

Human Health Risk Assessment Plan & Methylmercury – Lower Churchill

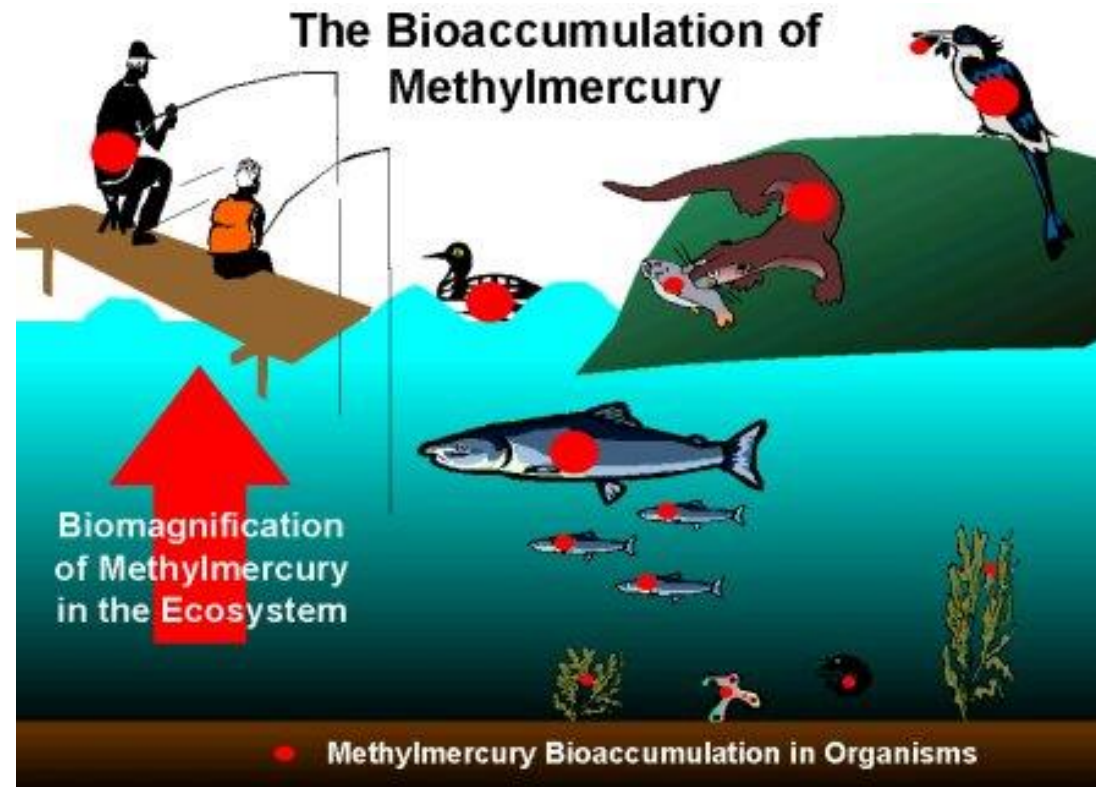
CIMFP Exhibit P-04128

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What is Methylmercury?

- Mercury occurs naturally in our environment (air, soil, and water)
- Formed from inorganic mercury by microbes.
- Newly flooded reservoirs provide nutrients.
- Taken up by fish & bio-accumulates in food web.
- High levels can cause human health effects.



How does Muskrat Falls affect Methylmercury?

- When the dam is built the river upstream of the dam will become a reservoir and land that has not been underwater will be flooded. For a number of years after this happens, the soil will release mercury into the water and, for a while fish will have more mercury in their bodies.
- MeHg is taken up by fish and other aquatic species and can cause adverse human health effects if an excess amount of these foods is consumed.
- This was a factor clearly identified during the environmental assessment of the project.
- To ensure mitigations were in place to protect human health, a number of conditions were placed on Nalcor when the project was released that related to methylmercury.

What is the Human Health Risk Assessment Plan (HHRAP)?

- The HHRAP submitted by Nalcor addresses three conditions of the environmental release Order, namely, environmental effects monitoring plans for:
 - methylmercury;
 - contaminant levels in country foods; and
 - human health.
- Key components include a dietary survey, and a human biomonitoring program (hair sampling).
- Core objective is to determine the potential human health effects of exposure to methylmercury in fish and other country foods (e.g. seal, waterfowl, berries) for local downstream consumption.

HHRAP Decision

- As a condition of release from environmental assessment ENVC is required to review and determine the acceptability of the HHRAP.
- Following extensive review and consultation, we are accepting the HHRAP dated April 12, 2016

Informed Decision

- The decision to accept the HHRAP was informed by:
 - Comments from Health Canada and Health and Community Services
 - Aboriginal consultation
 - Minister's February 22, 2016 meeting with the NG including a presentation by researchers
 - DFO Review of Mercury Bioaccumulation in the Biota of Lake Melville
 - Expert Workshop on March 22, 2016
- Full and fair consideration was given to the input received from all parties

Analysis and Key Considerations

- March 22, 2016 workshop key findings :
 - Schartup et al and Nalcor's modelling predicted similar results . There were differences in how far the effects would be detected downstream.
 - Removing all soil from the reservoir is not practical and would have other significant environmental effects, including the elimination of fish habitat.
- NG facilitated research:
 - The Schartup et al. study is noteworthy in providing insight into potential mechanisms for methylmercury production and uptake in Lake Melville.
 - Inuit potentially pushed above the Health Canada guideline for exposure ranges from 32 (low scenario) to >200 (high scenario).

Analysis and Key Considerations

- Referring agencies comments:
 - Health Canada has indicated the HHRAP is acceptable and has indicated they will review the information arising from the Plan.
 - Health and Community Services have indicated the HHRAP is acceptable.
- Other key considerations:
 - CCME Aquatic Life guideline for MeHg is 0.004 ug/L
 - Schartup et al. study results 0.00002 to 0.00006 ug/L

New Condition

- HRRAP acceptance is 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 Goose Bay and 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.

NG requests of Government

1. Fully clear the Muskrat Falls reservoir, including soil
2. Negotiate an Impact Management Agreement;
3. Establish an independent Expert Advisory Committee; and
4. Grant Inuit joint decision-making authority over downstream environmental monitoring.

Full Clearing Analysis (Timber)

- Full timber clearing:
 - Marginal benefits in MeHg reduction for timber removal between partial clearing (8%) vs full clearing (10%)
 - Safety concerns (i.e. working on steep slopes)
 - Approximate Cost = \$5million

Full Clearing Analysis (Soil)

- Soil clearing:
 - Stripping 25 cm of soil on half the flooded area = 5 million cubic metres
 - Approximate cost = \$30 million.
 - Environmental concerns (i.e. sedimentation, erosion)
 - Loss of fish habitat due to sterile reservoir
- Add graphic here –
dumploads

Moving Forward

- Nalcor will continue downstream effects sampling programs, including fish and seals, to measure methylmercury.
- If future sampling indicates methylmercury levels in fish and seals exceeds recommended consumption guidelines set by Health Canada then consumption advisories will be issued.
- If consumption advisories are required as a result of the project then the new condition will be triggered and Nalcor will need to consult and provide reasonable and appropriate compensation.