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**Written Closing Remarks from
Beyond Nuclear**

**Observations écrites finales de
Beyond Nuclear**

In the Matter of

À l'égard de

Ontario Power Generation Inc.

Ontario Power Generation Inc.

OPG's Deep Geological Repository (DGR)
Project for Low and Intermediate Level
Radioactive Waste

Installation de stockage de déchets radioactifs à
faible et moyenne activité dans des couches
géologiques profondes

Joint Review Panel

Commission d'examen conjoint

October 2014

Octobre 2014

October 9, 2014

Dear Chairman Swanson, and Members Archibald and Muecke, of the DGR JRP,

I am thankful for this opportunity to make closing remarks.

I have been actively opposed to OPG's DGR proposal for well over a decade, ever since hearing the first rumblings and rumors of this insane idea in the early part of the last decade. At first it seemed like a bad April Fool's joke. But it has long since become downright scary.

My opposition to the DGR began during my tenure as Radioactive Waste Specialist at Nuclear Information and Resource Service in Washington, D.C., where I served until July 2007. My opposition has continued since, up to the present, during my service as Radioactive Waste Specialist at Beyond Nuclear. My opposition also flowed naturally from my long service as a member of the board of directors for Don't Waste Michigan, representing the Kalamazoo chapter. My opposition also stemmed from my service as a member of Great Lakes United's (GLU) Nuclear-Free/Green Energy Task Force. In fact, for a portion of this JRP proceeding, I served as an expert witness for the bi-national GLU coalition, in opposition to the DGR.

My submissions in opposition to OPG's DGR have been written and oral. They included written and oral comments during the public comment period on the drafting of the environmental impact statement and environmental assessment guidelines that gave form to the JRP in the first place, many long years ago now.

Written and oral submissions to you, the JRP, have included the following:

May 24, 2013, written objection, as expert witness on behalf of GLU, against the JRP moving to the hearing stage;

August 13, 2013 written submission to the JRP, in support of my oral presentation scheduled for September 23, 2013;

August 27, 2013 submission of a power point presentation, to accompany my September 23, 2013 oral presentation;

My signature, on behalf of Beyond Nuclear, on the environmental coalition Request for Ruling regarding Decommissioning Wastes targeted by OPG for burial at the DGR, dated September 17, 2013;

My in-person September 23, 2013 oral testimony and power point presentation before you at the Royal Canadian Legion in Kincardine, Ontario;

My signature, on behalf of Beyond Nuclear, on the environmental coalition Request for Ruling regarding irradiated nuclear fuel, or other highly radioactive wastes, potentially targeted by OPG for burial at the DGR, dated October 3, 2013;

July 21, 2014, written submission to the JRP, in support of my oral presentation scheduled for September 16, 2014;

August 25, 2014 submission of a power point presentation, to accompany my oral presentation before the JRP scheduled for September 16, 2014;

My in-person September 16, 2014 oral testimony and power point presentation before the JRP at the Royal Canadian Legion in Kincardine, Ontario;

And now, my closing remarks, submitted on October 9, 2014.

My May 2013 objection to the JRP moving to the hearing stage in the first place was due to the woeful inadequacy of the OPG EIS, its half-baked nature on many levels. One was its coverage – or lack thereof – of cumulative impacts. This became the focus of my August 2013 written submission, and my September 2013 oral testimony.

As my September 2013 power point presentation concluded, OPG’s cumulative impacts Environmental Assessment is fatally flawed, and should be withdrawn. The proposed OPG DGR for “low” and “intermediate” level radioactive wastes should be blocked, given the significant cumulative effects from radioactive and toxic chemical hazards already suffered by residents of the Great Lakes, let alone the risks which would flow from the proposed Bruce DGR(s), both “low-/intermediate-” and, potentially, high-level.

As I emphasized in 2013, the Great Lakes Basin already suffers under the “routine radioactive releases” from a large number of atomic reactors. There is always the risk of a Chernobyl or Fukushima on the Great Lakes shoreline, as well, if a reactor disaster unfolds.

On Lake Michigan alone, Point Beach Units 1 and 2 in Wisconsin, Cook Units 1 and 2, as well as Palisades in Michigan, all still operate; even the permanently shutdown reactors, Kewaunee in Wisconsin, Zion 1 and 2 in Illinois, and Big Rock Point in Michigan, will still release radioactivity during decommissioning, and even long afterwards, as lingering contamination finds its way into the Great Lakes.

Most, even all of these reactors, open or shut, also store, on-site, most or all of the irradiated nuclear fuel they have ever generated, with no relief in sight. A growing number of high-level radioactive waste (HLRW) storage pools have leaked radioactivity into the ground and groundwater. The U.S. Nuclear Regulatory Commission (NRC), in its September 2014 Final Environmental Impact Statement (FEIS) for Continued Storage of Spent Nuclear Fuel (posted online at

links removed ; see Table Table E-4, Occurrence of Spent Fuel Pool Leakage at U.S. Nuclear Power Plants, Page E-23, or Page 611 of 687 on the PDF counter), has documented 16 separate nuclear power plants in the U.S. where HLRW storage pools have, or have likely, leaked. Pool leaks at Davis-Besse, Ohio in 2000, and Kewaunee, Wisconsin in 2007, put the Great Lakes shoreline on this dubious list. Such pool leaks on the shores, if not stopped, could ultimately result in radioactive contamination flowing through groundwater into the Great Lakes themselves.

But even HLRW dry cask storage could fail, and leak, over long enough time frames. NRC Chairman Allison Macfarlane has pointed to the loss of institutional control over long periods of time as of significant concern with very long-term on-site storage of HLRWs. Such radioactivity leaks from dry casks could likewise flow into the Great Lakes. This is of grave concern at the Bruce NGS itself, as some 2,000 dry casks are proposed to be filled and stored there over time.

And, as with reactors, whether due to natural disaster, industrial accident, outsider attack, or insider sabotage, the stored radioactive wastes on-site at all of these Great Lakes shoreline nuclear power plants are at perpetual risk of large-scale, catastrophic radioactivity releases, such as due to a densely-packed pool fire.

These “routine,” and potentially catastrophic, radiological assaults and risks on the Great Lakes shoreline continue downstream into the Lake Huron Basin. The Blind River Uranium Refinery and its waste incinerator still operate. So do 8 operable CANDUs at Bruce Nuclear Generating Station (NGS). There is also the Western Waste Management Facility (WWMF) at Bruce, with its incinerator and storage for all 20 of the OPG CANDUs’ so-called “low” level radioactive wastes (LLRWs), as well as storage for so-called “intermediate” level radioactive wastes (ILRWs). Even permanently shut facilities and ended activities continue to inflict radiological harm: uranium mine and mill tailings at Elliot Lake (10 sites), Pronto, and Agnew Lake release hazardous radioactivity, such as radium, into Georgian Bay, some two decades after the end of mining and milling operations. Even the permanently shuttered Douglas Point prototype reactor, and leaking radioactive waste sites at Bruce, such as RWOS-1, pose ongoing radioactivity risks.

Such cumulative radioactive risks continue downstream throughout the Great Lakes, with the large number of nuclear facilities along the U.S. and Canadian shores of Lake Erie, Lake Ontario, and the St. Lawrence.

And, as I mentioned throughout my 2013 submission and presentation, such radioactivity risks interact synergistically and cumulatively with other toxicological risks in the Great Lakes Basin, as from the burning of fossil fuels. Biologist Rachel Carson presciently

warned about the synergistic risks of mixing chemical toxins with radioactivity in her ground-breaking book *Silent Spring* a half-century ago.

Dr. Rosalie Bertell, founder of the International Institute of Concern for Public Health (IICPH, another party to this proceeding), a member of the Roman Catholic Grey Nuns of the Sacred Heart, and author of *No Immediate Danger? Prognosis for a Radioactive Earth*, led efforts at the International Joint Commission (IJC) in the 1990s to prohibit the release of hazardous radioactivity into the Great Lakes. The IJC Nuclear Task Force on which she served published two reports, “Inventory of Radionuclides for the Great Lakes,” and its follow on “Report of Bioaccumulation of Elements to Accompany the Inventory of Radionuclides in the Great Lakes Basin.” These reports, and updates to them, should have been incorporated into OPG’s cumulative impacts EA.

In fact, Anna Tilman of IICPH is the cartographer behind the GREAT LAKES REGION NUCLEAR HOT SPOTS map (posted online at

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. I cited her April 2013

update of Irene Koch’s Nuclear Awareness Project map (1990-1991) numerous times in my submissions and presentations to the JRP. The 2013 updated map does an excellent job of conveying the radioactivity risks of the uranium fuel chain facilities located throughout the Great Lakes Basin.

To these risks of numerous operating, and permanently shut/decommissioning, nuclear facilities on the Lake Michigan-Lake Huron and other Great Lakes Basin shorelines, OPG would now add the permanent burial of 200,000 cubic meters of Ontario’s L&ILRWs from reactor operations and refurbishments: DGR1 at Bruce NGS.

But wait, there is DGR2! Like pulling teeth, OPG finally grudgingly admitted, under pressure from the Request for Ruling we and numerous of our colleagues filed with the JRP on September 17, 2013, that it actually had concealed long-term plans to bury another 200,000 cubic meters of L&ILRWs from across the province – this time, decommissioning wastes. In one fell swoop, OPG was forced to admit, the DGR could well double in size.

OPG’s obscure, ever-expanding DGR waste inventory proposal – its game of bait and switch -- alone deserved to bring this entire proceeding to a halt, given the company’s attempted deceptions.

Another revelation late in the JRP process also deserved to bring this proceeding to a screeching halt. OPG’s incompetence, or worse – matched, aided and abetted by CNSC’s own – was made clear by Dr. Frank Greening’s disclosure that the DGR’s radioactivity inventory had been underestimated by orders of magnitude.

But wait! What about DGR3?! As stated in my 2013 presentations, we continue to object to the JRP's refusal to consider the foreseeable irradiated nuclear fuel DGR, targeted at the Bruce area. After all, a number of Bruce NGS area municipalities are still volunteering to be considered for Canada's national high-level radioactive waste (HLRW) dump. OPG has retained the Nuclear Waste Management Organization (NWMO) as its primary DGR1 contractor for several years, while NWMO's primary mission is supposed to be focused on questions of HLRW disposal, not L&ILRW disposal.

Bruce NGS already concentrates a tremendous amount of radioactivity risks in one place. DGR1, DGR2, and/or DGR3 would add significantly to this, including cumulative impacts.

And the notion that two separate, multi-billion dollar DGRs – one for L&ILRWs, and another for highly radioactive irradiated nuclear fuel – would be constructed and operated in near proximity, and not merged into one DGR, beggars belief. Also, such supposedly low price tags (if a billion dollars can be considered a small amount of money!) for DGRs is hard to believe. The U.S. Department of Energy's last estimated price tag for the now-cancelled Yucca Mountain, Nevada HLRW dump, issued several years ago, would now surpass *\$100 billion*, when adjusted for inflation. This point is driven home all the more so, when the *Los Angeles Times*' estimate for the cost of recovering from the February 2014 radioactivity release at the Waste Isolation Pilot Plant (WIPP) – around a *billion* dollars – is considered. A billion dollars?! To recover from the rupture of a *single* radioactive waste barrel in the WIPP underground?! What if *another* barrel, with similar or identical contents – of which there are some 368, according to long-time WIPP watchdog Don Hancock of Southwest Research Information Center, an expert witness for Northwatch in this DGR JRP proceeding -- ruptures after a billion dollars has been spent "recovering" WIPP?!

OPG and CNSC's assertions that there is little to nothing for them to learn from the WIPP disaster represent dangerous arrogance. Their claims that Canadian safety culture, management practices, and regulatory oversight are simply better than those "south of the border" represent sheer denial. They ring hollow, especially in light of the many hundreds of Bruce NGS workers exposed to internal contamination by ultra-hazardous alpha particle emitting radioactive dust in November and December, 2009. As with two-dozen WIPP workers who inhaled alpha-contamination at the surface, during the 15.5-hour-long radioactive release, only time will tell how many lung cancers, or other malignancies, will result.

Dr. Frank Greening, in his closing remarks to the DGR JRP, wrote:

“[L]et’s consider what OPG and the CNSC have to say about workplace safety and accidents at nuclear facilities. The DGR Public Hearing documentation shows that OPG and the CNSC share the belief that accident prevention at nuclear facilities stems from a “a healthy safety culture”. Indeed, a check of the September Hearing transcripts shows that the term “*safety culture*” was repeated no less than 100 times in the first two days of debate alone. And OPG and the CNSC evidently see “*a healthy safety culture*” as a universal panacea that protects nuclear workers from all possible sources of harm. And furthermore, OPG and the CNSC believe, and yet fail to prove, that the Canadian nuclear industry operates with an ideal, accident preventative, safety culture.” (emphases in original)

Dr. Greening has cited – as have I -- the exposure of 557 workers at Bruce NGS to alpha particle inhalation in November and December 2009 as a counter example to OPG and CNSC claims of safety culture perfection.

Those who would attempt to distance OPG from the Bruce Power management debacle must answer the question: how could OPG lease its Bruce NGS to such an incompetent company as Bruce Power in the first place, then, obviously unable to protect the health and safety of its own workers?

Another counter example to OPG and CNSC claims of safety culture again involves Bruce Power. Its CEO, Duncan Hawthorne, testified before CNSC in Ottawa in September 2010 regarding Bruce Power’s proposed transport of 64 radioactive steam generators from Bruce NGS, by boat on the Great Lakes, across the Atlantic, to Sweden for so-called “recycling.” It came out under questioning by environmental opponents to the proposal that there was no emergency plan in place in the event one of the shipments sank on the Great Lakes. Mr. Hawthorne indicated that a response would be determined, ad hoc, after the sinking had occurred. Despite such a glaring lack of safety culture and competent management, CNSC rubberstamped the controversial proposal anyway. But a groundswell of opposition throughout the Great Lakes Basin, including in Quebec along the St. Lawrence, and extending all the way to Europe, stopped the risky scheme dead in its tracks. But the question remains, how can CNSC speak so confidently about its own safety culture and regulatory skills, after having supported and approved Mr. Hawthorne’s risky scheme a few years ago? How can OPG brag up its devotion to nuclear safety, after leasing Bruce NGS to a company that would ship radioactive waste on the waters of the Great Lakes without an emergency plan in place in case one of its boats sank?!

Another similarity between the radioactive steam generator controversy, and this DGR, comes to mind. Dr. Gordon Edwards of Canadian Coalition for Nuclear Responsibility discovered that Bruce Power and CNSC had significantly underestimated the radioactivity content of the steam generators, to begin with. They had left out an isotope of plutonium, which instantly doubled the radioactivity content of the steam generators. Dr. Greening has revealed a similar level of OPG and CNSC incompetence in this proceeding, regarding their significant underestimation of the radioactivity content of L&ILRWs targeted for burial in the DGR.

CNSC's response to my concerns, which I had raised in my September 2014 oral presentation, regarding zirconium fires at the DGR, has not reassured me. CNSC's response (Pages 156 to 158 of the September 18, 2014 transcripts, posted online at: <http://www.ceaa-acee.gc.ca/050/documents/p17520/100112e.pdf>) was that the 2012 Oregon, USA zirconium fire I cited as a cautionary tale was not relevant to the DGR. In fact, CNSC's, and also OPG's, handling of zirconium fire risks, mostly in response to Dr. Greening's expressed concerns, throughout the September 2014 hearings, left a lot to be desired. It amounts to another failure of safety culture at OPG and CNSC. They should strive to think outside the box, to be on guard against unexpected accident or even intentional attack scenarios that very well could set zirconium at the DGR on fire. Zirconium is an ingredient in cluster bombs, for goodness sake. Every precaution must be taken to prevent it from igniting amidst the radioactive waste, amidst which it is proposed to be transported, stored, and buried on the Lake Huron shore. One of many lessons that should be drawn from the WIPP radioactivity release disaster is that an "It can't happen here" attitude is not protective of public health, safety, and the environment. In fact, what was not supposed to happen in nearly 200,000 years at WIPP, happened in just 15 years. Yet, CNSC's and OPG's consistent response to the risk of zirconium fires at the DGR – whether accidental or due to intentional attack – was one of adamant denial. This lack of curiosity, lack of concern, and closed mindedness, is not conducive with a "healthy safety culture."

Yet another similarity between the Bruce Power radioactive steam generator shipment scheme, and this OPG DGR proposal, is the very important role of First Nations in the decision making process. First Nations, such as The Mohawk Nation communities of Akwesasne, Kahnawake, and Tyendinaga, played a decisive role in the victory against Bruce NGS's proposed radioactive waste shipments on the Great Lakes. In this JRP DGR proceeding, the Saugeen Ojibwe Nations have played a huge role, as they strive to protect their traditional homelands.

First Nations opposition to the DGR is growing in Michigan, as well. Just last month, Steve Pego, Chief of the Saginaw Chippewa Indian Tribe, joined State Senator Phil Pavlov (Republican-St. Clair Township) at a series of town hall meetings in east Michigan organized to rally opposition against the DGR. "We call [the Great Lakes] our lifeblood, because without it we wouldn't survive. What about our grandchildren, when the tanks corrode?" Chief Pego was quoted as saying, in local media reports. (see:

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And last February, United Tribes of Michigan (UTM) joined with State of Michigan Senator Hopgood (Democrat from Taylor) and Representative Sarah Roberts (Democrat from St. Clair Shores), in opposing the DGR.

Homer A. Mandoka, President of UTM, stated: “Tribes and First Nations’ citizens have a strong spiritual and cultural connection to the Waters, the protection and preservation of which are fundamental to the exercise of treaty rights and to the perpetuation of our sense of place, our sense of being, and our way of life. The United Tribes of Michigan stands firmly opposed to the construction of a nuclear waste storage facility at the Bruce Nuclear Power Plant site in Ontario, or any other site situated in the drainage basin for the Great Lakes.” (see: [links removed](#))

Just as Bruce Power failed to adequately consult with First Nations before launching into its rush to ship radioactive steam generators on the Great Lakes, OPG has skipped adequate consultation with First Nations – both in Ontario and Michigan – on the DGR.

While WIPP in New Mexico, and Yucca Mountain in Nevada, are located in arid regions, the OPG DGR at Bruce NGS would be located in the heart of the Great Lakes Basin. The Great Lakes comprise more than 20% of the entire planet’s surface fresh water, and around 95% of North America’s. 40 million people in 8 U.S. states, 2 Canadian provinces, and a large number of Native American First Nations, depend on the Great Lakes for their drinking water. If Yucca Mountain, Nevada is too wet for a DGR, how can the Lake Huron shoreline be dry enough?!

Growing numbers of Great Lakes inhabitants can only wonder, with growing alarm, what OPG and CNSC are thinking, proposing a Yucca Mountain or WIPP-like dumpsite in the bosom of the Great Lakes. As Stop the Great Lakes Nuclear Dump has asked, “Would you bury poison beside your well?” Over 70,000 signatories to their petition have expressed a resounding NO!

Along the same lines, Stop the Great Lakes Nuclear Dump has documented that 135 resolutions have been passed, opposing OPG’s DGR, as of now. These various municipalities in both the U.S. and Canada represent *16.3 million residents* of the Great Lakes Basin. Just today, Cook County, Illinois – home to Chicago – passed such a resolution. Like the United Tribes of Michigan, the Cook County resolution expresses opposition not only to the OPG DGR, but to *any* radioactive waste dump in the Great Lakes Basin.

Cook County now joins such others as Duluth, Minnesota; Sheboygan, Wisconsin; Wayne County, Michigan (home to Detroit); Toledo, Ohio; Erie, Pennsylvania; Rochester, New York; Toronto, Ontario; and scores of others, from small rural villages to big cities.

The State of Michigan Senate, in a very rare unanimous and bipartisan fashion, has passed a resolution, introduced by State Senator Hoon-Yung Hopgood, who has testified

himself, in person, before the JRP. Similar legislation, supported by both Republican and Democratic State Legislators, has now been introduced in the State of Michigan House of Representatives.

Such a groundswell of popular resistance has caught the attention of the U.S. congressional delegations from the Great Lakes States. In the U.S. House of Representatives, Members from Michigan to New York State have introduced a resolution of opposition to the DGR, calling on the Obama administration to take action. A companion bill in the U.S. Senate won bipartisan co-sponsorship from Illinois, Michigan, and Wisconsin.

This wild fire of resistance to OPG's DGR is similar to the dynamic that unfolded against Bruce Power's proposed radioactive steam generator shipments on the Great Lakes and St. Lawrence. For example, hundreds of municipalities in Quebec, representing millions of residents, passed resolutions opposed to the radioactive waste shipments near their communities. They contributed mightily to the grassroots victory against Bruce Power's and CNSC's dangerous scheme. The resolutions against OPG's DGR continue to roll in, from all levels of government.

This is a very clear indication that OPG's claims of adequate consultation with U.S. elected officials do not hold water. In fact, the sentiment expressed by numerous elected officials, such as Michigan State Senator Pavlov, is that OPG's, and even Canadian government agencies' behaviour in regards to the DGR has violated century-old principles of mutual trust and treaty obligations – as embodied in the Boundary Waters Treaty of 1909 -- between our two countries, especially in regards to protecting our shared planetary treasure, the Great Lakes.

Most recently, and significantly, Canadian elected officials have begun speaking out against OPG's DGR, like never before. On September 29, 2014, NDP Border and Great Lakes Critic, Brian Masse (Windsor West), sent a letter to the Ministers of Environment and Foreign Affairs requesting they consider American concerns of when deciding on approvals for the long-term storage of nuclear waste. He cited the fact that the proposed DGR's location, only one kilometre from the shores of Lake Huron, has raised the ire and drawn attention south of the border. "It is clear from the Great Lakes communities in America and the Michigan State Senate that our neighbours are opposed to burying and abandoning low and intermediate nuclear waste near this shoreline or indeed anywhere in the Great Lakes Basin. We need to ensure that we can protect this shared water source for both countries for generations to come," Masse said. (see his letter, posted online at:

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This is another parallel between Bruce Power's doomed proposal to ship radioactive wastes on the Great Lakes, and OPG's proposed DGR. The NDP actively opposed the radioactive waste shipments on the Great Lakes, in response to the groundswell of grassroots opposition, contributing to hard won victory that stopped them dead in their tracks. (see, for example:

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While this may be my closing comments, due to JRP's announced deadline, this will NOT be my last word in opposition to the DGR. My resistance, and that of countless others, will continue, until this insane proposal is stopped, for good.

To conclude, I would like to say the DGR is a DUD. This acronym, coined by Dave Martin of Greenpeace Canada, stands for Deep Underground Dump. But DUD well sums up OPG's DGR proposal.

Sincerely,

Kevin Kamps, Beyond Nuclear