

**Information Note**  
**Department of Environment and Conservation**

**Title:** Methylmercury Mitigation Workshop and Human Health Risk Assessment Plan for Lower Churchill Generation Project

**Issue:** This note was provided for information purposes only on the Methylmercury Mitigation Workshop held on August 4, 2016 in HV-GB and the appeal by the NG of the Human Health Risk Assessment Plan (HHRAP).

**Background and Current Status:**

- On March 15, 2012, Nalcor's Lower Churchill generation project was released from environmental assessment (EA) after a comprehensive independent joint (fed-prov) panel review process. The project was released subject to an extensive list of terms and conditions as outlined in the Lower Churchill Hydroelectric Generation Project Undertaking Order 18/12 (the Order) that required Nalcor to submit documents such as a variety of environmental protection plans, environmental effects monitoring plans, socio-economic benefits plan and the establishment of an Environmental Monitoring and Community Liaison Committee.
- The Order listed several EEMPs related to methylmercury that include monitoring the aquatic environment, water quality, methylmercury in the water, and contaminant levels in country foods and human health.
- Nalcor, in consultation with government departments, has received approval for all of the EA release conditions with the exception of:
  1. Wetland / riparian compensation plans (to be submitted prior to flooding reservoir).
- One of the key findings of the Lower Churchill panel review was regarding the issue of methylmercury accumulation in the reservoir due to flooding and the possibility of bio-accumulation in country foods in particular fish and seals in Lake Melville. The Nunatsiavut Government (NG) was particularly concerned with this issue claiming it may impact on their treaty fishing rights.
- Methylmercury is created in reservoirs whereby normally occurring inorganic mercury (relatively non-toxic form) is converted to methylmercury (toxic form) by flooded vegetation. Methylmercury is taken up by fish and other aquatic species and, rather than being excreted, remains in animal tissue and then bio-accumulates up the food chain. High levels of methylmercury can cause adverse human health effects which can result in consumption advisories.
- Nalcor will be conducting downstream effects surveys on methylmercury. A Fisheries Act Authorization has been issued by DFO for monitoring and sampling programs that will include fish and seals. The reservoir and downstream sites will be tested to determine the presence of methylmercury.
- Limits are set by Health Canada on the amount of methylmercury that can be consumed in country foods (i.e. fish and seals). If the studies indicate methylmercury exceeds recommended guidelines by Health Canada then consumption advisories will be issued.
- In July 2013, ECC issued a permit to "Alter a Body of Water" to allow for the construction of a dam, power house and other related infrastructure for the generation facility at Muskrat Falls. The NG applied to the courts to quash the permit claiming the province failed to

consult and accommodate the NG with respect to the impacts of methylmercury accumulation in the water and henceforth on their treaty fishing rights. On January 12, 2015, the Trial Division dismissed the application by the NG in favor of the province, citing the matter was dealt with during the EA review process where the NG was fully engaged.

- In addition to the methylmercury monitoring and research being conducted by Nalcor, the NG is conducting their own human health research in Lake Melville and potential impacts to their communities. The NG contributed funding to a study entitled "*Freshwater discharges drive high levels of methylmercury in Arctic marine biota*" (the Harvard Study) which included researchers from Harvard University. The NG feel the study demonstrates that significant increases in methylmercury inputs to Lake Melville will result (up to 380%) because of discharges from the Muskrat Falls reservoir. It is the NG's position that Inuit communities rely on Lake Melville for hunting and fishing.
- On November 9, 2015 (during the fall 2015 caretaker convention) the NG wrote ECC requesting a meeting to discuss the potential for the Muskrat Falls hydroelectric dam to cause serious harm to downstream Inuit communities. The NG is requesting that the Government of Newfoundland and Labrador direct Nalcor Energy to:
  - Fully clear the Muskrat Falls reservoir (including soil removal);
  - Negotiate an Impact Management Agreement;
  - Establish an independent Expert Advisory Committee; and
  - Grant Inuit joint decision-making authority over downstream environmental monitoring and management of the Lower Churchill project.
- On or about January 18, Minister Trimper called President Sarah Leo seeking support for a scientific workshop to take place in Happy Valley-Goose Bay, which would be a gathering of technical experts to discuss the methylmercury issue and the Harvard study. During the conversation, President Leo welcomed the idea of a workshop. Minister Trimper followed up with correspondence. However, The NG subsequently informed the Minister informally it would not take part in a workshop. It was the NGs position that it had provided Government with all the information it had and saw no reason to participate in the gathering of experts.
- On February 23, 2016 the ECC Minister met with the NG in HV-GB to hear their perspectives on the methylmercury research. A researcher from Harvard University participated via conference call and provided information regarding the previously released study as well as new research findings that at the time was still pending release. During this meeting, Minister Trimper reiterated his intent to convene a workshop of scientific experts, noting that participation of the NG and the researchers from Harvard, would be valuable.
- On March 10, 2016 the NG formally informed the Minister via correspondence that it would not attend any workshop and issued a press release stating entitled "*Facts indisputable and no value to hold workshop on downstream effects of Muskrat Falls*" - Minister Shiwak. The release also stated "*The workshop being proposed by Minister Trimper would be of no added value to the Nunatsiavut Government as it will not change any of the facts*".
- On March 22, 2016 a workshop was held in St. John's titled "*Methylmercury and Muskrat Falls: Sharing and Understanding Our Varied Perspectives*". The workshop attendees included scientific experts from: ECC, H&CS, Health Canada, DFO and Nalcor Energy along with their environmental/health expert consultants.
- The NG has commented on several versions of the HHRAP submitted by Nalcor since early 2015 and indicated the plan does not contain sufficient detail to enable a technical review. The HHRAP was re-submitted by Nalcor (revision B5) on April 12, 2016 as one of the

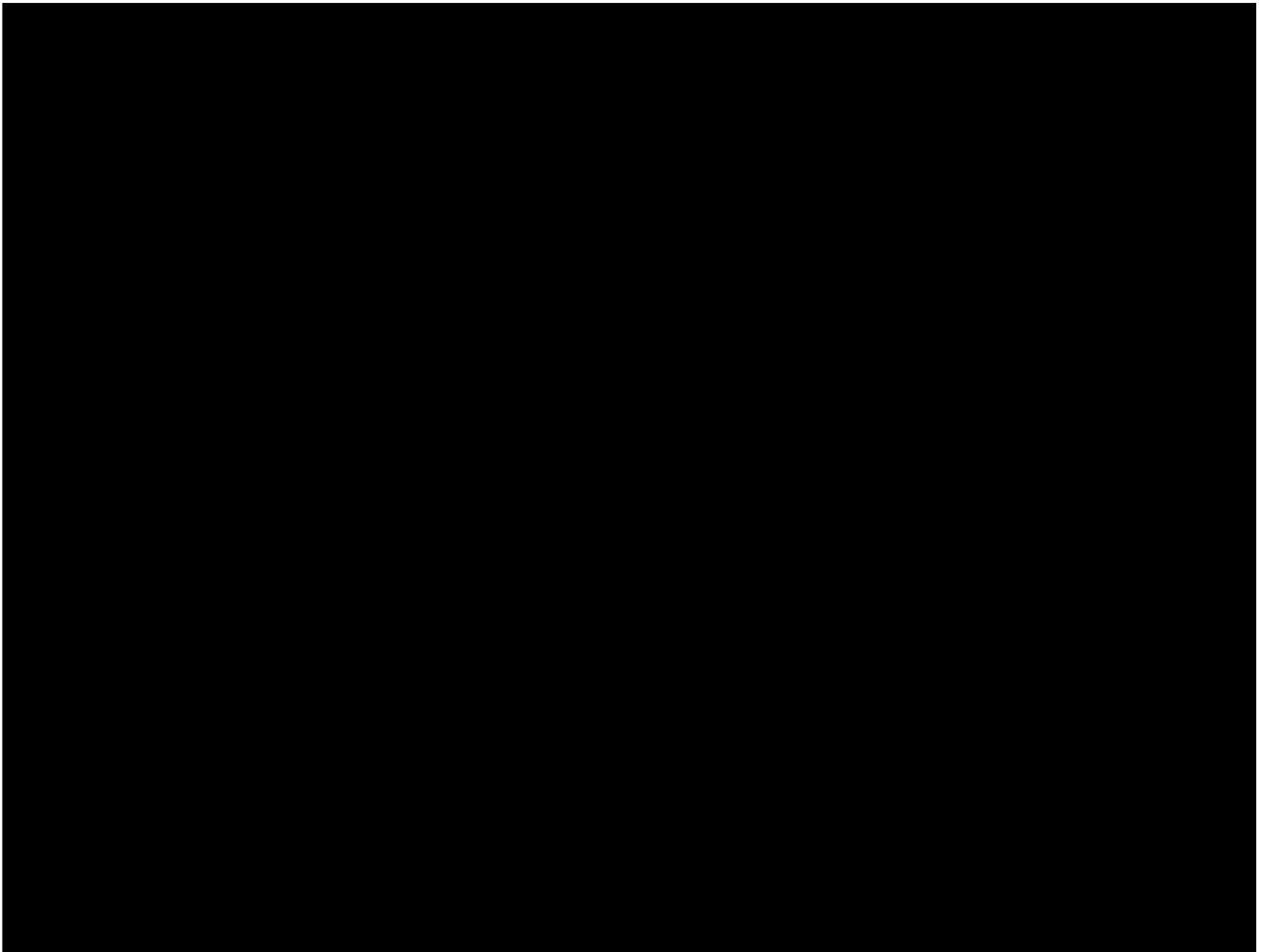
EEMP requirements listed above and a review is almost completed.

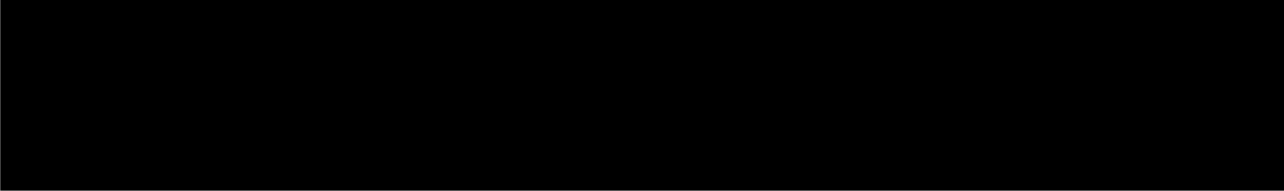
- On April 18, 2016 the NG along with a Harvard researcher conducted a press conference in St. John's to release the findings of a four year study on methylmercury research work. The Study predicts the levels of methylmercury will rise in Lake Melville beyond the predictions in the EIS modelling for downstream effects.
- Media outlets have reported methylmercury levels are predicted to rise from 13 to 380% based on low, medium and high prediction scenarios described in the Study if nothing is done to fully clear the reservoir including soil removal.
- Nalcor Energy responded to media inquiries indicating they do not expect any change to existing project design. They noted they have been closely studying methylmercury and will continue to monitor the downstream effects from the reservoir created by the Muskrat Falls dam.
- On June 14, 2016 the ECC Minister approved the HHRAP with the following condition: Should downstream methylmercury monitoring identify the need for consumption advisories as a result of the project, Nalcor shall consult with relevant parties representing Lake Melville resource users. Based on the location of the consumption advisories these users could include Aboriginal Governments and organizations as well as other stakeholder groups. Following consultation, Nalcor shall provide reasonable and appropriate compensation measures to address the impact of the consumption advisory.
- On Jun 21, 2016 the ECC Minister wrote NG Minister Darryl Shiwak indicating acceptance of the clearing plan as the most practical and safe option. With respect to removal of soil this was accessed at the March 2016 workshop and determined that soil clearing was inappropriate based on the following factors: environmental concerns (sedimentation, erosion), loss of fish habitat, and stripping 25cm on half of the accessible soil would produce 5 million cubic metres that would create an environmental challenge in terms of soil disposal.
- On August 4, 2016 a second workshop was held in HV-GB titled: Methylmercury Mitigation and Muskrat Falls: A Discussion of Practical Solutions.

#### **Analysis:**

- The NG wants full tree clearing and removal of all the brush and soil from the reservoir. This is contrary to the Province's response to the Joint Review Panel which stated, *"The Government of Newfoundland and Labrador agrees with the principle of maximizing the utilization of the forest resource. With limited opportunities to use the resource, and the likely insignificant reductions in mercury levels associated with full versus partial clearing, the Government supports partial harvesting of the flood zone. If an economic opportunity to use the resource materializes, consideration will be given to harvesting additional fiber."*
- The area of inundated land to be flooded by the reservoir is in the order of 41km<sup>2</sup>. The full clearing of the reservoir to include both vegetation soil has the following implications:
  - o Full clearing of the timber raises significant safety issues due to steep terrain.
  - o Scientists at the workshop concluded that removal of vegetation from a partial clearing versus a full clearing scenario would reduce methylmercury by an estimated 2% (8% vs 10% respectively). There is still uncertainty regarding this estimate. The cost of full timber clearing would be in excess of \$50 million in addition to \$200 million in penalties for construction delays. The removal of the soil has not been costed.

- o The removal of the soil is not known to have been done with other hydroelectric developments.
- o Full clearing and soil removal would not negate the need for monitoring for methylmercury downstream and in country foods.
- o Soil removal option has never been environmentally assessed to address potential effects such as:
  - impacts on fish/fish habitat with the creation of a fish bowl effect or sterilization of the reservoir;
  - impacts on water quality by the elimination of a vegetated buffer zone during construction period which would leave no protection of the Churchill River;
  - the impact of the displaced soil which would require an area estimated to be 1km in diameter and 60m high.
- The NG's request for an Impact Management Agreement is premature without determining the results of the HHRAP/EEMP to determine whether adverse impacts have occurred. Nalcor has committed to negotiate and Impact Management Agreement and compensation, if appropriate, as committed to in the Environmental Impact Statement.
- With regard to establishing an independent Expert Advisory Committee it is worthy to note that the Order required Nalcor, prior to the commencement of construction, to establish an "Environmental Monitoring and Community Liaison Committee" to provide feedback to Nalcor Energy and government on the effects of the project. The NG was invited to be a member of this committee but declined to participate.



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- A key point made in the March 22, 2016 workshop was that the same results that were being used by the Harvard study were the same as those used in the EIS modelling predictions. Both were predicting the same volume of organic carbon would be present in the reservoir and will flow downstream to produce methylmercury. The differences were how far the impacts would be seen downstream.
  - DFO are the lead regulator as per "*Fisheries Act Authorization*" for monitoring the levels of methylmercury in seals and fish. They are conducting a comprehensive multi-year monitoring program. DFO conducted an internal federal government review of the Harvard Study and found no significant changes to their monitoring program with the exception of adding another monitoring site further downstream to determine the extent of the effects that would be detected.

**Action Being Taken:**

- The EA Division has reviewed the information that was the subject of the NG's April 18, 2016 press conference; as well as the findings from the March 22, 2016 workshop and the input from the federal and provincial review agencies as part of the review of the HHRAP/EEMP.
- This review is nearing completion, in compliance with the Undertaking Order, and a recommendation on its acceptability will be provided to the minister during the week of April 25, 2016.
- A summary report of the workshop is being finalized and will be made available to the public, the timing of which will be determined as part of the communications strategy.
- A Communications strategy is being developed that will include a press conference to announce the minister's decision on the HHRAP/EEMP and an approach to responding to the NG's four requests of the province.

**Prepared/approved by:** P. Carter/B. Cleary, Director/  
**Ministerial Approval:**

August 24, 2016