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Comments regarding Information Requests # 4

Dam Failure: Re: JRP # 162

(In the newest set of Nalcor Answers to IR # 4 Fig. 4.1, a map called "Probably Maximum Flood, Post Gull Island and Muskrat Falls, Failure of Gull Island Main Dam and Muskrat Falls North RCC Dam.) This is a continuation of the flood scenario maps from Attachment A of the HATCH Dam Failure Study which was submitted by Nalcor in October, 2009 as part of its responses to the Joint Panel's third batch of Information Requests.

The maps provided are extremely small and residents who might be living within the possible flood zone will have a difficult time determining whether their property could be affected. Although, as Nalcor points out, it may be unlikely that both the Gull Island and Muskrat Dams will fail; should it occur, it would be catastrophic and therefore all citizens should be informed directly if their property is within the flood zone. Nalcor is asked to provide a larger, more detailed map showing the 380 homes they refer to in the EIS Volume III, Section 7.5.3 (Community Health) that flood waters would affect in the event of a double breach at Gull Island and Muskrat Falls, in Happy Valley-Goose Bay and Mud Lake. In fact, a look at the Dam Failure Study GI1190 has various scenarios which quote different numbers of homes affected in each and every scenario. All of these homes must be identified so that local homeowners are aware that should they accept this project, they are agreeing to this risk as well as all other risks associated with this project since as with the recent Hurricane damage on the Island of Newfoundland, it is well known that Insurance Companies will not cover flood damage. As well, other infrastructure that would be affected; such as the local Hospital and new Long Term Care facility, Town Hall, College of the North Atlantic, Supreme Court House, Mealy Mountain High Collegiate, Peacock School, Middle School, Service Stations, Grocery Stores, North Star Building, Post Office, Banks, United Church, Catholic Church, Anglican Church, Pentecostal Church, Schools, Government Services Buildings, proposed sewage treatment plant, all businesses within the possible flood zone, the Town Water Wells

located along the banks of the Grand (a.k.a. Churchill) River, HV-GB Hydro facilities, all Welborn Bay Cabins, Terrington Basin Cabins, the Christian Youth Camp, North West River Road near Gosling Park, etc. needs to be clearly identified and proper assessments of the actual damage done. (This is only a partial list of the infrastructure in the path of several of the dam failure scenarios) As stated in the conclusion of the Hatch Submission to the Panel's most recent batch of Information Requests (# 4) on page 11 of that document, section 5.2,

"These estimates are not comprehensive and only include residential homes, roads, the 138 kV Transmission line, and Blackrock Bridge. They do not include losses to Nalcor property or the energy loss that would be associated with dam failure."

To accurately portray the possible damage and its relevant costs Nalcor should be required to produce accurate estimates connected with each and every scenario they quote of all infrastructures within the flood zones, not just residential homes. As well, all streets within the towns should be clearly marked so that residents can see where their particular property would be located with regards to possible flooding. Also, since Nalcor is a Crown Corporation they should be instructed to produce accurate estimates of damage to Nalcor Property and the energy loss since these losses are not only a concern of Nalcor but also of the Shareholder of Nalcor; the citizens of the Province.

Emergency Preparedness Plan (EPP) and Evacuation:

Nalcor's answer regarding Emergency Preparedness Plans and Evacuation in Appendix E are insufficient to provide comfort to residents that SHOULD a dam breach occur, all residents will be evacuated safely, and all damage will be properly compensated.

1. Nalcor's example of an EPP for Long Pond Reservoir is offered as the type of plan that will be provided for Happy Valley-Goose Bay and Mud Lake. In section 2.2 (f) (page 2-4 of that plan), under the heading EVACUATION: the following statement is made: "Evacuation of inhabited areas that could be inundated is the responsibility of the incorporated municipalities, NLEMO, and agencies authorized through NLEMO, that is, unincorporated municipalities. The RCMP is generally the agency that carries out the evacuation order." (NLEMO –Newfoundland and Labrador Emergency Management Organization???????) Again in section 6.5 Evacuation, the same statement is made with the additional statement "*The inundation mapping is provided in this EPP for use by these agencies to prepare appropriate evacuation routes and procedures.*" (emphasis added)

It is therefore imperative that Nalcor provide the Towns of HV-GB and Mud Lake Councils and consequently the residents of both these towns with detailed mapping of the streets that will be affected along with a complete list of home owners, business and other infrastructure. It is also imperative that both these Town Councils prepare an evacuation plan with input from all residents and businesses who fall within the possible flood zones and any other residents who are interested. These evacuation plans must be created,

reviewed and approved by all interested parties, BEFORE the public hearings for this project take place.

TABLE 3.1 – ASSUMPTIONS FOR ECONOMIC DAMAGE ASSESSMENT: HATCH SUPPLEMENTAL DAM BREAK ANALYSIS. IR # JRP 96

On page 6 of HATCH Dam Break Analysis, Table 3.1 assumes all homes in Happy Valley-Goose Bay and Mud Lake can be replaced for \$100,000., with absolutely no mention or assessment of any other types of buildings. The assumption for residential homes is likely about half of the actual cost of replacing a home and its contents in HV-GB...for example, a conversation with 4 of the homeowners along the riverbank at Hamilton River Road and in Terrington basin reveals that the cost to replace these homes is estimated at \$200,000., \$280,000., \$190,000., and \$175,000., respectively, not including the contents! As well, many extremely expensive buildings sit within the flood zone, some of which have been mentioned above. Therefore, Nalcor's estimates of economic damage for Post Gull Island and Muskrat Falls, Failure of Gull Island Main Dam and Muskrat Falls North RCC dam under the Probably Maximum Flood scenario of \$87,000,000., is obviously orders of magnitude too low if you consider just one of those buildings, the new hospital came in at a cost of approximately \$30 million and now has a new extensive wing to service Long Term Care that cost approximately \$10 million.

A true estimate of ALL properties along the possible flood zones and within all scenarios is required and should be included in the future costs of this project. It is recommended that Nalcor contact each and every business, organization, government office and residence within the flood zone and at the very least, use the last property tax assessment and a proper estimate of the contents for each building.

It should also be required that Nalcor show different time scenarios with regards to possible dam failures i.e. should the dams fail during filling or shortly thereafter, or in 10 years or in 50 years etc. and they should be required to discount future costs of more than 10 years and put their figures in present value terms... It is also important that the discount rate used is not too low! As well, as part of its Contingency Plan, Nalcor should be required, as with the Fish Habitat Compensation Package, to post a bond covering the cost of the worse case scenario of loss of property, loss of life, environmental damage, etc. in an amount that should include these true and possibly far into the future costs! After all, loss of personal property and loss of human life must surely be at least as important as loss of fish and fish habitat!

We also question how a "fair weather" failure would bring twice the damage as a "Probable Maximum Flood" scenario, as stated in the HATCH Dam Break analysis. It would seem that any complete dam failure would bring about nearly the same amount of damage, whether it was during "fair weather"

when all systems are go, or during a heavy rain event, or a reservoir induced seismic event? We have asked several people if they understand the difference and thus far have been unable to find anyone who can understand this. Nalcor should be asked to please explain exactly why a dam failure during fair weather would bring twice the economic damage as a dam failure under the probably maximum flood scenario.

MAPS OF INUNDATION SENARIOS:

MAPS OF INUNDATION AREAS MUST BE PROVIDED IN PAPER FORMAT SO THAT ALL RESIDENTS CAN SEE WHAT IS TO BE FLOODED... NOT JUST IN DIGITAL FORMAT AS STATED BY NALCOR IN ITS ANSWER TO IR JRP.96 VOLUME III CEAA REFERENCE NO. 07-05-26178. These maps should include all street names, and identify each and every home that could possibly be inundated as well as all other main infrastructure/buildings etc.

JRP. 148, Reservoir Preparation:

It is not possible to determine whether Nalcor's ideas for reservoir clearing are acceptable unless a proper detailed harvesting plan has been submitted, with proper scale maps, details on the number of access roads, location of access roads, detailed plans on how the roads that will not end up in the flood zone will be decommissioned, details on how they plan to store the merchantable timber, specifics on amount of trees to be harvested, who will purchase it and what it's end use will be. The area to be flooded is within the District 19A Forestry Plan and as such any harvesting must specifically follow that plan; meaning, all parts of the trees cut must be used for secondary wood processing. Nalcor should be required to submit its properly prepared harvesting plan for consideration before this project goes to Hearings.

With regards to the amount of clearing that Nalcor states can be done, it does not appear that they have considered a couple of possible methods of clearing, such as manual cutting, and a self-levelling harvester, (a few of which are currently already in use on the Island). It's possible that these two methods could substantially increase the amount of trees that could be removed from the flood zone and as such should be considered.

Mulching and burying of wood, i.e. the non-merchantable portion of any harvesting, should not take place. There are markets available for bio-energy and Nalcor should research those markets for buyers. This is also in line with the District 19 Ecosystem based Forest Management Plan. Their vision statement is copied below.

“Vision Statement

To manage and sustainably develop the forest ecosystems of Forest Management District 19A while not compromising their ecological and cultural integrity, productive capacity, resiliency or biodiversity”

As in other areas of their responses, Nalcor , in its answer to JRP .148 Part C, continues to site the “commercially sensitive nature of contracting information and detailed cost estimates” as reasons for not including the detailed cost estimates in their appendices. It is hardly possible for one to determine whether this project is economically viable if many of the costs are continually withheld this way. There must be a disclosure of at least best estimates of costs relative to the preferred disposal methods of burying waste as opposed to removing it from the site.

With regards to section g, of JRP.148, Nalcor states under the paragraph headed **Slope Failures (Mass Wasting)** “The Banks along the lower Churchill River are generally high and steep, and in many cases are prone to natural slope failures.” “As a whole, the banks initially become more unstable as a result of wave and water velocity effects acting on the newly exposed banks due to reservoir filling. The result of these erosional forces acting upon the new shoreline, which will essentially erode portions of the bank at the water’s edge, could potentially lead to an increase in bank failures from undercutting effects. This would lead to new sediments being released into the reservoir system and would likely continue until a stable shoreline is created post impoundment.”

Then in the paragraph under Figure 1, headed **Hjulstrom Diagram, Showing the Relationship Between the Velocity of Water Flow and the Transport of Loose Grains**, Nalcor states that due to the quick rate of filling, the quantity of material that would become eroded and enter the system and thus (be) available for transport and deposition is predicted to be minimal; the one exception would be a potential slope failure which would have the potential to introduce a larger quantity of material into the system.”

Also under the paragraph headed **Mitigation Measures** Nalcor states “Limited options exist to mitigate increased erosion and sedimentation effects during reservoir filling.”

1. We do not understand Nalcor’s rationale that the short time for reservoir impoundment will avoid sedimentation... In fact it would seem that the “faster” filling of the reservoir would create more instability than if it happened at a slower rate?
2. Having witnessed “mass wasting” and “slumping” along the river banks, especially near the Sand Banks area ourselves on various canoe trips down river, we question first Nalcor’s statements that the quantity of material that would become eroded and enter the system is predicted to be minimal and second, what effect a huge amount of slumping, or mass wasting will have on the overall output with regards to energy production.

JRP.163- Cumulative Effects:

Nalcor states in the conclusion of this section that **mineral sands exploration** activities have not been included in cumulative effects assessment due to this being a “past” activity. It should be noted that Grand River Ironsands Inc is still actively pursuing exploration activity within the Grand (a.k.a. Churchill) River valley and the eventual outcome of “exploration” will likely be a project. Thus this particular project should be included as a “reasonably foreseeable project” in the cumulative effects analysis.

As well, it is questionable whether an **aluminum smelter** can be considered a hypothetical project since it has been talked about by the Premier and our local MHA several times in the media over the past 3 or 4 years and the proposed Lower Churchill Hydro Project is likely the only possible way an aluminum smelter could ever be considered due to the amount of power needed to run that type of facility. In other words, it probably would never happen without the Lower Churchill project and thus should be considered in cumulative effects.

To say that **proposed uranium mines** are located well north of the biophysical cumulative effects assessment areas for the Project and are therefore not likely to cause cumulative effects seems short sighted as well. What of the extra road traffic along the Trans Labrador Highway? What of the extra pollution from mining dust that would add to pollution from the hydro project and effect air quality? What of the extra water pollution that could happen should one of the trucks carrying yellow cake overturn and spill its contents? Again, there seems to us to be very good reasons to include proposed uranium mines in an assessment of cumulative effects.

JRP.147, Alternatives:

While this particular information response from the Panel deals with the hydroelectric project specifically, there still remains the question of “alternatives to the project”. How could \$12 to \$14 billion dollars be better spent? The proponent has never entertained the idea that tax payers dollars could be spent on other, more environmentally sustainable projects that could possibly provide as many or more jobs, and provide as much or possibly more power; or be more profitable economically, or any number of possible scenarios that tax payers could choose from, if they could be informed of these “alternatives to the project”.

The proponent and the Newfoundland Government (its main shareholder) should be directed to consider how this amount of money could be better spent and provide a set of true alternatives to the project so that citizens can make a more informed decision.

On page 4 of Nalcor’s response to the Panel’s request .147, under the heading :*The following transmission options exist, including*, Nalcor states, “The construction of either phase of the Project will not start until a level of market access that supports at least the construction of either Gull Island or Muskrat Falls is achieved.” This is a clear indication that the “transmission” and “generation” projects are inextricably linked and without transmission lines to take the power market, economic viability for the generation project cannot ever be reached and therefore other alternatives to the project should be considered.

JRP.148, Cost-Benefit analysis of partial versus full clearing of the reservoir area:

The proponents response is drawn out and confusing and does not present a clear picture of the partial versus clearing costs and benefits. Also, Nalcor’s reference to the Halifax Global Inc. report titled

“Strategic Plan to Develop Labrador Secondary Manufacturing and Value Added Wood Products Industry” and their reference to the selling price of wood/timber based on the purchase price of Labrador wood when sold to pulp mills on the Island should be increased. Wood/timber in the district 19A Forestry Plan is slated for secondary processing and would therefore fetch a higher price than round logs sold for pulp use only.

JRP.149, Project Operating Regime (Water Levels):

Nalcor’s response on page 8 under part c of the Panel’s Information Request makes reference to “effects to fish habitat throughout the winter months) is a natural phenomenon in many unregulated rivers.” And “It currently occurs in the lower Churchill River as well as a result of flow regulation by the Churchill Falls facility during the winter months.” These statements say two things to us: first, that Nalcor refuses to acknowledge that the Lower Churchill project will destroy more, and possibly so many of the fish eggs as to wipe out certain species of fish which deposit their eggs during the fall, and second, that they continually compare the Project effects with “natural phenomenon” which makes absolutely no ecological sense.

JRP.150 Decommissioning:

Nalcor’s columns for the three options of decommissioning on page 5 under the heading **Cost**, shows an estimated range for complete removal of from %5.4-Billion to \$8.1-Billion. Since this would be the only scenario that would allow the River to re-establish its flow patterns and natural channels this then is the scenario that should be prepared for, leaving the final decision to future generations as to which scenario they choose but preparing for the “best case” scenario. We also question whether the figures given by Nalcor are in today’s dollars or do they reflect what the costs might be in the future and are then converted to today’s dollars. Future costs and benefits as well should be discounted and everything put in present value terms and again, the discount rate must be agreed upon and cannot be set too low, or at least have them specify and justify which rate they are using and why. As with the fish habitat compensation package, a bond should be set to cover the most extensive scenario so that future generations are not left to pay the price should Nalcor be non-existent within 75 to 100 years. Decommissioning should be at least as important an environmental and socio-economic issue as fish habitat compensation, especially if the reason for decommissioning in the future should be for the safety of downstream communities.

JRP. 151, Aboriginal Consultation and Traditional Land and Resource Use:

Nalcor states in paragraph two of its response to this information request that “although there is no legal requirement to enter into consultation/capacity agreements, the Panel has now indicated that the implementation of these agreements is necessary to enable the Panel to assess the potential environmental effects of the Project on the current traditional land and resource use of the various Aboriginal groups referenced in the Guidelines.” Nalcor continues on in the third paragraph to respectfully disagree with these statements saying in paragraph four that “Nalcor has executed agreements with some of the Aboriginal groups listed in the Guidelines, as set out below. However, the absence of executed agreements with other Aboriginal groups listed in the Guidelines does not, in any way, prevent Nalcor from continuing to engage in meaningful consultation.”

We respectfully disagree with Nalcor’s apparent exertion that they might be engaging in “meaningful consultation” with other groups other than the Innu Nation since it is apparently ONLY the Innu Nation

with whom Nalcor has signed a tentative Impact Benefits Agreement. It would seem that “meaningful consultation” with other Aboriginal groups which have current traditional land and resource use within the project area would include similar agreements!

JRP.152, Downstream effects below Muskrat Falls:

The proponent is again refusing to admit any downstream effects of the project below Muskrat Falls, even in the face of DFO Science Reviewers who basically told Nalcor this statement was, in effect, ridiculous, (our words not theirs) and even in the face of statements from D.M.Rosenberg’s report “Large-scale impacts of hydroelectric development” that downstream effects of dams could have far reaching effects as far as hundreds of kms., one of the reports quoted by Nalcor in the EIS. And as a reference to their response to the Panel’s question in JRP.152.

We are absolutely not convinced that this Project, this huge interruption in the sediment transport and flow of this river will not have devastating effects as far downstream as Lake Melville and even out into Groswater Bay.

JRP.153, Fish Habitat Compensation strategy:

Again we re-iterate that a project of this size and effect on the fishes within the river system cannot be effectively compensated for. We have repeatedly explained to Nalcor’s representatives in various meetings that their plans to “create” fish habitat were futile and that we have no faith that their habitat compensation package, even if executed to the best of their ability, will succeed in maintaining the species that currently exist in the river system.

Also, as mentioned in various other submissions, our concerns are further verified by DFO scientist’s and the Commissioner of the Environment’s reports that most compensation packages fail to produce “No Net Loss” of fish habitat.

It is therefore time for Nalcor to admit that fish species will be lost in the creation of this project and that this loss must be considered as “significant” when assessing the environmental effects of the project.

JRP.143, Ashkui:

Nalcor consistently suggests that new “ashkui are likely to occur” within the reservoirs and uses this statement to consistently state that the effects of changes in current ashkui on migrating waterfowl will be “not-significant”. They also state, “In the unlikely event that new ashkui do not form or do not have the same characteristics, other ashkui that form in the lower Churchill River watershed that would be beyond the reservoirs would be available for use by wildlife and the Innu.”

We suggest that while the Innu may be able to make a conscious decision to move along to other ashkui in the lower Churchill River watershed, waterfowl may not, due to their inability to think rationally, be able to make a conscious decision to do the same. It is a known fact that waterfowl come back to the same areas year after year and if those areas of ashkui are not found they may not have the reserves to “look around” for other open water areas, depending on how far away those areas might be.

Nalcor should admit that they really have no idea whether these ashkui areas will occur and that if they don't, it will likely have an adverse effect on migrating waterfowl and is therefore a "significant" effect, since they are refusing any additional mitigation and/or adaptive management measures.

JRP.156 , Mercury Levels in Fish:

New studies and tests by Dr. Masazumi Harada on the Grassy Narrows First Nations group should be reviewed and included in this assessment. A CBC report states, "Dr. Harada visited Grassy Narrows in 2004 and found that 43 per cent of the people who had mercury levels above Health Canada guidelines in 1975 had died. He also found that even the residents whose mercury levels were within the safe limits set by Health Canada still experienced mercury-related health problems. Of the 156 people from Grassy Narrows and Wabaseemong with levels below the guidelines whom Harada's team examined in 2004, 89 percent had Minamata disease, Minamata disease with complications or possible Minimate disease." Again in April, 2010, a translated study of Dr. Masazumi's was released, exactly 40 years after the Ontario government banned fishing on the Wabigoon River and this unprecedented study found that, even with decreased levels of mercury found in the Wabigoon River today, the people of Grassy Narrows are still suffering from mercury poisoning, now more than ever." (from the Intercontinental Cry, an on-line blog) These are not anecdotal statements, they are reports from the Doctor who has visited these communities and been consistent in his research on the health of the communities since shortly after mercury contamination caused by a paper mill upstream in Dryden, Ontario poisoned the fish in the Wabigoon and English river systems near the grassy Narrows First Nation.

It is therefore important that since "as many as 48% of the mixed general population of the Upper Lake Melville area still consume harvested wild foods, including fish and caribou." (taken from an informal survey done by the Food Security Coordinator, Upper Lake Melville Area), that increased mercury levels should be considered as a significant issue with regards to this assessment even if they are currently below the Health Canada regulations.

JRP.157, Red Wine Mountain Caribou:

While we agree that the Red Wine Mountain Caribou are in serious decline and must be protected, it also appears we should be even more concerned about the George River Caribou Herd (GRCH). In response to a recent CBC interview with former Regional Wildlife Biologist in Labrador, Stuart N. Luttich, concerns have been heightened about the current 2010 census results for the GRCH. It seems the herd may have declined to approximately 100,000, down from an estimated 8 to 900,000 just 15 or 20 years ago. It is now obvious then that the George River herd, which appears to have been dismissed as of less importance than the Red Wine Caribou Population in the current analysis, should now be discussed in greater depth. While the Red Wine herd is classified as "endangered or threatened", the George River herd is still the "bread and butter" resource for many people in Labrador. Therefore, based on evidence being reported in the local and regional media regarding the significant decline of this herd, to ignore this new information and the effects of a huge development like the Lower Churchill directly in the path of the herd's winter foraging area would be a failure of the EIS to address the full scope of the issues. It is therefore imperative that this new information be incorporated into the Environmental Impact Statement and the full effects of the project on the George River caribou herd be assessed.

