, chemical changes within the sediments and oxygen-free conditions above them all work together to release P in a form that is highly biologically available as phosphate (just like in a fertilizer).

On the Canadian Shield, where most of Ontario's Cottage Country is located, fertilized bottom sediments are still few. In other regions, for example, where former seas were situated (e.g., in the Great Lake/St. Lawrence basin), the soils were naturally P enriched even before European settlement. But the trigger, bottom anoxia, occurs naturally in many lakes in Cottage Country. Many of these lakes do not encourage mixing because of their shape, deep and small, or because their tea-like color traps sunlight in the warm surface water so that the bottom water remains cold. In addition, this brown stain enhances bottom water oxygen depletion as it is produced by organic material. When the organic material decomposes, it consumes oxygen. For example, in half of the lakes in the District of Muskoka, anoxia is so frequent in the bottom water it is as if the whole lake surface area was completely anoxic for 10 days per year. In more eutrophic lakes, bottom anoxia occurs more because of algae and other plankton that settle to the bottom and are consumed by bacteria that use up the oxygen in the process.

Important phosphorus forms

Phosphorus (P): Usually means total phosphorus, which is all phosphorus that can be analysed in a water sample. It includes phosphate, particulate forms, and other forms not easily available to be used by algae. Much external loading is comprised of all these forms.

Phosphate: A proportion of phosphorus that is directly available to plankton (algae, bacteria) in the water; it is usually below analytical detection limits in lakes on the Canadian Shield, except where internal loading occurs.

It is difficult to generalize the importance of internal load in lakes. The interplay between external and internal P loading is depicted as stages (Figure 1). Internal load was first described in highly eutrophic lakes in Europe and the USA (Stage 3), where, despite a major reduction of external load (usually by collecting and treating all waste water as point source reduction), in some lakes the P concentration did not decrease and water quality continued to deteriorate. More recently, it has been described in many other lakes even if it is not as obvious (Stage 2). Its quantification includes methods based on P budgets, P mass balance models, sediment incubation and analysis, and determination of anoxia. In general, it's been the consensus that internal loading may occur in more places than previously thought. Traditionally, it was only described in eutrophic lakes, as it usually takes a long time for sediments to become enriched and oxygen depleted enough to release P. But recent analyses has shown that oligotrophic systems on the Canadian Shield, like small deep lakes or those stained with organic acids, are vulnerable because of the natural occurrence

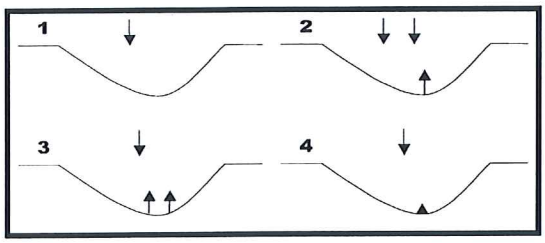

Figure 1. Presumed stages during the eutrophication process in lakes with respect to internal P load from the lake bottom (upwards arrow) in response to external load (downwards arrow). During Stage 1, external load happens, but no internal load. Even if the hypolimnia may be anoxic, there is not enough releasable P in the sediment surfaces to be released. In Stage 2 the external load increases, due to anthropogenic sources from development, and sediment P release will eventually commence, depending on the oxygen state of the sediment surfaces. Even when management efforts reduce the P load from the watershed as in Stage 3 internal load will still occur until the reductant-soluble sediment P has been flushed out (Stage 4).

of oxygen depletion; here, any P additions can potentially be released instantly and fertilize the water, perhaps creating cyanobacterial blooms.

Further Reading: Nürnberg, G.K. 2001. Eutrophication and Trophic State - Why does lake water (quality) differ from lake to lake? LakeLine (North American Lake Management Society) 21(1), 29-33.

Nürnberg, G.K., and LaZerte, B.D. 2004. Modeling the effect of development on internal phosphorus load in nutrient-poor lakes. Water Resources Research. 40, (1), W01105, DOI:01110.01029/02003WR002410.

ATTACHMENT D

MEMORANDUM

November 21, 2017

TO: Catherine Lyons

FROM: Ray Dewey, PhD.

RE: Review of "Lakecap" Model

The District Municipality of Muskoka uses their "Water Quality Model (MWQM), a variant of the MOE's as one component of the Lake System Health program to guide planning policies for recreational lake development in a large and complex watershed of over 500 lakes and lake segments." [1] A review of the MWQM and the Lakecap model indicates that the model's accuracy is not sufficient to use it as a tool to determine specific lakeshore development capacity.

"Lakecap" Model (2010)

The Ministry of Environment and Climate Change (MOECC) has developed the Lakecap model – a method to assess a lake's capacity to shoreline development (adding more people and cottages). The model was originally a paper exercise of estimating various parameters that influenced the amount of Total Phosphorous (TP) that would be contributed to the lake through natural sources and human activities. The final model output was an estimate of Dissolved Oxygen (DO) deficit in the lake. The size of the estimate was then used as a control factor for additional shoreline development.

The level of TP in a lake reflects the lake's ability to grow algae, which in turn consume DO in the lake, particularly at depth – which will negatively affect the cold-water fishery. For example Lake Simcoe was once a cold water lake, where the DO levels at depth (below the thermocline) were able to sustain a diverse fishery with Lake Trout and other Salmonids. For the past thirty years the lake has been classed as a warm-water fishery and Salmonids are extremely rare. In fact Lake Simcoe now has a TP budget and only a specific number of tonnes of TP are allowed to be discharged to the lake. Through much effort and money the lake is slowly recovering.

The Lakecap model aims to establish the TP budget for a lake, and through some equations turn that budget into a "number" representing the allowable human impact -development of lots for cottages.

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[1] Revised Water Quality Model and Lake System Health Program, Final Report, Hutchinson Environmental Sciences Ltd., April 2016 (The Hutchinson Report).

From the Hutchinson Report

> *"The model is implemented by calculating that a lake can sustain, for example, the phosphorus loading from 128 seasonal residences and maintain phosphorus concentrations below the Provincial standard of "Background+50%". Thus, the "capacity' of the lake is 128 lots and the Province advises that any development beyond 128 lots be refused in OP Policy. Our review concluded that modelled phosphorus concentrations often differed from measured values. The Province advises that the modelled phosphorus concentration should be accurate to within 20% of the measured value.*
>
> *The revised model, on average, overestimated phosphorus concentrations by 38%, and underestimated them by 23%. Error exceeded 40% in 81 of the 206 lakes monitored by DMM. This error means that one cannot defend a "capacity" estimate as fine as 128 lots for use in Policy."*

What does overestimated TP cause – the developer that wanted to build out say 20 lots is now reduced to building 10 – this is bad for the developer but good for the lake. Underestimating TP is the opposite; the developer can now build say 20 lots rather than the original proposed 10 lots, good for developer, very bad for the lake.

The Lakecap model predictions were found to be unreliable with respect to TP levels. An error of 40% in 81 of the 206 lakes that were monitored indicates the model has some serious shortcomings.

The MOECC has accepted the fact that the model is not reliable. The model may work in isolated small watersheds where the initial assumptions of the model exist. The District of Muskoka watershed is very complex which makes assessing some of the input parameters very difficult.

The Hutchinson Report states they used the latest estimates for several parameters including:

- Atmospheric loading of TP – this is the TP added to the lake from dust and rain falling on the watershed. This value has been extensively measured as it is used in many other watershed models.
- Revised wetland TP exports – how much TP is released from wetlands. Question – does each wetland behave the same? I don't know how wetlands behave with respect to TP, but would think decay of biomass would release some TP; is it constant of the year?

The "new inputs" should have made the model more accurate.

What could be wrong?

The one parameter that is a major source of TP to a lake is the cottage septic system. Municipal wastewater treatment plants are the other major source and are known as point source loads, their impact is more easily estimated.

The Hutchinson Report recommends the use of best management practices (BMP) for septic siting and design for new development. The contribution of TP to the lake is an estimate of how well a system will

store/release TP – I am not sure how advanced the science is to make accurate assessments given the variability of the soils, rock depths and other variables (distance of septic bed to lake, vertical distance to lake, trees and grass to intercept groundwater flows). What about older systems built before there were any regulations? How is the impact from them added to the lake TP budget?

Non-point source loads are the hardest to estimate – and there are many, below I list a few that stand out.

Other factors contribute to TP and should be included in comprehensive model:

For example: estimate how much fish biomass is removed from the lake by fishing activities? There is TP in fish flesh so catching a fish and consuming it will remove some TP from the budget – assuming the by-products of consumption do not remain in the watershed. How are fish caught by birds and wildlife accounted for?

TP is imported to a watershed in large quantities via lawn and garden fertilizer; I have never seen this amount accounted for. Every spring, garden centers pop up at shopping malls and pallets of bags of fertilizer are trucked in, the big box stores have fertilizers year round. Once the fertilizer is applied to a lawn, the TP is now released into the watershed, it may take several years, but the TP will eventually reach a nearby watercourse, and the lake. Lawn clippings break down and release the TP into the soil, some is recycled into new growth, but some will escape. Once TP comes over the border of a watershed it is there to stay.

It is easy to see why a model can be inaccurate in predicting the TP response of a lake, given that the science is lacking in so many of the factors affecting the TP budget. The Hutchinson Report comes to the same conclusion:

> *"After extensive testing and analysis of the revised model we once again concluded that the modelled estimates of phosphorus concentrations in lakes were not reliable enough to set and defend specific lakeshore capacities as numbers of cottage or residential lots, as intended by the MOECC."*