Denise Baker

April 27, 2016

File 16573.00001

City of Greater Sudbury
PO Box 5000, Station A
200 Brady Street
Sudbury, Ontario
P3A 5P3

Attention: Caroline Hallsworth, City Clerk

Dear Ms. Hallsworth:

RE: Greater City of Sudbury Official Plan Review

We are solicitors for 1789682 Ontario Limited, owners of property at Moonrock Avenue, legally referred to as Lot 7, Concession 1 (the "**subject property**"). As Council may be aware, site-specific development applications related to the subject property have been appealed to the Ontario Municipal Board (OMB File No. PL160045).

The purpose of this correspondence is to indicate that we are monitoring progress of the Official Plan Review to ensure the emerging planning framework accommodates the site-specific development applications.

Accordingly, please accept this correspondence as our clients' formal written submission prior to the adoption of any Official Plan Amendment (the "**OPA**"). We request that we be provided with notice of any open houses or public meetings with respect to the official plan review as well as any staff reports, Council and/or Committee's resolutions, and any decisions of the approval authority with respect to the official plan review. We reserve the right to augment our comments as the need arises.

Thank you for your consideration of these submissions. Should you have any questions or

require further information, please do not hesitate to contact the undersigned or Paul Chronis, Senior Planner in our office

Yours truly,

WeirFoulds LLP

Denise Baker

PC/DB/cl

Cc: Kris Longston, Manager of Community & Strategic Planning
Kris Menzies, MHBC Planning
Client
Paul Chronis

Debbie Belowos - RE: Official Plan Review

From: "Ian Rutledge"
To: "'Kris Longston'" <Kris.Longston@greatersudbury.ca>
Date: 5/2/2016 10:51 AM
Subject: RE: Official Plan Review
CC: "'Debbie Belowos'" <Debbie.Belowos@greatersudbury.ca>

Ok thanks

From: Kris Longston [Kris.Longston@greatersudbury.ca]
Sent: Monday, May 02, 2016 10:44 AM
To: ian.r@zpplan.com
Cc: Debbie Belowos <Debbie.Belowos@greatersudbury.ca>
Subject: Re: Official Plan Review

Hi Ian,

Yes, a draft has been prepared and presented to Planning Committee and we are currently in the process of undertaking public consultation and soliciting public input.

Please see our OP review website for more details or to submit comments.

http://www.greatersudbury.ca/inside-city-hall/official-plan/phase-1-official-plan-review/

If you have any further questions, please contact me.

Thanks,
Kris

Kris Longston, MES, MCIP, RPP
Manager, Community and Strategic Planning,
Department of Growth and Development
City of Greater Sudbury,
PO Box 5000, Stn. A,
200 Brady Street,
Sudbury, ON
P3A 5P3

Tel : (705) 671-2489, Ext. 4353
Fax: (705) 673-2200
Email : kris.longston@greatersudbury.ca

>>> "Ian Rutledge" 5/2/2016 9:46 AM >>>
Hi, has a draft Official Plan been prepared for the new Official Plan?

Debbie Belowos - Fwd: Roads

From: Kris Longston
To: Belowos, Debbie; Carre, Krista; Ed Landry
Date: 5/3/2016 8:41 AM
Subject: Fwd: Roads

I'm assuming that this is in relation to the Official Plan review.

Debbie, can you please print out and add to Ed and I's binders and update the spreadsheet.

Thanks,
Kris

Kris Longston, MES, MCIP, RPP
Manager, Community and Strategic Planning,
Department of Growth and Development
City of Greater Sudbury,
PO Box 5000, Stn. A,
200 Brady Street,
Sudbury, ON
P3A 5P3

Tel : (705) 671-2489, Ext. 4353
Fax: (705) 673-2200
Email : kris.longston@greatersudbury.ca

>>> Kathryn Farrell 5/3/2016 2:34 AM >>>
Our roads, as usual, are in great need of repairs (pot holes). The lines need to be painted! In some areas we can no longer see the lines and it makes it more difficult for night time driving.

KATHRYN

Comment Form:
Phase 1 of the Official Plan Review

City of Greater Sudbury
Official Plan
Flexible | Balanced | Sustainable

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Contact Information

Name (first and last)* Adam Bonczak

Organization (if applicable) —

Comments

If you wish to give feedback on a specific area of the Official Plan please provide your comments in the appropriate area. You can add comments to as many categories as you would like. Leave the categories blank if you do not wish to provide comments. For general comments, please use the General/Other comment box.

General/Other

My vision For Sudbury involves looking at the past, and that being our mining heritage. I believe we should look at a plan for our area's economic development & Future that would involve a "World Class" underground network of tunnel systems similar to the sketches I created and submitted For the "Adanac Ski Hill" mountain range. Biulding a "SUBbury" underground would help deal with such issues as shelter, climate change, Food production, transportation and tourism just to name a Few. A "World Class" tourism site could be tied in with Science North, and other unique climate controlled enviroments & be the "Envy" of the world.

Secondary Suites

Climate Change

Growth Settlement and Urban Structure

Local Food Systems

Heritage Resources

Natural Resources

Urban Design

Water Quality

Privacy Statement:

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I hereby declare that the facts provided in this comment form are true and are complete to the best of my knowledge and I have read and consent to my information being collected, used and disclosed by the City.

Signature: Adam Bowyer

Date: May 10/16

Please return this completed form to:
Kris Longston, Manager of Community and Strategic Planning, by phone at 705-674-4455, extension 4353, by email at kris.longston@greatersudbury.ca, or by mail to 200 Brady St., PO Box 5000, Station A, Sudbury, ON, P3A 5P3.

MY VISION!

I believe to look ahead in terms of economic growth and development to 2025 and beyond, you first have to look at the past. Mining has been such an integral part of our history and advancement as a community, and therefore I believe this would have great merit in developing our area into something the world has never seen.

My vision incorporates the "ADANAC SKI AREA" which is centrally located near the downtown and can be accessed from every area, and with the help of our mining partners this mountainous region could be utilized to it's fullest potencial by being mined out to accomadate differant venues and activities.

The mined out fill would be transported up the hill to build up an even bigger ski hill that could rival Searchmount in the Sault, or even Mount Tremblant in Quebec.The ski lift would be a newly developed "Underground Cage Lift" which would be a new experiance for most skiers.

The trails around the area along with Junction creek could be developed into cross country ski trails, as well as oil lamp lit skating paths.

The top of the new Adanac area would feature a unique revolving restaurant that would capitalize on the breathtaking view of our city,

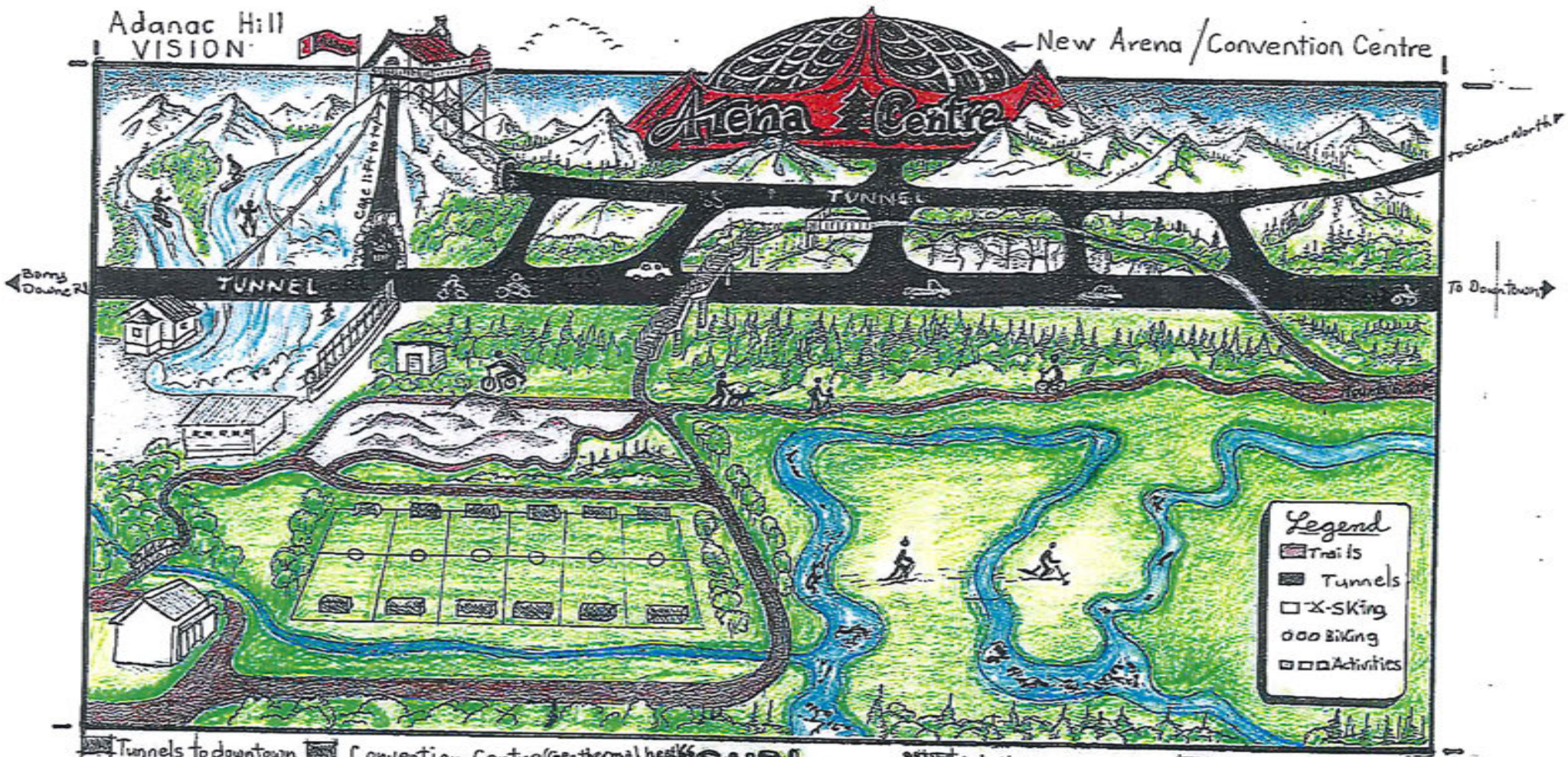
The mountain top would feature the new ARENA/CONVENTION centre which could be accessed by underground tunnels. The Arena would be a tourist destination point from Science North and other venues. The underground tunnel system would be a world leader in GEO- THERMAL heating, and offer the area farmers a longer growing season thus helping the community to be more self sufficient.

Transportation systems could be developed underground, thus alliviating traffic congestion to the downtown area.I believe there could be many more diversifications developed from this underground experiance, and I've submitted a preliminiary sketch with just a few of the other "visionary"ideas I have for the new "SUBbury" vision.

Please don't hesitate to call me with any questions you may have

Sincerely, Adam Bonczak

"SUBbury"



- Tunnels to downtown
- Fill for Larger Hill
- Underground ECO-CENTRE
- Ore Car trolley's
- Imax Theatres
- Hotel in Rock
- Olympic Ski-jumping hill
- Convention Centre (Geothermal heat)
- Arena & Community Centre
- Climate Controlled Gardens
- Shops & Retail underground
- Tunnels tieing into Science N.
- Underaround Activity Centres
- Wave pools, Hot Springs tubs

"SUBbury"
CITY WITHIN A CITY

- Wall Climbing Ctr.
- Condos on the Rock
- Mountain Biking
- X country skiing
- Olympic Training Centre
- Cage Lift in Rock
- Junction Cr. Skating Path
- Climate Controlled Caves
- Mining Exhibition Centre
- Golf Driving Range
- Revolving Restaurant on hill.
- Trolley Cars to Science N.
- Mountain St. to Barredowne Tunnel
- Horse drawn Sleigh rides

Note: This "Legacy" project would not only drive our economic development, but it would showcase our mining history, & be a first of it's kind in the world, which would help promote our tourism base. Geo-Thermal heating and cooling would drive the engine for this project.

Debbie Belowos - Fwd: Official Plan Comment - Projection Scenarios

From: Kris Longston
To: Belowos, Debbie; Ed Landry
Date: 5/18/2016 11:51 AM
Subject: Fwd: Official Plan Comment - Projection Scenarios

For OP comment file and spreadsheet.

>>> John Lindsay 5/17/2016 2:52 PM >>>
Hi Jason: Good to see you last evening and taking a look at the Official Plan draft. A lot of work has gone into the document and revisions.

Further to our talk on population and work force projections, it is indeed true that forecasting is always difficult. There are many different factors to be taken into consideration.

I have concerns with respect to what I believe are the most recent background papers (2013 and 2015) which indicate growth which I feel may be overly optimistic and that, as we discussed, perhaps a scenario should be included in which there is little or no growth or even decline so as to be prepared in case of that eventuality.

I have been a resident of Sudbury for the past 50 years and have had the opportunity to observe the "good and bad" times as a labour market and human resource specialist with the Federal Govt for almost 30 years and in the financial services industry since then.

Growth is predicated largely on expansion of the mining industry which is problematic. As the Hemson (2013) report states "as long as the Chinese and Indian economies continue to grow there is good reason to anticipate Sudbury will do well". Unfortunately these economies are not doing well and in the case of China growth is predicted to be much reduced for the foreseeable future and India is unlikely to replace that deficiency. This could be the situation for possibly the next 10 years and after that no guarantee of growth in the industry competing against other sources of supply and/or improved technology reducing workforce needs. Even now, for every new mine opening, one closes and it is likely that further expansion will not take place, some industry experts predict, over the next 20 years.

The matter of new hires to replace those retiring has to be balanced with the mortality rate of the large number of older adults in the community who had participated in the work force over time, together with those who leave for other areas. At best it would seem to be status-quo in terms of absolute numbers.

Sudbury has done well in economic diversification in the past however we may have "maxed out" in the areas of mining supply, education, health, tourism, retail and other sectors. Recent initiatives over the past several years to expand in these and other areas have not been particularly productive. New housing starts are down and apartment vacancy rates have gone up, as the number of available units increase. This could indicate a potential oversupply situation and/or a weak employment market with job losses and an outflow of labour to other areas. Is this cyclical, perhaps, but if not have we run out of options to reduce this decline?

There is a difference in being pessimistic and realistic and is the reason why I think it is important to have a "what if" scenario as part of the Official Plan in case we are not to be in a growth situation going forward. I think is is always wise to prepared for the worse as well as hoping and planning for the best.

Always happy to discuss further

John

Debbie Belowos - Fwd: [BULK] Re: Official Plan Comment - Projection Scenarios

From: Kris Longston
To: Belowos, Debbie; Ed Landry
Date: 5/18/2016 1:56 PM
Subject: Fwd: [BULK] Re: Official Plan Comment - Projection Scenarios

For OP file, binders and spreadsheet.

Thanks,
Kris

>>> "Lionel Rudd" 5/17/2016 3:31 PM >>>
Hi John,

A further oversight is the impact of Cuba on the supply of nickel. The Americans are not getting friendly with the Cubans just for their rum and cigars. Canada has slipped from around 35% of the world's nickel market in 1990 to less than 10% now. Local mining supply companies are currently focusing there efforts and interest in Toronto and elsewhere. Real estate signs are going up in my neighbourhood like mushrooms after a thunderstorm. There is a very big elephant in the room that nobody wants to see. On top of all this, with less high paying jobs in the minerals industry and too many retirees dieing off the overall income levels will drop - so who and how will all the nice frills be funded.

Keep yer stick on the ice....

Lionel R

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Always happy to discuss further

John

Debbie Belowos - Fwd: Watershed Study Comment Submission - Official Plan reference

From:	Kris Longston
To:	Belowos, Debbie; Ed Landry
Date:	5/19/2016 10:21 AM
Subject:	Fwd: Watershed Study Comment Submission - Official Plan reference
Attachments:	Watershed Study Comment Submission - Official Plan reference

For OP file, binders and spreadsheet.

thx
Kris

>>> Jason Ferrigan 5/19/2016 9:31 AM >>>
An Official Plan Review Comment

Debbie Belowos - Watershed Study Comment Submission - Official Plan reference

From: John Lindsay
To: <jason.ferrigan@greatersudbury.ca>
Date: 5/18/2016 8:54 AM
Subject: Watershed Study Comment Submission - Official Plan reference
Cc: Lynne Reynolds <lynne.reynolds@greatersudbury.ca>, Fern Cormier <fern.co...

Hi again Jason:

Below submission to Ramsey Watershed Study Plan - note reference in last paragraph to Official Plan:

John

These comments are made on behalf of the Minnow Lake Restoration Group in the Watershed of Lake Ramsey representing the northern boundaries of the watershed. We are not so much concerned about methodology or process as we are about outcomes.

The aim of the study should be to determine the ability of the watershed at its present level of urban development to prevent contamination of the water body (Ramsey Lake) and what the effects on this ability would result from further urban development and what preferably natural means might be employed to achieve the desired level of protection for Ramsey Lake, both in the present state of the watershed and in the future as referenced in section "6.1 Opportunities and Constraints" of the Plan.

Specifically to reference and quoting from the 1991 Ramsey Lake and Watershed Community Improvement Plan - a 100 Year Vision:

"The quality of water flowing in the watershed should be maintained by working with the natural processes, improving the diversity and health of the total natural system and continuing to regenerate the watershed ecosystem toward its original state" and

"Lakeshore and watershed development principles should be established based on hydrogeological and ecological models to achieve the high degree of fit between the human and natural landscapes to maintain quality and quantity" and

"Waterfront (watershed included) development should be prohibited in areas which have recognized environmental constraints and areas where the integrity of the natural system or water supply would be damaged"

Due to the recognized inherent fragility of the watershed, consideration should be given to the cost of remedial action to protect the water body in relation to future urban development.

It might well be in the best interests of the watershed and Ramsey Lake as a result of this study to consider amendments to the official plan to redesignate certain lands within the watershed from urban development status to other non development designations providing compensation to the property owners related to the original purchase price or trade of public less sensitive non Ramsey watershed lands,

Respectfully submitted

John Lindsay,

President

Minnow Lake Restoration Group

Debbie Belowos - Fwd: Fw: [BULK] Re: Official Plan Comment - Projection Scenarios

From: Kris Longston
To: Belowos, Debbie; Ed Landry
Date: 5/23/2016 8:55 PM
Subject: Fwd: Fw: [BULK] Re: Official Plan Comment - Projection Scenarios

Hi Debbie,

For OP file, Binder and spreadsheet.

Thanks,
Kris

>>> Jason Ferrigan <Jason.Ferrigan@greatersudbury.ca> 5/18/2016 6:39 PM >>>
An OP Review comment.

Sent from my BlackBerry 10 smartphone on the Bell network.

From: Lionel Rudc
Sent: Wednesday, May 18, 2016 10:16 AM
To: John Lindsay
Cc: Jason Ferrigan
Subject: [BULK] Re: Official Plan Comment - Projection Scenarios

Hi Again,

Something else that will scare the hell out of the profiteers and "manipulators" is the outcome of the long form census. It will identify demographic trends and shifts. Also it will identify where the money is and where the money is going. So whatever the City of Sudbury is planning with all the grandiose plans and ice skating mausoleums and grand highways we could end up like a western ghost town - even Tim Horton's and Walmart might move out...

Comrade Lionel R

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Contact Information

Name (first and last)* Louise Beauvais

Organization (if applicable) _____

Comments

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General/Other

I am definitely in favor of the change of division of lots/acres in Urban (the change from 5 acres to 2 acres)

Changes are good for our city + this change needs to be higher considered.

If I have 5 acres + want to divide it in 2 for my mother to build beside me then that should be approved. It is a lot of land that is wasted when one does not use more than 2 acres

Secondary Suites

the other 3 acres land could be enjoyed by another family + this would bring $ for the city (paying taxes, etc)

Climate Change

This topic has been discussed for a long time + this change needs to occur. Stop the talk + make the change - changes are good for everyone.

Growth Settlement and Urban Structure

Local Food Systems

Heritage Resources

Natural Resources

Urban Design

Water Quality

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I hereby declare that the facts provided in this comment form are true and are complete to the best of my knowledge and I have read and consent to my information being collected, used and disclosed by the City.

Signature: [signature]

Date: May 19/16

Please return this completed form to:
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The Official Plan (The OP) is a blueprint to help guide Greater Sudbury's development over the next twenty years. It establishes long-term goals, shapes policies and outlines social, economic, natural and built environment strategies for our city.

The Province of Ontario, through the Planning Act, requires municipalities to conduct a review of their Official Plans every five years. This allows our city to consult with residents and stakeholders to find out what's important for the future of the community. It also ensures existing OP projections and priorities are still relevant, and presents an opportunity to adapt the plan on a regular basis, to better reflect any changes in the community.

The Official Plan review is your chance to share your vision for Greater Sudbury with decision-makers. We want to know what you see for the future of the city, and how you think we can get there.

The Phase 1 Draft of the the OP Review is now ready for your comments. This review is centered on community consultation and feedback. As a resident of Greater Sudbury, you are invited to participate in the review process. This is your community, and the Official Plan Review is your opportunity to affect its future. The Phase 1 Draft is available to view at www.greatersudbury.ca/opreview or at a Citizen Service Centre near you.

Legal Requirements for receiving Notice of Public Meeting, Notice of Adoption, and Notice of Decision:

Should you wish to receive a notice of public meeting, you must write to the City Clerk requesting such, and provide your address.

Should you wish to receive a notice of adoption, you must file with the City Clerk a written request to be notified if the plan is adopted.

Any person or public body will be entitled to receive notice of the decision of the Minister of Municipal Affairs and Housing if a written request to be notified of the decision is made to the Minister. Any requests shall include the person's or public body's address. Requests for Notice of Decision shall be submitted to the Ministry of Municipal Affairs and Housing, Municipal Services Office North - Sudbury, Suite 401, 159 Cedar St., Sudbury, Ontario, P3A 6A5.

Submitting Comments and Your Right to Appeal to the Ontario Municipal Board:

If a Person or Public Body does not make oral submissions at a public meeting or make written submissions to the City of Greater Sudbury before the proposed official plan amendment is adopted, the person or public body is not entitled to appeal the decision of the Minister of Municipal Affairs and Housing to the Ontario Municipal Board.

Submitting Comments and Your Right to be Added as a Party to the Hearing of an Appeal to the Ontario Municipal Board:

If a Person or Public Body does not make oral submissions at a public meeting or make written submissions to the City of Greater Sudbury before the proposed official plan amendment is adopted, the person or public body may not be added as a party to the hearing of an appeal before the Ontario Municipal Board unless, in the opinion of the Board, there are reasonable grounds to add the person or public body as a party.

Contact Information

Name (first and last)* Sandra Poffley

Organization (if applicable) _____

Comments

If you wish to give feedback on a specific area of the Official Plan please provide your comments in the appropriate area. You can add comments to as many categories as you would like. Leave the categories blank if you do not wish to provide comments. For general comments, please use the General/Other comment box.

General/Other

Secondary Suites

Climate Change

Growth Settlement and Urban Structure

I am in favour / in support of change of the official planning policies. ~~of~~ 5 acres lots to 2 acres.

I would like the change due to reasons of we property owners should be able to decide or have options of doing what we want with our properties

It also create more money for the City in economic growth taxes, etc.

Local Food Systems

Heritage Resources

Natural Resources

Urban Design

Water Quality

Privacy Statement:

*The personal information collected in this comment form, and any attachment, will be used during Phase 1 of the five-year review of the Official Plan conducted in accordance with Sections 26 and 17 of the Planning Act. Your personal information may be disclosed in a public forum for the purpose of the City's Official Plan Review Program. Questions about collection of this information may be directed to **Kris Longston, Manager of Community and Strategic Planning, by phone at 705-674-4455, extension 4353, by email at kris.longston@greatersudbury.ca, or by mail to 200 Brady St., PO Box 5000, Station A, Sudbury, ON, P3A 5P3.**

I hereby declare that the facts provided in this comment form are true and are complete to the best of my knowledge and I have read and consent to my information being collected, used and disclosed by the City.

Signature: _____

Date: May 6 2016

Please return this completed form to:
Kris Longston, Manager of Community and Strategic Planning, by phone at 705-674-4455, extension 4353, by email at kris.longston@greatersudbury.ca, or by mail to 200 Brady St., PO Box 5000, Station A, Sudbury, ON, P3A 5P3.

Debbie Belowos - Fwd: Official Plan- Comment form

From: Kris Longston
To: Ed Landry; Belowos, Debbie
Date: 5/20/2016 12:05 PM
Subject: Fwd: Official Plan- Comment form
Cc: Mazza, Guido; Taylor, Eric

For OP file and Second Unit Report

Ed, I would be interested in hearing Tony D's or Joe's comments on the tax implications, first I have heard of this.

Thx
Kris

>>> "Labelle, Mike" 5/19/2016 8:35 PM >>>
Good evening,

I attended the review at the Howard Armstrong Community Center in Hanmer today. I have a few questions in regards to Secondary Suites.

I live at 2155 Dominion Dr. Hanmer (P3P 0A5) and we entered into an agreement ~ 4 years ago with the City of Sudbury for a "granny flat" to house my aging parents. The agreement is for 10 years with renewal options (X2). I suspect that many other residents with Granny flats for their parents must also be concerned. I am aware of at least 4 others within 2 miles of my address....I am sure there are more.

My questions are :

1. Will the agreement that we have in place today be respected , given the changes proposed? That is, will the City honor the agreement and the conditions we enjoy today. Presently, the added house on my property is NOT subject to increases in property taxes based on the fact that it is a second dwelling.
2. Once my parent move out of the granny flat, and this transitions to the new plan, will I be exempt from any development charges if I plan to leave the building on the existing site?
3. Referencing question #2: same question applies if I were to sell the property with the Granny flat on site. Would the buyer also be exempt, given that the building is on site and has already been inspected and approved by the City ? (note that this building is not mobile..it's a stick framed house)

Regards,

Mike

Mike Labelle

Debbie Belowos - Fwd: Re: Official Plan Comment - Projection Scenarios

From: Kris Longston
To: Belowos, Debbie; Ed Landry
Date: 5/23/2016 8:09 PM
Subject: Fwd: Re: Official Plan Comment - Projection Scenarios

Hi Debbie,

For OP file, binders and spreadsheet.

Thanks,
Kris

>>> dot Klein 5/20/2016 8:24 PM >>>
>
May 20/16
Dear All:
Thank you John Lindsay for expressing these concerns about the Official Plan and the Projection Scenario s to City Council. Thak you for taking the time to put this concern into written form and circulating. John Lindsay is ecpressing the concern of many seniors who are familiar with Sudbury and North Eastern Ontario. We MUST be realistic.Our elected officials must be responsible when they make plans for our city.The Official Plan Draft does not reflect the present or forseeable future economy of Sudbury, NE Ontario or even Northern Ontario.
Dot Klein
Resident of Ward 11

----- Original Message -----
From: John Lindsay
To: jason.ferrigan@greatersudbury.ca
Cc: Kris Longston ; Brian Bigger ; Al Sizer ; Joscelyne Landry-Altmann ; Michael Vagnini ; Mark Signoretti ; Deb McIntosh ; Fern Cormier ; Gerry Montpellier ; Robert Kirwan ; Rene Lapierre ; Lynne Reynolds ; Mike Jakubo ; Evelyn Dutrisac
Sent: Tuesday, May 17, 2016 2:52 PM
Subject: Official Plan Comment - Projection Scenarios

Hi Jason: Good to see you last evening and taking a look at the Official Plan draft. A lot of work has gone into the document and revisions.

Further to our talk on population and work force projections, it is indeed true that forecasting is always difficult. There are many different factors to be taken into consideration.

I have concerns with respect to what I believe are the most recent background papers (2013 and 2015) which indicate growth which I feel may be overly optimistic and that, as we discussed, perhaps a scenario should be included in which there is little or no growth or even decline so as to be prepared in case of that eventuality.

I have been a resident of Sudbury for the past 50 years and have had the opportunity to observe the "good and bad" times as a labour market and human resource specialist with the Federal Govt for almost 30 years and in the financial services industry since then.

Growth is predicated largely on expansion of the mining industry which is problematic. As the Hemson (2013) report states "as long as the Chinese and Indian economies continue to grow there is good reason to anticipate Sudbury will do well". Unfortunately these economies are not doing well and in the case of China growth is predicted to be much reduced for the foreseeable future and India is unlikely to replace that deficiency. This could be the situation for possibly the next 10 years and after that no guarantee of growth in the industry competing against other sources of supply and/or improved technology reducing workforce needs. Even now, for every new mine opening, one closes and it is likely that further expansion will not take place, some industry experts predict, over the next 20 years.

The matter of new hires to replace those retiring has to be balanced with the mortality rate of the large number of older adults in the community who had participated in the work force over time, together with those who leave for other areas. At best it would seem to be status-quo in terms of absolute numbers.

Sudbury has done well in economic diversification in the past however we may have "maxed out" in the areas of mining supply, education, health, tourism, retail and other sectors. Recent initiatives over the past several years to expand in these and other areas have not been particularly productive. New housing starts are down and apartment vacancy rates have gone up, as the number of available units increase. This could indicate a potential oversupply situation and/or a weak employment market with job losses and an outflow of labour to other areas. Is this cyclical, perhaps, but if not have we run out of options to reduce this decline?

There is a difference in being pessimistic and realistic and is the reason why I think it is important to have a "what if" scenario as part of the Official Plan in case we are not to be in a growth situation going forward. I think is is always wise to prepared for the worse as well as hoping and planning for the best.

Always happy to discuss further

John

The Minnow Lake Community Action Network and the Minnow Lake Restoration Group submit the following proposed revisions to the Official Plan

In order that any new developments, regardless of size, are in the words of the Official Plan "compatible with the existing aracter of the neighbourhood" and **important environmental concerns are respected**, the following suggested evisions to the City of Greater Sudbury Official Plan are suggested. Changes are noted in brackets or in comments.

3.2.1 Living Area 1 – Communities – Policy 6 b.

"the proposed development is compatible with the surrounding neighbourhood (in a radius of 500 metres in each direction) in terms of scale, massing, height, siting, setbacks and the location of parking and amenity areas (in relation to a minimum of 75 per cent of the properties within this area)"

Rational: This specifically defines the extent of the "neighbourhood" and the comparison to other properties.

3.3 Intensification – Policy 1.b

Opportunities for intensification will be supported on lands:
"where the present use is maintained but the addition of residential uses can be accomplished in a complementary manner (in consideration of 3.2.1 6b)

8.5.1 Environmental Constraints on Development

Keep all policies in place but change "may" to "shall" for Environmental Impact Studies for all new development in lakes under 50 ha, trout lakes, unique natural feature etc as described in Policy 3.

Rational: remove the possibility of the city to arbitrarily determine if studies are necessary.

8.2 Watershed Approach – The Link between Land and Water: Source Water Protection - Policy 1.i

change "may" to "shall" with respect to "a site plan control agreement required prior to the enactment of an amending y-law".

Rational: remove possibility of city arbitrarily determining if site plan required.

20.6 Site Plan Control Areas.

Change "may" to "shall" with respect to "waterfront properties subject to site plan control in order to implement policies and programs related to the protection of water resources.

Rational: remove the possibility of city arbitrarily determining if site plan required.

Site Plan Requirements for development:

That site plans be required for all residential development beginning with duplex (R2) developments.

Rational: All revenue properties, other than single family units be required to have a site plan as part of the development approval, to limit potential development abuse and to protect neighbourhood interests.

Community Notification of Development Proposals and Participation in Process:

That the general public (citizens and residents) be informed of any development applications through local Community Action Group(s) in those wards where the development is to take place, and that these organizations be invited to contribute to the creation of the staff planning document to go before the Planning Committee. This is in consideration of City Council's stated "terms of engagement" with respect to Community Action Networks to "promote democracy and inclusiveness by giving participants (Community Council, City Staff) a unique vehicle to work in harmony towards common goals" and to "enhance the overall quality of life in Greater Sudbury in social, environmental and economic sectors" The CAN is also to "represent the broad interests of the community or neighbourhood represented and to be open and transparent and to encourage participation from all residents" Also other relevant community groups such as Lake Stewardship committees should be invited to participate in the planning document process.

John Lindsay

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John Lindsay

Debbie Belowos - Fwd: Re: TR: Changement de zonage

From: Kris Longston
To: Belowos, Debbie
Date: 6/27/2016 6:24 PM
Subject: Fwd: Re: TR: Changement de zonage
Attachments: Settlement Area Expansion Request.BlezardCon5Lot8.pdf

For Phase 1 OP review comment file.

Thanks,
Kris

>>> Ed Landry 6/23/2016 10:20 AM >>>
Gentlemen,

FYI, in case they call again. See my response below on a settlement area expansion request for land in Lot 8, Con 5 in Blezard Twp (see attached map).

I told the lawyer that the City is undertaking a 5-year review - as part of comp review, we've determined there is a sufficient amount of land - staff would not support this request. Pointed them to permitted uses in Rural. However, should they wish to proceed, they would need a ZBLA and OPA + fees.

Finally, they asked about current land value. I advised them to contact a local real estate agent, or to call MPAC.

Please let me know if you have any questions.

Thanks

Ed

>>> Ed Landry 6/23/2016 10:10 AM >>>
Bon matin Me Tortorici,

Merci de votre courriel. Les terres sont présentement désignées et zonées Rurales.

Il faut noter que les terrains sont situés à l'extérieur d'une zone de peuplement ('settlement area'). La ville entreprend présentement un examen quinquennal du plan officiel. Dans notre examen complet (voir notamment cette étude: http://www.greatersudbury.ca/linkservid/70EEB281-E406-496A-CEB798AA1A980D5C/showMeta/0/), nous avons déterminé qu'il existe des possibilités de croissance suffisantes dans les zones de peuplement actuelles pour répondre aux besoins prévus sur l'horizon de planification visé (c'est à dire une période de 20 ans).

Conformément à la politique 1.1.3.8 de la Déclaration de principes provinciale (la DPP - www.ontario.ca/dpp), et conformément au plan officiel municipal, nous ne pouvons pas supporter une

expansion des limites actuelles d'une zone de peuplement. C'est à dire, nous ne pouvons pas supporter le changement de zonage des terrains de rural à "100% résidentiel".

La partie 9 du règlement de zonage élabore les utilisations permises d'une zone rurale: http://www.greatersudbury.ca/?LinkServID=9DF4AD75-A545-FE8D-59D2F1E4F01E6E43#page=154&view=fit - Dans le tableau 9.3, vous pouvez aussi voir les exigences pour la création de lots dans les zones rurales.

Vous avez bien trouvé les documents nécessaires afin de faire une demande de modification au règlement de zonage. Une demande de modification coûte $2,820.00 + le frais pour l'avis public (380.00). Vu que vous aurez aussi besoin d'une modification au plan officiel, le frais serait de $2,820 + l'avis public (+$225 (c'est moins cher pour le 2e avis)).

En termes de valeur actuelle de la propriété, je vous conseille de contacter un agent immobilier local, ou de contacter la Société d'évaluation foncière des municipalités (MPAC) au 1-866-296-6722 ou bien au www.mpac.ca

J'espère que vous trouverez ces informations utiles. N'hésitez pas à me contacter si vous avez besoin plus d'infos.

Bien à vous,

Edouard

Ed Landry, MUP, MCIP, RPP
Senior Planner, Community and Strategic Planning
Department of Growth and Development
City of Greater Sudbury
200 Brady Street
PO Box 500, Station A
Sudbury, ON P3A 5P3

tel: 705.674.4455 x 4298
fax: 705.673.2200
e-mail:ed.landry@greatersudbury.ca

>>> Elaine Tortorici · 6/23/2016 8:23 AM >>>

Bonjour Edouard,

Simplement pour m'assurer que vous avez bien reçu mon courriel ci-dessous envoyé mardi.

Merci de me confirmer le tout!

***Veuillez prendre note que nos bureaux seront fermés les vendredis, et ce, à compter du 3 juin jusqu'au 2 septembre inclusivement. Nous vous remercions de votre habituelle collaboration et nous vous souhaitons un très bel été!

Me Elaine Tortorici, avocate

De : Elaine Tortorici
Envoyé : 21 juin 2016 11:23
À : 'Ed Landry'
Objet : RE: Changement de zonage

Bonjour Edouard,

Merci de m'avoir répondu rapidement! Pour vous mettre en contexte, nous avons un client qui possède des terrains à Sudbury. Il habite au Québec et entend vendre ses terrains. Notre bureau ne fait pas du tout ce type de mandat et donc, nous aurions aimé avoir le plus d'information possible pour le rediriger vers les bonnes personnes à Sudbury.

Vous trouverez en pièce jointe toute la documentation que j'ai entre les mains concernant les terrains détenus par notre client (sa société) pour que vous puissiez en prendre connaissance en premier lieu.

Dans le passé, il y aurait eu une possibilité de modifier le zonage des terrains afin de les rendre « semi-commerciaux ». Par contre, notre client n'aurait jamais donné suite au projet et ne sait pas quel est le zonage actuel des terrains...

Aujourd'hui, notre client aimerait ouvrir le dossier à nouveau afin de faire changer le zonage des terrains qu'il détient dans le but de les vendre. Il veut donc savoir comment procéder et quels seraient les frais pour obtenir la modification de zonage actuelle pour rendre les terrains « semi-commerciaux ». Ensuite, il aimerait savoir si une telle modification serait possible afin que les terrains soient considérés comme zonés « 100 % résidentiel ».

Enfin, il aimerait faire évaluer les terrains pour connaître leur valeur actuelle. Il aimerait qu'on lui réfère une personne à Sudbury et obtenir un estimé des frais afférents à un tel travail.

À noter, j'ai copié seulement la première page de 3 documents qui semblaient être volumineux et qui sont probablement facilement accessibles pour vous sur internet (Application to amend the zoning by-law, Zoning By-Law No 83-300 et Office consolidation city of Greater Sudbury zoning By-Law 2010-100Z) . N'hésitez pas à communiquer avec moi si vous voulez que je vous envoie les documents en entier.

Si vous avez des questions ou besoin de précisions relativement au présent courriel, n'hésitez pas à me contacter par téléphone ou par courriel.

Je vous remercie pour l'attention que vous porterez aux présentes.

Cordialement,

Elaine

***Veuillez prendre note que nos bureaux seront fermés les vendredis, et ce, à compter du 3 juin jusqu'au 2 septembre inclusivement. Nous vous remercions de votre habituelle collaboration et nous vous souhaitons un très bel été!

Me Elaine Tortorici, avocate

De : Ed Landry [mailto:Ed.Landry@greatersudbury.ca]
Envoyé : 21 juin 2016 09:16
À : 311; Elaine Tortorici
Objet : Re: Changement de zonage

Bon matin Me Tortorici,

Merci de votre courriel. SVP n'hésitez pas à me contacter pour vos questions concernant le règlement de zonage du Grand Sudbury.

À bientôt,

Edouard

Ed Landry, MUP, MCIP, RPP
Senior Planner, Community and Strategic Planning
Department of Growth and Development
City of Greater Sudbury
200 Brady Street
PO Box 500, Station A
Sudbury, ON P3A 5P3

tel: 705.674.4455 x 4298
fax: 705.673.2200
e-mail:ed.landry@greatersudbury.ca

>>> Elaine Tortorici 6/20/2016 11:59 AM >>>
Bonjour,

Un client de notre bureau possède des terrains à Sudbury et voudrait possiblement en faire changer le zonage.

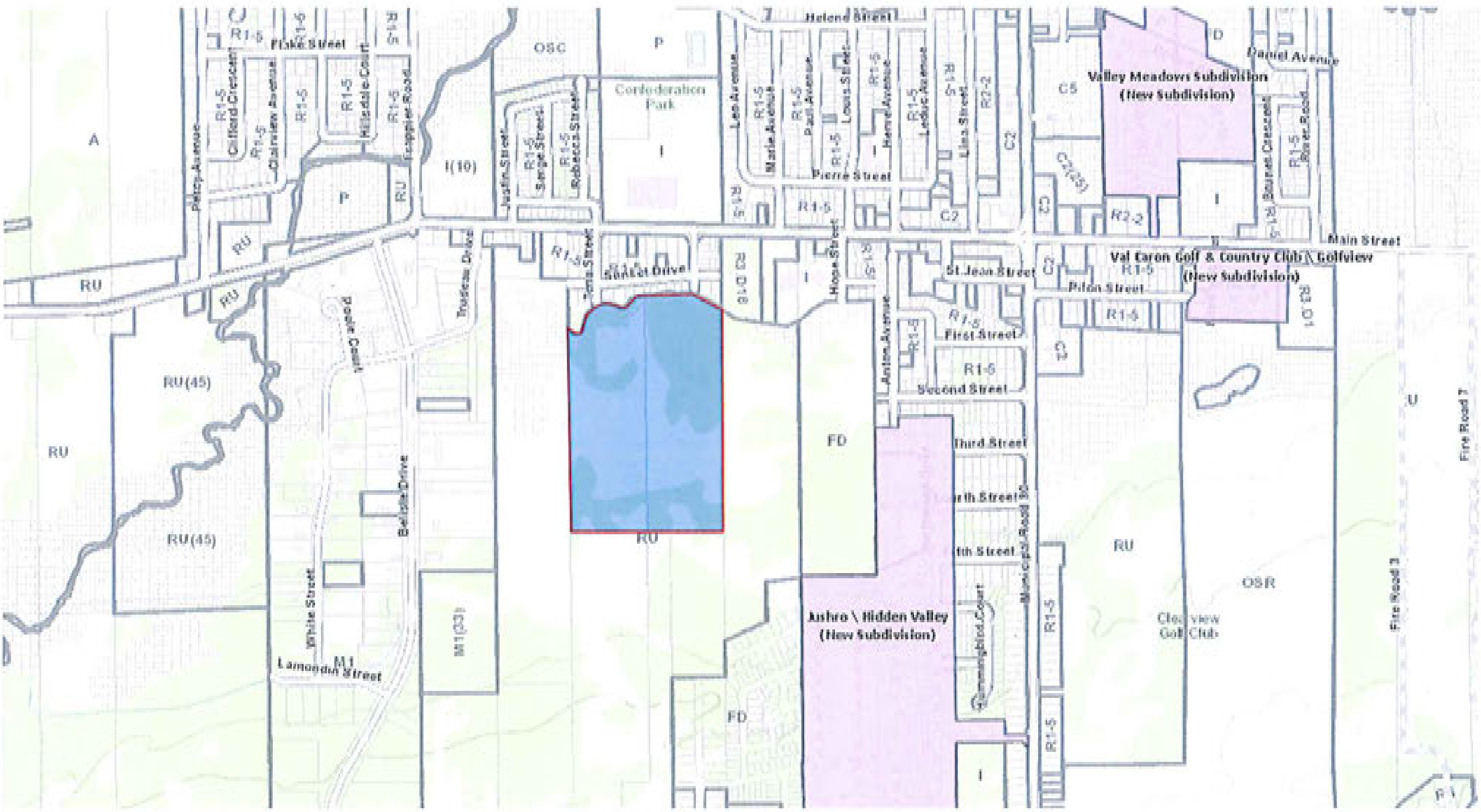
Nous sommes présentement en communication avec un bureau d'avocats de Sudbury et aurions aimé savoir si vous pouviez nous référer des planificateurs (« planner ») ; premièrement, pour vérifier quel est le zonage présentement des terrains et ensuite, pour nous indiquer quelles seraient les démarches et possibilités pour effectuer un changement.

Cordialement,

Me Elaine Tortorici

***Veuillez prendre note que nos bureaux seront fermés les vendredis, et ce, à compter du 3 juin jusqu'au 2 septembre inclusivement. Nous vous remercions de votre habituelle collaboration et nous vous souhaitons un très bel été!

Me Elaine Tortorici, avocate



Valley Meadows Subdivision (New Subdivision)
Val Caron Golf & Country Club \ Golfview (New Subdivision)
Jushro \ Hidden Valley (New Subdivision)
Main Street
Confederation Park
Clearview Golf Club
Helene Street
Flake Street
Pierre Street
St.Jean Street
Pilon Street
First Street
Second Street
Third Street
Sunset Drive
Lamondin Street
White Street
Fire Road 7
Fire Road 3
RU
RU(45)
FD
OSR
OSC

From: officialplan
To: Ed.Landry@greatersudbury.ca, Kris.Longston@greatersudbury.ca, Debbie.Bel...
Date: 7/5/2016 7:30 AM
Subject: Fwd: Official Plan Review Phase 1 - submissions (Official Plan Review Email)
Attachments: OPinput_phase1_Water_NaturalEnvironment_June2016.pdf; OPinput_phase1_CLS_June2016.pdf

This email was received by the officialplan@greatersudbury.ca / planofficiel@grandsudbury.ca email address and has been forwarded for your attention. Please review and file as necessary.

- Official Plan

>>> Naomi Grant 07/05/16 07:30 >>>

Good morning,Please find attached two submissions to the Official Plan Review Phase 1.1. A joint submission from Coalition for a Liveable Sudbury, Greater Sudbury Watershed Alliance, and Vermilion River Stewardship on water and natural environment.2. A joint submission from Coalition for a Liveable Sudbury and reThink Green on climate change, smart growth, and citizen engagement.Thank you for the opportunity to provide input.Regards,Naomi

Greater Sudbury Official Plan Review, phase 1

July 4, 2016

Joint submission on water and the natural environment

By: Coalition for a Liveable Sudbury, Greater Sudbury Watershed Alliance, Vermilion River Stewardship
Supported by reThink Green

Watersheds

1.1 Context, P-3
Background: The OP text reads "*Greater Sudbury is divided into two main watersheds – the French and the Spanish River Watersheds*".

Concern: For the purpose of watershed planning, it is important to recognize that Greater Sudbury resides in the Vermilion River, Wanapitei River and Whitefish River Watersheds. This is the scale used by Conservation Sudbury (http://www.nickeldistrict.ca/images/uploaded_files/documents/maps/ndca_watershed_map.pdf).

Recommendation: Correct text to read "The City of Greater Sudbury drains into two main watersheds – the French and the Spanish River Watersheds, which drain the eastern and western parts of our city, respectively. The City of Greater Sudbury is contained within three main watersheds, the Vermilion River, Wanapitei River, and Whitefish River Watersheds. These are further divided into 25 smaller subwatershed units."

8.5.2 Stormwater, P-144 and 145
Background: The Official Plan clearly states on P-5 that "*It is increasingly understood that it is necessary to consider entire watersheds in dealing with the protection of lakes*". P-9 also reads, "*The Official Plan recognizes the interdependencies that exist in the natural environment and introduces a watershed-based approach to planning*".

Section 8.5.2 reads: "*It is the intent of this Plan to ensure that proper stormwater management practices are undertaken to foster sustainability of the urban subwatersheds and provide opportunities for the enhancement of urban lakes and watercourses.*"

The City will complete subwatershed studies for Ramsey Lake, Junction Creek (7 studies combined: Junction Creek, Mud Lake, Simon/McCharles Lake, Garson, Meatbird Creek – Lively, Copper Cliff and Kelly Lake) and the Whitewater Lake (Azilda) subwatersheds.

It is also recommended that subwatershed studies be completed on the Whitson River, Richard Lake,

Wahnapitae (Wahnapitae and Coniston) and Dowling subwatersheds.

Concern: Stormwater management practices must also foster sustainability of the urban watershed. The Vermilion River Watershed takes the cumulative stormwater runoff from all the subwatersheds, and must be properly considered in a watershed study.

Section 8.5.2 (2) of the OP lists 17 sub-watershed plans to be developed; however, there is no provision in the OP to do a Vermilion River watershed study. This is in spite of the fact that the OP recognizes the importance of a watershed planning approach as being a critical first step in protecting the City's water resources.

The Vermilion River is the main drain for the greater portion of the City of Greater Sudbury, and its subwatersheds. It is also a major source of municipal drinking water for over 13,000 people, and feeds numerous private water intakes along the system as well. The Vermilion River Watershed has experienced a long legacy of impacts from its 8 municipal Wastewater Treatment Facilities (WWTF), 2 mining/smelting industrial WWTFs, 3 municipal sewage lagoons, 3 smelters, and 1 hydroelectric impoundment.

A Vermilion River Watershed study would take a big picture perspective and consider the cumulative effects that past and present development, stormwater runoff and wastewater and mining effluent and emissions are having on the Vermilion River. This would better inform potential mitigation measures required for the subwatersheds contained within it.

It is imperative that the City of Greater Sudbury takes a true watershed approach to better prepare for the extremes of climate change. Protecting natural ecosystem functions and benefits must be a primary focus.

The Wanapitei Watershed is already included in the list of subwatersheds to be studied.

Recommendation: The City of Greater Sudbury must follow its own best practices of "*addressing water-related issues from a watershed-based planning approach*". The Vermilion River Watershed must be listed for a watershed study to be completed.
Recognize the importance of the Vermilion River and Wanapitei River watersheds (need for full watershed studies). Pg. 145

Subwatershed Studies

8.2 Watershed Approach – The Link Between Land And Water, P-120

Background: The OP identifies three types of watershed based plans: the Greater Sudbury Source Protection Area Source Protection Plan, subwatershed studies that focus on stormwater management, and watershed based studies that focus on recreation and natural heritage values.

Concern: It is concerning that subwatershed plans are divided into those primarily addressing stormwater management and those addressing natural heritage values. All subwatershed studies should address all values and follow best practices as set out by Conservation Ontario. Section 8.5.2.

is entitled Subwatershed Studies, but refers instead to Stormwater Management Plans (and is placed in the Stormwater Section). Stormwater Management Plans may be a component of a subwatershed study, but cannot replace a subwatershed study, which is much more comprehensive.

Recommendation:
All subwatershed studies should follow best practices recommended by Conservation Ontario.

All subwatershed studies must take a full look at the watershed:

- Aquatics: the ecology and biology of aquatic systems and communities;
- Water Quality: the physical, biological and chemical characteristics of surface waters;
- Hydrology: the surface water flows in a watershed and influences on flows;
- Stream Morphology: erosion, transfer and deposition of sediment;
- Groundwater: the sub-surface water, its occurrence, movement, chemistry, factors that influence it including interactions with surface flow systems;
- Terrestrial: the ecology and biology of terrestrial systems and communities, and connections to other systems outside the watershed;
- Social: social values & structures, minimize the threat to life, property and natural resources from flooding and erosion, local knowledge, demographics, cultural heritage, resource use:
- Economics: the economic impacts of activities or plans on values.

It must identify form, function and linkages of the natural system (aquatic & terrestrial), identify where development may or may not be permitted, and assess cumulative impacts of changes to natural environment.

It must assess and identify the most significant challenges in the subwatershed.

The overall goal should be healthier, more resilient watersheds.

Goals and objectives must include the primary focus of subwatershed studies: protecting natural ecosystem function. Objectives should include: improve water quality; restore aquatic life and biodiversity; protect and enhance habitat; reduce phosphorus; reduce discharge of contaminants; protect and restore important natural areas; increase natural wetland and vegetative cover and decrease impermeable surfaces within the watershed; increase urban forest cover; increase resilience to climate change; address invasive species; reduce number of beach closures; and protect public drinking water sources (including from salt). Quantitative targets are desirable.

It must specifically **identify sensitive surface water features, sensitive groundwater features, wetland occurrence and sensitivity of individual wetlands, and environmental constraints within the watershed**. This will trigger protective policies in our Official Plan to protect the health of our watersheds.

It should include a monitoring plan, and measures for compliance, as part of implementation.

Section 8.5. must be edited to distinguish properly between subwatershed studies and stormwater management studies and clearly list the requirements of each.

Septic Systems

12.2.3 Individual Systems, Policies, Pg-203

Background: The OP was edited as follows: "*the City will work with its partners to encourage (ensure) that a regular system of inspection of individually operated water and wastewater systems is carried out throughout the City and faulty systems are repaired, maintained and upgraded to meet health and environmental standards.*"

Concern: The language has been softened from "ensure" to "encourage".

In a 28 July 2014 letter to Mayor and Council, regarding changes to the Official Plan, the Greater Sudbury Watershed Alliance (GSWA) formally requested a mandatory Septic Inspection Program to require regular maintenance and inspection of all holding tanks, septic tanks, leaching beds (including outhouses and pit privies) in order to preserve fresh water resources, and protect the environment and public health and safety. Following the institution of the program, re-inspections would be repeated every 5 years."

Additionally, in a letter dated 6 December 2014 to City Council, the Long Lake Stewardship also urged the City of Greater Sudbury, along with the Board of Health of the Sudbury District Health Unit, to establish septic system re-inspections in the Greater Sudbury area. The purpose was to help identify septic systems with deficiencies, and to work with property owners to ensure that their septic systems operate properly.

The rationale for requesting these inspections is the prevalence of blue-green algae blooms in Sudbury lakes and rivers, and the knowledge that a properly working septic system can limit some phosphorus loading in a waterway. This situation has only worsened, as 2015 was a record year for reported blue-green algae blooms in Sudbury lakes. Further rationale for mandatory septic system inspections is contained in the amended Ontario Building Code (OBC) Ontario Regulation 315/10. The OBC has established mandatory on-site maintenance programs administered by the Principal Authorities in vulnerable areas. These programs target source protection but could include sites located within 100m of lakes, rivers, streams, creeks and wells.

Recommendation: GSWA is again requesting mandatory septic inspection, and requests that the original language be restored to read, "*the City will ensure that a regular system of inspections on individually operated water and wastewater....*".

Protecting sensitive waterbodies

We are pleased that proposed policies prohibit new lot creation within 300m where lake exceeds provincial Interim Water Quality Objective for phosphorus or where lake trout lake is at capacity.

8.4.2 Lakes with Phosphorus Enrichment Concerns, P-133

Background: Policy 8.4.2.3. (P-135) reads:

Lot creation or land use changes that result in a more intensive use are not permitted where any portion of the leaching bed is or would be within 300 metres of the shoreline of a lake where ***all of the following conditions*** *are met:*
a) lots proposed are without municipal wastewater services;
b) lake has a measured, 10-year mean for total phosphorus (TP) that exceeds the Interim Provincial Water Quality Objective of 20 micrograms per litre or if less than 10 years of data are available then mean TP exceeds 20 µg/l; and,
c) lake has a measured total phosphorus (TP) value in at least one (1) of the five (5) most recent spring samples that exceeds 20 micrograms per litre.

Concern: This policy refers to lakes only, and not to rivers.
A waterbody that has a mean TP above 20 micrograms per litre OR has had a TP above this value within the past 5 most recent samples may be in trouble.
Private wastewater systems are not the only source of phosphorus from new lots.

Recommendation: Replace lake with 'lake or river'.
Replace 'all of the following conditions' with 'conditons a, and either condition b or c.'
A subwatershed study (which will look at a phosphorus budget) should be required for consideration of the creation of 3 or more lots on a waterbody satisfying condition b or c, even if they will be serviced by municipal wastewater services.

Vegetative buffers

We are pleased to see that vegetative shoreline buffers have been increased to 20m for lakes and rivers and 12m from permanently flowing streams.

Wetlands

9.2.3 Wetlands, Policies, P-153

Background: The OP remains unchanged: *"In areas without a watershed or subwatershed plan, site-specific wetland occurrence and EIS requirements will be determined by municipal staff prior to or at the time of application."*

Concern: The OP properly reports on the valuable ecosystem services that wetlands provide. Wetlands also buffer the effects of a changing climate. Identification of wetlands and completion of an EIS should not be discretionary.

Recommendation: The text should read, "In areas without a watershed or subwatershed plan, site-specific wetland occurrence and EIS will be required."

Wetlands provide vital ecological functions including fish and wildlife habitat, groundwater recharge and discharge, water quality protection, flood and erosion control and increased biodiversity. They are havens of biological richness, and include marshes, swamps, bogs and fens. Wetlands in Greater Sudbury also retain high levels of heavy metals from entering water bodies and need to be protected.

Mechanisms should be in place for permanent protection of wetlands through conservation easements, land purchase, or other means of land securement.

Development on shorelines

We are pleased that "Development or redevelopment on a lot on any shoreline of a lake or river will be subject to site plan control."

8.4.1.5 Surface Water Resources, P 133

Background: Development or redevelopment on shorelines will now be subject to site plan control. This is positive.

Concern: This section should specify that site plan control will require best practices for shoreline development, including low impact development.
Lack of enforcement of site plans and bylaws is a common concern reported by water stewards. Follow up is needed to ensure that shoreline site plans are adhered to.

Recommendation: Specify that site plan control will require best practices for shoreline development. These plans would incorporate low-impact development techniques (which manage rainfall at the source) and green infrastructure." "Encourage the use of green infrastructure and require low-impact development techniques that include integrating green space in design strategies, landscaping with native plants, and using natural water systems to generate less runoff from developed land."
Specify that follow up site visits will be made for all shoreline site plans, to ensure compliance.

Low Impact Development & Green Infrastructure

8.5.3.12 Stormwater, P 148

Background: Low Impact Development and green infrastructure are not mentioned in the Official Plan. However, it does state *'Development and intensification are encouraged to maximize the use of pervious materials and manage stormwater as close to the source as possible. P. 148.'*

A municipality should have a plan that provides direction to avoid or minimize and mitigate stormwater volume, contaminant loads and impacts to receiving water courses in order to: maintain groundwater quality and flow and stream baseflow; protect water quality; minimize the disruption of pre-existing (natural) drainage patterns wherever possible; prevent increases in stream channel erosion; prevent any increase in flood risk; and protect aquatic species and their habitat.

Concern: Low Impact Development and green infrastructure should be an integral part of stormwater management, as recommended by the province (Policy Review of Municipal Stormwater

Management in the Light of Climate Change: https://www.ontario.ca/page/policy-review-municipal-stormwater-management-light-climate-change).

Recommendation: Add to 8.5.3.12: 'LID and innovative best practices for stormwater management as recommended by the province (Policy Review of Municipal Stormwater Management in the Light of Climate Change) should be encouraged through site plan control for private and public developments.'

Add to programs: '2. Identify and implement opportunities for green infrastructure contributing to stormwater management on public land.'

Thunder Bay's stormwater management plan (in progress) 'identifies more than 600 locations on public lands in the city that can be used to naturally treat and disperse storm water before it enters the watershed.'
http://www.cbc.ca/news/canada/thunder-bay/thunder-bay-council-gets-first-look-at-storm-water-management-plan-1.2989051

Low-impact development defined: "An approach to stormwater management that seeks to manage rain and other precipitation as close as possible to where it falls in order to mitigate the impacts of increased runoff and stormwater pollution. It comprises a set of site design strategies and distributed, small scale structural practices to mimic the natural hydrology to the greatest extent possible through infiltration, evapotranspiration, harvesting, filtration and detention of stormwater. Low impact development can include: bio-swales, permeable pavement, rain gardens, green roofs and exfiltration systems. Low impact development often employs vegetation and soil in its design, however, that does not always have to be the case."

'A MOE policy vision for resilient systems for municipal stormwater management may include, for example, the following considerations:

- *Include both source control (lot, neighbourhood) and conventional stormwater management.*
- *Reduce the generation of stormwater by building communities that interfere less with the natural water cycle.*
- *Reuse stormwater and recognize stormwater as a resource (e.g. for flushing toilets, landscape watering).*
- *Recycle the municipal stormwater back into the natural water cycle, with careful regard for water quality and quantity cumulative impacts on watersheds and groundwater.*
- *Include data collection and vulnerability assessment for the existing conventional stormwater management systems to assist in adaptation decisions by municipalities.*
- *Include long term planning for municipal stormwater management including a systematic approach to adaptation and assessment of the cumulative impacts on the watershed.*
- *Include tracking the progress of climate change adaptation, in particular source control, across the province as part of public education.*

There would be environmental and possible fiscal benefits to municipalities through adopting this approach.' Policy Review of Municipal Stormwater Management in the Light of Climate Change

Floodplain

10.2 Flooding And Erosion Hazards, P-164

Background: The OP text acknowledges the role of the NDCA and the MNRF in regulating development and site alteration on floodplains.

Concern: The role of the City in regards to relevant PPS policies should also be acknowledged. The Policy restricting development within 15m of floodplains has been removed. With increased flooding anticipated with climate change, restrictions on building on and adjacent to floodplains should be strengthened, not weakened.

Recommendation: Restore the Policy 'no development is permitted within 15 metres of the Flood Plain boundaries.'

In 10.2. 3. Add reference to the floodplain: 'For purposes of clarity, institutional uses such as hospitals, long-term care facilities, retirement homes, pre-schools, elementary schools and secondary schools; essential emergency services and industrial uses involving the disposal, manufacture, treatment or storage of hazardous substances are not permitted on floodplains or lands subject to flooding or erosion hazards.

Incorporating Green Space Advisory Panel reports

We are happy to see some of the work of the Green Space Advisory Panel incorporated into the Official Plan Review, including the park classification (P-106), disposal policy (P-114), tools to fill gaps in the parks system (P 110), and some provision standards (P-108).

7.2 Parks And Open Space Classification And Provision Targets, P-106

Background: The OP text gives provision standards for active parkland in 7.2.1, on the basis of service area (hectares of parkland per resident). However park service standards based on proximity are in the preceding section.

Concern: It would be clearer to have all park service standards (by service area and by proximity) in the same section. Both service standards are important in guiding the development of the parks system. The wording should also be clarified.

Recommendation: List provision standards for both service area and for proximity in 7.2.1. and clarify wording. E.g. Natural parks - larger sizes (>2 ha) are preferable where possible. Natural parks will be identified based on natural value, independent of service standards or accessibility. All neighbourhood residences should be served by a Natural Park within a 10 minute walk (800 metres) without crossing a major barrier.

Add reference to meeting provision standards (overall and by park classification) in 7.3.7, guiding decisions regarding parkland dedication.

7.3 Parks And Open Space Designation, P-108

Background: The OP 7.3.1, 7.3.2 provide general guidance for permitted uses and development in parks. However, there is no further guidance according to park classification.

Concern: Open space (passive parks) have different appropriate uses and development than Active Parks. This is addressed to some extent in the Park Classification System (Green Space Advisory Panel Final Report 2010, Appendix C).

Recommendation: Provide further guidance in 7.3, for permitted uses and development in passive parks. E.g. Development in Natural Parks and Linear Parks will be limited to trail development, wayfinding and educational signage. Parking, washroom facilities, rest areas, or interpretive centres could be concentrated in a small area of the park (but will not use more than 1% of area) if there is no negative impact on the natural aesthetic and natural heritage value. Ecological Reserves may or may not be publicly accessible, depending on appropriate land use. If public access is appropriate it may contain minimal supportive infrastructure such as trails, boardwalks, interpretive signage. This infrastructure will never exceed 0.5% of the area, or impinge on the natural value of the site. The protection of the natural assets is always the guiding principle.

Ensure that all Natural Parks and Ecological Reserves have a land use designation of Parks and Open Space (Schedule 1).

In 7.3.b: add community gardens

In 7.3.h: add rain gardens, green infrastructure, rain capture, and plantings of native species as examples.

7.3.6. Parks And Open Space Designation - tools and mechanisms to address gaps in the existing parks system, P-110

Background: The OP 7.3.6 provides a good summary of tools and mechanisms the City may use to address gaps in the parks system.

Concern: No guidance is given on identifying gaps and prioritizing properties to be brought into the parks system.

Recommendation: Add reference to the Green Space Advisory Panel's gap analysis and acquisition ranking as guiding documents to address gaps in the parks system. Refer to the factors guiding prioritization of addressing gaps in the parks system: acquisition priority ranking, gap analysis results, community impact, and practical considerations.

Urban hilltops

14.6.5 Built Heritage And Natural Environment Feature Integration, P-231

Background: Section 14.6.5 (Built Heritage And Natural Environment Feature Integration) states: 'In the City's urban areas, urban landform features such as rock outcrops and hilltops provide visual assets that contribute to defining the image of Greater Sudbury. New developments that are proposed on or near an urban landform feature will ensure, to the satisfaction of the City, that there will be no significant change to the visual asset provided by the landform feature. The City may require such developments to include measures that must be taken to mitigate any impacts on these visual assets.' Hilltops are also referenced in regards to CUPD.

Concern: Despite this policy, several urban hilltops have been lost to development.

Recommendation: Add 'any development or redevelopment of a site with an urban hilltop will be subject to site plan control to protect the visual asset as well as public access where appropriate and desired'.

Priority VETAC sites

9.4 Ecosystem Recovery: Land Reclamation And The Urban Tree Canopy, P-159

Background: Section 9.4.2 states: 'New development, redevelopment, and municipal infrastructure works on previously restored land will be required to mitigate any impacts to existing soil and vegetation. Where mitigation through avoidance is not possible, onsite soil erosion will be prevented and all vegetation removed will be replaced through appropriate and adequate site landscaping and/or land reclamation measures.'

Concern: Reclaimed sites have scientific value (collection of long term data) as well as community and green space value, which cannot be replaced. VETAC has a short list of the sites of most scientific value, and these sites should be protected for continued long term study. The 'Sudbury Protocol,' which benefits not only Sudbury but other communities worldwide, relies on long term data collection on reclaimed sites.

Recommendation: Add 'any development or redevelopment on restored land identified as a priority site by VETAC will be subject to an EIS, and to site plan control to protect the scientific value of the site, in consultation with VETAC'.

Protection of private green space opportunities

We were pleased to see in the staff responses and recommendations (responses to public input), the recommendation: **Proposed policies to avoid/mitigate development impacts on private green space opportunities classified as Ecological Reserve and as Natural Park.**
However, we cannot find reference to such a policy.

Similarly, we were pleased to see a recommendation: **Consider including policies that address the degradation of natural heritage areas/features on a site prior to receiving necessary development approvals.**
We cannot find reference to such a policy.

Programs

We were pleased to see the recommendation: **Include program policy to reflect a tree cutting-bylaw.** However, this program has been struck out (P-158).
Recommendation: Add a program that Council shall consider passing a Tree Cutting Bylaw to prevent misuse of forest resources, and to protect the urban forest.
Add a program to develop an Urban Forest Management Plan.

Similarly, a program for education on shoreline best practices has been deleted, and should be restored (P-141).
Recommendation: Add a program to encourage revegetation of shorelines and other best practices on existing properties (above and beyond existing educational outreach).

For the Program 'Maintain an updated inventory and geographic database of municipal parks and open space properties (including their classification and listing of leisure assets) and establish a protocol for updating the database,'
Add: 'Maintain an updated inventory of public and private green space opportunities. Maintain an updated gap analysis of the parks system.'

Greater Sudbury has many natural features and areas that are locally significant, but do not have provincial significance.
Add: 'Develop criteria for evaluating local significance and appropriate policies to protect locally significant natural features and areas.'
We recommend using Significant Natural Areas as in Guelph's OPA42 as an example.

Natural and Cultural Heritage of local waterways

1.4 Vision, P-11
Background:
New text has been added: "*Greater Sudbury values and protects its natural heritage features and areas. Endangered and threatened species, fish habitat, significant wetlands like the Vermillion River Provincially Significant Wetland Complex, and significant wildlife habitat like that used by moose during the late winter are protected for their environmental, ecological and social benefits.*"

Concern:
The Vermilion River Stewardship made an OP submission on 23 January 2012, during Phase I, to recommend that the Vermilion River be recognized for its Natural Heritage value, so we are very pleased to see the Vermilion River Provincially Significant Wetland Complex recognized in the OP as a Natural Heritage feature. However, we are suggesting that the Vermilion River's rich cultural heritage

also has great value and interest, and should be recognized for its cultural and socio-economic contribution to the City of Sudbury.

The Vermilion River is the traditional territory of the Atikameksheng Anishnawbek (descendants of the Ojibway, Algonquin and Odawa Nations), and central to the success of a thriving Finnish community. The Vermilion River was also used as a waterway for the Hudson's Bay Fur Trading Company, and was central to the logging and mining industry in this area.

Recommendation:
Text to read: *Greater Sudbury values and protects is natural heritage features and areas. Endangered and threatened species, fish habitat, significant wetlands like the Vermilion River Provincially Significant Wetland Complex, and significant wildlife habitat like that used by moose during the late winter are protected for their environmental, ecological and social benefits.* The Vermilion River is also imbued with a rich historical and cultural heritage through its archaeological record of pre-contact indigenous occupation along its banks, as well as its central role in the establishment of Sudbury through the fur trade, logging, and mining industries.

Paula Worton also made a strong submission for recognition of the cultural heritage value of Lily Creek and we support that submission.

Housekeeping

Recommendation:
Correct spelling errors to read "Vermilion" and "Wanapitei". E.g. in Sections 1.1, 2.2.1, 21.7.5, 22.58.

Thank you for the opportunity to comment.
Regards,

Naomi Grant, Coalition for a Liveable Sudbury, clsudbury@live.com
Lilly Noble, Coalition for a Liveable Sudbury
Margaret McLaughlin, Greater Sudbury Watershed Alliance, mmclaugh7@sympatico.ca
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Greater Sudbury Official Plan Review, phase 1

June 27, 2016

Submission by Coalition for a Liveable Sudbury and reThink Green on the topics of Climate Change, Smart Growth, and Citizen Engagement

Climate Change

We are pleased to see the Program: 'The City, through the **Climate Change Adaptation Strategy**, will assess the risk associated with climate change and flood hazards and formulate appropriate strategies.'

We trust that this document will also address climate change mitigation, and set targets for greenhouse gas reduction for Greater Sudbury.

In the interim, reference to mitigating and adaptation to climate change should be made in all relevant sections of the Official Plan, such as managing growth and change, local food and agriculture, water and natural environment, flooding and erosion hazards, transportation and infrastructure, urban design, and energy.

Climate change poses a serious challenge for maintaining existing infrastructure and planning for new infrastructure, however, these risks can be mitigated through vulnerability assessments. Similarly, comprehensive stormwater management planning, including considering the use of low impact development, can increase the resiliency of our communities.

Regard should be given to new provincial proposed recommendations (Shaping Land Use In The Greater Golden Horseshoe – Responding to Climate Change http://www.mah.gov.on.ca/Page14809.aspx#ClimateChange)

We can anticipate similar requirements by the province for all of Ontario:

- Require upper- and single-tier municipalities to incorporate climate change policies in their official plans, consistent with the objectives of the province's Climate Change Strategy and greenhouse gas reduction targets.
- Encourage municipalities to develop greenhouse gas inventories, emission reduction strategies, and related targets and performance measures.
- Require municipalities to undertake more comprehensive stormwater management planning for their settlement areas and for major developments and to examine their infrastructure for weaknesses associated with climate change.
- Encourage the use of green infrastructure and require low-impact development techniques that include integrating green space in design strategies, landscaping with native plants, and using natural water systems to generate less runoff from developed land.

- Enhance policies to align with those in the Provincial Policy Statement regarding planning for resilient infrastructure.

Here is a small example from the City of Windsor Climate Change Adaptation Plan 2012 (http://www.citywindsor.ca/residents/environment/environmental-master-plan/documents/windsor%20climate%20change%20adaptation%20plan.pdf)

Reducing Risks associated with increasing precipitation and temperatures		
Development of a Green Roof Policy	Reduction in storm water runoff, improved storm water quality	Mitigation of the Urban Heat Island Effect and reduces summer air conditioning demand
Develop pilot projects for the use of Porous Pavement on City properties and develop guidelines for development	Reduction in storm water runoff and flows to the waste water treatment plant	Improved storm water quality
Installation of Rain Gardens as a pilot project to determine effectiveness	Reduction of storm water runoff and temporary storage for larger events	Improved storm water quality
Improvement and Enhancement of Green Space to improve rain water retention	Reduction of storm water runoff	Mitigation of the Urban Heat Island Effect, improvements to air quality, improved quality of life for the residents of the City
Increase Tree Planting	Reduced Urban Heat Island Effect	Reduce storm water runoff, improved quality of life for the residents of the City

We are concerned that the sections on green and alternative energy have been removed from the Official Plan (P-206), and recommend that this section be restored and strengthened, in consultation with the local Community Energy Planning Committee. Local food, energy, and water security will all be more important with climate change.

Smart Growth

Rural lot splitting increases costs to the municipality and often permanently removes rural properties as land available for farming or farming related activities. We are disappointed that changes in the Official Plan will facilitate rural lot splitting and do not support these changes.

We are pleased to see the program 'The City will disseminate information on methods of residential intensification and alternative forms of development to local developers, builders and residents. (P-38).

We are pleased to see the program: 'The City will develop comprehensive Urban Design Guidelines that build on the policies of this Plan in order to establish appropriate design criteria for communities, neighbourhoods, public realm elements and all forms of public and private development. Such

guidelines will consider alternative design standards, recent developments in eco-sensitive design and safety, amongst other matters'. (P-235)
We recommend that Urban Design Guidelines include sustainable neighbourhood design.

Similarly, site and building design policies(P-228) should incorporate sustainable design.

LEED and LEED-ND provide existing quantifiers for sustainable building and neighbourhood design.

The Guelph draft OP is one example where certain designated areas (termed Greenfield areas) must follow sustainable planning.

We are pleased to see the program 'The City will develop a Nodes and Corridor Strategy to guide and stimulate the long term intensification of strategic core areas (e.g. Downtown, Regional Centres and major public institutions and medium change areas (e.g. Town Centres and Mixed Use Commercial corridors).' (P-38)

Guelph, Waterloo, and Ottawa all provide examples of designated nodes and corridors that are higher density, mixed use, walkable areas that support a high level of public transportation. Ottawa also identifies Mixed Use Centres and Mainstreets.

We would like to see the basic principles of this idea used to guide intensification.

We are pleased to see an increased intensification target: 'The City will aim to accommodate 20 percent of future residential growth and development through intensification within the Built Boundary'. The addition of a built boundary is positive. However, given Greater Sudbury's low growth, focusing that growth where it can most provide the benefits of intensification (such as supporting better transit service) would be more effective. (P-36)
We recommend that intensification be directed to Downtown, Town Centres, Regional Centres and Mixed Use Commercial Corridors. This should be reflected In Section 2.3.1. (Reinforcing The Urban Structure – Objectives, P-33).

To support walkability, we support permitting a wider range of compatible uses within residential neighbourhoods so that people can walk to fulfill their daily needs, and to support home employment in home offices, home businesses, and other small neighbourhood businesses.
Guelph's Neighbourhood Mixed Use Centres provides one example. Waterloo and Kingston also provide examples.

We are pleased to see the addition of Policy 13.2.2 'A cultural heritage impact assessment will be required for development and intensification proposals or public works that include or are contiguous to a property designated under the Ontario Heritage Act or non-designated property included on the Municipal Heritage Register,' and other policies related to cultural heritage. (P-214)

Citizen Engagement

We are disappointed that no improvements have been made to Section 20.11 Citizen Participation and Public Meetings. Citizen engagement is a key component of a healthy community. Earlier and more meaningful engagement with the public leads to better outcomes for residents and the community.

Municipalities benefit (and are permitted) to go above and beyond Planning Act provisions for notification and consultation.

We recommend that Greater Sudbury use the provision for an alternative method, and outline this method in Official Plan policies, to support enhanced consultation during the early review process and not rely solely on the notice of public meeting as outlined in the Planning Act.

Best practices include:
- Use of on-site signage as well as newspaper and mail-out notices for Official Plan Amendments, Zoning By-Law Amendments, Plans of Subdivision.
- Circulation of notices to stakeholders such as Community Action Networks, community groups, and water stewards.
- On-going conversations with stakeholders, early in the process.
- Informal neighbourhood meetings early in the design process, so that neighbourhood concerns and knowledge can be incorporated in the design.
- Design charrettes where more in-depth conversation and input is needed
- Holding neighbourhood meetings and/or open houses in facilities neighbourhood residents are comfortable in, bringing in trusted facilitators, offering child care, holding meetings at a variety of times of day, offering transit vouchers, providing snacks.
- Providing information ahead of time on-line and in person, including background studies.
- Providing opportunities to ask questions and submit input on-line.

Please see the excellent recommendations in IMPROVEMENTS TO PUBLIC ENGAGEMENT IN THE PLANNING PROCESS (2015, City of London):
https://www.london.ca/newsroom/Documents/PlanningEngage.pdf

Also refer to the *Growing Conversation* process being undertaken by the City of Toronto.
http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=8a9351bff89c6410VgnVCM10000071d60f89RCRD

Thank you for the opportunity to provide comments.
Regards,

Naomi Grant
Lilly Noble
Co-chairs, Coalition for a Liveable Sudbury

Rebecca Danard
Executive Director, reThink Green

2016 Official Plan Submission to City of Greater Sudbury

From: Stewardship of Long Lake

July 7, 2016

Attachments:

1. Water Quality and Capacity Study for Long Lake, City of Greater Sudbury

2. Small sample of 6 recently built homes on Long Lake that violate city bylaws and building codes.

July 7, 2016

Official Plan Review by City of Greater Sudbury

Submission by Stewardship of Long Lake

Drinking Water Protection:

In the province of Ontario legislation that governs our drinking water is a complicated process due to the numerous government agencies that are responsible. Among this group are Ministry of Environment and Climate Change(MOE), Ministry of Natural Resources and Forestry(MNR), Sudbury and District Health Unit (SDHU), Conservation Sudbury(CS), Department of Oceans and Fisheries (DOF), Ministry of Municipal Affairs and Housing(MMAH) and the City of Greater Sudbury (CGS). Due to the division of responsibilities of the job of protecting our drinking water there really is no one responsible.

However most agree that the "buck stops" at the feet of the City of Greater Sudbury. Many of the agencies listed above no longer feel responsible for what happens within city limits. The agencies commonly use the term "downloading" as their reasoning why they no longer uphold their legislated responsibilities within CGS city limits. We have never been able to find this legislation but concede that it is a widely held thought.

This submission will work from the basis's that the City of Greater Sudbury is responsible for its citizens drinking water, with some overlap from other government agencies.

There are many acts that legislates drinking water. One being the Source Water Protection Act (SWPA), a powerful piece of legislation that falls under the CGS and CS responsibility. When the act was passed the CGS and CS made the decision to limit the range of what the act could cover. They chose to only protect the city's main municipal water supply. These include Ramsey Lake, Wahnapitae Lake, Vermilion River and some wells within CGS. CGS is unique in the province in that it has far more citizens who consume open water sources for their potable water in their homes than any other community. Approximately ten per cent of the CGS population falls into this category. This will vary between seasons of the year but up to 20,000 CGS citizens fall in to this category. We feel it was mistake to ignore the drinking water of so many under the SWPA. The MMAH has stated many times, in clarification, that the SWPA does not just cover municipal water supplies but shall "include in respect to local interests "(PG. 15, SWPA). The bulk of the work for the SWPA for CGS, with the limited water under study, is now completed. It was not as difficult/onerous as first thought. We believe it is time to include the other

major lakes and rivers within CGS that the missing ten percent consume as their potable water. The CGS should start with the most populated lakes from which residents consume the water for their own use and those who have had Blue Green Algae Blooms (BGA).

"The first barrier to the contamination of drinking water involves protecting the sources of drinking water."

- Justice Dennis O'Connor, Walkerton Inquiry 2002

The CGS was the first city in Canada to introduce legislation regarding the reduction of phosphates into our surface water bodies. It is time to be the first to include water that does not fall under municipal water supplies. We need to be concerned about all our citizens' water supply.

By utilizing the SWPA the CGS has the legislative power to enact many other protective programs such as conducting existing field bed inspections.

Though it has been discussed for many years, in 2001 the MMAH passed legislation to make it easier for municipalities to complete these inspections. CGS did not choose to enact these inspections in 2001. However in the 2004 CGS OP it was included that these inspections will be done. The Waterfront and Rural Background Study (WARBS) of 2004, which still referenced to today in the current CGS OP, clearly states (Section 4.1) that these inspections are necessary. We quote the opening paragraph of 4.1,

"Given the amount of existing development in the City, the potential impact of septic systems on water quality makes septic system inspection one of the primary unserviced development issues in the City. Policies or programs influencing the inspection of septic systems are equally as important as policies governing new development."

A powerful, very direct statement, written is 2004, included in every OP since, and up to today completely ignored by CGS staff and council. In 2008 the CGS began to experience BGA blooms on a regular basis.

Would we be experiencing BGA blooms for the past eight years if CGS staff and council had reacted in 2001 with MMAH recommendations to commence existing field bed inspections, or in 2004 when CGS said it was going to?

CGS is in a unique situation where old, some say outdated, provincial legislation has put the responsibility for septic field beds under the SDHU responsibility. Most cities in Ontario manage these inspections under their own in house Building Control departments.

The SDHU has been a major road block to the City commencing a city wide, waterfront, existing septic field bed inspection program. The SDHU, in contradiction to the MMAH, MOE, MNR, Federation of Ontario Cottager's Association (FOCA), the highly regarded Lake Simcoe Protection Plan, the Clean Water Act, and the many communities in Ontario presently completing these inspections, says that they do not work and will not complete them even if requested by the City.

These inspections presently being completed by communities in Ontario for years have been finding faults in the range of 25 to 60 percent. Most of these faults were easily fixed by the homeowners, once they knew what to fix.

The SDHU was forced by SWPA to complete these septic field bed inspections in CGS for the three water bodies noted earlier and quite proudly noted that they only found one faulty field bed in CGS. Further digging into the facts has shown that the SDHU inspections inspected for only one thing, raw sewage on the ground. These inspections by SDHU were also only completed on "volunteer homeowners". Most communities inspect for a range of between 12 to 16 items of concern. The SDHU most likely was not working within the context of the law nor, at the minimum, within the spirit of the law. It is time for the CGS to complete its own inspections, from new to existing field beds. This has been pointed out to CGS OP in the past by submissions by the Greater Sudbury Watershed Association.

A survey of citizens living on watersheds completed in the 2004 WARBS of twenty lakes in the City found that the implementation of existing field bed inspections was their priority.

The OP was edited as follows: "the City will work with its partners to encourage (ensure) that a regular system of inspection of individually operated water and wastewater systems is carried out throughout the City and faulty systems are repaired, maintained and upgraded to meet health and environmental standards." We strongly disagree with the city stepping back from the previous language of "ensure" to "encourage". As stated earlier, the city needs to assume the septic field bed responsibilities.

The health of a lake is most often determined by what is put into it by humans. What nutrients and pollutants that enter a lake are most often determined by the development of its shorelines. Nature rarely has problem with a lake by its own cause. Almost always the downfall of a lakes health is determined by human influence. Left alone nature has permitted trees and other vegetation to grow on the shoreline of waterbodies. These naturally vegetated shorelines stop excessive nutrients from entering a waterbody and keep the lake in balance.

CGS has recognized the importance of the shorelines within its boundaries in its Official Plans dating well back. CGS has followed these OP guidelines by passing bylaws to ensure the extremely important shorelines are protected. These include setback bylaws dictating that at a minimum 12 metres before any construction of residence. In addition CGS bylaws dictate that should the protected 12 metres be developed for access or construction of a dock or steam bath, that the destruction of the 12 metres be limited to twenty five percent of the protected area.

The trouble is that anyone boating around our lakes in the CGS can readily see that these bylaws are not being followed by homeowners, or city staff responsible to ensure that the bylaws are followed. The city's own surveys of shoreline development posted on the city web site point this out too.

The three parties (CGS Building Controls, MNR and CS) who approve waterfront development in CGS do not deem it necessary to follow CGS bylaws.

There are other important bylaws too that are not being followed. Fill being dumped into our waterbodies, illegal docks, illegal construction without appropriate building permits, illegal dredging of the lakes and shorelines, homes that far exceed the allowed construction for a lot that size and so on. The Stewardship of Longlake have given presentations to senior city staff, numerous councillors and two mayors regarding the abuse of the waterfront shorelines with no corrective actions taken. The Stewardship of Long Lake have presented opposition to senior city staff ,two mayors and councillors as to illegal construction

We did not get to the time in our lives of consistent BGA blooms by accident. It was attitude of dis-concern for many years.

The Long Lake Stewardship has presented these facts of the ignoring city bylaws to two Mayors, numerous City Councillors and the Minister of MNR. The facts have been presented to the CGS Lake Advisory Panel on two occasions. No one has taken an interest. Why?

The Long Lake Stewardship recently completed a three year Lake Capacity Study by one of Ontario's top water quality study firms. It is quite possibly most detailed study ever done on a lake in the CGS. It has clear conclusions and suggestions of moving forward to try and improve the health of Long Lake. It has been presented to MNR, MOE, SDHU, and to CGS (Two Councillors and Staff). No one has taken an interest. Why?

CGS completed a Lake Capacity Report in 2014 by the firm Hutchison. It was completed over approximately one year period and was for 364 lakes. (Approximately one lake was evaluated each day) There was some criticism of the Hutchinson report because even though Freedom of Information Requests was filed at CGS the details of the Hutchinson report were not released by City staff. How can it be studied if we don't know what was considered for its conclusions. MOE also had some criticism (re MOE submission to the OP) of the Hutchinson report, in that it failed to consider upstream contributing waters and failed to list "triggers" that indicate that a lake is trouble and needs to be under closer scrutiny.

The CWA also addresses the need for CGS to note" increasing trends of parameters that are identified as "issues" and the area that contributes to the issue."

The LLS Lake Capacity report addressed some of these concerns. The LLS Lake Capacity Report is attached.

We would like to have the LLS Lake Capacity Report referenced to in the CGS OP and that Long Lake be designated as an area of concern and any further development be given special consideration (to ensure no more loading) as the lake is already over its capacity for development.

The LLS Lake Capacity Report is not in conflict with the Hutchinson Report per see as it probably had a narrow band, and information, to work within but as noted earlier we will never know as the CGS has refused to release what Hutchinson was contracted to do and what information it was given to work with.

The OP (Section 8.3.70), as written today, states that there are only three types of water bodies in CGS. We disagree and believe that a fourth should be included – lake based policies for water consumed by both municipal water and private citizens. It should be clearly stated as all water consumed by CGS citizens should be protected.

The OP (8.4.1) considers the recommendation by MOE to ignore the MOE standard that a lake be considered at capacity should the Total Phosphate (TP) level exceed the back ground TP plus 50%. We strongly disagree with this. The LLS Lake Capacity Report has shown that Long Lake has exceeded the plus 50% for TP standard by 150%. Long Lake has had fairly consistent BGA blooms since 2008. Would Long Lake be having these blooms today had CGS staff reacted to the 50% plus rule when it occurred?

We have asked for clarification by the MOECC Minister as to the Sudbury MOECC staff as to the background plus 50% is not to be applied when deciding if a lake is at capacity.

MOE (Sudbury) has suggested that the OP 8.4.1 use 20 ug/L TP, and if holds for 10 years at that level, as the guideline for excessive TP. Just the example of Long Lake shows how wrong this suggestion is. Long Lake has BGA blooms and the TP is only in the 8.4 range. Almost all the lakes in CGS that are experiencing BGA blooms are well below 20ug/L. If we allow TP to rise to 20 ug/L for the next ten years we won't have a usable lake.

Again we do not believe this position by MOE Sudbury is supported by MOE outside of Sudbury and have requested clarification from the Minister.

Presently the CGS does not consider oxygen levels of lake as a factor for Lake Capacity determination. We think this should change. Low oxygen levels are not only a sign of a lake in distress but fish cannot survive.

The OP (8.3.7) (8.4.7) states that it is going to rewrite the vegetative buffer zones policy once a new watershed study is completed. CGS has ignored the 2004 WARBS, which was well done. Why complete another one if it too is going to be ignored? CGS need to step up and implement present bylaws first. Adding more, to only ignore them too is pointless. A review of shorelines in other regions within the province shows a stark contrast. Boat houses can be seen but not the homes. It is rare in CGS that the house cannot be seen. Many home owners cut the grass right to the shoreline, a rarity in most other communities.

Long Lake Stewardship has requested several times to CGS elected representatives that a letter be written to the local MNR office requesting that the MNR when issuing shoreline permits within the CGS that, as per MNR's own policy that a MNR permit "shall not break any law" when issuing a permit, observe CGS bylaws. In particular the 12 m set back rule and the bylaw restricting the extent and reason the 12 m buffer can be disturbed. The MNR presently pays no attention to these CGS bylaws when issuing a permit for shoreline work.

It was disturbing during the completion of the LLS Lake Capacity Report with the lack of co-operation of CGS staff in regards to the sharing of data and other information regarding Long Lake. The study took longer and cost lake residents considerable more money as the CGS staff refused to share data collected by the city, using our tax dollars, for a long time. Data and information collected by CGS should be readily available to its residents. At times it was felt that CGS staff deliberately gave long lake residents miss-leading information. This should be investigated and corrected. We cannot keep our waterbodies safe for present and future use if we are not all on the same team.

Stephen Butcher
Chair
Stewardship of Long Lake

Debbie Belowos - Fwd: Official Plan Submission from Stewardship of Long Lake

From: Kris Longston
To: Belowos, Debbie; Ed Landry; Monet, Stephen
Date: 7/13/2016 2:25 PM
Subject: Fwd: Official Plan Submission from Stewardship of Long Lake
Cc: Jason Ferrigan
Attachments: 2016 Official Plan Submission.docx; Freshwater Research LongLake_Report 2015-12-22.pdf; 40 LongLake 2015Survey 102.JPG; 40LongLakeSurvey2015-2 044.JPG; 40LongLakeSurvey2015-2 052.JPG; 40LongLakeSurvey2015-2 124.JPG; 40LongLakeSurvey2015-2 128.JPG; 40LongLakeSurvey2015-2 170.JPG

Hi Debbie,

Please print and include in the OP comment binders and spreadsheets.

Thanks,
Kris

>>> "Stephen Butcher" 7/7/2016 1:58 PM >>>
Hi Kris,

Please acknowledge receipt of our comments attached for the Official Plan review.

Thank you,

Stephen Butcher

Water Quality and Capacity

for Long Lake, City of Greater Sudbury

Prepared by

Gertrud Nürnberg, Ph.D.
Bruce LaZerte, Ph.D.
Freshwater Research

Prepared for

Long Lake Stewardship
Sudbury, Ontario
December 22, 2015

Acknowledgement

The members of the Long Lake Stewardship and the Chair and founding member, Stephen Butcher, provided steady support and enthusiasm, which is gratefully acknowledged. Without Stephen's knowledge and provision of background information and maps, this study would not have been possible. Monitoring was provided by lake volunteers Keith Romo, Bill Dopson, Stephen Butcher, Joe and Kate Fyfe and the services by Jan Linquist of N.A.R. Environmental Consultants Inc. A special note should be made for the extensive time, energy and funding provided by Joe and Kate Fyfe for the 2015 monitoring effort and general guidance to LLS. We are indebted to Bill Keller, Director, Climate Change and Multiple Stressor Aquatic Research, Laurentian University for the confirmation of watershed connectivities and to Dr. Charles Ramcharan, Dept. Biology and Cooperative Freshwater Ecology Unit, Laurentian University for the inspiration of this study and his availability during its completion. Without the many historic monitoring data graciously provided by the City of Greater Sudbury Environmental Services and the Lake Partner Program of the MOECC, this study would be less conclusive. MOECC generously provided sediment cores and TP data for June 7, 2015.

Funding sources are Long Lake Stewardship, with more than 300 individual contributions by its members.

Cover Photo by GN: 25 Aug 2014, vista on Long Lake

Executive Summary

Members of Long Lake Stewardship (LLS) had observed several water quality problems including toxic cyanobacterial (bluegreen) blooms in Long Lake, Greater Sudbury Area, Ontario. The blooms triggered potable water advisories by the Sudbury and District Health Unit for four consecutive years. LLS members therefore retained Freshwater Research for a study that focussed on Long Lake water quality and its capacity for further development around the shoreline.

Long Lake and its watershed are located in the Sudbury mining area that has been severely affected by acid deposition. But biological and chemical changes indicate that Long Lake and most of its upstream lakes have been recuperating from acidity at least since 2003. Because Long Lake was only comparably mildly acid-stressed, other impairment, above all the increased abundance of nutrients, is becoming more prominent. Long Lake almost certainly has a legacy of nutrient enrichment in its sediment from years of waste water input and developmental exposure in the southern CGS. Like other recently enriched lakes in the developed region of the CGS, it experiences signs of eutrophication including cyanobacterial blooms. This hypothesis is confirmed by the scientific literature and observations by lake shore residents.

The Long Lake watershed is complicated and includes at least 6 streams that connect Long Lake to 10 upstream lakes. Most of the lakes have decreased in acidity becoming circum-neutral and increased in their nutrient status or trophic state. This means that eutrophication is on an upward trajectory, possibly for reasons of reduced acidification and increased anthropogenic input. Long Lake has become borderline oligo-mesotrophic based on total phosphorus (TP) and Secchi transparency data. The bottom water in its various basins has exhibited oxygen depletion since first measurements in 1974.

There are indications of internal P loading as release from anoxic bottom sediments that may be the cause of the increased frequency of cyanobacteria blooms in Long Lake. Such sediment P (confirmed by an independent study as reductant soluble P) likely has formed after P introduction from anthropogenic sources because the natural soils are generally P starved, especially in region with a history of mining and acidity. Released P is highly biologically available, because it is in the chemical form of phosphate and therefore has a more fertilizing effect than P from external sources. However, fall measurements of TP are lower than expected (compared to summer and spring concentrations) and more study is needed to determine the potential effect of internal loading to Long Lake water quality.

Most of the upstream lakes were oligotrophic, except for the immediate upstream lake McFarlane and its upstream lake Richard that were mesotrophic based on recent TP and Secchi transparency data. Both of these lakes also had confirmed cyanobacterial blooms and it is likely that they negatively influence Long Lake.

A lake capacity study is a tool for municipalities to determine whether present or future development may jeopardize the water quality of specific lakes in their jurisdiction. The assessment of lake capacity is a multi-step process, and we here present the technical aspect of determining average growing season TP concentrations that are representative for Long Lake for different loading scenarios. The implementation of the assessment falls to the municipality.

Based on the model input (variables for Long Lake and its upstream lakes concerning morphometry and hydrology, shoreline resident information, point source and other anthropogenic input) external load was computed separately for the individual sources and then summed. The

anthropogenic load to Long Lake is 41%, which is just as large as the load from natural sources of 43%, even though the estimated urban area (includes roads, gardens, and dwellings) is only 0.1 % of the total watershed area. Of the total load to Long Lake, upstream lakes contribute 16% from equal portions of natural and anthropogenic sources.

Using only the external load estimate of 1,012 kg/yr the mass balance model predicts a TP concentration of 7.0 µg/L. The addition of an internal load of 173 kg/yr increases the model prediction by 1.2 µg/L to a total summer/fall average of 8.2 µg/L. This value compares well to the observed average spring TP concentration of 8.3 µg/L (2004-2014), but not to the lower fall concentrations (2014, 2015). The model predicts a low TP concentration of 3.6 µg/L for undeveloped conditions, based on just natural loads. This undeveloped scenario assumes that less than 15% of the watershed was cleared (same as the developed scenario) and that there is no P input from shoreline development, point sources, and agriculture, and no internal load, while input via precipitation and from wetlands are not changed.

The PWQO (Provincial Water Quality Objectives) for lakes on the Precambrian Shield allows a 50 per cent increase in TP concentration from a modeled baseline of water quality in the absence of human influence. Multiplying the undeveloped TP result by 1.5 yields a MOECC capacity threshold of 5.4 µg/L. This means that the current spring concentration of 8.3 µg/L, as well as modelled summer and summer-fall concentrations are above the MOECC capacity threshold of 1.5 times the background load.

This partitioning of loads not only means that Long Lake is at capacity with respect to MOECC loading criteria, but that anthropogenic loads have to be decreased, if any deterioration of Long Lake water quality and cyanobacteria blooms are to be avoided. According to the mass balance, upstream anthropogenic sources only contribute 8%. Nonetheless, addressing these P sources would help Long Lake, in addition to the upstream lakes (Richard, possibly Silver and McFarlane Lake). While this study is not to evaluate any capacity of the upstream lakes, it appears that Richard, possibly Silver and McFarlane Lake reached capacity as well, which should be investigated and considered by the responsible governmental agencies.

The most direct approach to averting increased eutrophication is the prevention of additional sources by new development and the diminishment of existing external inputs. Existing excessive nutrient input include faulty septic systems, point sources of malfunctioning waste water treatment plants, and cosmetic fertilizer application. Restoration measures include the installation of vegetative buffers close to the lake shore and the application of other well-established best management practices (BMPs). Such measures would also decrease the fraction in the sediment that is released as internal load and possibly triggers the cyanobacterial blooms.

Without such action the frequency of cyanobacteria blooms will probably increase because of climate change. The predictions include the increase of temperature, which increases both internal load (available phosphate) and cyanobacteria abundance, and amplified extreme weather events like flash floods, which increases external inputs from runoff.

Further studies including more consistent monitoring of the trophic state variables, especially of phosphorus, throughout the year and in all basins, the quantitative and qualitative identification of cyanobacteria and other limnological assessment including that of the upstream lakes as well as the further testing of model input and performance has been suggested throughout this report. But these tasks can hardly be accomplished and supported by a lake association like LLS.

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Glossary and Acronyms

ANC: Acid neutralizing capacity related to pH and alkalinity

Annual areal water load, q_s (m/yr): The annual outflow volume (Q, cubic m) per surface area (A_o, square m), where $q_s = Q/A_o$.

Catchment basin or *watershed area:* Area around a lake that includes all upstream water and land.

CGS: City of Greater Sudbury

Chlorophyll a: A measure of *algal* or *phytoplankton* biomass, the green pigment that is analyzed in water is chlorophyll *a*. This measure of chlorophyll concentration in lake water is prone to analytical errors and its standardization is difficult, so that accuracy and precision are often low.

Cyanobacteria: Often called *bluegreens* or *bluegreen algae*, although they belong to bacteria. They can produce toxins that can create health effects if ingested in quantity (life stock, pets).

External load, L_{ext}: The sum of annual TP inputs from all external sources, i.e. stream, non-point and point sources, precipitation and groundwater. Units are in kg/ yr or in mg per square meter of lake surface area per year ($mg/m^2/yr$). External load is a gross estimate. Much of its phosphorus is in a chemical form that is not available to algae.

HES: Hutchinson Environmental Services, Ltd.

LLS: Long Lake Stewardship

Limiting nutrient: Algae, bacteria and phytoplankton in lakes are usually nutrient limited, so that any addition of the bioavailable form would increase such biomass. The nutrient that elicits the largest response is called the limiting nutrient (usually phosphorus or nitrogen).

MOECC: Ontario Ministry of the Environment and Climate Change, former *MOE*

MNRF: Ontario Ministry of Natural Resources and Forestry, former *MNR*

SDHU: Sudbury & District Health Unit

Secchi disk transparency: The depth at which the round black and white disk disappears is an integrated measure of algal biomass. Because its use is wide-spread many relationships with nutrients and chlorophyll concentration from other lakes are available (as regression equations).

Thermal stratification: period when a deep lake basin is warm in the surface mixed layer (*epilimnion*), but remains cold in the bottom layer (*hypolimnion*). Temperature is intermediate between these layers at the *thermocline* in the *metalimnion*. *Dimictic:* spring and fall mixing occurs during spring and fall turnover with a stratified period in the summer and in the winter under ice.

Total phosphorus, TP: All phosphorus (P) that can be analyzed in a water or sediment sample. It includes phosphate (highly available for algae), particulate forms (includes algae and non-living suspended particles), and forms not easily available for algae.

1 Introduction

Members of *Long Lake Stewardship* (LLS) have observed several water quality problems including toxic cyanobacterial (bluegreen) blooms in Long Lake, Greater Sudbury Area, Ontario. The blooms triggered potable water advisories to residents by the Sudbury Health Unit for four consecutive years (Sudbury & District Health Unit, 2015). LLS members therefore decided to support a study that focussed on Long Lake water quality and would help to determine the capacity for further development around the shore of Long Lake. Consequently, they retained *Freshwater Research* to determine past and current water quality of Long Lake and its shoreline development capacity.

A recent study commissioned by the *City of Greater Sudbury* (CGS) and conducted by Hutchinson Environmental Services, Ltd. (HES, 2014) investigated a large area of 354 lakes that included Long Lake, and LLS members were concerned about the applicability of such a cursory study to Long Lake. Also, because part of Long Lake is outside of the CGS boundaries, not the whole lake was investigated by HES (2014). HES's classification of Long Lake as "moderate" with respect to needing special requirements in the planning policy, despite their classification as a lake with previous cyanobacteria bloom history, was perceived as worrisome. To determine limnological relationships in such a case, HES suggested that further studies would be required[1].

Indeed, the first step in any lake capacity assessment should be the evaluation of a lake's limnological characteristics (Section 2). Only when understanding the lake's history respective background limnological characteristics and general water quality, can meaningful models be applied. Besides effects of the mining history, it is important to consider a nutrient source not usually measured in lakes on the Canadian Shield (also not considered by HES), which could trigger cyanobacterial blooms. Such a source is internal and stems from previously accumulated phosphorus (P) in the sediment, which can be released during periods of thermal summer stratification, as observed in several lakes before (Nürnberg et al., 2013).

To increase the knowledge about Long Lake's water quality a monitoring plan was created so that data collected in the past can be compared to recent observations. Section 3 describes past and current water quality of Long Lake and Section 4 presents available information for the upstream lakes.

In Section 5, we applied a lake shore capacity model similar to that employed by the MOECC (Version 3 of LSC) or by the District of Muskoka (DMM) in order to determine the sources of phosphorus entering the lake (external P load, Section 5.1). The determination of a lake's capacity for development is based on the separation of natural and anthropogenic P loads and their application in a model that predicts ("models") growing season (summer and early fall) P concentration in the lake from these loads in combination with other lake characteristics, such as morphometry and hydrology. Such a model can also estimate pre-development P concentration and determine whether any potential further development around the lake would noticeably reduce its present water quality. Internal P load, was determined independently in Section 5.2 and was incorporated as described in Nürnberg and LaZerte (2004). To validate the capacity model with its

1 "If the classification is "Moderate" or "Standard" and any flag is triggered then "Moderate" or "Standard" planning policy would apply, but a causation study would be warranted and any revisions to planning policy would be based on the outcome." HES, p. 38, where "Trigger 3. Cyanobacterial (blue-green algae) blooms have been confirmed."

lake specific inputs predicted lake P concentrations for current conditions (*Section 5.3*) are compared with observed concentrations.

Based on the present water quality and hypothetical development scenarios the model can predict future water quality so that informed decisions on the extent of any future development can be made.

However, water quality issues are not just caused by processes immediately influencing a lake, but reflect watershed usage and upstream water quality. Long Lake has a large watershed with 10 interconnected upstream lakes of variable size (0.20-3.06 km^2). Water quality of and loading from these upstream lakes were assessed as well and combined to achieve a total watershed load to Long Lake.

This report presents (a) a limnological characterization of Long Lake, (b) a characterization of the watershed and upstream lakes, and (c) Long Lake development capacity based on a lake shore capacity model and information obtained from (a) and (b).

2 Background

2.1 Review of acid deposition history and potential effects on Long Lake future water quality

Long Lake and its watershed are located in the Sudbury mining area that has been severely affected by acid deposition. These conditions have to be considered when describing and investigating Long Lake's water quality and general limnology. We have assembled some relevant sections of the primary literature and present our understanding of Long Lake.

Emissions that lead to wide-spread acidification in the area have been reduced. "Over a century of sulphur and metal particulate emissions from metal smelters led to widespread terrestrial and aquatic damage near Sudbury .... It is estimated that over 7000 lakes in a 17,000 km^2 area around Sudbury were acidified to the point that biological damage occurred .... However, large-scale emission reduction programs were implemented at the Sudbury smelters in the 1970s and 1990s, achieving overall reductions of ~90% in sulphur and metal emissions in comparison with the peak emission levels in the 1960s" (Keller, 2009).

Long Lake is relatively fast flowing and has a large watershed (Section 2.2), which means that it may have recuperated from acidity more rapidly than other lakes in the region. "It was observed that connected, rapid flushing lakes, those on low or moderately sensitive bedrock, and peatlands showed the greatest improvement in pH and acid neutralizing capacity whereas glacial headwaters and lakes on highly sensitive bedrock showed the least improvement." (Nriagu et al., 1998).

A reduction in acidity in such lakes has been documented repeatedly using biological and chemical indicators.

Biological signs of recuperation (Daisy and Tilton Lake are in Long Lake's watershed): "With wide-scale smelter emission reductions commencing in the 1970s, scaled chrysophyte assemblages in Swan and Daisy lakes have started to show signs of biological recovery in ~1984 and ~1991, respectively. Although the scaled chrysophyte assemblage in Tilton Lake has not recovered toward the pre-disturbance assemblage, the decline in acidophilic taxa and increase in circum-neutral taxa in recently deposited lake sediments indicate that the community is responding

to increased lake water pH. Conversely, diatom assemblages within each of the study lakes have not begun to recover, despite well-documented chemical recovery." (Tropea et al., 2010)

Chemical signs of recuperation: a comparison between 1990 and 2003 chemical variables indicates the changes and recuperation of the lakes in the Sudbury region in general and the lakes in the Long Lake watershed in particular (Table 1).

Table 1. Comparison of 1990 with 2003 summer water quality variables in composite samples of the mixed surface layer (epi- and metalimnion) of lakes in the Long Lake watershed (Section 2.2). *Source: Appendix 1 of (Keller et al., 2004).*

Lake	Year	pH	Alkalinity (mg/L)	Ca (mg/L)	TP (µg/L)
Clearwater	1990	4.9	-0.85	6.1	<2
	2003	6.3	1.19	4.3	5
Lohi	1990	4.9	-0.69	6.2	<2
	2003	6.3	2.57	4.3	9
Daisy Lake	1990	4.8	-0.88		2
	2003	6.2	2.02	2.6	9
Richard	1990	7.3	17.61		2
	2003	7.3	21.85	8.5	12
Silver	1990	4.3	-2.90	9.0	<3
	2003	6.0	0.87	7.3	7
McFarlane	1990	7.1	31.68	16.4	10
	2003	7.3	33.72	15.7	18
Tilton	1990	5.8	0.84	4.8	<8
	2003	6.3	2.63	3.5	7
Long	**1990**	**6.9**	**13.79**	**10.2**	**<5**
	2003	**7.1**	**16.83**	**8.5**	**8**

Of the described lakes, Richard (upstream of McFarlane), McFarlane (upstream of Long Lake) and Long Lake had circum-neutral pH and a relatively high alkalinity above 10 mg/L already in 1990, while the other lakes in the Long Lake catchment basin were still severely acidified (also, Pearson D.A.B., Gunn J.M., Keller W., 2002). Silver Lake has been the most acid stressed (also, Nriagu et al., 1998). However, the signs of severe acidification had changed by 2003, when all lakes exhibited pH values of at least 6.0 and at least some alkalinity. Alkalinity was at least 16.8 mg/L in Richard, McFarlane, and Long Lake. Further studies suggested that recovery of acidified lakes in the Sudbury region has commenced (Keller et al., 2007).

In all lakes calcium concentration was lower in 2003 compared to 1990, reflecting the generally observed decrease in Ca in softwater lakes on the Canadian Shield, which has been attributed to leaching during acidification from the soils in the catchment basin (Jeziorski et al., 2008). These chemical changes have a severe effect on the biota that need calcium such as certain zooplankton and crayfish (Hadley et al., 2015).

In the context of the present study the changes in the nutrient total phosphorus (TP) is most important because P is the nutrient that limits algal productivity and growth. In all lakes TP concentration was higher in 2003 compared to 1990, with Richard and McFarlane reaching above 10 µg/L. (Not shown, but also increased were concentrations of the nutrient nitrogen.)

In addition to the chemical indications, transparency (clarity) in the mining-affected Sudbury area lakes used to be high, when productivity was curtailed by acidity and metal toxicity in these lakes (Yan, 1983). Recently, clarity has decreased (Keller et al., 2007).

Figure 1. Conceptual model of anticipated changes during reclamation of acidified lakes

(Source: Figure 5 in Keller et al., 2007)

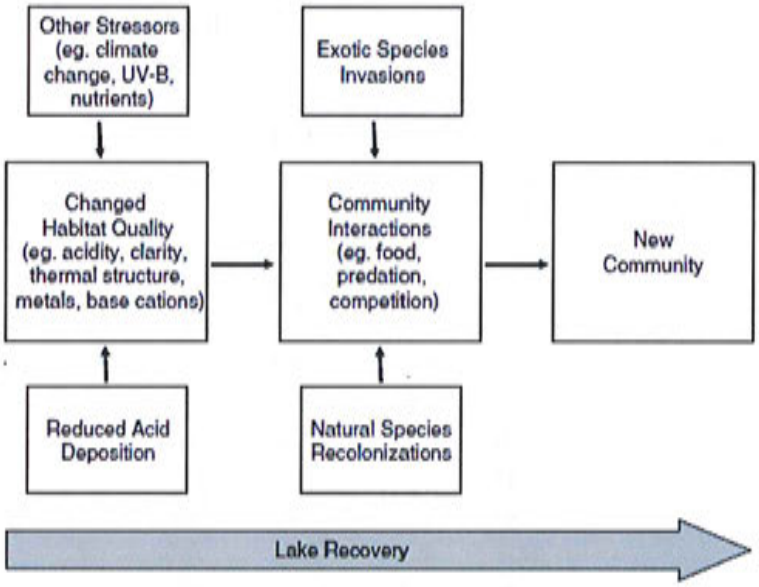


Fig. 5 Relationships between some factors influencing the recovery of lakes from acidification

Hypothesis explaining Long Lake's water quality trajectory:

Because Long Lake was only comparably mildly acid-stressed (Table 1), other impairment, above all the historically high nutrient loading, is becoming more prominent. Long Lake almost certainly has a legacy of nutrient enrichment in its sediment from years of waste water input and developmental exposure in the southern CGS. Therefore, it may be one of the first few regional lakes that experience signs of eutrophication including cyanobacterial blooms. This is expected because acidification does not basically alter or destroy limnological functions of lakes (Nriagu et al., 1998).

Such thoughts can be expressed in Keller's conceptual model of biological recovery (Keller et al., 2007, Fig. 5; reproduced here as Figure 1). These ideas are corroborated by observations of Long Lake resident Stephen Butcher, who remembers (18 Nov 2014):

"I have lived on this lake for 40 years. It was very clear 40 years ago. Practically no vegetation in the lake. Rarely caught a fish. We have colour now and some fish. Our pH is slightly under 7. Don't know what it was before though my father-in-law said it was low. We have vegetation now though Eurasian milfoil is killing it all off. The smoke stacks from INCO certainly dumped sulfur smoke on us. At times you could not go outside. However it was nothing compared to those lakes on the east side of the stack."

2.2 Morphometry, hydrology, and monitoring stations

Characteristics such as morphometry and hydrology greatly influence the water quality of lakes and are required input to a lake capacity model. Detailed variables are listed in Table 2 for Long Lake and close upstream McFarlane Lake.

Table 2. Morphometric and hydrological characteristics of Long Lake and McFarlane

Characteristics	Long	McFarlane
Approximate location (Lat,Long):	46.36, -81.1	46.25, -80.59
Surface Area, A_o (km^2):	8.65	1.67
Total Watershed Area, A_d (km^2):	108.06	22.48
Ratio of areas A_d/A_o:	12.55	13.54
Maximum Depth, z_{max} (m):	36.5	
Mean Depth, z (m):	7.53	8.95
Volume (10^6 m^3):	65.2	15.0
Annual flushing rate (per yr):	0.86	0.78
Annual water load (m/yr):	6.5	7.0
Perimeter (km)	52.9	
Maximum Length (km)	Almost 15	
Maximum Width (km)	Mostly < 1	

The (total) watershed to lake surface area ratio is relatively large in both lakes, indicating that their surrounding upstream areas have a large influence on their water quality (Table 2). Long Lake is extremely elongated in the direction of its flow, which make it appear as a wide river. But different from a river, it consists of bays of various depths that are separated by shallower bars, creating a chain of variously deep basins (Figure 2), with the main inflow from McFarlane Lake via Grant Lake in the north-east (Figure 3).

To account for this variety, previous and current monitoring have included several stations along its axis (Figure 4). Accordingly, depth is variable between sampling stations along the lake with the deepest locations closer to the inflow.

Figure 2. Long Lake depths contours (from light blue, 0-5m, to darkest blue, 35m)

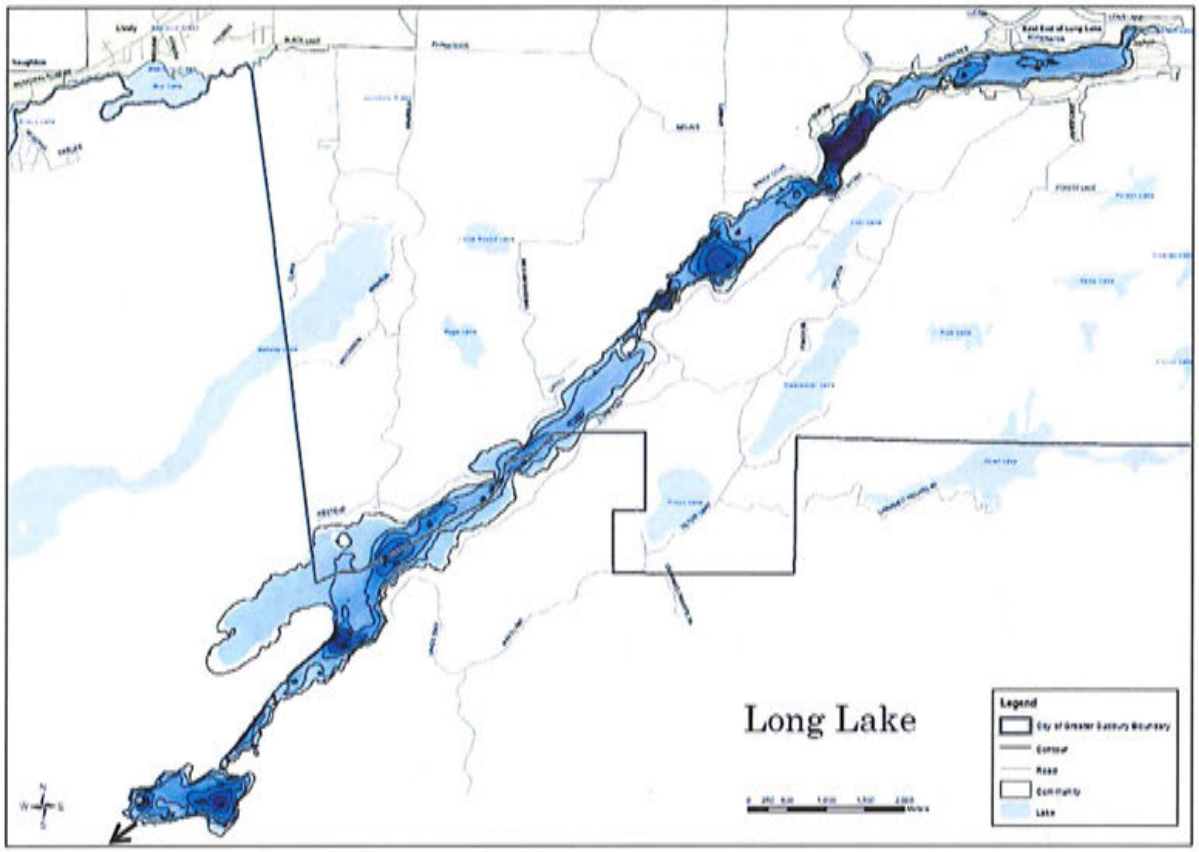
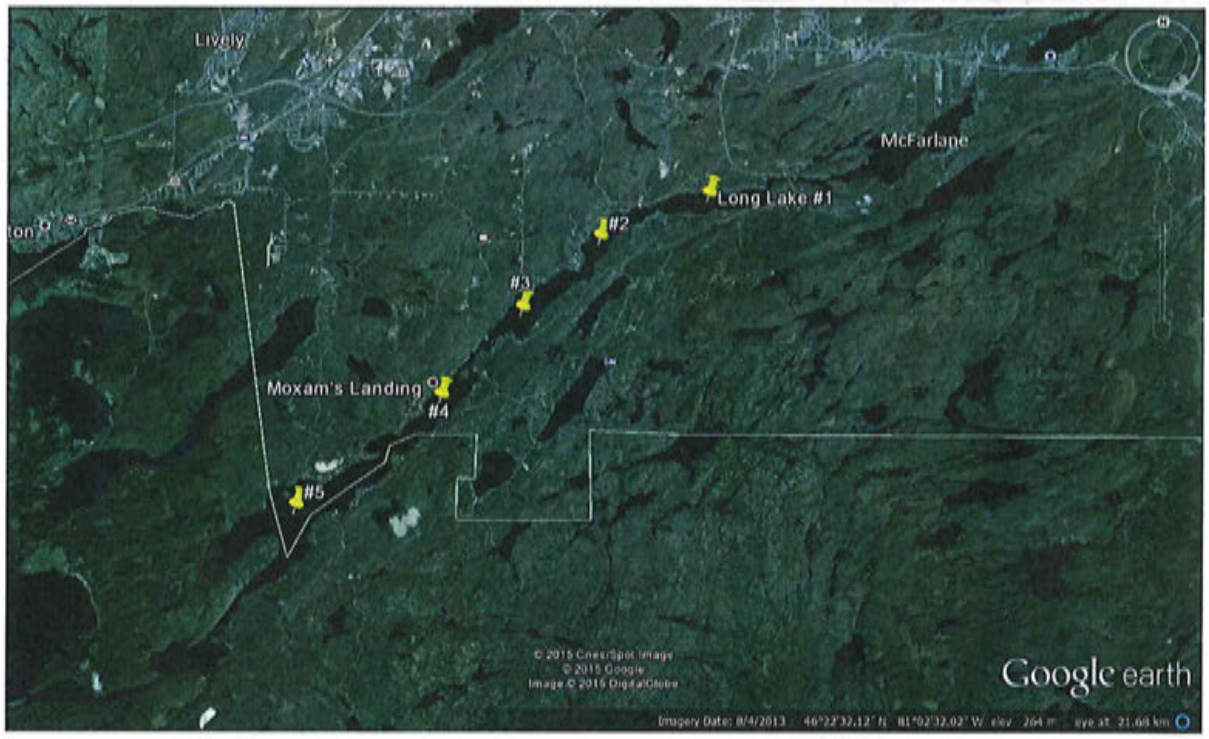


Figure 3. Main inflow creek into Long Lake out of McFarlane via little Grant Lake

Stephen Butcher, Nov 19, 2015

Figure 4. Satellite view of Long Lake indicating the 5 current stations, McFarlane Lake, and the limit of the Metro of Greater Sudbury (Google Earth). Flow direction from north-east out of McFarlane Lake to south-west out of Long Lake.



Stn #	Latitude, Longitude	Approximate Depth (m)
1	N46°24.387' W081°01.336'	9-10
2	N46°23.917' W081°02.637'	34-37
3	N46°23.154' W081°03.7556'	24
4	N46°22.317' W081°05.076'	8
5	N46°21.132' W081°07.290'	22

2.3 Watershed connectivity

The Long Lake watershed is complicated (Figure 5, Table 3) and requires a lot of information to correctly determine connections between wetlands and lakes. There are at least 6 tributaries contributing to Long Lake from upstream lakes. The most important are the creek from McFarlane Lake (via little Grant Lake, Figure 3) at the north eastern side, and Wavy Creek at the south eastern side (Figure 5). The values of the contributing areas (watershed area, A_d) to the upstream lakes and their lake areas (A) are not always consistent between the data sources and required repeated adjustment. Although we are confident that the most adequate information is included (we have used information from local resident Stephen Butcher, as well as researcher, Bill Keller, familiar with the area), a future review of connectivity and size of the contributing areas would help ascertain the values used in this study.

Figure 5. Schematic connections between lakes (indicated by arrows)

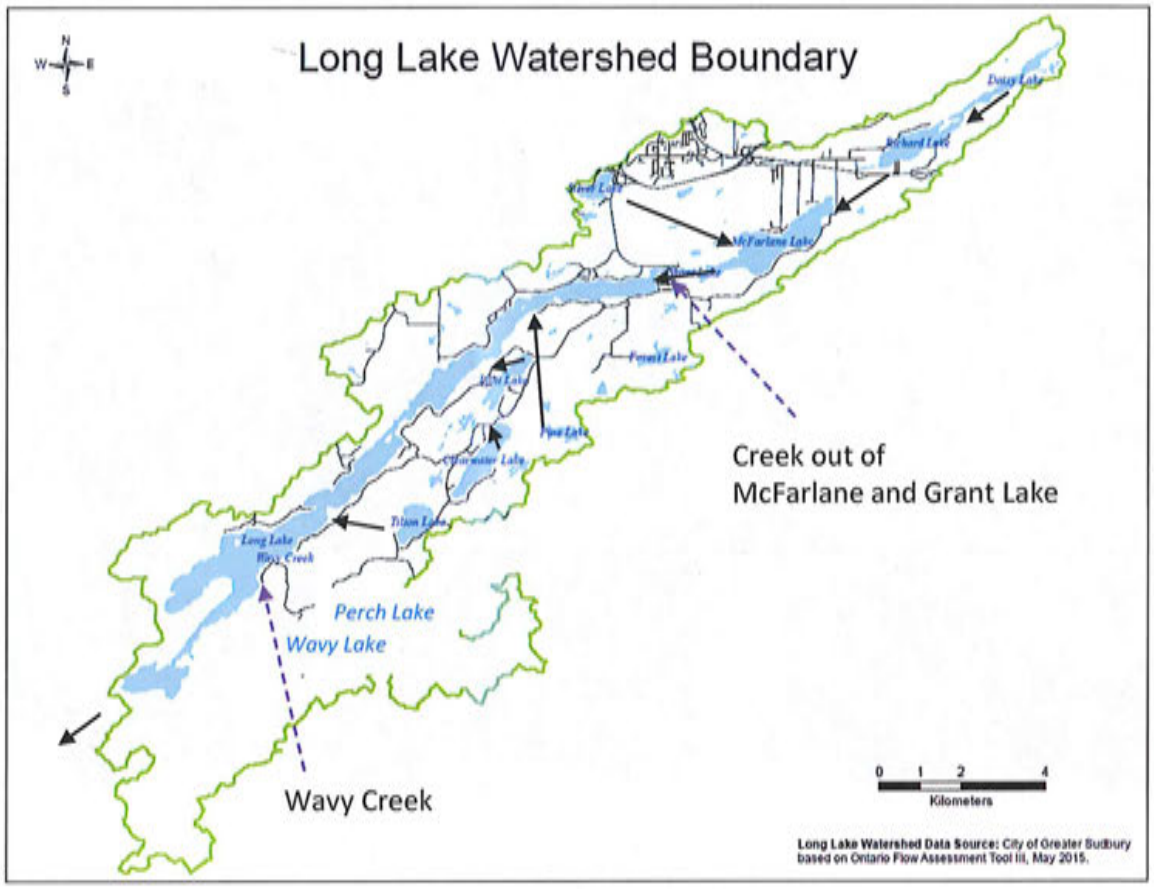


Table 3. Upstream lake names and areas

Lake #	Lake Name	Lat	Long	Upstream Lakes #	Upstream Lakes Name	Surface Area, Ao (km^2)	Immediate Watershed Area* (km^2)
163	Clearwater	4622	8103		none	0.77	2.44
174	Lohi	4623	8102	163	Clearwater	0.41	0.73
165	Daisy	4627	8054		none	0.36	2.43
185	Richard	4626	8055	165	Daisy	0.79	4.65
187	Silver				none	0.22	0.40
177	McFarlane	4625	8059	185,187	Richard, Silver	1.67	16.37
184	Pine				none	0.19	1.74
188	Tilton	4622	8105		none	0.52	2.43
196	Perch	4619	8106		none	0.20	12.15
197	Wavy				none	3.06	31.58
175	Long**	4636	8110	174, 177, 184, 188, 196, 197		8.65	37.01

Lake # are based on HES (2014), except 196 refers to Perch Lake at Wavy Creek and 197, Wavy Lake is not within CGS and was not described in HES.

*Watershed areas exclude the upstream lake and watershed areas.

**Long Lake names of the immediate upstream lakes are: Lohi, McFarlane, Pine, Tilton, Perch, and Wavy Lake.

Inflows are variable between each other and vary with season. According to local knowledge (Stephen Butcher, e-mail of May 2, 2015) …

> The whole group that feeds Wavy Creek, Wavy, Perch, Clearwater etc. all have to come down to Wavy Creek to enter Long Lake.
>
> Other than in the spring Wavy Creek barely produces any water. I canoe it every year. There is a beaver dam about 1 km up and throughout the majority of the year not a drop gets over it. I have to drag the boat over sections it's so shallow. The whole area over there is natural bush. Wavy Lake has some camps but that's it. The water from Clearwater only runs out in the spring. Clearwater is mostly fed by natural under water springs and is the best water I have ever tested. Perch from what can see is a large pond. No roads or camps on it.
>
> Silver Lake, if it enters Long Lake it must be a trickle. I have studied that end of the lake and driven all the roads and I cannot see how it gets here.
>
> The runoff creek from the four corners (far east end and north side of the lake) runs hard in the spring but then stops completely. The creek from Lohi runs in the spring only.
>
> Daisy, McFarlane, Grant, and Richard runs year round. 20 ft. wide 1-2 ft. deep in the spring. 10 feet wide 4-6 in deep the rest of the year.

It is evident from the maps that there are several lakes upstream of lakes that themselves are upstream of Long Lake. The "immediate watershed areas" in Table 3 exclude the areas belonging to all considered upstream lakes. They affect a lake directly via runoff because they represent that part of the catchment area that does not enter it via a stream from upstream lakes.

2.4 Methods and data sources

Data sources include previous reports by MOECC, peer-reviewed scientific publications, and the recent report on the *Development and Application of a Water Quality Model for Lakes in the City of Greater Sudbury* (Hutchinson Environmental Sciences Ltd. 2014). In addition, raw data were provided from CGS. These different data sources were scrutinized and where ambiguous, the parameters and information that were deemed most accurate and defensible were selected for the present study. Sources are indicated in tables and as footnotes throughout. Sometimes, only spatial or temporal averages could be extracted out of old reports and loose-leaf information.

Monitoring data in 2014 and 2015 were collected by licensed professionals or knowledgeable LLS volunteers. Temperature and dissolved oxygen concentration were measured with calibrated instruments from the boat, and water samples were analyzed with standard methods by licensed commercial laboratories.

3 Water quality of Long Lake

3.1 Trophic State

A general description of a lake's water quality is based on the trophic state classification system. Based on several water quality variables a lake can be classified into three categories (Table 4). Clean pristine and clear lakes are called oligotrophic and have high Secchi disk transparency, and

low nutrient and algae concentrations, while lakes with more nutrients and algae are intermediate and called mesotrophic. Lakes that have a high nutrient load from the watershed and from the sediments are usually eutrophic, showing low Secchi transparency, high nutrient and algae concentrations including toxin-producing cyanobacteria, and exhibit an oxygen deficit (dissolved oxygen concentration is below saturation) in their bottom waters (hypolimnion) during the summer thermal stratification period.

As presented in the following sections in more detail, Long Lake's trophic state variables indicated borderline oligo-mesotrophic conditions for the monitoring period in 2014 - 15 (Table 4), while trophic state was lower, oligotrophic, before (see also Table 1). This means that eutrophication is on an upward trajectory, possibly for reasons of reduced acidification and increased anthropogenic effects as hypothesized in Section 2.1.

Table 4. Trophic state categories (Nürnberg, 1996) based on water quality of the growing seasons indicated in parentheses.

	Long Lake	Oligotrophic	Mesotrophic	Eutrophic
Secchi Disk Transparency (m)	**4.7** (1988) < **4.0** (2014,15)	> 4	2 – 4	1 – 2.1
Total phosphorus (µg/L)	**8.3** (2004-2015)*	< 10	10 – 30	31 – 100
Total nitrogen (mg/L)	**0.252** (2003)*	< 0.350	0.350 – 0.650	0.651 – 1.200
Chlorophyll *a* (µg/L)	**2.5** (1988)	< 3.5	3.5 – 9	9.1 – 25
Anoxia at deep sites	**summer/fall**	possible	possible	during most of the summer stratification
Modeled anoxia (AA, d/summer)***	**9.3**	< 20	20 – 40	40 – 60

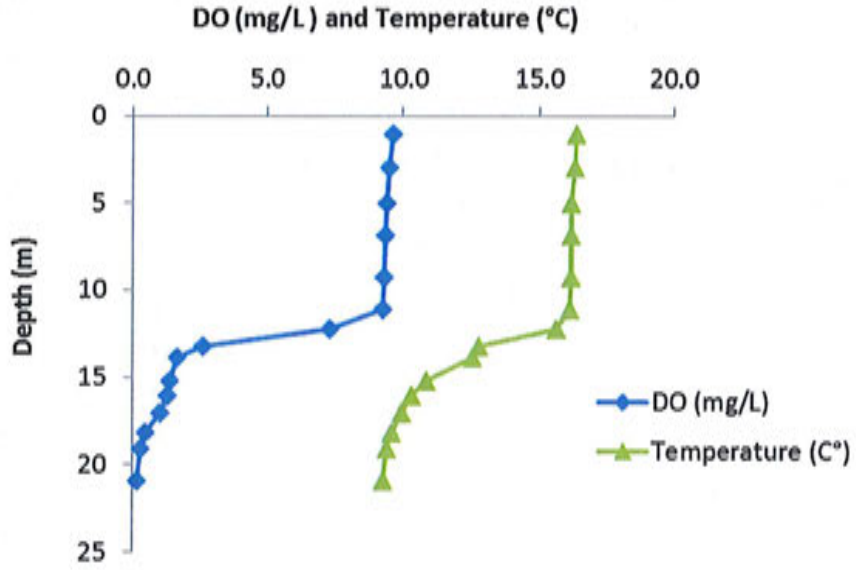
*Spring averages
**Underestimate because it is only based on total Kjeldahl nitrogen, Appendix 1 of (Keller et al., 2004).
***Computed from TP concentration (Appendix H)

3.2 Temperature and dissolved oxygen profiles

Temperature profiles are available since 1978 and indicate summer stratification at all deeper stations as is typical for deep temperate lakes. This means that there is little or no exchange between water from the mixed surface layer (epilimnion) with the bottom layer (hypolimnion) during summer and early fall. During this time, dissolved oxygen (DO) can be used up by microbial processes within the bottom sediments and this oxygen depletion can lead to hypoxia (e.g., DO below 3-4 mg/L) and anoxia (no oxygen, measured as DO below 1-2 mg/L) in the bottom water.

A typical fall temperature and DO profile is presented in Figure 6 for Station 5 (Sep 18, 2015), when the thermocline was at about 13 m depth below which temperature and DO were distinctively lower than in the mixed layer above.

Figure 6. Typical dissolved oxygen and temperature profiles that indicate summer-fall stratification and hypoxia, Station 5, Sep 18, 2014. Hypoxia in the bottom water coincides with the largest temperature change (thermocline).



Many more oxygen profiles are available and the data collected by LLA for 2014 and 2015 are presented in Appendix A. Oxygen depletion occurred as early as June 28 in 2015 at Site 1 from 8 m down to the bottom at 15 m (Table 5). However, there was no severe hypoxia under ice on Apr 12, 2015, when only the deepest measurements, which were possibly touching the sediment, revealed hypoxia. While there are no detailed and continuous data available, several occasions of hypoxia were recorded as early as 1978 at most stations (Table 5). Further evidence of oxygen depletion exist in all available profiles since 2000. This means that hypoxia seems to have occurred already in the past.

Hypoxia is a sign that organic substances have accumulated in the sediments possibly caused by external inputs. If the lake has a history of elevated P input, a large portion has probably accumulated in the bottom along with the organic compounds. Geochemical processes then can render this P into a form that can be released when the sediment surfaces and bottom water are anoxic. This process is called internal loading (Section 5.2) as opposed to external (watershed) loading (Section 5.1) and contributes to the eutrophication of lakes. Because it is in a chemical form that is phosphate (like in fertilizer), internal load is more effective in sustaining phytoplankton biomass and in triggering cyanobacterial blooms.

Table 5. Dates when dissolved oxygen concentration were below saturation in Long Lake

Year	Date	Location or Station #	Depth	DO	Temperature	Source
		(Stations of Figure 4)	(m)	(mg/L)	(C)	
1978	07-Jul-78	Upper	10-14.5	**1**	8	MOE
			9-15	**3-5**	9	MOE
		Middle	26-29	**0-1**	8	MOE
			22-25	**5-5.5**	5	MOE
		Lower_NE	17-19	**5.5**	10	MOE
1990	26-Sep-90	2	16-36.5	**< 6.0**		
2000	26-Aug-00	1	17-25	**0-4**	7	
		2	29-37	**1.5-6.4**	5.3	
2009	14-Aug-09	1	8	**0.8**	15.5	CGS
		2	14	**1.2**	5.5	CGS
		3	15	**6.2**	8.5	CGS
		4	7	**0.5**	20.1	CGS
		5	15	**5.3**	17.6	CGS
2011	25-Aug-11	2	15	**5.3**	10.0	CGS
		3	15	**5.6**	7.6	CGS
		4	11	**0.1**	21.4	CGS
		5	11	**0.2**	16.6	CGS
2012	18-Jul-12	1	8	**0.1**	8.2	
2014	18-Sep-14	1	8-9.6	**0.3**	15.0	LLS
		2	35	**4.3**	3.5	LLS
		3	21-21.8	**2.9**	5.7	LLS
		5	13.2-20.9	**0.7-2.6**	9.3-12.8	LLS
	22-Oct-14	3	20.1-22	**1.8-2.6**	21.0	LLS
2015	28-Jun-15	1	8-15	**0.0-2.8**	6.4-10	LLS
		5	22	**2.9**	7.3	LLS
	12-Jul-15	1	8-15	**0.0-2.0**	6.7-11.3	LLS
		5	19-21	**1.9-2.7**	7.6-7.9	LLS
	4-Aug-15*	5	12-20	**0.2-2.9**	8.1-15.3	LLS
	31-Aug-15*	5	11-21	**0.0-1.9**	8.4-17.2	LLS
	26-Sep-15*	2	11-12	**2.3-2.4**	12.9-14.4	LLS
		3	10-17	**2.8-3.9**	5.4-13.5	LLS
		5	14-21	**0.0-0.4**	8.5-14.5	LLS
	17-Oct-15*	3	13-17	**3.0-3.9**	5.7-8.4	LLS

* No profile for Site 1

3.3 Total Phosphorus

The trophic state evaluation with respect to total phosphorus is based on the summer and fall (late May to end of September) growing period. For this period, there are only data for 4 years available previous to the effort by LLS. TP concentrations averages ranged from 5.1 to 11 µg/L, without any apparent trend with time (Table 6). The three dates sampled in the fall of 2014 and 2015 are too variable to obtain useful results (see discussion below). We conclude that Long Lake summer mixed layer growing season concentration has probably been at most 7 µg/L, certainly below 10 µg/L, which is indicative of oligotrophic conditions (Table 4).

Table 6. Total phosphorus concentration along the lake sampled throughout summer and fall (without spring values).

Date	Surface TP (µg/L) for stations from inflow to outflow (Figure 4)						
	1	2	3	4	5	6	AVG
1978-07-05	5.0	7.0	6.0	5.0	2.0	6.0	**5.1**
1981-07-27*							**11.0**
1988 (12-May to 17 Oct)	8.0	6.0	5.0	4.0	4.0	4.0	**5.2**
1990 once/summer**		<5.0					
2003 once/summer**		8.0					
2014-09-18		4.4	6.0	6.8	5.1		**5.6**
2015-06-07***			7.6		6.2		**6.9**
Summer average	**6.5**	**6.1**	**6.2**	**5.3**	**4.3**	**5.0**	**6.8**
2014-10-22	6.6	1.9	2.6	1.9	1.9		**3.0**
2015-10-17****		7	<2		2		**3.7**
Fall average							**3.4**

*The 1981 value (sampled by MNRF) appears high and may be an outlier.
**From Table 1, Keller et al. 2004
***MOECC
****The 2015 TP detection limit was 2 µg/L, analyzed by Glencore – XPS Analytical Facility Sudbury

While summer observations are few, there are many years of spring TP values available, partially from early studies by MOECC and later by the Lake Partner Program of the MOECC (http://desc.ca/programs/LPP) and the City of Greater Sudbury (Table 7).

The spring TP concentrations appear to be consistently higher than those taken later in the growing season, although the uneven sample size renders a direct comparison problematic. The long-term spring TP average of all stations and years was below 10 µg/L. In early years 1975-1988 data were collected along the lake at up to 6 sampling sites (Figure 4) so that spatial trends can be examined. There appeared to be a decreasing trend from the first station close to the inflow towards the outflow. While this trend was still apparent in 2001 and 2004, it is not consistent throughout the years (e.g., 2002), when TP concentration at downstream Stations 4 and 5 were elevated (Table 7).

A higher concentration at the inflow and decreasing trend along Long Lake can be explained by a high P input from upstream productive McFarlane Lake (Section 4), which can occur especially in the spring during snowmelt when flows are highest.

Table 7. Total phosphorus concentration sampled in the spring (April 14 – May 26).

Year	Spring TP (µg/L) for stations from inflow to outflow (Figure 4)						
	1	2	3	4	5	6	Average
1975		6.0		18.0	5.0	5.0	8.5
1978		8.0		4.0	6.0	6.0	6.0
1982		13.0	9.0	7.0	4.0		8.3
1983	14.0	16.0	13.0	9.0	10.0	13.0	12.5
1985	10.0	6.0	7.0	7.0		4.0	6.8
1988	6.0	3.0	3.0	4.0	1.9	3.0	3.5
2001	10.0		7.6		5.7		7.8
2002	7.3		6.9		10.3		8.2
2004	10.0		7.3	5.3			7.5
2005	8.6				6.6		7.6
2007	6.4				9.7		8.1
2008	9.6		12.4		5.6		9.2
2009			9.9		10.0		9.9
2010	8.7		11.5		5.2		8.5
2011	5.2		17.7		7.0		10.0
2012			6.8	6.7	6.8		6.8
2014		8.6			5.8		7.2
1975-2014	**8.7**	**8.7**	**9.3**	**7.6**	**6.6**	**6.2**	**8.0**
2004-2014	**8.1**	**8.6**	**10.9**	**6.0**	**7.1**		**8.3**

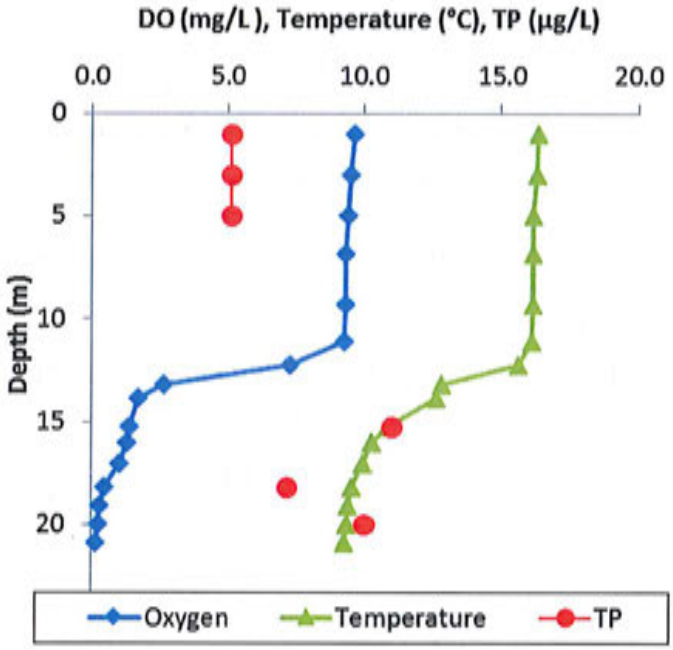
In an effort to determine whether there is any release of phosphorus from Long Lake sediments, samples were taken at various depths below the thermocline and about 1 m above the sediments at the deeper sites in 2014 and 2015 (Appendix B). Bottom concentrations were sometimes elevated compared to the mixed layer concentration on Sep 18, 2014 (Figure 7) and under ice on April 12, 2015, which is consistent with sediment release.

On Oct 22, 2014 and on Oct 17, 2015, when most of the thermal stratification was disrupted indicating fall turnover (Appendix A), surface TP concentrations were unexpectedly small, sometimes below 2 µg/L throughout the water column, except for the deepest sample of 1 m above bottom (Appendix B). Typically internal P loading elevates TP concentration after fall mixing. This low concentration may be an artifact or indicate precipitation by metals mixed into the water column at time of turnover. (Usually iron is released with P under anoxic conditions. Lakes within the Sudbury mining region and previous acidity may also have an unusual high aluminum concentration that can adsorb P effectively.)

Oct 17, 2015 TP concentration were below the detection limit of 2 µg/L at stations 2, 3 and 5 mid-depth, but were elevated at the 1 m above bottom depth at the shallower stations (Stn 3: 60 µg/L and Stn, 5, 54 µg/L, Appendix B). Manganese and iron, which are also released under low oxygen concentration were elevated as well, which supports the redox-related release of P. However, elevated concentrations of non-reducible aluminum that accumulate in the sediments may mean that these particular samples included sediment particles and these results may not solely describe redox related P release.

To determine any spatial and temporal trends with certainty, more detailed studies of the relationship between, TP concentration at fall turnover and sediment P release is recommended.

Figure 7. Total phosphorus concentration (compared to dissolved oxygen and temperature profiles) is consistent with sediment P release, Station 5, Sep 18, 2015.



3.4 Phytoplankton biomass: cyanobacteria, Secchi disk transparency, and chlorophyll concentration

Cyanobacteria "bluegreens"

The main reason for the present study are the increased occurrences of "bluegreen blooms", which are created by cyanobacteria. Many cyanobacteria species can be toxic as they release microcystin or other cyanotoxins (Chorus and Bartram, 1999) and special consideration is given to these species in this report.

Health Canada (HC) recreational guidelines and provincial drinking water standards exist for cyanotoxins. The maximum concentration for microcystin-LR under the Ontario Drinking Water Quality Standard is 1.5 µg/L (O. Reg. 169/03, Schedule 2) and the provisional HC guideline for recreational activities is 20 µg/L (Health Canada, 2009).

MOECC regards any cyanobacterial bloom as potentially toxic, whether or not toxins are detected in the water upon testing (Winter et al., 2011). This is because toxicity changes with the state of the bloom and is not necessarily correlated to cell number. While the potential risk to human and animal health depends on the extent the water is used recreationally (e.g., public beaches, parks, and swimming areas), in a developed lake like Long Lake with a year-round population a continuous protection is necessary.

Observations by lake residents suggest that most blooms have first been observed at the north western shore of Long Lake (close to Edgewater and Sunnyside Road). It is likely that blooms often started in upstream McFarlane Lake and then were distributed with the natural water flow via Grant Lake into Long Lake, because they occurred in the same years since 2008 (Table 8). Conditions in Long Lake apparently were supportive of the blooms that did not seem to decrease along the lake.

The Sudbury & District Health Unit (SDHU) program monitoring blooms since 2006 identified blooms in several years since 2008 on Long Lake (https://www.sdhu.com/wp-content/uploads/2015/07/Blue-Green-Algae-Identified-from-2006-to-present_Compliant.xlsx), including November 2008, June 2011 and 2012, and October 2013 and 2014 (Table 8).

According to local resident (Stephen Butcher) there have been 8 blooms since 2008 occurring once and sometimes twice per year except for 2009 and 2010 when there was no bloom registered (Table 8). Some of the blooms were elusive so that they were only observed by residents. Drew Brennan of MOECC recalls two blooms with one showing trace amount of the toxin, microcystin (Appendix D) but species information was not available.

The only available species identification is published in a study from 2008 (Evans and Saleh, 2015) and determined *Leptolyngbya*, *Phormidium*, *Anabaena*, and *Cylindrospermum* in McFarlane Lake, which probably were then delivered to Long Lake via the connecting streams. *Anabaena* is known to produce toxic microcystin as well as several sub-species of *Leptolyngbya, Phormidium*, and *Cylindrospermum.*

Table 8. Registered cyanobacterial blooms in Long Lake and upstream McFarlane Lake since 2008

Date	Description
Aug/Sep 2008	First known bloom, Aug-Sep. *Leptolyngbya*, *Phormidium* (Evans and Saleh, 2015)
Nov 2008	SDHU
Oct, Nov 2008	McFarlane Lake, *Leptolyngbya* or *Phormidium*, *Anabaena*, *Cylindrospermum* (Evans and Saleh, 2015), SDHU
24-Jun-2011	Trace of microcystin (MOECC confirmed)
Jul 2011	In McFarlane, SDHU
19-Jun-2012	No microcystin (below detection, MOECC confirmed)
October 2013	SDHU
29-Jun-2014	In McFarlane (MOECC confirmed)
October 2014	SDHU
27-Jun-2015	Near Edgewater Rd (visual observation)
June 2015	In McFarlane, SDHU

Secchi disk transparency

Secchi disk transparency is a simple, but robust measure of algal biomass. The depth at which the round, black and white Secchi disk disappears is an integrated measure of water transparency and depends on algal biomass and colour (Figure 8). The larger its value the clearer the lake, so that

high values mean better water quality than low values. Because its use is wide-spread many relationships with nutrients and chlorophyll concentration from other lakes are available.

Figure 8. Secchi transparency taken in a highly eutrophic urban lake (0.67 m)

Long Lake's average growing period Secchi transparency was 4.7 m in 1988 (the only year with complete data) indicating oligotrophic conditions (Table 4). Lake average Secchi transparency was below 4 m in Sep and Oct 2014, and in Aug 2015 (Appendix C), which represents mesotrophic conditions. Lower transparency in recent years is expected upon recovery from acidity (Section 2.1).

Secchi disk transparency varied with location and tended to increase from the inflow towards the downstream end of Long Lake in earlier years (Figure 9, Appendix C). But the trend was not consistently observed in the recent monitoring effort (reliable measurements are not available for a complete growing season) and further monitoring is recommended. Secchi transparency was much lower at the upstream stations on 22 Oct, 2014 (Figure 9), which exhibited oxygen depletion in the summer. But transparency was smaller at Stations 4 and 5 during thermocline erosion on 18 Sep, 2014 leading to fall turnover (Figure 9), which could indicate higher phytoplankton biomass at these locations. Increased biomass is consistent with internal P loading that occurs mostly in the fall, when hypoxia was measured at Station 5.

Transparency in the mining-affected Sudbury area lakes used to be comparably high, when it was affected by acidity and metal toxicity that reduced productivity in these lakes (Yan, 1983). These geochemical changes have to be considered in the interpretation of long-term patterns in Secchi transparency in these lakes.

Figure 9. Secchi disk transparency from inlet bay (Station 0) to downstream Stations 5 and 6.

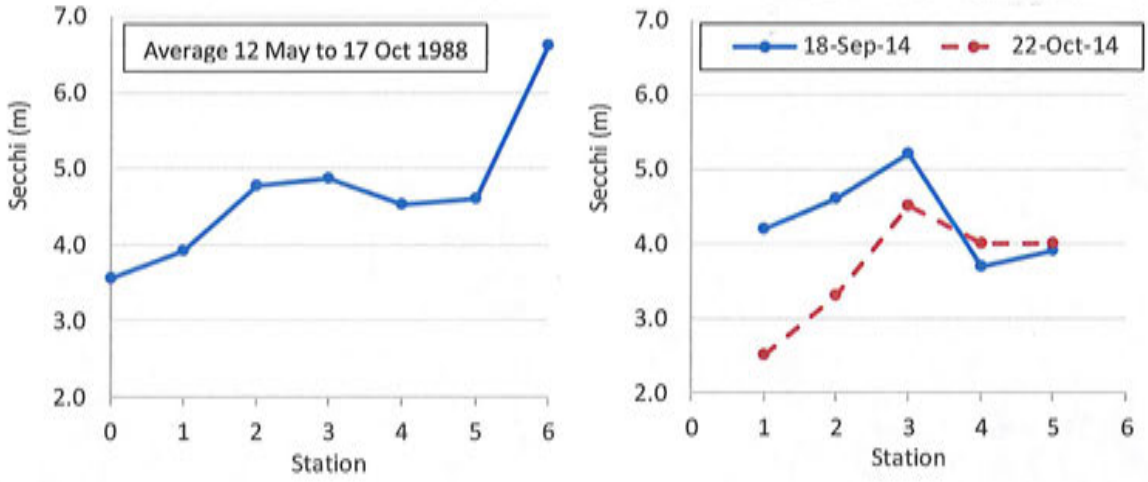
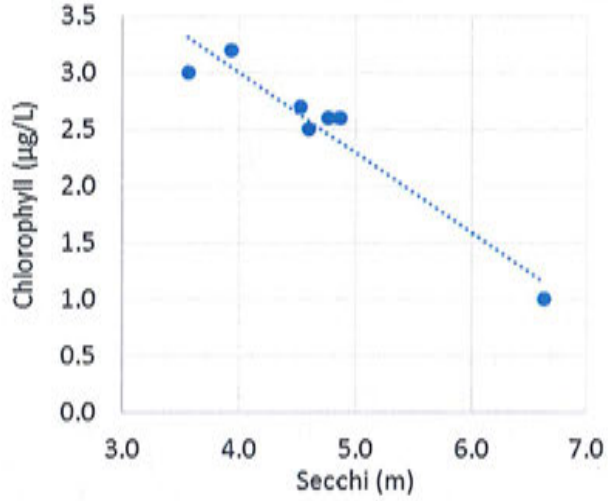


Figure 10. Comparison of chlorophyll concentration averages with Secchi disk transparency averages available for 7 sites of the 12 May – 17 Oct 1988 growing period (R= -0.96, n=7, p<0.0001).



Green pigment chlorophyll a

A measure of algae biomass besides the actual identification and counting of cells is the extraction and analysis of chlorophyll *a*, which is the green algal pigment used in photosynthesis. This measure in lake water is highly dependent on the distribution of algae and is prone to analytical errors and its standardization is difficult, so that accuracy and precision are often low. Chlorophyll concentration is only available for two years, a single value of 5-Jul -78 (1.5 µg/L average along

lake) and for the growing period in 1988 (12 May to 17 Oct, 2.5 µg/L average along lake). These are low values and indicate oligotrophic conditions (Table 4).

Much of the variation in Secchi transparency can be attributed to phytoplankton biomass during the growing period, because there is a highly significant linear correlation between the 1988 measurements for both variables (Figure 10). Therefore, Secchi disk transparency can be deemed a viable tool for the determination of phytoplankton biomass in Long Lake. We recommend further testing to determine that this relationship still holds currently. It is possible that recent changes in water chemistry, including increased pH and buffer capacity and the occurrence of cyanobacteria blooms may have altered this relationship.

3.5 Fish

There are at least 15 species of fish observed in Long Lake including a good number of predators. This means that Long Lake has been recuperating from the acidification effects (Table 9).

Although lake trout (*Salvelinus namaycush*) is listed (*MNR fish_online.com*), naturally recruiting trout does not occur and Long Lake is classified as a "*Put, Grow, Take*" lake, where lake trout and possibly cisco are stocked routinely. With respect to development capacity, Long Lake is therefore not classified as a "Lake Trout Lake" and the provincial dissolved oxygen criteria to protect lakes with the natural occurrence of lake trout (Ontario Ministry of Natural Resources, 2006) do not apply.

Table 9. Fish species in Long Lake.

Catfish - Family Ictaluridae	Pike - Family Esocidae
Brown Bullhead	Northern Pike*
Minnow - Family Cyprinidae	Sunfish - Family Centrarchidae
Common Shiner	Pumpkinseed
Golden Shiner	Smallmouth Bass
Creek Chub	Largemouth Bass
Spottail Shiner	Sucker - Family Catostomidae
Perch - Family Percidae	White Sucker
Iowa Darter	Lake Trout - Family Salmonidae
Log Perch	Lake Trout*
Walleye*	Cisco (Lake Herring)
Yellow Perch*	

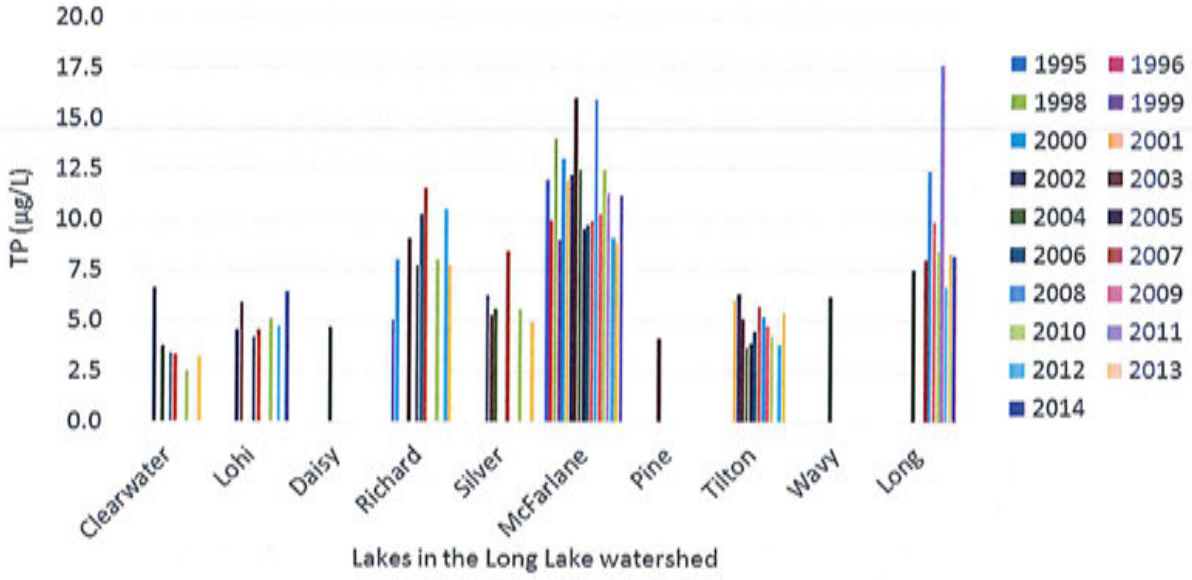
*MNR *fish_online, www.web2.mnr.gov.on.ca/fish_online/fishing/fishingExplorer_en.html* (downloaded, Aug 2014)

4 Water quality of upstream lakes

Most of the upstream lakes have displayed lower spring TP concentrations than Long Lake (Figure 11, top). But Richard that feeds McFarlane, and McFarlane Lake that is immediately upstream of Long Lake had higher TP (Table 3, Figure 12). Richard and McFarlane also exhibited relatively low Secchi transparencies compared to the other lakes (Figure 11, bottom) indicating poorer water

quality (mesotrophy, Table 4) as well. A dissolved oxygen profile revealed oxygen depletion (<3 mg/L) from 10 to 20 m already on Sep. 15, 1990 in McFarlane Lake (MNR 1990). Based on these and MOECC Lake Partner data, it appears that McFarlane Lake (including its upstream Richard Lake) may have an adverse effect on Long Lake water quality, while most other monitored lakes have comparably good water quality.

Figure 11. Spring total phosphorus concentration (top) and mean growing season Secchi transparency (bottom) in lakes of the Long Lake watershed (MOECC Lake Partner Program, Appendix E and Appendix F).



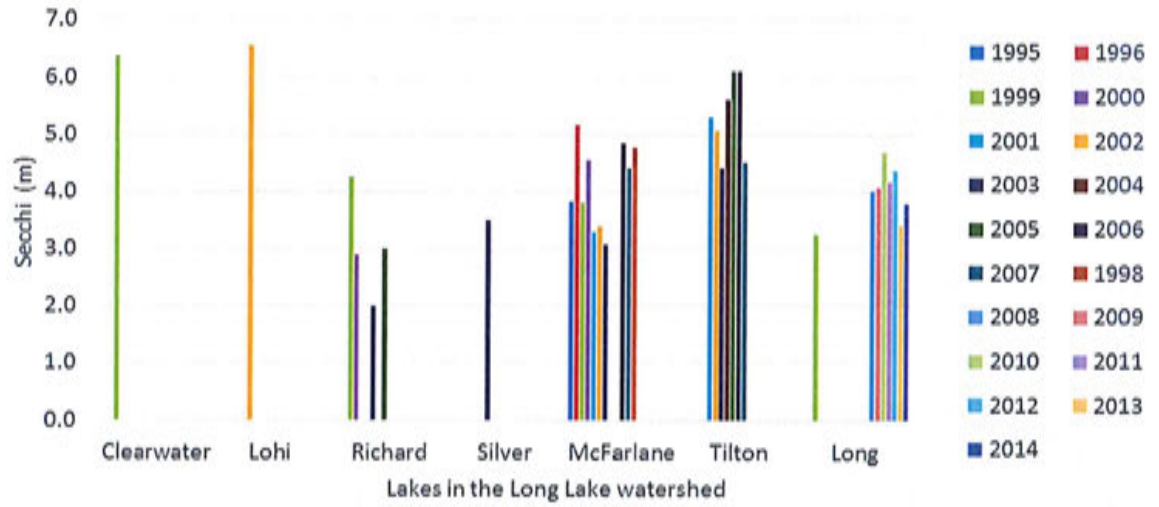


Figure 12. Location of Richard and McFarlane Lake immediately upstream of Long Lake.

The history of acidification of the upstream lakes (Section 2.1) has to be considered in assessing their water quality. As mentioned before, transparency in the mining-affected Sudbury area lakes used to be comparably high, when it was affected by acidity and metal toxicity that reduced productivity in these lakes. For example upstream Lohi Lake (Table 3) used to be severely acidified, but was then experimentally neutralized and re-acidified (Yan, 1983), and Silver Lake has been the most acid stressed of these lakes (Nriagu et al., 1998). It is conceivable that these lakes remain oligotrophic longer despite dense development (Section 5.1) and will not have the nutrients and internal P loading to trigger cyanobacteria blooms as in McFarlane and Long Lake.

However, despite historically high transparency and low productivity, some of the Sudbury area lakes have recently experienced cyanobacteria blooms (Evans and Saleh, 2015) and are listed in a spreadsheet of the Sudbury & District Health Unit https://www.sdhu.com/wp-content/uploads/2015/07/Blue-Green-Algae-Identified-from-2006-to-present_Compliant.xlsx and map https://www.google.com/maps/d/viewer?mid=zZBRA81TKEPU.km9eH-LM0cW8). These lakes include Silver (no dates available, investigations to support our hypothesis above would be interesting), Richard (July 2015), and McFarlane (October 2008, November 2008, July 2011, and June 2015) besides Long Lake.

5 Lake Capacity for development

A lake capacity study is a tool for municipalities to determine whether present or future development may jeopardize the water quality of specific lakes in their jurisdiction. The assessment of lake capacity is a multi-step process, and we here present the technical aspect of determining average growing season TP concentrations that are representative for Long Lake for different loading scenarios. The implementation of the assessment falls to the municipality.

There are several methods to determine the development capacity for a lake, which are specific to geographic and jurisdictional regions. We are using an approach that is similar to those used in the Ontario MOECC's Lake Shore Capacity approach described in the Lakeshore Capacity Assessment Handbook (Ministry of Environment, 2010) and the District of Muskoka (Nürnberg and LaZerte, 2004).

5.1 External P load

The partitioning of external P sources that contribute to the lake TP concentration are the core of a lake capacity model. Whenever feasible, model input was used in accordance with the latest version of the MOECC Lake Shore Capacity model (LSC 3). When more detailed information was available, like that of land use in the watershed and internal P loading for Long Lake, appropriate input was applied to render the model more specific. Some input with respect to shore line usage was based on the District of Muskoka Model (DMM), as it is more specific and applicable to this region than corresponding input by the LSC (Table 10).

Table 10. General model input variables to compute external P load

Variable	Value	Source*
Precipitation (mg P m^{-2} yr^{-1})	16.7	LSC 3
Runoff (m yr^{-1})	0.41 - 0.46	MOECC 2001
P-export from the watershed (mg m^{-2} yr^{-1})		
Wooded < 15% cleared areas	5.5	LSC 3
Wooded > 15% cleared areas	9.8	LSC 3
Agriculture	30	LSC 3
Urban	50	LSC 3
Industrial areas, gravel pits	50	LSC 3
Lake shore lot within 300 m (dwelling, resort, campground)	22.5	DMM
Lakeshore usage figures (capita years yr^{-1})		
Seasonal cottage	0.69	LSC 3
Year-round dwelling	2.30	Specific to Long (2.65 in LSC3)
Resort unit	1.27	LSC 3
Campground, some trailers	0.37	LSC 3
Trailer park	0.69	LSC 3
P Supply from tile fields of septic systems (kg $capita^{-1}$ yr^{-1})		
Within 100 m	0.30	DMM
Trailer & camp sites within 100 m	0.15	DMM
Average developed areas per lot (m^2 $unit^{-1}$)**		
Cottage	2000	DMM
Resort	1000	DMM
Campground/Trailer park	1000	DMM

*Source: LSC 3, third version of the MOE Lake shore Capacity Model (Paterson et al., 2006)
DMM, District of Muskoka Model and survey (Nürnberg and LaZerte, 2004).
MOECC 2001, previous capacity modeling

**Used to determine P export from lake shore lots

External P input from atmospheric and terrestrial sources in the catchment basin to the individual lakes was estimated according to assumptions and constants of LSC. This approach considers the amount of cleared and wetland areas (percentage of their respective watersheds, Table 11) in addition to sources from shoreline development (septic systems), point sources and agriculture. Based on land use information provided by LLA and TP export coefficients (Table 10), external load was evaluated for the lake capacity assessment of Long Lake and its upstream lakes.

Table 11. Watershed characteristics of the modeled lakes (incl. latitude, longitude)

Lake #	Lake Name	Lat	Long	Upstream Lakes* #	Watershed Area, Ad (km^2)	Ratio Ad/Ao	Cleared Area** (%)	Wetland Area*** (%)
163	Clearwater	46.22	81.03	-	2.44	3.2	10	2.32
174	Lohi	46.23	81.02	163	0.73	1.7	10	6.99
165	Daisy	46.27	80.54	-	2.43	6.7	10	1.20
185	Richard	46.26	80.55	165	4.65	5.9	10	5.27
187	Silver			-	0.40	1.8	10	3.82
177	McFarlane	46.25	80.59	185,187	16.37	9.8	14	7.81
184	Pine			-	1.74	9.4	10	8.78
188	Tilton	46.22	81.05	-	2.43	4.7	10	4.20
196	Perch	46.19	81.06	-	12.15	59.9	11	7.32
196b	Wavy			-	31.58	10.3	12	9.42
175	Long	46.36	81.10	174, 177, 184, 188, 196, 196b	37.01	4.3	9.34	8.76

Lake # are based on HES (2014), see note to Table 3.
* Upstream Lake, e.g. Lohi's upstream lake is Clearwater Lake, Lake #163
** Estimated from maps
*** Hutchinson (2014) or MOECC-2001

In a watershed like that of Long Lake the numerous upstream lakes (10 lakes) have to be considered in any modeling of TP concentrations in the receiving lake (Long Lake). Depending on the interconnectivity of theses lakes and their morphometric and hydrological characteristics, they retain a large part of their immediate P input. This P retention was determined according to previously developed models (Table 12, Appendix G). P input from the upstream lakes was estimated for each of the ten lakes separately and then the load affecting the downstream lake diminished by P retention (Effect on lake= upstream load – [upstream lake R x upstream load]).

Table 12. Lake characteristics of the modeled lakes

Lake #	Lake Name	Volume* (10^6m^3)	Mean* Depth, z (m)	Runoff** r (m/yr)	Discharge Q (10^6m^3/yr)	Flushing Rate (per yr)	Water Load, qs (m/yr)	TP Retention (proportion)
163	Clearwater	6.85	8.95	0.41	1.32	0.19	1.72	0.76
174	Lohi	2.84	6.85	0.43	1.80	0.63	4.34	0.67
165	Daisy	1.95	5.35	0.45	1.25	0.64	3.44	0.70
185	Richard	3.67	4.66	0.45	3.69	1.01	4.69	0.66
187	Silver			0.43	0.26		1.20	0.78
177	McFarlane	14.96	8.95	0.43	11.64	0.78	6.96	0.60
184	Pine	0.62	3.32	0.43	0.82	1.33	4.40	0.67
188	Tilton	3.25	6.31	0.42	1.24	0.38	2.40	0.74
196	Perch			0.46	5.66		27.88	0.33
196b	Wavy	30.34	9.91	0.46	15.86	0.52	5.18	0.65
175	Long	65.16	7.53	0.42	56.18	0.86	6.50	0.61

* MNR, unpublished bathymetry (pers. comm. MOECC-Aug 2015)
** MOECC-2001

Development information around the shoreline of Long Lake is based on the 2014 census for the area within CGS borders and by information from LLA for the south-western areas in Eden Township (Table 13). The development of the upstream lakes is based on MOECC-2001 information dating back to previous years. One waste water treatment plant is located in the study area and contributes to McFarlane Lake.

Table 13. Lake shore development units and urbanized area

Lake		Vacant	Permanent Year-round	Seasonal	Resort	Campground	Urbanized Area	Waste* Water Treatment Plant
#	Name	Lots	(#)	(#)	(units)	Sites (#)	(km^2)	(kg/yr)
163	Clearwater		8	30		15		
174	Lohi		5	18				
165	Daisy							
185	Richard		75	15		50	0.28	
187	Silver		10	10				
177	McFarlane		132	26		20	1.38	5
184	Pine							
188	Tilton		8	16				
196	Perch							
196b	Wavy		2	30				
175	Long	82	431	155	25		1.38	

No entries are zero numbers.
*For 2004-2007, Hutchinson (2014)

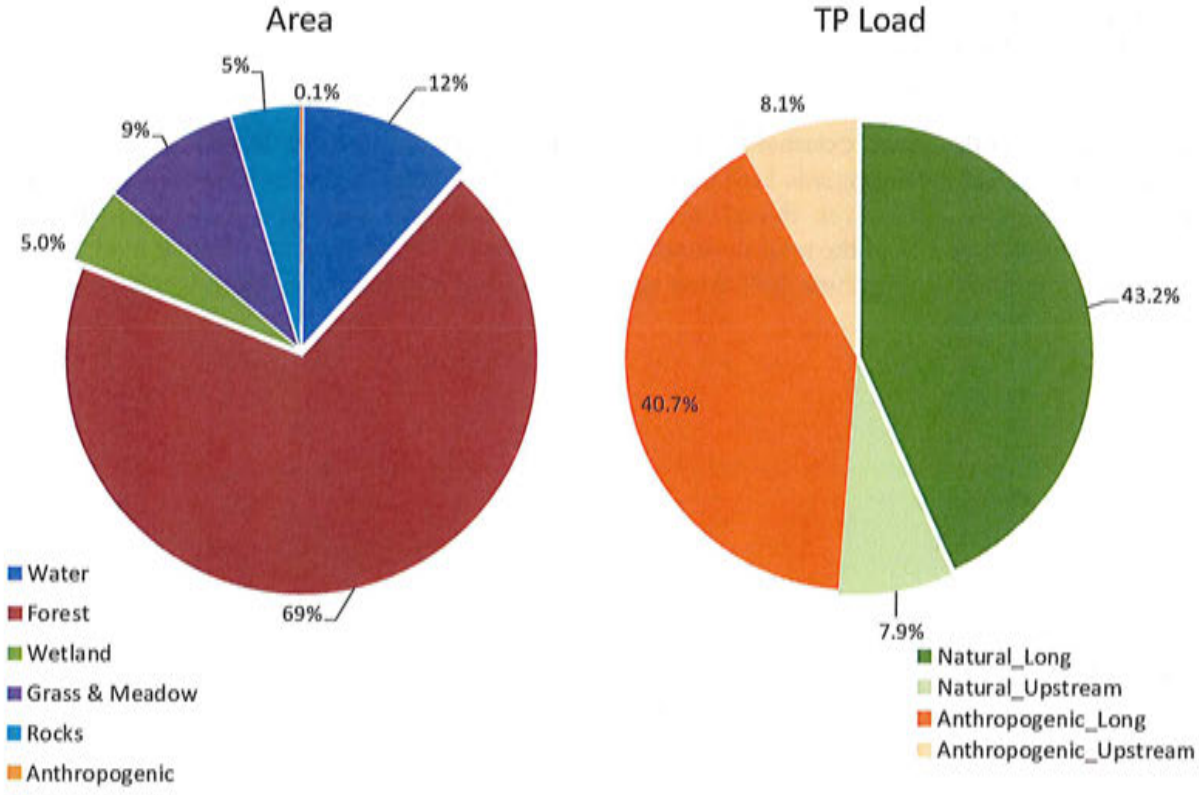
Based on the model input, external load was computed separately for the individual sources and then summed. The anthropogenic load to Long Lake is 41%, which is just as large as the load from natural sources of 43%, even though the estimated urban area (includes roads, gardens, and dwellings) is only 0.1 % of the total watershed area (Table 14, Figure 13). Of the total load to Long Lake, upstream lakes contribute 16% from equal portions of natural and anthropogenic sources.

Table 14. Separate land use areas and external TP loads for Long Lake

Land Type	Area	
	(m^2)	%
Water	13,575,500	11.6%
Forest	81,045,525	69.4%
Wetland	5,840,570	5.0%
Grass & Meadow	10,806,070	9.3%
Rocks	5,403,035	4.6%
Anthropogenic	100,000	0.1%
Total	116,770,700	100%
Load Type	**TP-Load**	
	(kg/yr)	%
Natural for Long Lake	438	43.2%
Natural for upstream lakes*	80	7.9%
Anthropogenic for Long Lake	412	40.7%
Anthropogenic for upstream lakes*	82	8.1%
Total	1,012	100%

*Phosphorus retention (settling) by the upstream lakes has been considered

Figure 13. Watershed proportional areas and external loading percentage separately for TP load of upstream lakes diminished by P retention (settling), based on Table 14.



5.2 Internal P load

In some lakes P is produced within a lake as an internal P load. The most important internal source is usually a chemical release from anoxic sediments, while senescing macrophytes (decaying weeds), gas formation and wind action that distributes bottom and shoreline sediments can be a minor source. The release from anoxic sediment surfaces occurs in the summer during warm and thermally stratification and is dependent on the previously accumulated P. It therefore represents a kind of legacy P source. The underlying mechanism is that anoxia leads to the dissolution of iron hydroxides in sediments with concomitant release of adsorbed P (i.e., P attached to the iron surfaces) to adjacent lake water. Internal loading mostly stems from former external inputs which are stored in sediments, nonetheless it is often ignored in P mass balance studies. The dependency of internal load on external load such as septic systems, is supported by an observation of lakes in the Seattle area (Moore et al., 2003). Only lakes with septic systems (and not necessarily high density developed shorelines) showed increased hypolimnetic (deep water) TP concentration, surface TP and algae biomass, measured as chlorophyll a pigment.

It is especially important to consider this internal P source, because it can be the single most important "point" source of a readily available form of P, which is phosphate, as it is directly injected into the lake water where it can be used by P starved phytoplankton. The probable causal influence on cyanobacteria blooms has been described in meso- and eutrophic lakes before (Lake Simcoe, Ontario; Lake Winnipeg, MB, Lake Champlain, Vermont, Lake Balaton, Hungary, for references see Nürnberg et al. 2013).

Long Lake and several of the upstream lakes are in the CGS area and have been developed for a long period. Long Lake Gold Mine records indicate housing started at the eastern side of the lake in the late eighteen century to service the mine. Previous acidification and the presence of P scavenging metals (e.g., aluminum and iron) prevented elevated productivity and internal load in the Sudbury lakes, but recent remediation is apparent from increased pH and alkalinity (Table 1), which also makes it possible that accumulated P is released into the water as internal load.

Various water monitoring data indicate that internal P load has been occurring in Long Lake. Such indications include severe oxygen depletion (<2 mg/L dissolved oxygen, Section 3.2) and elevated TP closer to the lake bottom in the summer and fall (Section 3.3). A more direct indication is the amount of sediment P that is in releasable form. Bottom sediments in undeveloped lakes on the Canadian Shield usually have none or only a very small amount of this fraction. In an independent study the total P in the bottom sediment and the P fraction that is releasable under anoxic conditions (BD-P) was determined at two sites of similar depth in Long Lake (Fischer 2015). These concentration were relatively high, and the upstream station (Site 3, 24 m) had higher concentration than downstream station (Site 5, 22 m) (Figure 4). Such a pattern reflects the morphometry and loading mechanism of Long Lake, where a high P load from McFarlane Lake settles along the lake during the flow towards the outlet.

Internal P load can be determined from the releasable P fraction of the sediment using models for P release rates and anoxic sediment areas. For Long Lake (Appendix H), a model involving BD-P concentrations in the 0-5 cm and 5-10 cm sediment layers at the two Sites 3 and 5 predicts a release rate of 2.17 mg/m^2/day. The observed spring average TP concentration of 8.3 µg/L (Table 7) and morphometry (Table 2) predicts a release area of 9.3 days/year (= *-50.4 + 61.4 log(TP) + 1.02 z/A$^{0.5}$, Nürnberg 1995*). This expression means that an area equal to the whole lake surface area would actively release P for 9.3 days per year or that 25% of the surface area (which resembles and area

at 10 m and below) would release P for 37 days per year. This estimate appears to be realistic, considering that low oxygen concentration was observed at most stations in the late summer below 10 m.

Because pristine lakes on the Canadian Shield do not typically encounter internal loading (Nürnberg, 1988), Long Lake internal P load (the quantity of sediment derived P determined from BD-P) was only added in the current, i.e., "developed" scenario of the capacity model as a potential load.

5.3 Modeled TP concentration

Using only the external load estimate of 1,012 kg/yr (Table 14) the mass balance model (Appendix G) predicts a TP concentration of 7.0 µg/L (Table 15). The addition of an internal load of 173 kg/yr (Section 5.2) increases the model prediction by 1.2 µg/L to a total summer/fall average of 8.2 µg/L. This value compares well to the observed average spring TP concentration of 8.3 µg/L (Table 7), but not to the lower fall concentrations (Table 6).

The model predicts a low TP concentration of 3.6 µg/L for undeveloped conditions, based on just natural loads. This undeveloped scenario assumes that less than 15% of the watershed was cleared (same as the developed scenario) and that there is no P input from shoreline development, point sources, and agriculture, and no internal load, while input via precipitation and from wetlands are not changed.

The PWQO (Provincial Water Quality Objectives) for lakes on the Precambrian Shield allows a 50 per cent increase in TP concentration from a modeled baseline of water quality in the absence of human influence (Ministry of Environment, 2010). Multiplying the undeveloped TP result by 1.5 yields a MOECC capacity threshold of 5.4 µg/L. This means that the current spring concentration of 8.3 µg/L, as well as modelled summer and summer-fall concentrations (Table 15) are above the MOECC capacity threshold of 1.5 times the background load.

While this study is not to evaluate any capacity of the upstream lakes, it appears that Richard, possibly Silver and McFarlane Lake reached capacity as well, which should be investigated by the responsible governmental agencies.

Table 15. Comparison of observed Long Lake TP concentrations (µg/L) with various modeled values including the capacity threshold.

Period	Long Lake TP concentration (µg/L)		Number of years and source for observations	
	Modeled	Observed		
Spring	-	8.3	9	2004-2014, Table 7
Summer (minimum, w/o internal load)	7.0	8, 5.6	2	2003, 2014, Table 6
Summer-fall (average), includes internal load	8.2	3.4* – 5.6	2	2014, 2015, Table 6
Undeveloped	3.6	-		
Capacity Threshold	5.4	-		
Exceeded (Summer-fall)	2.8	-		
Exceeded (Summer)	1.6	-		

*Monitored fall values are unexpectedly low, see discussion in Section 3.3

5.4 Confidence in results, especially respective lake capacity ratings

A direct evaluation whether a lake P mass balance model and its input are realistic is the comparison of observed (monitoring) lake TP concentrations with the modeled ones.

For Long Lake this comparison supports the model (Table 15), when assuming that spring TP concentration are representing annual average concentrations.

The most frequently measured and reliable TP results are available from the MOECC Lake Partner Program that determines mixed layer concentration in the spring. Such data are available for Long Lake as well as the upstream lakes. But spring values are not modeled by the mass balance model and we recommend to measure growing season mixed layer concentration in the future. Meanwhile however, spring values can be converted to a summer-fall average by a regression equation based on several lakes on the Canadian Shield (Clark and Hutchinson, 1992), (Appendix G). The differences between modeled (by the capacity model) and summer-fall averages adjusted from observed spring values for the various lakes ranged from -0.7 to 4.4 µg/L, except the Silver Lake prediction was 10.9 µg/L higher (Table 16). The larger positive deviations representing overestimation by the model may indicate the generally low productivity of the acid-stressed lakes, as described before (Section 2.1 and Section 4), besides errors in monitored and modeled concentrations.

Nonetheless, we conclude that the mass balance and external load computed for Long Lake is supported, considering the paucity in data for most upstream lakes. To support these results, we suggest that the model input for the upstream lakes be reviewed and model results tested with monitoring data for summer and fall growing periods.

Table 16. Comparison of modeled with observed TP concentrations (µg/L) in the study lakes.

Lake	Modelled			Observed	Adjusted*	Deviation**
	Summer	Fall	Annual Average	Spring	Summer-fall	(Modeled – Observed)
Clearwater	7.3	12.7	8.6	3.2	4.2	4.4
Lohi	5.4	5.4	5.4	5.0	5.6	-0.2
Daisy	4.7	4.7	4.7	4.6	5.3	-0.7
Richard	11.1	16.8	13.0	9.4	9.2	3.9
Silver	12.9	33.8	17.5	6.1	6.5	10.9
McFarlane	12.4	17.2	14.3	10.9	10.4	4.0
Pine	6.8	6.8	6.8	4.1	4.9	1.9
Tilton	6.9	6.9	6.9	4.8	5.5	1.4
Perch	11.1	11.8	11.6			
Wavy	7.2	8.3	7.6	6.2	6.6	1.0
Long	7.0	10.1	8.2	8.3	8.3***	-0.1

* Adjusted according to Equation (3) in Appendix G

**Modeled annual average *minus* summer-fall adjusted from observed spring TP

***Long Lake adjusted summer-fall values are the same as observed spring values, although observed summer-fall values were lower (Table 6).

6 Conclusions and recommendations

The acidification history is the reason for a relatively slow eutrophication trajectory in the lakes of the CGS area. But Long Lake was comparably mildly acid-stressed so that other impairment, above all the increased abundance of nutrients, is becoming more prominent. Long Lake almost certainly has a legacy of nutrient enrichment in its sediment from years of waste water input and developmental exposure in the southern CGS. Like other lakes in the developed part of the CGS, it experiences signs of eutrophication including cyanobacterial blooms.

A P mass balance and lakeshore capacity model determined that 43% of all external inputs to Long Lake are natural, while 41% are anthropogenic. The remaining 16% arrive from upstream sources including the 10 upstream lakes; the upstream loads originate half from natural and half from anthropogenic sources.

This partitioning of loads not only means that Long Lake is at capacity with respect to MOECC loading criteria, but that anthropogenic loads have to be decreased, if any deterioration of Long Lake water quality and cyanobacteria blooms are to be avoided. According to the mass balance, upstream anthropogenic sources only contribute 8%. Nonetheless, addressing these P sources would also help Long Lake, in addition to the upstream lakes (Richard, possibly Silver and McFarlane Lake) that are potentially at capacity as well.

A separate study determined that the bottom sediments in Long Lake contain a substantial amount of P that can be released as internal loading under certain water conditions. The monitoring program by LLS verified some of those conditions, including low oxygen and some elevated P concentrations in the bottom water during summer and fall, but no elevated fall concentrations. Even though the internal load is predicted to be small (19%) compared to external load, timing during the summer-fall growing period and the highly biologically available chemical form as

phosphate render increase its importance in triggering cyanobacterial booms. Internal load likely originated from former external inputs from development (septic systems, urbanization, point sources from waste water) around the lake and throughout the upstream watershed. Also a local study correlated the TP content of attached algae with development on septic systems in Long Lake indicating that septic systems may be related to the enriched nutrient status of the lake water and sediment (Dykstra 2015).

Therefore, the most direct approach to averting increased eutrophication is the prevention of additional sources by new development and the diminishment of existing external inputs. Existing excessive nutrient input include faulty septic systems, point sources of malfunctioning waste water treatment plants, cosmetic fertilizer application. Restoration measures include the installation of vegetative buffers close to the lake shore and the application of other well-established best management practices (BMPs), listed in Table 17. Many of the suggestions are documented and addressed by various groups and publications, including the internet. A Guide to Stewardship of Ontario's Waters (Federation of Ontario Cottagers' Associations (FOCA), 2009) and the *Watershed* chapter in the North American Lake Management Society's (NALMS) publication on managing lakes and reservoirs (Holdren et al., 2001) provide further information.

Without such action the frequency of cyanobacteria blooms would probably increase because climate change predictions include the increase of temperature, which increases both internal load (available phosphate) and cyanobacteria abundance, and include the amplified extreme weather events including flash floods, which increases external inputs from runoff.

Table 17. External load remedial options and techniques *(BMP, best management practice)*

- Source control
  - Identify and renovate leaky septic systems
  - Minimize erosion
  - Minimize impervious area & maximize infiltration
  - Diminish runoff from agricultural non-point sources (BMPs)

- Reduce loading from lake shore
  - Stabilize the shoreline; protect the riparian zone
  - Maintain vigorously growing shrubs and trees next to water surface
  - Stabilize eroding shoreline
  - Route drainage away
  - Establish vegetation
  - Educate lake shore residents and lake users

- Reduce agricultural impact
  - Prevent livestock access to creeks
  - Optimize timing of tilling, fertilizer application
  - Improve agricultural operation by further BMPs
  - Educate farmers

Further studies including more consistent monitoring of the trophic state variables, especially TP, throughout the year and in all basins, the quantitative and qualitative identification of cyanobacteria and other limnological assessment including that of the upstream lakes and testing of model input has been suggested throughout this report, but can hardly be accomplished and supported by a lake association like LLS.

7 References

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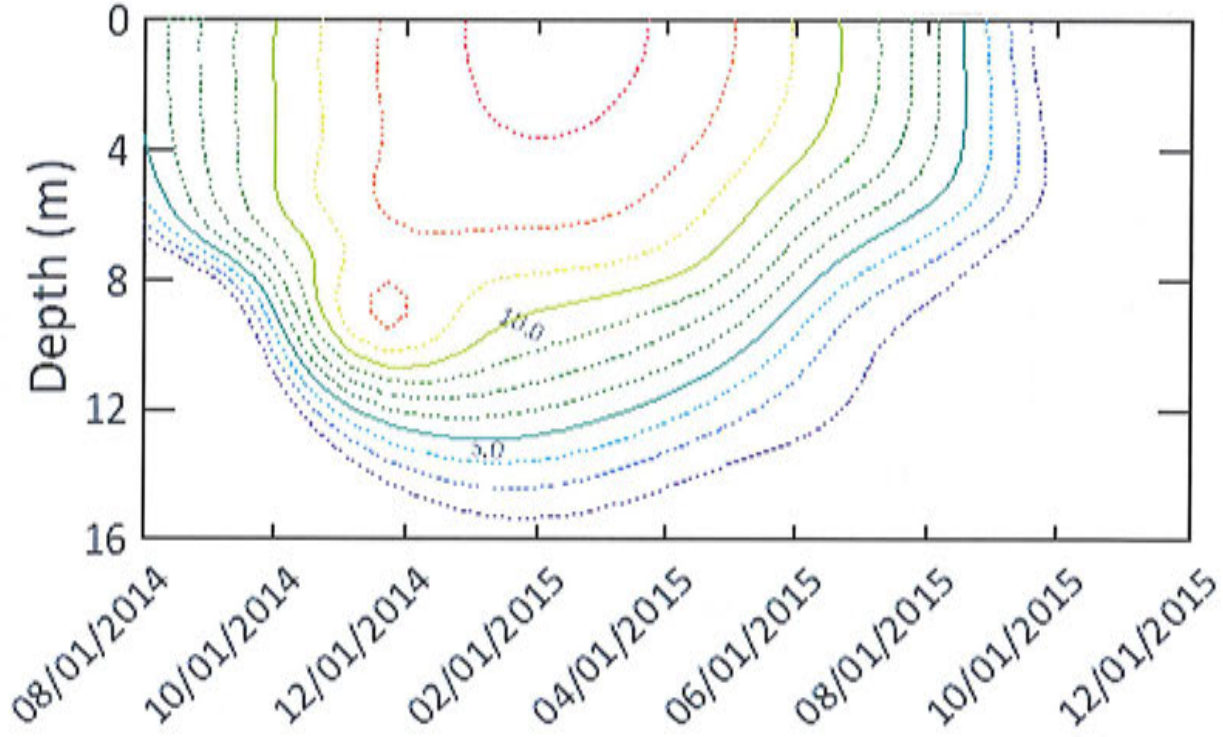
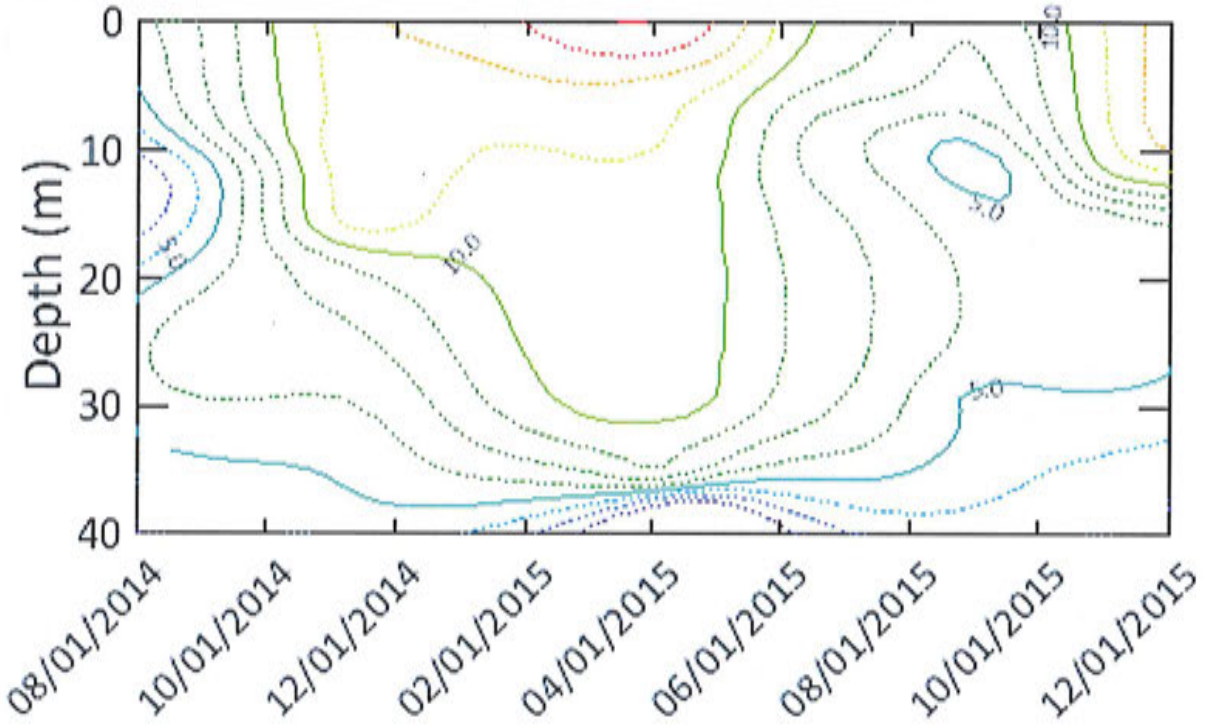
Appendix A: Dissolved oxygen isopleths (mg/L) and profiles in 2014-15

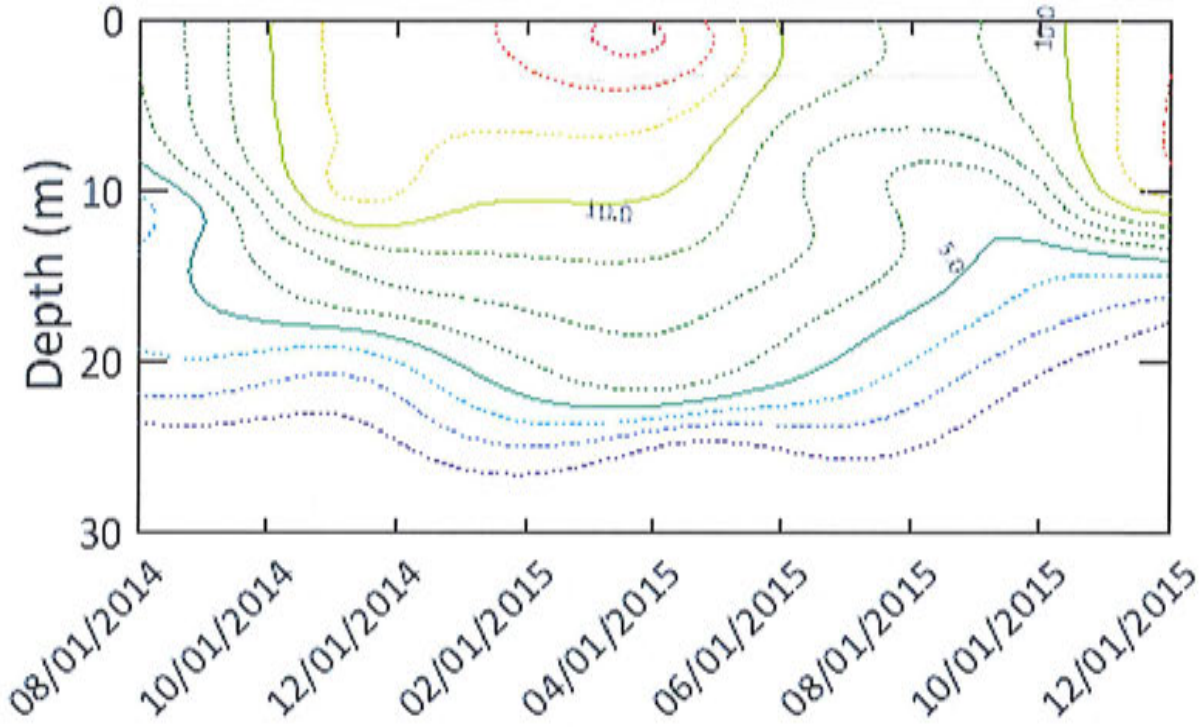
Station 1



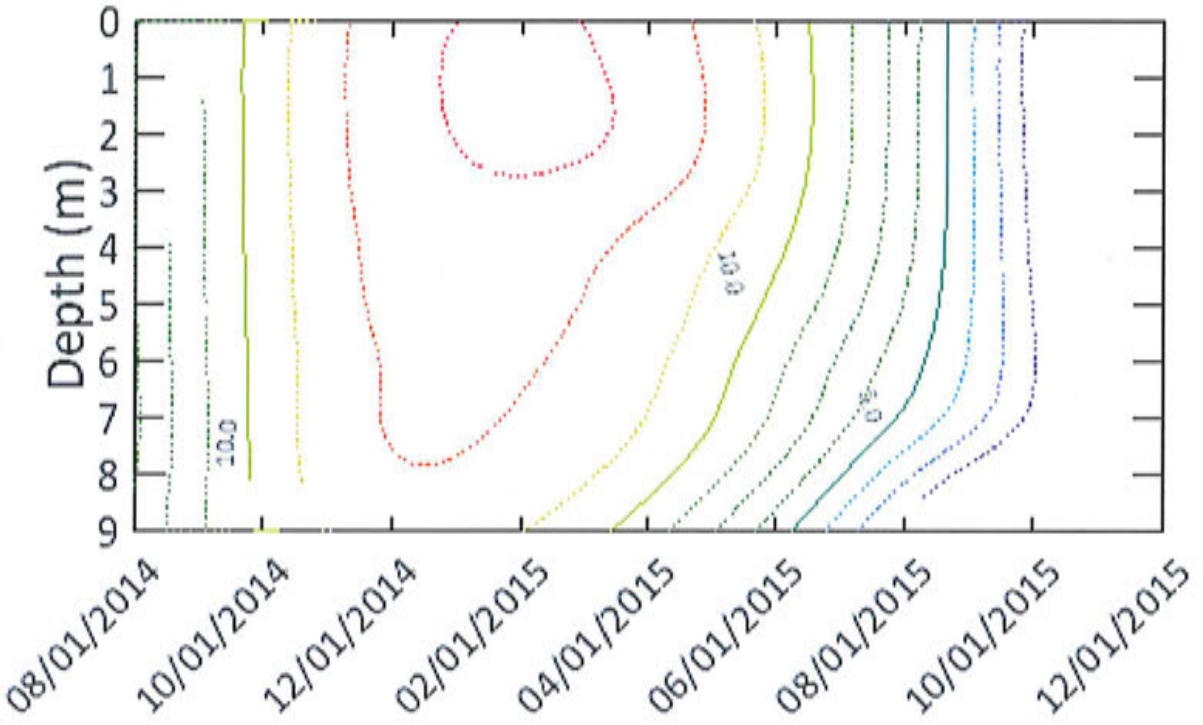
Stations 2



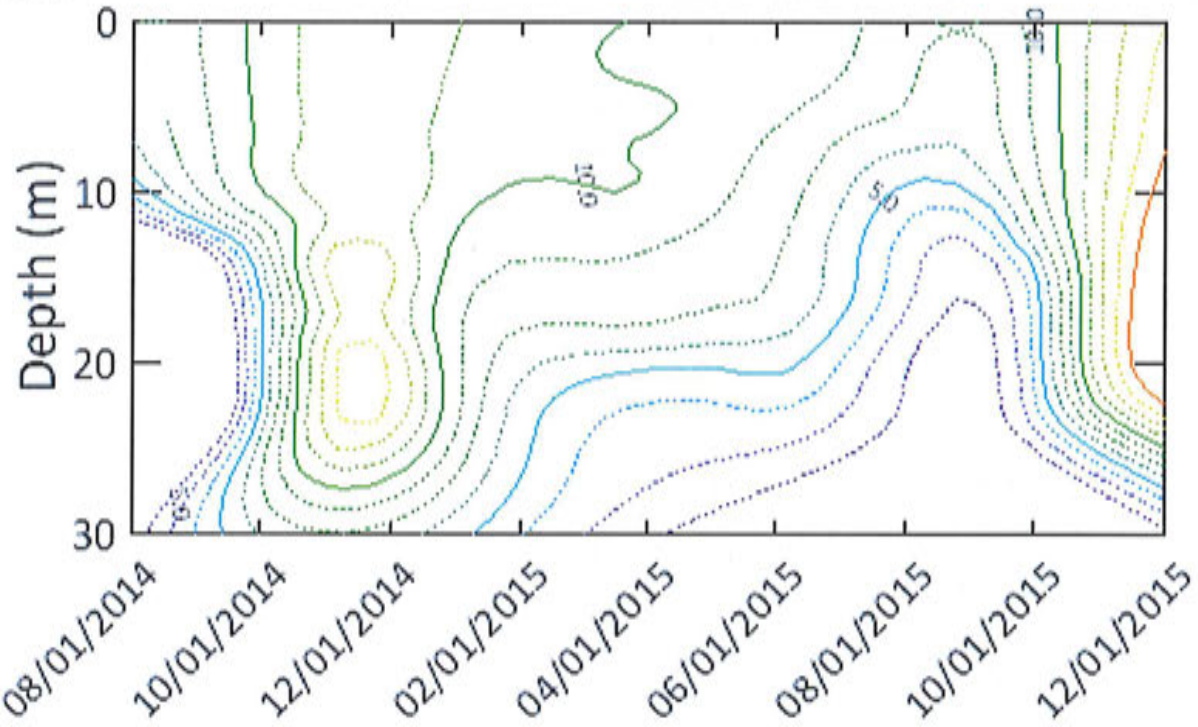
Station 3



Station 4



Station 5



Note that these graphs are a crude visualization of the actual values presented in the table below.

Dissolved oxygen concentration below 3 mg/L indicating hypoxia are shaded. All profiles by LLS except the 2015-08-28 profiles were provided by CGS. Stn 2 was 35 m deep and the oxygen meter probe of 30 m did not reach to this depth.

STN	Date	Depth (m)	Temp (C°)	DO (mg/L)
1	2014-09-18	1.0	16.3	9.28
1	2014-09-18	2.1	16.1	9.07
1	2014-09-18	3.0	16.1	9.00
1	2014-09-18	4.1	16.1	8.97
1	2014-09-18	5.0	16.1	8.98
1	2014-09-18	6.0	16.1	8.99
1	2014-09-18	7.0	16.0	8.99
1	2014-09-18	8.0	15.0	2.65
1	2014-09-18	9.1	11.0	0.31
1	2014-09-18	9.6	10.7	0.26
2	2014-09-18	1.0	16.5	8.84
2	2014-09-18	3.2	16.5	8.75
2	2014-09-18	5.0	16.5	8.74
2	2014-09-18	6.8	16.5	8.71
2	2014-09-18	9.1	16.5	8.65
2	2014-09-18	10.9	12.3	5.65
2	2014-09-18	12.9	8.9	5.77
2	2014-09-18	13.8	8.0	5.99
2	2014-09-18	15.1	7.5	6.03
2	2014-09-18	16.9	6.9	6.17
2	2014-09-18	17.8	6.9	6.20
2	2014-09-18	19.2	5.9	6.54
2	2014-09-18	20.7	5.1	6.92
2	2014-09-18	22.9	4.4	7.08
2	2014-09-18	24.5	4.2	7.11
2	2014-09-18	25.1	3.9	6.99
2	2014-09-18	26.9	3.8	6.87
2	2014-09-18	28.9	3.6	6.47
2	2014-09-18	30.7	3.6	5.94
2	2014-09-18	33.0	3.5	5.39
2	2014-09-18	35.1	3.5	5.19
2	2014-09-18	35.3	3.5	4.31
3	2014-09-18	1.1	16.5	9.05
3	2014-09-18	3.0	16.5	9.01
3	2014-09-18	4.9	16.4	8.95
3	2014-09-18	6.8	16.4	8.86
3	2014-09-18	9.0	16.3	8.87
3	2014-09-18	10.8	10.4	6.47
3	2014-09-18	11.0	9.8	5.56

3	2014-09-18	13.2	7.5	6.21
3	2014-09-18	15.1	6.7	5.88
3	2014-09-18	17.0	6.1	5.30
3	2014-09-18	19.1	5.8	3.97
3	2014-09-18	21.0	5.7	2.94
3	2014-09-18	21.8	5.6	2.46
4	2014-09-18	1.0	16.2	9.82
4	2014-09-18	2.0	16.2	9.77
4	2014-09-18	3.0	16.2	9.74
4	2014-09-18	4.3	16.2	9.70
4	2014-09-18	5.0	16.2	9.68
4	2014-09-18	6.1	16.1	9.62
4	2014-09-18	7.0	16.1	9.53
5	2014-09-18	1.0	16.3	9.66
5	2014-09-18	3.0	16.3	9.52
5	2014-09-18	5.0	16.2	9.42
5	2014-09-18	6.8	16.2	9.35
5	2014-09-18	9.3	16.2	9.34
5	2014-09-18	11.1	16.1	9.28
5	2014-09-18	12.2	15.6	7.33
5	2014-09-18	13.2	12.8	2.63
5	2014-09-18	13.8	12.6	1.67
5	2014-09-18	15.2	10.9	1.38
5	2014-09-18	16.0	10.3	1.30
5	2014-09-18	17.0	10.0	1.01
5	2014-09-18	18.2	9.6	0.47
5	2014-09-18	19.1	9.4	0.31
5	2014-09-18	20.9	9.3	0.18
1	2014-10-22	1.2	10.2	11.29
1	2014-10-22	3.0	10.1	11.10
1	2014-10-22	6.0	10.1	11.06
1	2014-10-22	9.2	10.0	11.00
2	2014-10-22	1.1	10.6	11.16
2	2014-10-22	5.0	10.5	11.03
2	2014-10-22	10.1	10.5	10.99
2	2014-10-22	15.1	10.2	10.64
2	2014-10-22	20.2	5.8	7.73
2	2014-10-22	22.7	4.6	7.23
2	2014-10-22	26.2	4.0	6.87
2	2014-10-22	28.9	3.8	6.21
2	2014-10-22	32.1	3.6	5.59
3	2014-10-22	0.9	10.7	11.16
3	2014-10-22	5.0	10.6	11.06
3	2014-10-22	10.1	10.5	11.06

3	2014-10-22	14.9	8.8	6.52
3	2014-10-22	16.8	7.2	7.48
3	2014-10-22	17.7	6.2	4.34
3	2014-10-22	19.3	5.9	3.05
3	2014-10-22	20.1	5.9	2.61
3	2014-10-22	20.9	5.8	2.25
3	2014-10-22	22.0	5.8	1.83
4	2014-10-22	0.9	10.2	11.75
4	2014-10-22	2.4	10.2	11.74
4	2014-10-22	3.0	10.1	11.73
4	2014-10-22	4.8	10.1	11.70
4	2014-10-22	7.0	10.1	11.67
5	2014-10-22	1.0	10.3	11.46
5	2014-10-22	2.2	10.3	11.45
5	2014-10-22	4.9	10.3	11.43
5	2014-10-22	9.9	10.2	11.42
5	2014-10-22	14.9	10.1	11.41
5	2014-10-22	19.5	10.0	11.40
5	2014-10-22	21.1	9.9	11.13
1	2015-04-12	2.0	2.77	13.02
1	2015-04-12	4.0	2.49	12.57
1	2015-04-12	6.0	2.68	11.64
1	2015-04-12	7.0	2.98	11.27
1	2015-04-12	8.1	3.18	10.75
1	2015-04-12	8.7	3.71	7.44
2	2015-04-12	2.2	3.35	13.85
2	2015-04-12	5.1	3.62	11.74
2	2015-04-12	10.0	3.29	11.19
2	2015-04-12	15.0	3.29	10.90
2	2015-04-12	20.1	3.24	10.85
2	2015-04-12	24.9	3.23	10.71
2	2015-04-12	29.8	3.19	10.72
2	2015-04-12	35.9	3.19	10.09
2	2015-04-12	36.9	3.31	0.81
3	2015-04-12	2.1	3.73	13.74
3	2015-04-12	5.0	3.67	11.73
3	2015-04-12	8.0	3.96	10.62
3	2015-04-12	10.0	3.96	10.21
3	2015-04-12	13.0	3.99	9.07
3	2015-04-12	16.1	4.03	7.97
3	2015-04-12	18.0	4.03	7.50
3	2015-04-12	20.4	4.01	7.50
3	2015-04-12	22.1	4.02	7.30
3	2015-04-12	23.1	4.17	2.67

4	2015-04-12	2.2	3.91	13.19
4	2015-04-12	4.0	4.03	11.59
4	2015-04-12	6.0	3.81	11.14
4	2015-04-12	6.8	3.81	11.04
5	2015-04-12	2.1	4.66	9.49
5	2015-04-12	5.3	4.06	10.22
5	2015-04-12	10.2	4.21	9.87
5	2015-04-12	15.4	4.35	8.13
5	2015-04-12	18.2	4.36	7.50
5	2015-04-12	20.4	4.5	4.42
5	2015-04-12	21.2	4.54	4.27
5	2015-06-13	0.0	19.0	9.27
5	2015-06-13	1.0	18.9	9.29
5	2015-06-13	2.0	18.4	9.28
5	2015-06-13	3.0	18.1	9.28
5	2015-06-13	4.0	17.7	9.21
5	2015-06-13	5.0	17.3	9.03
5	2015-06-13	6.0	16.9	8.88
5	2015-06-13	7.0	16.4	8.74
5	2015-06-13	8.0	16.1	8.65
5	2015-06-13	9.0	15.4	8.39
5	2015-06-13	10.0	14.9	8.22
5	2015-06-13	11.0	14.5	8.04
5	2015-06-13	12.0	13.8	7.83
5	2015-06-13	13.0	13.2	7.69
5	2015-06-13	14.0	12.4	7.44
5	2015-06-13	15.0	11.3	7.55
5	2015-06-13	15.5	10.7	7.42
5	2015-06-13	16.0	9.8	7.24
5	2015-06-13	16.5	9.3	7.32
5	2015-06-13	17.0	9.0	7.05
5	2015-06-13	17.5	8.4	6.92
5	2015-06-13	18.0	8.0	6.63
5	2015-06-13	19.0	7.3	6.00
5	2015-06-13	20.0	7.0	5.44
5	2015-06-13	21.0	6.9	5.30
1	2015-06-28	0.0	23.1	9.21
1	2015-06-28	1.0	22.6	9.30
1	2015-06-28	2.0	22.2	9.22
1	2015-06-28	3.0	21.0	8.85
1	2015-06-28	4.0	20.4	8.53
1	2015-06-28	5.0	19.0	8.01
1	2015-06-28	5.5	15.5	6.65
1	2015-06-28	6.0	14.7	6.36

1	2015-06-28	6.5	11.8	4.83
1	2015-06-28	7.0	12.3	5.12
1	2015-06-28	8.0	10.0	2.83
1	2015-06-28	9.0	9.2	1.91
1	2015-06-28	10.0	8.7	1.54
1	2015-06-28	10.5	8.6	1.56
1	2015-06-28	11.0	7.9	2.06
1	2015-06-28	12.0	7.4	1.73
1	2015-06-28	13.0	6.9	1.20
1	2015-06-28	13.5	6.8	0.90
1	2015-06-28	14.0	6.5	0.00
1	2015-06-28	14.5	6.5	0.00
1	2015-06-28	15.0	6.4	0.00
3	2015-06-28	0.0	23.5	8.95
3	2015-06-28	1.0	22.7	9.04
3	2015-06-28	2.0	22.3	9.05
3	2015-06-28	3.0	21.9	9.00
3	2015-06-28	4.0	20.9	8.90
3	2015-06-28	5.0	19.7	8.35
3	2015-06-28	6.0	17.6	7.93
3	2015-06-28	7.0	16.1	7.60
3	2015-06-28	8.0	14.7	7.22
3	2015-06-28	9.0	13.5	7.02
3	2015-06-28	10.0	11.3	7.05
3	2015-06-28	11.0	8.3	7.53
3	2015-06-28	12.0	7.3	7.58
3	2015-06-28	13.0	6.3	7.53
3	2015-06-28	14.0	5.9	7.31
3	2015-06-28	15.0	5.6	6.99
3	2015-06-28	16.0	5.2	6.70
3	2015-06-28	17.0	4.9	6.13
4	2015-06-28	0.0	22.7	8.96
4	2015-06-28	1.0	22.3	9.01
4	2015-06-28	2.0	21.7	8.99
4	2015-06-28	3.0	20.9	8.81
4	2015-06-28	4.0	20.5	8.61
4	2015-06-28	5.0	19.8	8.17
4	2015-06-28	6.0	18.9	7.63
5	2015-06-28	0.0	22.4	8.92
5	2015-06-28	1.0	22.2	9.00
5	2015-06-28	2.0	21.9	8.93
5	2015-06-28	3.0	21.4	8.92
5	2015-06-28	4.0	20.6	8.63
5	2015-06-28	5.0	19.9	8.03
5	2015-06-28	6.0	17.8	7.30

5	2015-06-28	7.0	16.8	7.08
5	2015-06-28	8.0	16.3	6.84
5	2015-06-28	9.0	15.8	6.74
5	2015-06-28	10.0	15.2	6.65
5	2015-06-28	11.0	14.4	6.46
5	2015-06-28	12.0	13.7	6.15
5	2015-06-28	13.0	13.2	5.83
5	2015-06-28	14.0	12.8	5.59
5	2015-06-28	15.0	11.7	5.92
5	2015-06-28	15.5	10.9	5.92
5	2015-06-28	16.0	9.7	5.85
5	2015-06-28	16.5	9.3	5.77
5	2015-06-28	17.0	8.9	5.55
5	2015-06-28	17.5	8.4	5.26
5	2015-06-28	18.0	8.0	4.91
5	2015-06-28	19.0	7.6	4.42
5	2015-06-28	20.0	7.4	4.08
5	2015-06-28	21.0	7.3	3.71
5	2015-06-28	22.0	7.3	2.86
1	2015-07-12	0.0	25.3	8.88
1	2015-07-12	1.0	24.1	8.99
1	2015-07-12	2.0	23.6	8.99
1	2015-07-12	3.0	23.2	8.94
1	2015-07-12	4.0	23.0	8.90
1	2015-07-12	5.0	22.8	8.78
1	2015-07-12	6.0	17.5	6.02
1	2015-07-12	7.0	14.5	4.71
1	2015-07-12	8.0	11.3	2.02
1	2015-07-12	9.0	10.1	0.74
1	2015-07-12	10.0	9.2	0.26
1	2015-07-12	11.0	8.5	0.35
1	2015-07-12	12.0	7.6	0.34
1	2015-07-12	13.0	7.0	0.00
1	2015-07-12	14.0	6.8	0.00
1	2015-07-12	15.0	6.7	0.00
2	2015-07-12	0.0	24.5	8.92
2	2015-07-12	1.0	23.8	8.96
2	2015-07-12	2.0	23.1	8.95
2	2015-07-12	3.0	22.8	8.88
2	2015-07-12	4.0	22.6	8.80
2	2015-07-12	5.0	22.3	8.64
2	2015-07-12	6.0	20.1	7.60
2	2015-07-12	7.0	17.1	6.61
2	2015-07-12	8.0	15.3	6.30

2	2015-07-12	9.0	14.4	6.28
2	2015-07-12	10.0	13.8	6.27
2	2015-07-12	11.0	12.8	6.33
2	2015-07-12	12.0	11.5	6.68
2	2015-07-12	13.0	8.7	7.16
2	2015-07-12	14.0	7.8	7.33
2	2015-07-12	15.0	7.1	7.37
2	2015-07-12	16.0	6.4	7.48
2	2015-07-12	17.0	5.9	7.53
2	2015-07-12	18.0	5.6	7.63
2	2015-07-12	19.0	5.2	7.65
2	2015-07-12	20.0	4.8	7.69
2	2015-07-12	21.0	4.4	7.70
2	2015-07-12	22.0	4.0	7.63
2	2015-07-12	23.0	3.9	7.61
2	2015-07-12	24.0	3.8	7.62
2	2015-07-12	25.0	3.7	7.61
2	2015-07-12	26.0	3.6	7.64
2	2015-07-12	27.0	3.5	7.56
2	2015-07-12	28.0	3.5	7.40
2	2015-07-12	29.0	3.5	7.26
2	2015-07-12	30.0	3.5	7.07
2	2015-07-12	31.0	3.4	6.98
3	2015-07-12	0.0	25.4	8.60
3	2015-07-12	1.0	23.7	8.83
3	2015-07-12	2.0	22.6	8.88
3	2015-07-12	3.0	22.3	8.82
3	2015-07-12	4.0	22.2	8.80
3	2015-07-12	5.0	22.1	8.75
3	2015-07-12	6.0	20.5	7.81
3	2015-07-12	7.0	17.7	6.79
3	2015-07-12	8.0	15.1	6.19
3	2015-07-12	9.0	13.6	6.15
3	2015-07-12	10.0	11.3	6.49
3	2015-07-12	11.0	9.1	7.11
3	2015-07-12	12.0	7.8	7.17
3	2015-07-12	13.0	6.8	7.31
3	2015-07-12	14.0	6.2	6.82
3	2015-07-12	15.0	5.8	6.61
3	2015-07-12	16.0	5.4	6.23
3	2015-07-12	17.0	5.2	5.44
4	2015-07-12	0.0	25.2	8.76
4	2015-07-12	1.0	24.1	8.83
4	2015-07-12	2.0	23.6	8.85
4	2015-07-12	3.0	23.4	8.87

4	2015-07-12	4.0	23.1	8.67
4	2015-07-12	5.0	21.1	7.84
4	2015-07-12	6.0	18.5	5.71
5	2015-07-12	0.0	25.2	8.75
5	2015-07-12	1.0	23.3	8.84
5	2015-07-12	2.0	22.9	8.81
5	2015-07-12	3.0	22.6	8.74
5	2015-07-12	4.0	22.5	8.71
5	2015-07-12	5.0	22.4	8.63
5	2015-07-12	6.0	20.6	7.50
5	2015-07-12	7.0	18.1	6.20
5	2015-07-12	8.0	17.5	5.97
5	2015-07-12	9.0	16.6	5.69
5	2015-07-12	10.0	15.8	5.41
5	2015-07-12	11.0	14.9	5.16
5	2015-07-12	12.0	14.3	4.97
5	2015-07-12	13.0	13.4	4.80
5	2015-07-12	14.0	12.9	4.59
5	2015-07-12	15.0	11.8	4.82
5	2015-07-12	15.5	11.1	4.95
5	2015-07-12	16.0	10.6	4.87
5	2015-07-12	16.5	9.8	4.69
5	2015-07-12	17.0	9.1	4.33
5	2015-07-12	17.5	8.7	4.01
5	2015-07-12	18.0	8.4	3.82
5	2015-07-12	19.0	7.9	2.74
5	2015-07-12	20.0	7.6	2.25
5	2015-07-12	21.0	7.6	1.92
2	2015-08-04	0.0	22.5	8.54
2	2015-08-04	1.0	22.7	8.5
2	2015-08-04	2.0	22.7	8.47
2	2015-08-04	3.0	22.6	8.45
2	2015-08-04	4.0	22.6	8.4
2	2015-08-04	5.0	22.5	8.35
2	2015-08-04	6.0	22.4	8.3
2	2015-08-04	7.0	21.7	7.2
2	2015-08-04	8.0	18.1	5.33
2	2015-08-04	9.0	16.4	4.79
2	2015-08-04	10.0	15	4.75
2	2015-08-04	11.0	13	4.85
2	2015-08-04	12.0	11	5.33
2	2015-08-04	13.0	9.1	6.04
2	2015-08-04	14.0	8.1	6.31
2	2015-08-04	15.0	7.3	6.46

2	2015-08-04	16.0	6.7	6.45
2	2015-08-04	17.0	6.3	6.58
2	2015-08-04	18.0	6.1	6.61
2	2015-08-04	19.0	5.8	6.74
2	2015-08-04	20.0	5	6.89
2	2015-08-04	21.0	4.6	6.9
2	2015-08-04	22.0	4.4	6.85
2	2015-08-04	23.0	4.2	6.77
2	2015-08-04	24.0	4.1	6.86
2	2015-08-04	25.0	3.9	6.89
2	2015-08-04	26.0	3.8	6.79
2	2015-08-04	27.0	3.7	6.76
2	2015-08-04	28.0	3.6	6.42
2	2015-08-04	29.0	3.6	6.21
2	2015-08-04	30.0	3.5	6.13
2	2015-08-04	31.0	3.5	5.7
3	2015-08-04	0.0	22.1	8.54
3	2015-08-04	1.0	22.1	8.51
3	2015-08-04	2.0	22.1	8.47
3	2015-08-04	3.0	22.1	8.43
3	2015-08-04	4.0	22.1	8.39
3	2015-08-04	5.0	22.1	8.37
3	2015-08-04	6.0	22.1	8.33
3	2015-08-04	7.0	20.6	6.44
3	2015-08-04	8.0	17.3	5.07
3	2015-08-04	9.0	15.6	4.54
3	2015-08-04	10.0	12.5	4.94
3	2015-08-04	11.0	9.3	5.84
3	2015-08-04	12.0	7.9	6.3
3	2015-08-04	13.0	6.9	6.18
3	2015-08-04	14.0	6.2	6.39
3	2015-08-04	15.0	5.8	6.03
3	2015-08-04	16.0	5.6	5.37
3	2015-08-04	17.0	5.5	4.67
5	2015-08-04	0.0	22.1	8.36
5	2015-08-04	1.0	22.1	8.35
5	2015-08-04	2.0	22.1	8.34
5	2015-08-04	3.0	22	8.3
5	2015-08-04	4.0	21.9	8.26
5	2015-08-04	5.0	21.8	8.22
5	2015-08-04	6.0	21.8	8.18
5	2015-08-04	7.0	21.8	8.15
5	2015-08-04	8.0	19.9	5.09
5	2015-08-04	9.0	18.6	4.36
5	2015-08-04	10.0	17.4	3.56

5	2015-08-04	11.0	16.4	3.24
5	2015-08-04	12.0	15.3	2.88
5	2015-08-04	13.0	14.4	2.62
5	2015-08-04	14.0	13.4	2.35
5	2015-08-04	15.0	12.1	2.46
5	2015-08-04	16.0	10.8	2.33
5	2015-08-04	17.0	9.6	1.39
5	2015-08-04	18.0	8.7	0.78
5	2015-08-04	19.0	8.3	0.49
5	2015-08-04	20.0	8.1	0.17
1	2015-08-28	0.0		
1	2015-08-28	1.0	21.5	3.7
1	2015-08-28	2.0	21.2	3.8
1	2015-08-28	3.0	21.1	3.9
1	2015-08-28	4.0	21.0	3.9
1	2015-08-28	5.0	21.0	3.9
1	2015-08-28	6.0	20.9	3.9
1	2015-08-28	7.0	18.2	0.9
1	2015-08-28	8.0	13.0	0.2
1	2015-08-28	9.0	10.6	0.2
1	2015-08-28	10.0	10.0	0.2
1	2015-08-28	11.0	9.3	0.1
1	2015-08-28	12.0	9.2	0.1
1	2015-08-28	13.0	9.1	0.1
1	2015-08-28	14.0	8.7	0.1
2	2015-08-28	0.0		
2	2015-08-28	1.0	21.2	4.4
2	2015-08-28	2.0	21.1	4.5
2	2015-08-28	3.0	21.1	4.6
2	2015-08-28	4.0	21.0	4.7
2	2015-08-28	5.0	21.0	4.7
2	2015-08-28	6.0	21.0	4.8
2	2015-08-28	7.0	20.9	4.8
2	2015-08-28	8.0	19.2	3.9
2	2015-08-28	9.0	17.2	3.1
2	2015-08-28	10.0	14.8	3.2
2	2015-08-28	11.0	13.2	3.5
2	2015-08-28	12.0	11.1	4.1
2	2015-08-28	13.0	10.0	4.6
2	2015-08-28	14.0	8.1	5.6
2	2015-08-28	15.0	7.2	5.9
2	2015-08-28	16.0	6.7	5.9
2	2015-08-28	17.0	6.3	6.0
2	2015-08-28	18.0	6.0	6.2

2	2015-08-28	19.0	5.6	6.3
2	2015-08-28	20.0	5.2	6.4
2	2015-08-28	21.0	4.8	5.0
2	2015-08-28	22.0	4.7	6.3
2	2015-08-28	23.0	4.7	5.9
2	2015-08-28	24.0	4.7	5.8
2	2015-08-28	25.0	4.5	5.7
2	2015-08-28	26.0	4.0	5.5
2	2015-08-28	27.0	3.8	4.9
2	2015-08-28	28.0	3.0	3.0
2	2015-08-28	29.0	1.7	1.2
2	2015-08-28	30.0	-	-
2	2015-08-28	31.0	-	-
3	2015-08-28	0.0		
3	2015-08-28	1.0	20.1	4.3
3	2015-08-28	2.0	21.0	4.3
3	2015-08-28	3.0	20.8	4.4
3	2015-08-28	4.0	20.8	4.5
3	2015-08-28	5.0	20.8	4.5
3	2015-08-28	6.0	20.8	4.5
3	2015-08-28	7.0	20.7	4.4
3	2015-08-28	8.0	20.0	3.8
3	2015-08-28	9.0	15.7	2.9
3	2015-08-28	10.0	12.2	4.0
3	2015-08-28	11.0	9.6	4.7
3	2015-08-28	12.0	8.2	5.3
3	2015-08-28	13.0	7.2	5.5
3	2015-08-28	14.0	6.5	5.8
3	2015-08-28	15.0	6.0	5.6
3	2015-08-28	16.0	5.6	5.3
3	2015-08-28	17.0	5.2	6.2
3	2015-08-28	18.0	5.4	5.4
3	2015-08-28	19.0	4.2	4.2
3	2015-08-28	20.0	4.1	4.1
3	2015-08-28	21.0	3.1	3.1
4	2015-08-28	0.0		
4	2015-08-28	1.0	21.0	4.1
4	2015-08-28	2.0	21.0	4.2
4	2015-08-28	3.0	21.0	4.2
4	2015-08-28	4.0	20.9	4.1
4	2015-08-28	5.0	20.9	4.1
4	2015-08-28	6.0	20.9	4.1
4	2015-08-28	7.0	20.8	4.1
4	2015-08-28	8.0	20.7	0.7
5	2015-08-28	0.0		

5	2015-08-28	1.0	20.8	3.3
5	2015-08-28	2.0	20.8	3.4
5	2015-08-28	3.0	20.7	3.4
5	2015-08-28	4.0	20.7	3.5
5	2015-08-28	5.0	20.7	3.5
5	2015-08-28	6.0	20.7	3.5
5	2015-08-28	7.0	20.6	3.5
5	2015-08-28	8.0	20.5	3.5
5	2015-08-28	9.0	20.2	3.4
5	2015-08-28	10.0	20.0	3.2
5	2015-08-28	11.0	19.9	1.6
5	2015-08-28	12.0	17.0	1.1
5	2015-08-28	13.0	15.5	0.8
5	2015-08-28	14.0	14.6	0.7
5	2015-08-28	15.0	13.8	0.9
5	2015-08-28	16.0	12.3	0.6
5	2015-08-28	17.0	11.0	0.3
5	2015-08-28	18.0	9.9	0.1
5	2015-08-28	19.0	8.9	0.1
5	2015-08-28	20.0	8.6	0.1
5	2015-08-28	21.0	8.4	0.1
5	2015-08-28	22.0	8.4	0.1
5	2015-08-28	23.0	8.3	0.1
5	2015-08-28	24.0	8.2	0.1
2	2015-08-31	0.0	22.0	8.76
2	2015-08-31	1.0	21.4	8.75
2	2015-08-31	2.0	21.2	8.70
2	2015-08-31	3.0	21.1	8.62
2	2015-08-31	4.0	21.1	8.54
2	2015-08-31	5.0	21.0	8.53
2	2015-08-31	6.0	21.0	8.48
2	2015-08-31	7.0	21.0	8.43
2	2015-08-31	8.0	20.6	7.86
2	2015-08-31	9.0	17.9	3.73
2	2015-08-31	10.0	15.2	3.20
2	2015-08-31	11.0	13.6	3.35
2	2015-08-31	12.0	12.1	3.80
2	2015-08-31	13.0	10.2	4.60
2	2015-08-31	14.0	8.6	5.18
2	2015-08-31	15.0	7.5	5.51
2	2015-08-31	16.0	6.9	5.72
2	2015-08-31	17.0	6.6	5.75
2	2015-08-31	18.0	6.2	5.95
2	2015-08-31	19.0	5.9	6.04

2	2015-08-31	20.0	5.4	6.23
2	2015-08-31	21.0	5.0	6.30
2	2015-08-31	22.0	4.7	6.28
2	2015-08-31	23.0	4.4	6.28
2	2015-08-31	24.0	4.2	6.35
2	2015-08-31	25.0	4.0	6.31
2	2015-08-31	26.0	3.9	6.22
2	2015-08-31	27.0	3.8	6.03
2	2015-08-31	28.0	3.7	5.76
2	2015-08-31	29.0	3.7	5.54
2	2015-08-31	30.0	3.6	5.30
2	2015-08-31	31.0	3.6	4.80
3	2015-08-31	0.0	21.7	8.59
3	2015-08-31	1.0	21.1	8.59
3	2015-08-31	2.0	20.9	8.54
3	2015-08-31	3.0	20.8	8.47
3	2015-08-31	4.0	20.8	8.43
3	2015-08-31	5.0	20.8	8.42
3	2015-08-31	6.0	20.7	8.42
3	2015-08-31	7.0	20.7	8.18
3	2015-08-31	8.0	20.1	6.61
3	2015-08-31	9.0	16.4	3.08
3	2015-08-31	10.0	12.9	3.75
3	2015-08-31	11.0	10.3	3.75
3	2015-08-31	12.0	8.4	5.33
3	2015-08-31	13.0	7.4	5.30
3	2015-08-31	14.0	6.8	4.73
3	2015-08-31	15.0	6.3	4.75
3	2015-08-31	16.0	6.0	4.62
3	2015-08-31	17.0	5.6	4.11
5	2015-08-31	0.0	21.3	8.35
5	2015-08-31	1.0	21.0	8.52
5	2015-08-31	2.0	20.8	8.46
5	2015-08-31	3.0	20.7	8.32
5	2015-08-31	4.0	20.6	8.26
5	2015-08-31	5.0	20.6	8.27
5	2015-08-31	6.0	20.6	8.25
5	2015-08-31	7.0	20.6	8.22
5	2015-08-31	8.0	20.5	7.98
5	2015-08-31	9.0	20.3	7.73
5	2015-08-31	10.0	20.0	7.01
5	2015-08-31	11.0	17.2	1.90
5	2015-08-31	12.0	16.0	1.10
5	2015-08-31	13.0	14.5	0.59
5	2015-08-31	14.0	14.0	0.49

5	2015-08-31	15.0	12.6	0.52
5	2015-08-31	16.0	11.3	0.54
5	2015-08-31	17.0	9.8	0.08
5	2015-08-31	18.0	9.1	0.02
5	2015-08-31	19.0	8.8	0.00
5	2015-08-31	20.0	8.5	0.00
5	2015-08-31	21.0	8.4	0.00
2	2015-09-26	0.0	19.3	8.63
2	2015-09-26	1.0	19.0	8.62
2	2015-09-26	2.0	19.0	8.59
2	2015-09-26	3.0	19.0	8.56
2	2015-09-26	4.0	18.8	8.53
2	2015-09-26	5.0	18.8	8.36
2	2015-09-26	6.0	18.7	8.33
2	2015-09-26	7.0	18.6	8.29
2	2015-09-26	8.0	18.6	8.28
2	2015-09-26	9.0	18.6	8.28
2	2015-09-26	10.0	18.3	7.60
2	2015-09-26	11.0	14.4	2.34
2	2015-09-26	12.0	12.9	2.45
2	2015-09-26	13.0	10.1	3.58
2	2015-09-26	14.0	8.3	4.32
2	2015-09-26	15.0	7.7	4.54
2	2015-09-26	16.0	7.2	4.55
2	2015-09-26	17.0	6.7	4.71
2	2015-09-26	18.0	6.5	4.84
2	2015-09-26	19.0	6.4	4.94
2	2015-09-26	20.0	5.6	5.30
2	2015-09-26	21.0	5.2	5.48
2	2015-09-26	22.0	5.0	5.54
2	2015-09-26	23.0	4.8	5.49
2	2015-09-26	24.0	4.3	5.38
2	2015-09-26	25.0	4.3	5.23
2	2015-09-26	26.0	4.1	4.99
2	2015-09-26	27.0	4.0	5.00
2	2015-09-26	28.0	3.8	5.18
2	2015-09-26	29.0	3.8	5.13
2	2015-09-26	30.0	3.7	4.52
2	2015-09-26	31.0	3.6	4.41
3	2015-09-26	0.0	19.5	8.80
3	2015-09-26	1.0	19.5	8.77
3	2015-09-26	2.0	19.3	8.72
3	2015-09-26	3.0	18.9	8.63
3	2015-09-26	4.0	18.8	8.55

3	2015-09-26	5.0	18.7	8.50
3	2015-09-26	6.0	18.7	8.46
3	2015-09-26	7.0	18.7	8.39
3	2015-09-26	8.0	18.6	8.37
3	2015-09-26	9.0	18.6	8.33
3	2015-09-26	10.0	13.5	2.89
3	2015-09-26	11.0	10.3	3.87
3	2015-09-26	12.0	8.6	4.08
3	2015-09-26	13.0	7.1	4.08
3	2015-09-26	14.0	6.5	3.73
3	2015-09-26	15.0	6.0	3.64
3	2015-09-26	16.0	5.7	3.41
3	2015-09-26	17.0	5.4	2.81
5	2015-09-26	0.0	19.3	8.65
5	2015-09-26	1.0	19.2	8.67
5	2015-09-26	2.0	19.1	8.65
5	2015-09-26	3.0	19.0	8.59
5	2015-09-26	4.0	18.8	8.52
5	2015-09-26	5.0	18.6	9.37
5	2015-09-26	6.0	18.5	8.34
5	2015-09-26	7.0	18.5	8.29
5	2015-09-26	8.0	18.5	8.27
5	2015-09-26	9.0	18.4	8.23
5	2015-09-26	10.0	18.4	8.21
5	2015-09-26	11.0	18.4	8.13
5	2015-09-26	12.0	18.2	7.89
5	2015-09-26	13.0	17.9	7.38
5	2015-09-26	14.0	14.5	0.38
5	2015-09-26	15.0	12.6	0.17
5	2015-09-26	16.0	11.5	0.13
5	2015-09-26	17.0	10.3	0.10
5	2015-09-26	18.0	9.6	0.08
5	2015-09-26	19.0	9.1	0.06
5	2015-09-26	20.0	8.8	0.05
5	2015-09-26	21.0	8.5	0.04
2	2015-10-17	0.0	12.1	10.39
2	2015-10-17	1.0	12.2	10.33
2	2015-10-17	2.0	12.3	10.27
2	2015-10-17	3.0	12.3	10.23
2	2015-10-17	4.0	12.3	10.20
2	2015-10-17	5.0	12.4	10.14
2	2015-10-17	6.0	12.4	10.11
2	2015-10-17	7.0	12.4	10.09
2	2015-10-17	8.0	12.4	10.06

2	2015-10-17	9.0	12.4	10.04
2	2015-10-17	10.0	12.4	10.01
2	2015-10-17	11.0	12.4	9.99
2	2015-10-17	12.0	12.4	9.90
2	2015-10-17	13.0	12.3	9.85
2	2015-10-17	14.0	9.8	4.94
2	2015-10-17	15.0	7.8	4.77
2	2015-10-17	16.0	7.1	4.77
2	2015-10-17	17.0	6.6	4.89
2	2015-10-17	18.0	6.3	5.00
2	2015-10-17	19.0	5.9	5.33
2	2015-10-17	20.0	5.5	5.49
2	2015-10-17	21.0	5.2	5.58
2	2015-10-17	22.0	4.8	5.70
2	2015-10-17	23.0	4.4	5.89
2	2015-10-17	24.0	4.3	5.89
2	2015-10-17	25.0	4.2	5.86
2	2015-10-17	26.0	4.0	5.61
2	2015-10-17	27.0	3.9	5.54
2	2015-10-17	28.0	3.8	5.32
2	2015-10-17	29.0	3.8	5.01
2	2015-10-17	30.0	3.7	4.72
2	2015-10-17	31.0	3.7	4.49
3	2015-10-17	0.0	12.1	10.69
3	2015-10-17	1.0	12.1	10.52
3	2015-10-17	2.0	12.1	10.48
3	2015-10-17	3.0	12.1	10.45
3	2015-10-17	4.0	12.1	10.40
3	2015-10-17	5.0	12.1	10.35
3	2015-10-17	6.0	12.1	10.33
3	2015-10-17	7.0	12.1	10.31
3	2015-10-17	8.0	12.1	10.31
3	2015-10-17	9.0	12.1	10.30
3	2015-10-17	10.0	12.1	10.25
3	2015-10-17	11.0	12.1	10.14
3	2015-10-17	12.0	12.0	9.52
3	2015-10-17	13.0	8.4	3.85
3	2015-10-17	14.0	6.8	3.96
3	2015-10-17	15.0	6.1	3.72
3	2015-10-17	16.0	5.8	3.30
3	2015-10-17	17.0	5.7	2.98
5	2015-10-17	0.0	12.0	10.75
5	2015-10-17	1.0	12.0	10.72
5	2015-10-17	2.0	11.9	10.69
5	2015-10-17	3.0	11.9	10.67

5	2015-10-17	4.0	11.9	10.65
5	2015-10-17	5.0	11.9	10.63
5	2015-10-17	6.0	11.9	10.60
5	2015-10-17	7.0	11.9	10.58
5	2015-10-17	8.0	11.9	10.54
5	2015-10-17	9.0	11.8	10.52
5	2015-10-17	10.0	11.8	10.50
5	2015-10-17	11.0	11.8	10.47
5	2015-10-17	12.0	11.8	10.45
5	2015-10-17	13.0	11.8	10.43
5	2015-10-17	14.0	11.7	10.42
5	2015-10-17	15.0	11.7	10.40
5	2015-10-17	16.0	11.7	10.38
5	2015-10-17	17.0	11.6	10.37
5	2015-10-17	18.0	11.6	10.36
5	2015-10-17	19.0	11.5	10.33
5	2015-10-17	20.0	11.4	10.30
5	2015-10-17	21.0	11.3	9.51

Appendix B: Total phosphorus concentration 2014-15 collected by LLS.

Date	Station	Station Depth (m)	Sampling Depth (m)	TP (µg/L)
18-Sep-14	3	23.8	0-6	6.0
	3	23.8	14	4.7
	3	23.8	17	12.0
	3	23.8	20	7.3
	4	8.3	0-6	6.8
	4	8.3	7	22.7*
	5	22	0-6	5.1
	5	22	15	11.0
	5	22	18	7.2
	5	22	20	10.0
22-Oct-14	1	10.3	0-4	6.6
	2	33.8	0-4	1.9
	2	33.8	33	1.9
	3	23.7	0-4	2.6
	3	23.7	20	1.9
	4	8.1	0-6	1.9
	5	22.5	0-6	1.9
	5	22.5	19	1.9
12-Apr-15	1	9	5	9
	2	37	5	5.4
	2	37	34	11
	3	24	5	5.8
	3	24	20	6.8
	4	7.5	5	5.2
	5	22	5	2.5
	5	22	20	6.5
17-Oct-15	2	34	0-1	7
	2	34	~15	3
	2	34	33	<2
	3	24	0-1	<2
	3	24	~12	<2
	3	24	23	60
	5	22	0-1	2
	5	22	~11	3
	5	22	21	54

Appendix C: Phytoplankton information: Secchi and chlorophyll concentration, 1974-2015

Historic Data (Source: MOECC Reports and Lake Partner Program, and scientific literature)

Location*	Station	Year	Date	Secchi (m)	Chlorophyll (ug/L)**
Average		1974	1974	4.40	
Average		1978	01-May-78	3.80	
Average		1978	05-Jul-78	4.92	1.5
Average		1981	27-Jul-81	7.90	
Average		1982	13-Jul-82	4.50	
Average		1983	05-Jul-83	4.00	
Upper	1	1988	25-May-88		5.1
Inflow Bay	13	1988	25-May-88		7.3
Upper	1	1988	12-May-17 Oct 1988	3.93	3.2
Middle	2	1988	12-May-17 Oct 1988	4.78	2.6
Middle	3	1988	12-May-17 Oct 1988	4.87	2.6
Lower_NE	4	1988	12-May-17 Oct 1988	4.53	2.7
Lower_Middle	5	1988	12-May-17 Oct 1988	4.61	2.5
Lower_SW	6	1988	12-May-17 Oct 1988	6.63	1.0
Inflow Bay	13	1988	12-May-17 Oct 1988	3.56	3.0
Average		1999	22-Apr-99	3.25	
NW end	3	2008	08-May-08	4.00	
NW end	3	2009	10-May-09	4.08	
NW end	3	2010	10-May-10	4.69	
NW end	3	2011	13-May-11	4.17	
NW end	3	2012	08-May-12	4.37	
Average				**4.58**	**3.1**

*Often, only spatial or temporal averages are known and could be recorded.

**Total chlorophyll, not corrected for pheophytin.

Study period 2014-15, data collected by LLS and CGS.

Source	Station	Date	Secchi (m)
	1	18-Sep-14	4.20
	2	18-Sep-14	4.60
	3	18-Sep-14	5.20
	4	18-Sep-14	3.70
	5	18-Sep-14	3.90
	1	22-Oct-14	2.50
	2	22-Oct-14	3.30
	3	22-Oct-14	4.50
	4	22-Oct-14	4.00
	5	22-Oct-14	4.00
LSS	**Average**	**2014**	**3.99**
	1	28-Aug-15	4.80
	2	28-Aug-15	3.50
	3	28-Aug-15	4.20
	4	28-Aug-15	3.20
	5	28-Aug-15	3.60
CGS	**Average**	28-Aug-15	**3.86**

Appendix D: Cyanobacterial blooms

"As for the Blue-green, there have been two (2) blooms that have occurred in the past on Long Lake. The first one occurred on June 24, 2011 and again on June 20, 2012. The blooms were called in by residents, both blooms were small in size and dissipated rather quickly. I sampled both of the blooms at residents' homes off Sunnyside Road."

Brennan, Drew (MOECC)

Appendix E: Total phosphorus concentrations for lakes in the Long Lake watershed

Available from the MOECC Lake Partner website (http://desc.ca/programs/LPP).

Lake Name	Township	STN	Site ID	Site Description	Latitude	Longitude	Date	Year	TP
Clearwater	TILTON, BRODER	902	2	Mid Lake, deep spot	462210	810305	20-May-02	2002	**6.6**
Clearwater	TILTON, BRODER	902	2	Mid Lake, deep spot	462210	810305	11-May-04	2004	**3.7**
Clearwater	TILTON, BRODER	902	1	Sudbury-Mid Lake	462214	810300	15-May-06	2006	**3.4**
Clearwater	TILTON, BRODER	902	1	Sudbury-Mid Lake	462214	810300	15-May-07	2007	**3.3**
Clearwater	TILTON, BRODER	902	3	Mid Lake deep spt, CGS CLE-1	462214	810300	14-Apr-10	2010	**2.5**
Clearwater	TILTON, BRODER	902	3	Mid Lake deep spt, CGS CLE-1	462214	810300	23-May-13	2013	**3.2**
Daisy	NEELON	6960	1	Mid Lake, deep spot	462706	805303	11-May-04	2004	**4.6**
Lohi	BRODER	2759	1	Mid, 200m offshore	462314	810239	25-Aug-02	2002	**4.6**
Lohi	BRODER	2759	1	Mid, 200m offshore	462314	810239	19-May-03	2003	**5.9**
Lohi	BRODER	2759	2	Mid Lake, 200m offshore	462326	810218	15-May-06	2006	**4.1**
Lohi	BRODER	2759	2	Mid Lake, 200m offshore	462326	810218	15-May-07	2007	**4.5**
Lohi	BRODER	2759	3	Sudbury - Mid lake, deep spot	462326	810220	14-Apr-10	2010	**5.1**
Lohi	BRODER	2759	3	Sudbury - Mid lake, deep spot	462326	810220	11-May-12	2012	**4.7**
Lohi	BRODER	2759	3	Sudbury - Mid lake, deep spot	462326	810220	26-May-14	2014	**6.4**
Long	EDEN, BRODER	2784	1	Sudbury Stn 1	462424	810053	11-May-04	2004	**10.0**
Long	EDEN, BRODER	2784	3	Sudbury Stn 3	462307	810355	11-May-04	2004	**7.3**
Long	EDEN, BRODER	2784	4	deep spot	462211	810509	11-May-04	2004	**5.3**
Long	EDEN, BRODER	2784	1	Sudbury Stn 1	462424	810053	15-May-07	2007	**6.4**
Long	EDEN, BRODER	2784	4	deep spot	462211	810509	15-May-07	2007	**9.7**
Long	EDEN, BRODER	2784	5	NW end, Sudbury Stn 3	462309	810348	08-May-08	2008	**12.4**
Long	EDEN, BRODER	2784	5	NW end, Sudbury Stn 3	462309	810348	10-May-09	2009	**9.9**
Long	EDEN, BRODER	2784	1	Sudbury Stn 1	462424	810053	14-Apr-10	2010	**8.7**
Long	EDEN, BRODER	2784	7	Main Bay west LON-5	462056	810731	14-Apr-10	2010	**5.2**
Long	EDEN, BRODER	2784	5	NW end, Sudbury Stn 3	462309	810348	10-May-10	2010	**11.5**
Long	EDEN, BRODER	2784	5	NW end, Sudbury Stn 3	462309	810348	13-May-11	2011	**17.7**
Long	EDEN, BRODER	2784	5	NW end, Sudbury Stn 3	462309	810348	08-May-12	2012	**6.8**
Long	EDEN, BRODER	2784	4	deep spot	462211	810509	11-May-12	2012	**6.5**
Long	EDEN, BRODER	2784	8	NE End, deep spot, Stn 2	462350	810239	05-May-13	2013	**8.3**

Long	EDEN, BRODER	2784	8	NE End, deep spot, Stn 2	462350	810239	08-May-14	2014	**10.2**
Long	EDEN, BRODER	2784	6	North east bay LON-2, Stn 1?	462426	810048	26-May-14	2014	**8.6**
Long	EDEN, BRODER	2784	7	Main Bay west LON-5, Stn 5	462056	810731	26-May-14	2014	**5.8**
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	05-May-02	2002	**12.2**
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	03-May-03	2003	**17.6**
McFarlane	BRODER	3101	1	Sudbury # 2, Mid-lake	462500	805900	09-May-03	2003	**14.5**
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	30-May-04	2004	**12.5**
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	30-Apr-05	2005	**9.6**
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	09-May-06	2006	**10.9**
McFarlane	BRODER	3101	4	Sudbury-W Basin	462448	805804	15-May-06	2006	**9.0**
McFarlane	BRODER	3101	5	Sudbury-E Basin	462510	805701	15-May-06	2006	**9.3**
McFarlane	BRODER	3101	1	Sudbury # 2, Mid-lake	462500	805900	17-May-07	2007	**9.9**
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	25-May-08	2008	**16.0**
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	11-May-09	2009	**10.3**
McFarlane	BRODER	3101	1	Sudbury # 2, Mid-lake	462500	805900	14-Apr-10	2010	**9.2**
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	20-May-10	2010	**15.7**
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	23-May-11	2011	**11.3**
McFarlane	BRODER	3101	6	West Bay	462503	805748	11-May-12	2012	**9.1**
McFarlane	BRODER	3101	6	West Bay	462503	805748	09-May-13	2013	**8.9**
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	19-May-14	2014	**11.2**
McFarlane	BRODER	3101	3		462500	805900		1995	**12.0**
McFarlane	BRODER	3101	3		462500	805900		1996	**10.0**
McFarlane	BRODER	3101	2		462500	805900		1998	**14.0**
McFarlane	BRODER	3101	2		462500	805900		1999	**9.0**
McFarlane	BRODER	3101	2		462500	805900		2000	**13.0**
McFarlane	BRODER	3101	2		462500	805900		2001	**12.0**
Pine	BRODER	7320	1	Mid Lake, deep spot	462235	810132	09-May-03	2003	**4.1**
Richard	DILL	4621	2	E end, deep spot	462626	805419	06-May-03	2003	**8.4**
Richard	DILL	4621	3	Mid Lake, deep spot	462616	805458	06-May-03	2003	**8.5**
Richard	DILL	4621	1	Mid Lake, deep spot	462617	805500	11-May-03	2003	**10.3**
Richard	DILL	4621	1	Mid Lake, deep spot	462617	805500	05-Jun-05	2005	**7.7**
Richard	DILL	4621	4	Sudbury-Mid Lake	462617	805457	15-May-06	2006	**7.6**
Richard	DILL	4621	1	Mid Lake, deep spot	462617	805500	13-Jul-06	2006	**13.0**
Richard	DILL	4621	4	Sudbury-Mid Lake	462617	805457	17-May-07	2007	**11.6**
Richard	DILL	4621	4	Sudbury-Mid Lake	462617	805457	14-Apr-10	2010	**8.0**
Richard	DILL	4621	4	Sudbury-Mid Lake	462617	805457	11-May-12	2012	**10.5**
Richard	DILL	4621	4	Sudbury-Mid Lake	462617	805457	09-May-13	2013	**7.7**
Richard	DILL	4621	1		462600	805500		1999	**5.0**
Richard	DILL	4621	1		462600	805500		2000	**8.0**
Silver	BRODER	4953	1	Mid Lake, deep spot	462544	810051	20-May-02	2002	**6.3**
Silver	BRODER	4953	2	N end, deep spot	462550	810047	06-May-03	2003	**5.1**
Silver	BRODER	4953	3	S end, deep spot	462539	810056	06-May-03	2003	**5.4**
Silver	BRODER	4953	1	Mid Lake, deep spot	462544	810051	12-May-04	2004	**5.5**

Silver	BRODER	4953	1	Mid Lake, deep spot	462544	810051	17-May-07	2007	**8.4**
Silver	BRODER	4953	3	S end, deep spot	462539	810056	14-Apr-10	2010	**5.6**
Silver	BRODER	4953	3	S end, deep spot	462539	810056	17-May-13	2013	**4.9**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	08-May-02	2002	**5.3**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	30-Jun-02	2002	**8.9**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	31-Jul-02	2002	**5.3**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	05-Sep-02	2002	**6.2**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	03-Oct-02	2002	**4.6**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	17-Oct-02	2002	**7.8**
Tilton	TILTON	5382	3	Mid-lake	462126	810417	09-May-03	2003	**5.5**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	11-May-03	2003	**5.1**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	16-May-03	2003	**4.7**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	03-May-04	2004	**3.7**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	18-May-05	2005	**3.9**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	08-May-06	2006	**4.5**
Tilton	TILTON	5382	3	Mid-lake	462126	810417	17-May-07	2007	**6.7**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	13-Jun-07	2007	**4.7**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	29-Jun-08	2008	**5.2**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	13-Jun-09	2009	**4.7**
Tilton	TILTON	5382	3	Mid-lake	462126	810417	14-Apr-10	2010	**4.1**
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	16-Apr-10	2010	**4.4**
Tilton	TILTON	5382	3	Mid-lake	462126	810417	11-May-12	2012	**3.8**
Tilton	TILTON	5382	3	SW bay, deep spt CGS TIL-1	462126	810417	23-May-13	2013	**5.4**
Tilton	TILTON	5382	1		462200	810500		2001	**6.0**
Wavy	EDEN	5760	1	Mid Lake, deep spot	461809	810545	03-May-04	2004	**6.2**

Appendix F: Secchi disk transparencies for lakes in the Long Lake watershed

Available from the MOECC Lake Partner website (http://desc.ca/programs/LPP).

Lake	Township	STN	Site ID	Site Description	Latitude	Longitude	Year	Secchi (m)
Richard	DILL	4621	1	Mid Lake, deep spot	462617	805500	1999	4.2
Richard	DILL	4621	1	Mid Lake, deep spot	462617	805500	2000	2.9
Richard	DILL	4621	2	E end, deep spot	462626	805419	2003	2.0
Richard	DILL	4621	3	Mid Lake, deep spot	462616	805458	2003	2.0
Richard	DILL	4621	1	Mid Lake, deep spot	462617	805500	2005	3.0
Silver	BRODER	4953	2	N end, deep spot	462550	810047	2003	3.5
Silver	BRODER	4953	3	S end, deep spot	462539	810056	2003	3.5
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	2001	5.3
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	2002	5.1
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	2003	4.4
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	2004	5.6
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	2005	6.1
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	2006	6.1
Tilton	TILTON	5382	1	S/W Bay, deep spot	462113	810432	2007	4.5
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	1995	3.8
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	1996	5.3
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	1998	4.8
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	1999	3.8
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	2000	4.5
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	2001	3.3
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	2002	3.4
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	2003	3.1
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	2006	4.8
McFarlane	BRODER	3101	2	Stn 2, W Basin	462454	805751	2007	4.4
McFarlane	BRODER	3101	3	Stn 3, E Basin	462514	805659	1995	3.9
McFarlane	BRODER	3101	3	Stn 3, E Basin	462514	805659	1996	5.0
Clearwater	TILTON, BRODER	902	1	Sudbury-Mid Lake	462214	810300	1999	6.4
Lohi	BRODER	2759	1	Mid, 200m offshore	462314	810239	2002	6.5
Long	EDEN, BRODER	2784	1	Sudbury Stn 1	462424	810053	1999	3.3
Long	EDEN, BRODER	2784	5	NW end	462309	810348	2008	4.0
Long	EDEN, BRODER	2784	5	NW end	462309	810348	2009	4.1
Long	EDEN, BRODER	2784	5	NW end	462309	810348	2010	4.7
Long	EDEN, BRODER	2784	5	NW end	462309	810348	2011	4.2
Long	EDEN, BRODER	2784	5	NW end	462309	810348	2012	4.4
Long	EDEN, BRODER	2784	8	NE End, deep spot	462350	810239	2013	3.4
Long	EDEN, BRODER	2784	8	NE End, deep spot	462350	810239	2014	3.8

Appendix G: Phosphorus mass balance model and regression equations

Growing season TP concentration was modeled according to mass balance equations presented in detail in Nürnberg 2009. In particular, a specifically designed retention (R) model was applied that predicts only sedimentation (and not sediment release) as it was developed with a dataset of stratified lakes with no or low potential of sediment P release. The specific R-model (R_{sed}, equation 1) therefore represents the downward flux of TP due to settling and sedimentation.

$$R_{sed} = 15 / (18 + q_s), \quad (1)$$

where q_s, is annual areal water load (m/yr).

The prediction of lake TP concentration can be accomplished by adding an internal loading term to the general mass balance equation. In this way, both upward and downward fluxes are considered and specific seasonal or annual TP concentrations can be predicted in stratified and polymictic lakes according to Nürnberg (2009).

The model for average TP concentration is based on the same term of retention for both external and internal loads (areal loads, L_{int} and L_{ext}, mg/m^2/yr) and is predicted with equation (2).

$$TP = \frac{L_{ext} + L_{int}}{q_s} \times (1 - R_{sed}) \quad (2)$$

This model predicts annual average TP in stratified lakes with and without internal loading and growing season concentrations of polymictic lakes.

Observed TP concentration collected with the MOE Partner Program are usually measured during the spring turnover period. Such values are typically smaller than annual average or growing season T P and can be converted by equation (3), developed from observations of lakes in the Haliburton-Muskoka region (Clark and Hutchinson, 1992).

$$\text{TP growing season average} = 0.80 \times \text{TP spring} + 2.04 \quad (3)$$

Chlorophyll and Secchi disk depth were predicted from observed and predicted (equation 2) phosphorus using equations (3) and (4) that were developed on eastern North American lakes, including many lakes on the Precambrian Shield (Nürnberg 1996). Although these relationships can be considered applicable, ideally they should be verified with lake specific data, when they become available over the years of future monitoring. At the moment such input is limited to Basswood Lake for which several years of TP and Secchi observations are available.

$$\text{Log Chlorophyll} = -0.27 + 0.87 \log \text{TP} \quad (n=42, R^2 = 0.89, p<0.0001) \quad (4)$$

$$\text{Log Secchi} = 1.35 - 0.455 \times \log \text{TP} - 0.283 \times \log \text{Colour} \quad (n=38, R^2=0.89, p<0.001) \quad (5)$$

Colour is a measured or assumed value of lake water (true colour) in platinum units.

Appendix H: Sediment P fractions and internal load estimates

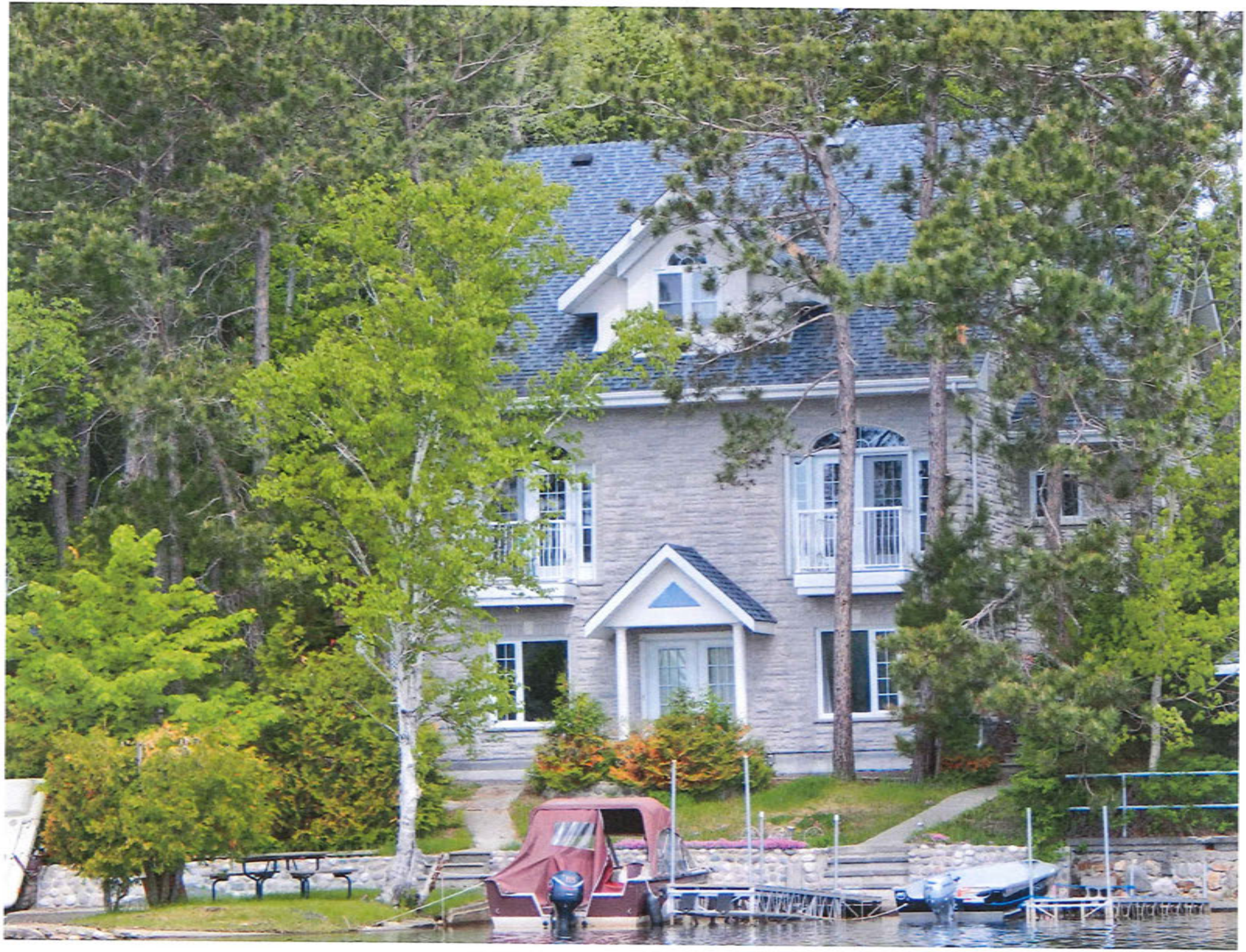
Source: Fischer (2015).

The BD-P fraction resembles the fraction of sediment P that is released under anoxic conditions. This fraction is related to areal release rates and is a useful indicator of internal load. Multiplied by the spatial and temporal extent of anoxic sediments (AF) it can be used to estimate internal load quantitatively.

Sediment layer (cm)	Average P concentrations (ug/g dry weight, mean ± standard deviation, for n=3 samples per depth)		Predicted release rates (RR, $mg/m^2/d$)[1]			Anoxic sediment factor (AF, d/year)[2]	Internal Load (RRxAF, $mg/m^2/year$)
	Site 3	Site 5	Site 3	Site 5	Avg		
BD-P							
0-5	184 ± 40.3	114 ± 13.0	3	1.57	2.17	9.31	20.2
5-10	157 ± 14.9	94 ± 5.3	2.85	1.24			
TP							
0-5	1511 ± 249.5	1233 ± 41.1	5.05	4.65			
5-10	1840 ± 412.7	1398 ± 138.1	6.56	5.34			

[1]Predicted from equations using BD-P (Nürnberg, 1988).

[2]Predicted from equation (Nürnberg, 1995) using Long Lake average TP concentration (8.3 µg/L).



Debbie Belowos - Fwd: OP Review letter final 2016

From: Kris Longston
To: Belowos, Debbie
Date: 8/18/2016 8:39 AM
Subject: Fwd: OP Review letter final 2016
Cc: Ed Landry; Melissa Riou
Attachments: 2016 07 06 Letter re OP Phase One.doc

For OP comment file and comment sheet.

Thanks,
Kris

>>> Alice Haasdyk 8/15/2016 12:34 PM >>>

Dear Mr. Jason Ferrigan,

Please find attached a response to the Official Plan 2016 from the Greater Sudbury Food Policy Council. This letter was submitted to the City of Greater Sudbury Planning Committee July 11, 2016.

Thank-you,
Alice Haasdyk
GSFPC Co-Chair

Greater Sudbury Food Policy Council
www.sudburyfoodpolicy.com

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

~~May 19~~July 11, 2016

To the City of Greater Sudbury Planning Committee and Planning Departmental Staff

Re: Official Plan Phase One Draft

This letter is intended to ~~both~~ express the appreciation and support of the Greater Sudbury Food Policy Council (GSFPC) for the integration of a Local Food Systems lens into the Phase One Draft Official Plan, as well as highlight ~~an~~ additional concerns expressed by ~~of~~ the local agriculture industry and shared by the Food Policy Council.

In particular, the GSFPC supports the prioritization of the development of a **Food Strategy** for the community. We plan to be active partners on that effort, along with other relevant organizations in the community, and see it as an important way to engage the community, identify priorities, and in so doing set the stage for a more prosperous, healthy and equitable food system as identified by Sudbury's Food Charter.

Given the many programs for local food and agriculture identified in the draft official plan, ~~One of the priorities for local food system development in the draft official plan is to remove barriers to agricultural production within the city. In this spirit the GSFPC recommends the city consider~~ the Food Policy Council also recommends the City review the following further items relative to the official plan or its programs and policies regarding Sudbury's food system:

- the impact on the long-term availability of viable land for food production of the official plan changes that allow **smaller rural lots to be created through splitting;**
- ~~how the official plan, or alternatively its bylaws or internal reviews processes, could be used to~~ how **~~reduce or address~~ conflicts between residential developments and adjacent farm production** can be reduced or better mitigated. These conflicts can involve surface water drainage, or normal farm practices that can sometimes result in dust, odour, flies, smoke, light, vibrations or noise disturbances. ~~These conflicts have been identified for both new and existing residential developments, and generally involve both the impact of agricultural land drainage, and complaints received from residents regarding normal farm practices that can sometimes result in dust, odour, flies, smoke, light, vibrations or noise disturbances.~~

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- how Sudbury's **organic waste management and land reclamation policies** and programs could support the improvement of soil on both active farms and lands whose soil has been stripped.
- Review the potential medium and long-term risks and opportunities arising from **the impacts of climate change** on local food production.

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We look forward to further discussing this recommendation with you, in order to better understand what ~~safeguards~~ programs and policies are in place ~~in this~~ currently ~~regard~~. Thank you for your work to date in supporting the further development of the food system in Greater Sudbury.

Sincerely,

Alice Haasdyyk
GS~~P~~FPC Co-Chair

~~Bridget King~~Joseph LeBlanc
~~GSFPC Co-Chair~~

cc. Stephen Monet, Coordinator of Environmental Planning Initiatives
Jason Ferrigan, Manager of Community and Strategic Planning

Greater Sudbury Food Policy Council
www.sudburyfoodpolicy.com

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

July 11, 2016

To the City of Greater Sudbury Planning Committee and Planning Departmental Staff

Re: Official Plan Phase One Draft

This letter is intended to express the appreciation and support of the Greater Sudbury Food Policy Council (GSFPC) for the integration of a Local Food Systems lens into the Phase One Draft Official Plan, as well as highlight additional concerns expressed by the local agriculture industry and shared by the Food Policy Council.

In particular, the GSFPC supports the prioritization of the development of a **Food Strategy** for the community. We plan to be active partners on that effort, along with other relevant organizations in the community, and see it as an important way to engage the community, identify priorities, and in so doing set the stage for a more prosperous, healthy and equitable food system as identified by Sudbury's Food Charter.

Given the many programs for local food and agriculture identified in the draft official plan, the Food Policy Council also recommends the City review the following further items relative to the official plan or its programs and policies regarding Sudbury's food system:

- the impact on the long-term availability of viable land for food production of the official plan changes that allow **smaller rural lots to be created through splitting**;
- how **conflicts between residential developments and adjacent farm production** can be reduced or better mitigated. These conflicts can involve surface water drainage, or normal farm practices that can sometimes result in dust, odour, flies, smoke, light, vibrations or noise disturbances. .
- how Sudbury's **organic waste management and land reclamation policies** and programs could support the improvement of soil on both active farms and lands whose soil has been stripped.
- Review the potential medium and long-term risks and opportunities arising from **the impacts of climate change** on local food production.

We look forward to further discussing this recommendation with you, in order to better understand what programs and policies are in place currently. Thank you for your work to date in supporting the further development of the food system in Greater Sudbury.

Sincerely,

Alice Haasdyk
GSFPC Co-Chair

cc. Dr. Stephen Monet, Manager, Environmental Planning Initiatives
Jason Ferrigan, Director of Planning Services

Comment Form:
Phase 1 of the Official Plan Review

City of Greater Sudbury
Official Plan
Flexible | Balanced | Sustainable

Introduction and Legal Requirements

The Official Plan (The OP) is a blueprint to help guide Greater Sudbury's development over the next twenty years. It establishes long-term goals, shapes policies and outlines social, economic, natural and built environment strategies for our city.

The Province of Ontario, through the Planning Act, requires municipalities to conduct a review of their Official Plans every five years. This allows our city to consult with residents and stakeholders to find out what's important for the future of the community. It also ensures existing OP projections and priorities are still relevant, and presents an opportunity to adapt the plan on a regular basis, to better reflect any changes in the community.

The Official Plan review is your chance to share your vision for Greater Sudbury with decision-makers. We want to know what you see for the future of the city, and how you think we can get there.

The Phase 1 Draft of the the OP Review is now ready for your comments. This review is centered on community consultation and feedback. As a resident of Greater Sudbury, you are invited to participate in the review process. This is your community, and the Official Plan Review is your opportunity to affect its future.
The Phase 1 Draft is available to view at www.greatersudbury.ca/opreview or at a Citizen Service Centre near you.

Legal Requirements for receiving Notice of Public Meeting, Notice of Adoption, and Notice of Decision:

Should you wish to receive a notice of public meeting, you must write to the City Clerk requesting such, and provide your address.

Should you wish to receive a notice of adoption, you must file with the City Clerk a written request to be notified if the plan is adopted.

Any person or public body will be entitled to receive notice of the decision of the Minister of Municipal Affairs and Housing if a written request to be notified of the decision is made to the Minister. Any requests shall include the person's or public body's address. Requests for Notice of Decision shall be submitted to the Ministry of Municipal Affairs and Housing, Municipal Services Office North - Sudbury, Suite 401, 159 Cedar St., Sudbury, Ontario, P3A 6A5.

Submitting Comments and Your Right to Appeal to the Ontario Municipal Board:

If a Person or Public Body does not make oral submissions at a public meeting or make written submissions to the City of Greater Sudbury before the proposed official plan amendment is adopted, the person or public body is not entitled to appeal the decision of the Minister of Municipal Affairs and Housing to the Ontario Municipal Board.

Submitting Comments and Your Right to be Added as a Party to the Hearing of an Appeal to the Ontario Municipal Board:

If a Person or Public Body does not make oral submissions at a public meeting or make written submissions to the City of Greater Sudbury before the proposed official plan amendment is adopted, the person or public body may not be added as a party to the hearing of an appeal before the Ontario Municipal Board unless, in the opinion of the Board, there are reasonable grounds to add the person or public body as a party.

Contact Information

Name (first and last)* VICTORIA FOR 160

Organization (if applicable) _____

Address* _____

City* SUDBURY Province* ON Postal Code* _____

Email _____

Phone number _____

Comments

If you wish to give feedback on a specific area of the Official Plan please provide your comments in the appropriate area. You can add comments to as many categories as you would like. Leave the categories blank if you do not wish to provide comments. For general comments, please use the General/Other comment box.

General/Other

To revitealize the city you need to turn most of the Downtown OFFICES to AFFORDABLE HOUSING; THAT WAY People will shop Downtown. Then MOVE the RAIL STATION to the OUTSKIRTS. Put the track that ARE Downtown outskirts. (This would relieve congestions) IN the Place of the RAILSTATION, MAKE A PARKING SO MORE CARS HAVE A PLACE TO PARK THEN WITH the tracks out - MAKE WALKING trails/PATHS.

Secondary Suites

→ IN REGARDS to SOCIAL HOUSING → there should be BUILDINGS SMOKE FREE / PET FREE / FRAGRANT FREE
→ I have OVER 10 ENVIORMENTAL ALLERGIES)
→ CITY NEEDS to MOVE PEOPLE WITH PHYC. ISSUES TO the KIRKWOOD BUILDING (OUT OF SOCIAL HOUSING) → SO MANY PROBLEMS IN Building BECAUSE THEY Don't TAKE THEIR MEDS.

Climate Change

With the MAILEY DRIVE Road being MADE - HAVE ALL LARGE TRANSPORT TRUCKS BE CHANGED TO ELECTRIC ENGINES OR PUT UP TOLLS to PAY FOR the COST OF the NEW ROAD + REPAIRS.

Growth Settlement and Urban Structure

THERE SHOULD BE MORE LOW RISE CONDO'S FOR SENIORS IN the OUTSKIRT TOWNS IE, LEVACK & LIVELY FALCONBRIDGE etc.,

→ THERE SHOULD BE ANOTHER GROCERY STORE ON NOTRE DAME (NEXT TO VALUE VILLAGE). THERE SHOULD BE A COMMUNITY POOL IN the DOWNTOWN CORE. THERE SHOULD BE A DANCE HALL DOWNTOWN.

→ THE BUS Routes should be smaller & MORE FREQUENT. THERE SHOULD BE MORE SHELTERS @ BUS STOP

Local Food Systems

→ THERE SHOULD BE A FULL GROCERY STORE IN LEVACK.

→ THERE SHOULD BE A FULL GROCERY STORE IN WARREN.

→ SKED SHOULD HAVE A GROCERY STORE

→

Heritage Resources

→ ALL NEW IMMIGRANTS SHOULD GET A COPY OF the DOCUMENARY OF SUDBURY "RICHES BEYOND OUR ROCKS". THIS should ALSO BE SHOWN IN SCHOOLS.

→ THE DOCUMENTRY OF CANADA "CANADA'S HISTORY"

Natural Resources

MORE TREES TO BE PLANTED OVER the BARE ROCKS.

Urban Design

- Should be A WATER SLIDE IN BELL PARK.
- SIDEWALKS AROUND THE CITY ARE BROKEN & MUST BE FIXED (I tripped + FELL)
- Bus Routes NEED TO BE MORE FREQUENT + Should be regular HR till MID. (currently AFTER 10 pm Routes ARE combined)
- MORE PUBLIC WASHROOMS OPEN IN the WINTER!
- MORE PUBLIC FOUNTIANS Around the city.
- MORE BENCHES Around the Whole CITY AREA!

Water Quality

- I like the WATER AT the Fountian @ Children Aids Building + Science NORTH & the Hospital. (I WALK ALL OVER the city)

(SORRY FOR SCRAPPY WRITTING) (Thanks FOR ALLOWING ME to VOICING MY OPINIONS)

Privacy Statement:

*The personal information collected in this comment form, and any attachment, will be used during Phase 1 of the five-year review of the Official Plan conducted in accordance with Sections 26 and 17 of the Planning Act. Your personal information may be disclosed in a public forum for the purpose of the City's Official Plan Review Program. Questions about collection of this information may be directed to Kris Longston, Manager of Community and Strategic Planning, by phone at 705-674-4455, extension 4353, by email at kris.longston@greatersudbury.ca, or by mail to 200 Brady St., PO Box 5000, Station A, Sudbury, ON, P3A 5P3.

I hereby declare that the facts provided in this comment form are true and are complete to the best of my knowledge and I have read and consent to my information being collected, used and disclosed by the City.

Signature: Victoria Forys

Date: July 21/16

Please return this completed form to:
Kris Longston, Manager of Community and Strategic Planning, by phone at 705-674-4455, extension 4353, by email at kris.longston@greatersudbury.ca, or by mail to 200 Brady St., PO Box 5000, Station A, Sudbury, ON, P3A 5P3.

Ministry of Municipal Affairs

Ministry of Housing

Municipal Services Office
North (Sudbury)
159 Cedar Street, Suite 401
Sudbury ON P3E 6A5
Telephone: 705 564-0120
Toll-Free: 1 800 461-1193
Facsimile: 705 564-6863

Ministère des Affaires municipales

Ministère du Logement

Bureau des services aux municipalités
du Nord (Sudbury)
159, rue Cedar, bureau 401
Sudbury ON P3E 6A5
Téléphone : 705 564-0120
Sans frais : 1 800 461-1193
Télécopieur : 705 564-6863

Ontario

July 22, 2016 **by email and regular mail**

Kris Longston, MCIP, RPP
Manager of Community & Strategic Planning
City of Greater Sudbury
P.O. Box 5000, Station A
200 Brady Street
Sudbury, ON P3A 5P3

Re: Draft Five Year Review Official Plan Amendment
One-Window Early Consultation Comments
MAH File No.: 53-OP-140087

Thank you for advising this office that a revised draft official plan was posted on the City's website. Though not formally submitted by the City to the province for review, we have taken the opportunity to request comments from the Ministry of the Environment and Climate Change on the revised policies that pertain to the protection of lake water quality. Please find attached a copy of these comments. I note that the MOECC has requested to meet with the City and MMA to further discuss the enclosed comments, and I would be pleased to arrange this meeting.

We understand that the City has received comments and a technical study pertaining to Long Lake, and has sought a peer review of this study. We also understand that the City may be undertaking further technical analysis related to Long Lake. Should any of this new information form part of the background materials on which the City is basing its decision on the official plan, as part of the One Window review process we would be pleased to review that new information and any resulting official plan policy revisions. Please feel free to submit any new background materials to this office.

For more information regarding these comments please contact me at 705-564-6802 or toll free at 1-800-461-1193 ext. 46802.

Sincerely,

Wendy Kaufman, MCIP, RPP
A\Manager, Community Planning and Development
Municipal Services Office – North (Sudbury)

Encl: MOECC comments

cc: Derrick Moggy, MOECC (email only)

Ministry of the Environment

199 Larch Street
Suite 1201
Sudbury ON P3E 5P9
Tel.: (705) 564-3254
Fax: (705) 564-4180

Ministère de l'Environnement

199, rue Larch
Bureau 1201
Sudbury ON P3E 5P9
Tél. : (705) 564-3254
Téléc.: (705) 564-4180

Ontario

July 19, 2016

Wendy Kaufman, Planner
Municipal Service Office (Sudbury)
Ministry of Municipal Affairs and Housing
159 Cedar Street, Suite 501
Sudbury ON P3E 6A5

Dear Wendy:

Re: City of Greater Sudbury
Comments on Water Quality Report

Thank you for the opportunity to provide comments on City of Greater Sudbury's Draft Official Plan, dated February 2016. The Ministry of the Environment and Climate Change (MOECC) had previously provided comments on the lake-based policies for recreational water quality of the Draft Official Plan, dated November 2014.

The February 2016 revised Draft OP policies reflect only partial modification in response to MOECC comments and some important details of implementation that were in the November 2014 Draft OP have been removed. As a result, there is insufficient information in the revised document for MOECC to fully evaluate the City's proposed approach for water quality protection and lake capacity. Please see the attached table for specific comments on the draft Official Plan.

MOECC would like to meet with the Ministry of Municipal Affairs and Housing and the City to further discuss these comments as soon as possible to develop a path forward. Please contact me at 705-564-3254 to arrange a time to meet.

Yours truly,

Derrick Moggy
Environmental Planner/EA Coordinator
Technical Support Section
Northern Region

copy Ed Snucins, Surface Water Specialist, MOECC
Rosanna White, APEP Supervisor, MOECC

MOECC Comment	City Staff Comment	MOECC Response
Section 8.4 Surface Water Resources – Lakes and Rivers The Province is providing the following comments on the draft OP's policies on recreational water quality and lake capacity. The comments are provided to strengthen the draft OP's consistency with the water policies of the 2014 PPS and the direction provided within the Ministry of the Environment and Climate Change's Lakeshore Capacity Assessment Handbook. General Comment The Official Plan includes three types of watershed-based plans for water quality protection: source protection to address municipal drinking water; sub-watershed to address flooding and storm water; and lake-based to address recreational and habitat issues. It is the lake-based policies for recreational water quality that generated my comments. The lake-based policies for recreational water quality emerged from considerable technical work done by the City and its consultant and	No comment as this is a preamble to the specific comments below.	

that was summarized in the OP's water quality model background document. The background document aimed to determine how much development and re-development of un-serviced shoreline lots could occur while still meeting the intent of the Provincial Water Quality Objective (PWQO) for phosphorus and the Provincial Policy Statement. It concluded that the water quality model for Sudbury currently has insufficient accuracy to support implementation of the model-based total phosphorus PWQO for Precambrian Shield lakes (modeled background+50%). As an alternative it proposed using watershed-based lake management classifications, along with water quality triggers to address uncertainty of those classifications, to guide Official Plan policies for management of shoreline lot development. Two important underpinnings of the proposed lake classification approach, the contribution of phosphorus from all sources in a watershed (a criterion for lake classification) and water quality monitoring as a safeguard against uncertainty, were not carried over into the water quality protection policies of the final draft Official Plan. Missing from the proposed policies is consideration of non-shoreline and upstream phosphorus sources and downstream receptors, by definition part of watershed-based planning. Also missing is mention of water quality monitoring triggers. These are significant omissions. The following		

technical review comments identify how the draft policies for water quality protection can include important safeguards against uncertainty of the lake classification approach and can be made more consistent with provincial recommendations in the Lakeshore Capacity Assessment Handbook, Ontario's Water Management Policies, and the Provincial Policy Statement. **8.4.1 General Policies** Recommendation 1: State the water quality protection goal for phosphorus. For example: "The guideline for total phosphorus in lakes, rivers and streams is the Interim Provincial Water Quality Objective (PWQO). A goal for development decision-making will be to avoid water quality deterioration to the Interim PWQO." Rationale: This statement is needed to ensure that the OP will be consistent with the provincial water quality protection goal for phosphorus. In a situation such as Sudbury where the lakeshore capacity model fails and the model-based total phosphorus PWQO for Precambrian Shield lakes (modeled background+50%) cannot be applied, the Province recommends the Interim PWQO be followed as a guideline. The Interim PWQO for total phosphorus is as follows: *To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for*	Change recommended in part. Staff proposed policies are consistent with protecting, improving and restoring the quality of water, as well as ensuring consideration of environmental lake capacity, where applicable. Staff proposed policies include criteria of 10-year mean of 20 ug/L and greater TP values for which no new serviced lots are to be permitted.	The OP Section 8.4.2 Lakes with Phosphorus Enrichment Concerns has clear policy for the 20 ug/L PWQO, but uncertain approach for the other part of the PWQO that is intended to protect against aesthetic deterioration of lakes naturally below 10ug/L. The monitoring trigger of increase in measured TP proposed in the OP (8.4.2 Policy 1) could help to meet the intent of the 10ug/L PWQO, but that goal is missing from the OP. The only response to trend of increasing TP that is described in the OP (Section 8.4.2 Policy 2) is a requirement for causal study, unless source already established, with no mention of what actions might follow. **Recommendation: The OP should indicate what actions will be taken to protect lake water quality from further deterioration when there is statistically significant trend of increase in measured TP.** Section 8.4.2 Policy 3 (c) states that spring TP values will be compared to the PWQO.

the ice-free period should not exceed 20 ug/L. A high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 10 ug/L or less. This should apply to all lakes naturally below this value. Excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L."		**Recommendation: The Section 8.4.2 Policy 3 (c) comparison to PWQO, defined as 20ug/L ice-free period average TP, should use spring overturn TP converted to ice-free average. For this there is an equation (Clark et al. 2010) included with Lakeshore Capacity Model. This policy should also indicate that where lakes have substantial internal P loading, spring overturn samples alone may not be sufficient to accurately characterize ice-free average TP and additional sampling will be required.**
Recommendation 2: Add as a general policy that upstream sources and downstream receptors will be considered. Note this is particularly important when development occurs upstream of (a) a lake trout lake or other cold water lake or stream, (b) a lake classified as Moderate or Enhanced, or (c) a lake with flagged water quality monitoring trigger. Rationale: Watershed-based planning acknowledges the zone of influence for phosphorus loading is the watershed; upstream sources and downstream receptors need to be considered. Particularly sensitive and valuable natural assets of the City are the	Change not recommended as the lake water quality model considers both upstream sources and downstream receptors.	The lake water quality model considered upstream sources to develop lake management classifications, but the report's authors (HESL 2014) recognized uncertainty of this model-based classification system and recommended water quality monitoring triggers as safeguard. It is not clear if or how the City intends to implement the HESL-recommended lake management classifications and their linkage to water quality monitoring triggers. The revised draft OP (Feb. 2016) only states that the water quality model will assist in the development of lake-specific watershed plans and site plan control guidelines, as described in 8.4.1 General Policies (Policy 5 and Program Policy 1). With the OP stating that guidelines are to be developed in the future, the document provides MOECC with insufficient information

lake trout lakes and other cold water lakes and streams. Lakes classified as Enhanced or Moderate and lakes of any classification with flagged monitoring triggers require particular attention to avoid unacceptable water quality change.		to evaluate the potential effectiveness of this approach. **Recommendation: The OP should include sufficient detail about how the lake water quality model will be applied that MOECC can evaluate the potential effectiveness of the proposed approach.** Dealing with upstream sources is part of watershed-based planning, as described in the Lakeshore Capacity Assessment Handbook, and consistent with PPS policy 2.2.1. The water quality model did not provide acceptably accurate predictions of lake phosphorus concentrations for many City lakes and water quality monitoring triggers were recommended (HESL 2014) as a safeguard. **Recommendation: The OP should indicate how the City will prevent upstream inputs from further degrading lakes that have demonstrated water quality problems (e.g. 20 ug/L TP, significant trend TP increase, lake trout dissolved oxygen PWQO).** The revised OP describes responses to triggers of 20ug/L TP PWQO and lake trout lake dissolved oxygen PWQO (MVWHDO 7mg/L) that include prohibition of lot creation or more intensive land use in areas without

Recommendation 3: Add a general policy "When a lake has documented algal bloom or monitoring shows deteriorating water quality (e.g. TP increase trend; dissolved oxygen decrease trend; water clarity decrease trend) or TP is at Interim PWQO (10 ug/L or 20 ug/L for lakes; 30 ug/L for rivers and streams) there will be moratorium on un-serviced lot development and additional phosphorus loading." Rationale: Observations of algal bloom, deteriorating water quality trend or TP that is at the threshold of Interim PWQO trigger a moratorium on additional phosphorus loading, allowing for assessment of measures to maintain or improve water quality.	Change recommended in part. Staff proposed policies to include triggers and responses to triggers including causation studies.	municipal services. This approach is consistent with guidance in the Lakeshore Capacity Assessment Handbook and with recommendations in the City's lake water quality modeling report (HESL 2014). By contrast, other HESL-recommended monitoring triggers have incomplete policy (TP trend) or are not mentioned at all (cyanobacteria blooms). **Recommendation: The OP should include more complete policy for monitoring triggers of TP trend and cyanobacteria blooms.**
8.4.2 Lakes Classified as Enhanced or Moderate Recommendation: Change the first sentence to "Lot creation, development or redevelopment on shoreline lots **or lots within 300 metres of the shoreline or tributary stream** of lakes that have been classified as Enhanced or Moderate..." Rationale: As detailed in the Lakeshore Capacity Assessment Handbook, the province	Change not recommended as the staff proposed policies have been revised to no longer mention lake classification.	Acknowledged. **Recommendation: The City should clarify if or how the lake management classifications will be used.**

considers the zone of influence for phosphorus loading from septic systems to be within 300 m of lake shore or tributary of the lake, unless scientifically demonstrated otherwise.		**Recommendation: Include tributary streams of a lake as part of watershed planning.**
8.4.3 Shoreline Lot Creation Is Not Permitted - Conditions Recommendation 1: Change first sentence to "Lot creation is not permitted on the shoreline of a lake **or within 300 m of the shoreline or tributary of a lake** where all of the following conditions occur". Rationale: As per Lakeshore Capacity Assessment Handbook, the province considers the zone of influence for phosphorus loading from septic systems to be within 300 m of lake shore or tributary of the lake.	Change recommended in part. Staff proposed policies include lots within 300 metres of the shoreline but not 300 metres of tributary streams.	Acknowledged.
Recommendation 2: Remove the second condition: (b) lake is classified as enhanced. Rationale: Enhanced classification lakes are	Change recommended.	

not the only lakes that experience water quality deterioration due to human nutrient sources. Indeed, the OP's water quality model background document lists examples of lakes with moderate classification that have TP>20 ug/L due to anthropogenic phosphorus (e.g. Kelly, Mud, Simon, McCharles, Minnow, Robinson, Beaver E). Avoiding additional phosphorus loading to those lakes is consistent with the Interim PWQO and Ontario's Water Management Policies. Similarly, the OP's background water quality model report recommended avoidance of additional phosphorus loading in any lake with TP>20 ug/L, regardless of management classification.		Acknowledged.
<u>Recommendation 3:</u> Change the third condition (c) to "lake has a measured, 10-year running mean for total phosphorus (TP) that exceeds 20 micrograms per litre **or if less than 10 years data available then mean TP exceeds 20ug/L**". <u>Rationale:</u> All lakes in the City do not yet have 10 years of monitoring data. When data from a lower number of years have mean TP>20 ug/L there should be a moratorium on additional phosphorus loading at least until sufficient data have been collected to determine the 10-year average.	Change recommended.	

8.4.5 Site Development Report Recommendation: Add the following two information requirements for site development reports: (1) evaluation of water quality triggers (measured TP, algal blooms, water clarity, dissolved oxygen, and for lake trout lakes mean volume-weighted hypolimnetic dissolved oxygen); (2) evaluation of impact to downstream lakes. Rationale: Water quality triggers address uncertainty in the lake classifications. Evaluating impact to downstream lakes recognizes that the zone of influence for phosphorus loading is the watershed, consistent with watershed-based planning.	Change not recommended. Site-specific technical studies may be required during site plan review but not as OP policy. Technical studies intended to address site specific requirements to ensure best practices are incorporated by the proposed development. Water quality triggers will be addressed by other policies in the OP.	OP policies are incomplete for some of the water quality triggers, as discussed above (8.4.1 General Policies MOECC Recommendation 3). The description of Site Development Report that was in the November 2014 draft OP and included a list of required information was removed from the February 2016 revised draft OP and replaced by a requirement for Site Plan Control (8.4.1 General Policies), but with guidelines to be developed in the future. As a consequence, the OP no longer provides specific instructions for guideline content. **Recommendation: Include as part of Site Plan Control guidelines the information requirements that were listed in the November 2014 draft OP 8.4.5 Site Development Report 1 a) b) c) d) e) f) g).**
8.4.6.1 Lake Trout Lakes Over Threshold Recommendation: Change first sentence to "Development within 300 metres of the shoreline **or tributary stream or first two lakes upstream** of any lake trout lake that the	Change not recommended.	Dealing with impacts from upstream sources is described in the Lakeshore Capacity Assessment Handbook and is consistent with PPS policy 2.2.1 for watershed planning. **Recommendation: Include upstream sources from tributary streams and lakes within OP policy for lake trout lakes over threshold.**

Province has determined to be over threshold...." Rationale: As detailed in the Lakeshore Capacity Assessment Handbook's requirements for development on lakes at capacity, the province considers the zone of influence for P loading from septic systems to be within 300 m of lake shore or tributary, unless scientifically demonstrated otherwise. Upstream lakes are included because part of their phosphorus load is exported downstream. The first two lakes upstream are commonly within the Lakeshore Capacity Assessment Handbook's definition of the watershed for a lake that is at capacity. **8.4.6.2 Lake Trout Lakes Not Over Threshold** Recommendation: Change first sentence to "Development within 300 metres of the shoreline **or tributary stream** of any lake trout lake will be subject to the following policies". Rationale: Unless scientifically demonstrated otherwise as per Lakeshore Capacity Assessment Handbook's requirements for development on lakes at capacity, the province considers the zone of influence for P loading from septic systems to be within 300 m of lake shore or tributary.	Change not recommended.	**Recommendation: Include upstream sources from tributary streams within OP policy for lake trout lakes.** Acknowledged.

8.4.7 Vegetative Buffers Recommendation: Identify buffer sizes for cold water and warm water streams, if they differ. Rationale: OP 9.2.4 Fish Habitat states that vegetative buffer sizes may differ among cold water and warm water streams. Cold water streams are generally considered more sensitive than warm water streams. **Schedule 5 Natural Heritage** Recommendation: Identify cold water streams and lakes. Rationale: This would support OP Policy 9.2 Significant Natural Features and Areas and 9.2.4 Fish Habitat. Cold water streams and lakes are significant natural features and valuable natural assets that are sensitive to watershed alterations, shoreline development and climate change.	Change not recommended. Stream buffer widths beyond the 12 m minimum will be addressed during the watershed planning process.	

File copy

Debbie Belowos - Fwd: Re: Feedback on the draft OP

From: Kris Longston
To: Belowos, Debbie; Ed Landry
Date: 8/7/2016 8:47 PM
Subject: Fwd: Re: Feedback on the draft OP

Please make copies and put in OP comment binders.

Thanks,
Kris

>>> Jason Ferrigan 7/28/2016 1:18 PM >>>
Hi Donna:

My summer has been great so far. I hope that you have been enjoying the beautiful weather with family and friends as well.

Thank you for this feedback on the Official Plan Review. I am cc'ing Kris Longston (our Manager of Community and Strategic Planning) who is leading the file. I am sure that Kris will take this into consideration as we finalize the document and prepare to bring it forward to Planning Committee for consideration in the Fall.

We have really enjoyed working with the community on the Kivi Park project so far. It will be a tremendous community asset.

Take care, Jason.

>>> Donna VENDRAMIN 7/13/2016 2:52 PM >>>
Hi Jason:

Hope this note finds you happy and well and enjoying your summer.

I know that your office is collecting feedback on the OP and I hope I am not too late. I attended the open house at Adanac several weeks ago.

I am fully supportive of Evelyn Dutrisac's long-standing efforts to expand the number of rural lots per parcel and to reduce the size of the lots. Even though I am no longer a property owner of the 300 acres behind the Long Lake School and have no direct interest, I believe that the recommendations made by City Council should be implemented and that the Province should allow the City to have the authority to implement their own recommendation. Over the years, we received many, many inquiries to purchase smaller and more parcels other than the 8 that were allowed under the existing zoning regulations. Many people want to live in a rural area of Sudbury on a parcel of land that is less than 5 acres.

Thanks so much for the opportunity to offer input. And thanks Jason for the efforts your department has put into making KIVI PARK an outstanding opportunity for the people of Sudbury. I am thrilled!

Have a great day.
Donna

Debbie Belowos - Fwd: RE: Draft OP Council date

From: Melissa Riou
To: Belowos, Debbie
Date: 9/13/2016 2:20 PM
Subject: Fwd: RE: Draft OP Council date

Hi Debbie,

Please add this to the OP comments list and Melissa Miceli to the mailing list.

Thanks,

Melissa

>>> Melissa Miceli 9/1/2016 9:58 AM >>>
Hi Kris,
Yes, if you could add me to the notification list that would be great.
Thanks again,

Melissa Miceli | Development Coordinator | Canadian Tire Real Estate Limited | 416.480.3895

From: Kris Longston [Kris.Longston@greatersudbury.ca]
Sent: September-01-16 9:56 AM
To: Melissa Miceli
Cc: Belowos, Debbie
Subject: Re: Draft OP Council date
Hi Melissa,
We are looking to have a special Planning Committee meeting for the Public Hearing for Phase 1 of the Official Plan Review in mid November. The date is still TBD at this point. If you aren't already on our notification list, would you like us to add you so that you get the public notice for the OP open houses and public hearing?
Thanks,
Kris

Kris Longston, MES, MCIP, RPP
Manager, Community and Strategic Planning,
Department of Growth and Development
City of Greater Sudbury,
PO Box 5000, Stn. A,
200 Brady Street,
Sudbury, ON
P3A 5P3
Tel : (705) 671-2489, Ext. 4353
Fax: (705) 673-2200
Email : kris.longston@greatersudbury.ca

>>> Melissa Miceli 9/1/2016 9:49 AM >>>
Hi Kris,
I have been monitoring the draft OP process and was wondering if a Council date has been set yet?
Thanks,

Melissa Miceli
Development Coordinator
Canadian Tire Real Estate Limited
2180 Yonge Street, 15th Fl., Toronto ON M4P 2V8

PREMIER NATIONAL PARTNER
GRAND PARTENAIRE NATIONAL

To: Jason Ferrigan, Director of Planning Services, City of Greater Sudbury
From: Long Lake Stewardship Committee
Date: September 12, 2016
Subject: Establishing Discretionary Septic System Re-inspection Policy and Program

BACKGROUND (Why)

Many Ontario lakes are affected by the nutrients released from septic systems. In March 2011, the Ministry of Municipal Affairs and Housing (MMAH) announced that on-site septic systems in certain parts of Ontario would require mandatory re-inspections every five years. MMAH amended parts of the Ontario Building Code (O. Reg. 350/06 – now O. Reg. 332/12) made under the *Building Code Act, 1992*, governing the installation, operation and maintenance of small septic systems. Local authorities in certain areas (i.e., municipalities, conservation authorities, boards of health) must now develop inspection programs for septic systems that treat up to 10,000 litres of wastewater per day. The ministry stated that the amended regulation helps protect the province's drinking water and the natural environment.

From a municipal drinking water perspective, the new mandatory septic systems re-inspection requirement should help to identify and address bacterial contamination risks to municipal drinking water sources. From a watershed protection perspective, however, the new approach is not adequate. Because of the focus on protecting municipal wellhead areas, the geographic reach of the re-inspection program will be patchy, and will not capture many lakes and streams that are vulnerable to nutrient loadings from septic systems. In many parts of our province, septic systems will continue to discharge nutrients without periodic inspections, with unquantified impacts on aquatic ecosystems.

Enforcement of the on-site sewage provisions of the Building Code Act, 1992 is the responsibility of local enforcement bodies, or "principal authorities" – the municipality, the board of health or the conservation authority, depending on the location within Ontario.

The Ministry of Municipal Affairs and Housing (MMAH) is supportive of initiatives which are designed to ensure that existing septic systems are properly maintained and operated by property owners. The BCA provides regulatory powers that can be used for the re-inspection of existing septic systems.

There are many benefits from the implementation of a septic system re-inspection program. These benefits include a raised awareness among property owners as to septic system operation and maintenance issues; the identification of properties with older, potentially failed or failing systems so that corrective action can be undertaken; and a general improvement in the natural environment and public health. The importance of tourism in many areas where septic systems are used cannot be overlooked as water quality plays a significant role in maintaining the viability of local tourism industries.

Since septic repairs and replacement costs can be significant, they are often delayed or not completed until it is too late. Although new mandatory septic system inspections related to source water protection are good, they do not capture the majority of systems especially those near water bodies or other sensitive ecological areas.

Ontario Regulation 315/10 also amended the Building Code to govern discretionary maintenance inspection programs established by principal authorities. The regulation provides that discretionary inspection programs shall apply to all on-site sewage systems in the area affected by the program, and that an inspector shall inspect all sewage systems affected by the program.

The regulation authorizes inspectors who are not fully qualified under the building code to undertake inspections of on-site sewage systems under mandatory and discretionary on-site sewage system maintenance inspection programs. However, these inspectors must be supervised by a Chief Building Official or qualified inspector and may not issue orders.

Note: "Mandatory" and "Discretionary" are reference terms related to the regulatory requirements for inspections under the Building Code Act.

What is a Septic System Re-inspection?

Generally, a septic system re-inspection is a non-invasive review of a property's private existing sewage system. It is largely a visual inspection to look at the ground surface and surrounding area for either existing or potential problems. Such inspections do not damage any system components.

The Province of Ontario has delegated the responsibility to regulate on-site sewage systems (with total daily design flow of less than 10,000 litres per day) to municipalities. The authority to do so was transferred from the Environmental Protection Act to Part 8 of the Ontario Building Code which defines a sewage system as a "building". Implementation of Code requirements is meant to ensure proper installation, operation and maintenance of on-site sewage systems. A sewage system that is discharging effluent onto the surface of the ground, or that has not been maintained or operated in accordance with the Code is determined to be an unsafe "building". Any remedial action required will be addressed pursuant to the Ontario Building Code.

Given Sudbury's large number of septic systems many of which are aging, a preventative discretionary Septic System Re-inspection program is prudent. Many other municipalities have developed similar programs. The Program should build on best practices and lessons learned while adhering to the new source water protection septic system re-inspection guidelines.

WHAT: Establish a discretionary re-inspection policy and program for individual sewage systems which could negatively affect water quality.

WHERE: Long Lake.

HOW: Use knowledge and practices gained by other municipalities which have already moved to discretionary sewage system re-inspection programs (e.g. Township of Springwater).

WHEN: Now or as soon as possible. Set plan dates and deadlines.

WHO: Collaboration on plan between LLSC and CGS.

RESOURCES:

GSWA letter to city re: Septic System Re-inspections - July 28, 2014

LLSC letter to city re: Septic System Re-inspections - Dec 16, 2014

Township of Springwater presentation (detailed in LLSC letter to City Dec. 16, 2014 - attachment 4).

LLSC approach to city - June 16, 2016 (Lake Capacity/Official Plan/Septic Systems)

Township of Springwater:

- Septic Re-Inspection Program Guide
- THE CORPORATION OF THE TOWNSHIP OF SPRINGWATER
  BY-LAW 2015-034 - A By-Law to Implement a Septic System Re-Inspection Program - see:
  http://www.springwater.ca/municipal_services/building_services/septic_re-inspection_program/

Ministry of Municipal Affairs and Housing (MMAH) - March 2011 - On-Site Sewage System Maintenance Inspections - see
http://www.mah.gov.on.ca/Page11153.aspx

Final Report - University of Guelph to MMAH - May 2007 - see
http://www.uoguelph.ca/orwc/Research/documents/reinspection_final_report_with_appendices.pdf

Township of Tiny – Septic Re-Inspection Program -see
http://www.tiny.ca/Pages/Septic-Re-Inspection.aspx

Township of North Frontenac – Septic Re-Inspection Program Report - see
http://www.northfrontenac.com/assets/pdf/council/minutes/2012-01-09pres.pdf

...The LLSC would be happy to discuss any of the suggested wording changes as below with whomever the City deems appropriate prior to the Official Plan being finalized...

Submission by Long Lake Stewardship committee (LLSC) on the following:

1. Suggested wording for the Official Plan with regard to **section 12 – Individual Systems - Policies**: Leave the wording as it was in the plan before the phase 1 OP draft – as follows:

12.2.3.2. The City will ENSURE (KEEP THIS WORDING PLEASE) that a regular system of inspection of individually-operated water and wastewater systems is carried out throughout the City and that faulty systems are repaired, maintained and upgraded to meet health and environmental standards.

2. Suggested wording for the Official Plan with regard to **section 21.11 - Long Lake Area Waterbodies** (as shown on the map on Schedule "2a"):

21.11 LONG LAKE UNSERVICED RESIDENTIAL & LONG LAKE WATERBODIES.

Certain inhabited shorelines, as shown on Official Plan Schedule "2a" (FOR LONG LAKE & LONG LAKE WATERBODIES) remain unserviced and will not likely be serviced within the plan period.

1. On existing lots in these areas, single detached permanent dwellings are permitted provide that:
   a. The lot fronts on a public road that is open and maintained year round by the City, of where a registered right of way provides access from the parcel to an existing public road maintained year round;
   b. The City engineer is satisfied that a potable source of water supply is available;
   c. Approval is obtained from the Principal Authority (the appropriate regulatory authority) for a private sewage disposal system; and ,
   d. All new dwellings or conversion of existing seasonal dwellings in these areas can meet the standards specified in the Zoning By-law and the Ontario Building code for permanent dwellings; and ,
   e. All new dwellings or conversion of existing seasonal dwellings follow current guidelines for setbacks/buffers from the shorelines as per City and Ministry directives (20m) whichever is greater;
   f. All destruction of natural shoreline buffers to be limited to 25% of the total linear frontage on the lakeshore, for a dock or boathouse only.

2. Severances may be permitted provided that:
   a. The lot created and the lot remaining have a minimum lot size of 0.8 hectare (two acres) and minimum water frontage of 45 metres (148 feet); and,
   b. The conditions of Policy 1 can be met.

3. The Lake Capacity Study undertaken by the Long Lake Stewardship committee and completed in Dec. of 2015 is to be the official baseline for Lake Water Quality and Phosphorus loading in the lake. The report resulting from the study is a snapshot of lake health and should be used as a planning tool and a term of reference for future decisions concerning development on Long Lake.

4. All public boat launches located on City property and private boat launches where authorized by the owner(s) shall require signage (at a minimum) to alert boaters to the issue of invasive species that can be transferred by unclean boats and other watercraft. (WISH LIST ITEM: Ideally there should be boat washing stations erected at all public boat launches and personnel manning these stations to collect a fee for mandatory boat washing before entering Long Lake or any city lake with a watercraft however we do concur that this is not very realistic.)

5. Limiting excessive nutrients carried into Long Lake, particularly phosphorus, with runoff from fertilized lawns, urban or agricultural activity and poorly maintained septic systems, is a number 1 priority in maintaining Long Lake water quality and preventing detrimental effects on the lake including frequent undesirable algae blooms, excessive growth of aquatic plants, decrease in water clarity and possible increases of carcinogens.

6. Recognition is given to the approximately 25% of 331 permanent residences on Long Lake whose primary source of drinking water is lake water (or Long Lake waterbodies water) and the City will endeavour to protect these primary drinking water sources and all water consumed by private citizens as governed by the Source Water Protection Act and the Clean Water Act.

7. The City will ensure that a comprehensive discretionary septic system re-inspection program be implemented on all septic systems on Long Lake and Long Lake waterbodies as per a multi-year schedule proposed by the Long Lake Stewardship Committee in Sept. of 2016. In addition, any new septic systems that are approved for new construction to be subject to a final approval by the Principal Authority's certified representative before an occupancy permit for the new residence is issued by the City and also be subject to a 5 year re-inspection

following construction, to ensure the septic system is functioning properly after installation)

(POSSIBLE SCHEDULE FOR RE-INSPECTION THAT LLSC IS WILLING TO ASSIST IN RESEARCHING AND DEVELOPING)

Year 1 (2017) - CGS designated Principal Authority; Council approval/budget; funding sources; admin tasks; training of inspectors and pumpers, public info sessions

Year 2 (2018) - letters to owners of high-risk systems 20+ years at beginning of year; inspection and follow up of high-risk systems from spring to fall

Year 3 - (2019) - letters to owners of medium-risk systems 10-20 years at beginning of year; inspection and follow up of medium-risk systems from spring to fall

Year 4 - (2020) - letters to owners of low-risk systems 0-10 years at beginning of year; inspection and follow up of low-risk systems from spring to fall

Revised KRIS

CHAIR AND MEMBERS OF PLANNING COMMITTEE
CITY OF GREATER SUDBURY
PO BOX 5000
200 BRADY STREET
SUDBURY, ON, P3A 5P3

MART KIVISTIK

SEPTEMBER 30, 2013

CHAIR AND MEMBERS OF PLANNING COMMITTEE:

I REPRESENT MR. ANGELO CUSINATO WHO OWNS CERTAIN LANDS ON VALLEY VIEW DRIVE IN VALLEY EAST. ON HIS BEHALF I WROTE A LETTER DATED APRIL 8, 2013 TO MR. MARK SIMEONI, MANAGER OF COMMUNITY AND STRATEGIC PLANNING REQUESTING THAT THE CITY CHANGE THE OFFICIAL PLAN LAND USE DESIGNATION FROM RURAL TO INDUSTRIAL OF MR. CUSINATO'S PROPERTY AS PART THE OFFICIAL PLAN REVIEW PROCESS.

THIS LETTER PROVIDES YOU THE BACKGROUND AND THE PLANNING RATIONALE TO DESIGNATE MR. CUSINATO'S PROPERTY AS INDUSTRIAL WHICH WILL THEN PERMIT HIM TO APPLY FOR AN INDUSTRIAL ZONING AND A DRAFT PLAN OF SUBDIVISION.

PROPERTY DESCRIPTION:

PIN 73501-2148 AND PIN 7350-6370, LOT8, CONCESSION 5, TOWNSHIP OF BLEZARD AND IS 30 HECTARES (71 ACRES) IN AREA.

LOCATION:

ATTACHED TO THIS LETTER ARE TWO MAPS. MAP "A" IS AN EXCERPT OF THE OFFICIAL PLAN LAND USE MAP WHICH IDENTIFIES THE INDUSTRIAL DESIGNATION OF THE VALLEY EAST INDUSTRIAL PARK IN GRAY COLOUR AND THE LOCATION OF THE CUSINATO LANDS IN YELLOW TO THE EAST. MAP "B" IS A ZONE MAP OF ZONING BY-LAW 2010-100Z IDENTIFYING THE "MI", LIGHT INDUSTRIAL ZONING OF THE VALLEY EAST INDUSTRIAL PARK OUTLINED IN RED. THE CUSINATO PROPERTY IS COLOURED YELLOW.

PLEASE NOTE THAT A NORTHERLY PORTION OF THE CUSINATO PROPERTY ABUTS A PORTION OF THE VALLEY EAST INDUSTRIAL PARK WHICH IS DESIGNATED INDUSTRIAL IN THE OFFICIAL PLAN BUT IS STILL ZONE AS "RU", RURAL.

THE CUSINATO PROPERTY IS ON THE NORTH SIDE OF VALLEY VIEW DRIVE AND HAS SOME 328 METRES OF FRONTAGE ON VALLEY VIEW DRIVE AND ABUTS A PORTION OF THE EXISTING VALLEY EAST INDUSTRIAL PARK WHICH IS WEST FROM THESE LANDS.

SURROUNDING LAND USES:

THE VALLEY EAST INDUSTRIAL PARK IS TO THE WEST AND THE LANDS IMMEDIATELY TO THE WEST ARE USED FOR INDUSTRIAL PURPOSES AS ARE THE LANDS ON THE THE SOUTH SIDE OF VALLEY VIEW DRIVE. SCATTERED RURAL RESIDENTIAL USES ARE FURTHER EAST ALONG VALLEY VIEW DRIVE.

SERVICES:

MUNICIPAL WATER IS AVAILABLE ON VALLEY VIEW DRIVE BUT THERE ARE NO SANITARY SEWER SERVICES AVAILABLE.

CLARIFICATION:

IN OUR LETTER OF APRIL 8, 2013 TO MR. MARK SIMEONI WE REQUESTED THE CHANGE IN LAND USE DESIGNATION TO INDUSTRIAL AS WELL AS AN AMENDMENT TO THE SETTLEMENT BOUNDARY. WE WERE UNDER THE IMPRESSION THAT AN AMENDMENT TO THE BOUNDARY WAS NECESSARY TO ACCOMMODATE THE CHANGE TO INDUSTRIAL. THIS IS NOT THE CASE AND WE ARE NO LONGER REQUESTING A BOUNDARY EXPANSION TO INCLUDE THESE LANDS. WE ARE ONLY REQUESTING THAT THESE LANDS BE DESIGNATED INDUSTRIAL.

SOME OTHER EXAMPLES OF INDUSTRIAL LANDS BEING OUTSIDE SETTLEMENT BOUNDARIES INCLUDES THE WALDEN INDUSTRIAL PARK AND VARIOUS SITE SPECIFIC INDUSTRIAL USES.

OFFICIAL PLAN COMFORMITY

POLICY 4.5.1 5 STATES THAT WHERE DEVELOPMENT OCCURS IN AREAS THAT ARE NOT FULLY SERVICED, ONLY DRY INDUSTRIES THAT GENERATE LESS THAB 4,500 LITRES OF WASTEWATER A DAY MAY BE PERMITTED. THIS PROPOSED DEVELOPMENT IS SIMILAR TO OTHER PROPERTIES IN THE VALLEY EAST INDUSTRIAL PARK WHICH HAVE BEEN DEVELOPED WITHOUT MUNICIPAL SANITARY SERVICES, USING PRIVATE WASTE DISPOSAL SYSTEMS. THE WALDEN INDUSTRIAL PARK IS ANOTHER EXAMPLE OF INDUSTRIALLY DEVELOPED LANDS IN SUDBURY WITH NO MUNICIPAL SANITARY SERVICES , ONLY WATER.

GROWTH AND SETTLEMENT POLICY DISCUSSION PAPER JUNE 24TH, 2013

THIS PAPER WAS PRESENTED TO PLANNING COMMITTEE BY PLANNING STAFF TO FORM THE BASIS OF THE NEW OFFICIAL PLAN. THE REPORT STATES THAT THE CITY CURRENTLY HAS 175 HECTARES OF DRAFT APPROVED INDUSTRIAL SUBDIVISIONS AND 795 HECTARES OF VACANT DESIGNATED INDUSTIAL LANDS. THE CITY USES A FORMULA OF 15 JOBS PER HECTARE TO CALCULATE THE NUMBER OF JOBS FROM THE DESIGNATED LANDS. THE COMBINED ACREAGE OF INDUSTRIAL LANDS, 970 HECTARES CAN CREATE 14,550 JOBS. THE 795 DESIGNATED HECTARES CAN CREATE 11,925 JOBS. BASED ON THE HIGH GROWTH SCENARIO OF THE REPORT OF 345 NEW JOBS PER YEAR, THESE DESIGNATED LANDS WOULD REPRESENT ABOUT A 34 YEAR SUPPLY OF INDUSTRIAL LANDS.

THE PAPER STATES THAT THERE ARE REQUESTS TO ADD AN ADDITIONAL 53 HECTARES OF INDUSTRIAL LANDS, 30 OF WHICH ARE MR. CUSINATO'S AND 23 BY SOMEONE ELSE. THE CUSINATO PROPERTY OF 30 HECTARES WOULD ONLY ADD AN ADDITIONAL 450 JOBS TO THE EQUATION. THIS WOULD REPRESENT A 1.3 YEARS SUPPLY.

PROVINCIAL POLICIES

THE PROVINCIAL POLICY STATEMENT REQUIRES THAT MUNICIPALITIES HAVE A 20 YEAR SUPPLY OF INDUSTRIAL LANDS TO MEET FUTURE NEEDS.

THE GROWTH PLAN FOR NORTHERN ONTARIO, 2011, APPROVED BY THE LIEUTENANT GOVERNOR IN COUNCIL, IS MUCH MORE SPECIFIC IN ITS POLICIES. IT REQUIRES THAT OFFICIAL PLANS MAINTAIN UP TO A 20 YEAR SUPPLY OF INDUSTRIAL LANDS IN APPROPRIATE LOCATIONS TO SUPPORT ECONOMIC DEVELOPMENT OBJECTIVES.

CITY SUPPLY OF INDUSTRIAL LANDS

THE COMMUNITY AND STRATEGIC PLANNING SECTION'S APPENDIX D OF THE GROWTH AND SETTLEMENT POLICY DISCUSSION PAPER OF JUNE 24, 2013 STATES THAT THE CITY HAS 795 HECTARES OF DESIGNATED DEVELOPABLE INDUSTRIAL LANDS. THIS AREA WOULD CREATE 11,925 JOBS WHICH WOULD BE A 34.5 YEAR SUPPLY, WELL IN EXCESS OF THE 20 YEARS AS REQUIRED UNDER THE PROVINCIAL POLICY STATEMENT. OF THIS TOTAL 79.1 HECTARES OR 9.9% ARE IN VALLEY EAST AND 449.7 HECTARES, 56.5% IN NICKLE CENTRE. ONLY 213.1 HECTARES OR 26.7 % ARE IN THE CITY.

BASED ON THE 34.5 YEAR SUPPLY, WELL IN EXCESS OF THE PROVINCIAL REQUIREMENT, PLANNING STAFF IS RECOMMENDING THAT NO ADDITIONAL LANDS BE DESIGNATED AS INDUSTRIAL.

ANALYSIS OF INDUSTRIAL LAND DATA

THE VAST MAJORITY OF THE INDUSTRIALLY DESIGNATED LANDS IN NICKLE CENTRE , SAY 80% OR 357.3 HECTARES ARE IN CONISTON. THESE LANDS HAVE BEEN AVAILABLE FOR DEVELOMENT FOR MANY DECADES BUT TO THIS DAY HAVE NOT BEEN DEVELOPED BUT REMAIN PART OF THE INDUSTRIAL LAND SUPPLY INVENTORY. IN VALLEY EAST THE 79 .1 HECTARES CONSTITUTE THE CITY OWNED LANDS IN HANMER TOWNSHIP WHICH HAVE BEEN ZONED AND READY FOR DEVELOPMENT FOR SOME 30 YEARS BUT REMAIN VACANT TODAY. THIS TOTAL ALSO COUNTS TOWARD THE EXISTING INVENTORY.

THESE TWO AREAS TOGETHER HAVE 436.4 HECTARES OF DESIGNATED INDUSTRIAL LANDS WHICH WOULD CREATE 6,546 JOBS AND WOULD BE AN 18.9 YEAR SUPPLY.. THE PROVINCIAL POLICY STATEMENT REQUIRES THAT THE CITY HAVE A 20 YEAR SUPPLY OF INDUSTRIAL LANDS AVAILABLE TO ACCOMMODATE THE 6,900 NEW JOBS TO BE CREATED DURING THIS TIME PERIOD. THESE TWO AREAS BY THEMSELVES ALMOST SATISFY THE PROVINCIAL REQUIREMENT. IF STRICTLY APPLIED THE CITY WOULD ONLY NEED AN ADDITIONAL 20.9 HECTARES OF INDUSTRIAL LANDS OVER THE NEXT 20 YEARS TO SATISFY THE PROVINCE.THE FACT THAT THESE TWO AREAS HAVE NOT BEEN DEVELOPED OVER THE LAST 25-35 YEARS LEADS TO THE CONCLUSION THAT THEY ARE NOT IN AN APPROPRIATE LOCATION WHERE THE DEMAND IS AND SHOULD NOT BE COUNTED IN THE 20 YEARS SUPPLY CALCULATIONS. IF THESE 436.4 HECTARES ARE NOT COUNTED THEN THE CITY ONLY HAS 353.6 HECTARES AVAILABLE AND AT 15 JOBS PER HECTARE IT WOULD ONLY YIELD 5,304 JOBS. THIS WOULD ONLY BE A 15.37 YEAR SUPPLY. IN ORDER TO COMPLY WITH THE PROVINCE AN ADDITIONAL106.4 HECTARES

OF INDUSTRIAL LANDS WOULD BE REQUIRED. THE 106.4 HECTARES WOULD ACCOUNT FOR 1,596 JOBS AND A 4.6 YEAR SUPPLY.

STAFF RECOMMENDATION

THE STAFF RECOMMENDATION IN THE GROWTH AND SETTLEMENT POLICY DISCUSSION PAPER OF JUNE 24TH IS TO MAINTAIN THE STAUS QUO AND NOT DESIGNATE ANY ADDITIONAL INDUSTRIAL LANDS. TO MAINTAIN THE STAUS QUO WILL IMPAIR THE CITY'S ABILTY TOGROW OVER THE NEXT 20 YEARS AND GOES COUNTER TO THE CITY OFFICIAL PLAN POLICIES ON ECONOMIC DEVELOPMENT WHICH STATE THAT THE CITY IS OPEN FOR BUSINESS.

CONCLUSION

THE INVENTORY OF DESIGNATED INDUSTRIAL LANDS ARE NOT IN APPROPRIATE LOCATIONS. THE VALLEY EAST AND CONISTON LANDS HAVE BEEN AVAILABLE FOR DEVELOPMENT FOR SOME 25-35 YEARS BUT THERE HAS NOT BEEN A DEMAND IN THOSE LOCATIONS. THE DEMAND HAS BEEN ELSEWHERE, IN APPROPRIATE LOCATIONS. THESE LANDS SHOULD NOT BE COUNTED IN THE INVENTORY OF DESIGNATED INDUSTRIAL LANDS.

THE CUSINATO PROPERTY OF 30 HECTARES IS ABLE TO PROVIDE 450 JOBS WHICH REPRESENTS A 1.3 YEAR SUPPLY. AS INDICATED EARLIER THE CITY NEEDS TO ADD AN ADDITIONAL 106.4 HECTARES OF INDUSTRIAL LANDS TO SATISFY THE PROVINCIAL REQUIREMENT OF A 20 YEAR SUPPLY. SOME OF THIS SHORTFALL CAN REDUCED BY THE DESIGNATION OF THE CUSINATO LANDS AS INDUSTRIAL.

IF THE CITY HOPES TO ATTAIN ITS ECONOMIC GOALS AS ARTICULATED IN THE OFFICIAL PLAN IT MUST FIND ADDITIONAL INDUSTRIAL LANDS IN APPRPOPRIATE LOCATIONS AS DICTATED IN THE GROWTH PLAN FOR NORTHERN ONTARIO, 2011. ONE OF THESE LOCATIONS IS THE CUSINATO LANDS ON VALLEY VIEW ROAD.

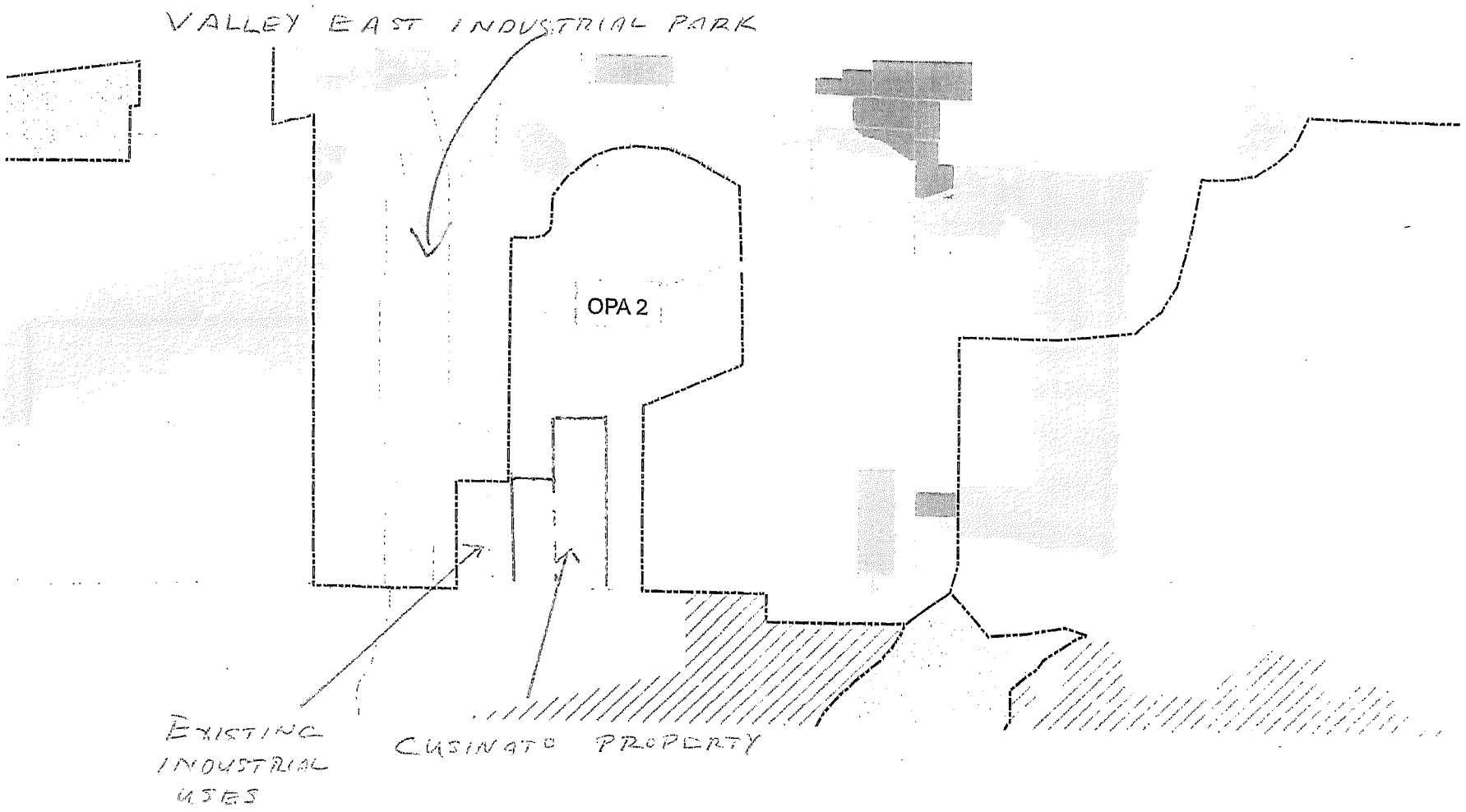
FAILURE TO DESIGNATE THE CUSINATO LANDS AS INDUSTRIAL MEANS THE CITY WILL NOT BE ABLE TO AMENDS ITS OFFICIAL PLAN UNTIL THE NEXT COMPREHENSIVE REVIEW OF THE OFFICIAL PLAN, SOME MANY YEARS AWAY. THE CITY WILL NOT BE ABLE TO RESPOND TO MARKET DEMANDS FOR INDUSTRIAL AND EMPLOYMENT LANDS AND WILL NOT BE ABLE TO COMPETE WITH OTHER NORTHERN ONTARIO MUNICIPALITIES.

RESPECTFULLY SUBMITTED

MART KIVISTIK MCIP, RPP

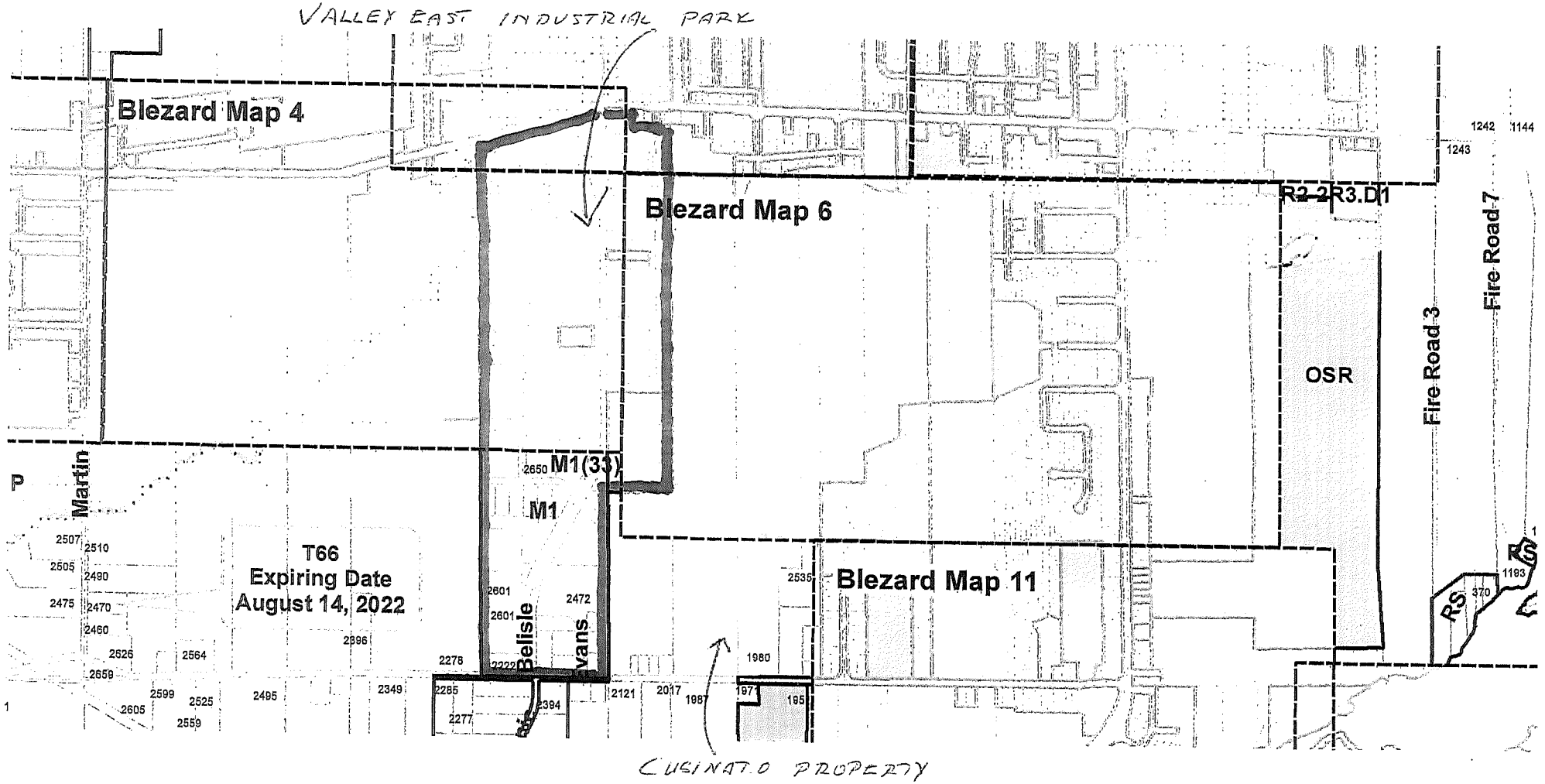
CC: MR. ANGELO CUSINATO
COUNCILLOR DUPUIS

EXCERPT FROM OFFICIAL PLAN
LAND USE MAP



MAP "B"

Zone Map
By-law 2010-100Z



Debbie Belowos - Fwd: RE: GSCC Submission: Phase 1 OP Review (please refer to this one)

From: Kris Longston
To: Belowos, Debbie; Melissa Riou; Ed Landry
Date: 11/16/2016 9:10 PM
Subject: Fwd: RE: GSCC Submission: Phase 1 OP Review (please refer to this one)
Attachments: Advocacy- GSCC Submission- OP Review Phase 1 - 2016 -FINAL.pdf

For inclusion with the OP comments. We should add the chamber to the mailing list if they aren't already.

Thanks,
Kris

>>> Joyce Mankarios 11/10/2016 11:13 AM >>>
My apologies – please disregard the previous submission. The most up-to-date submission is attached. Please refer to this document.
Sorry about that.
Joyce

Joyce Mankarios
Policy and Public Relations Manager
Greater Sudbury Chamber of Commerce
100-40 Elm Street, Sudbury, ON P3C 1S8
T:
F:

www.sudburychamber.ca
#voiceofbusiness

Your Business Network

From: Joyce Mankarios
Sent: November-10-16 11:01 AM
To: 'Jason Ferrigan'; 'Kris Longston'; 'Ed Landry'
Subject: GSCC Submission: Phase 1 OP Review

Dear Jason, Kris and Ed:

Thank you again for presenting an overview on the Official Plan to the chamber.

Please find attached the chamber's submission in response to Phase 1 of the OP Review.

Please let me know if you have any questions.

Many thanks in advance.
Joyce

Joyce Mankarios
Policy and Public Relations Manager
Greater Sudbury Chamber of Commerce
100-40 Elm Street, Sudbury, ON P3C 1S8

www.sudburychamber.ca
#voiceofbusiness

Your Business Network

Greater Sudbury Chamber of Commerce
Chambre de commerce du Grand Sudbury

40 Elm Street, Suite 100
Sudbury, ON P3C 1S8
Tel: 705.673.7133
Fax: 705.673.1951

Planning Services
City of Greater Sudbury
PO BOX 5000, STN 'A'
200 Brady St.
Sudbury, ON, Canada
P3A 5P3

RE: Draft Comments on Phase 1 of the *Official Plan* Review

Thank you very much for allowing the Greater Sudbury Chamber of Commerce the opportunity to provide input in response to Phase One of the *Official Plan* (OP) Review.

We also would like to thank Jason Ferrigan, Ed Landry and Kris Longston for presenting an update to the chamber on the *Official Plan*.

The chamber supports the principles of flexibility within the plan and positive opportunity/incentives for residential and commercial growth while balancing environmental concerns. We also believe the Official Plan should reflect what future generations would like to see for our City, such as opportunities for active transportation and living, working and playing in your own neighbourhood or community.

Below you will find some initial comments from the chamber regarding Phase One of the Review.

Areas of Focus

The *Official Plan* makes reference to the City developing a *Nodes and Corridor Strategy* to guide and stimulate the long term intensification of strategic core areas (e.g. Downtown, Regional Centres and major public institutions and medium change areas (e.g. Town Centres and Mixed Use Commercial corridors). The Plan identifies three Regional Centres: Kingsway at Barry Downe Road/Second Ave.; Lasalle Boulevard at Barry Downe Road and Regent Street at Paris Street/Long Lake Road. These nodes have been identified as areas of focus for more intensive forms of mixed-use development, active transportation and transit supportive development.

The chamber sees the identified areas as important centres in our community; however we find these areas largely retail focused. In an effort however to further promote areas of the city where people can live work and play in the same area, we recommend broadening the regional centres/nodes to reflect this balance.

Residential Target for the Downtown

The Plan outlines that the "… City will aim to double the number of people living in Downtown during the lifetime of this Plan." It also notes that in 2011, approximately 1,720 people lived in the Downtown. The 2012 Downtown Master Plan proposes a Greater Downtown population between 3,000 and 5,000 additional residents by 2020. In looking at the goal presented in the Downtown Master Plan for a span of eight years as well as the intention in the *Official Plan* to have more people living and working in the same area, we believe the target of doubling residential growth in the Downtown to be low considering the 20 year life span of the *Official Plan*. The chamber recommends that the target in the *Official Plan* be increased to be consistent with the types of targets

that have been established in the Downtown Master Plan. Considering this goal, the chamber also believes the *Official Plan* should have an enhanced focus on increasing residential development in the Downtown through incentives and other growth promotion strategies. In order for these ambitious targets to be met, we will have to make it as easy and attractive as possible to live in the Downtown.

Downtown Master Plan – Changes to the Plan

Page 59 of the OP Review document notes that "The City will monitor and adjust, as appropriate, the Downtown Sudbury Master Plan."

The chamber is seeking clarity around this statement and cautions against changes to the Downtown Master plan that proceed in a vacuum without community engagement. The chamber recommends that any proposed changes to the Master Plan be examined in collaboration with the Community Liaison Group and other relevant stakeholders. We recommend that the language in the review document pertaining to changes to the Downtown Master Plan be clarified to leave no room for interpretation.

Downtown Master Plan – Parking, Private-Public Partnerships and Innovation

We value the incorporation of the *Downtown Master Plan* within the *Official Plan*.

The chamber believes that an important part of the *Official Plan* should be to develop initiatives that leverage and build on the projects identified in the *Downtown Master Plan* and broaden the Downtown residential base in order to create conditions that ensure businesses in the Downtown can be viable.

On p.63 the document states that "the city will work with partners to invest in the infrastructure necessary to support growth in the Downtown through projects such as a structured parking facility." Parking is also referenced on page 188 (section 11.4). With significant developments being proposed in the Downtown (such as Place des Arts, the Synergy Centre) etc… we recommend that the *Official Plan* support a Downtown parking plan that meets the projected parking needs that will accompany these projects. These projects will potentially reduce the availability of parking spots in the Downtown and also create additional parking needs.

The *Official Plan* also makes reference to the economic potential of the agriculture sector in the city. The Downtown can serve as a potential area to accommodate commercial businesses that support the food sector in Sudbury as well as the agri-innovation cluster that go beyond the Farmer's Market.

We would also add that the *Official Plan* should encourage collaboration between public, private and non-profit sectors (particularly P3 relationships) when it comes to Downtown growth and development.

The chamber supports planning in the Downtown for spaces, services and activities that promote/encourage interaction and creativity, support innovation and contribute to a high quality of life. In this regard, the chamber supports the use of space in the Downtown for innovative uses such as business incubation. Business incubators (similar to NORCAT) for sectors such as tech or food for example that are supported with expertise and mentorship opportunities can serve as a useful tool to spur entrepreneurship and growth in the Downtown.

We also believe a reference to promoting the Downtown as a tourism destination should also be added to the *Official Plan*.

Transit Terminal Relocation

The OP Review doc states that "... the City will work with its partners to invest in the infrastructure necessary to support growth in the Downtown through projects such as structured parking facilities and, in the long term, examining the feasibility of relocating the Downtown transit terminal." In regards to the feasibility of relocating the transit terminal, the chamber believes this goal should be strengthened. This block near and around the transit terminal has not been functional and has raised a number of issues for the Downtown. This has been a continuous issue of debate in our city for years. The chamber believes the *Official Plan* should provide a timeline and specific goals related to making a decision on the transit terminal and fixing this section of the Downtown. We believe the current language in the review document stating that the city in the long-term will examine the feasibility of relocating the transit terminal is too broad and opens up the process to potential delays in decision making given the length of the plan.

Parks and Open Space Designation

On p.111 of the OP review document, it states that the City will require the dedication of land for parks or other recreational purposes. It also states that in areas where parkland targets have already been met, or lands to be dedicated are unsuitable, that the City will require payment-in-lieu of the parkland dedication. This section also outlines that the dedication of parkland will be calculated "for residential development with a density less than or equal to 36 units per hectare and residential development in the Downtown – 5%".

The chamber seeks clarification on what this type of fee entails and what the implications of this fee would mean for development in the Downtown. We would also like to seek clarification on how this parkland fee could potentially impact a developer/property owner developing lofts with more than 36 units for example. Being that a goal of the OP is to encourage residential development/intensification in the Downtown, the chamber recommends that the city look at the possibility of issuing exemptions to this parkland fee requirement for projects with significant economic development spinoffs for the City.

Heritage Buildings

In the chamber's discussion with the City's planning staff, staff noted that in terms of protecting the cultural heritage of buildings, that the plan is looking at the softer side of promoting the history of historic buildings rather than the hard designation. However, we find some of the language to be more on the restrictive side including the reference to it being up to the city's discretion or a cultural heritage impact assessment when it comes to decisions such as alterations renovations, additions or intensification of heritage buildings.

Although we recognize the importance of maintaining heritage integrity, we do want to ensure that burdensome/restrictive conditions are not imposed on business owners of heritage structures. We recommend the language in the document be amended to ensure that it is indeed the soft side of heritage protection that the city is advancing. The chamber cautions against imposing restrictions from another level of government when it comes to owning a heritage building. We do however

support initiatives such as plaques for heritage buildings or promoting greater education about these historic sites.

Additionally, the chamber would exercise caution in the area of preserving a heritage structure over efficient retrofitting for energy conservation. Although we understand the desire to protect the architecture of the past, we don't want to see it done at the expense of the environment of the future.

Active Transportation

The chamber appreciates the goals within the report to enhance active transportation in the city.

One element we see as potentially missing within this section is enhanced commuter parking spots in the New Sudbury/South End/Bell Park areas where people can park their cars and ride their bikes to work on trails or bike paths. Enhanced availability of commuter parking can lead to more commuters riding their bicycles to the Downtown from different areas of the City such as Val Caron. Enhancing commuter parking options can also lead to increased active transportation, reducing the overall number of cars in the Downtown.

Emerging Transportation Trends

The review document does not make mention of changing transportation trends in the province when it comes to trends such as the increased use of Uber (and other tech based applications), electric vehicles or the future of driverless cars for example.

The chamber recommends that the OP take into consideration some of these emerging trends in order to remain relevant and competitive. We also recommend that the OP reflect the need for charging stations across the city for electric vehicles.

Safety

In reflecting on the review document, the chamber found that there was limited mention of safety within the document. The chamber recommends that safety be integrated more significantly throughout the plan as a factor of constant consideration, particularly as it pertains to proper lighting for bike paths for example.

Increased Walkability around Seniors' Facilities/ Supportive Housing

There is a shortage of amenities/services near facilities such as Finlandia Village that residents can access by foot. The chamber recommends addressing the lack of walkability by offering zoning changes and incentives for business relevant to residents through the *Official Plan*.

Industrial Lands

The *Official Plan* references industrial lands and outlines that the Plan should "ensure that existing industrial lands are used efficiently and promote the development and redevelopment of existing, underutilized, and unused sites."

The chamber believes that the *Official Plan* should support the City of Greater Sudbury's Industrial Lands Strategy that was adapted by Council in 2012 to increase the number of shovel ready properties for investment opportunities. This strategy prioritizes a number of different industrial lands for infrastructure and wastewater upgrades. The chamber believes that the city should collaborate with property owners to also upgrade existing lands facing deficiencies to allow for business use of these properties.

The chamber would also like to seek clarification on what percentage of industrial lands in Greater Sudbury are development/shovel ready.

Urban Design Guidelines

The *Official Plan* states that the City will develop comprehensive Urban Design Guidelines.

The chamber supports the city's move to draft urban design guidelines to improve the quality and character of our community. We recommend that these guidelines be designed by working with the great talent in our community such as the School of Architecture, local architects, Post-Secondary Institution's design programs as well as local innovators and marketing/design agencies.

Support for our Resource Industry

The chamber appreciates the recognition within the *Official Plan* of Greater Sudbury's natural resources sector as globally important.

Although the plan includes separate land use designations for the extraction and processing of mineral and aggregate resources, we feel the plan lacks references to the promotion of mining as an economic engine for Greater Sudbury. We see the *Official Plan* as a potential venue to support expansion of the existing natural resource base but also supporting future development related to projects such as the Ring of Fire. Positive land use incentives can make Sudbury a more attractive option/destination for the location of a processing facility for the Ring of Fire, for example.

Secondary Suites

We commend the city on its work on secondary suites. We are in agreement with the planning department that secondary suites should not be subject to development charges.

*****

The chamber thanks you again for allowing us the opportunity to provide input into Phase One of the OP Review. Please feel free to consult us should you have any questions on our submission.

Yours truly,

Debbi Nicholson.

Debbi M. Nicholson
PRESIDENT & CEO

Debbie Belowos - Fwd: Letter Requesting Notice of Adoption of the Official Plan

From: Ed Landry
To: Debbie Belowos
Date: 12/16/2016 10:45 AM
Subject: Fwd: Letter Requesting Notice of Adoption of the Official Plan
Cc: Melissa Riou
Attachments: 20161212150014406.pdf

Hi Debbie,

Please add this to the comment binder and add the requesters to the adoption notification list.

Thank you

Ed

>>> Renee Stewart 12/16/2016 8:38 AM >>>
Please find attached the above mentioned document.

Thank you,

Renée Stewart
Clerk's Services Assistant
Clerk's Services
705-674-4455 Ext 2476

DECEMBER 5/16

CITY CLERK

PLEASE ACCEPT THIS LETTER AS OUR OFFICIAL REQUEST TO RECEIVE NOTICE OF ADOPTION OF THE OFFICIAL PLAN.

THANK YOU

PERRY MCKINNY & SANJA O'KANE

Debbie Belowos - Fwd: Re: Watershed Advisory Panel Official Plan Submission

From: Kris Longston
To: Melissa Riou; Belowos, Debbie; Ed Landry
Date: 1/3/2017 1:41 PM
Subject: Fwd: Re: Watershed Advisory Panel Official Plan Submission
Attachments: WAPOfficial_Plan_Submission_Dec2016.docx

For file and comment sheet.

thx
Kris

>>> Lilly Noble · 12/9/2016 3:46 PM >>>
Hi Stephen and Kris,

Here is the input from the Watershed Advisory Panel.

Thanks,
Lilly

On 2016-12-09, 11:23 AM, "Stephen Monet" <stephen.monet@greatersudbury.ca> wrote:

> Lilly: I meant to speak with you yesterday at the Ramsey Lake Subwatershed Study information session. Are the comments that you attached to the email below the final version? If so, I will send to Kris Longston and his group so they can be officially logged.

Thanks,

Stephen
Re: Watershed Advisory Panel Official Plan Submission
>>> Lilly Noble · 12/7/2016 12:11 PM >>>
Here's the final draft for our Official Plan submission so I'll be sending it to Stephen Monet unless I hear from any of you in the next couple of days.

Thanks,

Lilly

Submission to the Official Plan Review 2016 from the Watershed Advisory Panel for the City of Greater Sudbury

Reviewed by: Jeffery Huska; Charles Ramcharan; John Gunn; Derrick Luetchford (MNRF); Ed Snucins (MOECC); Anoop Naik; Lin Gibson; Sarah Woods; Wendy Wisniewski; Paul Truskoski; Lilly Noble; Mary Henderson; Margaret McLaughlin

8.2 Watershed Approach – The Link Between Land And Water, P-120

Background: The OP identifies three types of watershed based plans: the Greater Sudbury Source Protection Area Source Protection Plan, subwatershed studies that focus on stormwater management, and watershed based studies that focus on recreation and natural heritage values.

Concern: It is concerning that subwatershed plans are divided into those primarily addressing stormwater management and those addressing natural heritage values. All subwatershed studies should address all values and follow best practices as set out by Conservation Ontario. Section 8.5.2. is entitled Subwatershed Studies, but refers instead to Stormwater Management Plans (and is placed in the Stormwater Section). Stormwater Management Plans may be a component of a subwatershed study, but cannot replace a subwatershed study, which is much more comprehensive.

Recommendation:

All subwatershed studies should follow best practices recommended by Conservation Ontario.

All subwatershed studies must take a full look at the watershed:

- Aquatics: the ecology and biology of aquatic systems and communities;
- Water Quality: the physical, biological and chemical characteristics of surface waters;
- Hydrology: the surface water flows in a watershed and influences on flows;
- Stream Morphology: erosion, transfer and deposition of sediment;
- Groundwater: the sub-surface water, its occurrence, movement, chemistry, factors that influence it including interactions with surface flow systems;
- Terrestrial: the ecology and biology of terrestrial systems and communities, and connections to other systems outside the watershed;
- Social: social values & structures, minimize the threat to life, property and natural resources from flooding and erosion, local knowledge, demographics, cultural heritage, resource use:
- Economics: the economic impacts of activities or plans on values.

It must identify form, function and linkages of the natural system (aquatic & terrestrial), identify where development may or may not be permitted, and assess cumulative impacts of changes to natural environment.

It must assess and identify the most significant challenges in the subwatershed.

The overall goal should be healthier, more resilient watersheds.

Goals and objectives must include the primary focus of subwatershed studies: protecting natural ecosystem function. Objectives should include: improve water quality; restore aquatic life and biodiversity; protect and enhance habitat; reduce phosphorus; reduce discharge of contaminants; protect and restore important natural areas; increase natural wetland and vegetative cover and decrease impermeable surfaces within the watershed; increase urban forest cover; increase resilience to climate change; address invasive species; reduce number of beach closures; and protect public drinking water sources (including from salt). Quantitative targets are desirable.

It must specifically **identify sensitive surface water features, sensitive groundwater features, wetland occurrence and sensitivity of individual wetlands, and environmental constraints within the watershed**. This will trigger protective policies in our Official Plan to protect the health of our watersheds.

It should include a monitoring plan, and measures for compliance, as part of implementation.

Section 8.5. should be edited to distinguish properly between subwatershed studies and stormwater management studies and clearly list the requirements of each.

12.2.3 Individual Sewage Systems, Policies, Pg-203

Background: The OP was edited as follows: "*the City will work with its partners to encourage (ensure) that a regular system of inspection of individually operated water and wastewater systems is carried out throughout the City and faulty systems are repaired, maintained and upgraded to meet health and environmental standards.*"

Concern: The language has been softened from "ensure" to "encourage".

In a 28 July 2014 letter to Mayor and Council, regarding changes to the Official Plan, the Greater Sudbury Watershed Alliance (GSWA) formally requested a "mandatory Septic Inspection Program to require regular maintenance and inspection of all holding tanks, septic tanks, leaching beds (including outhouses and pit privies) in order to preserve fresh water resources, and protect the environment and public health and safety. Following the institution of the program, re-inspections would be repeated every 5 years."

Additionally, in a letter dated 6 December 2014 to City Council, the Long Lake Stewardship also urged the City of Greater Sudbury, along with the Board of Health of the Sudbury District Health Unit, to establish septic system re-inspections in the Greater Sudbury area. The purpose was to help identify septic systems with deficiencies, and to work with property owners to ensure that their septic systems operate properly.
The rationale for requesting these inspections is the prevalence of blue-green algae blooms in Sudbury lakes and rivers, and the knowledge that a properly working septic system can limit some phosphorus loading in a waterway. In a disturbing trend, 2015 was a record year for reported blue-green algae blooms in Sudbury lakes. Further rationale for mandatory septic system inspections is contained in the amended Ontario Building Code (OBC) Ontario Regulation 315/10. The OBC has established mandatory on-site maintenance programs administered by the Principal Authorities in vulnerable areas. These programs target source protection but could include sites located within 300m of lakes, rivers, streams, creeks and wells.
Furthermore, for lakes in the city core, most properties might likely have approved septic systems, but the situation may differ for outlying lakes where absence of approved septic systems may be common. Efforts should also be directed towards identifying these properties that do not have approved septic system.
Recommendation: We are requesting that the original language be restored to read, *"the City will ensure that a regular system of inspections on individually operated water and wastewater...."*.

9.2.3 Wetlands, Policies, P-153

Background: The OP remains unchanged: *"In areas without a watershed or subwatershed plan, site-specific wetland occurrence and EIS requirements will be determined by municipal staff prior to or at the time of application."*
Concern: The OP properly reports on the valuable ecosystem services that wetlands provide. Wetlands also buffer the effects of a changing climate. Identification of wetlands and completion of an EIS should not be discretionary.
Recommendation: The text should read, "In areas without a watershed or subwatershed plan, site-specific wetland occurrence and EIS will be required."
Wetlands provide vital ecological functions including fish and wildlife habitat, groundwater recharge and discharge, water quality protection, flood and erosion control and increased biodiversity. They are havens of biological richness, and include marshes, swamps, bogs and fens. Wetlands in Greater Sudbury also retain high levels of heavy metals from entering water bodies and need to be protected. Mechanisms should be in place for permanent protection of wetlands through conservation easements, land purchase, or other means of land securement.

8.5.3.12 Stormwater, P 148

Background: Low Impact Development and green infrastructure are not mentioned in the Official Plan. However, it does state *'Development and intensification are encouraged to maximize the use of pervious materials and manage stormwater as close to the source as possible. P. 148.'*
A municipality should have a plan that provides direction to avoid or minimize and mitigate stormwater volume, contaminant loads and impacts to receiving water courses in order to: maintain groundwater quality and flow and stream baseflow; protect water quality; minimize the disruption of pre-existing (natural) drainage patterns wherever possible; prevent increases in stream channel erosion; prevent any increase in flood risk; and protect aquatic species and their habitat.
Concern: Low Impact Development and green infrastructure should be an integral part of stormwater management, as recommended by the province (Policy Review of Municipal Stormwater Management in the Light of Climate Change: https://www.ontario.ca/page/policy-review-municipal-stormwater-management-light-climate-change).
Recommendation: Add to 8.5.3.12: 'LID and innovative best practices for stormwater management as recommended by the province (Policy Review of Municipal Stormwater Management in the Light of Climate Change) should be encouraged through site plan control for private and public developments.'
Add to programs: '2. Identify and implement opportunities for green infrastructure contributing to stormwater management on public land.'

Low-impact development defined: "An approach to stormwater management that seeks to manage rain and other precipitation as close as possible to where it falls in order to mitigate the impacts of increased runoff and stormwater pollution. It comprises a set of site design strategies and distributed, small scale structural practices to mimic the natural hydrology to the greatest extent possible through infiltration, evapotranspiration, harvesting, filtration and detention of stormwater. Low impact development can include: bio-swales, permeable pavement, rain gardens, green roofs and exfiltration systems. Low impact development often employs vegetation and soil in its design, however, that does not always have to be the case."
'A MOE policy vision for resilient systems for municipal stormwater management may include, for example, the following considerations:

- *Include both source control (lot, neighbourhood) and conventional stormwater management.*
- *Reduce the generation of stormwater by building communities that interfere less with the natural water cycle.*
- *Reuse stormwater and recognize stormwater as a resource (e.g. for flushing toilets, landscape watering).*
- *Recycle the municipal stormwater back into the natural water cycle, with careful regard for water quality and quantity cumulative impacts on watersheds and groundwater.*

• *Include data collection and vulnerability assessment for the existing conventional stormwater management systems to assist in adaptation decisions by municipalities.*

• *Include long term planning for municipal stormwater management including a systematic approach to adaptation and assessment of the cumulative impacts on the watershed.*

• *Include tracking the progress of climate change adaptation, in particular source control, across the province as part of public education.*

There would be environmental and possible fiscal benefits to municipalities through adopting this approach.' Policy Review of Municipal Stormwater Management in the Light of Climate Change

10.2 Flooding And Erosion Hazards, P-164

Background: The OP text acknowledges the role of the NDCA and the MNRF in regulating development and site alteration on floodplains.
Concern: The role of the City in regards to relevant PPS policies should also be acknowledged. The Policy restricting development within 15m of floodplains has been removed. With increased flooding anticipated with climate change, restrictions on building on and adjacent to floodplains should be strengthened, not weakened.
Recommendation: Restore the Policy 'no development is permitted within 15 metres of the Flood Plain boundaries.'
In 10.2. 3. Add reference to the floodplain: 'For purposes of clarity, institutional uses such as hospitals, long-term care facilities, retirement homes, pre-schools, elementary schools and secondary
schools; essential emergency services and industrial uses involving the disposal, manufacture, treatment or storage of hazardous substances are not permitted on floodplains or lands subject to flooding or erosion hazards.

9.4 Ecosystem Recovery: Land Reclamation And The Urban Tree Canopy, P-159

Background: Section 9.4.2 states: 'New development, redevelopment, and municipal infrastructure works on previously restored land will be required to mitigate any impacts to existing soil and vegetation. Where mitigation through avoidance is not possible, onsite soil erosion will be prevented and all vegetation removed will be replaced through appropriate and adequate site landscaping and/or land reclamation measures.'
Concern: Reclaimed sites have scientific value (collection of long term data) as well as community and green space value, which cannot be replaced. VETAC has a short list of the sites of most scientific value, and these sites should be protected for continued long term study. The 'Sudbury Protocol,' which benefits not only Sudbury but other communities worldwide, relies on long term data collection on reclaimed sites.
Recommendation: Add 'any development or redevelopment on restored land identified as a priority site by VETAC will be subject to an EIS, and to site plan control to protect the scientific value of the site, in consultation with VETAC'.

Climate Change

We are pleased to see the Program: 'The City, thought the **Climate Change Adaptation Strategy**, will assess the risk associated with climate change and flood hazards and formulate appropriate strategies.'

We trust that this document will also address climate change mitigation, and set targets for greenhouse gas reduction for Greater Sudbury.

In the interim, reference to mitigating and adaptation to climate change should be made in all relevant sections of the Official Plan, such as managing growth and change, local food and agriculture, water and natural environment, flooding and erosion hazards, transportation and infrastructure, urban design, and energy.

Climate change poses a serious challenge for maintaining existing infrastructure and planning for new infrastructure, however these risks can be mitigated through vulnerability assessments. Similarly, comprehensive stormwater management planning, including considering the use of low impact development, can increase the resiliency of our communities.

- Require upper- and single-tier municipalities to incorporate climate change policies in their official plans, consistent wit the objectives of the province's Climate Change Strategy and greenhouse gas reduction targets.
- Encourage municipalities to develop greenhouse gas inventories, emission reduction strategies, and related targets an performance measures.
- Require municipalities to undertake more comprehensive stormwater management planning for their settlement areas and for major developments and to examine their infrastructure for weaknesses associated with climate change.
- Encourage the use o green infrastructure and require low-impact development techniques that include integrating green space in design strategies, landscaping with native plants, using natural water systems to generate less runoff from developed land.
- Enhance policies to align with those in the Provincial Policy Statement regarding planning for resilient infrastructure.

We are concerned that the sections on green and alternative energy have been removed from the Official Plan (p.206), and recommend that this section be restored and strengthened, in consultation with the local Community Energy Planning Committee. Local food, energy, and water security will all be more important with climate change.

Debbie Belowos - Fwd: LU Access Road Comments

From: Kris Longston
To: Belowos, Debbie; Melissa Riou; Ed Landry
Date: 1/3/2017 11:02 AM
Subject: Fwd: LU Access Road Comments
Attachments: TMP - LU access letter.pdf

For OP File and comment form.

>>> Kristi Arnold 12/12/2016 2:29 PM >>>
Hi Kris,
I am resending our comments, as the letter was sent in 2012.
Thanks.
Kristi

Kristi Arnold
Dalron
130 Elm Street, Suite 100
P3C 1T6

Website: www.dalron.com

Find us on facebook

Dalron
SINCE 1969
130 Elm St., Sudbury, ON P3C 1T6 Tel: (705) 560-9770 Fax: (705) 560-9800 www.dalron.com

City of Greater Sudbury
PO Box 5000 Stn A
200 Brady Street
Sudbury, Ontario
P3A 5P3

December 12, 2016

To: David Shelsted - Director of Roads and Transportation
Kris Longston - Manager of Community and Strategic Planning
Melissa Riou - Senior Planner

Re: Transportation Study – Official Plan Review
Laurentian University 2nd Access

It is our understanding the City of Greater Sudbury has retained the services of MMM group Ltd. To conduct a review of the City's Transportation Plan as part of the Official Plan Review. As part of this endeavour, we would request that the review include a re-examination of the need for a four lane divided right-of-way, with a cross section of 61 metres (200 feet), for the new roadway proposed to provide a second access to the South Peninsula of Lake Ramsey from Highway 69 South.

It is Dalron's intention to seek subdivision approval for lands owned by Dalron consisting of Parcels 15951, 47429, 11480 & 2132 S.E.S., in Lot 3, Concession 6, Township of Broder and Lot 4, Concession 1, Township of McKim. Schedule 7, Road Right of Way Widths, of the City Official Plan shows a proposed new road crossing these lands and extending through Laurentian University owned lands (Parcel 30769), ultimately connecting to South Bay Road. Schedule 7 indicates the right of way width for this road will be "Up to 61 metres", and staff advise that it is intended to be a four lane divided roadway.

Dalron shares the City's view that a second access to the South Peninsula is certainly warranted to accommodate existing traffic which is currently restricted exclusively to Ramsey Lake Road, as well as future growth on lands designated under the Official Plan for development within the South Peninsula. Further, recent expansions at the University as well as anticipated future development on the University campus would benefit from a second access to the South Peninsula. However, the issue we feel must be re-examined is the need for a four lane divided roadway.

The length of this roadway traversing Dalron lands will be approximately 1.6 kilometres, and will sterilize approximately 10 hectares (24 acres) of the site. When compared to a standard 20

metre right-of-way, the impact will be 3 times greater, resulting in a significant loss of lands for development purposes. Further, since access to the new roadway will be seriously restricted by the City, the usefulness of the road for Dalron's purposes will be minimal.

While we certainly cannot speak for the University, the City must keep in mind that the University has previously indicated that it does not support the construction of the road through University lands. We understand that this position will be re-evaluated as part of the University's Master Campus Plan which is currently underway. The most significant impact on University lands will be environmental. Placing a roadway of some 2.4 kilometres in length, with a footprint covering some 15 hectares (36acres), is difficult to justify given the current use of these lands which in effect form the backbone of the University ski trail system. As such, they play a significant role related to the University's academic programs in Physical and Health Education, as well as the overall "outdoor wilderness experience" associated with the University.

We also question the financial feasibility of construction of a four lane divided roadway , largely at public cost, at a time when there is no shortage of major road projects that warrant the City's attention. Since no direct access from abutting properties would be allowed onto the four lane divided roadway, the majority of the construction costs would be assumed by the City, as Dalron would not be allowed to benefit from the road. We would also assume that the City would assume majority of the cost of the road through University lands. Depending on the final position of the University with respect to this roadway, this may also include the cost of expropriation of University lands.

As originally indicated, Dalron understands the need for a second access to the South Peninsula, and we would hope that the University also comes to the same conclusion through their review of their Campus Master Plan. However, we feel that the City's desire for a 61 metre right-of-way is cost prohibitive, both to Dalron and the City , is environmentally unsound, and cannot be justified based on low traffic volumes that have been identified through this corridor. We would therefore propose that a more "modest" roadway is more appropriate under the circumstances. A 26 metre right-of-way, providing sufficient space for a two lane road together with sidewalks and a bike path, would serve the needs of providing the second access and would be more than sufficient to accommodate the projected traffic volumes anticipated. Further, allowing some limited access from abutting properties for development such as condominiums would in turn place the financial responsibility for road construction with Dalron rather than the City, since Dalron would then be in a position to benefit from the road construction. Such a road may also be more palatable to the University, whose cooperation is integral in achieving this second access.

Dalron is anxious to proceed with the development of their lands in this area. The major deterrent to this project has been the City's position with respect to this roadway which brings the feasibility of this development into question. Our proposal would see construction of the second access to the South Peninsula begin, at little to no cost to the City based on the current cost sharing policy. We would submit that adherence to the present objective of the Official

Plan with respect to this roadway will jeopardize any chance of this access being constructed without significant public funding.

We would therefore respectfully request that this position be considered by City staff and its consultants during the Transportation Plan and Official Plan review.

Yours Truly,

Kristi Arnold

Cc: Fern Cormier – Ward 10
Deb McIntosh – Ward 9

Debbie Belowos - Re: OP Review Notices Request

From: Kris Longston
To: Kevin Jarus
Date: 12/19/2016 9:24 PM
Subject: Re: OP Review Notices Request
Cc: Belowos, Debbie; Ed Landry; Melissa Riou

Hi Kevin,

We will add you to the notification list.

Thanks,
Kris

Kris Longston, MES, MCIP, RPP
Manager, Community and Strategic Planning,
Department of Growth and Development
City of Greater Sudbury,
PO Box 5000, Stn. A,
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Sudbury, ON
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Tel : (705) 671-2489, Ext. 4353
Fax: (705) 673-2200
Email : kris.longston@greatersudbury.ca

>>> "Kevin Jarus" 12/13/2016 3:59 PM >>>
Good afternoon Kris,

Please add me to the notification list in relation to any meetings, public hearings, or releases of Official Plan Review documents.

Best,

Kevin Jarus, M.Pl.
Planning Project Manager

TULLOCH
ENGINEERING
25 YEARS

Debbie Belowos - Fwd: lafreniere letter

From: Kris Longston
To: Belowos, Debbie; Ed Landry; Melissa Riou
Date: 12/22/2016 1:24 PM
Subject: Fwd: lafreniere letter
Cc: Jason Ferrigan
Attachments: lafreniere letter of auth.pdf

For OP file.

Thanks,
Kris

>>> Lis Kivistik 12/22/2016 12:58 PM >>>
Hi Kris:

Further to our recent meeting with Angelo and Paolo Cusinato regarding property on Dominion Drive we have now received authorization from Mrs. Lafreniere to deal with the City regarding the lands that the Cusinato's have agreed to purchase.

I am now writing you to request that the City approach the Ministry to obtain their feedback on our proposal to designate as Living Area in the proposed Official Plan now, the lands which will no longer be in the floodplain once the drain has been constructed. You will have to detail the background of this request wherein the City has agreed to amend the Official Plan to Living Area upon the completion of the drain.

We are requesting that the lands be included in the OP now with a special policy provision which restricts any development from taking place until the flood lines have been officially modified by the Conservation Authority. The Cusinato's would like to start the planning approval process for a draft plan of subdivision and rezoning as soon as possible. The zoning by-law to be put in place would be a " holding " by-law which would be lifted by Council once the flood plain on this part of the Cusinato property is removed by the Conservation Authority. Similarly the special policy provision for this property in the Official Plan with a similar requirement would ensure no development taking place until the flood plain has been removed.

This approach would save the Cusinato's considerable time compared to waiting to go through the OP amendment process after the approval of the Official Plan before starting the process for subdivision and rezoning approval.

This approach is more expeditious and less bureaucratic and achieves the same result but in a much shorter time frame.

Thanks

Marty Kivistik

Sent from my iPad