Can something be done to reduce (mitigate) the production of methylmercury?

The IEAC looked at various ways to reduce (or mitigate) the amount of methylmercury that will be produced due to flooding of the Muskrat Falls reservoir. The experts committee (IEC) could not find a single example worldwide where action had been taken to control methylmercury production at a hydroelectric reservoir but there were some studies published in the scientific literature that offered suggestions.

All soils, in addition to vegetation, naturally contain inorganic mercury (a less toxic form) as well as varying amounts of organic carbon. After flooding, the naturally occurring bacteria that are present consume the carbon, deplete the oxygen at the bottom of the reservoir and this creates conditions that allows the conversion of inorganic mercury into methylmercury. This methylmercury can then flow downstream and enter the food chain.

The removal of topsoil and vegetation is one way to reduce the amount of carbon that is available for the bacteria to 'eat', thus resulting in conditions less favorable for methylmercury production. It is important to know how much of this carbon can be removed safely. In order to gather site-specific information on the option of removing organic carbon from the future reservoir, the IEAC made the following recommendations to the Minister of Municipal Affairs and Environment (NL) on Sept 22, 2017:

IEAC Recommendation #1: The IEAC recommends that a feasibility study be undertaken by December 20, 2017, for the removal of soil and vegetation from the future reservoir area."

On December 22, 2017, the IEC received the draft report "Muskrat Falls – Soil and Vegetation Removal from the Future Reservoir Area", prepared by SNC Lavalin for Nalcor. The following observations were made by the IEC on this draft report:

The report addressed the technical and economic factors associated with the removal of *all* the vegetation and topsoil from the entire reservoir area, up to 42m above sea level (asl), which is 3m above the full impoundment level, and did not exclude problematic areas such as steep slopes and unstable soils.

The constructability for full soil and vegetation removal was considered feasible within the project timeline, but was described as very challenging

Points of important note for the committee included: the greater than anticipated minimum depth of soil clearance (0.5 m in summer, 1.5 m in winter), which essentially removes the full soil organic profile; the need to re-profile cleared land, even on moderate slopes (>30%), in order to maintain ground stability; and the widespread erosion potentially associated with such extensive ground disturbance, which could unintentionally stimulate MeHg production.