Name: Algonquin Eco Watch

Date of Submission: November 10, 2016

Location: Spring Bay, Ontario

Comment:

Document attached.

Mike Wilton
Algonquin eco watch.

BILGE AND GRAY WATER

QUESTION/REQUEST:

Please outline the requirements regarding the treatment of bilge and gray water disposal in Canadian waters for all pleasure and commercial water craft, up to and including lake freighters.

.....

Comments (to be read):

After having diligently searched the internet, I have been unable to locate any reference to legislation regarding the treatment of gray water or bilge water in Canadian waters.

From a practical point of view, I realize that storing either gray or bilge water in an onboard facility is probably impractical; particularly, in the latter instance if you have a leaky boat.

However, it seems to me that it should/must be legislated that all gray water and bilge water be filtered for noxious substances, such as petroleum products, prior to exhausting outside of the hull, or be stored on board until suitable pump-out facilities can be accessed.

Filter systems are available for smaller pleasure craft that are well within the disposable income of the average pleasure boater, but must be made compulsory if success is to be achieved.

Do you plan to seek such legislation? If so when?

NOTE: I recognize that clogging of filters can occur through time, effectively disabling bilge pumps and resulting in serious problems.

I do not accept that as a viable reason not to enact legislation prohibiting bilge and gray water from entering Canadian waters untreated.

It is the shared responsibility of boat owners and government agencies to ensure that Canadian waters remain clean.

Mike Wilton, Dominion Bay, Manitoulin Island, Ontario. October 5th, 2016

wilton@algonquin-eco-watch.com (705-377-5072)

Mike Wilton

Name: Alliance for the Great Lakes

Date of Submission: December 5, 2016

Location: Chicago, Illinois

Comment:

Attached are comments from Alliance for the Great Lakes.

ALLIANCE for the GREAT LAKES

Dec. 5, 2016

VIA ONLINE SUBMISSION at: www.participateIJC.org

Mr. Gordon Walker, Q.C., Canadian Chair
International Joint Commission
234 Laurier Avenue West, 22nd Floor
Ottawa, On K1P 6K6

Ms. Lana Pollack, U.S. Chair
International Joint Commission
2000 L Street NW, Suite #615
Washington D.C. 20440

RE: Governments' Progress Implementing the Great Lakes Water Quality Agreement

Dear Commissioners Walker and Pollack:

On behalf of the Alliance for the Great Lakes, we appreciate the opportunity to comment on the United States and Canada's performance for the past three years implementing the Great Lakes Water Quality Agreement. Evaluating the governments' performance is a critical role of the International Joint Commission (IJC) and we appreciate the IJC's efforts to allow public comment during this process. These comments focus on four annexes of particular concern for our organization—Annexes 4, 5, 6 and 8.

The Alliance works to protect the Great Lakes for today and tomorrow. We involve tens of thousands of people each year in advocacy, volunteering, education, and research to ensure the lakes are healthy and safe for all.

Annex 4 – Nutrients

First, we are pleased that the governments have adopted nutrient reduction targets for Lake Erie. The Western Basin of Lake Erie needs urgent attention and action to address runoff from agricultural sources that feed algal blooms.

We are concerned that the Domestic Action Plans will continue to rely on voluntary adoption of agricultural best management practices, which have been unsuccessful in reducing pollution from farms enough to curb toxic algae. The Domestic Action Plans must include programs, policies and protections that will successfully meet nutrient reduction targets. Without these, the Domestic Action Plans will fail to achieve the 40% reduction goal just as voluntary attempts to control nutrient pollution have failed elsewhere across the country.

The Progress Report of the Parties does not provide any details of what the Domestic Action Plans will contain. Several key concepts are needed for successful Domestic Action Plans:

- Domestic Action Plans should incorporate the concept of developing a Nutrient Management Plan process for crop farms and livestock operations within the western Lake Erie watershed.
- The IJC's water quality board recommendations for development of Lake Erie watershed management plans should be implemented.[1]
- Development and implementation of statewide, standardized soil testing programs should be required in Ohio, Indiana and Michigan.
- Domestic Action Plans should incorporate a commitment by EPA to develop a TMDL for U.S. Lake Erie waters and an equivalent plan by Environment Canada for Canadian waters. Such a TMDL could be modeled after the Chesapeake Bay TMDL.
- Domestic Action Plans should describe in detail what additional legislation is needed to implement reductions from agricultural sources.
- A short and long term comprehensive funding plan should be developed for each Domestic Action Plan.

[1]Evaluating Watershed Management Plans – Nutrient Management Approaches in the Lake Erie Basin and Key Locations Outside of the Lake Erie Basin, Aug. 5, 2016. Available online here: http://ijc.org/files/tinymce/uploaded/WQB/WQB_LakeErieReport_Aug2016.pdf

In addition to developing Domestic Action Plans, the Alliance calls on US EPA to develop an enforceable TMDL for U.S. Lake Erie waters and an equivalent plan by Environment Canada for Canadian waters. Michigan has declared its portion of western Lake Erie as impaired under the Clean Water Act and we have asked Ohio to do the same for its western Lake Erie waters since it is glaringly obvious that these waters are impaired under federal law. While a TMDL is not a panacea, it is the most effective tool we have under U.S. law that can help solve Lake Erie's problems.

Beyond Lake Erie, the Alliance has been engaged with addressing nutrient pollution in Green Bay and the Lower Fox River. We would like to see further effort in this area. Key needs are monitoring and outreach.

On monitoring, a more comprehensive approach is needed. We would like to see weekly forceasts and early season algae projections. There should be more than one real-time buoy in Green Bay to collect data. We understand that NOAA and NWS are developing runoff risk reduction tools for 10-day forecasts. This information needs to be available to fertilizer applicators and farmers and connect to policies to prevent nutrient spreading during high-risk times. Also, data from USGS and NRCS should be shared in an expeditious and meaningful way as possible.

On outreach, the Alliance supports bringing farmers to the table and growing educational and certification professional processes that affect on-farm decision making and serve a vital link between planning, policy, and implementation action. We encourage putting into place and building off of demonstration farms with a watershed system and farms systems approach to learning and operational internalization. We support creating farmer education units within structured college programs that start with defining a watershed and extend to indexes and metrics that link soil health to water quality, and helping farmers build uniformity for data management and tracking cost-benefits and nutrient/erosion performance evaluation. For example, Indiana's Conservation Partnership uses a common load reduction model to track and report the impact of installed BMPs on water quality. Nutrient and sediment load reductions are then estimated from state and federally funded programs. This process helps farmers see the benefits from their actions and drives improvements.

Another approach would be to have NRCS do an assessment of best practices and policy options for reducing nutrient loadings to achieve targets, much like Canada's – "Growing Forward" – an agricultural policy framework that includes a stewardship initiative for farmers.

Through such an effort, farmers would act as advisors taking a watershed wide systems approach to managing, demonstrating, verifying, measuring and modeling nonpoint phosphorus loading.

Overall, we want to be thinking of how we want farmers to be involved. Our work helps to create robust feedback loops through monitoring, support for outreach, and including social indicators in evaluation of progress. This enables state and federal agencies to move from evaluating by a practice based mindset to a reduction performance based mindset.

Annex 5 – Vessel Discharges

Ballast Water Discharges

We are pleased by the governments' efforts to inspect vessels' ballast water tanks when they enter the St. Lawrence Seaway. Since the opening of the Seaway in 1959, ships' ballast water discharges have been widely recognized as one of the primary sources for the introduction and spread of invasive species into the Great Lakes and many of our nation's other waters. Invasive species cost federal and state taxpayers more than $8 billion annually - including hundreds of millions of dollars in the Great Lakes alone - in damage to public water supplies, energy generation systems, and commercial and recreational fisheries.

Stopping invasive species before they enter the Great Lakes is critical to the health of the lakes. Since a recent court decision requiring revisions to EPA's ballast water requirements, we are pleased that the EPA is now considering stronger ballast water provisions that meet the Clean Water Act's requirements. EPA's new permit provisions should require the best technology available be used, include numeric standards, consider on-shore treatment options, and cover all classes of vessels. We urge the EPA to complete this work expeditiously and allow additional opportunities for public comment and input on these important provisions while they are being developed.

We are concerned by efforts in the U.S. Congress to undermine the Clean Water Act's protections, such as legislation like the Vessel Incidental Discharge Act which would weaken ballast water protection. We have and will continue to oppose these Congressional efforts.

Crude Oil Discharges

We are pleased by the governments creation of a working group on Maritime Transportation of Hydrocarbons and their by-products but are concerned with the direction of this group given the workplan's focus on facilitating such transport through preparedness, response, liability and compensation. We are very concerned by the risk of shipping crude oil on the Great Lakes—especially nonfloating tar sands crude. Right now, there is no proven, effective method for recovering or cleaning heavy crude oil from the floors of sensitive waterbodies like the Great Lakes.

A spill of crude oil in the Great Lakes could cause irreversible damage. A conventional oil spill on the Great Lakes could spread so fast that response crews would not be able to contain it –even if the spill is discovered quickly. A spill of nonfloating crude oil would likely never be fully cleaned up. Many of the oil refineries in the Great Lakes Basin are located near or in vulnerable waterways. Proposed legislation is being considered in the United States' Congress to ban the shipment of any form of crude oil by vessel on the Great Lakes. Given these circumstances, the Alliance urges more careful study of the risks of crude oil vessel transport on the Great Lakes and the costs and benefits if a ban were enacted.

Annex 6 – Aquatic Invasive Species

We are pleased that several government agencies have been working together to keep Asian carp out of the Great Lakes, although we believe that the decision-making processes are moving forward too slowly. At the local level, the Alliance has engaged with the Chicago Area Waterway System (CAWS) Advisory Committee which has met since 2014 to reach consensus on a set of recommendations on short and long-term measures to prevent Asian carp and other aquatic invasive species (AIS) from moving between the Mississippi River and Great Lakes basins through the CAWS. This Committee has called for additional assessment on whether an AIS lock or system of AIS locks can be designed and implemented in the CAWS to be effective at two-way prevention and whether and how control points could be implemented consistent with the mid-system locations. We urge that this study move forward rapidly to help arrive at a long-term solution as soon as possible. Adequate federal funding is needed for the Army Corps and other parties to complete this essential work.

In the meantime, we are concerned with the "Contingency Plan" released in May 2016 by the Asian Carp Regional Coordinating Committee. The plan provides only a menu of possible

response actions and a process flow chart with no guarantee that any particular actions will be taken. This is unacceptable. The region deserves to have a plan with assurances that certain measures listed will be taken in certain parts of the system in response to specific threats.

One other key area of work that should be accelerated involves construction at the Brandon Road Lock and Dam--a key choke point between the leading edge of the Asian carp population on the Illinois River and the electric barriers near Chicago. The Army Corps says it will not have any advanced control measures completed at Brandon Road until 2030. That leaves only the electric barriers between the fish and Lake Michigan -- barriers that studies have shown allow small fish to pass through. We urge faster construction at Brandon Road and immediate work to design a permanent solution.

Annex 8 – Groundwater

Protecting Great Lakes groundwater quality is important to protect human health, especially where groundwater affects a drinking water source. Such threats to human health could be used as a factor to prioritize future groundwater research.

We are generally pleased with the recent report – "Groundwater science relevant to the Great Lakes Water Quality Agreement: A status report" – and the effort to provide a comprehensive overview of the state of the science surrounding the Great Lakes and interaction with groundwater. The report suggests several priority areas where further research is needed. The report, however, does not describe how this research will be funded or prioritized. Looking forward, it will be essential to determine what research can be feasibly conducted and how it will be performed and paid for.

Identifying procedures or policies that have improved source water quality can provide a model for elsewhere around the Basin. Further research into measures that can be applied elsewhere to protect drinking water sources should be prioritized. For example, the report's "Major Science Need 2" recommends: "Establish science-based priorities to advance the assessment of the geographic distribution of known and potential sources of groundwater contaminants relevant to Great Lakes water quality, and the efficacy of mitigation efforts."[2] We are pleased by this proposal and encourage looking at contaminants existing in the water supply as a

[2] Groundwater Report pp. 69-70, online at https://binational.net//wp-content/uploads/2016/05/GW-Report-final-EN.pdf

priority. By focusing on the quality of the water source, we help to ensure that water treatment costs are not shifted from the polluters to the public. We support further efforts along the lines suggested by "Major Science Need 2," including studying the benefits of mitigation efforts. In particular, we support the examination of "changes in regulations, practices, remediation prevention and containment approaches, and introduction of beneficial management approaches."[3] Identifying the best policies and practices to protect groundwater quality will help provide useful models for elsewhere in the Basin.

Sincerely,

Molly Flanagan, VP for Policy

[3] Id.

Name: Bay of Quinte Waterfront Owner

Date of Submission: January 23, 2017

Location: Napanee, Ontario

Comment:

I have made numerous requests for someone to complete a site visit on the Bay of Quinte, as a crop farmer has been releasing toxins into the waterway, several times per year. This is in the area of Staples Lane and Third Concession Road Napanee. A law inforcement officer did come out, but I was unable to get the results from that visit. When I contacted the ministry, they had no record of this. We are quick to call our private landowners, but large crop farms, go unchecked, even with complaints. How can we call this environmental protection, when no one returns your calls, or can follow up on a law enforcement visit. They are contaminating the waterways, and road allowances with toxic sprays. They are planting in the ditches to the road edge, with all the winter run off going directly into those ditches. I have advised this crop farm of my concerns, and their response was. No one will uphold bylaws, as they are all busy sitting at a desk, so give it up. I found this to be so true. Even as I tried several times to get a response, no one returned my calls. Basically the site inspection by the law enforcement was a waste of time. So when I read these reports, how can I take it seriously when it has been proven that the employee's of these agencies don't seem to want to do their jobs, and protect the environment. They just keep passing you off to another agency that won't pick up their calls, nor return their calls. Send out a questionnaire to people who live along these waterways, and you will find that is a lot of concern, but no where to direct those concerns. The crop farmer owns several parcels of land on the bay of Quinte, and Lake Ontario waterfronts. This crop farm is Wynn Farms from Bath Ontario. They continue to spray toxins at the road edge, as along with the shorelines. Without any restrictions. It seems very clear that there are other crop farms, like Hay Bay Genetics, that are farming with the same practices, with no vision for water protection.

Name: Canadian Environmental Law Association

Date of Submission: October 10, 2016

Location: N/A

Comment:

I am attaching CELA's speaking notes on the 2016 Progress Report of the Parties. CELA presented at the public forum in Toronto on October 5, 2016. The Commissioners requested a copy of CELA's speaking notes at that time.

Please let me know if you have any questions.

Thank you,

Canadian Environmental Law Association
Speaking Notes
International Joint Commission, Public Forum
October 5, 2016

Introduction

My name is Jacqueline Wilson and I am a lawyer with the Canadian Environmental Law Association ("CELA"). Thank you for the opportunity to provide comments on the 2016 Progress Report of the Parties.

CELA is an Ontario legal aid clinic with a long history of work on the Great Lakes. We are a member of the extended subcommittee on chemicals of mutual concern. This presentation will focus on the progress of the parties in implementing Annex 3 of the *Great Lakes Water Quality Agreement.*

1- Current tracking of pollution levels in the Great Lakes is insufficient

The scope of the issue of toxic substances in the Great Lakes is large. Over 1.5 million kilograms of carcinogens were released to air in Ontario alone in 2012.

Provinces/States Bordering the Great Lakes by 2012 Population and Air Releases of Carcinogens

Province or State	Quantum of Release of Carcinogens to Air (kg)	Population (millions)
Indiana	2,230,276.11	6.5
Ontario	**1,589,212.99**	**13.4**
Quebec	1,220,091.37	8.1
llinois	1,114,305.98	12.9
Ohio	955,879.89	11.6
Pennsylvania	863,564.03	12.8
Michigan	730,259.29	9.9
Minnesota	422,643.16	5.4
Wisconsin	411,036.80	5.7
New York	174,696.76	19.6

Sources: CEC, Taking Stock; Statistics Canada; United States Census Bureau

The data for this table was collected from the Commission for Economic Cooperation website. It is out of date. The public does not have access to up to date data. We therefore recommend

prioritizing annual reporting of pollutant releases and transfers to the Great Lakes basin. All parties, particularly the public, should be working from an accurate base of data.

The trend in pollution levels is moving in the wrong direction. In the Great Lakes watershed, on-site and off-site releases of pollutants increased by 35.15% between 2009 and 2013.[1] There was also a 12.37% increase in the levels of bioaccumulative substances from 2009 to 2013.[2]

The current pace of work under Annex 3 does not reflect the urgency of dealing with toxic substances in the Great Lakes. It has taken three years for the parties to confirm the first short list of chemicals of mutual concern. There are no binational strategies in place. There is no clear timeline in the 2014 Canada-Ontario Agreement to identify and address chemicals of concern.

2- Public engagement under Annex 3 is declining

We are at a critical juncture in implementation of Annex 3. Work on Binational Strategies on chemicals of mutual concern is underway.

CELA, along with 110 other environmental, health and advocacy groups from both the United States and Canada urged the parties to jointly designate radionuclides as chemicals of mutual concern under Annex 3 in March, 2016.[3] The public requires clarity on the next steps of the decision-making process on what to include as a chemical of mutual concern and public engagement in that process. The process which is developed needs to reflect the commitment of the parties to enhance public engagement, found in the preamble and article 2(4)(k) of the *Great Lakes Water Quality Agreement.*

3- Canadian Environmental Law Association, *Great Lakes-St. Lawrence River Basin Roadmap on Toxic Chemicals: Advancing Prevention by Promoting Safer Alternatives,* June 2015[4]

CELA's 2015 report examined the challenge of regulating toxic substances from non-point and product-based sources. We drew on the EU's Registration, Evaluation and Authorization of Chemicals framework. Annex 3 binational strategies should focus on prevention and adoption of new approaches, like informed substitution and safer alternatives.

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[1] CEC's Taking Stock Online: the 2009 releases were 15,703,237.80 kg (on-site) + 3,938,773.09 kg (off-site) = 19,642,010.89 kg. The 2013 releases were 23,981,298.06 kg (on-site) + 2,564,580.06 kg (off-site) = 26,545,878.12 kg. There was an increase of 35.15%.

[2] CEC's Taking Stock Online: the 2009 releases were 107,527.75 kg (on-site) + 220,646.23 kg (off-site) = 328173.98 kg. The 2013 releases were 39,159.21 kg (on-site) + 329,637.13 kg (offsite)= 368,796.34 kg. There was an increase of 12.37%.

[3] Canadian Environmental Law Association et al., *Letter Re: Nomination of Radionuclides as a Chemical of Mutual Concern under the GLWQA*, March 2, 2016 <http://www.cela.ca/sites/cela.ca/files/NGO-Letter-radionuclides-nomination.pdf>
Canadian Environmental Law Association, *Radionuclides as a Chemical of Mutual Concern in the Great Lakes Basin*, February 2016 <http://www.cela.ca/sites/cela.ca/files/Radionuclides-CMC.pdf>

[4] Canadian Environmental Law Association, *Great Lakes-St. Lawrence River Basin Roadmap on Toxic Chemicals: Advancing Prevention by Promoting Safer Alternatives,* June 2015 <http://www.cela.ca/sites/cela.ca/files/GLRoadmap.pdf>

Name: Council of Great Lakes Industries

Date of Submission: October 18, 2016

Location: N/A

Comment:

Good afternoon Ms. Pollack and Mr. Walker: As you may recall, CGLI yielded comment time during the IJC's Public Information Session at the Great Lakes Public Forum so that others in attendance could participate in the session. In lieu of verbal comments, we offer the attached written comments for your consideration. Please let us know if you have any questions or other follow up.

Thanks again for providing an opportunity for public input. KAB

CGLI Council of Great Lakes Industries

October 12, 2016

Mr. Gordon Walker, Q.C., Canadian Chair
International Joint Commission
234 Laurier Avenue West, 22nd Floor
Ottawa, On K1P 6K6
commission@ottawa.ijc.org

Ms. Lana Pollack, U.S. Chair
International Joint Commission
2000 L Street NW, Suite #615
Washington D.C. 20440
commission@washington.ijc.org

Dear Commissioners Walker and Pollack:

Thank you for providing an opportunity at the 2016 Great Lakes Public Forum to offer perspectives on the information provided by the Parties and others with interests in the restoration, management, and protection of Great Lakes. We were pleased to see large number of attendees take advantage of the opportunity to stand up and share comments, points of view, and questions during the IJC public consultation session on October 5.

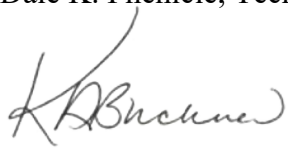
As we indicated during the session, we were pleased to yield our comment time to others due to time limitations but would like to follow up by offering our brief perspectives in the attached document. We believe that the progress demonstrated by the Parties place the region at a pivotal point where progress is increasingly supported by ecosystem indicators. Continued success in meeting the objectives of the Great Lakes Water Quality Agreement will further move the region along the path toward restoration and will provide important economic benefits.

We urge and look forward to renewed enthusiasm for robust collaboration efforts focused on opportunities such as building the Blue Economy.

Very truly yours,

COUNCIL OF GREAT LAKES INDUSTRIES

Dale K. Phenicie, Technical and Projects Director



Kathryn A. Buckner, President

Cc: ParticipateIJC@ottawa.ijc.org

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Great Lakes Public Forum 2016
International Joint Commission Public Session
On Great Lakes Success and Challenges
October 5, 2016

CGLI Perspectives

Good afternoon, my name is Dale Phenicie. I serve as the Technical and Projects Director for the Council of Great Lakes Industries. On behalf of CGLI's members and President Kathryn Buckner I am pleased to provide a few comments.

The presentations provided by the Parties over the past two days have highlighted the substantial progress made to restore and protect the Great Lakes. As you are well aware, Great Lakes water resources are largely responsible for the economic and industrial might for which the region is known. Industry has been pleased to have been a part of the restoration effort and looks forward to additional opportunities to engage with resource managers to continue this important work and sustainably rely on these resources over the long term for operational and economic success.

These presentations have also demonstrated the importance of science programs that assess the State of the Lakes and support the detailed analysis needed to attain the goals and objectives of the Great Lakes Water Quality Agreement. This prompts our first observation - continued support of these science and monitoring programs by the Parties is essential. We hope you agree and will pass on this need to the Parties.

Second, we note that much credit has been given by the Parties to the region's stakeholders for pitching in to assist and guide remedial and protective work. We very much appreciate this and believe that such engagement is extremely important and the key to success for the work that lies ahead. Opportunities for industry to engage in both the scientific studies and development of resource management policy are essential. We would like to see more opportunities like these – similar to those available during the early 2000's when the Great Lakes Regional Collaboration Strategy was developed.

Finally, the third observation came this morning during the presentation regarding the protection and restoration of native habitats and species. Given the progress that we have now made, incorporation of the concepts presented by the Annex 7 team in a way that melds economic and social needs with those of the natural environment now seems possible. The Great Lakes system now appears more capable of providing the needed habitats that can successfully support these important native species.

CGLI was founded on a sustainable development platform. Over the past few years we have participated in the work of a group of regional visionaries seeking to identify and promote the region's robust water resource attributes within a framework called the "Blue Economy." Let's see what we can do to put the successes of the past 20 years together with a robust collaborative approach focused on building the "Blue Economy."

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734-663-1944 • Fax: 734-663-2424 • Web: www.cgli.org

Name: Dr. Latham Hunter

Date of Submission: January 20, 2017

Location: Hamilton, Ontario

Comment:

I'm stunned that public consultation is even being collected here. What kind of input are you waiting for? If governments have any intention of protecting our environment, then strict restrictions on farms must be put in place immediately. It's not only livestock farms, either -- nitrogen run-off from agricultural farms are also a severe threat to the health of the Great Lakes. If anyone from the public is ignorant enough to suggest that farms should be given free reign, and to continue in the irresponsible manner in which they've been allowed to engage, then their comments should be ignored completely -- it's way past time for governments to take a leadership role in environmental protection, rather than being wagged by its tail. We know from ample evidence that corporations (including farms, especially factory farms) will not carry out "voluntary" means of diminishing their negative impact on the environment -- the concept is laughable and completely irresponsible for any government to accept as plausible. As as life-long citizen of Ontario, I am dismayed that so little has been done to protect the Great Lakes, and I demand much, much more stringent legislation in this area. Dr. Latham Hunter

Name: Dr. Sandy Greer

Date of Submission: November 18, 2016

Location: N/A

Comment:

See attached.

The Imperative Need for Addition of Radionuclides to the List of `Chemicals of Mutual Concern'

by Dr. Sandy Greer, PhD ©

An Introduction

It is imperative for radionuclides to be added within the second round of `chemicals of mutual concern.' Doing so is not only long overdue but, more importantly, essential at this historic moment when a number of upcoming activities have been proposed by various divisions of the nuclear industry that will cause inevitable, and irreversible, harm to the well-being of the Great Lakes Basin.

Even more emphatically, for too long the environmental monitoring conducted by the nuclear industry as well as the Canadian Nuclear Safety Commission (CNSC) - all of whom continue to suggest that low level radioactive materials do not cause harm - has been carried out by totally inadequate scientific tools. Moreover, such assumptions contradict independent research. Most particularly, international research demonstrates the ongoing quest in efforts to improve on the empirical tools of measurement that the more astute scientists recognize are, indeed, sorely inadequate to measure the multi-leveled impacts upon the environment, through the long term, during which radionuclides will continue to demonstrate differing effects that will continue beyond the era when institutions have been regulated to carry out such studies using human-created measurement tools that are fundamentally flawed, as outlined later in this paper.

Background to Reaching out to IJC to be a Binational Environmental Conscience

As an intervenor at two public hearings, respectively in 2013 and 2014, on a deep geologic repository proposed near Lake Huron's shoreline, and studying numerous international studies to improve the science of determining impacts of radionuclides on the environment, it is apparent that the Canadian nuclear players are not fully honest with the wider public in regard to the serious lack of scientific evidence at this time to justify licencing *any* DGR in the foreseeable future. For even the most recent international studies done in radioecology illustrate that the scientific tools still are not sufficient to identify and understand the complexity of the impacts of various types of radionuclides and, more so, in the long term assumptions.

My specific concern is a deep geologic repository (DGR) for low-and-intermediate radioactive waste proposed close to the shoreline of Lake Huron. As well, a second DGR, for high level radioactive waste, is in earlier phases of being promoted in several communities which include three rural municipalities on agricultural land in the same bioregion as the shoreline DGR.

Eventually both DGRs would corrode, releasing contaminants throughout the regional watersheds and, ultimately, add to the cumulative toxins impacting on the Great Lakes. Other nuclear issues which affect the growing cumulative effects of radionuclides on the Great Lakes include, but are not exclusive to, the proposed shipments by truck of high level liquid nuclear waste from Chalk River, Ontario to the Savannah River Site in South Carolina. Obviously, whatever route is chosen – if it is allowed to happen - will cross through the Great Lakes/ St. Lawrence water system as well as a number of American river systems.

As well, there is the longstanding issue of releases of radioactive substances into air and water through the regular operation of nuclear power plants, releases which has been underestimated, hence ignored, because they are considered too low. Important to note is the full picture of numerous nuclear industry facilities around the Great Lakes Basin, and cumulative effects that continue to be ignored, most particularly as per the now pertinent recognition of climate change. See http://friendsofbruce.ca/dgr/wp-content/uploads/2016/01/NuclearMap_NOinsert 20161.jpg

Rationale for IJC Adding Radionuclides to `Chemicals of Mutual Concern'

Given the statements by the IJC on binational priorities, the addition of radionuclides for the second round of included `chemicals of mutual concern' would be timely and fits all of the criteria. In `Priorities for Science and Action,' under Lakewide Management, is the action to: **"undertake scientific monitoring and research studies on stressors and cumulative effects in priority nearshore areas of the Great Lakes as identified through development of the integrated nearshore framework,"** [my bold] and Lake Huron is designated for study in 2017. This is most timely.

Thankfully, the 2016 IJC Science and Action document, under Lakewide Management, identifies the need to fill gaps for chemicals of mutual concern and "**provide an early warning for chemicals that could become Chemicals of Mutual Concern** [my bold]." Regarding science per se, this document also identifies the need to "identify potential subject areas for science assessments that would contribute to management actions and policy development."

Therefore, I strongly support the IJC's plan to implement an "ecosystem-based management approach," an approach acknowledged in your Great Lakes Nearshore Framework document, in citing a report by the 2013 European Environment Agency which states: "Maps produced with geospatial data can integrate information that has traditionally been analyzed separately, to achieve a more effective ecosystem-based management.

Indeed, I have seen numerous European Union environmental reports, authored by a number of international organizations that focus on radioecology, that indicate the serious pursuit to develop much more accurate measurements of the environment, from studies of single

organisms and individual species to environmental media (soil, water, air) and – increasingly recognized as essential – to impacts by radionuclides based on the fuller ecosystem approach.

By the way, these reports have the integrity to identify the multi-layered scientific challenge, namely, to study: (1) various radionuclides; (2) carried out at different environmental levels, from organisms to ecosystems; (3) using a combination of field and laboratory tests with computer modelling, although (4) recognizing that different computer models show different and often contradictory results, depending on the type of model and the scale studied, again, from single organisms and individual species to ecosystems. The ultimate challenge – which will take many years – is to figure out how to harmonize, if possible, measurements that truly tell us what we need to know, before making decisions from which there is no turning back.

Deep geologic repositories, for example, *do* eventually corrode, and *will* release radionuclides. How can anyone with a good conscience bestow that legacy upon the children yet unborn? For that reason alone no DGR anywhere in Canada, let alone the Great Lakes Basin, should be licenced because the actual scientific data to justify a DGR does not yet exist– if such data ever could. If we have the wisdom to do the essential - thus far missing - diligent research, the facts could confirm that long term nuclear waste storage methods other than DGRs be investigated.

The 2016 IJC reports, therefore, are heartening in outlining priorities for action. If the IJC is genuine in its cited principle in Article 2(4)(j): "**to anticipate and prevent `pollution and other threats'**…which `**places an onus on the Parties to "think ahead" and "act ahead,"** then essential baseline surveys of radionuclides must be carried out, as well as a diversity of other combined field, lab and computer modelling studies prior to any DGR being given a licence to proceed with construction, because the science simply is not yet there. Even the Canadian federal Minister of Environment and Climate Change has stated publicly, the science is not there. Minister Catherine McKenna has temporarily delayed potential DGR licencing, upon requesting the proponent Ontario Power Generation, Inc., to deliver by December 2016 better updated scientific evidence.

Nevertheless, a wiser, longer term, and totally justifiable longer delay strategy - if not termination of the DGR licencing process - by the Canadian government could be powerfully influenced by the principles and priorities of IJC, specifically in both the Great Lakes Nearshore Framework and the Groundwater Science report (Annex 8). Moreover, the groundwater report does include radionuclides (on page 3) in its list of contaminants.

However, I strongly challenge the suggestion within Major Science Need 2, which refers to the **"evaluation of the efficacy of mitigation efforts"** as the ultimate determinate in regard to anyone's assumptions that released radionuclides can, after the fact, somehow be contained. In a recent cross-country `Environmental Assessment Review' in Canada, the current EA process

was severely criticized, one reason being its priority on mitigation before "significant adverse effects" could be identified as conclusive in regard to eventual environmental effects.

Please know that within the final Joint Review Panel's acceptance of licencing of the first above-mentioned DGR, its acceptance is based upon close to a hundred mitigation strategies, most if not all which have not been attempted. In other words, they are totally unproven as per their effectiveness. Mitigation will be too little, too late, with the consequence of ever evolving, and totally unknown, multiple environmental impacts, through time, forever.
I recommend, therefore, that one of the IJC's selected `nearshore' study areas on Lake Huron be chosen in the bioregion surrounding the location of Bruce Power which includes the designated area for the proposed DGR regarding low and intermediate level radioactive waste. That same bioregion is where a second DGR, for high level radioactive waste, is being promoted in three municipalities on agricultural land (in watersheds that border Lake Huron), and which would eventually contaminate the groundwater and, ultimately, the wider region of interconnected watersheds that dump into Lake Huron.

Based on Major Science Needs 4, 6 and 8, described within the IJC groundwater science report, a diversity of field-based studies must be carried out, ranging from local-scale to ecosystem scale, together with laboratory tests, and avoiding reliance solely upon computer modelling. The limitations of the latter are well documented, one limitation repeatedly identified as an underestimation of contamination by computers in contrast to what is detected in the field. (I have read a number of European Union studies in regard to this conclusion, later citing an excerpt from a 2016 paper, and providing a major insight regarding the limits of computers.)

As a citizen seriously concerned about the arrogance of the nuclear industry, and its reluctance to be transparent, and honest, about what it does *not* yet know, the IJC process gives me hope that both the nuclear industry, and the Canadian Nuclear Safety Commission (as well as the American counterpart of the latter), will be held to a higher standard of accountability. Assertions of safety cannot be made when the science is not there yet.

Better science, in turn, will inspire and make possible better government regulations. Canada's federal government this 2016 autumn has been conducting a nation-wide `Environmental Assessment Review' in order to regain public trust, in its wise recognition that the EA regulations are seriously flawed. (In that regard, I contributed a 10-minute oral presentation at the EA Review held in Toronto on November 9th, and will prepare a written submission for its December 18th deadline.)

Meanwhile, it is reassuring to witness the IJC receptive to the development of an ecosystem-based management approach. Doing so, hopefully, will inspire both Canadian and American governmental agencies to get up to speed with what other, international jurisdictions are pursuing, in the spirit of planetary environmental well-being. All life is interconnected.

A published paper in 2005 titled "Prescription for Great Lakes Ecosystem Protection and Restoration – Avoiding the Tipping Point of Irreversible Changes" cited a `Scientific Consensus Statement for Marine Ecosystem-Based Management' adopted by over 200 scientists. They collectively emphasized the need for "a holistic, ecosystem-based management approach, including the dangers of managing only individual sources of stress or specific species." They recognized the limits of the natural world's resilience from toxic assaults:

> *"**Ecosystems can recover from many kinds of disturbance, but are not infinitely resilient*** [bold in original text]***.*** *There is often a threshold beyond which an altered ecosystem may not return to its previous state. The tipping point for these irreversible changes can be impossible to predict."*

A further cautionary statement in this insightful paper, which pertains to the need for much more rigorous study of the impacts of radionuclides is: "**The [Great] lakes represent a more closed system than coastal ocean waters, and respond more slowly to contaminant loadings** (with longer hydraulic flushing times than coastal areas) [my bold]."

Highlights of IJC History as per Radionuclides

Meanwhile, why it is taking so long for the IJC to address radionuclides is an open question, most particularly given the IJC's much more active role historically, as I try to fill in the blanks, through more recent research to explain this omission. Thus far, here is what I have discovered, first of all, citing this Canadian Nuclear Safety Commission (CNSC) document:

> *"In 1973, historical monitoring of radionuclides in the Great Lakes was initiated as a result of the signing of the U.S/Canada Great Lakes Water Quality Agreement (GLWQA) in 1972. Monitoring was discontinued in 1982 due to the measurement of consistently low levels of radionuclides."*

This information exposes more about the historical narrative of the nuclear industry than the IJC. The reason is, the CNSC's consistent message focuses on the safety and cleanliness of nuclear energy. The refusal by nuclear players to be more forthcoming in regard to what is *not* known has resulted in the industry's loss of trust among a growing number of citizens. What is essential is research *independent from* the control – and massaging of the message – by the nuclear industry.

Indeed, it was a disappointment to learn about a former IJC Nuclear Task Force being terminated in 1999. Further, in a press release supported by a number of Canadian and American environmental organizations as recently as 2012, its statement to the IJC reads:

"Currently, the IJC receives reporting from the national agencies governing nuclear industries, including the Nuclear Regulatory Commission in the US, and the Canadian Nuclear Safety Commission."

Frankly, for the IJC to rely so heavily upon the aforementioned agencies is not good enough, given my on-the-ground experience in witnessing the testimonies of the OPG and the CNSC at the two DGR public hearings in Ontario. The fact is, such government overseers of the nuclear industry, whose primary role is supposed to be public safety and, therefore, to be arms-length from the industry, clearly is not true. In fact, most recently, the Auditor-General of Canada published a scathing report about the shortcomings of the CNSC's activities. (See later link.) Meanwhile, the International Joint Commission's (former) Nuclear Task Force (NTF) knew some of the challenges in determining radionuclide environmental impacts as far back as 1997:

> *"…monitoring of radionuclides in the Great Lakes primarily meets the need for compliance by users of radioactive materials with the conditions of the licences for discharge. This results in differences in the radionuclides reported, how radionuclide levels in the environment are reported, the extent of off-site monitoring, and the specific biological compartments included in monitoring by facilities in Canada and the United States.* ***Very little of the monitoring activities are designed to address or are capable of considering the movement and cycling of radionuclides through environmental compartments and ecosystems*** [my bold emphasis]."

The above 1997 NTF excerpt certainly identifies some of both governments' problems, in the IJC Eighth Biennial Report Under the Great Lakes Water Quality Agreement, dated June 1996:

> *"The Governments should address the treatment of radioactive materials discharged to the Great Lakes as they have approached other persistent toxic substances. Many radionuclides fit the Agreement's definition of persistent toxic substances because they are persistent and toxic."*

In fact, the former IJC Nuclear Task force produced a commendable set of reports, including a radionuclide inventory in December 1997, followed by a two-part ***Report on Bioaccumulation of Elements to Accompany the Inventory of Radionuclides in the Great Lakes Region***.

In the latter report's `Introduction,' the Nuclear Task Force recognized even twenty years ago:

> *"An important component of the environmental transport and distribution of Elements is their cycling through biological compartments of ecosystems. This is also one of the most difficult processes to study. Even for the most heavily studied elements in biological compartments (i.e. carbon, nitrogen, or phosphorus), the research has been painstaking, taxed the ingenuity of investigators, pushed to*

> *the limits the state-of-the-art of instrumental and chemical methods, and raised more research questions than it answered."*

What distinguishes the IJC from the nuclear industry is the honesty in communicating publicly the limitations of science throughout the term of the Nuclear Task Force (NTF) research and, also importantly, being honest in stating the limitations of what could be known at that time.As well, the NTF authors stated more than once that they had to resort to European studies because of the insufficient data available in North America.

The same situation exists today, which is why I had to seek out international, mostly European Union, studies about radionuclides and environmental impacts, which are numerous.

Some Highlights in History of Environment Canada with More Recent Concerns

As for Environment Canada (the former name of Canada's federal Department of Environment and Climate Change), a second Priority Substances List (PSL2) of the Canadian Environmental Protection Act (CEPA) was published in 1995, with subsequent assessments on whether the identified substances were, in fact, toxic.

Following a draft assessment report made available for public comment through two months in 2000, the follow up revised report concluded: "releases of uranium and uranium compounds in effluent from uranium mines and mills are entering the environment in quantities or concentrations that may have a harmful effect on the environment and its biological diversity.

But, a `Synopsis of PSL2 dated September 2006, in reference to the impact of the release of radionuclides from nuclear facilities on non-human biota concluded: **"There is relatively little evidence that exposure to ionizing radiation resulting from current releases of radionuclides from nuclear facilities is causing environmental harm** [my bold]**."** This conclusion qualifies itself by adding: "However, **uncertainties and some conservative assumptions associated with risk estimates for ionizing radiation, complicate their interpretation** [my bold]**."**

The above publicly available federal statement indicates the lack of awareness by the Canadian federal government, and obviously not enhanced by other governmental jurisdictions. Lack of evidence about "causing environmental harm" is for the reason that appropriate and thorough studies, to this day, are lacking. Hence, governmental regulations are flawed in Canada, and I only can guess that a similar situation exists in regard to equivalent American authorities.

In fact, a letter dated November 20, 2015, from Citizens for Alternatives to Chemical Contamination (CACC), a grassroots environmental education and advocacy organization,

"opposes the potential by the U.S. Nuclear Regulatory Commission to adapt a theory of hormesis with regards to either low or very low levels of ionizing radiation. The CACC letter then includes citations from a list of independent science experts on the known fact that there is "no safe level" of ionizing radiation to human beings. The CACC also raises questions that pertain to environmental effects that accumulate through time not just from radionuclides but, moreover, states: "There are thousands of chemicals today in our environment, most of which have not been studied for synergistic effects with radionuclides."

Indeed, the fact of "multi-stressors" is increasingly recognized in international studies, and at least one North American example that I discovered, conducted by the University of Michigan – which I cited at the 2014 DGR public hearing, pointed out that the ecosystem immediately surrounding the location of Bruce Power – and the proposed DGR for low-and-intermediate level radioactive waste – is a Lake Huron area under cumulative stress. Also important is the fact that the U. of Michigan study, titled Great Lakes Environmental Assessment and Mapping Project (GLEAM) did *not* include radionuclides. (As I write this submission, I looked up that website to give you, but it had disappeared, and no time here to seek out where it now exists.)

By the way, regarding the controversial issue of `hormesis,' CACC was responding to an NRC request for public comments on the NRC's reconsidering of the Linear No Threshold theory of radiation's effects, to replace LNT with a hormesis model. Of possible interest to the IJC, Dr. Ian Fairlie, an independent consultant on radioactivity in the environment – not cited in the CACC document – severely critiques this potential acceptance by the NRC in his submission: http://www.ianfairlie.org/wp-content/uploads/2015/08/US-NRC-Consultation-4-1.pdf

Returning to information still available on the Canadian federal website for what was formerly named Environment Canada (EC), under the section `Assessment Status and Conclusion,' EC states: "Environment Canada has completed the **ecological science assessment** [my bold] of releases of radionuclides from nuclear facilities (impact on non-human biota). Sadly, this statement is a misrepresentation of the fact that "ecological science" – if that were to be interpreted as the same as an ecosystem model of assessment – in 2006 was still in the early years of what will be an extended, continuing exploration through continually improved, experiential tools, given the published evidence from international organizations in their ongoing pursuit to study radiological findings that integrate, of necessity, field, laboratory and computer model data.

Incredible to me, therefore, are these statements in an online Fact Sheet, as recently as June of this year by the CNSC, which declares that "licensees' environmental protection programs are working" as are all environmental monitoring programmes overseen by the CNSC, in regard both to the health and safety of people and also protection of the environment. To find out the specific shortcomings of the CNSC according to Canada's Auditor-General, please go to:

http://www.oag.bvg.gc.ca/internet/English/parl_cesd_201610_01_e_41671.html This report is authored by the Canadian Commissioner of the Environment and Sustainable Development.

The Systemic Problems of Computer Modelling

What is fundamentally important to understand, yet which is overlooked systemically in the current emphasis on science and technology globally to dominate human decisions regarding how we assume to manage the environment , is the disconnect between what the human mind can know vis á vis how the natural world of the planetary environment actually functions. More to the point, computer modelling in recent decades has become one of the standard bearers in how assumptions get created in the various fields of environmental studies, as a primary tool of measurement. Despite the best intentions in the continuing international pursuit ever to improve a fundamentally flawed human-created tool, here is an important insight provided by physicist/author Fritjof Capra in his book ***THE WEB OF LIFE, A New Scientific Understanding of Living Systems*** (1996), based on his research on computer science:

> *"A computer processes information, which means that it manipulates symbols based on certain rules. The symbols are distinct elements fed into the computer from the outside, and during the information processing there is no change in the structure of the machine. The physical structure of the computer is fixed, determined by its design and construction.*
> *The nervous system of a living organism works very differently…*[as Capra explains at length earlier in this book], *it interacts with its environment by continually modulating its structure, so that at any moment its physical structure changes. The nervous system does not process information from the outside world but, on the contrary, brings forth a world in the process of cognition… Human decisions are never completely rational but are always colored by Emotions, and human thought is always embedded in the bodily sensations and processes that contribute to the full spectrum of congition.*
> *As computer scientists Terry Winograd and Fernando Flores point out in their book* ***Understanding Computers and Cognition****, rational thought filters out most of that cognitive spectrum and, in so doing, creates a "blindness of abstraction."…In a computer program, Winograd and Flores explain, various goals and tasks are formulated in terms of a limited collection of objects, properties and operations, a collection that embodies the blindness that comes with the abstractions involved in creating the program"* [Capra, 1996, p. 274-5].

So, there it is, a powerful humbling insight that ought to give us pause. Sadly, the human condition today is the result, in part, of the longstanding split of human consciousness in recent centuries, from which we became disconnected from the worlds of Nature and Spirit, diminishing the development of all of our ways of knowing, and our schooling systems are partly to blame. But, I digress. Nevertheless, in my graduate studies in education, focused on

spiritual psychology and transformative learning, I have gained heartfelt insights in regard to what is essential for the restoration of an imperilled planet – a shift in human consciousness, to pursue through life's journey the continuing quest to protect the planet's life support system rather than support industrial forms of development that undermine its support system.

This imperative recognition is related totally to the risks and dangers of radionuclides that cannot yet possibly be measured even close to accurately, given the aforementioned gap between the human intellectual mind's creation of computerized models and the real life continual flux of all living matter whether plant, animal or mineral, and the countless variants in their interactions with what are referred to as `non-biota' and `environmental media' – note how even our language neglects the interrelatedness of all living matter – namely, the air, the water and the sediments.

Summing Up Why Radionuclides Must be Added to `Chemical of Mutual Concern'

The necessary continuing studies of radionuclides in their implementation, therefore, require the combination of field, laboratory and computer modelling, however imperfect will be these interwoven efforts, to address the dangers already imminent and upcoming dangers via potential nuclear waste dumps, aside from upcoming refurbishments and decommissioning of nuclear power plants as well.

The deadline for delivering this paper to IJC – after weeks of non-stop deadlines on related hearings and meetings related to the nuclear waste issue – curtails my more detailed provision of examples of a few of numerous international studies on how to address the huge dilemma of the impact of radionuclides upon the environment, locally and globally.

However, among the various environmental and science journals which include articles in this continuing, complex area of research – in which it is recognized that interdisciplinary fields need to become increasingly engaged, here is a final, quite recent, sobering quote from the ***Journal of Environmental Radioactivity***, within the article titled "Addressing ecological effects of radiation on populations and ecosystems to improve protection of the environment against radiation: Agreed statements from a Consensus Symposium, in its Abstract excerpt :

> *"The symposium gathered an academically diverse group of 30 scientists to consider the still debated ecological impact of radiation on populations and ecosystems…*
> *Scientific research conducted in a variety of laboratory and field settings has improved our knowledge of the effects of ionizing radiation on the environment. However, the results from such studies sometimes appear contradictory and there is disagreement about the implications of risk assessment…."*
> [Brechignac, F. et al, 2016, p. 22]

See full entry under *F. Brechignac et al/Journal of Environmental Radioactivity 156-159 (2016) 21-29.*

Another important reference is the website of the International Union of Radioecology, and I could mention several other valuable sources. If you would like further references, and/or more specific sources as per the content of this essay, you are welcome to contact me at: info@awakeningtopossibility.ca

-30-

Name: J. Kennedy

Date of Submission: October 4, 2016

Location: Ontario

Comment:

The health of our water is directly related to the health of our soils. For many countries it is estimated that agriculture causes about 70% of the water contamination. Because of the high level of agriculture in the Great Lakes Basin, water contamination due to agriculture practices is probably even higher than 70%. Since the mid 1990s the use of glyphosate in the Great Lakes Basin has risen exponentially. Algae blooms have also significantly increased. Phosphorous feeds algae and since glyphosate is an organophosphorus compound is glyphosate on the list of Chemicals of Mutual Concern and if not why not?

Name: James

Date of Submission: March 27, 2017

Location: Ontonagon, Michigan

Comment:

To all concerned, I am so glad the the paper mill in Ontonagon was shut down and demolished, they polluted for more than one-hundred years. The air,water,and fishing has improved greatly in the first few years since. My only other concern is the over harvesting of the fish in Lake Superior by the Charter fisherman and the local anglers. With the lack of DNR law enforcement and the increase of fishing derby's they may be harming the local fishery by over harvesting. Perhaps a coordinated effort between government, state, GLIFWC,and local officials could set limits on fishing derby's? Sincerely, James

Name: Kris DaPra

Date of Submission: February 10, 2017

Location: Elk Grove Village, Illinois

Comment:

Thank you for protecting our Great Lakes. I have lived my entire life on or near a Great Lake. As a child near Lake Huron, a student living on Lake Superior, and now Lake Michigan. My career as an ecologist has been focused on protecting our environment for not only itself but for human life. Please do everything in your power to protect our Great Lakes, especially from the Pruitt and Trump administration.

Name: Laura Horowitz

Date of Submission: July 4, 2017

Location: Pittsburgh, Pennsylvania

Comment:

I would like to urge the IJC to undertake a comprehensive, long-term (looking decades ahead), science-based review of the risks of transporting, "temporarily" storing, incinerating (as done with all of Ontario's combustible "low" level radioactive wastes, at Bruce Nuclear Generating Station's Western Waste Management Facility on the Lake Huron shore), and disposing (burying, or abandoning) radioactive wastes of all categories (so-called low, intermediate, and high-level) on the Great Lakes shore, as well as within the Great Lakes Basin. As someone whose state borders a great lake, I am deeply concerned about the overall health of the entire system.

Name: Macks Vic

Date of Submission: June 4, 2017

Location: St. Clair Shores, Michigan

Comment:

Protecting the Great Lakes from the Nuclear Threat Radionuclides should be identified as substances of concern and monitored and measured systematically on a continuous basis with real time measurements and assessments of the impacts on humans and other living things provided to the public. The Nuclear Regulatory Commission (NRC) does not do that. The The International Joint Commission (IJC) does not do that. In 1997, the IJC's Nuclear Task Force carried out an in-depth study to assess the adequacy of monitoring for radionuclides in the Great Lakes. They concluded that there was no uniformity in the measurements by users of radioactive materials. "Very little of the monitoring activities are designed to address or are capable of considering the movement and cycling of radionuclides through environmental compartments and ecosystems." Both the NRC and the ICJ leave the issue to users of radioactive materials and licensed specified releases which are computer generated numbers; not real time measurements publicly disclosed. Furthermore, the NRC has refused to study effects on people living within 50 miles of a reactor. What we have is measure nothing, study nothing preserves the capacity to say nothing happened. The U.S. NRC has stated "Public and occupational health can be compromised by activities at the Fermi site that encourage the growth of disease-causing microorganisms (etiological agents). Thermal discharges from Fermi into the circulation water system and Lake Erie have the potential to increase the growth of thermophilic organisms. These microorganisms could give rise to potentially serious human concerns, particularly at high exposure levels." **** While this statement references the Fermi site, the Davis Bessie reactor releases the same discharge into Lake Erie near Toledo. This has a direct bearing on the toxic plume in Lake ErieI that caused the shut down of water intake. I sent this to the IJC on 8-11-2014. It was ignored. The Nuclear Regulatory Commission states that all nuclear reactors are designed to and do emit radionuclides into the environment in normal operation. In addition, there are emissions from operator error, degraded equipment, failed equipment, and accidents. The National Academies of Sciences has stated that there is a linear no threshold and that even at low levels of zero to 100 millisieverts, nuclear radiation can produce not only cancer but also broad spectrum illness, morbidity and genetic mutations. There is no safe level of human exposure to nuclear radiation; only the pretense and deception of safety. The IJC has been silent on Ontario Power Generation's plan to build a deep underground nuclear dump near the shore of Lake Huron near Kincardine and the plan to transport 6,000 gallons of highly radioactive radionuclides in nitric acid liquid from Chalk River, Ontario to the Savannah River Site in South Carolina. These are extremely dangerous and unnecessary actions that put the Great Lakes at risk for being permanently poisoned with loss to the public of safe water. Despite efforts to protect this international resource by Canada and the United States, first nations and tribal governments representing indigenous peoples, individual provinces and states and many members of the public, the Great Lakes continue to be in jeopardy from a variety of threats. The greatest threat to the Great Lakes is the nuclear threat. Man made radionuclides cannot be turned off. Every nuclear reactor accident is a current event. 38

nuclear reactors operate on the Great Lakes basin. Ontario Power Generation's subsidiary wants to build a deep underground nuclear dump near the shore of Lake Huron. Canada and the U.S. have given the green light to the movement of 6,000 gallons of high level radionuclides in nitric acid solution from Chalk River, ON to Savannah River Site, NC. A nuclear accident can cause irretrievable and irreparable harm that cannot be undone, regardless of the resources put to the effort. An end to nuclear power with appropriate liability, accountability and responsibility assigned to those who have promoted and engaged in nuclear power and nuclear weapons, and generated vast quantities of nuclear waste. No new nuclear reactors should be constructed in the Great Lakes watershed. Existing reactors should be closed as soon as possible. Withdrawn nuclear fuel rods, lethal in minutes and dangerous for millions of years, must be shielded and monitored forever through every generation until there is a basis in science and engineering for an improved management process. No abandonment deep underground or elsewhere. Withdrawn fuel rods should be moved from overcrowded storage in pools to dry hardened on-site storage as soon as feasible. They should be stored at the reactor generating the waste in hardened on-site storage(HOSS) or as near to the site as feasible. The transport of nuclear materials should be prohibited on, near or over the Great Lakes. Increased comprehensive monitoring efforts must be directed toward radioactive contamination of the lakes, sediment, biota, drinking water and fish of the Great Lakes, to ensure progress in reducing exposure to radionuclides. **** Draft NUREG-2105, volume 1, October 2011, page 2-228 Vic Macks member, Alliance to Halt Fermi3, Michigan Stop the Nuclear Bombs Campaign, and Peace Action of Michigan 20318 Edmunton St. St. Clair Shores, MI 48080-3748 586-779-1782 vicmacks3@gmail.com

Name: Marion Cartwright

Date of Submission: February 4, 2017

Location: Lake Forest, Illinois

Comment:

I agree with and endorse the comments submitted by the The Alliance for the Great Lakes on the Progress Report of the Parties. Thank you for providing the public with the Progress Report and the 70+ page assessment of progress made to date. Yes, I read them and yes the public is paying attention to your work. Thank you again I am especially concerned about the Trump Administration budget proposal to cut $300 million from the Great Lakes Restoration Initiative. This cut came after all of your reports, but this cut shows just how important the IJC is.

Name: Mary Tibollo

Date of Submission: January 19, 2017

Location: Fort Erie, Ontario

Comment:

My concern about water quality is that the IJC is not doing enough to stop Ontario Power Generation from their plan to bury nuclear waste within 1 mile (!) of Lake Huron. This is our ONLY and LARGEST source of fresh water and we desperately need it protected from any source of contamination. There is no guarantee that this nuclear waste won't leak so why are we not taking a stand to stop this potential disaster from poisoning our water.

Name: Northeast-Midwest Institute

Date of Submission: April 14, 2017

Location: Washington, DC

Comment:

Dear Commissioners and Staff,

Please find attached the Northeast-Midwest Institute's comments on the IJC's TAP report and the 2016 PROP. Please let me know if you have any questions.

Best regards,

Ankita

Ankita Mandelia |Policy Analyst| Northeast-Midwest Institute

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April 14, 2017

International Joint Commission
Great Lakes Regional Office
100 Ouellette Avenue, 8th Floor
Windsor, ON, Canada

Northeast-Midwest Institute Comments on the International Joint Commission's *Triennial Assessment of Progress on Great Lakes Water Quality* and the Governments' of the United States and Canada *2016 Progress Report of the Parties*

Dear Commissioners,

The Northeast-Midwest Institute (NEMWI) has reviewed the *Triennial Assessment of Progress on Great Lakes Water Quality* and the *2016 Progress Report of the Parties*, and offers comments on two subjects of the documents (Nutrients and Areas of Concern), found below.

Nutrients

As noted by the IJC in the Triennial Assessment of Progress (TAP) report's technical appendix, there is a lack of specificity by the Parties in their commitment to "undertake and share research, monitoring and modeling necessary to establish, report on and assess the management of phosphorus and other nutrients and improve the understanding of relevant issues associated with nutrients and excessive algal blooms." (ECCC and USEPA, 2016) It is important that the Parties establish specific monitoring goals to help meet specific nutrient reduction goals.

Achievement of phosphorus reduction goals in Lake Erie, especially dissolved reactive phosphorus reduction goals, would benefit from monitoring that meets the following general criteria:

- Targets a variety of watershed scales and loading sources; and
- Occurs at significant frequencies over a period of time such that an adequate number of samples are obtained to detect trends in nutrient concentrations.

In the *2016 Progress Report of the Parties* (PROP), it is stated that in the U.S., there is work being done to expand edge-of-field monitoring. The Northeast-Midwest Institute (NEMWI) looks forward to seeing the results of these efforts, especially combined with existing watershed-level monitoring efforts already being conducted.

As mentioned in the main body of the TAP Report on page 45, the PROP "provides little discussion of declining nutrient levels in the open waters of most of the lakes and no plans are provided to address the issue." (IJC, 2017) Increasing monitoring to target this issue could help better understand what is causing the nutrient decline.

Areas of Concern

It is important to balance rapid removal of BUIs/delisting of AOCs and ensuring that remedial actions taken at these sites are permanent and robust. Post-delisting monitoring of site conditions should occur at a frequency and for a period of time that is adequate to ensure that recurrence of beneficial use impairments will not occur. Long-term post-delisting monitoring should be designed to ensure that former AOC sites are not degrading.

Annex 1 would benefit from the existence of a Great Lakes Executive Committee Annex Subcommittee. The wider sharing of information, especially between both Parties, may help to develop more effective remediation plans that consider more closely the biogeochemical cycling of the chemical pollutants, which may be more beneficial to the wide variety of physical and chemical conditions present at each AOC site.

A system should be set up to assist the five binational AOCs to better coordinate their actions to more closely follow an ecosystem approach to removing BUIs.

NEMWI strongly supports feedback given to AOCs on their delisting reports as stated on pages 150-151 of the TAP Technical Appendix.

Please feel free to contact us with any questions you may have.

Sincerely,

The Northeast-Midwest Institute

Name: Ohio Environmental Council

Date of Submission: October 5, 2016

Location: Columbus, Ohio

Comment:

The Ohio Environmental Council appreciates the opportunity to provide comments to the IJC. The Great Lakes Water Quality Agreement provides an unique opportunity to solve complex issues with an eye toward ecosystem services, recognizing not one state or Province can solve the problem alone. This agreement was signed in 2012 and yet we still have a very sick Lake Erie. When more than half a million people go without being able to use their tap water for three days or more we cannot claim success. I do realize solving these problems take time but tell that to the residents who are still scared to drink their water. We have solved the toxic algae in the past and I know we can solve the toxic algae issue in the future, BUT it comes down to political will to put into place the solutions that will achieve real reductions of phosphorus. We can no longer draw up plans to solve the algae problem using the same-ole-same-ole approaches because they have not worked to date so why do we think the same approaches will solve the problem in the future. The OEC strongly encourages and urges the USEPA, Environment Canada, the states, and Province of Ontario to draw up domestic action plans that incorporate new solutions, including regulations, as well as plans to monitor our progress throughout the process. The DAPs also have o include determining the sources of pollution and the amount of their contribution. While these plans are being developed we need the USEPA to step in now and work with Environment Canada to develop a TMDL for the western Lake Erie basin. We consistently hear an impairment status will kill Lake businesses, but let's be real, the toxic algae is killing Lake businesses. We also continue to hear regulating the agricultural industry will kill the farming industry, but I am pretty confident if we were to add up the costs to the Lake businesses, municipalities, hospitals, and employers throughout the Lake Erie basin the cost would be much more substantial than the cost of regulating the agriculutral industry. This is not to say farmers are bad people, but the only way we will solve this problem moving forward is with the political will. Without the political will to undertake a western Lake Erie basin TMDL and impose common sense regulations on the agricultural industry Lake Erie will continue to experience large toxic algal blooms. I am attaching recommendations the Lake Erie Collective, which the OEC is a member of, developed for the USEPA and Environment Canada as domestic action plans are developed. Lastly, this Public Forum was not conducive to true public participation. We need to do better. We need to be having conversations in the communities across the Great Lakes, rather than just one or two each year.

Expectations for Domestic Action Plans under the Great Lakes Water Quality Agreement

Alliance for the Great Lakes, Canadian Freshwater Alliance, Environmental Defence Canada, Freshwater Future, Michigan League of Conservation Voters, National Wildlife Federation, and the Ohio Environmental Council.

June 21, 2016

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Purpose

Seven regional and national organizations from Canada and the United States working in the Lake Erie basin have participated in the development of this document. These groups are the Alliance for the Great Lakes, Canadian Freshwater Alliance, Environmental Defence Canada, Freshwater Future, Michigan League of Conservation Voters, National Wildlife Federation, and the Ohio Environmental Council.

Annex 4 of the Great Lakes Water Quality Agreement calls for binational coordination to manage nutrient concentration and loadings into the Great Lakes. In 2015, the Governments of the United States and Canada (the "Parties" to the Agreement) adopted the ecosystem and substance objectives (the "targets") for Lake Erie. The Agreement calls on the Parties to define programs and other measures to be undertaken to achieve the nutrient targets. The Parties indicated they intend to cooperate with the jurisdictions in the Lake Erie basin to develop Domestic Action Plans (DAPs) to identify programs and measures to achieve the targets. The purpose of this document is to recommend actions that the aforementioned organizations believe should be included in the forthcoming DAPs that will be developed to achieve the targets.

This document articulates our expectations for the content in the DAPs to the Parties and to participating jurisdictions. This document will serve as a tool for the author organizations to evaluate the draft DAPs as they are released, and to communicate with Lake Erie stakeholders about the actions and investments needed for a clean, restored Lake Erie. The Parties have indicated they expect the DAPs to be "living documents", to be adjusted and elaborated over time as more information and resources are brought to bear on the issue of harmful and nuisance algal blooms in Lake Erie. Similarly, we anticipate revising this document to address the needed programs and measures to restore Lake Erie as implementation moves forward and more is learned about gaps, options and opportunities.

Introduction

The Great Lakes are a continental and global treasure – their waters sustain millions of people, thousands of communities, a vibrant economy and a truly remarkable ecosystem. Harmful and nuisance algal blooms caused by excess nutrient runoff are among the top threats to the Great Lakes, posing risks to drinking water supplies, quality of life and economic vitality. Nowhere is this more obvious than in the Lake Erie basin, where nearly half a million Americans in the surrounding Toledo, Ohio area went without drinking water for three days, and hundreds of Canadians on Pelee Island went without potable water for nearly two weeks. In addition, recurring algal blooms have negative impacts on tourism and travel, which generates more than $12.9 billion in annual economic impact in Ohio alone and sustains more than 120,000 jobs. In addition, the commercial fishery on Lake Erie, which accounts for about 80% of the total value of the province of Ontario's $234 million Great Lakes commercial fishery, could be hit especially hard since it relies heavily on species that are vulnerable to the effects of algal blooms.

Canadian and U.S. federal, provincial and state governments have committed to managing phosphorus concentrations and loadings in Lake Erie as a means of reducing algal growth. Phosphorus loading targets for western and central Lake Erie have been adopted under Annex 4 of the Great Lakes Water Quality Agreement of 2012 and under the 2015 Western Basin of Lake Erie Collaborative Agreement signed by the

governors of Ohio, Michigan and the premier of the Province of Ontario. This document provides information on the content we expect to see in the DAPs to be developed and adopted by the Parties to meet the obligations under the Great Lakes Water Quality Agreement. We understand the DAPs to be the defining documents for outlining the actions to be taken to meet the loading reduction targets[1].

The author organizations gratefully acknowledge the outline provided by U.S.EPA, *Common Elements for U.S. DAPs* (September 16, 2015). The outline covers a broad range of topics and includes recognition of the need for inclusion of items such as triggers for adaptive management, new policies and programs (both within and outside of existing authority), and accountability mechanisms that include timelines, benchmarks and reporting. Additionally, Susan Humphrey, Annex 4 Co-Lead (Canada) presented a similar outline at the June, 2016 Great Lakes Executive Committee meeting. This document builds on these outlines and includes recommendations and narrative to provide more context and specificity.

The re-emergence of harmful and nuisance algal blooms in Lake Erie is a stark reminder of the need for ongoing vigilance and steadfast commitment to the protection and conservation of the Great Lakes. Despite decades of effort and progress by local, state, provincial and federal governments – and a network of non-government organizations (NGOs) – our actions have failed to keep pace with major sources of pollution such as stormwater and agricultural runoff. While we expect the DAPs to demonstrate how existing actions will be scaled up and out across the basin, more of the same is unlikely to address the problem. DAPs must also include new and innovative approaches and policies, especially in light of the increasing challenges that are expected in a future of unpredictable climate change. Without such a comprehensive approach, decades of work to revitalize the economy, environment and quality of life in the Great Lakes region are at risk.

The DAPs can be an important catalyst for actions that enhance resilience and capacity to protect Great Lakes waters. As harmful algal blooms and other water quality issues become increasingly common and severe around the world, there is a unique opportunity in the Lake Erie watershed to demonstrate leadership on sustainable land use management practices, particularly in the agricultural sector. Transforming the way cities are built and land is farmed is not just needed in priority watersheds or the western Lake Erie basin. The DAPs can demonstrate how to encourage change across all landscapes, and how doing so can address multiple water quality issues and advance sustainable economic development.

The author organizations appreciate that the DAPs must account for varying amounts and quality of data and information, and different legal and policy frameworks in each of the Lake Erie jurisdictions. While many of the actions and policies required will need to be implemented at a local scale, the DAPs are an opportunity to provide guidance for needed actions, and to encourage consistency in measuring progress, across the entire Lake Erie basin.

To accomplish the reductions called for in the Annex 4 targets, the following eight components are required to be included in the DAPs. Though this is not an exhaustive list of all possible actions to address phosphorus loading, these recommendations provide a framework for collective action critical to move toward solving the nutrient-related problems facing Lake Erie.

[1] Note: U.S. jurisdictions have also included actions in the plans they submitted under the requirements of the 2015 Western Basin of Lake Erie Collaborative Agreement

Monitoring and Modeling

A. Monitoring

An integrated monitoring network across all jurisdictions in the Lake Erie basin will be necessary to assess progress towards improved water quality and ecosystem outcomes. An integrated network should apply accepted protocols for data collection and analysis and allow for comparisons across the Lake Erie basin. An integrated network is necessary to not only support ongoing measurement of progress towards compliance with the adopted targets, but also to provide sufficient information to support an adaptive management approach. Therefore, jurisdictions should seek to establish a robust monitoring network that is capable of tracking change in water quality in the watersheds draining to Lake Erie, as well as monitoring ecosystem change in the lake itself.

The recently released report and associated addendum from the Northeast-Midwest Institute (Betanzo, et al., 2015) provides an in-depth analysis of the gaps and needs for water data in the Maumee River basin. The report addresses the monitoring and information necessary to answer the question: How effective are management practices at reducing nutrients from nonpoint sources at the watershed scale in the Lake Erie drainage basin? The Parties and the jurisdictions must have scientifically credible data to answer this question, and to inform and guide policy solutions in order to fully implement the adaptive management approach called for in the adopted targets for Lake Erie. The report identifies critical monitoring recommendations for scale, sampling frequency and duration, monitoring parameters as well as data documentation and sharing.

Two other reports also identify limitations of current monitoring programs. The 2014 report by the International Joint Commission, *A Balanced Diet for Lake Erie, Reducing Phosphorus Loadings and Harmful Algal Blooms*, identified data gaps in monitoring networks across the Lake Erie basin. And in 2009, Conservation Ontario published *An Evaluation of Water Resource Monitoring Efforts in Support of Agricultural Stewardship in Watersheds of the Great Lakes Basin*, identifying the need for more coordinated and targeted water resource monitoring.

While these two reports do not include the level of detail in the Northeast-Midwest Institute report, they do highlight the need to address monitoring design scale and frequency (including seasonal temporal scales) in the jurisdictions in the Lake Erie basin.

Limitations of current monitoring networks highlight the need for all jurisdictions to undertake an assessment of current monitoring capabilities and identify gaps in order to align water quality monitoring with the adopted targets to meet the ecosystem objectives called for in the Agreement. This analysis should inform the commitments by the jurisdictions to update monitoring networks that will be used to monitor water quality conditions and track progress towards the target reductions. In addition, the assessments should address the extent to which common and accepted protocols for data collection and analysis are currently in effect and where adjustments and additions may be needed.

The DAPs should include a summary of the assessment of monitoring capabilities and gaps described above. Specifically, the DAPs should include the plans and commitments to address any shortfalls, incorporating the recommendations from the Northeast-Midwest Institute report and addendum (Betanzo, et al., 2015). The DAPs should include a description of the monitoring networks that will be implemented and are capable of supporting the data necessary to identify water quality and ecosystem trends and guide program investments.

The DAPs need to present monitoring network information by jurisdiction (i.e., states and province) as well as an overview for each respective country, which will facilitate an integrated network across jurisdictions. Clear information on how monitoring and modeling programs work together will enable consistent reporting on progress and trends, and will simplify reporting to the stakeholders and to the public. Consistent, reliable information will streamline assessing progress toward improved water quality, making strategic conservation and restoration investments.

The adopted targets for Lake Erie identify the top tributaries (i.e. priority watersheds) critical to nutrient loading to the Lake. Monitoring at the tributary mouths needs to be comparable across jurisdictions. Monitoring at these tributaries should include annual *and* spring loading data on total phosphorus, soluble reactive phosphorus and suspended sediments. Data collection should be sufficient to calculate flow weighted mean concentrations to enable comparisons of loadings in a consistent manner across the different river basins in the Lake Erie basin. An expansion of data collection on the Detroit River will also be necessary to refine information on Detroit River loads.

Lake Erie Targets

The targets adopted by the Parties to meet the goals of the Great Lakes Water Quality Agreement are based on the best available monitoring and modeling data. These targets are intended to meet the ecosystem objectives in the Agreement including:

- Large harmful algal blooms in the western basin;
- Nearshore algal blooms associated with 8 priority tributaries;
- Hypoxic conditions in the central basin; and
- Nuisance algae (while there is insufficient information to establish a target for *Cladophora* fouling the eastern basin, scientists believe that phosphorus reductions in the western and central basins will have a beneficial effect in the eastern basin.

The phosphorus targets for Lake Erie make a distinction between spring and annual loading depending on the ecosystem objective of the target. While the targets for both spring and annual loading call for a 40% reduction, the distinction is important in establishing the monitoring regimes necessary to measure and track progress towards meeting the nutrient reduction goals.

The *spring* phosphorus targets are linked to the ecosystem objectives of both the large harmful algal blooms in the western basin (solely for the Maumee River basin) and the smaller, nearshore blooms in eight priority tributaries. The target for a 40% reduction in *spring* loading applies to dissolved reactive and total phosphorus.

The *annual* phosphorus target is linked to the ecosystem objective of reducing the hypoxic area (low oxygen) in the central basin. This also calls for a 40% reduction target and this target applies to all tributaries around the basin draining to the western and central basins and is specific to total phosphorus. The numeric annual target to meet this goal is 6000 metric tons (the recommended limit for the central basin). A 40% reduction amounts to a reduction from the United States and Canada of 3,316 metric tons and 212 metric tons, respectively.

The total phosphorus loads for the major tributaries to Lake Erie have been identified for the 2008 water year (October 1, 2007 to September 30, 2008). We recommend that subwatershed allocations be established for the eight priority tributaries identified in the *Recommended Phosphorus Loading Targets for Lake Erie* final report based on the 2008 loads (excluding the Leamington tributaries).

This report recommends subwatershed allocations be made for all HUC 12 or HUC 10 watersheds within the priority tributaries. The scale for subwatershed allocations (HUC 12 or 10) should be consistent across the jurisdictions. This framework provides the basis for establishing "sub-target" reductions to achieve for each of the HUC geographic areas. Targets for subwatershed allocations will serve to focus local and regional nutrient reduction efforts. This approach facilitates a sense of shared responsibility toward meeting the broader goal while providing a narrower focus for ownership of a smaller "piece of the pie".

This report recommends subwatershed allocations be made for all HUC 12 or HUC 10 watersheds within the priority tributaries.

The sub-allocations will provide a framework whereby the progress on implementation can be tracked and reported within jurisdictions. Understanding where reductions are being achieved (or not being achieved) at the subwatershed level will be fundamental to taking swift action in areas lacking demonstrable progress.

In addition, a framework based on sub-allocations for the major tributaries will allow jurisdictions and stakeholders to measure, report and verify effectiveness of phosphorus reduction programs.

Such a process would include identifying nutrient pollution sources by category, utilizing emerging technologies such as phosphorus fingerprinting, and quantifying the amount of reduction from each source necessary to meet the allocated targets (at subwatershed scale). It would also help define the priorities within each subwatershed to meet its allocated targets.

Monitoring is at the heart of demonstrating success and as such related data and the synthesis of results should be publicly available and communicated in a manner easily understood by the public. The DAPs should specify how monitoring results from each jurisdiction will be made available in a manner that is transparent and publicly accessible.

The subwatershed framework should serve as the mechanism to support source identification and allocation, track implementation of best management practices (BMPs) and assess BMP effectiveness.

The Northeast-Midwest Institute report identifies data sharing and accessibility as critical issues and calls for a coordinating entity to facilitate collaboration among monitoring agencies and organizations. Towards this end, the DAPs should identify such an entity to facilitate more efficient and consistent data sharing while acknowledging there may be limits with data collection not conducted or sponsored by public entities.

B. Open Lake Modeling

The sensitivity of Lake Erie to environmental change makes it necessary to monitor and model ecosystem condition and ecological responses on a periodic, regular cycle. The Parties and the jurisdictions have

embraced an adaptive management approach to meet the targets; monitoring and modeling of ecosystem conditions and responses will be necessary to fully understand the ramifications of implementation investments. These analyses are also needed to capture other changes to the system including the impacts of invasive species, climate change and land use change.

The development of the targets for Lake Erie was based on a suite of nine models to quantify phosphorus loads and eutrophication response relationships for the Lake Erie ecosystem. The authors of this report support the recommendations in the *Recommended Phosphorus Loading Targets for Lake Erie* final report that these models be applied every five years and synchronized with the data collection efforts during the Coordinated Science and Monitoring Initiative (CSMI). The CSMI is a bi-national initiative that brings together over 150 federal, state, academic, and non-governmental institutions to coordinate intensive sampling on a single Great Lake every year on a five-year cycle.

The *Recommended Phosphorus Loading Targets for Lake Erie* report also recommends two additional open water modeling initiatives critical to understanding nutrient impacts on Lake Erie. These are: 1) modeling to determine the nearshore nutrient concentration interactions and quantifying the ecological response relationships; and, open water modeling for *Cladophora* in the eastern basin. We support these recommendations.

C. Tributary Modeling

Tributary modeling can be an invaluable tool for understanding phosphorus loss into surface water and its transport and delivery into the lake. In spring, 2016, the results from three separate modeling projects were announced, all yielding important insights about nutrient losses and need for conservation practices in the Maumee River basin. The three projects include:

- Western Lake Erie Conservation Effects Assessment Project (CEAP) – Cropland; conducted by USDA-ARS using detailed input data to model impacts of conservation practice adoption strategies at the edge of agricultural fields;
- Maumee Watershed Multi-Model; convened by the University of Michigan using six models to forecast likely changes in TP and DRP loads under potential conservation scenarios; and
- Western Lake Erie CEAP – Wildlife; conducted by The Nature Conservancy in partnership with USDA – ARS to estimate impacts of potential impacts of conservation practices on stream health (as indicated by biological indices).

Together, these modeling efforts provide invaluable information about the scope of conservation practices that will be necessary to meet phosphorus reduction targets. Going forward, additional data, particularly the edge-of-field projects underway in Ohio, will provide more detailed data and information for model input that will further refine the ability to simulate land management practices and water quality impacts. The DAPs should include commitments to continuing investments in simulations of agricultural conservation scenarios. As more data becomes available, future applications of watershed-based modeling will be crucial to understanding where and how land management practices need to change to ensure meeting targets. While most modeling efforts to date have focused primarily on the Maumee River basin,

comparable efforts need to be applied to other high phosphorus loading streams to Lake Erie. In particular, streams in the Province of Ontario should seek the data collection and model capability within its jurisdiction to apply these or similar models.

Monitoring and Modeling Recommendation Summary

- Undertake an assessment of current monitoring capabilities and identify the gaps to align water quality monitoring with the adopted targets to meet the ecosystem objectives called for in the Agreement.
- DAPs should include the plans and commitments to address any shortfalls, incorporating the recommendations from the Northeast-Midwest Institute report and addendum (Betanzo, et al., 2015).
- DAPs should include a description of the monitoring networks that will be implemented, making sure the networks are capable of supporting the data necessary to identify water quality and ecosystem trends and guide program investments.
- DAPs need to present monitoring network information by jurisdiction as well as an overview for each respective country.
- Tributary monitoring at the mouths should include annual *and* spring loading data that includes total phosphorus, soluble reactive phosphorus and suspended sediments. Data collection should be sufficient to calculate flow weighted mean concentrations to enable comparisons of loadings in a consistent approach across the different river basins in the Lake Erie basin.
- Data collection on the Detroit River should be expanded to refine information on its loads.

Monitoring and Modeling Recommendation Summary continued

- Subwatershed allocations should be established for the eight priority tributaries based on the 2008 loads (excluding the Leamington tributaries) utilize the subwatershed framework to support source identification and allocation, track BMP implementation [1] and assess BMP effectiveness (BMP tracking is discussed in the section on Tracking and Reporting).
- DAPs should identify a coordinating entity to facilitate collaboration among monitoring agencies and organizations. DAPs should specify how monitoring results from each jurisdiction will be made available in a manner that is transparent and publicly accessible coordinating entity.
- DAPs should incorporate commitments to the recommendations in the *Recommended Phosphorus Loading Targets for Lake Erie* final report that the models utilized to develop the targets be applied every five years and synchronized with the data collection efforts during the Coordinated Science and Monitoring Initiative (CSMI).
- DAPs should include commitments to continuing investments in simulations of agricultural conservation scenarios.

Tracking, Adaptive Management and Reporting

A. Tracking

The DAPs should describe how jurisdictions will track actions implemented to reduce phosphorus loading in the lake and subwatersheds. Reductions from all phosphorus sources should be tracked including (but not limited to) improvements to home sewage treatment systems, lowering allowable effluent discharge limits, projects to reduce combined sewer overflows and implementation of agricultural best management practices so that adoption rates can inform the adaptive management process. The Great Lakes Commission's Blue Accounting system has potential to assist in the aggregation and analysis of data to help account for data from these phosphorus sources and track progress towards nutrient reduction goals.

Tracking nutrient loading at the tributary mouths into Lake Erie will not be sufficient to determine the efficacy of programs and policies. Information and data on land management actions across the landscape is needed to understand and evaluate the scale and effectiveness of land-based implementation investments.

There are many limitations to tracking management practices in agricultural landscapes in both the U.S. and Canada. However, this information will be critical to understanding changes on the landscape and the resulting effects on nutrient loading to Lake Erie. An adaptive management approach needs to rely on data and information on land *and* water to ensure program delivery that is efficient and effective. Scientists and policymakers alike will need this information to understand year-to-year changes in loadings and resulting algal blooms in the western basin and nearshore areas. This information is also critical to guide ongoing investments for watershed-scale change.

The Ohio Lake Erie Phosphorus Task Force (August 2013) acknowledged this need and identified several opportunities to track the installation/implementation of land management practices. The Task Force concluded that information needs could be while also meeting the needs of the agricultural sector, who are concerned with maintaining information privacy. A similar analysis needs to be conducted to identify tracking options in Ontario. For both Parties, specific mechanisms need to be identified and implemented. The DAPs need to define by jurisdiction what methods will be employed to track BMP installation.

Tracking of BMP installation will be absolutely critical for policy makers and land managers to understand the extent of nutrient management practices across the landscape, the rate of adoption of practices and sustainability over time. This information will be necessary to determine if the investments being made, both public and private, need to be adjusted and in what ways. Governments cannot know how to manage adaptively without the information to understand the actions that have been taken.

Our organizations recommend establishing BMP tracking that will include practices supported through state, provincial and federal assistance programs. Additionally, the Parties should initiate a program that utilizes third party data collection to inventory the significant number of BMPs that farmers have installed without technical or financial assistance from the public sector. A comprehensive accounting of practices needs to accurately reflect all conservation efforts in order to understand what drives water quality change. The Maryland Department of Agriculture Nutrient Management Program[2] may provide useful insight for this type of tracking and accounting.

In addition to tracking BMP utilization, the author organizations recommend the jurisdictions establish an independent auditing program of BMPs that evaluates installation and functioning. A BMP audit program will serve to verify properly functioning practices that can be evaluated against water quality benefits. Independent audits will ensure taxpayer supported practices are used wisely and increase public confidence for implementation efforts. It will also ensure efforts to monitor BMP benefits are accurate and not undermined by poorly functioning equipment or lack of maintenance.

B. Adaptive Management

The promise of an adaptive management approach is that if something is not working - if actions are not achieving the desired effect - those actions will be adjusted. DAPs should identify specific “trigger” mechanisms that will initiate evaluation and modification of programs and actions based on results and new information. As one example, the DAPs should identify and commit to a 5-year review of the results of

[2] http://mda.maryland.gov/resource_conservation/Pages/farmer_information.aspx

nutrient loading at the tributary mouths and a periodic review of the subwatershed allocations. Lack of progress toward nutrient reduction goals should prompt a review of the implementation approaches, management practice effectiveness and consideration of new priority areas. One approach to a trigger mechanism might be to track BMP implementation and if a certain adoption is not achieved by a certain time, a change in our approach may be needed.

Furthermore, the Western Basin of Lake Erie Collaborative Agreement establishes a 20% reduction interim target for 2020. The DAPs should include a commitment by the participating jurisdictions to that Agreement and an evaluation of existing policies and programs triggered should the 20% reduction not be realized. Finally, the U.S. EPA should include a specific trigger to apply the authority of the Clean Water Act if after five years of DAP implementation monitoring results indicate western basin load reductions will not achieve the 40% target by 2025. This would include developing a Total Maximum Daily Load (TMDL) for the western basin that applies to the whole watershed, along with a tri-state (Indiana, Michigan, Indiana) watershed implementation plan that would restore beneficial uses for assessment units already designated as impaired on state 303(d) lists. Such a TMDL could be developed from the western Lake Erie basin targets and the watershed sub-allocations called for in this report. We recognize the Clean Water Act does not apply in Canada, however, the U.S. EPA can work with the provincial and federal governments to establish an appropriate target and action plan. There could be appropriate authority to do so under Ontario's Great Lakes Protection Act.

C. Reporting

To ensure plans and proposals will be implemented the DAPs need to include:

- Timelines for accomplishing tasks with clearly identified milestones;
- Clear roles and responsibilities for the multitude of agencies and partners involved in implementation;
- Measures of success - quantifiable ways of tracking progress; and
- Funding needs and potential funding sources.

Communicating progress and providing publicly available results is paramount for demonstrating success and recognizing areas for further improvement. An effective reporting process that incorporates relevant data and information from the jurisdictions and other partners will be crucial for tracking progress. The DAPs should include commitments and a plan for annual reports that detail the status of Domestic Action Plan implementation and progress toward reaching the targets. Such reports would have sections dedicated to each goal, objective, tactic as well as adherence to timelines and benchmarks. Within these sections the annual report should summarize monitoring results and include load reductions achieved in each subwatershed and in each lake basin. It should also detail progress implementing best management practices necessary to achieve target load reductions, and the level of success administering programs and policies. Finally, the report should discuss how the annual results align with the adaptive management framework, including a review of recent advancements in our understanding of the problems and solutions and their implications for the DAPs. There should also be an evaluation of how close we are to trigger points.

As monitoring programs and implementation actions are underway, the DAPs should identify a process to maintain an ongoing list of gaps in knowledge and science (including monitoring and modeling) that need to be addressed to direct future actions. Priorities should be identified and plans be developed to address these gaps. Our ability to address harmful and nuisance algal blooms in Lake Erie will require ongoing improvements in our understanding of land management and the impact on water resources. Ongoing science, monitoring and research will be necessary to inform which policies will move us toward meeting our phosphorus reduction targets.

Tracking, Adaptive Management and Reporting Recommendation Summary

- Track nutrient reductions from all sources.
- Identify and implement tracking mechanism(s) for a comprehensive accounting of all BMP installation funded by both public sector programs and private, independent sources.
- Establish an independent auditing program of BMPs that evaluates installation and proper functioning.
- DAPs should identify specific trigger mechanisms that will initiate evaluation and modification of programs and actions based on monitoring results and new information.
- The DAPs should identify and commit to a trigger mechanism that includes a periodic review of the results of nutrient loading at the tributary mouths and the subwatershed allocations.
- The U.S. DAPs should include a trigger that utilizes the Clean Water Act authorities, including development of a western Lake Erie basin TMDL and a tri-state watershed implementation plan should monitoring indicate the western basin target reduction will not be met by 2025.
- DAPs should include commitments and a plan for annual reports that detail the status of implementation and progress toward reaching the targets.
- DAPs need to include timelines, roles and responsibilities, measures of success and funding needs and funding sources.
- The DAPs should identify a process for maintaining an ongoing list of gaps in knowledge and science (including monitoring and modeling) that need to be addressed to direct future actions. Identify priorities and plans to address these gaps.

Eastern Basin of Lake Erie

The DAPs need to address the actions needed in the eastern Lake Erie basin to meet the ecosystem objective for the reduction of nuisance algae and the specific issues related to *Cladophora*. We appreciate that gaps in scientific understanding and inadequacy of available monitoring pose challenges in adopting a reduction target for the eastern basin, however ideally the draft targets would be released at the same time as the draft DAPs. If such timelines are not feasible, governments should be open and transparent about why. The DAPs should include the timelines for data collection, analysis and projected timeframe for establishing a target(s) for the eastern basin. If eastern basin targets are not set before the DAPs are released, the DAPs should be modified to incorporate action required to meet the eastern basin targets, where appropriate.

Funding

The DAPs should include a section detailing funding needs for each aspect of the plan and include a budget table outlining what resources are available and what resources are required to implement the actions identified in the plans. This would help demonstrate shortfalls under existing levels of funding. Additionally, this section should explain funding priorities and describe various scenarios that identify what actions and achievements are possible under different funding levels.

Among the top funding priorities, the author organizations recommend resources be made available to expand monitoring capacity and implement new programs, policies and authority. Jurisdictions should be investigating how to ensure ongoing funding is made available to support these programs at least until 2025. Such funding would support increases in each jurisdiction's technical capacity and support efforts to ensure compliance with plans and rules over the long term.

Ultimately, funding DAP implementation needs to go beyond supporting programs in priority watersheds, and transition into a comprehensive approach that will achieve holistic, sustainable agricultural practices across the region. A comprehensive approach will require an evaluation of all tools and approaches, whether they be voluntary or prescriptive through mandatory programs. Resources should be prioritized to account for current and new high nutrient loading areas and watersheds.

Funding Recommendation Summary

- DAPs should include a section detailing funding needs for each aspect of the plan and include a budget table outlining what resources are available and what resources are required to implement the actions identified in the plans.

Compliance and Enforcement

The DAPs should include commitments to ensure adequate compliance and enforcement of the programs and authority that will be applied to implementation of the Plan. Many programs rely on a complaint-based system by citizens for reporting suspected violations. These approaches often only apply to events after they have already polluted waterways, or when a neighbor actually witnesses a violation. Effective enforcement must utilize a proactive system that does not place the burden solely (or mostly) on citizen reporting. The author organizations recommend the DAPs specify how each jurisdiction will achieve the following:

- Establish fair, clear and consistently enforced consequences and penalties (i.e. fines, withdrawal of funding) for non-compliance with policies and plans.
- Dedicate adequate human and financial resources committed to support compliance monitoring and regulatory enforcement.
- Create an inspection program that will randomly assess compliance with plans, programs and rules targeted at key times when nutrient pollution risk is highest.

Tactics to Meet Nutrient Reduction Targets

The ability to reduce phosphorus entering the lake relies on the successful implementation efforts of each of the Lake Erie states and the province of Ontario. The core of any plan is the specific actions that define current and future steps to address both point and nonpoint sources. While there is variability of program and policy authority across the jurisdictions in the Lake Erie basin, the following describes top priority actions that should be undertaken that are essential for reaching nutrient reduction goals.

The DAPs should include specific information on measurable actions and timing for those actions by jurisdiction. The DAPs should also identify responsible entities for implementation. These details will ensure the plan establishes clear expectations and provides the necessary transparency to hold jurisdictions accountable for their implementation.

The focus on the watershed characterization of loads and call for specific programs, actions and delivery mechanisms with timelines and accountability metrics in the Objectives and Tactics sections in the USEPA Annex 4 Domestic Action Plan Outline (September 16, 2015) provide a useful framework for the inclusion of specific actions and authority. The Canadian plan should also include similar sections to add clarity and the requisite specificity necessary to ensure success. Such a framework aligns well with the recommendation earlier in this report for the jurisdictions to provide subwatershed allocations based upon a 40% reduction of the 2008 phosphorus loading identified for each of the major tributaries. Allocations by subwatershed, and associated source identification, will facilitate the ability to align the appropriate actions and authority to meet the allocated targets.

The DAPs should include a timeline to establish the framework and achieve load reductions within each subwatershed. Our organizations also recommend aligning specific tactics to address both point and nonpoint sources identified within each subwatershed proportionate to the amount of phosphorus contributing to the overall subwatershed load. In this manner the DAPs will appropriately address pollution sources both diffuse and discrete from urban areas as well as rural.

Section 5, titled "Tactics" of the US EPA outline document is reserved to detail how DAP implementation will occur and includes the evaluation of actions and programs both current and new to reduce nutrient pollution, as well as a section devoted to proposing necessary future tactics. These elements will be critical components of the DAPs. As noted above, there is wide variability in the programs and authority that exists across the jurisdictions, and the DAPs should include an inventory of these.

In addition, the DAPs should also include an analysis of program and policy gaps for those areas lacking in sufficient authority or funding to meet the reduction targets. Such an analysis should inform future tactics, specifically programs, processes or policy needs which may require new authority, funding, or other solutions beyond 12 months but within 36 months. Additionally, any new programs or policies should achieve both lake and subwatershed loading targets.

As stated, the DAPs must include specific tactics in proportion to the contributing sources.

Numerous studies and models show phosphorus from farm fields and livestock operations as the dominant source of western Lake Erie's harmful algal bloom and the most significant contributor to total lake loads. Historically, the main approaches to reducing agricultural pollution have been through voluntary adoption of conservation practices, which thus far have been insufficient to reduce phosphorus loads to the levels necessary to address algal blooms in the lake. Recent actions within some jurisdictions have attempted to strengthen voluntary programs and implement new policies. However to effectively reduce agricultural pollution, broad scale application of best management practices will be necessary. As stated, the DAPs must include specific tactics in proportion to the contributing sources. Therefore it is understandable the plans will have some solutions to address loads from urban and residential areas, but the overall emphasis must be on achieving significant reductions from the agriculture sector.

Furthermore, though the Parties ultimately are responsible for drafting the DAPs and overseeing their implementation, this work is being completed through the Annex 4 subcommittee, which includes participation from Lake Erie states and the Province of Ontario. As such, it is both reasonable and necessary for the DAPs to include specific actions that take place at the jurisdictional level such as promulgating new regulations, or working to enact new laws. Therefore the author organizations recommend the following for future tactics that take place between 12-36 months:

- The states and province should establish new mechanisms that require agricultural producers to identify and implement best management practices that effectively reduce both total and dissolved reactive phosphorus runoff from field surfaces and tile drains.
- The states and province should develop regular uniform standardized soil test sampling, methods and reporting protocols to ensure test results are consistent throughout the Lake Erie watershed.

- The states and province should enact new, or revise current authority, to ensure nutrient applications adhere to appropriate agronomic rates.
- Policies should be enacted or revised that eliminate nutrient application on frozen, snow-covered, and saturated ground, or when the weather forecast calls for heavy precipitation. Not all jurisdictions currently have this requirement, or do with problematic exemptions.
- Where viable or necessary, policies and programs should incentivize land conversion to low phosphorus contributing uses such as switchgrass on marginal agricultural lands, wetland restoration and construction, wood lots, etc.
- The federal, state and provincial governments should promote green infrastructure solutions to reduce urban stormwater pollution by providing funding, regulatory direction and technical support to municipalities and urging the use of green infrastructure as an alternative to more expensive stormwater controls where feasible and appropriate.
- The states and province should provide funding for and direction to local governments to conduct inspections of home sewage treatment systems to identify those that are poorly maintained or failing.
- The states and province should adopt jurisdiction-wide uniform septic code and inspection requirements.
- The states should establish allowable average phosphorus effluent limits of 1 mg/L for publicly owned treatment works (POTW) (1 million gallons per day & up), and growing season (April through September) average phosphorus effluent limits of 0.6 mg/L.
- Conduct an analysis to understand relative contributions of nutrient loading from all sources (including but not limited to home sewage treatment systems, wastewater facilities, combined sewer overflows and nonpoint source agriculture) in the Lake Erie watershed on the Canadian side. That analysis should inform targeting of investments to achieve nutrient reductions in the most efficient and effective manner
- End the dumping of dredged sediments from harbors and river mouths into Lake Erie.

Our organizations acknowledge it is the responsibility of each jurisdiction to implement these policies or programs and the Parties have limited ability to ensure their adoption. However, inclusion in the DAPs demonstrates jurisdictional support, though not necessarily success in actual implementation of each item. As such we ask the Parties to identify specific tools available under federal authority to spur adoption of the specified jurisdictional policies and programs. For example, the U.S. EPA could withhold Great Lake Restoration Initiative funding should the states fail to make the requisite changes in law or policy. Doing so will ensure the DAPs are effective and offer clear direction for the jurisdictions.

Tactics to Meet Nutrient Reduction Targets Recommendation Summary

- The DAPs should include specific information on measurable actions and timing for those actions by jurisdiction with identification of responsible entities for implementation.
- The Canadian Domestic Action Plan should include sections specifying objectives and tactics similar to the USEPA Annex 4 Domestic Action Plan Outline (September 16, 2015).
- A wide variability of programs and authorities available to implement the DAPs exists across the jurisdictions, and the DAPs should include an inventory of the relevant authorities by jurisdiction (perhaps as an appendix).
- The DAPs should include an analysis of program and policy gaps for those areas lacking in sufficient authorities or funding to meet the reduction targets, and incorporate analysis results into future actions.

In the section devoted to future programs, policies, funding, etc. necessary to achieve target reductions, the DAPs should include the following direction for each jurisdiction in order to address both municipal and agricultural sources of phosphorus pollution:

- The states and province should establish new mechanisms that require agricultural producers to identify and implement best management practices that effectively reduce both total and dissolved reactive phosphorus runoff from field surfaces and tile drains.
- The states and province should develop uniform standardized soil test sampling, methods and reporting protocols to ensure test results are consistent throughout the Lake Erie watershed.
- The states and province should enact new, or revise current, authorities to ensure nutrient applications adhere to appropriate agronomic rates.
- Policies should be enacted or revised that eliminate nutrient application on frozen, snow-covered, and saturated ground, or when the weather forecast calls for heavy precipitation. Not all jurisdictions currently have this requirement, or do with problematic exemptions.

Tactics to Meet Nutrient Reduction Targets Recommendation Summary continued

- Where viable or necessary, policies and programs should incentivize land conversion to low phosphorus contributing uses such as switchgrass on marginal agricultural lands, wetland restoration and construction, wood lots, etc.
- The states and province should promote green infrastructure solutions to reduce urban stormwater pollution by providing funding, regulatory direction and technical support to municipalities and urging the use of green infrastructure as an alternative to more expensive stormwater controls where feasible and appropriate.
- The states and province should provide funding for and direction to local governments to conduct inspections of home sewage treatment systems to identify those that are poorly maintained or failing.
- The states should establish allowable average phosphorus effluent limits of 1 mg/L for publicly owned treatment works (POTW) (1 million gallons per day & up), and growing season (April through September) average phosphorus effluent limits of 0.6 mg/L.
- Conduct an analysis to understand relative contributions of nutrient loading from all sources (including but not limited to home sewage treatment systems, combined sewer overflows and nonpoint source agriculture) in the Lake Erie watershed on the Canadian side. That analysis should inform future investments to achieve nutrient reductions.

The Parties should identify specific tools available under federal authority to spur adoption of future jurisdictional programs and policies necessary to achieve target reductions. For example, the U.S. EPA could withhold Great Lake Restoration Initiative funding should the states fail to make the requisite changes in law or policy.

Public Consultation

The GLWQA 2012 contains many places where the Canadian and U.S. federal governments commit to "cooperation and consultation" with the public. The author organizations interpret this as a government commitment to meaningful engagement of the public throughout the development and implementation of all aspects of the Agreement.

In the development of the DAPs, the parties should ensure involvement of all Lake Erie stakeholders. The ultimate success of restoring and maintaining the Lake Erie ecosystem depends on the efforts of everyone. As such, the DAP writing team should ensure ongoing dialogue with a number of stakeholder groups throughout the writing process to help develop recommendations and implementation plans for the identified actions.

Unfortunately, there are a number of examples of inadequate public consultation processes to point to in the implementation of the GLWQA 2012. For instance, the public was not consulted on the Lake Superior Draft LAMP in 2015, until after the document was fully drafted. It is in the development stage that one can have most impact on direction and contents. When working together with stakeholders, governments are more likely to come up with creative and implementable solutions.

Governments should also consider how to create circumstances that will result in the most valuable input and ideas from stakeholders. For instance, it is difficult for stakeholders to understand how they could contribute to collecting data that could help decision making without understanding what data the government has and where gaps in understanding exist.

Public Consultation Summary

- Involve stakeholders at an earlier stage and continuously through the DAP writing process.
- Share information where gaps in science and monitoring exist so that stakeholders can be part of the process that defines ways of addressing the gaps.
- Host a public consultation period that is no shorter than 60 days once the DAPs are drafted. This should be accompanied by in person meetings in key communities across the basin.
- Respond to the public consultation comments received.
- Consider hosting biannual webinars through the implementation process to keep stakeholders apprised of progress.
- Host webinars to complement each written annual progress reports.

Conclusion

Our organizations provide this collective input to help guide creating successful Domestic Action Plans. Toward this end, several key components deserve emphasis: robust, detailed monitoring and modelling requirements; ongoing tracking and reporting that informs a clear adaptive management approach; adequate and consistent funding; proactive compliance and enforcement mechanisms; and specific tactics that extend beyond traditional approaches that have failed to date to solve the problem. The DAPs must also address Lake Erie's entire basin, including the eastern portion. Finally, the public needs to be part of the whole process - including the development of the plans through to implementation.

The success of these Domestic Action Plans is absolutely crucial, not only in order to help restore Lake Erie's water quality, but to serve the millions of Canadians and Americans that rely on a healthy Lake Erie for their drinking water, recreation, employment and overall wellbeing. Excessive nutrient loading and algal blooms are a direct threat to their quality of life and strong local economies. Fortunately, federal, state and provincial governments in the basin have made a number of commitments to reduce phosphorus loading to the lake, and our organizations support the spirit of these efforts.

We would like to thank the Annex 4 leads and team for the opportunity to submit this document. We look forward to working with the team throughout the development and implementation of the DAPs. We view this document as a discussion piece that can act as a starting point for further constructive dialogue.

References

Betanzo, E.A., Choquette, A.F., Reckhow, K.H., Hayes, L., Hagen, E.R., Argue, D.M., and Cangelosi, A.A., 2015, Water data to answer urgent water policy questions: Monitoring design, available data and filling data gaps for determining the effectiveness of agricultural management practices for reducing tributary nutrient loads to Lake Erie, Northeast-Midwest Institute Report, 169 p., http://www.nemw.org

Betanzo, E.A., Choquette, A.F., and Hayes, L., 2015, Water data to answer urgent water policy questions: Monitoring design, available data and filling data gaps for determining the effectiveness of agricultural management practices for reducing tributary nutrient loads to Lake Erie., Addendum describing new, expanded, and planned monitoring sites, Northeast-Midwest Institute, 27 p., http://www.nemw.org

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Conservation Ontario, 2009. An Evaluation of Water Resource Monitoring Efforts in Support of Agricultural Stewardship in Watersheds of the Great Lakes Basin.

Name: Ontario Headwaters Institute

Date of Submission: October 7, 2016

Location: N/A

Comment:

We enclose comments on the 2016 report and the on-going work on the Great Lakes.

The attachment adds context and a 5th subject but otherwise reflects our oral comments made in Toronto on October 5.

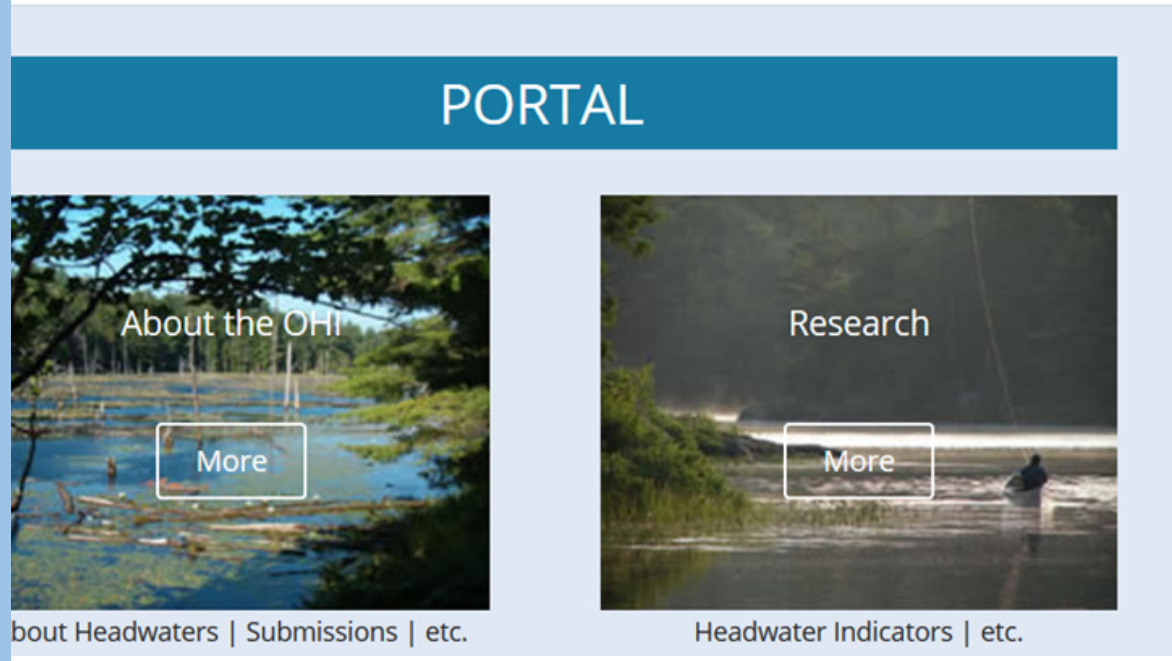

Ontario
Headwaters
Submission to the IJC
October, 2016

Ontario Headwaters

Portal About Research Education Best Practices Updates Webinars Subscribe Support Contact

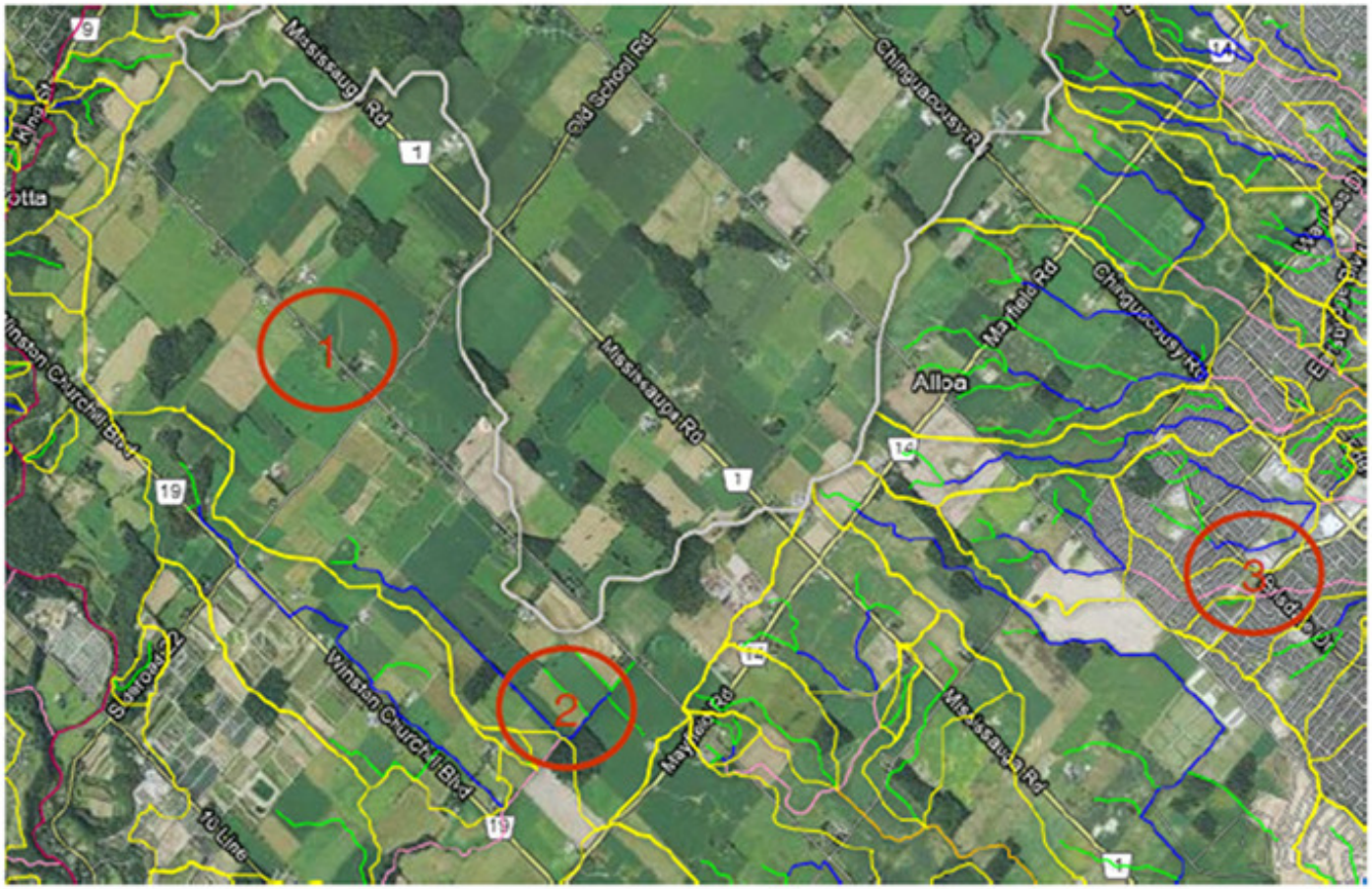
The OHI is a Canadian charity and the leading Ontario NGO working to protect headwaters and to implement Integrated Watershed Management across the province.

Our 3 main portfolios are Research, Education, and Best Practices



Research includes:

Developing Indicators of Headwater Health



Education includes:

OHMapping & Headwater Hikes

Best Practices currently focuses on submissions to government.

We have 5 observations and recommendations regarding the 2016 Annual Report and the work of the IJC.

1. **Congratulations on the Report and the work behind it.**

- **Progress and the trend to more progress are clear, particularly in the evolution of much of the science and increased monitoring.**
- **We are encouraged by the prospect of pending improvements in AOCs over the next few years, which will deliver substantial momentum to decades of work.**

2. Please stop calling the Lakes variants of "the largest freshwater ecosystem in the world".

- It is simply not true.
- The OHI lobbied against this term in the first two iterations of Ontario's draft Great Lakes Protection Act, successfully getting it amended in the third bill, which was passed.
- Since then, we have had assurances from both Ontario's MNRF and Environment and Climate Change Canada that they will not use the term.
- Its use by the IJC devalues your overall science credibility.

3. **We urge you to find a better balance between your efforts on the Lakes and their watersheds.**

- **We understand and support the hugely important science and remediation efforts focused on the Lakes, and the need to deal with both municipal and lake-side point-source pollution.**
- **However, too few trees, dried out wetlands, too many nutrients, and increased temperatures from the thousands of tributaries that contribute 48% of the annual inflow to the Lakes will cause challenges that cannot be ignored.**

4. **We ask you to consider recommending that the Parties commit to protecting the Basin by adopting minimal thresholds to protect natural heritage on a watershed basis.**

- **One set of such targets can be found in an Environment Canada publication called "How Much Habitat is Enough?", which were were the basis for the OHI's recent submission of the first set of targets under Ontario's Great Lakes Protection Act.**
- **Our suggested targets - and practical remediation goals where necessary - include:**
  - **a) A minimum 50% target for natural cover for each watershed;**
  - **b) Wetlands consisting at a minimum of the greater of**
    - **i. 10% of each major watershed and 6% of each sub-watershed, or**
    - **ii. 40% of the watershed's historic wetlands; and**
  - **c) A minimum 30-metre-wide naturally-vegetated riparian area along both sides of streams.**

5. Livestreaming and O&E

- We express our sincere appreciation for the livestreaming, a significant improvement from when the OHI brought a camera to a meeting and posted 8 hours of videos on YouTube.
- We hope the number of people who participated in the livestreaming justifies further similar efforts.
- Regardless, we urge the IJC and the Parties to expand their commitments to meaningful and effective O&E as the best way to increase such participation, as well as more direct connections to the Lakes, the Commission, the work of the Parties, and community-based efforts to celebrate, protect, and remediate the Great Lakes and their watersheds.


Ontario
Headwaters
ThankYou
Andrew McCammon
Executive Director
andrew@ontarioheadwaters.ca
416 231 9484

Name: Robert Zahn

Date of Submission: March 19, 2017

Location: Columbus, Ohio

Comment:

While progress has been made, we still need to continue to spend money on our Great Lakes. No other single resource is more important for the state of Ohio. Our State Senators need to ensure that the Federal Government also doesn't cut funding to these efforts.

Name: Sierra Club Canada

Date of Submission: October 26, 2016

Location: Toronto, Ontario

Comment:

These are our submissions endorsed by 44 other ngos from around the Great lakes

Canadian Coalition for Nuclear Responsibility

Regroupement pour la surveillance du nucléaire

October 17, 2016

The Right Honourable Justin Trudeau
Prime Minister of Canada
House of Commons
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President Barack Obama
United States of America
White House, 1600 Pennsylvania Ave. N.W.
Washington, DC 20500
president@whitehouse.gov

Dear Prime Minister Trudeau and President Obama:

Re: Elimination of irradiated weapons-grade uranium from Chalk River

The Canadian Coalition for Nuclear Responsibility (CCNR) and the organizations listed below fully endorse the goals of the Global Threat Reduction Initiative (GTRI) to eliminate stocks of irradiated weapons-grade uranium from civilian facilities, as stated in our letter of September 30. We are convinced that the fastest, safest, and cheapest way of achieving this goal is to down-blend the contents of the Chalk River Fissile Solutions Storage Tank (FISST) on-site, thereby converting the current inventory of highly enriched uranium (HEU) to non-nuclear-weapons-usable low-enriched uranium (LEU). The down-blending of this type of liquid waste has already been carried out in Indonesia just this year, in a matter of months, as documented in our earlier letter.

Because the GTRI is an agreement between Canada and the USA, your intervention in this matter is needed. Down-blending is preferable to transporting 23,000 litres of highly radioactive liquid waste over public roads and bridges in 100 to 150 truckloads, over a period of four years, at a cost of $2600 per litre, thereby endangering the waters of the Great Lakes. Calculations have shown that the cesium-137 concentration in the FISST liquid waste is about four times greater than that of the post-reprocessing liquid waste stored in hundreds of tanks at Hanford Washington, left over from the separation of weapons-grade plutonium for use in nuclear weapons.

Seventeen additional organizations have given their endorsements to the letter that I addressed to you on September 30; please see the attached list.

We look forward to hearing from you on this important matter.

Gordon Edwards

Gordon Edwards, Ph.D., President,
Canadian Coalition for Nuclear Responsibility
53 Dufferin, Hampstead QC, H3X 2X8

c.c.

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THE LETTER OF SEPTEMBER 30 CAN BE ACCESSED AT: http://ccnr.org/GLWQA_Letter_2016.pdf
THE LETTER HAS BEEN ENDORSED BY THE FOLLOWING NON-GOVERNMENTAL ORGANIZATIONS :

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ADDITIONAL ENDORSERS (NOT LISTED IN THE LETTER OF SEPTEMBER 30)

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Name: SOS Great Lakes

Date of Submission: November 18, 2016

Location: N/A

Comment:

I am contacting on behalf of SOS Great Lakes. Three of our members presented their concerns to the IJC at the Great Lakes Public Forum on October 5, 2016. I have attached their presentations along with an infographic that explores why radionuclides should be added as a Chemical of Mutual Concern under Annex 3 of the GLWQA. This can also be found on our website: http://www.sosgreatlakes.org/facts-and-infographics/

Attached you will find submissions by Jill Taylor (President, SOS Great Lakes), Ellen Dailey (Director, SOS Great Lakes), and Eugene Bourgeois (SOS Great Lakes).

Please confirm receipt of our submissions.

Thank you for your consideration.

Great Lakes Public Forum--Ellen Dailey, Director, SOS Great Lakes

Good afternoon Mr. Goffin, Mr.Davis, and fellow panelists.

Thank you for the opportunity to present my comments to the International Joint Commission (IJC) and to aid in the efforts to meet the goals of the Great Lakes Water Quality Agreement.

A number of challenges threaten the sustainability of the Great Lakes. These include toxic chemicals, such as legacy contaminants and substances of emerging concern.

The websites of both the Environmental Protection Agency (EPA) and Environment Canada state that chemicals of mutual concern are those that originate from anthropogenic sources and that are potentially harmful to human health or the environment.

According to the IJC, hundreds of chemicals have been identified in the Great Lakes ecosystem. As of 1994, 362 contaminants had been confirmed as being present in measurable concentrations in the water, sediments and/or in the tissues of fish, wildlife or humans. At the time of the 1994 report, 126 of these substances had been linked to toxic effects on various life processes.

Some of these chemicals have been labeled "critical" and "priority contaminants" based on factors such as presence and ambient concentration, degree of toxicity, persistence in the environment, bioavailabilty, and the potential to bioconcentrate and bioaccumulate in the Great Lakes environment.

Yesterday I brought to your attention two reports that were prepared for the IJC in the 1990s about radionuclides in the Great Lakes. Today I would like to elaborate on this topic and why it is imperative that radionuclides be included in Annex 3 of the Great Lakes Water Quality Agreement as a Chemical of Mutual Concern.

The "Inventory of Radionuclides in the Great Lakes" (1997) study concluded that radionuclides were present in the lakes and that the majority were from anthropogenic sources. The study also indicated that the radionuclides are

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info@sosgreatlakes.org

bioavailable, toxic, persistent in the environment, and have the potential to bioconcentrate and bioaccumulate.

The IJC's Nuclear Task Force noted that the bioaccumulation, biomagnification, and transfer factors used to describe the cycling of radionuclides and their transfer along exposure pathways to biota, including humans, came from the long history of work done in oceans, estuarine, and river environments. Comparable studies for the Great Lakes freshwater environment were virtually nonexistent. Yet for the Great Lakes, the need for transfer factors that describe lake environments is critical.

Toxicity of radionuclides

The Canadian Nuclear Safety Commission (CNSC), World Health Organization (WHO), and the American Cancer Society websites point out that exposure to ionizing radiation carries health risks. The review also states that some populations are more sensitive to the effects of radiation exposure such as women, children and, of course, the fetus.

The health risks include cancer, hereditary effects, cataracts, cardiovascular disease and stroke, immune effects, premature aging, radiation sickness, and death. Cancers associated with high dose exposure include leukemia, multiple myeloma, breast, bladder, colon, liver, lung, esophageal, ovarian, stomach, and thyroid cancers. Literature from the U.S. Department of Health and Human Services also suggests a possible association between radiation exposure and skin, prostatic, sinus, laryngeal, and pancreatic cancers.

Leukemia, a type of cancer that arises in the bone marrow, and thyroid cancer are among the most common radiation-induced cancers. The reason for this may be sensitivity of the cell line or the cell's propensity for uptake of a given radioactive element. The thyroid gland normally takes up iodine and bone takes up strontium. Each of these elements has a radioactive isotope produced by nuclear fission and is found in the Great Lakes.

Thyroid cancer is known to be prevalent in the Great Lakes basin population. According to the Canadian Cancer Statistics 2013 report, the incidence rate for thyroid cancer is increasing. Furthermore, the increased incidence observed is more than the increase being seen with other major cancers. There was a 6.8 percent per year increase in males since 1998 and a 7 percent per year increase in females since 2002.

Less known are the potential hereditary effects of ionizing radiation. Potential hereditary effects include congenital malformation, cognitive impairment, microcephaly, growth restriction of the fetus, prematurity, infertility and pregnancy

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loss, including miscarriage, fetal death, neonatal death and infant death. In addition, ionizing radiation may increase the risk of cancers and other health problems in future generations due to the subtle ongoing biological impacts that may become pronounced and irreversible over time through genetic mutations. The insidiousness of radiation injury is seen in its propensity to present only after irreversible genetic damage has already occurred over an unknown period of time.

The BEIR VII report on health effects of ionizing radiation concludes that current scientific evidence is consistent with the hypothesis that there is a linear dose response relationship between exposure to ionizing radiation and the development of radiation induced solid cancers in humans.

Human activities, both historic and current, have altered and will continue to impact the Great Lakes ecosystem and the biological diversity it sustains. Ontario Power Generation (OPG)'s proposed Deep Geological Repository (DGR) has the potential to leak radionuclides into the Great Lakes, and will likely leak, as no other DGR in the world has been successful in containing the toxic wastes it stores. The radioactivity and long-term toxicity of these lethal wastes could threaten present and future generations.

The Commissioner of Environment and Sustainable Development issued a report yesterday citing the CNSC for not providing appropriate inspections to ensure that nuclear facilities are meeting the regulatory requirements. It is imperative that a binational group be able to look at the data to determine what is truly happening with radionuclides in the Great Lakes.

We look to the continued comity between our two countries to motivate Canada and the United States to add Radionuclides to the list of Chemicals of Mutual Concern under Annex 3 of the Great Lakes Water Quality Agreement.

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Great Lakes Forum—Eugene Bourgeois, SOS Great Lakes

Good afternoon,

My name is Eugene Bourgeois and I am a retired sheep farmer living in Inverhuron, home to both a nuclear power plant and the proposed Deep Geologic Repository for low- and intermediate-level nuclear wastes, right here beside and below Lake Huron.

It is surprising to me that radionuclides are not already Chemicals of Mutual Concern in the Great Lakes Water Quality Agreement under Annex 3, as recommended by your own Nuclear Task Force 20 years ago.

We learned in the late 1880's that when we use our rivers as sewers innocent people die. We were reminded of this recently in Ontario when Walkerton's water was contaminated by farm sewage and a number of people died. In each case, the solution to pollution was believed to be dilution.

The National Academy of Sciences has established that there are no known safe concentrations of exposure to radionuclides and so, has adopted a Linear No Threshold standard. The recent KiKK study in Europe demonstrated the strong statistical correlation between exposure to chronic low doses of ionising radiation and childhood leukaemia, effects that increase the closer one lives to a nuclear power station, even when these are operating as permitted. Even without this, we still manage to be exposed to the harmful effects of chronic, low doses of radiation from both cosmic and solar sources, each of which can cause sickness and death.

During the Hearings for DGR, we learned that OPG's long-term plans for this radioactivity is for it to be discharged into the groundwater and from there to Lake

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Huron. It claims this won't happen for more than a million years, similar to WIPP. WIPP failed catastrophically after only 15 years.

In the 1950's, expectant mothers were X-rayed to determine the relative health of their babies. It was only after Alice Stewart organised the Oxford Survey in England and analysed these data that she showed X-raying foetuses itself led to early childhood death. Buster Brown shoes offered to X-ray your feet when I was a child and many of those adolescent boys who did so are sterile today.

The Great Lakes are the source of drinking water for more than 40 million Canadians and Americans. Water is something each of us needs every day of our lives. Mothers need it to mix baby food for their children. It was a mere 75 years ago that we first split the atom, setting the stage for nuclear power production. In every case our initial concerns about the impacts of exposure to ionising radiation have been far too liberal to safeguard people.

Radionuclides must be included and listed as Chemicals of Mutual Concern in Annex 3. Without having a clearly identified understanding of them and their inventories we will not be able to research their potential adverse health effects on the populations who live near and rely on the Great Lakes for water.

Thank you

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Great Lakes Forum – Jill Taylor, President, SOS Great Lakes

Introduction

SOS Great Lakes, is an organization of Canadian and American Citizens dedicated to keeping the burial of radioactive nuclear waste out of the Great Lakes Basin. We are not anti- nuclear, but are deeply opposed to the reckless plan of the Ontario Power Generation Inc. (OPG) to construct a deep geological repository for up to 400,000 cubic meters of Low and Intermediate Level nuclear waste on the shore of Lake Huron at the Bruce Nuclear Plant. This project, if approved, could begin before 2020. I will refer to this as "the plan".

The burial of this vast quantity of radioactive nuclear waste would result in a continuous risk of radiotoxic poisoning of Lake Huron, the Great Lakes and the St. Lawrence River System. The OPG Plan should concern this Forum for at least 3 reasons:

1. **These Radionuclides Are Persistently Destructive:** the extremely destructive character of this waste, the persistence, likely migration, and the long residence of its contaminant properties, (stated by OPG to last over 100,000 years);
2. **The Plan Violated the Canadian Environmental Assessment Act (CEAA):** OPG and the Federal Joint Review Panel (JRP) failed to follow the governing legislation in multiple ways on several occasions; to date, the Minister responsible for CEAA has failed to take appropriate action in response to these violations;
3. **Deeply Flawed Science:** both OPG and the JRP failed to rely on evidence based science. What they did use was demonstrably unreliable.

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1. Persistently Destructive

You have said in your Progress Report that you are interested in chemicals that are persistent: no substance is more persistent than the radioactive intermediate and high level waste, in combination with our waters. “Over 100,000 years”, exceeds the definition of ‘persistence’, and cannot be ignored.

Since the DGR idea was hatched in the 1990s, international experts have consistently derided the science and lack of common sense of a DGR on the Great Lakes, saying that the DGR will NOT be able to contain nuclear waste and prevent the contamination of the ecosystem, including the Lakes and the people around it. Yet, the Ontario and Canadian Governments continue to allow consideration of this plan long past its best before date, if it ever had one.

2. Multiple Violations of the Canadian Environmental Assessment Act (CEAA)

In a direct affront to the Canadian Environmental Assessment Act, OPG refused to consider alternate sites in addition to the sedimentary geology of the near shore environment of the Bruce. The Minister asked OPG for further and better information about alternate sites. OPG rephrased the Minister’s question and said it would provide a response to its rephrasing by December 2016.

Citizens groups such as ours have advised the Minister of multiple other violations of CEAA. To our knowledge, the “alternate site violation” is the only one to which the Minister has responded publically.

OPG has stated that not only will the DGR leak, but that their storm water management system to protect the ground water and Lake Huron in an unplanned event is totally insufficient to handle extreme weather events. In another affront to logic, OPG refused to consider that climate change, including already dramatic patterns of Great Lakes weather and precipitation, would increase the risks to public safety or the environment as they might act on the DGR, or have an effect on plans for emergency management of accidents and malfunctions during the 300 years of institutional control.

During the Joint Review Panel hearings in the fall of 2013, thousands of pages of testimony were read into the record by citizens, politicians from Canada and the US,

scientists of all stripe, including nuclear specialists and former OPG employees, economists, geologists, conservation advocates, sociologists, doctors and indigenous people that refuted the logic and safety of the proposal for the deep underground dump on the shore of Lake Huron in sedimentary rock.

Evidence of improper adjudication and presentation of evidence, financial coercion by the proponent and the denial of international obligations were rampant.

We have filed an application for Judicial Review (JR) against the Canadian Government, CNSC and OPG, to challenge JRP's acceptance of the OPG Nuclear Waste Dump Plan based primarily on these multiple violations. CEAA requires the Minister to either reject or accept the plan. If she rejects it, a Judicial Review Application is moot. If she accepts, the JR is converted automatically to a JR of her decision.

We believe there are ample environmental protection public policy reasons why this matter should never have to go to court.

3. Deeply Flawed Science

Every day, new evidence emerges exposing even more faults in the OPG DGR plan, and its woefully inadequate 'science'. OPG has acknowledged that the physical structure and storage vaults of the planned repository will disintegrate after construction, and that radionuclides will eventually leak into the water and environment. They say it is not if, but when the repository will leak.

The gravity of this and similar statements in their EIS persists despite tragic failures elsewhere. This year, there was a collapse of a tunnel during an underground scientific pre- test of similar DGR in sedimentary geology in France during which a worker was killed and others injured. In 2014, in Carlsbad New Mexico the DGR that was the design model for the DGR 1 here at the Bruce Plan was closed following radioactive releases into the environment and underground fires that threatened the lives of workers and the public.

Internationally, the concept of DGRs is in trouble! Multiple other accidents and closures of DGRs challenge the idea that a DGR will ever be built that is successful.

Conclusion

The regulator, CNSC, has demonstrated bias and protection of industry in its monitoring and categorization of radionuclide emissions into the environment, including into the water of the Great Lakes. Relying on reductive methods they are not diligent in reporting of contamination that in other jurisdictions would be unacceptable. It is imperative that an un-biased party acknowledge the danger of radionuclide contamination and list radionuclides as a chemical of mutual concern. This action must have an effect on the CNSC and the nuclear industry to provide transparent monitoring and emergency planning. It must influence the development review of nuclear projects as a binational concern, and provide sustainable and precautionary protective measures for all sites on the Great Lakes.

We also ask the Canadian and U.S. Governments to work together to stop the OPG plan, - a plan that was, and is, ill-conceived and does not follow the obligations of binational environmental protection about which you so proudly speak in this Forum.

By doing so, you will join:

- More than 154 municipalities that have signed petitions against the plan,
- The Great Lakes and St. Lawrence Mayors who have thrice passed resolutions opposing the plan, and
- 98 percent of all Canadians and Americans who responded to a letter writing campaign initiated by the Canadian Government in Sept 2015 to express their views about the decision to build this deeply flawed nuclear waste repository.

We urge the Executive Committee of the Great Lakes Forum to list radionuclides as a chemical of mutual concern and immediately act to oppose the OPG's plan for a Nuclear Waste Dump at Kincardine.

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Name: St. Clair River BPAC

Date of Submission: October 13, 2016

Location: Port Huron, Michigan

Comment:

Thank you for the opportunity to comment. I'd like to see a greater emphasis in the report and plans for improving drinking water and wastewater infrastructure. In the US, major wastewater upgrades were made in the 1970s. It is time to reinvest in this aging and vitally important infrastructure. The Flint drinking water crisis has brought attention to the need for improvements to the infrastructure especially in older cities. Please support increased funding for infrastructure to ensure safe and effective treatment and distribution of drinking water and wastewater.

Name: The Inverhuron Committee

Date of Submission: November 10, 2016

Location: Ontario

Comment:

Document attached.

Molly McFadzean
Chair of the Inverhuron Committee.

Presentation to the International Joint Commission regarding the Water Quality of
The Great Lakes
Wednesday, October 5, 2016
Allstream Centre, Toronto

Good afternoon, ladies and gentlemen of the International Joint Commission, audience and participants.

I represent a group called The Inverhuron Committee. We are citizens who live within 5 kms. of the Bruce Nuclear site which is the proposed location for a nuclear waste repository.

Before speaking directly to our concerns about this project, I would like to tell you a little bit about who we are and, also, how we came to be opposed to the proposed project by Ontario Power Generation to build a nuclear repository on the shores of Lake Huron to permanently bury low-level and intermediate-level nuclear waste from all of Ontario's nuclear power plants.

We are citizens of the previously named Hamlet of Inverhuron which has now been incorporated into the Municipality of Kincardine. We have both seasonal and permanent residents who live along the shoreline of Inverhuron Bay. Our residents trace their heritage back four, five and six generations to this location. In early days, they drew their water directly from the lake via sandpoints along the shore. More recently, they have relied on wells cut deep into the aquifers that run inland from the lake. Therefore, water quality has been integral to life along the shoreline for more than a century.

For that reason, our community incorporated The Inverhuron Committee as we have a large stake in ensuring that no radioactive contaminants would leak into the lake as a result of this project.

However, it wasn't long into our research that we widened our scope beyond the local shoreline because this potential repository would affect more than 40 million people along the shores of the Great Lakes should a human error, malfunction, severe weather event or act of terrorism occur. There would be contamination of their drinking water of a disastrous magnitude.

Our concern about leakage was re-enforced during the Joint Review Panel Hearings in 2014-2015 when Ontario Power Generation indicated that, when leakage occurred, radionuclides would be sufficiently dissolved in the waters of the Great Lakes. There is no dilution sufficiency when we look at the importance of our fresh water. As the caretakers of this precious resource, we cannot take a chance with our water.

We soon learned that this would be the first repository to be built in limestone (a karst susceptible geology) and that the only two functioning repositories of this type had, indeed, leaked into the ground water in Europe and they had been closed down. In 2014, another repository leaked in New Carlsbad, New Mexico and it has been closed – unable to be entered – since that time.

Our journey quickly led us to discover why the site at the Bruce Nuclear plant had been chosen. We questioned what other sites would be technically and geologically feasible.

Surprisingly, the Kincardine site was chosen because the Municipal Council had agreed to host the repositoryin return for compensation of 35 million dollars. A Hosting Agreement was signed in 2004 and, initially, a Referendum was planned but a telephone survey was substituted in the winter of 2005. The survey question was introduced in a preamble by indicating that the Council supported this project and the telephone question posed was nebulous in content.

Responders were simply asked if they agreed that there should be a permanent solution for the Western Waste Management Facility. There was no mention of nuclear waste or location.
Due to the time frame of this survey, the seasonal residents and the snowbird community were absent, biasing the results to a population which is dependent on the nuclear industry. Even at that, only 60% agreed and 13% refused to answer. The Inverhuron Committee was astonished to discover both the timing and the content of the survey. The politicians in Kincardine explained that survey forms were mailed to absent citizens but we have only found two households, out of 400, who remember receiving or, actually, received a letter.
Our group believes that a small rural community of 12,000 people should not have the power to decide how and where Canada should dispose of toxic nuclear waste.
Our Liberal Federal Government has indicated that science will form the foundation of environmental decisions for Canada and certainly, the process undertaken to find a host for the disposal of low and intermediate -level nuclear waste is at the opposite end of the scale from being science-based.
Our Federal Government needs to establish clear guidelines for the disposal of nuclear waste as well as establishing a revised Environmental Assessment Process (Panel is now in place) which includes social license and economic feasibility. We also need to rely on a truly independent overseer to review projects of this magnitude. The Canadian Nuclear Safety Commission was an obvious stakeholder during the Joint Review Panel Hearings on the repository project. They defended processes and conclusions of Ontario Power Generation and openly attacked dissenters, questioned motives of intervenors and qualifications of scientists who asked questions. Policies and guidelines need to be the first order of business and independent oversight needs to accompany this process.
The Honourable Catherine McKenna has directed that the proponent study alternate technically and economically feasible sites for this project. Unfortunately, Ontario Power Generation has refused to carry out this specific request by indicating that they will look at two unnamed sites, one in southern Ontario and one in Northern Ontario. It would appear that the Great Lakes Basin will still be involved in such a study. We cannot allow the permanent storage of nuclear waste in the Great Lakes or in its watershed.
On a final note, The Inverhuron Committee questions the financial wisdom of building a repository for low and intermediate-level waste (more than 80% of which is short-lived low-level waste) when this is not international practice. We want to be able to have this waste monitored above-ground until it is free of radioactivity.
We seek intervention from the International Joint Commission and from our Federal Minister of the Environment and Climate Change to ensure the safety of our water from toxic radionuclides and chemical elements that will change the condition of our environment forever.

Thank you,
Marti McFadzean,
Chair,
The Inverhuron Committee