

Information Note
Department of Environment and Conservation

Title: Methylmercury Workshop and Status of the Human Health Risk Assessment Plan/ Environmental Effects Monitoring Plan on the Lower Churchill Generation Project

Issue: This note was provided for information purposes only on the status of the methylmercury workshop held on March 22, 2016 to review the Human Health Risk Assessment Plan (HHRAP)/Environmental Effects Monitoring Plan (EEMP) and next steps regarding a decision on the 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 (federal-provincial) Review Panel (JRP) 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 plans 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 submitted the HHRAP as part of their EIS commitment (also in the Order) and EEMPs for "contaminate levels in country foods" and "human health" as one document, and will therefore fulfill three requirements under the Order.
- Nalcor, in consultation with government departments, has received approval for the vast majority of the EA release conditions with the exception of:
 1. Wetland/riparian compensation plans (to be submitted prior to flooding reservoir).
 2. EEMP for wetland and riparian habitats (not yet submitted).
 3. Human Health Risk Assessment Plan/Environmental Effects Monitoring Plan.
- One of the key findings of the Lower Churchill JRP 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 be mitigated by consumption advisories.
- Nalcor's currently sampling indicated that mercury levels in ringed seal liver samples collected in 2012, 2013 and 2014 may be a health concern for people consuming ringed seal liver. Nalcor Energy obtained the services of Dillon Consulting to conduct an

assessment of human exposure to mercury and risk from the consumption of ringed seal meat and liver.

- Nalcor will be conducting downstream effects surveys on methylmercury. Sampling programs 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 in food by Health Canada, then consumption advisories will be issued. Health Canada also has guidelines for total mercury in drinking water. ENVC continues to monitor ambient water quality of Lake Melville, including for total mercury.
- In July 2013, ENVC 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*” which included researchers from Harvard University (Schartup et al 2015). The NG feel the study demonstrates that increases in methylmercury inputs to Lake Melville will result in an increase of between 25 per cent – 200 per cent because of discharges from the Muskrat Falls reservoir. Subsequently, at the meeting between ENVC and NG in February 2016, results were presented from recent research that showed an increase of between 13 per cent and 380 per cent. While it does not appear that this more recent research has been published at this time, this information was presented during a press conference held by the NG in April, which is referenced below. 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 period), the NG wrote ENVC requesting a meeting to discuss the potential for the Muskrat Falls hydroelectric dam to cause serious harm to downstream Inuit communities. In that letter, the NG requested 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 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 Schartup et al (2015) 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 NG's 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 22, 2016, the ENVC Minister met with the NG in Happy Valley-Goose Bay to hear their perspectives on the methylmercury research. A researcher from Harvard University (Dr. Elsie Sunderland) participated via conference call and provided information regarding the previously released study, as well as new research findings that at the time were 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: ENVC, HCS, Health Canada, DFO and Nalcor Energy, along with their environmental/health expert consultants.
- The NG has commented on several versions of the HHRAP/EEMP submitted by Nalcor since early 2015 and indicated the plan does not contain sufficient detail to enable a technical review. The HHRAP/EEMP was re-submitted by Nalcor (revision B5) on April 12, 2016 as one of the EEMP requirements listed above and a review is almost complete.
- On April 18, 2016, the NG, along with a Harvard researcher (Dr. Elsie Sunderland) conducted a press conference in St. John's to release the findings of a NG report on methylmercury research work entitled "*Lake Melville: Avativut, Kanuittailinnivut (Our Environment, Our Health)*" (*Durkalec et al 2016*). The report predicts the levels of methylmercury will rise in Lake Melville beyond the predictions in the EIS modelling for downstream effects. This prediction was based on the initial pulse of methylmercury that would be present in the surface layer of Lake Melville within 72 hours after reservoir flooding which could increase the level of methylmercury by 13 per cent and 380 per cent. According to Dr. Sunderland, this will be the first ecosystem where this effect has ever been measured.
- 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.
- ENVC also responded to media requests stating that the Minister would soon make a decision on Nalcor's Human Health Risk Assessment plan, and that the Minister will be informed by the new information presented from the NG, Nalcor and the various agencies consulted on the proposed plan, including Fisheries and Oceans Canada, Health Canada and HCS, as well as the expert workshop.
- On April 27, 2016, Minister Shiwak wrote Minister Trimper, urging full consideration of the

research recently highlighted in the news conference in his future decision making. In the letter, Minister Shiwak noted that *“Any increase in methylmercury exposure to Inuit, therefore, is a significant impact and it is unethical to unilaterally impose such an increase upon Inuit or require them to modify their culture in order to attempt to avoid this.”*

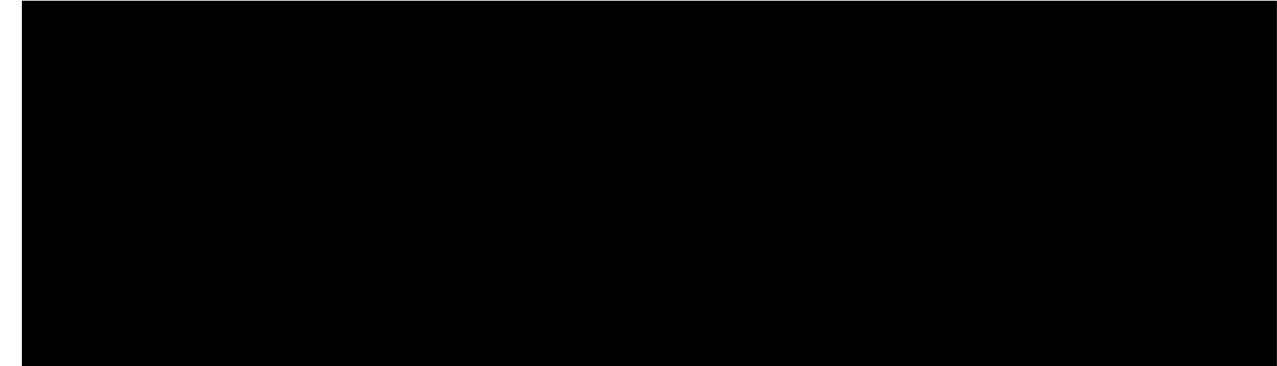
Analysis:

- 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 JRP 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 41km². The full clearing of the reservoir to include both vegetation and soil has the following implications:
 - Full clearing of the timber raises significant safety issues due to steep terrain. Mechanical harvesters and skidders are not capable of working on steep slopes. However, other methods such as cable or helicopter logging may be possible methods of removing trees on steep slopes.
 - 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 per cent (8 per cent vs 10 per cent respectively). There is still uncertainty regarding this estimate and this does not consider soil removal. Nalcor estimates the cost of full timber clearing would be in the range of \$125 - \$150 million in addition to impacts on other work, such as the diversion and construction of the main dam, which could result in an additional \$200 million. The removal of the soil has not been costed.
 - The removal of the soil is not known to have been done with other hydroelectric developments.
 - Full clearing and soil removal would not negate the need for monitoring for methylmercury downstream and in country foods.
 - Soil removal option has never been environmentally assessed to address issues 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 would create a pile of soil estimated to be 1km in diameter and 180m high; and,
 - a comparison of benefits of soil removal and methylmercury reduction versus the noted above impacts.
- It should be noted that the NG is opposed to the use of consumption advisories as a matter of principle, preferring to eliminate the risk altogether as opposed to having to monitor the risk and issue an advisory should a risk manifest itself. The rejection of advisories appears to overlook the fact that monitoring will be required for this project, regardless of the extent of reservoir clearing.
- In their final report, the JRP made the following recommendation (13.9): *“If the Project is approved and the outcome of the downstream mercury assessment (Recommendation 6.7)*

indicates that consumption advisories would be required for Goose Bay or Lake Melville, Nalcor enter into negotiations prior to impoundment with the parties representing – as appropriate – Goose Bay and Lake Melville resource users. Depending on where the consumption advisories would apply, these could include Aboriginal groups, the Town of Happy Valley-Goose Bay, Mud Lake Improvement Committee, the Town of North West River and the community of Rigolet. The purpose of the negotiations would be to reach agreement regarding further mitigation where possible and compensation measures, including financial redress if necessary. This recommendation would also apply later in the process if the downstream mercury assessment indicated that advisories were not likely, but monitoring subsequently required their application.”

- The Province’s response to that JRP recommendation was *“The Government of Newfoundland and Labrador accepts the intent of this recommendation. If consumption advisories are required as a result of the downstream mercury assessment, then Nalcor should consult with downstream resource users on further mitigation measures, including the potential for compensation.”*
- While Nalcor’s position has always been that if they are responsible for an effect they will be responsible for addressing it, including the need for compensation, the Province’s response does not bind Nalcor to negotiate and reach a final compensation agreement in the event consumption advisories are issued, and no such condition was included in the initial release of the project. ENVC is currently considering that as part of the approval of the HHRAP/EEMP, a condition be imposed on Nalcor as follows: “Should downstream methylmercury monitoring identify the need for consumption advisories as a result of the project, Nalcor shall consult with relevant parties representing Goose Bay and Lake Melville resource users. Based on the location of the consumption advisories these users could include, Aboriginal Government and organizations, the Town of Happy Valley-Goose Bay, Mud Lake Improvement Committee, the Town of Northwest River and the community of Rigolet. Following consultation, Nalcor shall provide reasonable and appropriate compensation measures to address the impact of the consumption advisory.
- It should be noted that this new condition does not require the negotiations to occur prior to impoundment. The NG’s request for an Impact Management Agreement is premature without comparing the baseline information from the HHRAP to the results of various future EEMPs to determine whether, and to what extent, adverse impacts have occurred.
- 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.
- With regard to granting joint decision-making authority on downstream monitoring and management, LAAO notes the following:
 - The JRP, which was fully aware of the issue of downstream methylmercury, did not direct a recommendation to Government to establish either joint decision-making with the NG or any other aboriginal organization, or an independent expert advisory committee, with respect to the downstream effects of methylmercury.
 - The law on Aboriginal consultation has superseded previous models that have been used for issues like this such as the Voisey’s Bay Environmental Assessment Board and

its associated technical committee. These bodies have been discontinued and replaced with Aboriginal consultation guidelines. Guidelines are now the common consultation method for permits. The NG and nine other Aboriginal organizations in Labrador and Quebec were consulted on the Generation EA, the JRP report and on provincial permits. Permits consultation was via Aboriginal consultation guidelines. Aboriginal consultation does not confer a veto on Aboriginal organizations, so ultimate decision making rests with Government, especially for an area outside the treaty territory.



- Notwithstanding the above arguments regarding the points raised in the NG letter, LAAO notes that although the NG was defeated in court regarding the permit to alter a body of water, they may seek to challenge the HHRAP/EEMP if approved by the Minister, as this likely represents the last obvious legal leverage point, other than which the NG's levers appear to be political/public pressure.
- A key point made in the March 22, 2016 workshop was that *Schartup et al (2015)* and Nalcor's modelling predicted similar results for mercury and mass of methylmercury going downstream. Both predicted the same volume of organic carbon would be present in the reservoir that will flow downstream to produce methylmercury. There were differences, however, in terms of how far the effects would be detected downstream.
- DFO are the lead regulator, as per the federal *Fisheries Act*, 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 *Schartup et al (2015)* 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. The additional monitoring site was the result of the findings in *Schartup et al (2015)* which identified a long stratified layer in Lake Melville. ENVC supports DFO's decision to require Nalcor to include an additional monitoring station downstream.
- Assuming the worst case scenario of 380 per cent arising from the research commissioned by the NG, there may be an increase in methylmercury concentration from 0.016 ng/L to about 0.06 ng/L. These are very small concentrations. As a reference point, the CCME interim guideline (*Canadian Water Quality Guidelines for the Protection of Aquatic Life, CCME 2003*) for methylmercury in freshwater is 4 ng/L (0.004 µg/L). It would actually require a 250 fold (25,000 per cent) increase in methylmercury before this interim guideline is exceeded. Note: this guideline may not be protective of higher level trophic fish but this serves to illustrate the relative significance of the changes modelled.

- With respect to the current baseline conditions, Nalcor's findings of methylmercury levels in seals were assessed by Dillon Consulting, whose report was shared with HCS, and subsequently with Health Canada. Based on a review of the Dillon Report, Health Canada concluded that health concerns are unlikely to result from the consumption of seal meat; however, refinements of the assessment are needed to draw firm conclusions regarding the consumption of seal liver. Based on their review of the Dillon report and Health Canada's comments regarding same, HCS concluded that further a review/additional risk assessment using currently available data would not change the overall risk estimate nor the recommendation by Dillon that it would be prudent for younger seals rather than older seals to be harvested and consumed. Additional information will be gathered by Dillon Consulting, for Nalcor, during the upcoming 2016 summer season as part of the HHRA process. HCS is not contemplating a public statement at this time and will review additional information as it becomes available from Nalcor or the independent work undertaken by the NG.

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 May 16, 2016. The recommendation will include a condition with wording as outlined above in this note.
- 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 has been prepared (attached) 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/M. Goebel/C. Janes, in consultation with A. Gover, LAAO and J. Mellor, JPS

Reviewed by: M. Collins/K. Quinlan, Cabinet Secretariat

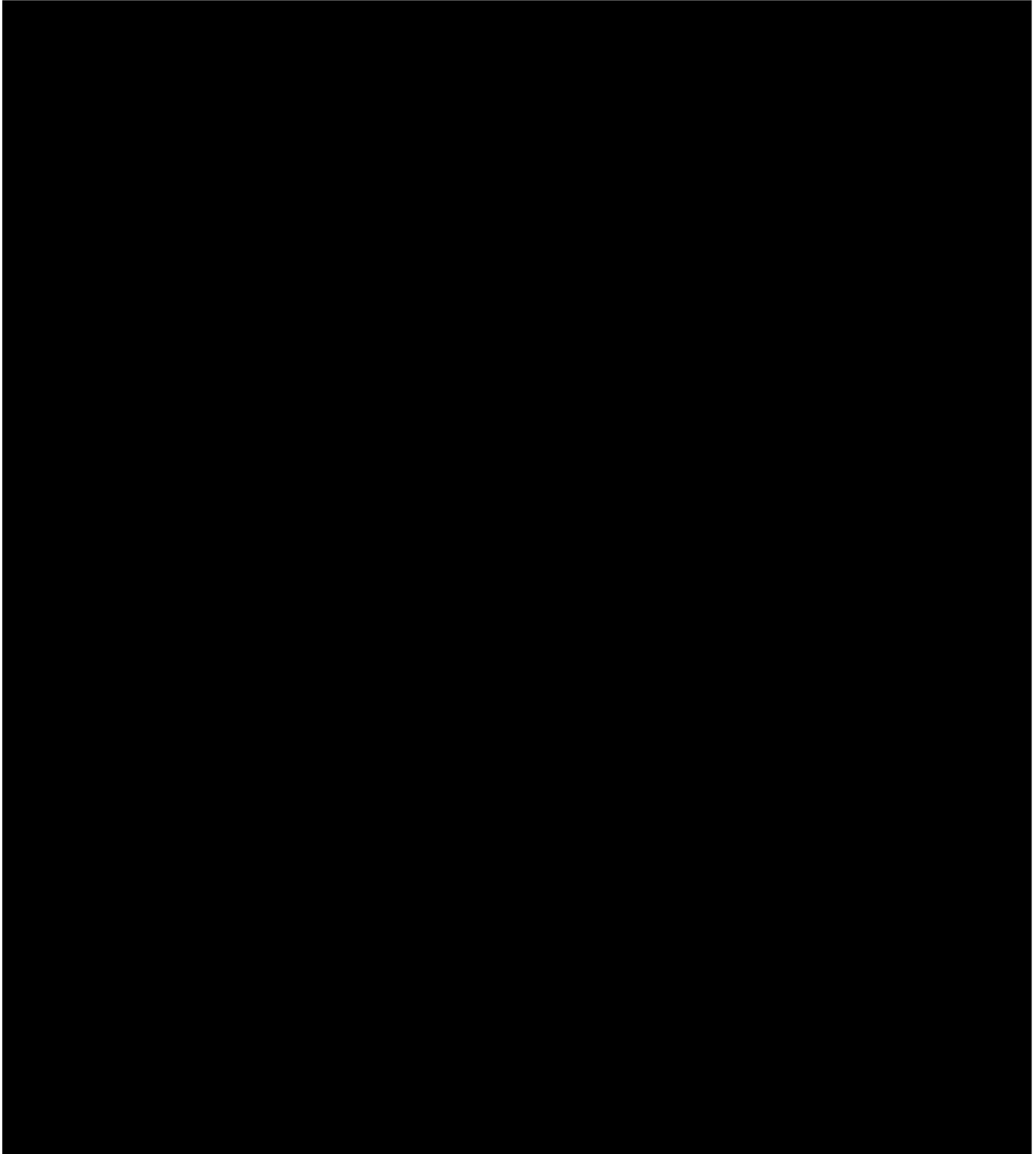
Ministerial approval: Received from Hon. Perry Trimper


May 16, 2016

Cabinet Secretariat Comment:

- The Communications Branch has requested that the department prepare a full communications plan to support this announcement. The branch will work with the department to finalize the plan. Upon the plan's completion, it will be provided to the Premier's Office for their approval. ENVC and LAAO advise that the letter will be addressed to Minister Shiwak rather than the President of the NG as indicated in this note.
- NR advises that the condition ENVC is considering imposing on Nalcor as part of the approval of the HHRAP/EEMP (outlined on page 5 of this note) should be reviewed with Nalcor to ensure that the right groups are being consulted, in light of the compensation measures discussed. ENVC advises that as a result of discussions with Nalcor and LAAO,

it is proposed that the wording of the condition will be reworded as follows: Should downstream methylmercury monitoring identify the need for consumption advisories as a result of the project, Nalcor shall consult with relevant parties representing Goose Bay and Lake Melville resources users. Based on the location of the consumptions 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.



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- ENVC advises that Nalcor has established the Environmental Monitoring and Community Liaison Committee as required and they meet regularly. The NG has continued to decline participation.
 - HCS believes that there should be an agreement in place prior to adverse effects occurring and that such an agreement could be subject to change depending on what occurs in the future. ENVC disagrees, noting that the reasons are outlined in the analysis section of this note and that the inclusion of the proposed new condition on Nalcor is an appropriate response to concerns regarding future potential consumption advisories that arise from the project.
 - LAAO does not have any concerns.

**Ministerial Decision on Nalcor's HHRA Plan within the Muskrat Falls Environmental
Effects Monitoring Program
Communications Synopsis**

Target Audiences

- Media
- Nunatsiavut Government (NG)
- Nunatukavut
- Innu Nation
- Residents of Lake Melville
- Members of the House of Assembly
- Department of Natural Resources
- Department of Health and Community Services
- Nalcor
- Labrador and Aboriginal Affairs
- Health Canada
- Opposition parties
- Public

Communications Objectives

- To communicate the Minister's decision as regulator to accept Nalcor's HHRA Plan with a condition;
- To communicate Minister's condition of release that should consumption advisories become necessary, Nalcor consult with downstream users and provide reasonable and appropriate compensation to address impacts of the advisories;
- To acknowledge the importance of the new information provided from the NG in the Harvard research;
- To show visually why removing the topsoil from the reservoir is not appropriate;
- To show visually how the modeled levels of methylmercury compare to CCME (Canadian Council of Ministers of the Environment) guidelines;
- To ensure understanding about what consumption advisories will mean and how important country food is to health;
- To communicate to the Nunatsiavut Government answers to their four questions posed in correspondence; and,
- To share what the department learned in the expert workshop of March 22, 2016.

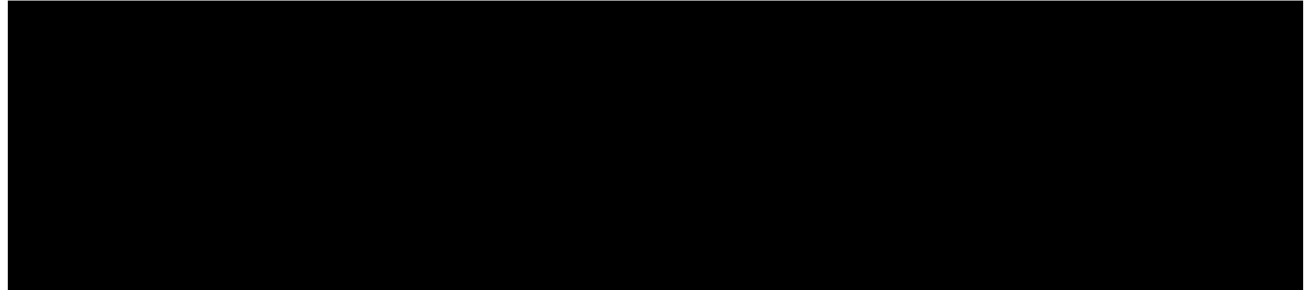
Communications Strategy:

Roll out of response to the Nunatsiavut's Government's four questions and communicating the Minister's decision on Nalcor's HHRA Plan will occur in close sequence:

1. A news conference hosted by Minister Trimper will address two of the NG requests – reservoir clearing and to negotiate an Impact Management Agreement – in addition to the acceptance of the HHRA Plan. The news conference will communicate:
 - a. That the Minister considered all information from the NG and the discussions of the workshop in making his decision.
 - b. What he learned from the NG and the workshop;
 - c. Some of the discussion highlights at the workshop;
 - d. That the department has accepted Nalcor's HHRA plan;
 - e. That Minister has taken the additional measure of releasing with a condition that should consumption advisories be necessary, Nalcor shall consult downstream

users including Aboriginal governments and organizations, and provide reasonable and appropriate compensation measures to address the impact of the advisories;

- f. That the NG's proposal of removing all soil from the reservoir is not possible;
- g. The low levels of projected methylmercury in the flooded reservoir versus CCME guidelines; and,
- h. What consumption advisories mean for people, and the importance of country food.



The Announcement

In accordance with guidelines regarding Aboriginal consultation, correspondence will be drafted from Minister Trimper to the President of the Nunatsiavut Government outlining the department's response to the NG's concerns on the HHRA Plan, and also responding to two of the four requests which will be also addressed in a news conference (Reservoir clearing and to negotiate an Impact Management Agreement).

(Consideration can be given to providing the NG with the media advisory announcing the time, place and subject matter, three days prior to the announcement date. This would match notice provided to government prior to the NG's April 18, 2016 news conference on the same issue.) One hour prior to the announcement, Minister Trimper will contact Minister Shiwak to summarize the decision.

Event scenario for news conference

- Location: Confederation Building Media Centre.
- Set up: PowerPoint presentation, head table.
- Head Table: Minister Trimper, Martin Goebel, ADM, ENVC
 - o Minister delivers remarks using presentation;
 - o Questions from media.
- Present in the audience, available for media thereafter to speak to what consumption advisories mean and the importance of country food- will be a health official [Gregory Kaminski, Health Canada workshop participant, TBC]
- Handouts: media kits which include:
 - o News release;
 - o Copy of presentation; and,
 - o Copy of the What We Heard document from March workshop.

Minister's Involvement

- The Minister of Environment and Conservation will be lead spokesperson.
- Health representative will respond to questions on what consumption advisories mean, methylmercury levels in humans, and the importance of country food.

Interdepartmental Co-ordination

- The Department of Environment and Conservation will lead on coordinating of activities.

Key messages, Q&As, PowerPoint presentation including infographics, news release to be developed.

Prepared by: Emily Timmins, Director of Communications, ENVC, in consultation with Labrador and Aboriginal Affairs (A. Gover and K. Guest.)

May 10, 2016

Approved by: Colleen Janes, DM.

