

XX2019-001



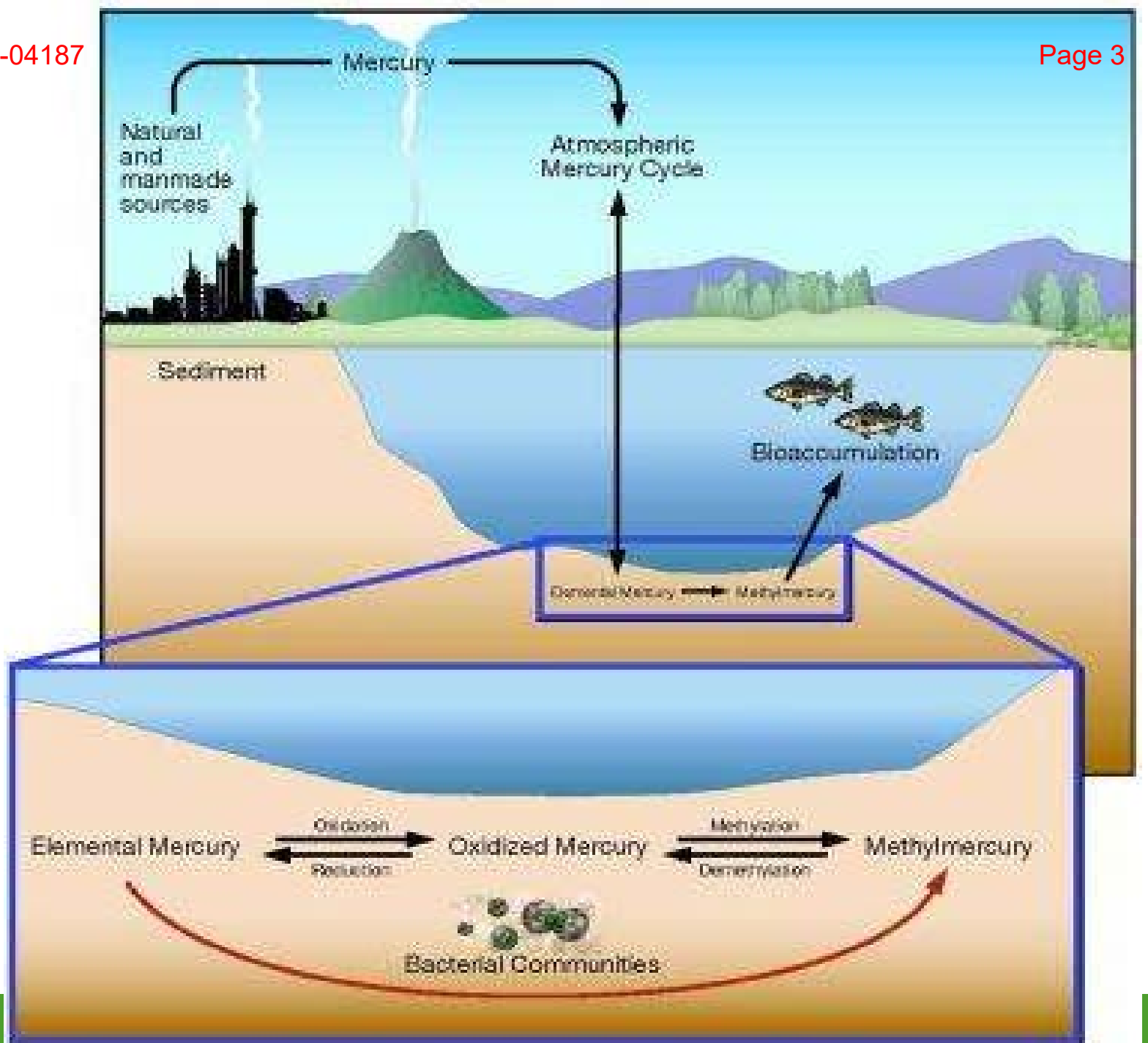
Response to the Independent Experts Advisory Committee's Methylmercury Recommendations

January 9, 2019

Overview

- Background: How MeHg is Formed
- Independent Experts Advisory Committee (IEAC) mandate
- IEAC recommendations
- Government's response to IEAC recommendations
- Methylmercury sampling program
- Nalcor's existing responsibilities for MeHg
- Next steps

Background: How MeHg is formed



IEAC Mandate

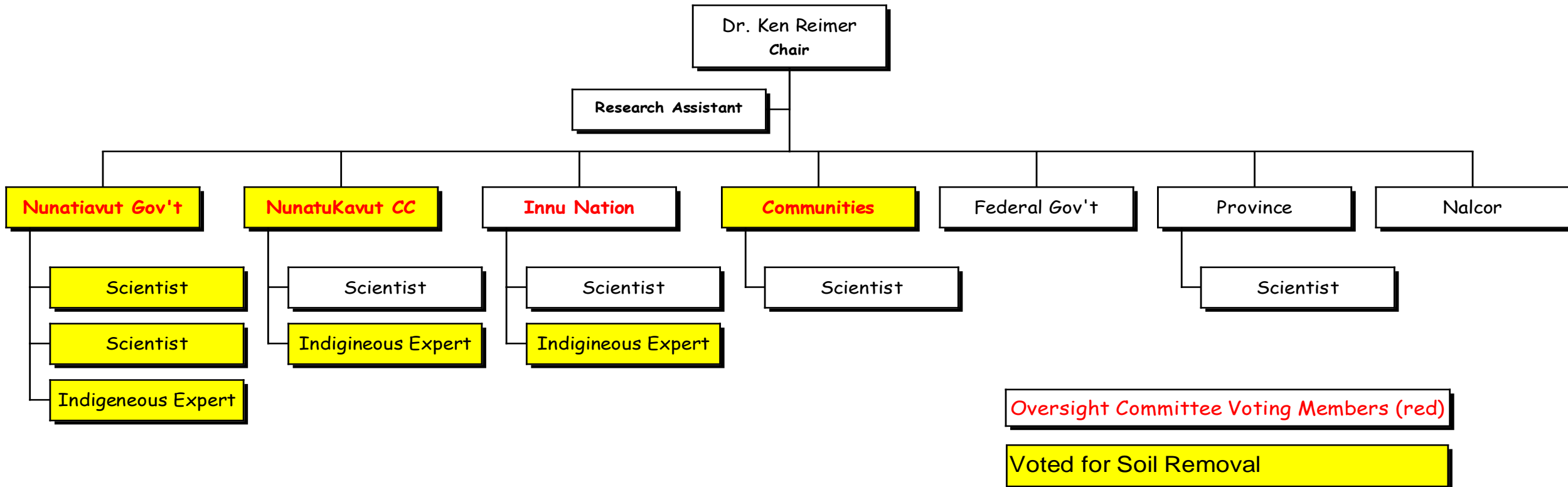
- The protection of the health of the Indigenous and local populations will guide the work of the IEAC. The mandate of the IEAC was:
 - to use the best available peer reviewed science and Indigenous knowledge, and may consider other relevant research only in addition to and not instead of the above-mentioned peer reviewed science, to assess and recommend options for mitigation of methylmercury impacts, including but not limited to discussing the feasibility, necessity and potential impacts of further clearing of the Muskrat Reservoir;
 - to review the plans for monitoring, monitoring results and key findings arising from research and monitoring, about or relevant for mitigation of methylmercury impacts; and,
 - to direct the research activities and recommend the design of new monitoring and mitigation measures for the protection of the health of Indigenous and local populations.

IEAC Recommendations on MeHg

The IEAC delivered four recommendations with respect to the protection of health of the people impacted by the methylmercury (MeHg) due to Lower Churchill Project.

1. Nalcor undertake targeted removal of soil and capping of wetlands.
2. Independent body develop a community based monitoring program with pre-established benchmarks to act as triggers for pre-established actions.
3. Posting of an impact security fund to ensure access to plentiful, high quality and culturally appropriate alternate foods.
4. Independent body to provide communication advice on importance of safely eating country food now and to ensure proper advice if monitoring under Rec #2 indicates increases in MeHg.

How the IEAC Members voted on the Proposed Soil Removal Recommendation



IEAC Rec. #1 on Mitigation: Soil Removal and Wetland Capping

- Nalcor undertake targeted removal of soil and capping of wetlands for the reduction of both the amount and duration of methylmercury production in the Muskrat Falls Reservoir as outlined in Annex A.

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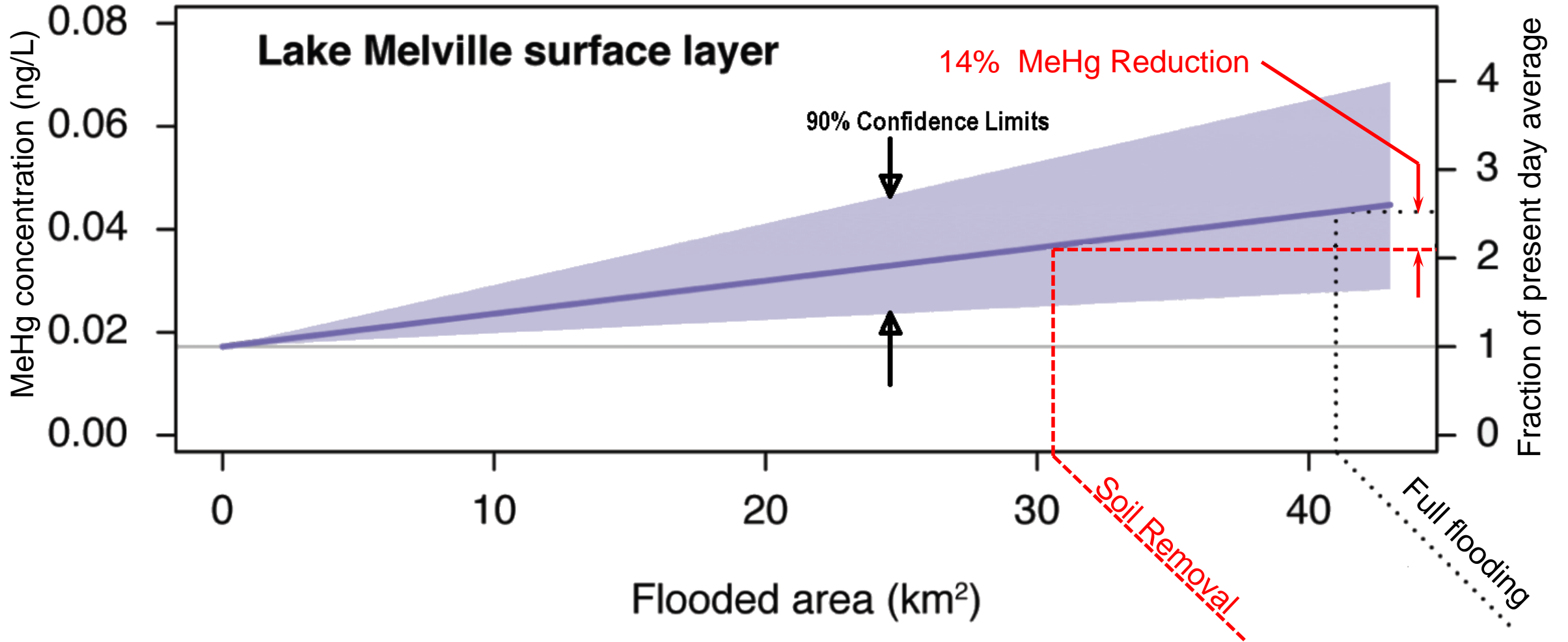
Government Response:

- Based on lack of consensus, uncertainty in the theoretical modelling approach, possible adverse environmental effects of soil removal and the fact that nowhere has soil removal for reservoir preparation to reduce MeHg ever been carried out, soil removal recommendation will not be accepted.
- Recognizing that wetland capping has very little theoretical benefit, it does give some long term benefit and does not present any environmental risks. It will be combined with fish habitat compensation. Wetland capping is therefore accepted.

Calder et al Model

- The Calder et al. model (Harvard University) was the main tool used by the IEAC to predict future MeHg after reservoir impoundment.
- The model is theoretical and is used to predict MeHg increases.
- IEAC used the model to test scenarios for soil removal and wetland capping.
- The next slide shows how the model predicts MeHg in Lake Melville after flooding and how soil removal reduces the MeHg impact by 14%.

Effect of Soil Removal on MeHg Concentration



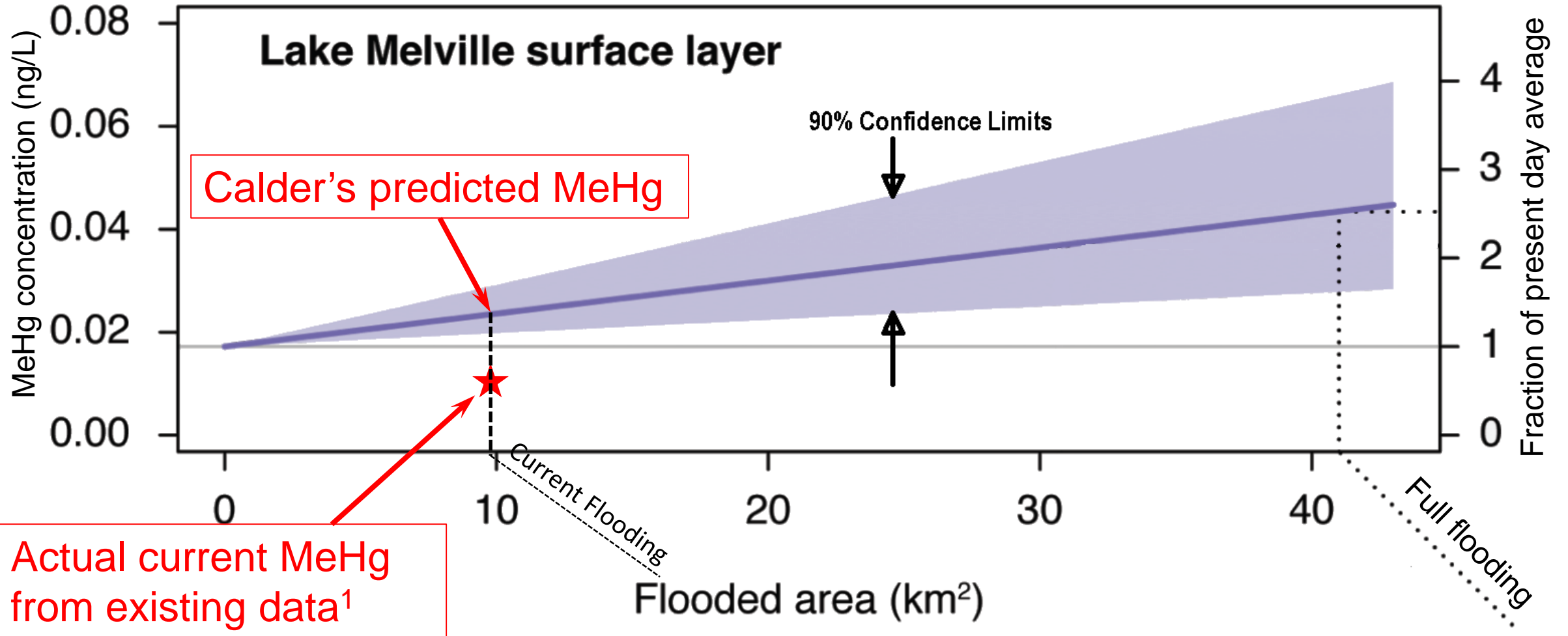
Methylmercury Sampling Program

- An extensive ongoing methylmercury sampling program was started in 2016. To date over 1,100 water samples have been collected and analyzed. The program monitors the changes (weekly/bi-weekly) in MeHg at 13 fixed stations throughout the system.
- This sampling program was vetted through the IEAC. Sample collection is done with the help of Nunatsiavut beneficiaries. Analysis is performed at an accredited laboratory, Flett Research Ltd.
- The Calder et al papers are based on 48 mostly random samples.

Comparison of Model to Actual Data

- The MeHg data collected continuously since October 2016 is sufficiently robust to draw meaningful conclusions.
- A comparison of MeHg concentrations collected as part of the sampling program before and after initial impoundment showed that there was a small increase in MeHg in the Churchill River (i.e. at the dam site) but the “signal” became weaker downstream and disappeared in Lake Melville.
- Significant differences were observed between the average that Calder predicted and the actual sampling program measurements at Lake Melville. The actual value is roughly half.
- The current level of MeHg in Lake Melville is lower than the starting concentration used in Calder et al’s model despite the initial impoundment.

Calder's MeHg Increase Prediction



Intangible Benefits of Wetland Capping

- Effectiveness of wetland capping is very limited based on the model output but there is some additional long term benefit on MeHg reduction.
- Lower cost – \$11.7 to \$19.4 m but only a very small area (39.5 ha).
- Supported by all 3 Indigenous groups including Innu Nation and municipalities representative.
- Some areas can be combined with habitat restoration/compensation as required by DFO.

IEAC Rec. #2 on Monitoring

- Recommend the design of a community-based monitoring program that answers questions about key indicators (i.e. water, key fish species, seal).
- Provide ongoing oversight to the implementation of the monitoring program.
- Develop pre-established benchmarks and appropriate responses to those results.

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Government Response:

- Government will establish a committee with Indigenous groups and municipalities and appoint new Chair (Public Health Professional) to begin with the setting of new terms of reference for implementing this recommendation.
- Nalcor's current environmental monitoring programs will be examined for further community involvement.
- Nalcor to be a full participant and funding agency.

IEAC Rec. #3 on Impact Security Fund

- A significant fund to replace loss of country food and compensate for loss of traditional practices related to the harvesting of that food, and to compensate for impacts on human health, both physical and mental if there are impacts to country foods resulting from impoundment of the Muskrat Falls reservoir.

Government Response:

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- Government has committed that Nalcor must provide reasonable and appropriate compensation measures to address the impact of food consumption advisories.
- Government will discuss details with the affected parties in the context of the health management objectives and benchmarks set to triggers under the monitoring program.

What are Nalcor's Responsibilities for Mitigating MeHg Issues?

Monitoring:

- MeHg Environmental Effects Monitoring Plan - Osprey and River Otter (top predators)
- Aquatic Environmental Effects Monitoring Plan – Hg in water, key fish species, seal, plankton
- Human Health Risk Assessment – MeHg in country foods, human hair samples, dietary surveys
- MeHg monitoring Plan for Surface Water – MeHg, Hg and other water quality parameters throughout the Churchill and Lake Melville system

Commitment (as condition of HHRAP release June 14, 2016):

“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.”

IEAC Rec. #4 on Health Management

- Standard advice be provided to pregnant women and the community at large that it is important and safe to eat country foods
- An independent body developing and assisting with the dissemination of communication materials.
- Work with Indigenous and local populations to develop benchmarks for action to ensure an appropriate response and communication plan should methylmercury increases in country food be detected through monitoring.

Government Response:

- Government agrees with this recommendation.
- Government will establish new committee with Indigenous groups and municipalities and appoint an independent public health professional to work on fully completing the recommendations

Current Measured MeHg Human Hair Concentrations

- Population MeHg concentrations were measured in 2 surveys,
 - Golder & Associates, 2015 (contracted to Nalcor, using 293 participants),
 - Calder et al, 2016 (using 474 participants).
- In Calder, one female exceeded the HC guidance value of 2 µg/g. One adult male exceeded 6 µg/g. No exceedances found in Golder survey.
- Majority of persons are well below HC guidance values. Average slightly higher than for Canada as a whole. Sensitive population (children, females) currently much lower on average.
- Calder predicted that median MeHg exposure would double for the majority of the downstream population. Greatest increases in Rigolet.

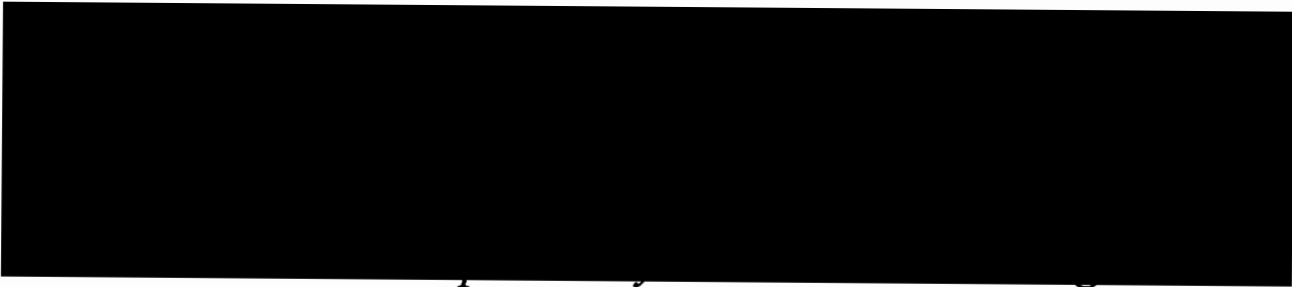
Canadian Guidance Values for MeHg

Group and age	Blood value µg/L	Corresponding hair value, µg/g	Recommended action
Pregnant Women Females, birth - 49 Males ≤ 18	< 8	< 2	No follow-up required
Pregnant Women Females, birth - 49 Males ≤ 18	8 - 40	2 - 10	Repeat hair/blood test in 6 months provide dietary advice
Pregnant Women Females, birth - 49 Males ≤ 18	> 40	> 10	Repeat hair/blood test immediately Schedule appointment with public health official
Females > 50 Males > 18	< 20	< 6	No follow-up required
Females > 50 Males > 18	20 - 100	6 - 30	Repeat hair/blood test in 6 months provide dietary advice
Females and males at any age	> 100	> 30	Repeat hair/blood test immediately Schedule appointment with public health official Refer to physician or medical toxicologist

Next Steps

- Brief Labrador MHAs
- Brief Federal Government officials
- Brief Federal MP for Labrador
- Meet with IEAC members
- Brief media
- News release and media availability

OVERVIEW



2019/01/09

MC2019- [REDACTED]

MAE/DM
Deputy Clerk
File

XX2019- [REDACTED]

A presentation respecting Response to the Independent Experts Advisory Committee's Methylmercury Recommendations was received.

Approval was given to proceed with responses to recommendations and with next steps as outlined in documentation on file with the Clerk of the Executive Council.

Clerk of the Executive Council