CNF-1013
EXHIBIT #
WUSKWATIM GENERATION
& TRANSMISSION PROJECT
CLEAN ENVIRONMENT COMMISSION

Sierra Club of/du Canada

SUBMISSION FROM THE SIERRA CLUB OF CANADA

TO

MANITOBA CLEAN ENVIRONMENT COMMISSION

PUBLIC HEARING

ON THE SUBJECT OF THE

WUSKWATIM GENERATION AND TRANSMISSION PROJECTS

PRESENTED APRIL 7, 2004 by Elizabeth May, Executive Director, Sierra Club of Canada

412-1 Nicholas Street, Ottawa ON K1N 7B7
Tel: (613) 241-4611 Fax: (613) 241-2292 email: info@sierraclub.ca web: www.sierraclub.ca/national

1. *The Sierra Club of Canada*

Thank you for allowing this brief from the Sierra Club of Canada. We had initially understood that the schedule was too tight and that there would not be time for the Sierra Club of Canada to appear before you. Your flexibility in this regard is appreciated.

The Sierra Club has been active in Canada since 1969. Its mission is to develop a diverse, well-trained grassroots network working to protect the integrity of global ecosystems. The national office of the Sierra Club of Canada in Ottawa works closely with its chapters in British Columbia, the Prairies, Eastern Canada, and Atlantic Canada. The Sierra Club of Canada also has a national youth arm, the Sierra Youth Coalition. The organization is non-profit and membership based. Financial support comes primarily from members and supporters. The Sierra Club of Canada is proud to be democratically governed, with national elections for the board.

The Sierra Club of Canada (SCC) is a leading voice on climate change and energy issues in Canada, working on a wide array of energy and atmosphere issues, from nuclear power to offshore drilling and pipeline issues. SCC is also respected for our work on biodiversity issues, concerned particularly with protection of old growth forests and wetlands. The Sierra Club of Canada is engaged in work to protect the boreal region and has undertaken cutting edge research on the role of forests and the carbon cycle. (See: *Forests, Climate Change and Carbon Reservoirs: Opportunities for Forest Conservation,* September 2003, www.sierraclub.ca)

Since 1992, SCC has maintained a priority campaign to raise awareness of the imperative to deliver reductions to greenhouse gas emissions. SCC intervened in the environmental assessment hearings in the early 1990s on the proposed Great Whale Hydroelectric project in Quebec. SCC's British Columbia chapter has been active in opposing the proposed GSX pipeline to Vancouver Island, while the Atlantic Chapter has been very engaged in issues of off-shore and near-shore oil and gas development. SCC intervened in the proposed Alberta tar sands mining and de-watering projects, such as the Horizon Project proposed by Canadian Natural Resources Ltd and the Jackpine mine proposed by Shell Canada.

In the wake of the ratification of the Kyoto Protocol, it is critical that projects with significant implications for GHG emissions be subjected to a thorough analysis of environmental, economic, and for community sustainability. Sierra Club of Canada is intervening in the environmental review of Hydro Quebec's proposed Rupert River diversion. We are a founding member of the Canadian branch of the international Climate Action Network.

2. *Sierra Club of Canada Concerns*

The Wuskwatim Generation Project involves a 200 megawatt generation station, an extensive transmission system, with stations and lines, requiring the clearing of rights of way (of 60 and 110 meters) in areas of largely undisturbed boreal forest, flooding of an area of half a square kilometre (37 hectares) with water fluctuating to maintain one metre of lake storage of impounded water. This flooding is, of course, additional to flooding from existing hydroelectric projects in this river system..

It is curiously referred to in the Environmental Impact Statement (EIS) as "modified run-of-river." Although the EIS refers to this as a "compromise,"[i] it could as easily be referred to as a slightly modified conventional dam. There is no similarity between the Wuskwatim Dam project and true "run-of-the-river" which, by most definitions, does not create permanent impoundments.

3. The Environmental Review Process

The Sierra Club of Canada wishes to note as a significant failure of the process, the failure to apply the guidance document from the Canadian Environmental Assessment Agency, "*Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners.*"[ii] While the EIS does take note of possible GHG emissions, it fails to incorporate the impacts of climate change as they impact on the project. The Alberta Energy and Utilities Board has concluded it will ensure the CEAA guidelines are followed in future Alberta hearings.[iii] The failure of Manitoba Hydro and Manitoba Conservation to follow CEAA climate change guidelines is disappointing, not to mention a serious gap in a proper review of a project reliant on predictable water flows.

Moreover, the project assessment did not include a true review of alternatives to meet energy needs. The thrust of the Manitoba Hydro energy planning appears to be the export of hydroelectric generated electricity to the United States, while continuing to operate fossil fuel burning electric stations for electricity for domestic provincial consumption. If the goal is long-term energy sustainability for Manitobans, the creation of on-going obligations to maintain high levels of exports to the United States through the energy chapter of the *North American Free Trade Agreement*[iv], the current energy policy is problematic. The approach also fails to deliver on a serious commitment to reducing greenhouse gases. The review of alternatives to meet the energy delivered by the proposed Wuskwatim Dam should have considered Demand Side Management (conservation), renewable sources of energy (true run-of-the-river, solar and wind), and significant co-generation opportunities. Pembina Institute, contracted to assess the lifetime greenhouse gas emissions from the project, was not asked to assess Demand Side Management or co-generation delivering the same energy, reducing greenhouse gases far more and avoiding the ecological costs of flooding, clear-cutting and fragmentation of remote boreal forests.

Prior to licensing decisions, the proponent should be required to conduct a thorough review of alternatives to aid the citizens of Manitoba in making a decision in the long term interests of the province. The EIS should be re-done to include the climate change impacts on the viability of the project (see section 4.)

3. ***Protected Areas and Biodiversity***

The Sierra Club of Canada also wishes to note with concern the failure of the EIS to reflect the significant threat to proposed protected areas. We are also concerned that the impact on fragmentation of the boreal forest through clearing of rights of way and the construction of transmission lines has been inadequately addressed in the EIS. The impact of opening up remote areas in this fashion is often to invite other users, whether hunters, off-road vehicles or others into a previously inaccessible area. This phenomenon increases significantly the impact on biodiversity of construction of transmission lines.

Clearly public policy for protected areas establishment has not received the technical treatment expected, including by the EIS guidelines.

4. ***Climate Change***

As previous presenters have spoken to a number of issues that also concern us, but as there has been very little attention to the science of climate change, it is the climate change issues to which we wish to direct most of our comments. Given the political leadership from the Doer Government on the Kyoto Ratification issue, it is quite shocking that the EIS prepared largely by Manitoba Hydro is so cavalier and sloppy regarding the state of the science.

Throughout the EIS, there are references to climate change as though the scientific community was in some large degree of doubt about the relative role played by solar and volcanic activity and human caused emissions of greenhouse gases in causing climate change.[v] The characterization of the issue is simply misleading.

The international community recognized in 1992 that human generated greenhouse gases, as well as land use changes, were a threat to the stability of global climate. The United Nations Framework Convention on Climate Change (FCCC), signed and ratified by Canada in 1992, as well as by approximately 180 countries, including the United States, sets forth key propositions on this issue: That human interference with the global atmosphere is a serious problem, that the "precautionary principle" applies, in other words action could not wait for 100% proof (likely only available through a planetary *post mortem),* that all parties to the Convention must aim to reduce greenhouse gases so that GHG stabilize in the atmosphere prior to reaching levels described as "dangerous."

The subsequent Kyoto Protocol, which is a creature of the umbrella FCCC, sets out targets and deadlines. Canada has ratified the Kyoto Protocol, once again accepting that the science is clear that human caused GHG emissions are more than a probable

small contributor to global climate change, as Manitoba Hydro's EIS would suggest, but are actually driving the climate system in new and dangerous ways.

The international scientific consensus can be set out as follows:

1. the world has been warming and will continue to warm for the forseeable future;
2. the warming is largely due to human activity;
3. the consequences of rising temperature are grave enough to warrant global action.

The consensus of scientific opinion on which I will draw key points for your consideration comes from a United Nations body established in 1988. Canada played an important role in its creation through a number of United Nations agencies. The body, the United Nations Intergovernmental Panel on Climate Change (IPCC) is comprised of approximately 2,000 scientists and experts appointed by governments from around the world. The IPCC reviews all the peer-reviewed scientific literature and negotiates a consensus view. It is important to underscore that the IPCC consensus, while viewed by some as over-stating the threat from human-generated GHGs, is equally viewed by many other scientists as seriously underestimating the risk.

One of the key differences between "natural" climate changes and what we are now experiencing is the rate of change. The *rate* of average temperature increase in the last century is unprecedented in the past 1000 years.[vi] The actual chemistry of our atmosphere is changing – and changing fast. Prior to the Industrial Revolution, the atmospheric concentration of carbon dioxide was approximately 275 parts per million (ppm). That level had been remarkably stable over the last 20 million years or so, as determined through a number of sources (carbon-dated Antarctic ice core data going back 160,000 years, proxy data from tree rings, corals, as well as more recent historical record.). But in the last century, and particularly in the period since the Second World War, human activity has been changing the atmosphere's chemical balance. The emission rates have shot through the roof, with global carbon dioxide emissions growing four-fold between 1950 and 1994. The carbon cycle of green plant life in ocean and forest stores much of that carbon. After all the "netting-out" of carbon through natural processes, the actual concentration in the atmosphere has risen to 370 ppm - more than a 30% increase.

Changes in the planet's atmospheric chemistry are largely irreversible. The atmosphere is a nearly unfathomably large and complex system. There are very long lag times between when action is taken, for good or ill, by humanity and when it reaches a new equilibrium in the atmosphere. For example, in the most recent IPCC assessment, it is stated that if humanity were able to reduce global emissions by fully 60% below 1990 levels and do so immediately, it would take a century for temperature levels to stabilize, more than a century for GHG concentrations in the atmosphere to stabilize, and 1,000 years for sea level rise to stop. Of course, if GHG were reduced by 60% below 1990

levels, the end point for temperature, GHG concentrations and sea level rise will be far lower than if we fail. In fact, reductions on the order of 60% below 1990 levels are essential, according to IPCC consensus, if we are to avoid a doubling of atmospheric concentrations (550 ppm). The 550 ppm mark has been used as a rough estimate of an unacceptable level of extreme danger for human activity on the planet. The lag times are important in keeping the hubris of human activity in some sort of context. The carbon dioxide we emit today will be impacting global climate for the next 100 years.

Another significant misunderstanding in the Manitoba Hydro EIS is in its dismissal of climate change science as having anything useful to tell us about climate change impacts on this particular project.

> Manitoba Hydro absolves itself of a significant obligation with the bald statement: **"Due to the level of uncertainty relating to the potential effects of climate change, Manitoba Hydro cannot project a specific climate change scenario for the Wuskwatim Generation Project Area."** [vii]

It is no doubt true that the greater the level of detail required in climate modeling, the less certain is the result. Nevertheless, there are some observed existing trends. These trends are consistent with larger scale general circulation global climate models. One of the emerging areas of increased confidence about our understanding of the relationship between human generated GHG and destabilization of global climate comes as a result of finding that models of climate change track very well along observed impacts.

There has not been a great deal of work on observed impacts on water resources form existing levels of climate change in Northern Manitoba, but there has been some. Dr. Xuebin Zhang of the Environment Canada Meteorological Service of Canada has published the work of his team in the April 2001 *Journal of Water Resources Research.*[viii] Their research demonstrated that generally, across Canada, annual mean streamflow has decreased. This was particularly a factor in southern Canada due to increased evaporation. Northern rivers, such as the Athabasca, which are glacier-fed, also show significant decline. In the study, northern Manitoba is also showing signs of changes in stream flow. Between 1957 and 1996, there are seasonal trends in monthly mean stream flow, with declines, although weak statistically, in April, and small increases in September.[ix] The same trends hold true for daily mean stream flow.

Sierra Club of Canada contacted Dr. Zhang for clarification on the trends in northern Manitoba. We urge the Manitoba Clean Environment Commission to do the same and engage a number of independent experts to review the available data, the global climate general circulation models and set out a range of likely climate scenarios. Dr. Zhang would not assert that past stream flow data can be used to draw a direct line to predict stream flow in the future. However, he, like most climate scientists, would agree that it is a near certainty that temperature in the region will continue to increase. As temperature does so, it is likely that evaporation will also increase. The greater the

evaporation the more stream flow will be negatively impacted. The Wuskwatim Dam Project is dependent on reliable and predictable levels of water flow. Climate change science suggests that future climate will be anything but predictable. It is not possible to assert at this point that the levels of climatic disruption of the system will render the project non-viable, but absent any attempt to analyze coming climatic impacts on the region, it is impossible to say that they will not.

The document, *"Manitoba and Climate Change: A Primer,"* co-produced by the Manitoba Clean Environment Commission and the International Institute for Sustainable Development (December 2001) anticipates the potential threat to projects such as this due to climate change impacts:

"The increased summer temperatures, together with reduced precipitation and higher evaporation, might reduce the amount of water available for Manitoba's hydroelectric production." (p.10)

The Canadian Environmental Assessment Agency guidelines on climate change should have been applied to the EIS.

4. Conclusion:

It is beyond the scope of this brief to comment on all aspects of the proposed project and EIS. Our role here is to focus greater attention on the urgent need to develop an adaptation strategy for Manitoba Hydro's operations in general, and this proposal in particular. Climate change impacts are real and will increase in the future. For a project anticipating a 100 year lifespan, this need is even more compelling.

There are other alternatives to meet Manitoba's energy needs that contribute directly to reducing GHG emissions, protect bio-diversity and stimulate the economy. Those alternatives should have been addressed.

Thank you.

NOTES

[i] EIS, Volume 1, page 4-7.
[ii] Canadian Environmental Assessment Agency, "Incorporating Climate Change Considerations in Environmental Assessment," Prepared by the Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment, November 2003.
[iii] Alberta Energy and Utilities Board decision in the Canadian Natural Resources, Ltd Horizon Mine decision, January, 2004.
[iv] The Energy Chapter of NAFTA requires proportional sharing *ad infinitum*. Whatever the level of energy export to the U.S. as a proportion of energy generated in the province must be maintained (e.g. If 50% of energy produced is being exported, that 50% must be maintained.) If Manitobans decide in the future to conserve energy and keep more hydroelectric generated power for use within Canada, future citizens will find their hands tied by NAFTA requirement.
[v] EIS, Volume 1, page 5-3, Volume 4, page 12-1.
[vi] Intergovernmental Panel on Climate Change, Working group 1, Summary for Policy Makers, Third Assessment Report, page 3.
[vii] EIS, Volume 1, p. 5-4.
[viii] Zhang, X, K. David Harvey, W.D. Hogg, and Ted R. Yuzyk, "Trends in Canadian Streamflow," *Water Resources Research,* Vol. 37, No. 4, Pages 987-998, April 2001.
[ix] Zhang, p. 991.