Supplemental Filing

Environmental Impact Statements:

Wuskwatim Generation and Transmission Projects

Responses to Technical Advisory Committee

August 8, 2003

Nisichawayasihk Cree Nation

Manitoba Hydro

0221-A-29-04
August 8, 2003

Mr. Trent Hreno
Chair, Technical Advisory Committee
Manitoba Conservation
160 – 123 Main Street
Winnipeg, MB
R3C 1A5

Dear Mr. Hreno:

re: SUPPLEMENTAL EIS FILING:
WUSKWATIM GENERATION and TRANSMISSION PROJECTS

Manitoba Hydro/Nisichawayasihk Creek Nation hereby file the attached Supplemental Filing to the associated Environmental Impact Statements (EIS's) filed earlier on April 30, 2003. We are providing 42 hard copies and electronic copies, as advised by Mr. L. Strachan in his e-mail to Mr. Grewar (August 5, 2003). We understand you will distribute these, as required, to members and to the Public Registries. We are also providing copies to all the participants registered with the Clean Environment Commission.

This Supplemental Filing responds to questions raised after the advertised review period for comment from your TAC members and the interested public. Our Supplemental Filing is organized into three distinct information packages, to correspond to the questions received, namely:

- Technical Advisory Committee comments, received July 10, 2003;
- Department of Fisheries & Oceans comments, received July 17, 2003; and
- Canadian Nature Federation comments, received July 11, 2003.

Our information is presented in three tabular formats, with attachments where required. For each package, we have identified the specific questions raised, including an identifier code as to source, the reference to the relevant EIS section, the issue or concern, and the response. We trust this cross-referencing will facilitate the review of this Supplemental Information.

In the course of developing these responses, Manitoba Hydro/Nisichawayasihk Cree Nation and/or their consultants communicated informally with some of the questioners to clarify their comments, including Department of Fisheries & Oceans and Manitoba Conservation. We believe these informal discussions have assisted us in responding to the issues.

Manitoba Hydro/Nisichawayasihk Cree Nation acknowledge with appreciation, the thorough review of the EIS's, as demonstrated by the extent and quality of the many questions raised for our consideration. These questions and our responses will assist in a rigorous, comprehensive review of our proposals.

We will be pleased to answer any other questions you may have on this filing.

Sincerely,

MANITOBA HYDRO

Ed Wojczynski
Division Manager
Power Planning and Development

NCN

for
Elvis Thomas
Councillor
Future Development Portfolio

cc: Larry Strachan
Director, Environmental Approvals Branch
Manitoba Conservation

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Manitoba Clean Environment Commission

EIS Supplemental Filing – August 8, 2003
Wuskwatim Generation and Transmission Projects

List of Contents

EIS Supplemental Filing – August 8, 2003
Wuskwatim Generation and Transmission Projects

List of Contents (Continued)

Listing of All Reviewer Author and Departments That Provided Comment on the Wuskwatim Project EISs - Identified in the TAC Comment Table

Comment Numbering	Letter Author and Department / Organization
EnvCan	Terry Youmans, Environmental Protection, Environmental Assessment Coordinator, MB Division, Environment Canada
ParksCan	Suzanne Therrien-Richards, Environmental Science and Assessment Coordinator, Parks Canada
HlthCan	Maria Ooi, EA Coordinator - Manitoba Region - Office of Environmental Health Assessment Services, Health Canada
INAC	Peter Garrett, Manager, Environmental Unit, Lands & Trust Services Directorate, Indian and Northern Affairs Canada, Manitoba Region
DFO	Beverley Ross, Impact Assessment Biologist, Department of Fisheries and Oceans (comments provided on July 16)
CCC	Denise Hickson, Manager, Operations Analysis, Crown Corporation Council (comments related solely to NFAAT submission)
MbCons (BM)	Blair McTavish, Director - Sustainable Resource Management Branch, Manitoba Conservation
MbCons (SD)	Steve Davis, Regional Director - Northwest Region, The Pas Manitoba, Manitoba Conservation
Mb ANA	Ken Agar, Agreements Management, Aboriginal and Northern Affairs (Manitoba Government)
MbHealth	Dr. James Popplow, Senior Medical Advisor, Environmental Health Unit, Public Health Branch, Manitoba Health
Mb HRB	C. Gordon Hill, Impact Assessment Archaeologist, Historic Resources Branch
Mb IgA	David Joplin, Policy Planner, Provincial Planning Services, Intergovernmental Affairs
Mb EST	Juliane Schaible, Industry Consultant, Energy, Science & Technology, Government of Manitoba

Table 1
Responses From Manitoba Hydro And Nisichawayasihk Cree Nation (NCN) To
TAC Reviewer's Comments (Received By July 10/03) Regarding EISs For The Wuskwatim Generation And Transmission Projects

Comnt. No.	Page (Para)	Nature of Comments: EIS Section	Nature of Comments: Issue	Nature of Comments: Summary of Comments	Response From Manitoba Hydro & Nisichawayasihk Cree Nation (NCN)
Wuskwatim Generation Project					
Project Description					
EnvCan - S-1	p2 (4)	Vol.1, Page (p) 4-16 and Vol. 5, Table 5-1	Water quality re: construction and removal of coffer dams and excavation of Wuskwatim Falls channel	Additional mitigation measures should be considered and discussed regarding minimizing water quality impacts during construction.	See response to DFO-S-1.
EnvCan - S-2	p3 (5) & p4 (1-3)	Vol. 3, Sec. 5	Potentially more frequent use of the "emergency mode of operation"	"…it is recommended that additional information be provided on: **a)** the downstream flow regime effects (primarily water level changes of 1 unit best gate to 3 unit full gate cycling operations from various low inflow scenarios (i.e. inflow below 660 m^3/sec) and three unit operation durations. This should include water level estimates to Birchtree Lake with its associated maximum water level change restriction (0.10 m open water and 0.15 m ice conditions) **b)** the degree to which low flow, 1 to 3 unit cycling may be used to meet integrated power system energy demands, including explicit statements regarding when and if this mode of operation will be used, and **c)** the environmental effects associated with 1 to 3 unit cycling on daily water level changes if this mode of operation will be used more frequently to meet system energy demands during low flow periods."	a) Additional mode of operation runs were completed to determine the Birch Tree Lake water level response for various emergency operations. Several emergency conditions were analyzed where by outflows were suddenly changed to full plant outflow (1100 cubic metres per second) for varying time periods ranging from 10 minutes to several hours for various starting conditions i.e. beginning of off-peak, middle of off-peak, end of off-peak and middle of on-peak. The results indicate that under some circumstances, water level changes at Birch Tree Lake could approach the maximum variations discussed if the emergency operation was to be maintained for 1 – 1.5 hours for the worst case inflow condition. For example, during the lowest flow on record, i.e. an inflow of 435 cubic metres per second, the plant would operate in a modified run-of-river mode of operation [i.e. one unit outflow at best gate (330 cms) during the off-peak and two units at best gate during the on-peak (660 cms)]. If the plant were to suddenly go to full gate flow, after approximately 1 to 1.5 hours, the Birch Tree Lake water levels would rise slightly more than the proposed maximum daily change restriction of 0.1 m. Other inflow conditions could permit emergency operations for longer than 1-1.5 hours before the Birch Tree Lake water level change constraint is exceeded. b) So the utilization of the above emergency operating mode would require the coincident occurrence of three very infrequent events. Firstly, the inflow condition must be low and secondly, the plant must be operating only at one unit outflow. This is estimated to represent only 3% of the time in consideration of all the expected inflow conditions. Thirdly, there has to be a coincident failure of Manitoba Hydro's HVDC transmission system. The joint probability of these three events is very rare. The EIS submission on page 5-18 estimates the frequency of this occurrence to be less than once in about 90 years. The submission speaks to typical emergency operation of 10 minute time periods which would not approach the Birch Tree Lake maximum daily water level change constraint. Anything of an hour or more (see Response "a") begins to approach the Birch Tree Lake constraint. This constraint effectively forces the operation to follow the modified run of river mode which generally limits the flow changes to approximately one unit outflow.

*** The numbering system refers to the letter number (source of comment, i.e., where there is more than one reviewer from the same organization, e.g., Manitoba Conservation) - (S=Supplemental filing) - comment number ("Comnt. No.") for that Provincial or Federal department within this table. See table entitled "Listing of TAC Reviewer, Author and Departments identified in the Draft TAC Comment Table".**

Note: This table is based on responses to a TAC letter from Trent Hreno, dated July 10, 2003. Comments on the Need For and Alternatives Submission (NFAAT) were also provided by the Crown Corporations Council (June 27, 2003 - Denise Hickson - Operations Analysis) and are not summarized here.

Comnt. No.	Page (Para)	Nature of Comments			Response From Manitoba Hydro & Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
EnvCan - S-2 (cont'd)	p3 (5) & p4 (1-3)	Vol. 3, Sec. 5	Potentially more frequent use of the "emergency mode of operation"		A record of the maximum daily change in water levels from the Birch Tree Lake continuously measured monitoring sites would provide the necessary information to confirm compliance with the stated Birch Tree Lake objective. Additional monitoring sites would be installed on Birch Tree Lake to provide sufficient data to allow averaging the lake elevation to remove the effects of wind and wave, local storms, etc. before the calculations are made to determine the water level changes resulting from the operation at Wuskwatim GS. c) This mode of operation can not be utilized more frequently as it will approach the Birch Tree Lake constraint.
MbCons (BM) -S-1	p1 (3)		Location of access control gate on access road	"The manned gate should be placed at the junction of the access road and PR 391."	The proposed location of the gatehouse was selected so the gatehouse can serve as a security point, mail drop off and shuttle area for buses from Thompson. The current location provides the maximum degree of control and access to the road. In order to restrict the access from the existing transmission line WL43 ROW which is located approximately 1.5 km south and parallel to PR 391 to the Mile 17 access road, a locked gate will be installed at the junction of the transmission line ROW and the access road. This is the location intended for the staffed gate for road access during the entire construction phase.
MbCons (BM) -S-2	p1 (4)		Intended level and means of allowing access along access road	Regarding the construction phase, "…the intended level of access, and the means by which access rights will be provided or denied should be specified."	As described in the Generation EIS, Volume 3, Appendix 3, during the construction phase the proponents intend to restrict access along the access road (by means of the staffed gate described in response to MbCons (BM)-S-1) to construction-related traffic and to others deemed by the Partnership (NCN and Manitoba Hydro) to be permitted to use the access road. The identification of who, beyond construction-related persons, may use the access road will be decided by a joint Access Management Committee, with representation from Manitoba Hydro and NCN. Manitoba Hydro and NCN have begun these discussions and intend to complete the construction portion of the Road Access Management Plan prior to the Clean Environment Commission hearings. The construction portion of the Road Access Management Plan will document the intended level of access and the means by which access will be provided or restricted.
MbCons (BM) -S-3	p1 (5)		Need immediate development of Access Management Plan	"The Access Management Plan for the [GS] access road should be developed immediately so that it can be reviewed and referenced in the Environmental Act Licence. There is a need for NCN and Manitoba Hydro to clearly state their intentions prior to development. This management plan should provide clear and practical methods of implementation."	The construction portion of the Road Access Management Plan will be prepared prior to the Clean Environment Commission hearings (see response MbCons(BM)-S-2). The operations phase portion of the Plan will not be required until after 2009, and will be prepared during the course of the 6-year construction phase. Manitoba Hydro and NCN have noted that the operations phase portion of the Road Access Management Plan would benefit by considering the objectives and measures set out in land and resource use plans being developed by the Nelson House Resource Management Board. These plans are not yet complete, but are anticipated to be completed in the next few years. In addition, the proponents note that the operations phase portion of the Road Access Management Plan is likely to benefit from monitoring of actual access experience during the initial years of the construction phase. As explained in the Generation EIS (see Volume 3, Appendix 3), to retain the option of maximum control of access, Manitoba Hydro and NCN intend to pursue private ownership or the equivalent for the access road.
EnvCan - S-3	Page 2 (3)	Vol.1, Page 4-16	Air quality / emissions from concrete batch plant	Environment Canada recommends that additional details be provided on how the operation of a concrete batch plant will impact air quality.	When the concrete batch plant is operated, there will be a short-term localized increase in particulate matter when it is in use. According to air quality estimating techniques from U.S. EPA's AP-42, Compilation of Air Pollutant Emission Factors, the majority of the process emissions from a concrete batch plant are fugitive in nature (i.e., non-point source). Fugitive sources associated with batch concrete plants include the transfer of sand and aggregate, truck loading, mixer loading, vehicle traffic and wind erosion of sand and aggregate piles. The amount of fugitive emissions from sand and aggregate transfer depends on the moisture content of the material and the cleanliness of the material. In the case of the Wuskwatim Project, all sand and coarse aggregate will be washed prior to its use, which will reduce the dust emissions from these sources. The largest dust emissions come from the central mix loading (or alternatively from the truck mix loading) part of the process. Based on a concrete batch plant production rate of 125 m^3/hr (164 cu. yards/hr) the particulate dust emissions (from a central mix loading process) are estimated to be about 7 kg/hr. Using dust control techniques on the central mix loading process, particulate emissions could be reduced to less than 3 kg/hr.

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		EIS Section	Issue	Summary of Comments	
Physical Environment					
EnvCan - S-4	p2 (5)	Vol. 1, Sec. 5.11; Vol. 4, Sec. 12	Monitoring and follow-up for each Phys. Env. Issue	Need for more detailed information be outlined regarding monitoring and follow-up programs for Climate, Physiography, Geology and Soils, Water Regime, Ice Processes, Wuskwatim Lake Erosion, Riverine Erosion, Sedimentation, and Woody Debris. "The detailed information should include: clear statement of the issue(s) associated with each VEC; it's associated monitoring program (e.g. parameters, frequency of measurement, significance criteria,); the assessment methodology; the reporting approach (e.g. frequency, format, distribution); and potential remedial action, if any, related to unfavorable results. Alternatively, the proponents should, as a minimum, identify whether and how stakeholder input will be incorporated into the development and finalization of follow-up programs."	Discussion of environmental monitoring and follow-up with respect to the physical environment is discussed in two parts of the EIS document, Section 5.11 (Volume 1) and Section 12.0 (Volume 4). The Volume 4 text best describes the status of the monitoring program and states that the ongoing monitoring program has been developed on a conceptual level by both NCN and Manitoba Hydro. Input from stakeholders, as reported through the PIP process, has been included in the preliminary design of monitoring programs. It is the intent that both parties will work out the details regarding monitoring program design including stakeholder input and regulatory reporting.
EnvCan - S-5	p3 (1)	Vol. 1 Sec. 5.1.1.4; Vol. 4, Sec. 2	Climate, air quality and climate change effects Study Area	"Environment Canada recommends that the proponent define the boundaries of the atmospheric study area."	The boundaries of the atmospheric study area are variable and dependent on the parameter being discussed. The grid spacing of the global and regional climate models is discussed in Volume 4, Section. 2.3.3.2. Climatic norm data (e.g. precipitation and temperature) at Thompson airport (50 km to the northeast) is considered representative of the Wuskwatim area (Volume 2, Section. 2.2). The boundaries of dust effects from transportation to the site and on the site on gravel roads (considering dust abatement program) will be localized to the area in the immediate vicinity of the road and site. There will be dust abatement program along the access road. The dust effects from rock crushing and the concrete batch plant will generally be within the confines of the contractors work area (Volume 1, Figure 4.4-2). The boundary of ice fog effects discussed in Section 2.3.2.5 (Volume 4) is generally within a 200 m radius of Taskinigup or Wuskwatim Falls.
EnvCan - S-6	p3 (3)	Vol. 1, Sec. 5.1.1.6; Vol. 4, Sec. 2.3.3	Climate change risk to public or environment	"The Proponent…fails to assess whether any of the effects of climate change on the project could pose a risk to the public or the environment. The proponent states that due to the level of uncertainty associated with the climate change scenarios generated by the GCMs, the effects of climate change on the project cannot be predicted. Although absolute predictions about future climates are not possible at this time, the proponents should include some discussion on the range of scenarios (e.g. warmer, wetter", "warmer, dryer", etc.) that may occur based on current models to assess if any of them could pose a risk to the public or the environment. If risks are identified, the proponent should develop an impact management strategy."	The EIS text (Volume 3, Section 2.3.3.3) reports that Global Climate Models (GCMs) are predicting a mean temperature rise in the Nelson-Churchill river basin due to climate change. This section also indicates that while the GCMs are relatively convergent on temperature trends, the GCMs are divergent with regards to precipitation and project a broad range of scenarios from higher-than-normal to lower-than-normal precipitation. Potential effects of these climate change scenarios in conjunction with the predicted effects of the Wuskwatim Generation Project were considered, to the extent possible given uncertainty within the cumulative effects assessment, for the aquatics and terrestrial environments (Volume 10, Section 3.4.6; Volume 5, Section 11.3; Volume 6, Section 5.6 and 9.6) It is considered that any risk posed to public safety by the effects of climate change is minimal for this Project. In terms of hydraulic risk, a warmer-drier climate scenario could result in less runoff and streamflow on average. This would negatively impact the long-term water supply to Wuskwatim Generating Station. To evaluate this risk, Manitoba Hydro has analyzed a scenario of 10% less inflow to the Wuskwatim Project and concluded that the Project economics are only slightly reduced. Manitoba Hydro also evaluated a scenario of 15% less streamflow on a system-wide basis concurrently with lower inflows to the Wuskwatim Project, and concluded that hydroelectric resources such as Wuskwatim would continue to be the most attractive resource available to Manitoba Hydro. In fact, if a warmer-drier scenario did occur, advancement of the Wuskwatim Project would be even more justifiable as the Manitoba Hydro system would require additional energy supply. Conversely, a warmer-wetter climate scenario that results n higher runoff and streamflow on average would have a positive impact on the long-term water supply to Wuskwatim Generating Station since the Project would be capable of producing even more energy.

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		EIS Section	Issue	Summary of Comments	
EnvCan - S-6 (cont'd)	p3 (3)	Vol. 1, Sec. 5.1.1.6; Vol. 4, Sec. 2.3.3			Another aspect of climate change is that some believe that precipitation events may become more variable and intense. The question then arises as to whether this would pose a risk to the Project and to the public. If precipitation events did change, this might have an overall impact on the frequency and magnitude of future flood events; however, it would not affect the structural integrity of the dam site. As described in Volume 3, Section. 2.5 the Project has been designed to safely pass the Probable Maximum Flood (PMF), which is a conservatively high design flood for this site. The PMF represents an upper limit for all current design standards, including the Canadian Dam Association (CDA) Dam Safety Guidelines referenced in the design of the plant. Assumptions made in the passage of the PMF through the Burntwood River system, and through the Wuskwatim site, were also conservative, providing an additional safety margin in terms of flood passage capability. It should be also noted that, even though the Project is designed to safely pass the PMF in an emergency situation, it is capable of passing even larger flows, (which are up to 10 percent larger) if reservoir levels are allowed to encroach on available freeboard allowances. Finally, in the extremely unlikely event that the dam should ever fail, dam break analyses have shown that there is minimal risk to loss of life downstream.
EnvCan - S-7	p4 (5)	Vol. 4, Sec. 2.4.2.2	Air quality; GHG emissions	"Environment Canada recommends that the proponent provide additional information on the following issues: **a)** expected GHG emissions over the operational lifetime of the project; **b)** the project's marginal contribution to total national and provincial GHG emissions on an annual basis; **c)** any plans to monitor the project GHG emissions." **d)** GHG assessment of displacement of other types of energy production considered out of scope.	The GHG emissions over the complete lifecycle of the Wuskwatim project are estimated to be about 0.571 Mt CO2e (including material, transportation, land-use change, etc.). Annualized over the life of the project this is about 0.006 Mt / year. Of this total, land-use changes account for about 0.300 Mt CO2e or 0.003 Mt CO2e / year. According Canada's Greenhouse Gas Inventory (1990 – 2000) released in June of 2002, the Canada's and Manitoba's total annual GHG emissions for the year 2000 are 726 Mt CO2e and 21.4 Mt Co2e, respectively. Wuskwatim's total annualized emissions are equivalent to less than 0.001% and 0.02% of the national and provincial annual emissions. GHG emissions are a global issue. It is essential to understand that if the energy produced by Wuskwatim will displace other sources of generation which have far greater emissions. While there are very small, GHG emissions resulting from the development of the Wuskwatim, the net global benefit in terms of greenhouse gas emissions is conservatively estimated to be more 0.76 Mt / year (more than 126 times the project's emissions). If even a small portion of this energy is used within Canada, the Project will result in reductions in Canada's national GHG emission inventory. However, regardless of where the energy is delivered, the global emission reductions are important to the consideration of the project's GHG implications. Manitoba Hydro intends to monitor emission levels from the reservoir over time, and monitor the effects of erosion and water fluctuations on peatlands. The rules, procedures and even the basic measuring techniques to account for GHG implications have not been well established. Manitoba Hydro will continue to participate and support many research programs with respect to aquatic and forest GHG implications and participate in national and international efforts to establish GHG accounting frameworks for electricity projects.
EnvCan - S-8	P3 (2)	V. 1, S.5.1.1.4; V. 4, S.2.3.2.4	Air quality data	"Environment Canada recommends that additional information be provided to support the statement that "*Existing air quality at the project site is considered to be good to excellent*."	The air quality statement made in the EIS is qualitative, but believed it to be correct. As indicated in the text (Volume 2, Section 2.3.2.4), air-quality monitoring is primarily associated with large urban sources and industrial point sources where pollution concerns become an issue of public safety. There are no industrial activities in the site area, so ambient air quality would be expected to be good. As indicated in the text the closest air quality monitoring station is Thompson and the only air quality parameter (of typically seven air quality parameters) measured at Thompson is sulphur dioxide. The air quality index of this parameter indicates that the air quality in Thompson is good. Ozone levels are measured by the BOREAS project at sites located along Highway 391 just north of the Wuskwatim site. The air quality index for this parameter measured at 3 metres above ground and below the boreal forest canopy indicates that ozone levels range from moderate to good. Based on discussions with individuals of the Air Quality section of Manitoba Government, they agree with the general statement made in the EIS; however, they also indicated that there are no data to confirm or disprove the EIS statement.

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		EIS Section	Issue	Summary of Comments	
Aquatic Environment					
EnvCan - S-9	P5 (1)	Vol. 5, Sec. 12.0, p 12-1	Additional pre-construction monitoring data	"The proponents indicate that baseline data are quite limited and opportunity exists for additional pre-construction monitoring. Environment Canada suggests this would be a necessity if the project is to go ahead. In our opinion, the 6 stated objectives of the aquatic monitoring program cannot be achieved without adequate (i.e. additional) pre-construction baseline data"	Agree. As indicated in Vol. 5 Sec. 12.0, page 12-3, collection of additional baseline data is ongoing to strengthen the existing database. A sufficient (and considerable) amount of information was collected to conduct the environmental assessment. As stated in the EIS (Vol. 5, Sec. 12), additional information will be collected to further strengthen the pre-construction database to assure that the six stated objectives of the monitoring program can be achieved.
EnvCan - S-10	p5 (2)	V.5, S.5.3.2.1, p 5-22 & V. 5, App 1	Water Sampling - analysis detection limits	"Baseline data for silver and mercury, and some measurements for copper, lead, selenium and cadmium were performed in a lab with detection limits above the Manitoba Water Quality Standards, Objectives and Guidelines (MWQSOG). We recommend that further baseline sampling for all these parameters be performed, and the samples analyzed at better detection limits. In section 5.3.4, pages 5-59 and 5-70, it is noted that in 2002, the lab detection limits for silver, mercury and selenium were decreased to below the MWSQSOGs. As in the above, further baseline data at the best detection limits should be acquired, pre-construction."	The reference to the 'sometimes inadequate analytical detection limits' (i.e., Vol. 5, Sec. 5.3.2.1, p 5-22) for some metals and metalloids was in reference to water quality data collected by Manitoba Conservation at the monitoring station on the Burntwood River at the City of Thompson. As such, this comment does not refer to the water quality data collected during the baseline studies for the proposed Project. However, it is also acknowledged that the analytical detection limits employed during the initial stages of the baseline studies were not sufficiently low enough for mercury, selenium, and silver and the analytical detection limits were reduced sufficiently to facilitate comparison to Manitoba Water Quality Standards, Objectives, and Guidelines (MWQSOGs) in 2002 (as acknowledged by Environment Canada). Data for these metals/metalloids have been collected in 2002, are currently being collected (i.e., 2003), and will be supplemented with additional sampling prior to construction. Please note that analytical detection limits for copper, lead, and cadmium have been sufficient for comparison to MWQSOGs throughout the baseline studies.
EnvCan - S-11	p5 (3)	Vol. 5, Sec. 5.4.1 and 5.4.2	Monitoring program data - how used to verify EIS predictions	"The proponents have considered most of the potential impacts of the project construction and operation, and mitigation strategies...Environment Canada recommends that further details of how the [aquatic] monitoring program will be used to determine if the project has caused statistical differences to any water quality parameters be provided."	A detailed water quality monitoring program will be developed and provided to Environment Canada prior to its implementation and the initiation of construction activities.
HlthCan -S-1	p3 (3)	Vol. 5, Table 9-7, p 9-25, 9-21 and 9-22	Mercury levels and "Recom-mended Maximum Weekly Intake" (RMWI)	EIS should emphasize that the RMWI figures in Table 9-7 apply to general population and that women of child bearing age require special consideration. It is suggested that the EIS report "more clearly state that .sensitive sub-groups of the population should limit their consumption of the above noted fish species to half of the RMWI levels. Sensitive sub-groups should include not only women of child-bearing age, but also infants and children." The basis of the footnote to Table 9-7 is not provided, nor is a reference provided.	A revised version of Table 9-7 (Vol. 5, Section 9.2.3, p. 9-25) has been attached (see Attachment HlthCan-S-1) to address the comments raised by Health Canada. The note to this table has been updated to indicate that more sensitive subgroups in the population (i.e., women of child-bearing age, children and infants) should limit their mercury dose from consumption of walleye (pickerel), pike and whitefish to approximately half of the levels presented in the table for the general public. For a child weighing 20 kg, this translates to less than two weekly meals of 150 g of whitefish. (In calculating the meal size of a 20 kg child the provisional tolerable daily intake (pTDI) of 0.20 g/kg bwt/day has been used, as suggested by Health Canada.) As noted in the EIS, the safe consumption limits for walleye and pike from Wuskwatim Lake fall between the limits calculated for fish from Leftrook Lake, a lake in a system unaffected by flooding, and Footprint Lake, a water body more severely flooded by CRD than Wuskwatim Lake. The revised version of Table 9-7 (see Appendix A, Attachment) also corrects a rounding error in the earlier calculations of weights and numbers of fish meals that can be safely eaten. It should also be noted that an editorial error occurred in the first paragraph of page 9-25 (Vol. 5, Sec. 9.2.3). This paragraph incorrectly stated that, post-Project, a 70 kg male should eat "1.6 fewer meals per week of walleye". It should read '0.5 fewer meals per week'. These same revisions would apply to the EIS sections related to effects on community health found in Vol. 1, Section 9.5.4.2 and Vol. 8, Section 5.2.2.3.

Comnt. No.	Page (Para)	Nature of Comments			Response From Manitoba Hydro & Nisichawayasihk Cree Nation (NCN)
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HlthCan -S-2	p4 (3)	Vol. 5, p 9-2	Recommended max. mercury concentration in fish muscle	Guideline level provided for fish muscle mercury concentration (0.2 ppm) cited outdated source (Wheatley 1984). First Nations and Inuit Health Branch (FNIHB) recommends that all fish consumers adhere to local provincial or territorial recommendations and advisories.	Maximum mercury concentrations in piscivorous fish (fish that eat other fish) in boreal reservoirs usually exceed 0.2 ppm or even 0.5 ppm in fish muscle. The first value (0.2 ppm) was the level formerly recommended by the Medical Services Branch of Health Canada that should not be exceeded by persons eating large quantities of fish (Wheatley B. 1984). Methylmercury in Canada; Exposure of Indian and Inuit Residents to methylmercury in the Canadian Environment. Health and Welfare Canada, Ottawa, Ont. 164 pp). The successor institution "First Nations and Inuit Health Branch" does not have guideline setting responsibilities and no longer recommends this level. Instead, subsistence and sport fishers are advised to adhere to provincial advisories.
MbCons (BM) -S-4	p2 (1)		Turbine mortality and downstream fish passage	Regarding a commitment made to assess turbine mortality in 2010: "This study should attempt to assess both turbine mortality and to quantify downstream fish passage".	Agree. As indicated in Vol. 5, Sec. 12, p.12-2, 12-4, and 12-5, an assessment of turbine mortality is proposed for 2010 and studies to assess fish movements upstream and downstream of the generating station forebay have been proposed for 2010/2011 and 2015/2016. See response to DFO-S-18.
MbCons (BM) -S-5	p3 (7)		Apparent mis-interpretation of the MWQSOGs regarding suspended solids	The one-day averaging period for total suspended solids should not be considered "on its own" (i.e. separate from the 30-day averaging period) - referring to the MB Water Quality Standards, Objectives and Guidelines (MWQSOGs)	Agree. As indicated in Vol. 5, Sec. 5.4.1.4, page 5-106 regarding the intent to limit increases in TSS to 25 mg/L above the background during construction, the "increase above background TSS is consistent with the Manitoba short-term water quality objective for a 1-day averaging duration for surface waters where total background concentrations of TSS are less than or equal to 250 mg/L (Williamson 2002). It is expected that there may be periods during construction when the 30-day averaging duration of an increase in TSS of 5 mg/L above background may be exceeded." Both objectives have been considered in the assessment of potential impacts.
MbCons (BM) -S-6	p4 (1)	Vol. 5, Table A6	MWQSOG values for ammonia	"Although it does not alter the outcome for interpretation of the data, it appears that the MWQSOG values for ammonia listed in Table A6-1 may not be quite right for the 30-day, 10C temperature or for most of the 4-day averaging period." Mixing of equations - with some meant for cool water species?	The calculated objectives for ammonia presented in Table A6-1 (see Appendix A Attachment) are for cold-water species (i.e., equations 7-9 were applied to a water temperature of 0^{o}C and equations 10-12 were applied to all other water temperatures presented). The calculation spreadsheet provided by Manitoba Conservation for the calculation of objectives has changed by Manitoba Conservation for the 4-day objective, in recognition of an anomaly in the formula. The corresponding changes to the values presented in Table A6-1 for the 4-day objective are presented in Appendix A, Attachment MbCons (BM)-S-6. Please note that, as acknowledged by Mr. McTavish, these changes do not "alter the outcome for interpretation of the data."
Terrestrial Environment					
MbCons (BM) -S-7	p2 (3)		HSI Models	"The HSI models referenced in the documents are not Manitoba based models but were developed for the Model Forest area. There is no indication of the fact that many of theses models were adjusted for use in this area of the province. No mention is made of the fact that many of these models are literature based and have not been validated. It is stated that there is no HSI model for the Hairy Woodpecker but one has been developed."	Most of the Manitoba-based HSI models were developed by the Manitoba Forestry/Wildlife Management Project "for use in the Boreal Plains and Boreal Shield ecozones of Manitoba, and designed to be used in conjunction with the Manitoba Forest Resource Inventory (FRI) database" (quoted from the disclaimer found in most of the HSI models) and are directly applicable to the project area. The Moose and Woodland Caribou HSI models were developed cooperatively by the Manitoba Forestry/Wildlife Management Project for the Manitoba Model Forest. Both of these models also utilize "data from Manitoba's Forest Resource Inventory (FRI) as the principle base" and are therefore compatible for use in other areas of the province covered by the FRI database. Both of these HSI Models also incorporated available Manitoba-based studies, and no site-specific studies in the project area are available which would have warranted modification of these existing models. Bird-related HSI models used in assessing the Access Roads for the Wuskwatim Generation Project are outlined in Volume 6, Section 8.2.4.4. The limitations associated with the use and interpretation of HSI models are detailed in Appendix C of the Wildlife Environment Supporting Document (Volume 4) for the Wuskwatim Transmission Project. Before using the models for both projects, Manitoba Conservation was contacted, and updated copies of all of the models and available validations were obtained. The Hairy Woodpecker HSI Model was inadvertently omitted. This model could be run and appropriate tables updated, if requested, but it is not anticipated that this will alter the assessment's overall impact predictions and conclusions.

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		EIS Section	Issue	Summary of Comments	
EnvCan - S-12	p3 (4)	Vol. 1, Sec. 5; Vol. 4, Sec. 3	Excavated materials area for disposal of dredgings	Additional information is recommended regarding the potential impacts to the terrestrial environment near the GS resulting from the creation of the excavated minerals area for disposal of dredgings from Wuskwatim Falls; including possible mitigation measures to minimize impacts from the disturbance of this area.	The potential impacts to the terrestrial environment associated with the excavated materials placement area were assessed in Vol. 6, Sec. 5.4. Impacts were incorporated into the assessment of habitat disturbance.
Socio-economic Environment (Includes Land and Resource Use)					
MbCons (BM) -S-8	p2 (2)	Vol. 7	Cabin construction - ineffective management	The Sustainable Resource Management Branch indicates that the process of regulating cabin construction under existing permitting by MB Conservation and review by the Resource Management Board is not currently effective for managing cabin construction within the Nelson House RMA.	Policy and practice regarding management of cabin construction within the Nelson House RMA is carried out under existing permitting by the Province of Manitoba and review by the Resource Management Board. Manitoba Hydro and NCN acknowledge the perspective of the Sustainable Resource Management Branch, but respectively note that this is a matter for ongoing consideration by the relevant authorities regardless of development of the Wuskwatim Generation Project. To the extent possible, Manitoba Hydro and NCN will support any improvements in policy and practices suggested by the Province of Manitoba and by the Resource Management Board. We anticipate that these concerns, as well as other matters, will in part be addressed through development of the Road Access Management Plan related to the access road.
HlthCan -S-3	p4 (1)	Vol. 7, Table 2-4	Determining edible weight of fish - conversion calculation	Table 2-4 does not specify whether the fish weights listed have already been converted to the total edible weight prior to the calculation of the estimated number of meals, in which case, the "weight" title in the Table 2-4 actually refers to "edible tissue weight", as opposed to total animal weight.	The weights in Table 2-4 have been converted to estimates of edible tissue. A note has been added at the bottom of the table to indicate this (see Appendix A, Attachment HlthCan-S-3).
HlthCan -S-4	p4 (2)	Vol. 7, Table 2-4 and p 2-27	Percentage of fish meals - error in calculations?	On pg. 2-27, Table 2-4 is cited as the source for the statement that fishing provided "an estimated 62,005 meals to NCN residents" or "approximately 2% of all meals consumed". However, those figures are not provided in Table 2-4. Health Canada, based on the information provided in the EIS, calculated 22%, rather than 2% based on domestic harvest figure of 46,381 fish meals.	The numbers presented in the text are correct and based on the entire harvest calendar and country foods data. The numbers presented in Table 2-4 are incorrect as they only represent the harvest calendar data from August 2001 to May 2002. A revised Table 2-4 has been provided (see Appendix A, Attachment HlthCan–S-3). The statement “approximately 2% of all meals consumed” refers to “all meals” consumed by NCN throughout the year (including non-country foods meals). This figure was based on a population of 3,300 eating three meals per day for 365 days per year or a total of 3,613,500 meals annually. Therefore, 62,005 country foods fish meals represent 1.7% or approximately 2% of “all meals” consumed by NCN residents. Similarly, hunting and trapping harvests (described in Vol. 5, p. 2-22) provided an estimated 178,257 meals to NCN residents, which is 4.9% or approximately 5% of “all meals” consumed.
HlthCan -S-5	p5 (1)	Vol. 8	General comments	Control of access to culturally valuable sites through a well implemented access management plan is important to the health of the community. Communication of all environmental and health monitoring results must be carried out quickly and regularly as described - plans must be in place in the event that these results show deterioration in environmental quality or people's health.	Control of access to culturally valuable sites will be among the considerations addressed by the joint Manitoba Hydro and NCN Access Management Committee in preparing the construction and operations portions of the Road Access Management Plan in consultation with the Nelson House Resource Management Board. Transmission line routes were selected to avoid culturally valuable sites. Communication of environmental and health monitoring results quickly and regularly is intended, as set out in the EIS. The monitoring program is intended to provide information to NCN, Manitoba Hydro and others, that will inform decision-making about the Project.

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INAC - S-1	p2 (2)		Impact assessment & contingency plan needed re: "in-migration" of people to NCN	"…the project has the potential to create an "in-migration" to the community due to the perception of increased revenues and employment. Should this occur this will negatively impact the resources and infrastructure of the Nisichawayasihk Cree Nation. This should be itemized as an impact and contingency plans developed to address this situation."	The potential for in-migration is itemized as a key potential effect on the community of Nelson House. Section 4.2 of Volume 8 of the Generation EIS sets out this effect – estimates of a range of in-migration effects possible, as well as monitoring and impact management plans that will be in place to address the effect.
Wuskwatim Transmission Project					
Project Description					
MbCons (BM) -S-9	p1 (6,7)		Development of Access Management Plan	"As specified in the proposal access management issues for the transmission line should be addressed prior to line clearing and construction through the development of an Access Management Plan. It appears that careful selection of the transmission line route was carried out to ensure that future access problems were minimized. Areas where access management issues will not be satisfactorily addressed by route selection should be identified and alternative means of access management, if any, should be described. The residual impacts of portions of the line where access concerns may have been raised and not resolved should be identified."	Manitoba Hydro intends to work with NCN to prepare a transmission-related Access Management Plan for each segment located within the Nelson House RMA prior to line clearing and construction for that segment. In areas outside the Nelson House RMA, where the issue of increased access is important to a community, an access management plan will also be prepared prior to clearing and construction. A similar approach will be applied in any case of access concerns being raised by other communities in the vicinity of the transmission lines. The plan(s) will identify access management objectives, the approach during Project construction and operation, means of communicating the plan to all parties, and a monitoring program to ensure that access issues are being addressed. The latter should ensure that any unresolved issues are identified. The plan(s) will be developed in consultation with directly affected communities and the appropriate Integrated Resource Management Teams (IRMTs).
MbCons (SD) - S-1	p4 (1)		Decommission & Rehabilitate	"Any infrastructure associated with the project that would no longer be required following the Construction Phase within our areas should be decommissioned without delay. A Decommissioning Plan should be provided and implemented. A joint final inspection should be carried out to identify any deficiencies."	Based on discussions at the time of the TAC workshops, it is our understanding that the concern relates to decommissioning of infrastructure required for construction of the Transmission lines (as opposed to any ultimate requirement for decommissioning of the lines themselves). Manitoba Hydro will decommission new access trails, if required, as well as borrow pits, waste disposal areas, etc., subject to review with the NRO. Further detail is provided in Manitoba Hydro's standard environmental protection practices and will be provided in the Environmental Protection Plan (EnvPP). Manitoba Hydro is committed to a joint final inspection once the lines are in service.
MbCons (BM) -S-10	p3 (3)		Routing of Transmission line inside Clearwater Lake Park	"The preferred routing for the transmission line shows a location just inside the Clearwater Lake Provincial Park. Although a routing outside of the Park would be preferred the department is willing to enter into more detailed discussions with the proponent regarding a route within the Park. Staff from Parks and Natural Areas should be contacted in this regard."	A small portion of the proposed route for the Herblet Lake to Rall's Island Stations 230 kV transmission line crosses through the Clearwater Lake Provincial Park. Through this area, based in part on earlier discussions with IRMT and the absence of a more attractive and feasible alternative, the transmission line is proposed to parallel the north side of the existing Hudson Bay Railway line to Churchill, and hence is just inside the park boundary. Routing to the south of the railway line was initially examined, but was dismissed because of technical (engineering) reasons. Manitoba Hydro would be pleased to enter into more detailed discussion with staff from Parks and Natural Areas Branch regarding the route alignment through this area. Further liaison and meetings with the IRMT regarding the route alignment in this area are also anticipated.

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MbCons (BM) -S-11	p3 (5)		Comparison of alternative T-line crossings of the Grass River	"The Grass River is a major canoe route. It would have been preferable to see an integrated comparison of the alternative transmission line crossings with advantages and disadvantages rather than separately by environmental and socio-economic discipline."	The proposed route for the Herblet Lake to Rall's Island Stations 230 kV transmission line crosses the Grass River between Wekusko and Tramping Lakes. Several preliminary crossing locations of the Grass River were identified for further analysis in consultation with local individuals, including a nearby lodge owner, Snow Lake Mayor and Council, and the IRMT. The proposed crossing of the Grass River was selected in consultation with the Town of Snow Lake, local interested parties and Manitoba Conservation. Manitoba Hydro sought to optimize the location of the transmission line structures so that their visibility, in relation to the shoreline and canoe route users, would be minimized. Manitoba Hydro is committed to minimizing potential aesthetic effects on the Grass River and will continue to work with Snow Lake Mayor and Council, local interested parties and the IRMT regarding the final route alignment. These recommendations will be further reviewed during the detailed design for the proposed transmission line.
MbCons (SD) -S-2	p3 (2)		Access management issues be addressed prior to construction	"We recommend that Access Management issues for the transmission lines be addressed prior to line clearing and construction. Unresolved access management issues should be identified and alternatives listed. Mitigation is the priority mechanism for resolution."	See response to MbCons(BM) -S-9.
MbCons (BM) -S-12	p3 (4)		Sewage lagoon northeast of The Pas	"Detailed plans should be provided to ensure that the operation of the (sewage) lagoon is not impaired during construction of operation of the line."	The proposed route for the Herblet Lake to Rall's Island Stations 230 kV transmission line crosses to the south of a sewage lagoon northeast of The Pas. No impacts on the lagoon or its operation are anticipated. Further discussions will be held during the detailed design stage for the proposed transmission line to ensure that the operation of the lagoon will not be affected during the construction and operation of the proposed transmission line.
MbCons (BM) -S-13	p2 (6)		Environmental Protection Plan development and content	The Environmental Protection Plan should contain details regarding "what the decision point will be for deciding when or what additional mitigative measures may be required to reduce impacts."	Agree. One of the reasons EnvPPs are prepared is to facilitate the mitigation of environmental effects throughout the full life cycle of the project by providing clear reporting protocols for field construction and operations personnel. As such, the EnvPPs will outline protocols to be followed to determine when and if additional mitigative measures may be required to reduce impacts.
HlthCan -S-6	p6 (1)		Electro-magnetic Fields (EMFs)	“The one outstanding health issue that Health Canada was hoping to review and comment upon deals with the health concerns related to Electric and Magnetic Fields (EMF’s).	We are awaiting this information from Health Canada to respond**.**
MbCons (SD) -S-3	p2 (6)		T-line crossing of Tom Lamb Wildlife Management Area	"…With respect to crossing the Tom Lamb WMA, we recommend that measures should be taken to minimize the number of access roads developed during construction and required for maintenance following construction. Also minimize vegetation destruction to allow for some vegetation cover to survive for natural re-growth."	Where possible, Manitoba Hydro uses the proposed right-of-way or available existing access roads/trails to construct and maintain its transmission lines. If new access trails are required outside the right-of-way, care is taken to avoid locally sensitive/significant features, and appropriate permits/approvals are obtained. The portion of the Herblet Lake to Rall's Island Station 230 kV transmission line which is routed through the Tom Lamb WMA is in close proximity to existing roads such as PR 287 and PR 384, as well as the Hudson Bay Railway line to Churchill. With respect to clearing of the right-of-way, clearing will occur in the winter to minimize potential effects. Clearing is generally expected to be accomplished by mechanical methods and vegetation is typically cleared to a maximum height of approximately six inches above the ground. Selective clearing methods will be specified in proximity to environmentally sensitive areas and will be detailed in an Environmental Protection Plan (EnvPP).

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Aquatic Environment					
EnvCan - S-13	p6 (2)	Vol. 1 and Vol. 3	Stream crossing mitigation measures - additional details	Environment Canada indicates that there may be benefit in providing additional details in the EIS regarding mitigation measures for the 4 stream crossings identified as being sensitive to disturbance and important fish habitat.	The Wuskwatim Transmission Project EIS outlines several mitigative measures to reduce potential effects on stream crossings. In addition, the EIS outlines Manitoba Hydro's standard environmental protection practices and the commitment to adhere to all relevant regulations and legislation, and the Manitoba Stream Crossing Guidelines for Protection of Fish and Fish Habitat. Site-specific mitigative measures to be followed at each of the four stream crossings will be developed following additional on-site inspections and will be outlined in Environmental Protection Plans (EnvPPs). A site-specific EnvPP will be prepared and submitted to the regulatory authorities for review prior to the commencement of clearing and construction activities for each of the transmission line segments (e.g., Thompson to Wuskwatim), and will include license conditions. (see DFO-S-42).
Terrestrial Environment					
EnvCan - S-14	p5 (5)	Vol. 1 Sec. 4; Vol. 4	Additional data needed regarding migratory birds present in project area	"Environment Canada acknowledges the migratory bird surveys that were undertaken for the project, but believes that, given the magnitude of the project, improvements could be made in the extent of primary field work to determine migratory bird species present in the project area. In many cases, the literature cited (for example Godfrey and Erskine) is dated. Environment Canada recommends that data be collected over a more representative period from April to July…". "Auditory data collection should be done in the early morning hours and bird surveys may also need to be repeated in successive seasons. We believe that this additional data would be necessary to support the conclusions on significant impacts (or lack thereof) on migratory birds. Furthermore, the collection of additional data may provide useful information for possible future transmission line projects in the region and contribute to a better understanding of avifauna in this region of Manitoba."	As outlined in Appendix B (Section 2) of the Wildlife Environment Supporting Document (Volume 4) for the Wuskwatim Transmission Project, breeding bird surveys were performed in the early morning hours (0445h to 1100h) between June 25 and July 2, 2002. Based largely on four years Breeding Bird survey experience (between 2000 and 2003) in the project area, as well as 9 years of experience in other Boreal and Sub-arctic study areas in Manitoba, TetrES has found that the optimal period for the collection of Breeding Bird data is within the period of late May to early July. Depending on the timing of spring and other environmental factors (e.g., temperature), breeding bird surveys that occur before or after this period do not achieve representative results regarding breeding bird populations that are potentially present at or near sample sites. The timing of the surveys were delayed to latter June in anticipation of the selection of the proposed route, which did not occur until after the fieldwork was performed. As such, Breeding Bird surveys were conducted in 2002 on the basis of habitat types (13 cover types) along or adjacent to the alternative transmission line routes. It is recognized that additional data of higher precision would be required to support the conclusions of no significant impacts on migratory birds. As such, in June 2003, breeding bird sampling occurred along the preferred route, as well as along a subset of sampling areas surveyed in 2002. This allowed further testing of the EIS conclusions and will permit the implementation of longer term study sites to support impact prediction verification, if required. As indicated in Section 7.5.2.3 of the Wuskwatim Transmission EIS (pg 7-103), "it is also anticipated that some follow-up wildlife monitoring programs will be undertaken to verify the predictions with respect to the anticipated effects on wildlife. This could include mammal sign transects and breeding bird transects. Further information will be outlined in the EnvPP." The data obtained from the environmental assessment will provide a better understanding of this region of Manitoba. However, it should be noted that Manitoba Hydro support of more broadly-based provincial and regional research is also an effective contribution to understanding of regional avifauna than the results of a project-specific environmental assessment study, particularly in circumstances where the potential for significant effects is limited.

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EnvCan - S-15	p6 (1)	Vol. 4	More consideration of impacts and cumulative effects	"Long-term alterations and/or losses of primeval habitat for migratory birds will occur along the transmission line corridors. The transmission lines will also impact on the aesthetics of the affected areas. These considerations, together with the cumulative effects of other reasonably foreseeable Manitoba Hydro projects and facilities, have not been sufficiently considered, in our opinion, and should be included, at least on a broad level, in the EIS."	Table 5-3 of the Wildlife Environment Supporting Document (Volume 4) for the Wuskwatim Transmission Project summarizes the direct disruption of migratory bird habitat, while Table 5-4 characterizes that disturbance in terms of "prime habitat equivalent" hectares potentially affected by the rights-of-way. Table 5-5 outlines the prediction of this ecosystem effect, both on and adjacent to the rights-of-way, within a 50-year timeframe and characterizes this projected ecosystem effect within the context of other developments in the area. With respect to aesthetics, as indicated in the EIS, the presence and appearance of the transmission lines will alter the landscape for as long as the facilities are in operation. In areas where the proposed transmission lines are in proximity to communities, use of existing transmission lines and rights-of-way have been maximized to avoid or reduce incremental adverse visual and aesthetic impacts. Given the general use of the region, it is not anticipated that the physical presence of transmission facilities will be a significant detriment. See also response to EnvCan –S-16.
MbCons (SD) -S-4	p3 (4)		Timber removal procedure	"As per the Forestry Directive D-1, we request that a minimum 12 months notice be given by the proponent to allow for orderly removal of merchantable timber off the lands to be cleared, burned, destroyed or salvaged. Any merchantable timber not utilized and disposed of on site or at a central burning or burial location shall have the following fees paid to the province against the said volume: Forest Renewal Charge, Forest Protection Charge, Timber Dues/Stumpage. Forest harvesting of the lines should be coordinated Manitoba Conservation (Forestry Branch), Manitoba Hydro and Tolko. Tolko has first right of refusal".	Manitoba Hydro will provide a minimum twelve months notice to allow for the orderly removal of merchantable timber from the rights-of-way for the proposed Wuskwatim to Herblet Lake Station, and Herblet Lake to Rall's Island Stations 230 kV transmission lines. With respect to the construction power line from Wuskwatim to Thompson, twelve months notice cannot be given due to the proposed schedule. There have been ongoing discussions with the Regional Forestry Branch in Thompson with respect to clearing of the construction power line from Wuskwatim to Thompson. As well, the construction power line is relatively short (approximately 45 km in length). Manitoba Hydro will continue to liaise with Manitoba Conservation (Forestry Branch) and Tolko, to ensure that any removal of merchantable timber from the right-of-way is conducted in an orderly manner. Manitoba Hydro will pay the fees, as required. Forestry harvesting activities for the proposed transmission lines will be coordinated with Manitoba Conservation (Forestry Branch) and Tolko, which has the first right of refusal.
MbCons (SD) -S-5	p2 (1)		Continued baseline and research efforts for Caribou	"We recommend that the corporation continue baseline and research monitoring of significant caribou habitat areas within the project boundaries and participate in a caribou management program through the NW Region Woodland Caribou Advisory Committee and Manitoba Conservation."	Over the last several years, Manitoba Hydro has actively participated with Manitoba Conservation and other research partners to develop a woodland caribou database in boreal Manitoba. Manitoba Hydro is committed to continuing to support such research initiatives and in participating in caribou management programs through multi-stakeholder woodland caribou advisory committees.
MbCons (BM) -S-14	p2 (3)		HSI Models	"The HSI models referenced in the documents are not Manitoba based models but were developed for the Model Forest area. There is no indication of the fact that many of theses models were adjusted for use in this area of the province. No mention is made of the fact that many of these models are literature based and have not been validated. It is stated that there is no HSI model for the Hairy Woodpecker but one has been developed."	See response to MbCons (BM) –S-7.

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MbCons (BM) -S-15	p2 (4)		Habitat fragmentation	The transmission line has the potential to disrupt 27 (square) km of wildlife habitat but it is the fragmentation of this habitat that is important. This aspect has been given little attention."	The impact assessment has considered this issue through the analysis of anticipated effects on wildlife, forestry and vegetation. Based on this assessment, the project is not anticipated to have significant impacts. Fragmentation issues with respect to wildlife movement are identified in Section 5.0 of Supporting Volume 4 of the Wuskwatim Transmission Project EIS. Definable fragmentation effects (primarily related to woodland caribou), as identified by literature values were incorporated into the evaluation. Potential fragmentation effects, whose magnitude could not be specifically defined by literature values, were noted in the assessment in Section 5.0 of Supporting Volume 4. See response in Table 3, CNF-S–72.
Socio-economic Environment (Includes Land & Resource Use)					
MbCons (SD) -S-6	p2 (2)		Grass River Crossing	"We recommend that the crossing of the Grass River should be at the narrowest point and at a 90 degree angle and preferably not on a straight stretch of the river to minimize aesthetic impacts. Aesthetics would also best be served if the river banks on either side of the crossing point were high to reduce sight lines."	See response to MbCons (BM)-S-11.
MbCons (SD) -S-7	p2 (3)		Crossing within Clearwater Lake Provincial Park	"Parks would prefer a transmission line Right of Way that avoided Clearwater Lake Provincial Park entirely."	See response to MbCons (BM)-S-10.
MbCons (SD) -S-8	p2 (5)		T-line crossing of Cormorant Resource Management Area	"We recommend that Manitoba Hydro mitigate any concerns that the Cormorant Resource Management Board have and provide a formal response. Manitoba Hydro has made a presentation to the Board in 2003 and Hydro should encourage the Board to participate in this review process."	Two meetings were held with the Cormorant RMB and some members of the Board participated in overflights of the alternative routes through the RMA. At the meeting in January 2003, Manitoba Hydro presented the preferred route for the transmission line crossing through the RMA. At the meeting, no outstanding issues or concerns were identified. Manitoba Hydro is committed to continuing to provide information regarding the proposed project to the RMB.
MbCons (BM) -S-16	p3 (1)		Enduring features and Protected Areas Initiative	"A more detailed discussion of the enduring feature impacts and implications would have been preferable. Overall, the material presented on protected areas is generally correct but there are some incorrect statements and apparent misunderstandings about the Protected Areas Initiative. For example, not all Areas of Special Interest or candidate sites under consideration for protection would automatically become park reserves. Citations and references to material describing the Protected Areas Initiative are spotty, out of date and incorrect. The proponent should contact Parks and Natural Areas staff for clarification and updates in this regard."	Although the issue of enduring features was not discussed in detail in the Wuskwatim Transmission EIS, a habitat/ecosystem effects assessment was undertaken as a basis for identifying ecosystem units, describing existing habitat and for predicting how the project may affect ecosystems (EIS, chapter 7.0, pages 7-56 to 7-64). Details regarding the rationale behind the approach are provided in Volume 1, Appendix F. Although several potentially significant habitat effects were identified prior to mitigation, it appears that significant broad and fine habitat effects can be mitigated. Mitigative measures are outlined in the EIS and will be further determined during the detailed design phase for the proposed transmission lines. These site-specific mitigative measures will be described in the EnvPPs which will be prepared prior to clearing and construction activities. With respect to the Protected Areas Initiative, it is acknowledged that not all Areas of Special Interest (ASI) or candidate sites under consideration for protection would automatically become Park Reserves. The reference to obtaining Park Reserve status was not clear, but was intended to mean that this was one option for candidate sites to achieve protected areas status. B. McTavish was contacted to clarify issues regarding the citations and references to the initiative. A citation reference to the revised 2000 Action Plan for Manitoba's Network of Protected Areas was inadvertently missed. The EIS made reference to the 1996 version only. The correct citation for the 1996 document is Manitoba Natural Resources, as Manitoba Conservation was formed in 1999. It is also acknowledged that all ecological reserves were brought under the umbrella of the Protected Areas Initiative in 1997, as opposed to 1987.

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HlthCan -S-7	p5 (2)	Vol. 7	Community health	"…a full description of the health status of the affected communities and premature mortality rates could improve this portion of the assessment."	Given the limited nature of expected Wuskwatim Transmission Project-related health effects and the difficulties associated with obtaining reliable, community-specific health data, a regionally-based analysis was deemed to be the most appropriate and practical for the purposes of this EIS assessment. The small population size of most project-area communities means that the data required to undertake a community-level analysis of health status and premature mortality may be suppressed in some cases (to protect residents' confidentiality), and may require securing local approval for its release. Further, assessment of health data for small populations is difficult and sometimes gives an unclear picture of health status due to issues related to statistical analysis on small numbers. A more detailed health analysis was undertaken for the Generation Project to address concerns raised specifically by NCN, particularly with regard to possible Project effects related to mercury and water quality. The data provided for the analysis were released by Manitoba Health and Health Canada's First Nations and Inuit Health Branch following approval from NCN Chief and Council.
HlthCan –S-8	p5 (3)		Herbicide Use	"As requested in our letter of March 4, 2002, regarding the EIS guidelines, this assessment needs to consider the possible health effects of herbicide use, for persons applying the herbicides as well as for local resource users. Other methods to manage weeds and deciduous plant growth should be encouraged."	The most common method of vegetation management Manitoba Hydro uses on its rights-of-way is mechanical clearing. There are some locations where other methods of management such as hand clearing, biological control and selective herbicide treatments may be used. With respect to the use of herbicides, the Province of Manitoba decides which herbicide products can be used and under what conditions they may be used. The Province also sets guidelines for the rates as which products may be used; how and when they may be applied; and where they may not be used. All applicators working for Manitoba Hydro must be trained and licensed by the Province. Each year, Manitoba Hydro applies for "Pesticide Use Permits" issued under The (Manitoba) Environment Act before any herbicide program is implemented and provides a "Post Seasonal Control Report" to Manitoba Conservation by year end. All herbicides used are regulated by the federal Pest Control Products Act. These regulatory requirements ensure that only approved herbicides are used safely and properly. Manitoba Hydro conducts public notifications related to proposed herbicide applications in accordance with the requirements of the Provincial Pesticide Use Permit Regulation.
Mb EST –S-1			Communication	"Manitoba Energy, Science and Technology has an interest in encouraging broadband links to the communities in the area by using the right-of-way necessary for the transmission lines."	Manitoba Hydro has noted the department's interest in encouraging broadband links to communities in the project area by using the future transmission line rights-of-way.
HlthCan –S-9	p5 (4)	Vol. 1, Sec. 3.7.2	Health and Safety Risks	"Under section 3.7.2 of Volume 1, a better description of risks associated with transmission line construction would be helpful. It is possible that the mitigation measures described are sufficient, however, it would be beneficial to have a full description of the risks involved."	Section 3.7 and its sub-sections of Volume 1 (Wuskwatim Transmission Project) outline Manitoba Hydro's standard environmental protection practices for the design and construction of its transmission lines. As such, these sections outline measures which are used, where relevant, to minimize potential effects. In the case of transmission line construction, risks to health and safety are considered minor if appropriate standards and regulations are adhered to as outlined in section 3.7.2.
MbCons (SD) -S-9	p3 (1)		Regular, continued consultation with the IRMT	"We recommend that Manitoba Hydro make regular presentations to the IRMT [Integrated Resource Management Team] at strategic intervals throughout the six year project to ensure mitigation has been occurring with affected local people and that concerns, issues, problems area dealt as judicially as possible as the project proceeds."	Manitoba Hydro is committed to continuing to liaise and meet with the IRMT respecting the proposed project and throughout its development.

Comnt. No.	Page (Para)	Nature of Comments			Response From Manitoba Hydro & Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
Both Wuskwatim Generating Station and Transmission Lines: Cumulative Effects & Other Comments					
EnvCan – S-16	p1 (3)		Cumulative Impacts (more info needed)	"One common issue…related to the need for better identification of cumulative impacts from these generation and transmission projects in relation to other possible hydroelectric projects in the region we suspect that enough additional information is likely available now on potential future generation and transmission projects, including Conawapa (both the dam and associated transmission lines), for cumulative effects to be better assessed, at least on a broader basis."	Both Wuskwatim Generation and Transmission EISs provide a cumulative effects assessment based on current information that includes consideration of other hydroelectric projects being considered by Manitoba Hydro for possible construction beginning within the next five to ten years (e.g., Gull [Keeyask], Notigi, Bipole III, Conawapa). In most cases, it was concluded that the anticipated environmental (physical and biophysical) effects of these projects do not overlap spatially with those of the Wuskwatim Transmission Project, the anticipated environmental effects of the proposed Notigi Generating Station overlap with those of the Project for some areas, as discussed in Section 7.3, Volume 1 of the Transmission EIS. There are also cumulative socio-economic effects with the Wuskwatim Generation Project and the future generation and transmission projects included in the cumulative effects assessment, as discussed in Section 9, Volume 1 of the Generation EIS and Volume 8 of the Generation EIS. Section 3 of the Canadian Environmental Assessment Agency (CEAA) Reference Guide, *Addressing Cumulative Environmental Effects* indicates that; "…only those environmental effects of other projects and activities that accumulate or interact with the environmental effects of the project in question should be included in the assessment. If the environmental effects of other past or future projects are not likely to act in combination then they should not be included in the cumulative environmental effects assessment of the project".
EnvCan –S-17	p2 (1,2)	Vol.1, Sec. 2.3.2	Cumulative Impacts (additional information needed)	"Section 3 of the…(CEAA) Reference Guide 'Addressing Cumulative Environmental Effects' indicates that the environmental effects of projects 'that will be carried out' must be examined in combination with the proposed project. Section 4.3 (Uncertainty) of the reference guide goes on to discuss when a future project should be included in the assessment of a project. The guide infers that the decision to include or exclude a project should be based on whether the weight of evidence suggests that there are strong indications that the future project will proceed."	CEAA [subsection 16(1)] states that any cumulative effects must be considered that are likely to result from the project in combination with other projects or activities "that have been or will be carried out". Section 3 of the CEAA Reference Guide goes on to advise the following in terms of identifying otherwise eligible future projects or activities to be included in cumulative effects assessment (the advice on "Uncertainty" in section 4 of the Guide remains subject to these prior guides regarding eligible future projects): • "…at a minimum, (only) projects or activities that have already been approved must be taken into account." • "The environmental effects of uncertain or hypothetical projects or activities need not be considered." • "Nevertheless, it would be prudent to consider projects or activities that are in a government approvals process as well." • "Where projects or activities are not subject to a formal government approvals process but are relevant to the assessment (for example pesticide spraying), they should also be considered if there is a high level of certainty that they will occur."
EnvCan - S-17	p2 (1,2)	Vol.1, Sec. 2.3.2	Cumulative Impacts (additional information needed)	Given the remaining undeveloped head along the Burntwood River, it would seem inevitable that future projects (e.g., Early Morning Rapids, Kepuche/Birchtree, Manasan) will be constructed. Environment Canada, therefore, recommends that additional information (at least on a qualitative basis) be provided on the various potential Burntwood River hydroelectric development scenarios currently under consideration during the life of the Wuskwatim project and the anticipated cumulative effects on the water regimes and other… [VECs] of these development scenarios."	Based on the CEAA Guide noted above, the cumulative effects assessment for the Wuskwatim Generation Project included projects being considered by Manitoba Hydro for possible construction starting within the next five to ten years even though these projects are not currently in a governmental approvals process.

Comnt. No.	Page (Para)	Nature of Comments			Response From Manitoba Hydro & Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
EnvCan - S-17 (cont'd)	p2 (1,2)	Vol.1, Sec. 2.3.2	Cumulative Impacts (additional information needed)		At this time, the Notigi Generating Station, which is included in the cumulative effects assessment for the Wuskwatim Generation Project, is the only facility on the Burntwood River that is being considered by Manitoba Hydro and NCN for possible construction starting within the next five to ten years. Based on advice provided in Section 3 of the CEAA Reference Guide, *Addressing Cumulative Environmental Effects*, other potential locations on the Burntwood River that have been identified for possible hydroelectric development in the future (e.g., Early Morning Rapids, Kepuche/Birchtree, Manasan) are not included in the cumulative effects assessment because their development in each instance, which would be subject to a formal government approvals process, is considered to be too uncertain and/or hypothetical for inclusion. There are no current known plans to develop any of these projects within the next 10 to 20 years, nor any applications or plans for applications for government approvals. For further information on scoping of the cumulative effects assessment, see Section 2.3, Volume 1 and Volume 10 of the Generation EIS.
EnvCan - S-18	p5 (4)	Vol. 5, Sec. 11	Cumulative Impacts (more info needed)	It is advised that further consideration and discussion be done regarding potential cumulative effects of increased mercury levels in fish species consumed by humans (also natural aluminum and iron) in combination with increases from other Hydro developments and INCO emissions.	Both the Wuskwatim Generation and Transmission Project. EIS's provide a cumulative effects assessment based on current information that includes consideration of other hydroelectric projects being considered by Manitoba Hydro for possible construction within the next five to ten years (see EnvCan-S-16 and EnvCan-S-17). Cumulative effects of emissions from the INCO smelter and the Wuskwatim GS were also considered in the CEA (see Volume 10, p. 3-13 to 3-15; Volume 5, Section 11.0, p. 11-1 to 11-2). Current INCO emissions and mercury levels were considered as part of the baseline from which project effects were predicted, and no additional future cumulative effects are anticipated. As indicated in Volume 5, Section 11.0, p. 11-2, emissions from the INCO smelter are anticipated to remain constant or decrease in the future.
MbCons (BM) -S-17	p3 (2)		Protected areas role in biodiversity	"The Cumulative Effects Assessment discusses implications to forestry of creating protected areas and the withdrawal of land for the transmission line but there is no discussion of the implications and benefits to society of creating protected areas to preserve biodiversity."	Manitoba Hydro, in its Sustainable Development Policy/Principles, states that, to the extent practical, Corporate facilities will be planned, designed, built, operated, maintained and decommissioned in a manner that protects essential ecological processes and biological diversity. As well, Manitoba Hydro and NCN acknowledge the benefits to society of protecting biodiversity. With respect to the Wuskwatim Transmission Project, the proposed route for the Herblet Lake to Rall's Island Stations 230 kV transmission line crosses through a portion of the Tom Lamb Wildlife Management Area, which has been identified as an ASI under the Protected Areas Initiative. The proposed transmission line is routed for approximately 47 km through the WMA, of which approximately 16 km parallels an existing railway line. The proposed route will have a minimal effect on the Tom Lamb WMA/ASI. No other ASIs are crossed by the proposed transmission line routes. As the proposed routes affect a portion of only one ASI, Manitoba Hydro believes that the objectives of the Protected Areas Initiative as it relates to preserving biodiversity can still be achieved in the region irrespective of this project.

Comnt. No.	Page (Para)	Nature of Comments			Response From Manitoba Hydro & Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
Mb ANA -S-1	p1 & 2		More info regarding easement lines and First Nations consultation	Specific areas which could have benefited from more information: process by which easements are obtained regarding potentially affected existing NCN TLE selections (determination of easement lines / granting of easements); ensuring consultation with First Nations and Northern Affairs Communities within a reasonable distance of the project area (including those without formal Resource Management Boards). Provide further information about NCN TLE selection adjacent to Wuskwatim Lake waterways potentially affected (including application of Article 12.05 of TLE Framework Agreement).	The Treaty Land Entitlement Committee, Manitoba and Canada signed the Treaty Land Entitlement Framework Agreement in 1997. The framework agreement provides a process by which lands will be transferred to 25 Manitoba First Nations to fulfill treaty obligations that tracts of land would be set aside and reserved for those First Nations. The NCN is to receive 79,435 acres. The framework agreement makes provision for lands to be selected along waterways where Manitoba Hydro has existing hydroelectric projects or may develop certain projects (specific sites are identified in the framework agreement) in the future, including Wuskwatim. The framework agreement enables Manitoba Hydro to exempt up to 10 square miles of TLE selections at 13 potential hydroelectric sites and two square miles at three others, provided that the lands are required for certain development requirements specified in the framework agreement. The TLE framework agreement also provides for easements associated with development of the 13 sites. The Nisichawayasihk Cree Nation has made selections in the Wuskwatim area. These include one selection at the project site itself and four that would require easements for the proposed low head project. Another seven would be affected under the development concept of a high head Wuskwatim project. The framework agreement requires Manitoba Hydro to provide its responses concerning TLE selection to Manitoba, and Manitoba Hydro has acted accordingly. Again, consistent with provisions of the framework agreement, NCN has asked for further discussion with Manitoba Hydro about these responses. NCN and Manitoba Hydro are continuing to discuss these selections. NCN and Manitoba Hydro agree that the outcome of these discussions will not alter the Wuskwatim project descriptions (i.e., the project will be built in the same manner as is now described in the environmental impact statements. Once the two parties have concluded their discussions, Manitoba Hydro will inform Manitoba of the outcome. Should easements be required, Manitoba Hydro will be responsible for retaining a professional engineer who will determine the location of the easement line according to the methodology outlined in the framework agreement. Manitoba and Canada, along with the Entitlement First Nation, will be responsible for the transference of land.

Table 2
Manitoba Hydro and Nisichawayasihk Cree Nation (NCN) Responses To
Department of Fisheries and Oceans (DFO) and the Canadian Coast Guard - Navigable Waters Protection Program (CCG - NWPP) Comments
(Received by July 16/03) Regarding EISs for the Wuskwatim Generation and Transmission Projects

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
COMMENTS FROM DFO					
Wuskwatim Generation Project					
Project Description					
DFO-S-1	4 (9)	Vol. 3, Sec. 4.6.8 & Vol. 1, Sec. 6.5.2.1	Request for additional detail re: sediment control and monitoring during construction	"Section 4.6.8 of Volume 3 provides a description of the process to be used to install and remove cofferdams, groins, and associated structures during the construction of the Wuskwatim Generation Station. While Section 6.5.2.1 of Volume 1 commits to "standard" mitigation and presumably monitoring, to be detailed in the proposed Environmental Protection Plan, details of how mitigation and monitoring for those high risk activities shall be accomplished has not been provided." "Please provide a detailed description of how potential release of sediment into waters during placement and removal of the cofferdams and associated groin structures, removal of rock plugs, and other high risk activities during construction will be mitigated. Include plans for monitoring potential sediment releases during construction and a description of remedial measures should increases in sediment levels become evident."	As discussed in Section 7.5.1 (Vol. 4), it is inevitable that there will be some increase in the TSS level during construction of the Wuskwatim Project. The magnitude of the anticipated increases are linked to the specific activities, and are summarized in Table A8.4-1, page 8-20. As discussed in Section 7.5.1 and in a PowerPoint Cofferdam Presentation to TAC on June 23, 2003, various general construction techniques will be employed to minimize the amount of material lost and carried downstream by the river flow during cofferdam construction such as initially only advancing the rock-fill groins and following progressively with sand and clay filters in “quieter” waters. It is anticipated that cofferdam construction will result in a TSS level increase of 25 mg/L or less. This increase will occur over 2 time periods totaling 15 weeks. Estimated increases due to cofferdam removal will be quite low, and in the range of 1 mg/L. If during construction it becomes apparent from the downstream monitoring program that TSS levels are significantly above those anticipated (and these are deemed to create a problem for aquatic life), then various mitigation strategies would be considered. These include the use of silt fences to trap sediment laden water within the confines of the immediate construction area, although potentially only practical for construction of the Stage I cofferdam and/or modifying the placement rate of material to reduce elevated TSS levels. The EIS indicates that there is one construction activity that could potentially result in much larger TSS increases, i.e., Stage II River Diversion (Section 7.5.1.4). To mitigate this potential effect, the EIS text indicates that studies will be undertaken to assess the strength of the bed material and if it is determined that the bed material has a low shear strength then mitigation strategies would be developed and reviewed with regulators before the diversion occurs. A sediment management plan (including monitoring and mitigative measures) will be produced in consultation with DFO and MB Conservation, prior to initiation of construction activities.

The numbering system refers to the letter number (source of comment) - (S=Supplemental filing) - comment number (Comnt. No.) for that Federal department within this table.

Note: This table is based on responses to a: a) letter from Beverly Ross of DFO, dated July 16, 2003; and b) memorandum from Kelly Cochrane of Navigable Waters Protection, dated July 17, 2003.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-2	10 (51)	Vol. 5	More details needed re: access road crossings	"Please provide more details on proposed crossings for the access road (e.g., culvert or bridge, culvert sizing, etc.)."	The proponent is currently preparing the NWPA applications for the stream crossings along the access road and plans to submit the applications before the CEC hearings.
DFO-S-3	10 (52)	Vol. 3, Sec. 4	Details needed re: fish protection system on water intake	"The EIS states that a water intake will be required for the camp (Vol. 3, Pg. 4-44). Please provide details for a fish protection system on this intake."	The design of the intake is in progress and will be submitted when completed. As described in the EIS on page 4-44 of Volume 3, the fish screen design will meet the requirements of "Freshwater Intake End-Of -Pipe Fish Screen Guide Line" issued by the Department of Fisheries and Oceans.
Physical Environment					
DFO-S-4	6 (20)	Vol. 1, Sec. 4 & Vol. 4, Sec. 7	Request for additional information re: downstream riverbank stability potential	"Volume 4, page 7-12 of the EIS states that it is unlikely that the fluctuating water levels will adversely influence the phreatic surface within the riverbank, therefore the potential for an increase in bank failure due to negatively impacted pore pressures is low. Operation of the dam could cause tailwater fluctuations up to 1.5 m, 54% of the time (Vol. 1, pg 4-30)." "Given that…tailwater fluctuations will be occurring fairly rapidly and frequently, please provide further comment on the potential for downstream riverbank stability to be compromised."	The text on page 4-30 is incorrectly paraphrased, as it implies that one particular unit is cycled on and off. What is meant is that 54% of the time there will be a cycling of units on and off. Depending on which units are being cycled on and off (i.e., the second unit or the third unit) and whether this is occurring during the open-water season or the winter, the resulting daily water level change in the tailwater area could range from 0.9 to 1.5 m. The maximum water level changes quoted represent water level fluctuations at the tailrace, and these fluctuations dampen with distance downstream. As shown in Figure 4.5-1 (Vol. 1) the daily cycling of flows will result in flows (and water levels) increasing for a portion of the day and then decreasing for the remainder of the day. Given the short duration of water level changes and the low permeability of the clay river bank soils along the Burntwood River it is unlikely that the phreatic surface in the river banks will increase during the on-peak cycling or decrease during the off-peak cycling. The probable phreatic surface in the banks is likely representative of the average daily water level. This means for bank stability analysis it is the drawdown between this average daily water level and minimum water level, which is of interest. The drawdown immediately downstream of the Generating Station will be somewhat less than the 0.9 to 1.5 m total fluctuation range quoted above. The discussion of the phreatic surface in Section 7 is referring to the clay riverbanks and not the peatlands in the off channel embayments. Generally speaking, stability of clay banks in any river or lake system could be affected if: i) there was a large and sustained drawdown of water levels; ii) the bank was relatively high (i.e., a large soil mass); iii) the clay soils were waterlogged; and iv) the geometry of the slope was such that there was insufficient soil mass at the base of the slope to prevent a "slip plane" slope failure. In this reach of the Burntwood River between the Project and Opegano Lake, the riverbanks are generally low (page 7-6) and therefore would have a very low susceptibility to slope failure. In those areas where the banks are higher (i.e., 3 to 4 metres in height) bank stability will not be dramatically affected because of the short duration of the water level change and because the magnitude of the drawdown is small relative to the average channel depths in the tailrace area. Channel depths in this area are in the order of 10 m or more, and this provides significant mass of water against the base of the slope to counter-act a potential slope failure.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-5	7 (21)	Vol. 1 Sec. 4, Vol. 4, Sec. 7	Need to comment on the potential for regain of sediment by eroding of downstream areas (project operation)	"Water passing downstream of dams is generally "sediment deprived". This is often due to a decrease in TSS and bedload resulting from the physical presence of the dam. A potential consequence of this is that the water will attempt to regain its sediment balance by eroding downstream areas. Please comment on the potential for this to occur in the context of increased downstream erosion."	It is possible that when a new reservoir is created in a river system, it may act as a sediment trap, and therefore create a sediment deprived condition for downstream reaches. However, this usually occurs with very large reservoirs and river systems carrying high sediment loads. In the case of the Wuskwatim Project, the reservoir for the Project, i.e., Wuskwatim Lake, already exists and the Project will be operated within the bounds of the current water level regime. The incremental flooding of 37 ha of land between Wuskwatim and Taskinigup Falls will add an insignificant amount of additional storage to Wuskwatim Lake. Therefore the Lake is expected to continue to act as it does now, as a partial sink for sediment. The impoundment of the reservoir will increase water depths in the area of the intermediate forebay by up to 6 m, drowning out the existing high velocity areas at Wuskwatim Falls and the head of Taskinigup Falls. Given the lower velocity in this zone, and the barrier created by the dam, there may be a small reduction or interruption in the bedload movement of any fine material. However, the existing bedload component is considered to be quite small in this reach since: • The high velocity zones in the vicinity of the two rapids (Wuskwatim Falls and the head of Taskinigup Falls) are in areas which are already bed rock controlled, and therefore unlikely to contribute material to the existing sediment budget; • Shear stresses along the bed in other sections of this local reach are relatively small, and incapable of supporting the large scale migration of any bed load; • Bathymetric data upstream of Taskinigup Falls reveals that a relatively large, deep pocket exists upstream of the falls. This pocket currently creates an adverse slope for any sediment movement along the bed, and essentially acts as a sediment trap under existing conditions, limiting any bed load migration to downstream areas. The intermediate forebay area will experience an increase in water levels, and a new shoreline will be established along the 234.0 m contour. Any erosion along the north side of the intermediate forebay will be limited since the shore will be protected by the granular materials forming the excavated material placement area. The south shore of the immediate forebay area is in a low wave energy area, and once impounded, velocities in the immediate forebay area will be much slower than under existing conditions. This will limit any potential erosion due to either wind events or riverine flows, and thereby limit any additional sediment that may be added to the immediate forebay area. Likewise, little change is anticipated in the current sediment volume passing through the lake. Therefore the potential for erosion rates downstream of the Wuskwatim Project to increase due to “sediment deprivation” is very low. Sediment outflows for the two conditions (current and post-Project) are expected to be similar.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-6	7 (39)	Vol. 4, Sec. 6	Need to clarify expected annual erosion rates and discuss shoreline erosion in immediate forebay	"a) There appears to be some inconsistency in the erosion rates shown in the above listed Tables in the EIS. Please clarify these expected annual recession rates. b) The overall erosion rates listed are "averages". Please indicate if any sort of sensitivity analysis [has] been done to attempt to determine the "maximum" potential increase in shoreline erosion due to the Project. c) The predicted shoreline erosion rates are based on assumed initial shoreline erosion rate of 1.5 m/yr (Vol. 4, pg. 6-46), which is a lower rate than the reported existing conditions (Vol. 4, pg. 6-45). What rationale is there for using this lesser value? d) No discussion of shoreline erosion rates in the immediate forebay was found. Please discuss shoreline erosion in this reach of the river."	a) The four tables are correct as shown. Table 6.3-10 lists average erosion rates without the Project. These are projected rates anticipated under current fluctuating water level conditions. Table 6.4-3 lists average erosion rates with the Project. These are projected rates anticipated under the proposed fixed water level of 234m. Projected rates with the Project are different than those anticipated without the Project, reflecting the change in anticipated erosion conditions under current fluctuating water levels versus the proposed fixed water level. Table 6.4-4 is a summary compilation of the previous two tables with and without the Project. Table A6.3-1 lists average erosion rates plus a 50% variability factor with and without the Project. The discussion of the use of this appendix table is found on page 6-39 (Vol. 4). b) Historical erosion rates have been modified to represent expected post project erosion conditions. The maximum erosion rates considered average plus 50% variability factor and were used for potential shoreline recession estimates (Section 6.4.3.2). The average rates were used for area/loss and eroded volume estimates (Section 6.4.3.1). Figure 6.2-1 illustrates the range of anticipated bank recession setbacks under average, above-average and below-average bank recession rates. As discussed in the text, it is expected that erosion could occur at the “above-average” rate at some locations, while an adjacent area could erode at a “below-average” rate, hence the use of average. In Section 6.3.4 (Volume 4), statistical analysis of measured bank recession rates indicates that erosion rates commonly range approximately 50% above and below average values. This is the value that was selected as the maximum erosion rate. The choice of “average” and “average plus 50% variability factor” erosion rates is discussed on page 6-38. c) It is correct on page 6-46 (Vol. 4) that the study is projecting an initial average post-project erosion rate of 1.5 m/yr for clay and silt banks in high wave energy settings. On page 6-45 it is reported that an average erosion rate of 2.2 m/yr was measured for the 1978 to 1985 period in clay and silt banks on the east and south shores of Wuskwatim Lake -- shores that are located in a high wave energy environment. As discussed on page 6-46, data from the 1978 to 1985 period provide an average of relatively high initial post-CRD rates (higher in 1978, decreasing to 1985). Early post-CRD rates during this period are expected to be higher than average rates under initial post-project conditions because the Project will cause a relatively small modification to an existing shoreline. The water level rise due to the CRD created an entirely new shoreline. The development of a gently sloping nearshore slope over more than 26 years since implementation of the CRD is expected to result in greater wave energy dissipation under post-project conditions than occurred under initial post-CRD conditions. Therefore, initial post-project erosion rates are expected to be slightly lower than initial post-CRD rates. The 1.5 m/yr rate for this shoreline type and wave energy setting is higher than what is occurring under current conditions, as shown in Figure 6.4-4.

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		EIS Section	Issue	Summary of Comments	
DFO-S-6 (cont'd)	7 (39)	Vol. 4, Sec. 6	Need to clarify expected annual erosion rates and discuss shoreline erosion in immediate forebay		d) The immediate forebay under existing conditions (without the project) is described on page 6-43. The immediate forebay area under with-the-project conditions is addressed on page 6-51 (Section 6.4.2.2). The shoreline under initial post-project conditions was taken to be 234m, which is up to 7m higher than the existing shoreline in the immediate forebay area. With the rise in water level, the shoreline in this area will change from a mainly clay over bedrock shore to a shore with mainly clay and silt banks. As a result, post-project erosion rates in this area are projected to be slightly higher than rates under current conditions. Even so, erosion is expected to be restricted to the south shoreline, which is classified as having clay and silt banks exposed to low wave energy. Erosion rates for this shoreline type and wave energy category are listed in Table 6.4-4 (page 6-53), which references back to previous tables. A summary of the key information can be found in Table 6.4-4 and Table A6.3-1. This would include the average erosion rates with and without the project and the average plus 50%, or maximum, rates. Attached as DFO–Q39d Summary Table
DFO-S-7	8 (40)	Vol. 4, Sec. 6	Need to clarify effects of a fixed water level vs. naturally variability in: shoreline erosion	The estimated increase in shoreline erosion due to the Project has been based on the increased water level in Wuskwatim Lake. This higher water level results in greater exposure to potentially erodible material on the shorelines. However the EIS does not discuss the effect of having a "fixed" water level, as opposed to "naturally varying" in the context of shoreline erosion.	Implications of a fixed higher-average water level versus existing varying water levels are central to the erosion projections made in the study. Indeed, the main difference between existing conditions and post-project conditions is a change from the current pattern of lake level fluctuations to a relatively constant level under post-project conditions near the upper end of the current post-CRD range. Under current conditions, the measured erosion rates at the monitoring stations listed in Table 6.3-7 on page 6-36 reflect average erosion rates for the past 10 years under a variety of water level conditions from low to high. Under low water level conditions, erosion of clay/silt shorelines will predominantly be controlled by nearshore downcutting, as illustrated in Figure 6.3-1 (page 6-14), which results in a slower rate of shoreline recession. At higher water levels, erosion rates in clay/silt shorelines will be dominated by toe-of-bank erosion, which results in a higher rate of shoreline recession. As the nearshore beaches develop over time, erosion rates will gradually decrease as discussed in Section 6.3.2. If the proposed project was based on a fixed water level of 233 m (versus the 234 m level being proposed) the projected post-project erosion rates would be lower than those projected with this study. While the above explanation focuses on clay/silt shorelines with no near-surface bedrock, the presence of exposed bedrock at low and moderate water levels, as shown in Figure 6.3-3, is a major factor affecting erosion rates. Therefore, an important part of this study was mapping clay over bedrock shoreline types into three sub-types based on the contact elevation of the bedrock.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-8	8 (42)	Vol. 4, Sec. 8 & Vol. 1, Sec. 6	Need explanation re: potential reasons for inc. sedimentation rates in Wuskwatim Lake	"…the existing record of sedimentation rates (years 2000, and 2001) in Wuskwatim Lake are nearly 2-3 times those recorded immediately after CRD. Please provide explanation as to potential reasons for the increased sedimentation, given that the TSS levels are reported to have returned to pre-CRD levels (Vol. 4, pg. 8-3), and that the shoreline erosion has decreased since CRD."	Although there is not a great deal of data on sedimentation rates within Wuskwatim Lake, existing sedimentation rates (i.e. current rates) are not believed to be 2 to 3 times those recorded immediately after CRD. On the contrary, rates immediately post-CRD were likely the highest experienced on the lake. As indicated in Section 8.3.1.4, a sediment core was taken in the middle of the lake in 2000. Analysis of this core indicated average pre- and post-CRD sedimentation rates were/are 0.16 and 0.32 $g/cm^2/yr$ respectively. However, the Post-CRD rate of 0.32 $g/cm^2/yr$ represents a rate averaged over 23 years. The initial rates in the early post-CRD period most likely exceeded this value, and current or existing rates have likely fallen below it. For comparison, our sediment budget calculations indicate a current deposition rate of around 0.21 $g/cm^2/yr$ for deepwater zones. It is noted in the EIS that the data collected for a single sediment trap operated in the deepwater section of Wuskwatim Lake, as reported on page 8-8 is quite high in comparison to the estimated sediment balance. In our analysis we have placed more confidence in the sediment core data as that data could be corroborated through our independent sediment balance calculations. As well, the sediment core represents data collected over a 23 year period rather than the more limited one or two year period represented by the trap data. As indicated in the text it is uncertain how representative this one sediment trap sample is of the entire deepwater area as it is only one point sample, and the one sample is likely an overestimate due to re-suspension (and settling) of at least some pre-existing bottom sediments and possible disruption from ice/boats. The plan is to develop a monitoring and analysis program to continue to develop a more thorough understanding of the sediment deposition processes to address areas of uncertainty like this.
DFO-S-9	8 (43)	Vol. 1, Sec. 6 & Vol. 4, Sec. 8	Need clarification on apparent contradiction of deposition percentages of eroded shoreline material	"Volume 1 page 6-11 of the EIS states that 50% of the eroded shoreline material will be deposited nearshore, and that 25% will be deposited in deepwater. Volume 4 page 8-2 states that 50% of the eroded shoreline material will be deposited nearshore, and that 50% will be deposited in deepwater. Please clarify this apparent contradiction."	The aquatic section on page 6-11 (Volume 1) is based on an interpretation of the physical environment text on page 5-31 (Vol. 1). It may have been clearer if the aquatic section stated that 25% of the deepwater deposition was only one of the sensitivity scenarios examined to examine potential downstream effects. The physical environment text on page 5-31 (Vol. 1) clearly outlines that the "base case" is a 50/50 split between nearshore and deepwater deposition and that a sensitivity case was made to determine downstream effects if half of the deepwater sediment moves downstream. Related text can also be found on the bottom of page 8-10 and Figures 8.4-1 and Figures 8.4-2 in Volume 4. In the second scenario of modeling potential downstream effects, Figure 8.4-2 indicates that, assuming 25% of the deepwater deposition moves downstream, the increase in TSS levels would be less than 1 mg/L. This was considered unlikely to be detectable, given the range of existing variability (page 8-10).
DFO-S-10	9 (44)	Vol. 1, Sec. 6	Need explanation re: reason why sediment transported downstream not expected to inc. TSS & turbidity	"Volume 1 page 6-29 of the EIS states that no significant changes to TSS or turbidity area expected downstream of the GS during operation. However Volume 1 page 6-27 states that potentially 25% of the material eroded from shorelines in Wuskwatim Lake could be transported downstream. Please explain why the sediment transported downstream is not expected to increase TSS and turbidity."	See response to DFO-S-9.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
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DFO-S-11	9 (45)	Vol. 4, Sec. 8	Justification needed for sediment deposition rates	Sediment Deposition Rates. Potential nearshore deposition rates have been estimated to be approximately 0.29 g/cm^2/yr for existing conditions. These rates are anticipated to increase to 0.74 g/cm^2/yr for the first 5 years of the project, and the rate will then drop from this initial value over the next 20 years. a) On what basis was the existing sedimentation rate selected given that much higher rates were recorded in 2000 and 2001. b) Please provide justification for the predicted decrease in nearshore sedimentation rates.	This question relates to clarification on the sedimentation deposition rates. It is assumed that the reviewer is asking for clarification on the measured nearshore deposition rates of 0.74 g/cm^2/yr in the year 2000 and the 0.48 g/cm^2/yr rate in year 2001 as stated in the text on page 8-5 versus the sediment budget model rate of 0.29 g/cm^2/yr for existing conditions (Figure 8.3-2). Given the above rates, the question relates to the basis (and justification) of the selection of the existing sedimentation rate. Development of the sediment model is discussed in Section 8.3.2 and is based on nearshore data collected on Southern Indian Lake in the early 1980s that showed 50% to 80% of the material eroded from shorelines is deposited in the nearshore zone. Since erodible sediments around the Wuskwatim Lake shoreline are similar in nature, to be conservative, a deposition ratio of 50 percent was selected for the nearshore zone and a ratio of 50 percent was selected for the deepwater zone, in developing the Wuskwatim Lake sediment budget. It is based on this assumption that a nearshore deposition rate of 0.29 g/cm^2/yr was calculated for existing conditions. The model results were then compared to the sediment trap data collected in 2000 and 2001. The 2000 data collection period is from Aug 19, 1999 to July 22, 2000, while the 2001 collection period covers the period July 22, 2000 to May 29, 2001 (see Appendix A8.3). The year 2000 was a high water year as shown in Figure 9.4-1 (page 9-23). Since the reporting period for both the 2000 and 2001 data spans the open water period in 2000 (a high water year), both data sets should reflect a higher sediment deposition rate. Under more moderate water levels, it is expected that the nearshore sediment deposition rates would be lower and closer to levels predicted by the sediment model. It is possible that once additional data is collected the nearshore deposition rate may need to be adjusted upwards to 80% versus the 50% used.
DFO-S-12	9 (46)	Vol. 1, Sec. 5; Vol. Sec. 8	Justification needed for deepwater sediment deposition rate	"Deepwater deposition has been estimated to be 0.21 g/cm^2/yr (Vol. 1. Pg. 5-31). Please provide justification for selecting this deposition rate given the recorded rate of 1.19 g/cm^2/yr (Vol. 4, pg. 8-5)."	The response to DFO-S-11 explains how the sediment model was developed and how the field data was used as a check of the model output. With respect to the large variation, see response to DFO-S-4 where it is indicated that this data point is one point measurement and there is uncertainty on how representative the 1.19 g/cm^2/yr measurement is. The rate of 0.21 g/cm^2/yr is quite consistent with rates obtained from the analysis of a sediment core taken in the middle of the lake. The higher value of 1.19 g/cm^2/yr is inconsistent with measured sediment inflows and outflows, and isn't believed to be representative of the lake as a whole. One possible reason for the elevated deposition rate at this site is the location of the trap. As shown on Figure A8.3, trap No. 6 is located along the western side of the lake, which is thought to carry a primary current for Burntwood River flows as they pass through the lake. This may result in some increased deposition in this local area. Also, sediment trap data will generally overestimate deposition rates due to a re-suspension (and settling) of at least some pre-existing bottom sediments, and possible disruption from ice/boats. It is unfortunate that two other sediment traps initially set in deepwater zones (4 and 5 on Figure A8.3) were lost, as they would have provided additional data in other areas of the lake.

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<tr><th>EIS Section</th><th>Issue</th><th>Summary of Comments</th></tr>
<tr><td>DFO-S-13</td><td>9 (47)</td><td>Vol. 1, Sec. 5 & Vol. 4, Sec. 8</td><td>Need to indicate if "sensitivity analysis" has been done to determine max. increase in sediment deposition due to Project</td><td>"The overall sediment deposition rates listed are "averages". Please indicate whether any sort of sensitivity analysis [has] been done to attempt to determine the "maximum" potential increase in sediment deposition due to the project."</td><td>As explained in the response to DFO-S-9 and DFO-S-11, a sensitivity analysis has been performed to determine the effect if more of the eroded sediment volume were to remain in suspension and move downstream, rather than be deposited in the deepwater zone. In the discussion in DFO-S-11 it is indicated that there is the potential, once additional data are collected, to adjust the nearshore deposition rate up to 80%, to match the recorded data. If this is done, the amount of sediment entering the deepwater zone or potentially moving downstream will be considerably less.
<table>
<tr><th rowspan="2">Case No.</th><th colspan="3">Deposition Ratios (%)</th><th colspan="2">Existing Condition</th><th colspan="3">Post Project, 1 - 5 Years</th><th colspan="3">Post Project, 5 - 25 years</th></tr>
<tr><th>Nearshore Zone</th><th>Deepwater Zone</th><th>Incremental Post-Project Sediment Outflow</th><th>Nearshore Rate (g/cm^2/yr)</th><th>Deepwater Rate (g/cm^2/yr)</th><th>Nearshore Rate (g/cm^2/yr)</th><th>Deepwater Rate (g/cm^2/yr)</th><th>Increase in Downstream TSS (mg/L)</th><th>Nearshore Rate (g/cm^2/yr)</th><th>Deepwater Rate (g/cm^2/yr)</th><th>Increase in Downstream TSS (mg/L)</th></tr>
<tr><td>1</td><td>50</td><td>50</td><td>0</td><td>0.29</td><td>0.21</td><td>0.74</td><td>0.30</td><td>0.00</td><td>0.39</td><td>0.23</td><td>0.00</td></tr>
<tr><td>2</td><td>50</td><td>25</td><td>25</td><td>0.29</td><td>0.21</td><td>0.74</td><td>0.25</td><td>0.68</td><td>0.39</td><td>0.22</td><td>0.16</td></tr>
<tr><td>3</td><td>80</td><td>20</td><td>0</td><td>0.46</td><td>0.17</td><td>1.19</td><td>0.21</td><td>0.00</td><td>0.63</td><td>0.18</td><td>0.00</td></tr>
<tr><td>4</td><td>80</td><td>10</td><td>10</td><td>0.46</td><td>0.17</td><td>1.19</td><td>0.19</td><td>0.27</td><td>0.63</td><td>0.18</td><td>0.06</td></tr>
</table></td></tr>
<tr><td>DFO-S-14</td><td>9 (48)</td><td>Vol. 5, Sec. 5 & Vol. 4 Sec. 8</td><td>Need for more information on expected impacts re: sedimentation in forebay</td><td>Volume 5, page 5-138 states that flooding of terrestrial habitat will create new sediments in the forebay of the Wuskwatim Reservoir. The EIS states that these impacts are not expected to be significant or long term. Please explain why these impacts are expected to be short term. Also, please comment on anticipated deposition rates in the forebay area.

"a) Please explain why these impacts are expected to be short-term? How will the sediment be removed?
b) There is little discussion in the EIS with regards to deposition rates in the forebay area. The physical presence of the dam could potentially increase sedimentation in the immediate forebay area given the change from ”river" to "lake" environment. This increase in sedimentation is likely to occur due to the physical presence of the dam, the significant decrease in water velocities, and the potential decrease in bedload sediment transport. Please quantify this potential deposition rate in the forebay area."</td><td>The predicted combined effects of the project (including flooding of terrestrial habitat in Reach 2) on the suitability of water for aquatic life in Reach 2 (i.e., the immediate forebay) were “negative” and “not significant (long-term, moderate, site-specific)” (Vol. 5, Sec. 5.4.2.3, p. 5-138). The impacts were not predicted to be short-term and sediments are not anticipated to be removed. Sediments will, however, experience changes in composition over time as the flooded organic matter decomposes, the river bed is altered by hydraulics and sedimentation, and the sediments come to equilibrium with the overlying surface water.</td></tr>
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Aquatic Environment					
DFO-S-15	10 (50)	Vol. 4, Sec. 4	Clarification needed re: effects of drawdown associated with plug removal from channel excavation at Wuskwatim Falls	Regarding the excavated channel at Wuskwatim Falls: "The EIS states that if the plug were removed during one of the diversion stages that Wuskwatim Lake would be drawn down by 2 m and this would result in undesirable environmental effects. Please clarify the details of this potential drawdown."	There will not be a 2m drawdown of Wuskwatim Lake due to the construction method employed for the removal of the upstream rock plug. The construction method requires that the water level be equalized on both sides of the rock plug prior to removal. The immediate forebay area will be impounded just before the plug is set for removal. This will be accomplished by regulating the outflow through the spillway gates (scheduled for the fall of 2008 as shown on Figure 4.2-1, Volume 3). See response to DFO-S-38 for further explanation of the blasting methods.
DFO-S-16	1 (1)	Vol. 1 & Vol. 5	Request for a "No Net Loss" plan / proposal	"…an Authorization under Section 35 (2) of the *Fisheries Act* will not be issued until acceptable measures to compensate for the habitat loss are developed and specific terms and conditions for the development of new habitat or enhancement of existing habitat are agreed upon." Furthermore, achievement of no net loss through relocation, redesign, mitigation and compensation for residual habitat loss may be viewed as means of addressing significant adverse environmental effects to fish habitat under CEAA. "Please provide a plan for the achievement of no net loss which includes the following: a) An accounting of the aquatic habitat that will be harmfully altered, disrupted or destroyed (HADD) including but not limited to...[see letter for list] b) A summary of the mitigation measures to be employed, with references to where they are described in the EIS and an explanation of how they will minimize the extent of the HADD. c) The means by which the residual unavoidable loss of fish habitat will be offset through the development of compensatory habitat according to DFO's Hierarchy of Preferences. d) A description of the monitoring program to determine if the compensatory habitat is functioning as intended, and corrective measures should this not be the case."	*a) Provide an accounting of aquatic habitat that will be harmfully altered, disrupted, or destroyed.* The following information was taken from Volume 5, Section 6.4. Following construction of the GS, about 3.1 ha of aquatic habitat will be lost from the upper extent of Reach 3 due to the concrete footprint of the structure (0.4 ha) and the dewatering of present-day Taskinigup Falls (2.7 ha). Reach 2 (immediate forebay upstream of GS) will experience an overall increase in water depth and decrease in velocity. In this reach there will be a 37.2 ha increase in wetted area. Of this, 3.4 ha will be part of the channel extension adjacent to Wuskwatim Falls, 8.9 ha will be flooded terrestrial habitat overlain by a dyke, and 24.8 ha will be newly inundated undisturbed terrestrial habitat. The increased frequency of water level fluctuations downstream of the GS will result in a conversion of 17 ha of wetted aquatic habitat to intermittently exposed aquatic habitat in Reach 3. An additional 3 ha of previously terrestrial habitat will become intermittently exposed aquatic habitat. In Reach 4, the intermittently exposed zone will increase in size from 50 ha to 86 ha; of this, 27.9 ha will be a conversion of permanently wetted to intermittently exposed habitat and 8.5 ha of terrestrial habitat will become intermittently exposed. In Reach 1 (Wuskwatim), 1,588 ha of intermittently exposed aquatic habitat will be converted to wetted nearshore habitat, primarily in tributary waters (e.g., Sesep Lake, Cranberry Lakes, and Wuskwatim Brook) and Wuskwatim south. This alteration is expected to increase the productive capacity of this habitat given that this area is currently periodically exposed (it should be noted that the water level regime does not follow a natural seasonal pattern). Approximately 13% of the combined intermittently exposed and nearshore habitat in Reach 1 will experience higher levels of total suspended solids and sedimentation in the first 5 years of Project operation (this estimate is based on the total area of these habitats in Wuskwatim main, which is where most of the increased erosion will occur). Additional detailed information can be provided to DFO as, and if, required. Additional details regarding habitat alteration will be provided to DFO as and if required. It should be noted that HADD will be addressed separately for the access road stream crossings.

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		EIS Section	Issue	Summary of Comments	
DFO-S-16 (cont'd)	1 (1)	Vol. 1 & Vol. 5	Request for a "No Net Loss" plan / proposal		*b) A summary of the mitigation measures to be employed, with references to where they are described in the EIS and an explanation of how they will minimize the extent of the HADD.* As described below, mitigation of aquatic effects has been incorporated into all stages of the project including: planning, design, construction, and operation. <u>Planning Phase:</u> The reduction and/or avoidance of environmental effects were key considerations during the design of the generating station and the development of the proposed operating regime. Mitigation measures (through impact reduction and avoidance) included the following: • It was determined that a low head design as compared to a high head design would significantly reduce Project impacts. Although the amount of energy produced would decrease from 350 megawatts (high head design) to 200 megawatts (low head design), the low head design would flood less than 0.5 km^2 as compared to 140 km^2. This significantly reduced the magnitude and duration of aquatic effects such as mercury mobilization; • It was also determined that Project effects could be significantly reduced if the facility was operated in a fashion that would limit water level fluctuations on Wuskwatim Lake and moderate potential water level fluctuations downstream. It was decided that the generating station would normally be operated such that over a 24-hour period the amount of water flowing into Wuskwatim Lake will be the same amount discharged by the station. Maximum daily water level changes on Wuskwatim Lake would generally be less than 13 centimetres (5 inches). Under routine operating conditions (97.5% of the time on a long-term basis), water levels on Wuskwatim Lake will be between 233.75 metres (766.9 feet) and 234.0 metres (767.7 feet) ASL. Wuskwatim Lake is part of the regulated CRD system and currently fluctuates as much as 1.5 m (4.5 ft) per year. The stabilization of Wuskwatim Lake water levels and the reduction in annual water level fluctuations would convert 1,588 ha of intermittently exposed aquatic habitat into wetted habitat (i.e., an increase in productive aquatic habitat). • Although not generally considered a mitigation measure, the broad extent of aquatic studies (which included both Traditional Knowledge and scientific studies) that were conducted to understand the existing environment and the potential effects of the Project on the environment, significantly assisted in reducing and/or mitigating Project effects (Volume 5).

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DFO-S-16 (cont'd)	1 (1)	Vol. 1 & Vol. 5	Request for a "No Net Loss" plan / proposal		<u>Construction Phase:</u> Mitigation during construction will focus primarily on impact avoidance to fish and fish habitat through adherence to a variety of plans, documents, and guidelines, including the following: • Guidelines for the Use of Explosives in or near Canadian Fisheries Waters; • Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat; • Safe handling of petroleum and non-petroleum based chemicals and spill containment measures; • Access Management Plan; • Freshwater Intake End-of-Pipe Fish Screen Guidelines; • Manitoba Hydro's Hazardous Material Management Handbook; and • The Environmental Protection Plan. In addition to the above, environmental protection workers will be on site to monitor, document, and interact with the proponents and contractors. <u>Operational Phase:</u> As described under the planning phase, measures taken to mitigate impacts (through impact reduction and avoidance) were incorporated into the design of the generating station (low head design) and the development of the proposed operating regime. *c) The means by which the residual unavoidable loss of fish habitat will be offset through the development of compensatory habitat according to DFO's Hierarchy of Preferences.* Initial discussions have taken place with the Department of Fisheries and Oceans regarding its policies towards HADD and the development of compensatory measures to address the HADD. The proponent(s) have suggested that compensatory measures be focused on habitat improvements in areas currently utilized by NCN resource harvesters (areas downstream of the Wuskwatim GS are not extensively utilized by NCN members). To this end, discussions have been, and will continue to be, held with NCN Elders and resource harvesters to identify opportunities for aquatic habitat improvements in areas currently utilized by the First Nation. The information provided by the NCN Elders and resource harvesters will be used as the basis for the development of a compensation plan that could include, among other things: improvements to spawning areas in Footprint Lake, Threepoint Lake, and other lakes utilized by NCN; improvements to spawning areas in streams; habitat diversification (e.g., creation of rubble/cobble areas); removal of blockages (e.g., debris) that could be limiting fish movements in streams; and planting of native shrubs on eroding shorelines to reduce erosion.

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<tr><th>EIS Section</th><th>Issue</th><th>Summary of Comments</th></tr>
<tr><td>DFO-S-16 (cont'd)</td><td>1 (1)</td><td>Vol. 1 & Vol. 5</td><td>Request for a "No Net Loss" plan / proposal</td><td></td><td>The habitat compensation plan will be developed with input from the Department of Fisheries, Manitoba Conservation, and the Nelson House Resource Management Board and will be designed to fully achieve a “no net loss” of aquatic habitat. Manitoba Hydro and NCN will undertake to have the habitat compensation plan materially developed prior to the CEC hearings. The compensation plan will subsequently be submitted to DFO for their approval (i.e., to provide an authorization under Section 35 (2) of the Fisheries Act).

d) A description of the monitoring program to determine if the compensatory habitat is functioning as intended, and corrective measures should this not be the case.

A long-term monitoring program will be developed following the finalization of the habitat compensation plan with the Department of Fisheries and Oceans and will be provided as an appendix to the Habitat Compensation Plan. The monitoring program will be developed with input from the Department of Fisheries and Oceans and Manitoba Conservation and will be designed to: a) determine the effectiveness of the proposed compensatory measures; and b) provide information that would assist in making alterations to improve the effectiveness of the compensatory measures as and if required.</td></tr>
<tr><td>DFO-S-17</td><td>1 (2)</td><td>Vol. 1, Sec. 6.8</td><td>Additional data required re: fish tagging / fishing effort results</td><td>"Please provide data indicating the relative fishing effort in Wuskwatim Lake and other areas within Reach 1, in the area between Wuskwatim Falls and Taskinigup Falls (Reach 2), and downstream of Taskinigup Falls (Reaches 3 and 4), after the fish were tagged. Include where appropriate any recovery by commercial or recreational fishers."</td><td>A total of 41,860 m of net were fished for a total of 4,458 hours in the study area between 1999 (application of the first Floy-tags) and 2002. Of this total, 26,003 m of net were fished for a total of 2,128 hours upstream of Wuskwatim Falls and 15,857 m of net were fished for a total of 2,330 hours downstream of Wuskwatim Falls.

All tag returns were from gillnetting conducted as part of the environmental studies for the Wuskwatim EIS. Reaches 1 - 4 are very difficult to access and have received little if any commercial, domestic, or recreational fishing effort between 2000 and 2002. Birch Tree Lake does receive some recreational fishing effort although, to date, no tags have been returned from that fishery.

Relative fishing effort in Reaches 1, 2, 3, and 4, after fish were tagged.
<table>
<tr><th>Location</th><th># of net sets</th><th>Time fished (hours)</th><th>Length of net fished (m)</th></tr>
<tr><td>Reach 1</td><td>305</td><td>2,128</td><td>26,003</td></tr>
<tr><td>Reach 2</td><td>14</td><td>238</td><td>1,160</td></tr>
<tr><td>Reach 3</td><td>36</td><td>414</td><td>3,504</td></tr>
<tr><td>Reach 4</td><td>38</td><td>487</td><td>3,822</td></tr>
<tr><td>Birch Tree Lake</td><td>54</td><td>1,191</td><td>7,371</td></tr>
<tr><td>Subtotal – Reach 2 to Birch Tree Lake</td><td>142</td><td>2,330</td><td>15,857</td></tr>
<tr><td>Total</td><td>447</td><td>4,458</td><td>41,860</td></tr>
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DFO-S-18	2 (3)	Vol. 1, Sec. 6.8.1.2 & Vol. 5, Sec. 8	Request for: an assessment of measures to limit downstream migration of fish; protection of fish from turbines & monitoring program	"Given the …recognized downstream movement at present, and the uncertainty as to whether the Project as proposed will reduce downstream migration, DFO recommends that measures be examined to reduce downstream fish migration through the proposed Wuskwatim Generation Station and limit fish mortality." "Please provide an assessment of possible measures to limit downstream migration (e.g., fish exclusion measures) and/or protect fish migrating downstream through the turbines, including a monitoring program to ensure the proposed level of protection is adequate, and a description of additional measures that will be undertaken should the monitoring indicate significant mortality through the Wuskwatim Generating Station."	Presently, an unknown portion of the Wuskwatim Lake fish community moves downstream over Wuskwatim and, in many cases, Taskinigup Falls. The results of radio- and Floy-tagging data have shown that some adult walleye, lake whitefish, and lake cisco move downstream over Wuskwatim Falls and Taskinigup Falls. While numbers are not known, larval fish also drift downstream out of Wuskwatim Lake over Wuskwatim Falls and likely Taskinigup Falls. Inundation of Wuskwatim Falls will result in a substantial change in water velocity and depths in the vicinity of the falls. Present water velocities range up to 10 m/s and these will be reduced to the order of 0.5-0.7 m/s (Volume 4 [Physical Environment]). A substantial post-Project reduction in water velocities upstream of the crest is expected to result in lower entrainment of larval fish in downstream flows and will allow most non-larval fish that move downstream over Wuskwatim Falls into Reach 2 to move back upstream into Reach 1. The GS will re-route the flow of the Burntwood River through the station's intake and, when in use (approximately 7% of the time), the spillway. The substantial reduction in post-Project water velocity upstream of the station (as compared to pre-Project Wuskwatim Falls) is expected to reduce the entrainment of larval and non-larval fish, such that fewer will move downstream out of Reach 2. Presently, fish residing in Reach 2 are confined to 46.5 ha of usable fish habitat. Construction of the Project will connect fish habitat in Reach 2 to Reach 1, providing fish currently resident in Reach 2 with access to habitat in Reach 1 and potentially further reducing the incidence of downstream movements. In summary, reduced water velocities at the inlet and outlet of Reach 2 due to construction and operation of the GS are expected to result in fewer fish moving downstream of the GS (an area that is not presently, nor expected to be, utilized by NCN commercial, domestic, and recreational fishers) and more fish being retained upstream of the GS (an area that is presently utilized by NCN commercial and domestic fishers and is expected to be used more frequently by NCN commercial, domestic, and recreational fishers). A variety of mechanical (e.g., screens, louvres, curtain walls, or netting) or behavioural barriers (e.g., light, sound, electrical; Loeffelman et al. 1991, Ploskey et al. 2000) aimed at reducing entrainment within turbine intakes have been installed at some hydroelectric plants. The effectiveness of these fish exclusion measures varies considerably among fish species, sites (Odeh and Orvis 1998, Bardy et al. 1991), turbidity, velocity, and temperature (Hadderingh and Bakker 1998). In their review of fish passage facilities at US hydropower projects, Cada and Sale (1993) state "no single fish protection system or device has yet been demonstrated to be biologically effective, practical to install and operable, and acceptable to regulatory agencies under a variety of site conditions".

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-18 (cont'd)	2 (3)	Vol. 1, Sec. 6.8.1.2 & Vol. 5, Sec. 8	Request for: an assessment of measures to limit downstream migration of fish; protection of fish from turbines & monitoring program		Due to the challenges in keeping fish permanently away from turbine intakes, particularly migratory fish that have a drive to move downstream, measures and structures have been designed to pass fish such as juvenile Pacific salmon around dams. The installation of these downstream fish passage systems is an attempt to guide fish away from turbine entrances and reduce time spent in the forebay, two of the key components contributing to fish mortality at hydroelectric generating facilities. The effectiveness of downstream passage is critically dependent on the approach flow, attraction flow, guidance devices, bypass location, conveyance mechanism, and plunge pool or tailrace condition. In addition, these features must be adapted to the specific site conditions and the behaviour of the target species. Since each site has its unique physical characteristics and often a particular set of species of interest, fish passage facilities can differ substantially in their specific designs. The Wuskwatim plant and its operation will significantly change the habitat and flow patterns in the forebay upstream of the GS. The "locations where fish congregate" (the recommended location for the passage intake) under the new regimes are unknown. It is possible that the deep, relatively sterile area immediately upstream of the powerhouse intakes will be unattractive to fish and that only a very small portion of the fish population is ever in a circumstance where they might be subject to entrainment and eventual downstream fish passage, either through the turbines, spillway, or the fish passage facility. In any case, the potential for a good estimate for the appropriate location in the pre-development period is very small. Due to the many uncertainties associated with the functionality of potential exclusion measures and by-pass devices, monitoring of fish abundance, movements, and turbine mortalities once the Wuskwatim plant is in operation will be important. Because of the general lack of information regarding the extent of migratory behaviour of north temperate fish species near hydroelectric dams, their mortality rates due to turbine passage, and the applicability of monitoring methods from studies in other regions, Manitoba Hydro wants to continue to expand the knowledge base on these topics and has committed to a study, in consultation with DFO, addressing the above topics. This study will provide valuable information on the following: - fish abundance and movements in the plant forebay; - species-specific turbine mortality rates; - identification of other sources of mortality during and shortly after plant passage; and - feasibility and effectiveness of fish passage monitoring techniques. Much of the data to be obtained from the above study will be applicable to the post-project Wuskwatim GS monitoring study. The extent of downstream movements and mortality at the Wuskwatim GS will be assessed by post-construction monitoring. Based on the results of the Wuskwatim monitoring study, the proponents will meet with DFO to determine: 1) whether mitigation is required; and 2) the nature of this mitigation/compensation.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-19	2 (4)	Vol. 3, Sec. 4	Request for a revised estimate of fish mortality re: turbine mortality	"The proposed trash-rack design [of the turbines]…is unlikely to prevent the entrainment of large-bodied fish within the turbines." "Please provide a revised estimate of fish mortality that reflects the proposed trash-rack design, which will not exclude large-bodied fish."	The estimated turbine mortality rate of 10-20% stated in the EIS incorporates all fish expected to move downstream out of Reach 2 as it was determined that the trash rack design (165 x 500 m spacing) would not prevent the entrainment of any fish. The estimated turbine mortality rate was based primarily on the results of the only two studies identified that have examined this issue for north temperate freshwater fish species similar to those found in the Wuskwatim GS study area (Matousek et al. 1994, Navarro et al. 1996). Both studies looked at a full complement of fish sizes that either passed through the turbines naturally or were introduced experimentally into the turbine draft-tube and included large-bodied individuals. Both studies found a relationship between fish size and mortality rate, but in both cases the largest fish were not necessarily the most vulnerable. These findings are consistent with several other studies that report non-linear effects of fish size on turbine mortality. Generally, the available information suggests that the specific interactions of power plant design, turbine type, and fish species composition have a much more pronounced effect on turbine mortality rates than fish length. Given the turbine type (low head, propeller), wide blade spacing, slow rotation, and operation at maximum efficiency under normal flow conditions, and supporting literature, it is felt that the estimate of 10-20% turbine mortality is conservative. It is proposed to monitor turbine mortality during operation of the plant to provide an actual measurement of fish mortality.
DFO-S-20	3 (5)	Vol. 1, Sec. 6, Table A9-1	Request for a plan to collect information on all fish assemblages, including forage fish	"Table A9-1 indicates that the fish community in Reaches 1-4 were assessed using standard gang index gillnetting. This methodology does not provide for an assessment of the forage fish community, which may provide important information on changes to species assemblages, a known impact of reservoir creation. DFO notes that some small fish have been identified during larval fish sampling and dietary analysis of predators (Vol. 5 Sec. 8.3.1). However, systematic sampling to determine the forage guild does not appear to have been carried out. DFO notes that the small fish community was sampled by backpack electrofishing in the tributary stream study (Vol. 5 Sec. 8.2.3). Please provide a plan for collection of complete information on the species assemblages, including forage species, in Wuskwatim Lake (Reach 1), in the area between Wuskwatim Falls and Taskinigup Falls (Reach 2), and the areas downstream of Taskinigup Falls (Reaches 3 and 4). Include in this plan provisions for collecting complete assemblage data from suitable control sites."	Information on forage fish (based on dietary analysis) was provided in the EIS. Additional information on the forage fish community in the study area will be obtained as requested. As seining is not possible in most areas (due to flooding of terrestrial vegetation) a program to collect information on the forage fish community in all four reaches of the study area has been designed using gill nets. Fieldwork is scheduled to be conducted in mid-August, 2003. Where seining is possible, seining sites would be established along suitable shorelines. Standardized small mesh gillnet gangs (3 – 10 m long, 1.8 m deep panels of each of 8, 10, and 12.5 mm bar mesh) would be set overnight at each of the 44 sites (28 in Reach 1; 2 in Reach 2; 8 in Reach 3; and 6 in Reach 4) used to describe the existing fish community of the study area. Small mesh gill nets would be set on the bottom at all 44 sites. Surface sets would also be employed at deepwater sites (> 5 m). Control sites would be established within Threepoint Lake at existing index gillnetting sites. Forage fish would be enumerated by species for each mesh size within a gillnet set. Size data would be collected from a sub-sample of the forage fish community within a given net set. A report will be provided to the Department of Fisheries and Oceans within three months of the completion of the study (around November 30, 2003).

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-21	3 (6)	Vol. 1 Sec. 6	Request for clarification of Project's effect on food production for fish	"The EIS suggests that food will increase over the long term. However, short term (about 5 years) reductions in food supply due to increased TSS and sedimentation are forecast. It is not clear how a five year decline in food supply might impact productive capacity over the long-term. Please clarify the Project's effect on food production for fish in relation to its effect on productive capacity. a) What effect will a 5 year reduction in potential food supply of benthic invertebrates have on fish communities over a longer term? b) Given that relatively small amounts of boulder/cobble and bedrock substrates (p. 8-86) might be disproportionately important to either food production and/or spawning for some species, and these seem to be the most affected habitats, what is the potential for some populations to become unstable?	Approximately 30% of the shoreline on Wuskwatim Lake main and in adjacent waterbodies is currently eroding and is expected to experience an increase in the rate of erosion and sedimentation. Increased frequency of exposure to highly turbid waters adjacent to eroding shorelines and increased deposition of fine sediments over areas of boulder/cobble and/or bedrock substrates could affect benthic invertebrate abundance and distribution. However, this effect would generally be limited to the first five years of operation when the increase in erosion rates is predicted to be the greatest. The conversion of about 1588 ha (18%) of the existing total lake area in Reach 1 that is periodically dewatered as a result of water level fluctuation (due to CRD operation) to more wetted nearshore aquatic habitat is expected to increase the total abundance of benthic invertebrates in this reach. Increased erosion and sedimentation along some portions of the shoreline in Wuskwatim Lake main and Cranberry Lakes may reduce the quality of spawning habitat for some species, including lake whitefish and lake cisco. However, this negative effect is expected to be offset by stabilization of lake levels at the upper end of the existing range that will result in an increase in the quantity of spawning habitat and eliminate the potential for exposure or ice-scouring of eggs and/or larvae due to winter drawdown that occurs under existing conditions in years when the water level declines between fall and late winter.
DFO-S-22	3 (7)	Vol. 1, Sec. 6.8, Table 6.8-2	Request for clarification of catch data in Table 6.8-2	"In viewing Table 6.8-2, it was assumed that the "total" CPUE and "%RA" figures were greater that the sum of the items in the table because the total included species other than the VECs enumerated (e.g.. Suckers, Goldeye etc.)." "Please verify this assumption and clarify within the Table."	The assumption is correct. Table 6.8-2 in Volume 1 was designed as a summary table and presents relative abundance and catch-per-unit-effort data for the four VEC fish species and total catch. An additional row presenting the relative abundance and catch-per-unit-effort data for the remaining non-VEC species could have been added to this table to avoid confusion. Relative abundance and catch-per-unit-effort for all species and total catch are presented in Volume 5, Tables 8-4 and 8-5, respectively.
DFO-S-23	3 (8)	Vol. 1 Sec. 6, page 6-7	Request for additional information regarding water quality sampling sites	"a) Please provide a description of how the selected water quality sampling sites are representative of current and predicted areas of active erosion. b) Provide the rational for the lack of water quality sampling sites in the area immediately downstream of the proposed project."	Water quality sampling sites were selected at locations that were representative of the lake as a whole. That is, two sites were selected in the main basin of Wuskwatim Lake and one in the south basin of the lake. These sites were not intended to measure TSS increases along shorelines related to erosion. Effects of erosion on TSS concentrations in the nearshore zone are highly variable (i.e., daily variations may be quite large) and as such, the water quality studies did not attempt to address this issue. Water was sampled downstream of Taskinigup Falls (i.e., the site of the proposed GS) from 1999-2001, as presented in the EIS (Vol. 5, Sec. 5) and sampling of this site continued in 2002 and is on-going (i.e. 2003). In addition, water quality has been assessed at numerous locations downstream of the proposed Wuskwatim GS, beginning in 2001, in part, to address potential concerns of downstream communities. Baseline information has been collected as far downstream of the proposed GS as First Rapids on the Burntwood River, beginning in 2002 (monitoring continues).

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-24	4 (10)	Vol. 5, Sec. 7 & Vol. 1, Sec. 6.13	Request for control sites for lower trophic levels and fish sampling and more sampling to document variability of lower trophic levels	"Control sites do not appear to have been included in the baseline data either for lower trophic levels or for fish." It is further noted that the three years of data for phytoplankton and zooplankton, 1 year of data for macrophytes, and 1 year of data for benthos in reaches 2-4, is not likely sufficient to provide a good estimate of inter-annual variability. This is acknowledged in Section 6.13 of Volume 1. Without a good estimate of this variability and without data from un-impacted sites (un-impacted pre- and post-project), there is no way for this data to be used to unequivocally assign or relieve responsibility for any changes in species distribution to the construction or operation of the Wuskwatim Generation Station. As a result of this lack of control sites, it will be impossible to distinguish between changes resulting from the project and changes that might result from other factors such as climatic variability. a) Please provide plans for collection of baseline data from appropriate control sites. It is suggested that lotic and lentic locations affected by the CRD but not to be affected by the current project would be good choices for control sites. b) Please provide plans for collection of additional baseline data for lower trophic levels, appropriate for detection of future impacts (see [p. 12(11)] for additional comments)."	Aquatic studies of numerous lake and river sites upstream of the Wuskwatim Generation Project were conducted in 1998 and 1999 (environmental monitoring) and 2000 and 2001(as components of an environmental impact assessment for the Notigi Generation Project); studies were then suspended, due to a decision to delay consideration of development of this project. Lakes sampled during these studies included: Leftrook Lake; Threepoint Lake; Footprint Lake; Wapisu Lake; Notigi Lake; and, Osik Lake. The use of these lakes as reference systems, with respect to the Wuskwatim Generation Project, were considered during the initial stages of the baseline studies. In particular, Threepoint Lake was initially thought to be an appropriate reference lake. However, data collected during the Notigi Generation Project studies indicated that none of these lakes are appropriate reference systems (including Threepoint Lake), with respect to the Wuskwatim Generation Project. This conclusion was based on information gathered pertaining to lake morphologies, bathymetries, limnological characteristics, retention times, and proportion of flooded terrestrial habitat. On this basis, none of the upstream lakes that are affected by CRD were included as reference systems in the Wuskwatim Generation Project EIS. However, it should be noted that the information collected during the Notigi Generation Project baseline studies (1998-2001) could be used in the post-project monitoring for the Wuskwatim Generation Project as gauges in the determination of project-related and 'natural' changes to lakes in the Wuskwatim study area (i.e., relative changes in the conditions in these upstream systems could be compared to changes observed in the Wuskwatim study area to assist in determining whether observed changes are project-related). It is further noted that aquatic studies have been, and continue to be, conducted in other lotic and lentic locations in northern Manitoba, as components of other projects conducted on behalf of Manitoba Hydro, particularly in the lower Nelson River system. This information can also assist in post-project monitoring and in the delineation between project-related effects and natural changes in the Wuskwatim study area. Additional details regarding the information collected during the aforementioned studies could be provided upon request. An additional year of sampling was conducted in 2002, in which further baseline data were collected for phytoplankton and zooplankton (archived samples) in Reaches 2-4. Please note that benthic invertebrate data are presented in the EIS for two years of sampling in Reach 4 (Vol. 5, Sec. 7.2.3.4, p. 7-13). Also note that sampling within reaches 2 and 3 is particularly difficult due primarily to safety considerations and to a lesser extent accessibility. However, in Vol. 1, Sec. 6.13, it is indicated that additional data would be collected prior to construction, including "collection of additional information on aquatic habitat and vegetation communities in backwater inlets of reaches 3 & 4 (2003)." Additional data would be collected following consultation with DFO to develop a focused, benthic invertebrate monitoring program during construction (see response to comment DFO-S-25).

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-25	4 (11)	Vol. 1, Sec. 6.13	Adjustment of aquatic monitoring program such that predicted impacts may be detected	"Data from all years should be examined to assess the ability of the sampling program to detect the predicted impacts. a) Please provide a quantitative estimate of predicted impacts to lower trophic levels against which the aquatic monitoring program can be evaluated. b) Provide a Power analysis to determine what minimum magnitude of change could be detected from existing data. When doing so, invertebrate samples from across years and subsamples should not be treated as independent replicates. c) If the minimum detectable difference exceeds the predicted, please modify the sampling program appropriately prior to any additional supplemental baseline data collections."	The lower trophic level studies were conducted with the objective of defining the lower trophic level communities over a large geographic area (i.e., an aquatic habitat-based survey). The program was not designed to provide exhaustive and extensive replication for each sampling location throughout the study area. However, it is suggested that a focused monitoring program could be designed, in consultation with DFO, in which core monitoring stations for representative habitat sites could be sampled with greater intensity (i.e., sufficient replication to facilitate statistical comparisons). It is further suggested that the data collected to date would be used to determine the appropriate sample sizes for this monitoring program, through such an approach as a Power Analysis. Additional supplemental baseline data collection would also consider selection of appropriate reference sites as indicated in response to comment DFO-S-24).
DFO-S-26	5 (12)	Vol. 1, Sec. 6.13	Request for monitoring impacts to lower trophic levels during construction	"In the currently proposed program, the lower trophic levels are not to be sampled again until 2010, which does not allow for the measurement of impacts of construction activities. Follow-up monitoring frequency for lower trophic levels is proposed to be every 3 years commencing in 2010 (Table 8.13-1, Volume 1). Please provide plans for measurement of aquatic impacts to lower trophic levels during the construction period."	As requested, the monitoring program will be expanded to include the monitoring of lower trophic levels during the construction phase of the Project. The proponent will meet with representatives of the Department of Fisheries and Oceans (DFO) to discuss the design and conduct of the monitoring program. The program will be developed and submitted to DFO for approval.
DFO-S-27	5 (13)	Vol. 5, Sec. 7.2.3.2	Information request regarding justification of sampling method used for macrophyte sampling	"With respect to sampling methodology for macrophytes, the data likely reflect the degree of susceptibility to being sampled by a multipronged hook rather than providing adequate information about relative abundance. Accepted methods for sampling macrophytes in order to generate either presence / absence data or relative abundance data include either quadrat or transect sampling with SCUBA or snorkel. It is likely that the method that has been used has caused the presence of some species to be overlooked or under-represented in the data. a) Please provide references or data that demonstrate that the use of a multipronged hook for macrophyte sampling adequately, and in an unbiased manner, samples the population of interest. b) If this cannot be	The aquatic macrophyte sampling program was intended to provide information on the "relative abundance, composition, and distribution within the study area waterbodies." (Vol. 5, Sec. 7.2.3.2, p. 7-7) Evaluation of aquatic macrophytes was conducted as a component of the mapping of aquatic habitat studies and was not intended to provide detailed quantification of macrophyte densities or abundance (i.e., the study was not intended to be an exhaustive 'macrophyte study' but rather a survey designed to define the general distribution of and define the most common species in the study area). This component of the aquatic environment studies was conducted towards providing information for the definition of fish habitat and ultimately to assist in predicting project-related effects to fish and fish habitat. The use of the three-pronged hook in the sampling of macrophytes was primarily for the purposes of ground-truthing data (i.e., species identification) collected during the visual assessments in the aquatic habitat surveys (i.e., the presence/absence and relative abundance of aquatic plants was determined primarily visually). It is recognized that this sampling approach likely resulted in sampling bias, however, a relatively small area was 'ground-truthed' with this sampling method. In addition, the use of SCUBA or snorkel in sampling for aquatic macrophytes is not a preferred option for the study area for two reasons: (1) safety considerations; and, (2) limited visibility.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-27 (cont'd)	5 (13)	Vol. 5, Sec. 7.2.3.2	Information request regarding justification of sampling method used for macrophyte sampling	demonstrated, please provide comment on the sampling bias introduced by the use of this method, including comparison of macrophyte sampling by the multipronged hook with quadrate-based sampling or some other standard method."	
DFO-S-28	5 (14)	Vol. 5, Sec. 7.2.3.2	Request for clarification of macrophyte sampling methodology	"Page 7-11 states that "rooted submergent plant presence/absence data are described with respect to the physical conditions that describe their distribution…" "Please clarify if this is referring to data collected by the aquatic habitat surveys or data collected from the 2001 boat-based surveys. If the latter, then sampling sites for the boat-based surveys were chosen to "ensure that aquatic macrophytes were sampled". "It is therefore not legitimate to construct relationships between macrophytes and physical habitat variables, as sites were not randomly chosen."	The rooted submergent data referred to on p. 7-9 and 7-11 (Vol. 5, Sec. 7.2.3.2) are data collected in the aquatic habitat surveys. The presence/absence and distribution of aquatic macrophytes were defined through the aquatic habitat surveys (i.e., distribution information was digitized into the Geographic Information System as polygons), in which physical conditions were used to describe the distributions of macrophytes within the sampling polygons. Data collected during the 2001 boat-based surveys were intended to provide supplemental information used to rank the relative abundance of species within the aquatic habitat distribution polygons (i.e., ground-truthing of aquatic habitat survey mapping).
DFO-S-29	5 (15)	Vol. 1, Sec. 6	Request for analysis of project impacts to emergent vegetation as fish habitat	"Consideration of vegetation in the aquatics section of the EIS was limited to rooted submergent vegetation areas. However, the transition zone between the purely aquatic and the terrestrial environment, which includes emergent vegetation, is considered fish habitat. Emergent aquatic plants can be areas of importance, for example, to spawning fishes like pike. Please provide an analysis of the effects of the Project on emergent vegetation as it relates to fish habitat."	As indicated in Vol. 5, Sec. 7.1, p. 7-1 and Sec. 7.2.3.2, p. 7-7, a description of emergent vegetation (i.e., the existing environment) and an assessment of project-related effects to this environmental component were provided in the terrestrial habitat assessment (Vol. 6, Sec. 5.3 and Sec. 5.4).
DFO-S-30	6 (16)	Vol. 5, Sec. 7.2.3.4	Request for additional sampling of benthic invertebrates using 400µm sieve	"With respect to the choice of a 500 µm sieve for sampling macroinvertebrates, a review of current benthological practices in the primary literature reveals that sieve sizes smaller than 500µm are considered preferable. Use of a 400µm sieve would furthermore provide the ability to compare to pre-CRD data. It is recommended that benthic invertebrates be re-sampled in autumn 2003 and	Selection of a 500 µm sieve was based on an understanding of common accepted practice for the evaluation of benthic invertebrates ; as indicated in Vol. 5, Sec. 7.2.2, p. 7-4, this sieve size is the standard method recommended in Standard Methods for the Examination of Water and Wastewater (APHA 1998). Environment Canada (2002a) provides the following recommendation, with respect to benthic macroinvertebrate monitoring required for Metal Mining Environmental Effects Monitoring, administered under the Metal Mining Effluent Regulations, Fisheries Act: "The recommendation for sieve and/or mesh size for all freshwater mines is 500 µm." It is acknowledged in this guidance document that under some situations, use of smaller sieves may be desirable, as follows: "1) for

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-30 (cont'd)	6 (16)	Vol. 5, Sec. 7.2.3.4	Request for additional sampling of benthic invertebrates using 400µm sieve	future years using a 400µm sieve. It is also recommended that, in the laboratory, samples should be passed through stacked 500µm and 400µm sieves and the resulting portions processed separately. This will directly provide data that can be used to compare to pre-CRD conditions and will also allow generation of some correction factors that may allow the 1998-2001 data to be used."	comparative purposes if historical benthic surveys for the system under investigation utilized smaller mesh sizes, or 2) if sampling needs to be conducted, for logistic reasons, at times when organisms are very small..." (p. 5-87). The same recommendations have been made for Pulp and Paper EEM (Environment Canada 2002b, p. 11-36 to 11-37). Comparison of the baseline data collected during the EIS studies to the limited data collected pre-CRD at limited sites in the study area (e.g., based on a single sample collected at each of three sites in Wuskwatim Lake in June 1973; Hamilton and McRae 1974) was not an objective of the baseline studies for the GS EIS. Conditions in the study area were altered by CRD; under this caveat, comparison to pre-CRD conditions was not conducted for the EIS of the Wuskwatim Project (i.e., current conditions are the baseline for the Project). Therefore, exception (1) indicated above is not applicable. Sampling was conducted in fall, when benthic organisms are not 'very small'. Therefore exception (2) does not apply. For these reasons, the sampling methodology employed for the baseline studies are considered adequate for defining the Project baseline and for the basis of impact assessment. REFERENCES AMERICAN PUBLIC HEALTH ASSOCIATION (APHA). 1998. Standard Methods for the Examination of Water and Wastewater. Twentieth Edition. L.S. Clesceri, A.E. Greenberg, and A.D. Eaton (ed.). Washington, D.C. 1220 pp. ENVIRONMENT CANADA. 2002a. Metal mining guidance document for aquatic environmental effects monitoring. June 2002. ENVIRONMENT CANADA. 2002b. Pulp and paper EEM technical guidance document. February 2002. HAMILTON, A.L. and G.P. McRAE. 1974. Zoobenthos survey of the lower Churchill River and diversion route lakes. Lake Winnipeg, Churchill and Nelson Rivers Study Board 1971-1975. Tech. Rep. Append. 5. Fish Limnol. Stud. 2H: 28 pp. WIENS, A.P. and D.M. ROSENBERG. 1994. Churchill River Diversion: Effects on benthic invertebrates in lakes along the lower Churchill and the diversion route. Can. Tech. Rep. Fish. Aquat. Sci. 2001: iv + 29 pp.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-31	6 (17)	Vol. 5, Sec. 7	Benthic invertebrate samples should be identified to Genus whenever possible	"Although a debate has occurred for many years in the benthological literature regarding the appropriate level of taxonomic resolution for impact assessment, the levels in question are Family versus Species. The use of "major group" in this EIS results in data that is inadequate to assess or detect changes resulting from the project. It is recommended that any archived benthic samples from previous years (and all future samples) should be identified to Genus wherever possible. All samples should be properly archived for the expected duration of the monitoring program."	Baseline benthic invertebrate populations were identified to level of major group from the initiation of the baseline studies in 1998. The EIS Guidelines for the Wuskwatim GS (dated April 29, 2002) indicated that "sufficient detail respecting the existing species composition and abundance of aquatic invertebrates shall be provided in order to assess the overall productivity of the aquatic eco-system, biodiversity, and potential effects on fish populations and their range." (p. 12) Following the release of these guidelines and discussion with the Department of Fisheries and Oceans (telephone conversation with B. Ross, June 07, 2002), a sub-set of benthic invertebrate samples collected from the study area were further identified to genus and/or species. This information was subsequently used to provide additional detail regarding benthic invertebrate communities in the study area and to generate an index of biodiversity. Samples collected during the baseline studies have been properly archived and subsequent samples collected during additional baseline studies and monitoring studies conducted during construction and operation will be properly archived.
DFO-S-32	6 (18)	Vol. 5 Sec. 7	Request for laboratory methods for processing benthic samples & quality control measures	"The processing of benthic samples requires care and technical expertise, and poor quality data can easily result when laboratory performance is not carefully monitored. Please provide the laboratory methods for processing of benthic samples as well as results from any quality control measures."	In the laboratory, fixed samples are rinsed with water, transferred to 70 % ethanol, stained with Rose Bengal to facilitate removal of organisms, and sorted using a Wild M3 dissecting microscope (incident light). All sorted samples are examined by a qualified North/South Consultants Inc. staff member. The staff member examines the sorted sample for organisms missed by the sorter. Organisms found would be added to the sample vials. The level of quality control and assurance is consistent with those employed in other monitoring programs (e.g., Golder Associates Ltd. 2002. Report on Oil Sands Regional Aquatics Monitoring Program (RAMP) Program design and rationale - Version 2. Submitted to the RAMP Steering Committee, June 2002, 022-2301/3000.). Specifically, a minimum removal efficiency of 10% was considered acceptable (i.e., if the staff member finds that a minimum of 90 % of all organisms have been sorted, the sample would pass; if less than 90 % of organisms have been sorted, the sorter would resume work and have the sample examined again once she/he is confident the sample would pass). Benthic invertebrates were identified and quantified by an invertebrate taxonomist. All samples were retained and archived should further analyses be required.
DFO-S-33	6 (19)	Vol. 5, Sec. 7	Request for verification of mollusc species identified re: current names	"Some of the species names, particularly for the molluscs, are no longer valid. Please indicate how mollusc species identifications were verified."	Species identifications (often for groups which are continually undergoing revisions), were done using standard taxonomic keys (e.g. Clarke 1981, Herrington 1962, Mackie et al. 1980), as indicated in Vol. 5, Sec. 7.2.3.4, p. 7-19.). Samples were archived, so that in the event of questions related to taxonomy, species could be rechecked and verified or for groups which have had revisions, changes made as requested by reviewers. If DFO identifies those Orders for which they would like to see a different taxonomic treatment used, they could identify their preferred taxonomic reference and the list will be updated using that reference. REFERENCES CLARKE, A. H. 1981. The Freshwater Molluscs of Canada. National Museum of Canada, 1981. NM95-17/5. 446 pp. National Museum of Canada, Ottawa. HERRINGTON, H.B. 1962. A Revision of the Sphaeriidae of North America (Mollusca: Pelecypoda). Miscellaneous publications Museum of Zoology, U of Michigan, No. 118. University of Michigan, Ann Arbor. 74 pp + 7 plates.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-33 (cont'd)	6 (19)	Vol. 5, Sec. 7	Request for verification of mollusc species identified re: current names		MACKIE, G.L., D.S. WHITE and T.W. ZDEBA. 1980. A guide to freshwater mollusks of the Laurentian Great Lakes with special emphasis on the genus Pisidium. U.S. Environmental Protection Agency, EPA-600/3-80-068. 143pp.
DFO-S-34	7 (22)	Vol. 1, Sec. 4 & Vol. 4, Sec. 7	Need to comment on the potential for downstream fish stranding in tributaries	"Given the fluctuating water levels downstream of the GS, there is the potential for fish stranding in the downstream tributaries. This stranding could be significant during certain times of the year such as migration seasons. Please comment on the potential for fish stranding in downstream tributaries due to fluctuating water levels, and the impacts associated with the stranding."	As indicated in Vol. 5, Sec. 8.4.2.1 (p. 8-93 and Tables 8-20 to 8-23), conversion of permanently wetted to intermittently exposed habitat, in conjunction with the increased frequency of water level fluctuations, is expected to negatively affect the quantity and quality of spawning, feeding and overwintering habitat available to fish in Reach 3. Access to spawning and/or feeding habitat will be particularly affected in the backwater inlets and tributary streams. While fish access into and out of the tributaries is expected to be negatively affected, fish stranding is not expected to be a major concern due to the following: (1) downstream water level fluctuations will occur gradually, particularly in the more downstream backwater inlets of tributary streams, thus providing opportunity for fish movements out of the tributaries; and, (2) bathymetric information of the study area indicates that fluctuations of water levels downstream of the Wuskwatim GS are not expected to result in the rapid creation of barriers to fish movement (i.e., stranding).
DFO-S-35	7 (23)	Vol. 1, Sec. 4; Vol. 4, Sec. 7; Vol. 5, Sec. 7.4.2.2, Sec. 6.8.2.2	Request for quantification of impact to fish habitat due to tailwater fluctuations & mitigation measures	"Page 20 of the Executive Summary states that downstream of the GS there will be a permanent decrease in wetted habitat during low flow periods. In addition, the greater frequency of water level fluctuations could result in a loss of aquatic vegetation in backwater areas. The expectation of potential loss of all existing macrophyte beds in reach 3 and a noticeable reduction in reach 4 could represent a substantial loss of high quality habitat. Macrophyte beds within both streams and lakes are the habitat in which the highest density and diversity of macroinvertebrates are found. Loss of this habitat will likely negatively impact on the productive capacity of that habitat. As indicated on p 6-94 of Volume 1, fluctuating water levels are "expected to negatively affect the quantity and quality of spawning, feeding, and overwintering habitat available to fish in Reach 3" and to a lesser extent in Reach 4. Ultimately, the predicted tailwater fluctuation due to the project will have implications on fish habitat. Please quantify the impact to fish habitat due to the tailwater fluctuation in the Burntwood River, and suggest potential means to mitigate the impacts."	Changes in downstream aquatic habitat (e.g., wetted habitat, water velocity, and rooted submergent aquatic plants), resulting from operation of the Wuskwatim GS (i.e., water level fluctuations) are quantified in Vol. 5, Sec. 6.4.2.3 and 6.4.2.4 (p. 6-84 to 6-94). See response to DFO–S–16.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-36	8 (41)	Vol. 4, Sec. 6	Request for quantification of impact to fish habitat due to tailwater fluctuations & request mitigation measures	"Ultimately the predicted increase in shoreline erosion due to the project will have implications on fish habitat. Please quantify the impact to fish habitat due to the increased shoreline erosion in Wuskwatim Lake, and suggest potential means to mitigate the impacts."	See response to DFO-S-16.
DFO-S-37	9 (49)	Vol. 5, Sec. 5	Request for the quantification of impacts to fish habitat re: sediment deposition	"Ultimately, the predicted increase [in] sediment deposition due to the project will have implications on fish habitat. Please quantify the impact to fish habitat due to the increased sediment deposition in Wuskwatim Lake, and suggest potential means to mitigate the impacts."	See response to DFO-S-16.
DFO-S-38	10 (53)	Vol. 1, Sec. 6	Need more detail re: blasting effects on fish and non-compliance with DFO Guidelines	"The EIS states that "temporary rock barriers...to enable construction under dry conditions...need to be removed by blasting to allow water to flow down the channels. This blasting may cause fish mortality in the immediate vicinity of the blast." While most project blasting will generally be conducted "in accordance with DFO guidelines" blasts for the removal of rock plugs in the spillway channel, channel improvement area, and at the station in 2008 and 2009, "may not be able to meet all the criteria in the guidelines". DFO will require additional information in relation to planned explosives use near water before determining if an Authorization under S.32 of the *Fisheries Act* will be required. Please indicate how fish mortality during blasting associated with removal of rock barriers and channel modification will be mitigated. Indicate which criteria in DFO's Guidelines (Wright, D.G. and G.E. Hopky. 1998. Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters. Can. Tech. Rep. Fish. Aquat. Sci. 2107, 1v + 34p) may not be met. Any residual mortality that is likely will require Authorization under Section 32 of the Fisheries Act."	Potential measures that will be considered include: a low-intensity pre-blast to displace fish present in the immediate area; air bubbler system upstream and downstream of the rock plug to absorb/reduce the explosive pressure wave; increasing the number of drill holes, reducing the size of the explosive charge and increasing the number of delays in the explosive charges. An excavation/blasting plan will be produced in consultation with DFO and Manitoba Conservation prior to initiation of construction activities.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-39	10 (54)	Vol. 3	Need for information on fish habitat impacts, monitoring and reporting re: changes to operation of the northern hydroelectric system	"Information provided at the "Needs and Alternatives" Technical Workshop (July 09, 2003) indicated that the "Wuskwatim Project would not change CRD operation and will not change flow patterns except for daily flow shaping in local area of Wuskwatim" but that "with the Project there may be a small effect on Lake Winnipeg Regulation" depending on the nature of the use of energy generated by the Project. a) Please indicate if the changes in system operation (under maximum potential change circumstances) could potentially impact fish habitat. b) Indicate how monitoring and reporting on system changes that could potentially affect fish habitat will be undertaken and reported."	The response to this question is provided in two parts. Part A is attached as Appendix B-DFO-S-39 and provides a conceptual explanation of the Hydro System operation and the role of the proposed Wuskwatim Generating Station, including possible effects on system operations. Part B follows below and draws on the information provided in the appendix. B) Cross Lake, which is immediately downstream from Jenpeg, is used as an indicator of the effects of LWR operational changes on fish habitat. Part A states that if Wuskwatim energy is used for domestic purposes or for firm export sales "that the summer elevation of Cross Lake is expected to decrease by an average of 0.04 feet with a maximum decrease of 0.11 feet" and that the "average winter elevation is expected to increase by 0.04 feet with a maximum increase of 0.12 feet". It also indicates that "these changes are so small that they will not be perceptible relative to the many other factors that affect outflows from Lake Winnipeg". Effects on fish and fish habitat from water level changes of the above stated magnitude are expected to be neither significant nor measurable with a "well designed sampling program". Over-wintering capacity may be slightly increased in the winter and feeding and rearing habitat may be marginally decreased in the summer but it is expected that neither (even under maximum conditions) would be of sufficient magnitude to measurably affect fish populations either positively or negatively. Effects would be completely masked by other factors such as normal changes in water supply (8 feet), wave up-rush (4 feet), ice staging (0.8 feet), and wind set up (0.5 feet). Part A also indicates that if Wuskwatim energy is used for non-firm export sales "that the summer elevation of Cross Lake is expected to increase by an average of 0.12 feet with a maximum increase of 0.34 feet" and that the "average winter elevation is expected to decrease by 0.08 feet with a maximum decrease of 0.20 feet". with "no perceptible change in elevation in both the upper and lower quartiles". Although the changes are marginally higher than for firm export sales, they remain small and the effects on fish and fish habitat (even under maximum conditions) are expected to be neither significant nor measurable with a "well designed sampling program". Feeding and rearing habitat may be marginally increased in the summer and over-wintering capacity may be slightly reduced in the winter (during average flow periods) but neither would be of sufficient magnitude to measurably affect fish populations either positively or negatively. Manitoba Hydro routinely collects detailed information on water levels and flows throughout its operating system. The information will be made available upon request.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-40	10 (55)	Vol. 1, Sec. 4.4.2, p. 4-37	Need information on the operation of northern generating system during project construction & potential effects to fish	"Describe how the northern generating system will be operated during construction of the Wuskwatim Generation Project. Are there occasions (e.g.. cofferdam placement) when the control structure at Notigi may be operated differently than usual? If so please describe potential effects to fish habitat."	The power requirements during construction of the GS will not cause any change to the way the northern hydroelectric system will be operated. The CRD operation will not be modified to assist in the closure of the cofferdam (Volume 3, Section 5.2.5.4).
DFO-S-41	11 (56)	Vol. 5	Need to summarize (tabulate) historical & on-going aquatic data collection in Wuskwatim study area	"It is DFO's understanding that a considerable amount of study and monitoring has been undertaken in or near the study area both pre- and post-CRD (e.g., The Federal Ecological Monitoring Program, Provincial monitoring, Manitoba Hydro monitoring under various agreements). It is not always clear, however, where and how this data was taken into account in the EIS. This becomes particularly important given that the system continues to be in flux, as a result of the Churchill River Diversion. Please provide, in table format, a summary of historical monitoring and study of aquatic ecosystem in relation to the Wuskwatim study area. Include in the table the study reference, the period of data collection, the parameters examined, and where each study or monitoring program was referenced in the EIS."	See the attached table (DFO–S-41, Appendix B) for a detailed summary of consideration granted to historical data, with respect to the Wuskwatim GS EIS, for the aquatic environment that were collected in the study area. Relevant and comparable historical data were used where possible to supplement data collected during the conduct of the baseline studies for the Wuskwatim GS EIS. It should be noted that in a number of instances, historical data were deemed of limited usefulness as the data were either: a) collected at a period of time in which the environment was in a state of transition (as a result of CRD); b) were collected prior to CRD; c) data were limited (e.g., Wiens and Rosenberg 1994); and/or d) the methods employed were not comparable to those employed in the baseline studies. Additional historical information related to the hydrological database and the physical environment can also be provided upon request. In addition to the above listed reports and sources of information, Manitoba Hydro has, since the completion of the CRD, collected and maintained various types of Hydrometric and Erosion information on various time frames (hourly, weekly, seasonally and annually) in corporate databases and reports. The information includes various hydrometric information (Appendix A4.2 of Volume 4) including video, photographs, air photo and satellite photography. Several additional reference documents are listed in Sections 6, 7 and 8 of Volume 4.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
Wuskwatim Transmission Project					
Project Description					
DFO-S-42	1 (2)	Vol. 1, Sec. 3	Need additional information re: tower setback distances from water bodies	"The report does not indicate what the maximum or minimum setback distance of the towers will be from streams or other water bodies. Such information would facilitate assessment of the potential for and severity of impacts to riparian zones that might ultimately affect fish habitat. Please provide additional information on the placement of the towers and on the proximity of the transmission lines to water-bodies."	The setback distance of the structures from streams and waterbodies will be determined during the detailed design phase for the proposed transmission lines. This information will be outlined in the Environmental Protection Plans, which will be prepared prior to the clearing and construction of the transmission lines. Page 3-22 of the EIS (Volume 1) indicates that "at waterway crossings, structures will be located as far back from the water's edge as possible for maximum stability and prevention of bank damage". Manitoba Hydro's Standard Environmental Protection Measures for the construction of its transmission lines are outlined in Volume 1, Chapter 3.0. These measures further describe standard protocols for clearing and construction operations in the vicinity of waterbodies and streams.
DFO-S-43	1 (4)	Vol. 1, Sec. 3.7.6	Need clarification / more information re: construction of roadway stream crossings	"On page 72, there appears to be some indication that there will be semi-permanent or permanent roadway crossings of streams which may involve fords, culverts or bridges along the new transmission line route. However, DFO was unable to find reference to such crossings elsewhere in the EIS. Please clarify whether construction of roadway stream crossings will be required for the transmission line project. If so, additional information on the proposed crossings will be required by DFO for review under Section 35 of the Fisheries Act, to determine if the harmful alteration, disruption or destruction of fish habitat is likely."	The section of the EIS Volume 1 which includes page 72 is part of Manitoba Hydro's Standard Environmental Protection Measures for the construction of its transmission lines. These are applied, where relevant, to the construction of new transmission lines. In the case of the Wuskwatim Transmission Project, it is not anticipated that permanent roadway stream crossings will be required. Winter crossings will be used for construction of the Transmission lines. Maintenance activity will be helicopter based. Further information will be outlined in the Environmental Protection Plans which will be prepared prior to the clearing and construction of the transmission lines, and which if appropriate will supply information required by DFO under Section 35 of the Fisheries Act.
DFO-S-44	2 (8)	Vol. 3, Sec. 3, p. 33	Need to state the width of the waterbody bufferzone re: herbicide use	"It is stated that "Herbicide will not be applied within the buffer zone of any waterbody and will be stored in secured locations at least 100 metres (328 feet) from any waterbody. Please clarify the "buffer zone" referred to in this case is 100 m, and if not clarify the width of the buffer zone."	The most common method of vegetation management Manitoba Hydro uses on its rights-of-way is mechanical clearing. There are some locations where other methods of management including hand clearing, biological control and selective herbicide treatments may be used. With respect to the use of herbicides in the vicinity of waterbodies, it is Manitoba Hydro's practice to avoid the use of sprayed herbicides within 30 metres of the high water mark of the stream bank. If there are sensitive sites along the rights-of-way where herbicide use should be avoided, these will be identified in the Environmental Protection Plans. The reference to the 100 meter buffer is related to the storage of herbicides in the event that they were being used.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-45	3 (10)	Vol. 1	Need to specify whether specific persons will ensure environmental protection provisions carried out	"Please indicate whether specific persons will be designated to conduct daily inspections of the stream crossings and the general transmission line route to identify unforeseen difficulties and to ensure that all environmental protection provisions are followed and met."	The roles of construction personnel will be described in the Environmental Protection Plans which will be prepared prior to the clearing and construction of the proposed transmission lines. Clearing and construction activities will be monitored by environmental protection workers who will report to an on-site Senior Construction Supervisor. During construction, the Construction Supervisor will enforce all the environmental protection requirements for the project. The environmental protection workers will be trained by Manitoba Hydro and will be familiar with all applicable legislation, regulations and guidelines, as well as the Environmental Impact Assessment submission and the Environmental Protection Plans. In the event of any non-compliance or any unforeseen difficulties, environmental protection workers will immediately report this to the Construction Supervisor who will implement measures to achieve compliance or ensure that mitigative measures are taken. As well, a pre- and post-construction inspection of all stream and creek crossings will be conducted with a representative from Fisheries & Oceans Canada.
Physical Environment					
DFO-S-46	1 (5)	Vol. 1, Sec. 3.8, p. 77	Need contingency & mitigation measures for adverse impacts to habitat under unusual winter conditions during construction	"Given the vagaries that we have experienced in the northern winters as of late, conditions may become less than optimal for transmission clearing and construction. What contingency measures will be taken to avoid or mitigate adverse impacts, such as severe rutting and erosion, in the event unusually prolonged and mild winter weather conditions (and consequently reduced construction seasons) are encountered?"	It is not anticipated that clearing and construction activities would occur during periods when frozen ground conditions are less than optimal. The Wuskwatim to Thompson 230 kV transmission line which will provide construction power for the generating station is currently proposed to be cleared between January and March 2004, with line construction occurring from January to March 2005 subject to the receipt of environmental approvals/licenses by December 2003. As this line is relatively short (45 km), clearing and construction could likely occur during one winter season, if required. Right-of-way clearing for the Wuskwatim to Herblet Lake Station, and Herblet Lake to Rall's Island Stations 230 kV transmission lines is proposed to take place in January to March 2006 and 2007. Logistics permitting, clearing could commence in January to March of 2005. Construction would take place in January to April 2006, 2007 and 2008, and possibly extend into January to March of 2009 (See EIS, Volume 1, Page 3-77, Figure 3.11). Logistics permitting, some construction could commence as early as January to April 2005. As the clearing and construction activities span several winter seasons, there is some flexibility in terms of these activities. The in-service date for these remaining transmission lines is April 2009. It should also be noted that Manitoba Hydro is committed to minimizing potential effects on the environment and has mitigative measures to minimize potential impacts including rutting and erosion. If unanticipated impacts do occur as a result of clearing and construction activities, Manitoba Hydro will repair the damage. A post-construction inspection will be conducted following the construction of each of the proposed transmission lines and any identified problems will be rectified.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
Aquatic Environment					
DFO-S-47	1 (1)	Vol. 1 Sec. 3	Need assessment of indirect impacts to fish habitat (e.g.. Changes in local drainage)	"Assessment of the potential transmission line impacts to aquatic habitat appears to be limited to those impacts directly related to the stream crossings. However, there may be other indirect impacts, such as potential impacts to local drainage, particularly when the impacts of the Project are considered cumulatively with other developments..." "Please provide an assessment of potential indirect impacts of the transmission line project on fish habitat."	Changes to local drainage are not expected to occur as a result of the Wuskwatim Transmission Project. However, Manitoba Hydro would implement erosion control measures immediately where the ground is disturbed and local drainage is affected. The disturbed ground would be repaired to minimize effects on local drainage. As well, where necessary, permanent erosion control measures will be implemented to minimize the potential for sediments entering adjacent waterbodies. As noted in DFO-S-43, it is not anticipated that permanent roadway crossings will be required. In addition, as noted in DFO-S-42, Environmental Protection Plans will be prepared prior to clearing and construction of the transmission lines.
DFO-S-48	1 (3)	Vol. 1, Sec. 3.3	Note regarding use of explosives and *Fisheries Ac*t	"It should be noted that the use of explosives near fish bearing waters may be subject to Section 32 of the *Fisheries Act* which is administered by DFO…"	It is not anticipated that explosives will be used near fish bearing waters. However, if explosive use were required, such use would be subject to Section 32 of the *Fisheries Act* which is administered by DFO. The guidelines will be followed and DFO will be consulted if explosives are to be used within 500 meters of a fish bearing waterbody.
DFO-S-49	1 (6)	Vol. 1, Sec. 6.7 & Vol. 3, Sec. 3	Need to re-visit stream crossing classifications & why 21 potential spawning streams were not classed as "critical"	"In Section 7.2.3.1 of Volume 1, the establishment of habitat classification categories are reported as follows: "critical", "important", "marginal" and "no fish habitat". As defined in the EIS, "critical" habitats are those that: 1. support a valued domestic, commercial or recreational fishery. 2. locally provide high capacity for fish production by providing year-round habitat for a variety of fish species through all life stages; 3. are important to the overall productive capacity of the system providing critical habitat (e.g. spawning habitat or migration routes). In Table 7.1, 21 of the stream crossings were deemed to have potential for spawning. A number of those stream crossings obviously provide important spawning habitats for fish. In some cases, these spawning areas have been verified by additional traditional ecological knowledge from local residents, which may imply that these areas have existed for a long time. However, out of a total of 46 watercourses	It is recognized that 21 stream crossings were deemed to have potential for spawning, but none were characterized as "critical" habitat. Habitat is described as "critical" by DFO for the following reasons: "importance in sustaining subsistence, commercial or recreational fisheries, their rareness, their high productive capacity, the sensitivity of certain life stages of the fish species they support, etc." The last reason provided implies that habitat in any stream that supports spawning should be classified as critical habitat. In contrast, "important" habitats are "utilized by fish for feeding, growth and migration which, while important to the fish stock, are not considered critical". Areas in this category usually contain relatively large amounts of similar habitat that are readily available to the stock. The definition that was used for classification of critical habitat for purposes of the EIS was as follows and should have read as such in the EIS: "Habitats that were considered to be rare and or highly productive, and/or vital to supporting particularly sensitive life stages of fish or provide vital spawning habitat were considered critical". Although this represents a slight variation (the word 'vital' has been added) from the definition provided in the Habitat Conservation and Protection Guidelines (DFO, 1998), it was deemed to be more appropriate for the purposes of this project. Critical habitats as categorized in the EIS are generally considered during the routing stage of a transmission line project and would be avoided if possible. It should be noted that the habitat classifications given in the EIS refer to habitat 100 meters upstream and downstream of the crossing and not to the entire stream. In this context, no habitat was identified through Traditional Knowledge, key person interviews or site inspections that was considered to be limiting to local fish populations. In addition, habitats identified were generally considered to be relatively common in the streams surveyed, and therefore were readily available to the local fish stocks at locations other than at the proposed crossings.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-49 (cont'd)	1 (6)	Vol. 1, Sec. 6.7 & Vol. 3, Sec. 3	Need to re-visit stream crossing classifications & why 21 potential spawning streams were not classed as "critical"	that are crossed by the Wuskwatim transmission lines, none of them were classed as "critical" habitat by the EIS. Please reconcile this observation with the criteria established in the EIS and the information provided in Table 7.1"	
DFO-S-50	2 (7)	Vol. 1, Sec. 6.7 & Vol. 3, Sec. 3	Need additional detail re: additional mitigation measures for high quality fish habitat	"Where relocation is not possible [near high quality fish habitat], DFO recommends that consideration be given in the EIS to other mitigative options beyond the standard ones considered on page 103 of Vol. 3 for those areas identified as important for critical life stages such as spawning." "Please provide additional detail of mitigation measures to be employed where high quality fish habitat has been identified."	Crossing locations that have been identified as having important fish habitat and classified as being either highly or moderately sensitive to disturbance will be revisited and site specific mitigation measures will be identified and outlined in the Environmental Protection Plans which will be prepared prior to clearing and construction of the proposed transmission lines.
DFO-S-51	3 (9)	Vol. 3, Sec. 3 & Vol. 1, Sec. 7	Need for additional mitigation measures for potential adverse effects to fish habitat in the Frog Creek - Pickerel Creek area	"DFO has identified the Frog Creek-Pickerel Creek area around Cormorant Lake as an area that requires special consideration." "It is evident that the northern portion of Moose Lake and the tributaries flowing into it are vital habitat for the fishery of Moose Lake, and protection of this habitat should be considered a priority." "While the transmission line crossing of Frog Creek may well be free of any direct environmental impacts, DFO is concerned that indirect impacts in the Frog Creek-Cormorant area may not have been adequately taken into account by the EIS." "Please provide a description of additional mitigation measures that will be employed to mitigate adverse impacts to fish habitat in the Frog Creek-Pickerel Creek Area."	Pickerel Creek was identified as important spawning location for walleye during the routing phase of the project. The proposed route for the Herblet Lake to Rall's Island Stations 230 kV transmission line was selected to avoid the creek at the request of representatives from the community of Cormorant. The proposed route does not approach within 2 km of the creek and does not intersect with the Pickerel Creek watershed. Therefore, the proposed project is expected to have no effect on Pickerel Creek. The proposed Herblet Lake to Rall's Island Stations 230 kV transmission line crosses southwest from Dyce Lake to the south end of Cormorant Lake and passes to the north of Moose Lake. Through this area, the proposed route crosses only one watercourse: Frog Creek. The segment between Frog Creek and the southernmost tip of Cormorant Lake appears to cross a number of channels as depicted on Map 6 in Volume 3. While these channels exist in form, they are historic and do not convey water to Moose Lake. Consequently, site-specific assessments of these crossings were not conducted. Although these channels no longer convey water, they will be considered as watercourse crossings for construction and, as such, will be subject to appropriate buffer zones, tower placements and mitigation measures. Site specific mitigation measures for Frog Creek will be developed following a further site inspection and will be detailed in the Environmental Protection Plan.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
DFO-S-52	4 (13)		Additional information / clarification need for stream crossings / classifications	"Please provide additional information and clarification on stream crossings as follows: **Crossing WH-5**: Explain why is the habitat sensitivity at this crossing is only rated as moderate and not high as in the case of TW-5, given that its erodible banks and slow moving currents seem to dictate that this site would be more sensitive or susceptible to impact. **Crossing Site WH-9**: Please indicate where the transmission towers are to be located for this crossing. Because of the wide floodplain at this crossing, if one or more of the towers were located in the floodplain, a greater potential for impacts that in a "simple" crossing might be expected. **Crossing Site WH-25**: This area (Wuskatasko River) appears to have potential for excellent spawning habitat and may be a significant spawning area for walleye. As there are relatively few areas in this region of Manitoba that have streams that are bedrock controlled, a classification of "critical" spawning habitat may be justified. **Crossing Site WH-28A:** Please provide a photograph of this site. Based on information gleaned from topographic maps; the crossing may provide important habitat. **Crossing Site HP-32 (Canada Creek) and Crossing Site HP-32A:)** Please provide photographs of these site. Observations noted for these crossings indicate the sites are important spawning areas for pike and suckers. **Crossing Site HP-33 and Crossing Site HP-39:** Please provide the rationale for the "high" habitat sensitivity ratings for these crossing sites. **Crossing Site HP-42: (Hayward Creek)** This stream crossing depicts typically pike spawning habitat. There is an abundance of pike spawning habitat on both sides of the creek. As there is a large amount of pike spawning habitat and negative impacts can be easily avoided, a lower sensitivity rating may be justified."	It should be generally noted that details with respect to stream crossings will be provided in the Environmental Protection Plans. With respect to crossing WH-5, please note that the reference is actually to crossing WH-7 as indicated on Map 1 (Volume 3). It is agreed that this site could have been given a higher sensitivity rating based on the potential for rutting riparian areas and initiating erosion. The rationale for the lower sensitivity was as follows: a) Substrates at the WH-7 crossing appear to be primarily scoured fines. Sediment deposition into such an environment would likely have less impact than deposition of sediment at the primarily boulder bedrock substrates observed at Site TW-5 (although it is recognized that the higher water velocities at crossing TW-5 would likely transport the majority of sediment downstream); b) given the higher water velocity and bedrock at crossing TW-5, it was felt that there was a higher potential for direct introduction of contaminants into the watercourse during winter construction than there would be at crossing WH-7 where water velocities are lower, ice cover may be thicker, and shorelines are clay mud. With respect to crossing WH-9, tower placement at this crossing has yet to be determined. Please note that the photographs in Volume 3 provide a general location for the proposed crossing, not the exact location. With respect to crossing WH-25, it is agreed that the habitat at this crossing is relatively unique in comparison to habitat at other crossing locations. However, the site was classified as important rather than critical for the following reasons: a) there was no information from Traditional Knowledge, key person interviews and on-site investigations suggesting that this crossing comprised critical habitat; b) the site is located relatively high up in the Wuskatasko River watershed and a relatively large distance from a significant river or lake population of fish and therefore was considered to have a high potential for natural isolation because of impassable falls and beaver dams. This site will be investigated further during field work for preparation of the Environmental Protection Plan and will be re-evaluated in the context of its accessibility and uniqueness in the Wuskatasko River. The classification will be re-considered at that time and adjusted, if appropriate. With respect to crossing WH-28A, WH-32 and 32a, photographs of these crossings will be taken during field work for the Environmental Protection Plan. It is anticipated that this can be provided in the near future. Canada Creek has been reported as a spawning location for suckers and pike. However, as the crossing is at the headwaters of the creek it is not expected that the habitat at the crossing is limiting to the fish population in Snow Lake. Classifications will be re-examined after completion of field work for the Environmental Protection Plan. The high sensitivity ratings assigned to crossings HP33 and HP39 were primarily related to the potential consequences of the introduction of pollutants into the watercourse. The Grass River and Snow Lake support important recreational and domestic fisheries and large fish populations, and the crossing locations provide suitable habitat for overwintering. Introductions of pollutants at the crossings during the winter construction period have the potential to directly affect large numbers of fish over a short period of time. With respect to crossing HP-42 (Hayward Creek), the site sensitivity rating is primarily based on the broad floodplain and the potential for lowland rutting initiating erosion. The sensitivity rating will be re-evaluated during field work for the preparation of the Environmental Protection Plan.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
Socio-economic Environment (Includes Land and Resource Use)					
DFO-S-53	3 (11)	Vol. 1, Sec. 4.3.1, p. 112	Need to clarify number of waterbodies used / licensed for wild rice harvest	"On page 112, it is stated that "Over 100 lakes/rivers within the project area are licensed for commercial wild rice harvests". However, Volume 3, Part 2.2.5, page 32 indicates only "Six lakes within the study area are licensed for commercial rice harvests …". "Please clarify this apparent contradiction. "	The figure of six lakes (Volume 3) is derived from the Fisheries Habitat Inventory and Classification System (FIHCS) [Department of Natural Resources]. In retrospect, use of this reference for this EIS was not appropriate. The figure from the EIS (Volume 1, page 112) is based on information from Manitoba Conservation, Crown Lands Branch (2000) and includes lakes, rivers and streams in the project area which are licensed for commercial wild rice harvests by Crown Lands Branch. This figure is considered to correctly identify the extent of current licenses of wild rice harvest in the project area in general. It should be noted that there are few lakes with licenses to commercially harvest wild rice in proximity to the proposed transmission line routes. Where there are such lakes in proximity to the proposed routes, these are generally in areas where there is already existing road and trail access.
DFO-S-54	3 (12)	Vol. 3, Sec. 2.4	Need cumulative effects assessment re: increased access effects to growing of wild rice & fish habitat	"The CEA does not appear to have considered the potential for the transmission line route to provide improved access to additional water bodies for the growing of wild rice, especially in areas in close proximity to existing roads or trails. This would compound the access problems already presented by forest harvest roads. Please provide comment on the potential for the transmission line, cumulatively with existing and potential road and trails, to facilitate increased growing of wild rice, and the potential effects of this to fish habitat."	With respect to the Wuskwatim transmission lines, the relatively remote location of the proposed rights-of-way and the nature of the terrain (i.e., rock outcrops, extensive fens) will limit access, particularly during the non winter months when wild rice harvesting would occur. It is not anticipated that the proposed transmission lines, either independently or cumulatively, will facilitate further access to lakes suitable for wild rice growing. Manitoba Hydro intends to work with NCN to prepare a transmission-related Access Management Plan for each segment located within the Nelson House RMA prior to line clearing and construction for that segment. In other areas outside the Nelson House RMA, an access management plan will be prepared if communities feel that transmission line-related access issues in areas used by them are of concern. The access management plan(s) will identify access management objectives, the approach during Project construction and operation, means of communicating the plan to all parties, and a monitoring program to ensure that access issues are being addressed. The latter should ensure that any unresolved issues are identified. The plan(s) will be developed in consultation with directly affected communities and the appropriate Integrated Resource Management Teams (IRMTs).
COMMENTS FROM CCG – NWPP					
Wuskwatim Generation Project					
Project Description					
CCG-NWPP-S-1	2 (4)	Vol. 4, Sec. 2.6.9	Operation of siren system - clarification needed *	Regarding the siren system to be installed that will warn of movement of spillway gates: "How will this siren system operate? How will the operation of the siren system be conveyed to local water users?"	Siren system will be initiated in advance of a spillway gate operation and will continue throughout the gate movement and will stop when the gate setting has been established. Large signs along both shorelines in the immediate forebay area (Section 2.6.9, Volume 3) will include notices regarding the Spillway Gate operation warning system.
CCG-NWPP-S-2	2 (4)	Vol. 4, Sec. 2.6.9	Why no safety boom upstream of GS? *	Regarding not installing a safety boom upstream of the generating station: "Please provide your rational for excluding this safety feature from the design."	During construction a temporary safety boom may be placed upstream of the outlet of Wuskwatim Lake to secure the work area in the summer time. A plastic brightly coloured snow fence may be placed on the ice upstream of the outlet of Wuskwatim Lake during the winter time. Following completion of construction, as indicated in Section 2, Volume 3, the flow velocities in the immediate forebay area will be low such that there is no safety concern and no safety boom is planned to be installed.

* Information should be provided within a navigability annex or appendix.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
CCG-NWPP-S-3	3 (1)		Need for more information on docking & launching facilities *	Regarding proposed docks and boat launches upstream and downstream of the GS: "Please provide more specific details regarding the design and location of these docking and launching facilities."	The proposed locations are shown in Figure 2.4-2 of Volume 3. The design of the docks and boat launch are in progress and are expected to be very similar to other existing dock and boat launch facilities located elsewhere in the region (Notigi Control Structure upstream and downstream docks and boat launches are examples).
CCG-NWPP-S-4	3 (2)		Need for plans of portage or navigational assistance* around the GS	"Details regarding plans for portage or navigational assistance around the generating station, during both construction and operation should be provided."	During construction, portagers will be guided to the upstream landing by a large sign and beacon. The sign will provide instructions (complete with map) on how to safely bypass the construction site.
CCG-NWPP-S-5	3 (3)	Vol. 4, Sec. 9.5.3.1	Additional details needed re: debris management program relating to boater safely & navigation *	"Please provide additional details regarding Manitoba Hydro's current debris management program as it relates to boating safety and the protection of navigation and any additional measures that will be taken with the construction of Wuskwatim Generating Station."	Manitoba Hydro operates a debris management program to meet all existing and emerging regulatory and contractual obligations. Manitoba Hydro and NCN discuss debris management in the Nelson House Resource Management Area on a regular basis. Manitoba Hydro consider NCN's impact on this issue to be important. The debris management program is based primarily on navigational safety but allow for consideration of other specific community needs. The basic premise used for qualifying navigational safety is "risk", which is primarily related to nature of debris and waterway use. Manitoba Hydro endeavors to rank the various reaches within its hydraulically affected waterways in terms of relative risk to navigation and to proportionately focus debris management efforts based on that ranking. In the case of Wuskwatim Lake in its current state, the density of debris that may cause navigational safety concerns is relatively high, but waterway usage is relatively low. The net result is that risk to navigation at Wuskwatim Lake is deemed to be relatively low, so debris management efforts are accordingly minimal. Low-head Wuskwatim development is not expected to significantly affect the nature of local debris, although it is projected that improved site access during and after construction may increase general use of Wuskwatim Lake. Debris management efforts at Wuskwatim Lake would likely be heightened accordingly during and after construction to address increased risk to navigation caused by increased waterway use.
CCG-NWPP-S-6	2 (2)		Determining navigability of each access road stream crossing	"Manitoba Hydro will be responsible for determining the navigability of each access road stream crossing. For water bodies deems to be navigable, separate applications for each crossing will be required for review under the NWPA." "Also, please note that information regarding any temporary stream crossings or other temporary structures associated with construction should be provided for review." (summarize in a navigability annex or appendix)	The proponent acknowledges the request for the determination of the navigability of each stream crossing. This information will be contained in the NWPA applications that are forthcoming for the stream crossings. See response to DFO Question CCG-NWPP-S-9.

Comnt. No.	Page (DFO no. or Para.)	Nature of Comments			Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
		EIS Section	Issue	Summary of Comments	
CCG-NWPP-S-7	2 (3) & 3 (5)		Need for a navigability annex or appendix	"…it is recommended that all information regarding the proposed generating station, access road and associated structures including cofferdams or other temporary structures; boat launches; docks; water intakes; outfalls; existing an proposed portages; current, historical and traditional use of impacted waterways; and predicted potential impacts to navigation be summarized in a navigability annex or appendix." (p2, para. 3).	The majority of navigation information is contained in the EIS. However the proponents have committed to prepare a summary navigation compilation to facilitate review of navigability concerns.
CCG-NWPP-S-8	3 (4)		Need for summary of project operation impacts on navigability *	"…the potential impact of dam operations and fluctuations on the navigability both upstream and downstream of the generating station has not been specifically addressed. Please provide a summary of the potential impacts of dam operations on navigability."	See response to DFO Question CCG-NWPP-S-7.
Wuskwatim Transmission Project					
Aquatic Environment					
CCG-NWPP-S-9	2 (1)		Determining navigability of each t-line stream crossing	"Manitoba Hydro will be responsible for determining the navigability of each transmission line stream crossing."	The proponent acknowledges responsibility for determining the navigability of each transmission line stream crossing, and has discussed this generally with Kelly Cochrane (DFO/NWPP). As explained elsewhere, none of these crossings will involve permanent roads or trails. To the extent that overhead conductors can potentially obstruct or impose a risk to navigation, none of the 46 stream crossings is considered to have the potential for navigation by watercraft (e.g., sailboats) which might be so affected. It is anticipated that further review with Kelly Cochrane may establish a generic application format for these crossings, which would assure DFO that tower locations would be outside the watercourses and that clearance between the conductors and the high water level would address safety standards. It is anticipated that all of the crossings will be subject to exemption under Section 5(2) of the *Navigable Waters Protection Act*.

Note: The DFO letter states that: "…our review of the Wuskwatim EIS's is ongoing and further clarifications and requests for additional information may be forthcoming. In particular, DFO is currently reviewing the adequacy of the cumulative effects assessment with respect to the requirements of the CEAA". The Cochrane memorandum contains a copy of the Ontario High Court of justice decision in the 1983 Coleman case which contains criteria that may be used to determine which of the subject waterways are deemed navigable in law and thus requiring review and approval under the Navigable Waters Protection Act.

Table 3
Responses from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN) to Canadian Nature Federation (CNF) Comments (Received by July 11/03) Regarding EISs for the Wuskwatim Generation and Transmission Projects

Comnt. No.*	Nature of CNF Review Comments				Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
	Page (Para)		Issue	Summary of Comments	
	Generation Project	Transmission Project			
Overall (Summary) Comments					
CNF-S-1	p42		Map deficiencies	Need for: 1:250,000 and 1:50,000 maps of entire project region that also include transmission components; need for appropriate geographical and spatial relationship displayed on existing maps that links various subjects, land boundaries and processes; need for a large map showing all project regions and study areas referred to.	Map (1: 500,000) of the project region including Transmission Lines, Generating Station components (construction and operation) and the access road is provided (see Map at end of document). Appropriate study and VEC-specific maps were provided in the corresponding volumes and sections of the EIS. A single map was not generated due to the need for varying spatial scales to adequately present the various spatial areas specific to each study and VEC.
CNF-S-2		p4 (1) & p45 (1) & p46 (6)		Need for: 1:250,000 and 1:50,000 maps of entire project region (for both projects - request similar to that made on page 42 of the GS Review Comments document - see above). Maps in T-line EIS need to include GS components (e.g. the access road).	The 1:50,000 and 1:250,000 maps which are appended to the EIS for the transmission project are intended to illustrate the project area, and alternative and proposed routes for the project. The locations of the existing stations are noted on the maps, as are the locations of the proposed Birchtree Station and the proposed generating station. Figure 3.7 in Volume 1 shows the overall site plan for the Wuskwatim Generating Station as it relates to proposed transmission lines in the vicinity of the proposed site. A 1: 500,000 map showing all of these features and the proposed access road has now been prepared and is provided.
CNF-S-3	p4 (5)			It is recommended that "…a set of maps (scale 1:250,000) be developed for the Wuskwatim project region and be included in the Wuskwatim Generation Project EIS. These maps should reference all Wuskwatim-related activities (both Generation and Transmission) including the construction site (both primary and secondary structures / facilities) as well as all three linear disturbances (the transmission line segments and the access road)."	See response provided for CNF-S-1.
CNF-S-4	p43 (1)	p46, (1)	Regulatory and public policy: environment not adequately described for project	a) "The EIS does not provide a complete description of the regulatory environment that the project exists within…a number of essential statutory, regulatory and public policy items are not listed and/or describes (EIS Guidelines Section 2.3.1)." "…the public policy standard in the EIS Guidelines …has not been fulfilled. There are several public policy elements relevant to these two proposals that are missing from the EIS as submitted, but required by the EIS Guidelines under the Environment Act.' (CNF Memo "Comments on Public Policy/Regulatory Context" – lists example of public policy elements missing from the EISs). This issue is further detailed in the covering memo from G. Whelan Enns. b) "…the EIS listing of references/citations do not support or match the listing of public policy and regulatory context for the EIS materials. For example, a ten-year old *Action Plan for a*	a) As required in both EIS Guidelines (s.2.3.1), the EISs for both the Wuskwatim Projects provide a description of the relevant "regulatory framework within which the …Project will be planned, built and operated", including a "summary of the regional, provincial or national objectives, standards, guidelines and relevant land and resource related agreements which have been used in the evaluation of the significance of the environmental effects". For example, see Vol. 1 Sec. 1.5 of the Generation EIS and Vol. 1, Sec. 1.6 and 1.7.4 of the Transmission EIS. Further, Appendix 3 of the Generation EIS provides a listing and detailed description of the provincial and federal legislation applicable to the Generation Project; Appendix A of the Transmission EIS provides a listing of related regulations, guidelines, policies and standards that apply to the Transmission Project. More specific detail on relevant regulations and policies is found in the various chapters and sections of each EIS as required to address evaluation of significance of different effects on different environments, i.e., the application of these policies in the evaluation of significance of environmental effects has generally been described in relation to particular effects (A listing of many such references in the EISs is attached to the CNF "Memo "Comments on Public Policy/Regulatory Context"). To the extent that certain of the references or citations were dated (e.g., protected area references in the Transmission EIS),

Comnt. No.*	Nature of CNF Review Comments: Page (Para) Generation Project	Page (Para) Transmission Project	Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
CNF-S-4 (cont'd)	p43 (1)	p46, (1)	Regulatory and public policy: environment not adequately described for project	*Network of Protected Areas* (1994) is cited. This ignores the 1998, 2000 *Action Plans*."	corrections are noted in the current responses (e.g., see response to MbCons(BM)-S-16). A comprehensive listing of related approvals/permits is part of ongoing planning for project implementation. b) See response to MbCons(BM)-S-16.
F-S-5	p43 (7)	p46, (7)	No rational for each subject-specific temporal/temporal boundaries	"The EIS describes but does not provide a rationale for each of the many subject-specific spatial and temporal boundaries used for the environmental assessment (EIS Guidelines Section 6)."	As explained in Volume 1 of the Generation EIS (e.g., Section 2.1, page 2-3), the rationale for each subject-specific spatial and temporal boundary used for the environmental assessment is described separately by environment in each section of the EIS (e.g., physical environment, aquatic environment, terrestrial environment, socio-economic environment, heritage resources). This approach reflects the considerable effort needed by each discipline dealing with each environmental component to define and explain the rationale for these boundaries as applicable to each environmental component. As noted in Volume 1 of the Transmission EIS (e.g., Section 2.2.2, page 2-7), a project area was defined that reflects the basic functional requirements of the project (see Volume 1, Chapter 3) and these boundaries were also sufficiently broad to allow for identification of several alternative routes for the proposed transmission lines. The rationale of the transmission approach is generally outlined in Volume 1, Chapter 3 of the EIS. It relies heavily on prior research and project experience, the results of which establish that potential transmission-related effects are confined principally to lands within and in the immediate vicinity of the rights-of-way. The selection of these boundaries has generally been confirmed during the ecosystem analysis for the project.
CNF-S-6		p47 (1, last sentence)	Inadequate representation of features / information re: Segments 1, 2 & 3	"The EIS fails to provide adequate protected areas, natural region and representation context, public policy, and mapping in relation to Segments 1, 2, 3. (EIS Guidelines Section 6.4.1)".	The maps provided in Volume 1, Appendix I illustrate lands in the project area which have been identified under the Protected Areas Initiative in relation to the alternative and proposed transmission line routes in Segments 1, 2 and 3. Discussion regarding the potential effects in relation to the project is outlined in Volume 1, Chapter 7.0. There had been liaison with government respecting these issues in the course of route selection and analysis. The related consultation and its effects on the route selection process are detailed in Volume 1, Chapters 5 and 6.
CNF-S-7		p39 (2)	Need for definition of "standard environmental protection practices"	"A definition of "standard environmental protection practices" is not provided within the EIS."	The definition is provided in the transmission EIS, Volume 1, Section 3.7, page 3-50. It is stated that these are general Manitoba Hydro practices for the design and construction of transmission lines and that the practices are subject to continuous update and improvement.
Project Description					
CNF-S-8	p4 (1)		Format of proposed project is problematic	"The proposed project, as presented in its current format, is quite problematic. The EIS states that Manitoba Hydro would not be able to justify Segment 1 and Segment 2 (as well as the proposed Wuskwatim and Birchtree stations) in the absence of the Wuskwatim Generation Project. Conversely, the Wuskwatim Generation Project (in its current format) cannot be justified if the Wuskwatim Transmission Project is not approved (i.e. there would be no mechanism to bring the 200 MW to the market)."	The Generation and Transmission EIS each indicated how the two projects as currently proposed are related to each other. Specific detail on selection of each segment of the Transmission Project is addressed in the Transmission EIS (see also response to CNF-S-20).

Comnt. No.*	Nature of CNF Review Comments		Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
	Page (Para)				
	Generation Project	Transmission Project			
CNF-S-9	p4 (2)		No schedule or plan for decommissioning	"There is no identified schedule or plan for decommissioning other than to state the expected 50-100 year life span. The EIS does not provide an environmental assessment in relation to decommissioning activities.	The Generation Project EIS addresses decommissioning in Volume 1, Sections 4.4.6 and 4.5.4; Section 2.1, pages 2-1 and 2-2 also explains the rationale for the assessment approach adopted for decommissioning of the Generation Project. The Transmission Project EIS addresses decommissioning in Volume 1, Section 7.2.7.
CNF-S-10	p4, (3, 6)		Need for maps of existing hydroelectric reservoirs	"There are no maps that identify and describe existing hydroelectric reservoirs in Manitoba." (p4 para. 3) It is recommended that …"Manitoba Hydro provide maps that show all existing hydroelectric reservoirs in Manitoba." (p4 para. 6)	These maps are already provided in each of the EIS submissions (see Figure 4.1-1 in Section 4, Volume 1 of the Generation EIS and as Figure 1.3 of Section 1, Volume 1 of the Transmission EIS). Descriptions of these existing facilities are found in Section 4.1, Volume 1 of the Generation EIS and Section 1.3.2, Volume 1 of the Transmission EIS. Further, Figure 5.1 in Chapter 5, Volume 1 of the NFAAT submission provides an overview of the Manitoba Hydro System and Section 5.2.1 of this chapter describes existing Manitoba Hydro generation facilities in Manitoba.
CNF-S-11	p4 (4)		"Rules" regarding GS project modes of operation not provided	"The "rules" regarding generation project modes of operation are referred to but not provided."	Volume 1 of the Generation EIS, Section 4.5.1 describes the proposed generation plant outflow regime under normal conditions, deviations from normal (estimated to occur in the long-term 2.5% of the time) under low-flow conditions and high or unusual power demands, and a potential emergency scenario (under low-flow conditions and co-incident failure of Manitoba Hydro's DC transmission system). It is stated (page 4-31) that the duration of sustained outflow change will be limited by the Birch Tree Lake daily fluctuation guideline. Section 4.5.2 describes upstream water levels, including the water level regime on Wuskwatim Lake under normal (estimated to occur in the long-term 97.5% of the time) and abnormal conditions. The final rules regarding project operation are typically defined during the Water Power Act approval process.
CNF-S-12	p4 (7)		Need for status summary of existing generation projects	It is recommended that Manitoba Hydro provide…"a detailed summary of the status of existing generation projects in terms of age, remaining lifetime in comparison to initial lifetime estimates, and in terms of any associated decommissioning plans. Reconstruction, repair, upgrade plans should be provided for the generation station and associated reservoirs."	The EIS describes the existing generation system as requested in the EIS Guidelines and as appropriate for assessment of the Wuskwatim Generation Project. Please also see response to CNF-S-10, including reference to the NFAAT submission.
CNF-S-13	p4 (8)		Need for mapping of all future projects referenced in EIS	"It is recommended that mapping for all future projects referenced in the EIS be included."	Descriptions and possible locations of potential future projects referenced in the EIS are provided in Section 2.3, Volume 1 of the Generation EIS and Section 2.4, Volume 1 of the Transmission EIS. Mapping of potential future projects is only possible for those projects where locations are determined - e.g., the Wuskwatim Transmission Lines and proposed Generating Station projects. It is not possible to concisely map other potential projects and activities included in the EIS (e.g., Bipole III; future forestry activities; climate changes) since their exact locations have yet to be determined. A map showing potential generation sites is already provided as Figure 4.1 in Chapter 4, Volume 1 of the NFAAT submission. There are also some maps in Volume 10 of the Generation EIS.

Comnt. No.*	Nature of CNF Review Comments		Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
	Page (Para)				
	Generation Project	Transmission Project			
CNF-S-14	p18 (1) & p19 (1)		Access Management Plan not part of EIS	The lack of inclusion of an Access Management Plan in the EIS "…is considered as a major deficiency…given the significant role that the plan is expected to play in mitigating potential adverse effects…" (p18 para. 1) "It is recommended that Manitoba Hydro be required to provide a separate Access Management Plan for the construction phase and operation phase for consideration prior to project approval"...and that MB Hydro "submit the completed plans for public review and comments (i.e. not just the stated goals and/or objectives)" (p19 para. 1).	See responses to MBCons (BM)-S-1 to S-3 (See Table 1).
CNF-S-15	P18 (2, 1st sentence) & (6)		Inadequate description of access road routing options	"…the EIS does not indicate whether there was any effort to design the access road parallel with required Segment 1 (S1) transmission line to south of Thompson (either via PTH 391 or directly to PTH 6)." (p18 para. 2) "It is recommended that Manitoba Hydro provide a completed assessment of alternative access road routes that parallel the preferred Segment 1 (S1) transmission corridors as per the proposed Wuskwatim Transmission Project" (p18 para. 6).	Following selection of a preferred access road route, the option of routing the Segment 1 (S1) transmission line along the preferred access road route was reviewed and considered to be impractical. An access road parallel to the preferred transmission line in segment 1 would require a major crossing of the Burntwood River in order to develop the construction camp and dam site as proposed. See also response to CNF-S-23 and 25. Note also that an access road parallel to the preferred transmission line in Segment 1 would require a major crossing of the Burntwood River in order to develop the construction camp and dam site as proposed.
CNF-S-16	p18, (3, second sentence) & p19 (2)		Access road ROW width not explained	"There is no sufficient explanation of why a width as large as 100m is necessary." (p18 para. 3) "It is recommended that Manitoba Hydro provide a sufficient explanation as to why the proposed access road requires a 100-meter right-of-way." (p19 para. 2).	The primary reason for a 100-metre right-of-way is to provide an adequate width for the roadbed, and associated drainage infrastructure, and operation. During construction, it also provides for stockpiling brush cuttings, topsoil, and snow during road construction while at the same time giving large construction machinery the room to pass safely and carry on their work while the primary grade is being built. Further, the larger width provides the contractor the opportunity to "borrow" a greater amount of construction material without having to disturb areas outside of the right-of-way.
CNF-S-17	p18 (4)		Access road route through enduring features	"No natural region or enduring features representation specifics are provided".	A meeting was held with Manitoba Conservation, Parks and Natural Areas (January 21, 2002) to discuss natural areas and enduring features related to access road routing. Information provided by representatives of Manitoba Conservation, Parks and Natural Areas was used to assist in the assessment of the Wuskwatim GS with respect to protected areas and enduring features, as indicated in Vol. 7.0, Sec. 9.0, p. 9-1 to 9-2. Maps of enduring features related to the access road area generated by Manitoba Conservation are provided in Appendix C (Figure CNF-S-17).
CNF-S-18	p18 (5, 1st sentence), (7)		Inadequate details regarding Alternatives Committee role, meetings, etc. re: access road	"Despite the significant role of the Alternatives Committee, the EIS does not provide details on who sits on [the Alternatives Committee], its history of meetings, and the basis of how it makes its decisions." (p18 para. 5) "Manitoba Hydro should also be required to provide details of the meetings held by the Alternatives Committee (i.e. record of meetings and minutes)..." (p18 para. 7).	A description of the composition of the Alternatives Committee and the process of route selection is found in Appendix 2 of Volume 3. Recommendations concerning preferred alternative selection were made to NCN Chief and Council and MB Hydro and were based on criteria identified in Appendix 2 (Volume 3). No formal minutes were kept; the results of the meetings are reflected in the proposed routes as outlined in the EIS.

Comnt. No.*	Nature of CNF Review Comments		Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
	Page (Para)				
	Generation Project	Transmission Project			
CNF-S-19	P43 (2)		No effects description of decommissioning, environmental rehabilitation plan or plan for major component replacement	"The EIS does not provide a description of the anticipated environmental effects associated with a decommissioning and an environmental rehabilitation scheme (EIS Guidelines Section 2.3.1), nor is there a plan that details the replacement of any major components."	See response to CNF-S-9
CNF-S-20		p3 (1 & 7), p. 21 (par.	Lack of adequate line segment justifications	Within the EIS, "Each line segment is presented as if it requires all of the others." (p3 para.1) "It is recommended that Manitoba Hydro provide transmission line design concept plans for the Wuskwatim Generation Project components that do not include direct or indirect connections to the Herblet Lake Station (i.e. Snow Lake)." and "...should also provide a sufficient description of their regional transmission system requirements and specify whether the existing system has the capacity to handle additional 200MW of power as generated by the proposed Wuskwatim Generation Project." (p3 para. 7) “A main limitation of the transmission corridor selection process was that it was entirely based on the underlying objective of connecting the Wuskwatim Project to the hydro grid at Thompson (i.e., Birchtree Station), at Snow Lake (Herblet Lake Station) and at The Pas (Rall’s Island Station). As a result, within the Wuskwatim Lake area, a total of three linear disturbances are proposed (i.e., S1, S2, and the proposed access road as per the Wuskwatim Generation Project).” P. 21 (par. 1).	See Appendix C (Attachment CNF – S – 20 to 25).
CNF-S-21		p3 (4), p4 (3, 4)	Inadequate justification for the need for S2 and S3 line segments	"Manitoba Hydro does not go far enough to provide adequate/sufficient justification of the need for S2 and S3 beyond brief mention in Volume 1 Section 3.1.2." (p3, para. 4) "Manitoba Hydro should …submit particulars…on its stated commitment to build S3...should include sufficient details that explain the need for the project and the timing of construction / in-service date." (p4 para.3). “Manitoba Hydro should apply its sustainable development and conservation policy framework to establishment of protected areas in the combined project areas/regions for the projects. This would include supporting NCN in nominating lands to be protected, while identifying options in the projects region the utility would support for protected status.” (p. 4, para. 4).	See responses to CNF-S-20 to S-25 (Appendix C).

Comnt. No.*	Nature of CNF Review Comments		Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
	Page (Para)				
	Generation Project	Transmission Project			
CNF-S-22		p3 (5, 6) & p4 (2, 3)	Notigi and East-West Power Grid not included in cumulative effects assessment	"…the EIS states that the development of generation at Notigi "would require the development of an additional 230 kV line between Herblet Lake Station and Grand Rapids"…and "could involve an additional transmission line between Notigi and either Thompson, Wuskwatim, or Herblet Lake." (p. 3, para. 5). "…Manitoba Hydro does not provide any further preliminary design details for the Notigi Generation Project nor does it even reference the planned East-West Power Grid. Neither project is included as part of a cumulative effects assessment." (p3, para. 6) "Manitoba Hydro should provide preliminary designs, plans and concepts that is has for the transmission lines and related facilities associated with the Notigi Generation Project and the 'East-West Power Grid'. This information is considered relevant for assessing the cumulative effects of increased transmission development in the affected regions." (p4 para. 2). "Manitoba Hydro should also be required to submit particulars that elaborate on its stated commitment to build S3 at some future point independent of the Wuskwatim Transmission Project (as currently posed). Particulars should include sufficient details that explain the need for the project and the timing of construction/in-service)." (p.4, para. 3).	The possible development of the Notigi G.S. and associated transmission facilities was considered in the CEA (Volume 1, pages 2-17 to 2-18;7-96 to 7-97). As there are no firm plans and commitments to develop an east-west power grid, this is too uncertain to be included in the CEA. See EnvCan - S-16 and 17 and Appendix C (Attachment CNF–S-20 to S-25).
CNF-S-23		p21 (2, 1st and 2nd sentences & 3)	Some linear corridor options not considered in EIS	"The EIS does not include an assessment of alternative scenarios with single or double width linear disturbances. It only assesses two of the three linear disturbances (i.e. Segment 1 and 2)." (p21 para. 1) "Unexplored options include an alignment east to PTH #6 and then north to Birchtree or in accordance with the mile 5 access road. The other two transmission segments could be cancelled or...postponed." (p21 para. 3).	The environmental impact assessment of the proposed routes includes the effects of the shared right-of-way for the Wuskwatim to Herblet Lake Station transmission lines. This is outlined in Volume 1, Chapter 7.0. To identify routes for the proposed transmission lines, a Site Selection and Environmental Assessment (SSEA) process was undertaken. Though this process, initial consideration was given to routing the proposed Wuskwatim to Thompson 230 kV transmission line north of the Burntwood River, in proximity to the access road. An alternative route along PTH 6 was also examined. The rationale for the routes selected is outlined in chapters 5.0 and 6.0 of the EIS Volume 1. See response to CNF-S-20 to 25 (Appendix C).
CNF-S-24		p21 (2, 3rd sentence) & P22, (2)	Access road not assessed in T-line EIS in combination with impacts of other linear disturbances in the region	The EIS "…does not assess the access road…and therefore does not sufficiently assess the overall impact on the Wuskwatim Lake region as a result of these linear disturbances." (p21 para. 2) "It is recommended that Manitoba Hydro be asked to provide a fuller set of alternative scenarios that include one and two model linear disturbances for the Wuskwatim Lake region with linkages with the proposed access road as per the Wuskwatim Generation Project." (p22 para. 2).	The cumulative effects of both developments were considered together. This assessment looked at all components of the Generation and Transmission Projects, including the proposed transmission lines and the access road.

Comnt. No.*	Nature of CNF Review Comments: Page (Para) Generation Project	Page (Para) Transmission Project	Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
CNF-S-25		p21 (7) & p22 (3 1st sentence)	Insufficient justification for the elimination of Option C	"The EIS does not provide sufficient justification for [the elimination of] S1 Option C." (p21 para. 7) "It is…recommended that Manitoba Hydro provide justification for the elimination of S1 Option C from detailed consideration…" (p22 para. 3).	The comparison of Option C (Wuskwatim to Thompson 230 kV transmission line) is outlined in Volume 1, Section 6.2.1. As noted in the EIS, three preliminary options for this proposed line were compared on the basis of effects on the project (cost and technical), people and the environment. Page 6-26 outlines the rationale for eliminating this option from further consideration. This option was not favored by NCN and entailed a cost penalty. It is noted that Manitoba Hydro has not made a decision "to forgo developing access management plans for affected regions". As described in the EIS, the intent is to develop access management plans for transmission line rights-of-way where there is community or local concern. In the case of Segments 1 and 2 within the Nelson House RMA, NCN has expressed such a concern and it is intended to prepare an access management plan.
Land & Resource Use					
CNF-S-26	p7 (1, 6 & 7)	p7 (1, 6 & 7)	Mapping deficiencies (re: areas of special interest)	"The Wuskwatim Generation Project EIS does not provide separate large map folios of the Wuskwatim region. The many large maps included within the Wuskwatim Transmission Project EIS do not indicate that Partridge Crop Hill is an Area of Special Interest (ASI). Rather Partridge Crop Hill is listed only as a proposed ecological reserve. These maps also do not indicate the location of the proposed all-weather access road." (p.7 para. 1) "It is recommended that Manitoba provide large folio maps as part of the Wuskwatim Generation Project EIS materials." (p.7 para. 6). "It is also recommended that Manitoba Hydro correct the current deficiencies with its large folio maps as part of the Wuskwatim Transmission Project EIS (i.e. identify Partridge Crop Hill as an ASI as well as identify Wuskwatim Generation Project proposed access road)." (p.7 para. 7).	A map of scientific study sites, Generation Project components, and Partridge Crop Hill is provided in Vol. 7.0, Sec. 9.0, p. 9-3, Figure 9-1. Partridge Crop Hill is acknowledged as an ASI in the Wuskwatim EIS supporting Vol. 7, Sec. 9.1, p. 9-2: "...an ASI has been identified around and including Partridge Crop Hill and extending northwards to the Burntwood River and east to Wuskwatim Lake." Maps provided by Manitoba Conservation, Parks and Natural Areas (R. Schroeder and H. Hernandez 2002) indicating enduring features and protected areas and the access road are provided as attachment (see also response to CNF-S-1). In the Transmission Project EIS, Partridge Crop Hill is identified on the Geographical Information System maps as a "Proposed Ecological Reserve". This was an error in labeling. The legend should read "Area of Special Interest/Proposed Ecological Reserve". The error has been noted respecting Partridge Crop Hill and will be corrected on any new mapping. See response to CNF – S – 1 and S - 2.
CNF-S-27		p8 (4, 7) & p45 (4)	Mapping deficiencies (re: areas of special interest)	"The large maps…do not accurately represent current ASIs in the project region, nor do they accurately reflect the status of Amisk Park Reserve." (p8 para. 4) "It is recommended that Manitoba Hydro correct deficiencies with its large maps with specific reference to the ASIs in the project region." (p8 para. 7) "The large maps do not indicate that Partridge Crop Hill is an Area of Special Interest (ASI), nor do they appropriately include other ASIs." (p45 para. 4).	The Amisk Park Reserve is located north of South Indian Lake and encompasses a small portion of the Nelson House Resource Management Area. The park reserve is removed from the project area. ASIs within the project area are included on the maps in Volume 1, Appendix 1. The error with respect to the labeling of Partridge Crop Hill has been noted, as outlined in the above response CNF-S-26.
CNF-S-28	p18 (5, last sentence) & p19 (3)		Mapping deficiencies (re: preferred and alternative access road routes)	"…the EIS does not provide sufficient maps with detail, scale, and capacity to illustrate the preferred route and the many alternatives in relation to the various VEC components including other significant land and resource values." (p18 para. 5) "Protected area and both natural region and enduring features representation information should be provided, with mapping, in respect to route options." (p19 para.3).	See response to CNF-S-1 and CNF-S-17.

Comnt. No.*	Nature of CNF Review Comments				Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
	Page (Para)		Issue	Summary of Comments	
	Generation Project	Transmission Project			
CNF-S-29	p7 (2, 8)		Insufficient detail on expected outcome of 7 NCN TLE selections	"The EIS does not provide adequate detail on the expected outcome of the seven NCN TLE selections within the project area. The EIS, in a number of other instances, has freely speculated on the consequences to particular VECs in relation to uncertain events. However, the EIS does not offer speculation on the issue of NCN TLE land selections. This is quite deficient given the fact that the entire Wuskwatim Generation site is located on one of these seven NCN TLE land selections." (p7 para. 2) "It is recommended that Manitoba Hydro provide extended detail as to the current state of the seven NCN TLE land selection within the Wuskwatim Lake region. Details should include an assessment of whether these lands will be approved and when such lands will be transferred over to federal jurisdiction and then made into actual Reserve Lands. Information should also be provided on the potential consequences, and likely outcomes, associated with NCN's TLE land selection at the proposed Wuskwatim Generation Project site.	See response to Mb ANA - S-1 (Table 1).
CNF-S-30	p43 (5)		Implications of TLE land selections not sufficiently described	"The EIS does not sufficiently describe the implications of Treaty Land Entitlements (TLE) land selections by NCN at the proposed generating site (i.e., TLE as a land and resource-related agreement as per EIS Guidelines Section 2.3.2)."	See response to Mb ANA - S-1 (Table 1)
CNF-S-31		p46 (4)		"The EIS does not sufficiently describe the implications of Treaty Land Entitlements (TLE) land selections by NCN and …OCN in relation to these land selections and the proposed routes which cross them (i.e. TLE as a land and resource agreement) as well as the Northern Flood Agreement (NFA) with particular reference to Articles 9.1 and 9.2 (EIS Guidelines Section 2.3.2)."	See response to Mb ANA - S-1 and also CNF-S-56
CNF-S-32		p8 (8)	Need detail on current status of TLE land selections	"It is recommended that Manitoba Hydro provide sufficient detail on the current state of the three TLE land selections within the project region that they propose to cross with the proposed transmission line routes. Details should include an assessment of whether these lands will be approved and when such lands will be transferred to federal jurisdiction and become actual Reserve Lands. Information should also be provided on the potential consequences, and likely outcomes, associated with NCN's TLE land selection at the proposed Wuskwatim Generation Project site."	See response to Mb ANA - S-1. It is not the proponent's mandate to speculate whether these lands will be approved and when they will be transferred to federal jurisdiction and become Reserve Lands.

Comnt. No.*	Nature of CNF Review Comments: Page (Para) Generation Project	Page (Para) Transmission Project	Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
CNF-S-33	p7 (3) & p8 (1)		Insufficient detail on assessment and status of enduring features	"The EIS does not provide a complete assessment of enduring features analysis within the affected region nor does it provide a status of the process of identifying enduring features. It is assumed that a process of identifying and classifying enduring features has begun given the brief discussion and preliminary conclusions made in relation to the identified enduring features associated with the proposed access road route." (p7 para 3) "It is recommended that Manitoba Hydro include a completed enduring features analysis on all access road route alternatives as well as for the project region as a whole. Should Manitoba Hydro not possess a completed enduring features analysis, it is recommended that Manitoba Hydro provide all information that is has on the subject." (p8 para. 1).	Enduring features were considered in the routing of the access road. The chair of the Alternatives Committee met on January 21, 2002 with Manitoba Conservation, Parks and Natural Areas to review and assess the alignment of the preferred routes for the access road as it relates to enduring features, prior to the Alternatives Committee making its recommendation to NCN Chief and Council and MB Hydro. See response to CNF-S-17.
CNF-S-34	p7 (5)		Premature conclusions / underscores values of enduring features	"The EIS makes what can be construed as premature conclusions with respect to the significance of the enduring features identified along the proposed access road route. It seems that the EIS attempts to underscore the value of certain enduring features by referring to the existence of similar enduring features within the Amisk Park Reserve boundaries."	Conclusions were made following review and analysis of the preferred route by Manitoba Conservation, Parks and Natural Resources.
CNF-S-35	p7 (4) & p8 (2)		Impacts on protected areas, and mitigation, are not detailed	"Effects on protected areas are not detailed in the EIS in relation to 'impacts and mitigation'." (p7, para. 4) "It is also recommended that a decision on the project (with its current proposed access road route) be deferred until a final decision has been made with respect to protected areas and caribou management plan within the region." (p8, para. 2).	There are no protected areas in the terrestrial habitat assessment sub-region. Decisions made regarding the project, protected areas, and a caribou management plan are the responsibility of various regulatory authorities, government agencies, and/or the First Nations.
CNF-S-36	p43 (10)		Impacts assessment not done for Areas of Special Interest	"The EIS speculates on the future status on certain Area of Special Interests (ASIs) but does not actually evaluate project-specific impacts on the Partridge Crop Hill ASI or any other ASI in the project region or natural regions impacts (EIS Guidelines Section 7.0)."	Partridge Crop Hill proposed ecological reserve borders on the west shore of Wuskwatim Lake. It is the only ASI in the GS project region. The potential effects of the project on this ASI were assessed indirectly in the terrestrial habitat assessment (Vol. 6, Sec. 5). The Partridge Crop Hill ASI was directly considered in the cumulative effects assessments for terrestrial habitat (Vol. 6., Sec. 5.6.1, p. 6.5-249 to 6.5-252) and mammals (Vol. 6, Sec. 9.6, P. 9-139 to 9-142).
CNF-S-37		p4, (4)	Need to support establishment of protected areas	"Manitoba Hydro should apply its sustainable development and conservation policy framework to establishment of protected areas in the combined project areas/regions for the projects. This would include supporting NCN in nominating lands to be protected, while identifying options in the projects region the utility would support for protected status."	Manitoba Hydro's sustainable development principles are intended to link its responsibilities for supplying electricity, protecting the environment and human health, and contributing to the competitiveness of Manitoba's economy. It is beyond Manitoba Hydro and NCN's mandate, as the proponents of this project, to establish protected areas in the project area.

Comnt. No.*	Nature of CNF Review Comments: Page (Para) Generation Project	Page (Para) Transmission Project	Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
CNF-S-38		p8 (1, 2, 3, 5, 6)	Insufficient detail on impacts to Tom Lamb WMA and other protected areas	"The EIS does not provide sufficient detail on the impacts to the Tom Lamb WMA as a result of the proposed route for segment 3 (I.e. within its boundaries)." (p8 para. 1) Manitoba Hydro should "…assist in identifying potential impacts to prospective protected areas with in the project region." (p8 para. 2) "The EIS does not provide sufficient detail ...on the impacts to the Clear Water Lake Provincial Park." (p8 para. 3). "It is recommended that a decision on the project (with its current proposed access road route) be deferred until a final decision has been made with respect to protected areas status within the Tom Lamb ASI". (p. 8, para. 5). "The EIS requires a specific 'segment analysis' for each 'site crossing' of a significant land designation (both existing and proposed...) such as the proposed crossing of the Clear Water Lake Provincial Park and Tom Lamb ASI/WMS." (p8 para. 6).	The EIS Volume 1 for the transmission project provides an assessment of potential environmental impacts for the full extent of the proposed routes regardless of their location relative to existing or potential ASIs. Volume 1, Chapter 7.0 also specifically outlines the impacts of the proposed project on the Tom Lamb WMA/ASI and Clearwater Lake Provincial Park in relation to the special policy status associated with those designations. Both the alternative and proposed routes for the Herblet Lake to Rall's Island Stations 230 kV transmission line were reviewed and discussed with government representatives, as well as the public and interested parties during the PIP. It is anticipated that Manitoba Hydro will enter into more detailed discussions regarding the route alignments through these areas. Further liaison and meetings with the IRMT regarding the route alignment in these areas is also anticipated. See also response to CNF-S-37.
CNF-S-39		p8 (9)	Status reports re: protected lands needed to augment EIS	"Full natural region status reports in respect to protected lands, and both enduring feature and natural region representation - worked up with Manitoba Conservation assistance - should be filed to augment the EIS. This status report should include fragmentation and linear disturbance impacts in relation to the potential to complete protected areas representation in the project region."	See response to Mb Cons (BM)-S-15 and CNF-S-6.
CNF-S-40		p21 (5) & p22 (5)	Insufficient detail on potential impacts to protected or proposed protected areas	"The EIS does not provide sufficient detail on the potential impacts to Clear Water Lake Provincial Park as a result of the Proposed 10-kilometer S3 breach." nor "…sufficient detail on the potential impacts to the Tom Lamb Wildlife Management Area (WMA)/Area for Special Interest (ASI) as a result of the planned 47-kilometre S3 breach."(p21 para. 5) "Manitoba Hydro should also provide a detailed impact assessment on the effects on Clear Water Lake Provincial Park and the Tom Lamb WMA/ASI." (p22 para. 5).	See response CNF-S-38.
CNF-S-41		p45 (5)	Mapping and text need to include Env. Canada eco-region framework as the basis for protected areas	"The Manitoba natural region or Environment Canada eco-region framework for the project region is absent from maps. As the Manitoba natural regions are the basis for protected areas design, consultations and decisions, and the EIS text includes reference to enduring features, both mapping and text need correction."	Maps showing the ecodistricts, ecozones and ecoregions are contained in the EIS, Volume 1 (Figure 4.5), and supporting Volume 5 (Figures 2.4 and 2.5).
CNF-S-42		p47 (2)	Impacts to Manitoba's Protected Areas Initiative not addressed	"The EIS does not address the effects of the project on Manitoba's Protected Areas Initiative (EIS Guidelines Section 8.0)."	As indicated, the EIS does not speculate as to the effects of the project on the overall Provincial Protected Areas Initiative. The EIS does not address impacts on existing and potential protected areas to the extent that these have been designated. The proposed routes cross through one ASI for a distance of approximately 47 km. Of this, approximately 16 km parallels a rail line. Potential effects of the project on Tom Lamb WMA/ASI and Clearwater Lake Provincial Park are discussed in Volume 1, Chapter 7.0.

Comnt. No.*	Nature of CNF Review Comments		Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
	Page (Para)				
	Generation Project	Transmission Project			
CNF-S-43	p32 (3, 7)		Need for Access Management Plan to fully assess impacts re: resource users	"Missing from the EIS is a range of scenarios that vary the level of access to the region (from worst case scenario to best-case scenarios) and the associated effects on the resource users". (p32 para. 3) "Given the determining role of the Access Management Plan, it is recommended that the plan be developed and submitted as part of the EIS"…and…"undertake a multiple scenario analysis on effects to resource users based on a range of high-low access scenarios." (p32 para. 7)	See responses to MbCons (BM)-S-1, 2 and 3 (Table 1).
CNF-S-44		p21 (6)	Lack of adequate access management plans	"Manitoba Hydro's position not to develop access management plans unless requested by affected communities raises significant concerns in the ability to protect wildlife and wildlife habitat in the affected regions especially in the winter months when access concerns are at their highest, or during construction activities before a plan is in place."	Because of the remote location and difficult terrain associated with much of the transmission line routes, access opportunities, even in winter conditions are limited. To the extent that increased access opportunities may be at issue, Manitoba Hydro believes that community and local guidance will otherwise ensure appropriate attention to access management's requirements. Manitoba Hydro and NCN have committed to preparing access management plans for the transmission lines which cross through the Nelson House Resource Management Area prior to clearing and construction of the transmission lines. In areas outside the Nelson House RMA, where the issue of increased access is important to a community, an access management plan will also be prepared prior to clearing and construction. A similar approach will be applied in any case of access concerns being raised by other communities in the vicinity of the transmission lines. The plan(s) will identify access management objectives, the approach during Project construction and operation, means of communicating the plans to all parties, and a monitoring program to ensure access issues are being addressed. The latter should ensure any unresolved issues are identified. The plan(s) will be developed in consultation with directly affected communities and the appropriate Integrated Resource Management Team.
CNF-S-45	p32 (5, 3rd sentence)		No reference to costs/risks re: Tourism	"…the benefits resulting from increased access and the absence of risk from increased access by tourism are highlighted in the EIS, without any reference to costs or risks from these activities."	Volume 7, Section 8.3 references the potential disbenefit of more people visiting the area during the operations phase. No increase in access for tourism is expected during the construction phase.
CNF-S-46	p33 (3) & (2)		Need for land use / watershed plan before project is approved	"It is also recommended that Manitoba Conservation and the Nelson House Resource Management Board (RMB) place a moratorium on forestry activities in and around the Wuskwatim Lake region until a sufficient long-term land use plan and/or caribou management/protection plan are established." (p33 para. 2) Recommended that the projects should be deferred…"until after a sufficient land use plan / watershed plan is put in place." (p33 para. 3)	The moratorium recommendation is made to Manitoba Conservation and the Nelson House Resource Management Board rather than the proponents. There are currently no forestry activities in the area. It is not within the mandate or authority of the proponents to design, execute, or manage land or watershed planning.
CNF-S-47		p22 (1 2nd sentence) & p22 (3 2nd sentence	Exclusion of recent motorized access along t-line report	"The EIS does not include a copy of the recent study respecting motorized access along transmission line ROW (Wildlife Resource Consulting Services MB Inc. et. al. 2003)." (p22 para. 1) "Manitoba Hydro should be required to provide a copy of the 2003 study concerning motorized access along transmission line right-of-ways (Wildlife Resource Consulting Services MB Inc. et. al.)." (p22 para. 3)	The EIS and supporting volumes do not include a copy of the study regarding motorized access along transmission line rights-of-way as this research is not specific to the project, but examines existing transmission line rights-of-way throughout the Province. A copy of the report will be provided to CNF; copies are otherwise available by contacting Manitoba Hydro.

Comnt. No.*	Nature of CNF Review Comments		Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
	Page (Para)				
	Generation Project	Transmission Project			
CNF-S-48		p36 (1 & 7)	Need for inclusion of detailed meeting notes re: resource users	"The EIS does not provide details of…meetings…held with resource users from the affected communities…" (p36 para. 1) "It is recommended that Manitoba Hydro provide detailed notes from its meetings with individuals associated with the communities of Snow Lake, Cormorant, Nelson House (i.e. Northern Affairs community), Opaskwayak Cree Nation, Wabowden, and Thicket Portage." and that "...these notes be put in a similar format as the notes provided in the Wuskwatim Generation EIS." (p36 para. 7)	Meeting notes were taken during the PIP meetings for the project. A summary of each of the meetings is provided in the Chapter 5.0 of the EIS (Volume 1) as the PIP was a key component of the transmission line routing process. The summary includes all issues of importance to the identification and comparison of alternative routes, and the identification of proposed routes, and describes how the PIP influenced the route selection process.
CNF-S-49		p36 (2)	No details provided on the proposed Transmission Development Fund (TDF) re: trappers	"The EIS…does not provide details on the proposed Transmission Development Fund (TDF) in relation to the impacts on trappers as a result of the project."	Impacts on trapping are anticipated to be limited to potential short-term disturbances during construction activity. Manitoba Hydro has a trapline compensation policy, which will be discussed with trappers affected by the proposed project. This is separate from the enduring benefits (transmission development fund) program. Manitoba Hydro will discuss the latter with affected Aboriginal communities whose traditional use areas may be traversed by the proposed project and will discuss the trapline compensation policy with the affected trappers.
CNF-S-50		p45 (3)	Need for documentation of individual trapline boundaries	"The large maps do not provide documentation of individual trapline boundaries."	Table 7.7 of the EIS, Volume 1 lists the registered traplines which are crossed by the proposed transmission line routes. As the proposed routes cannot avoid crossing registered traplines, the boundaries were not mapped. However, contacts with trappers both during the route selection process and with respect to compensation program are based on the registered trapline holders. Maps showing the traplines are available from the Province.
CNF-S-51		p47 (1, 1st sentence)	Impacts re: resource use and trapping not clear	"The EIS fails to clearly outline impacts regarding resource use and trapping."	Impacts to resource use and trapping are outlined in the EIS, Volume 1, Section 7.2.3.2 and supporting volume 6, section 6.2.1. See also response CNF-S-49.
CNF-S-52		p36 (3)	Clarification needed re: "INCO strip" forest section	"It is not clear what the "INCO strip" forest section is."	See supporting Volume 5 (page iii, Section 4.5 and Figure 4.2).
CNF-S-53		p36 (5)	Clarification needed re: forest productivity definition source	"Clarity as to the source for Manitoba Hydro definitions of productive forest, non-productive forest is required."	See supporting Volume 5 (glossary of terms and Chapter 3.0). The definitions are based on Manitoba Conservation Forest Resource Inventory data.
CNF-S-54		p36 (6) & (8)	Dated FRI information	"Sources for forest resource inventory information are dated." (p36 para. 6) "Manitoba Hydro needs to update its forest resource inventory data with the status of these FMUs / forest sections now. (7-year report may include data older than 7-years, and not include changes since 1996, such as fires." (p36 para. 8)	Manitoba Conservation is responsible for the Forest Resource Inventory (FRI data) and its update. FRI data is the most detailed information available in the Province. During the field studies, some sites were ground checked and compared to the FRI for accuracy. The fire history information for the surrounding area was updated to 2001.

Comnt. No.*	Nature of CNF Review Comments: Page (Para) – Generation Project	Page (Para) – Transmission Project	Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
Public Consultation					
CNF-S-55	p13 (1) & p14 (2, last sentence)	similar points (i.e. wording) as indicated on p15,16 and 17	Limited timing and location of public consultation activities	Public consultation activities "…have generally been limited to the communities selected by Manitoba Hydro. There have been no meaningful consultation activities (Open Houses or otherwise) for Winnipeg until Round Three. As a result, many individuals and/or organizations did not have meaningful opportunities to review the proposed Wuskwatim projects at the critical early stages. The first meaningful opportunity in Winnipeg was in Round Three after the preferred routes had already been chosen." (p13 para. 1).	The EIS describes meaningful opportunities for individuals and/or organizations in Winnipeg to review the proposed Wuskwatim Projects at the early stages before EIS documents were filed with regulators. In addition to the extensive information provided at public registry locations in Winnipeg and elsewhere since late 2001, and the Clean Environment Commission public meetings held in Winnipeg and in the north during February 2002 to review the Draft EIS Guidelines for these projects, Manitoba Hydro and NCN provided information on the Projects to the Manitoba Eco-network and interested member organizations during both Rounds One and Two of public involvement and consultation (see letter dated November 5, 2001 in Appendix 4 and letter dated March 19, 2002 in Appendix 5 of Volume 2 of the Wuskwatim Generation Project EIS). During Round One (November 2001), and in response to advice received by the organization, this information was provided to the Manitoba Eco-Network for distribution to interested member organizations. An offer was also made in Round One to the Manitoba Eco-Network for Manitoba Hydro and NCN to hold a meeting on the Wuskwatim Projects with Manitoba Eco-Network members if there was sufficient information. In Round Two a Wuskwatim Project Web site was developed and linked to the Manitoba Hydro Web site (www.hydro.mb.ca/wuskwatim). This Web site has been updated by Manitoba Hydro and NCN on a regular basis, and includes links to key documents prepared to date (e.g. newsletters, the Agreement-in-Principle, samples of community presentations and key documents submitted to the regulators). The Web site also includes a mechanism for the public to submit questions, comments or concerns. A Winnipeg ENGO Forum was held immediately prior to a Winnipeg Open House in January 2003 to review initial EIS findings with interested individuals and/or organizations. The forum and open house, which were held as part of Round Three before EIS documents were filed with the regulators on April 30, 2003, included opportunity to review and comment on proposed preferred routes in the context of all alternatives under review.
CNF-S-56	p13 (2) & p14 (1, 2)	similar points (i.e. wording) as indicated on p15,16 and 17	No description of consultation requirements	"The EIS does not describe the consultation requirements as per Section 35 of the *Constitution Act*, 1982 with Aboriginal Peoples in relation to the proposed project. The absence of this important reference is notable given that the June, 2003 minutes from a Technical Advisory Committee (TAC) meeting explicitly recognized a need to administer Section 35 consultations. The EIS does not describe Manitoba Hydro's role in these Section 35 consultation requirements. Furthermore, the EIS does not reference consultation requirements pursuant to Article 9.1 and 9.2 of the 1977 Northern Flood Agreement (NFA). " (p13 para. 2, except last sentence) "It is recommended that Manitoba Hydro provide a completed written analysis on the consultation requirements pursuant to Section 35 of the Constitution Act, 1982, the consultations pursuant to Articles 9.1 and 9.2 of	Manitoba Hydro regularly consults with First Nations and aboriginal communities about matters of mutual concern. The Public Information Plan for the Wuskwatim Project is illustrative of Manitoba Hydro's approach. It is described on Pages 1-14 of volume 2 of the Wuskwatim Generation Project EIS, and it is fully documented in the appendices of Volume 2. NCN and Manitoba Hydro have and will continue a consultation process with First Nations and aboriginal communities that is fair, reasonable, flexible and responsive to the needs of the parties involved. Certain consultations with Aboriginal people are required under Section 35 of the Canadian Constitution. Federal and Provincial governments are jointly undertaking appropriate consultations intended to be consistent with these requirements. The EIS prepared by Manitoba Hydro and NCN does not address these government consultations, beyond noting that both governments expect to undertake appropriate consultations during their respective decision-making process (see for example, Generation EIS, Volume1, Section 1.5.2).

Comnt. No.*	Nature of CNF Review Comments: Page (Para) Generation Project	Page (Para) Transmission Project	Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
CNF-S-56 (cont'd)	p13 (2) & p14 (1, 2)	similar points (i.e. wording) as indicated on p15,16 and 17		the"..."NFA"..."and compare these consultation requirements to its process completed to date." (p14 para. 1).	The EIS does reference consultation requirements pursuant to the 1977 Northern Flood Agreement (NFA); for example, see Generation EIS, Volume 1, section 1.5, footnote 10. Information on consultations specifically associated with Articles 9.1 and 9.2 of the Northern Flood Agreement is available in Volume 2 of the Generation EIS (see summary of activities tables in Appendix 4, 5 and 6, and also correspondence with the Cross Lake First Nation in Appendix 5 and 6). Note that the NFA has its own dispute resolution provisions and NFA disputes are outside the scope of this environmental assessment process.
CNF-S-57	p13 (2, last sentence) & p14 (2)	similar points (i.e. wording) as indicated on p15,16 and 17	No description of consultation-related definitions	While the EIS refers to what it calls "proper consultation" concerning Aboriginal people and communities it <u>does not</u> define what is "proper consultation" nor does it specifically make reference to Aboriginal and treaty rights. Also absent are definitions for important consultation terms such as 'meaningful', 'bona fide', and 'informed consent'. It is recommended that Manitoba Hydro provide a written definition of its term 'proper consultation' and other important terms that it has so far failed to reference in the EIS but are considered essential for addressing Aboriginal consultation requirements. These terms include 'meaningful', 'bona fide', and 'informed consent'. The EIS should also provide detailed information beyond a simple chronology of the various meetings and activities that took place within NCN about the projects.	The EIS summarizes the objectives of the Manitoba Hydro/NCN Public Involvement Plan filed with regulators in accordance with Section 4 of the EIS Guidelines (for example, see Generation EIS, Volume 1, Section 3.1), including objectives related to proper consultation with Aboriginal Peoples. The EIS sets out specific references to consultation requirements for Manitoba Hydro with NCN and other First Nations pursuant to agreements involving Manitoba Hydro. No attempt has been made in the EIS to provide definitions of the relevant legal terms set out in the CNF comment. Details on consultation and involvement activities with NCN and other Aboriginal communities can be found in Section 3 of Volume 1 of the Generation EIS and Chapter 5 of Volume 1 of the Transmission EIS. Extensive additional detail is provided in supporting volumes and/or appendices as noted in these sections. See also response to CNF-56.
CNF-S-58	p13 (3) & p14 (3)	similar points (i.e. wording) as indicated on p15,16 and 17	No consultation standards / guidelines provided	"An important component missing from the EIS is Manitoba Hydro consultation standards and/or operational guidelines for undertaking consultations with aboriginal people whose Aboriginal and/or treaty rights may be affected by the proposed project." …an important question is how these standards and guidelines (assuming they in fact do exist) are communicated to these consultants." (p12 para. 3) "It is recommended that Manitoba Hydro provide written information detailing any corporate principles, policies, programs, standards, guidelines, or practices that pertain to undertaking consultations with Aboriginal people whose Aboriginal and/or treaty rights may be affected by the proposed project." MB Hydro should also "...provide details of how these corporate principles, [etc. as above] are communicated to its team of consultants working on these projects." p14 para. 3).	Detail on Manitoba Hydro's and NCN's approach to undertaking consultations with Aboriginal communities potentially affected by the proposed Wuskwatim Generation and Transmission Projects can be found in the Wuskwatim Projects Public Involvement Plan (PIP). The PIP approach reflects the experience of both Manitoba Hydro and NCN, current practice and principles for consultations in the environmental assessment context, and current Public Participation Guidelines provided by Manitoba Conservation and the Clean Environment Commission to achieve effective and timely decisions and results which respect the knowledge, values and rights of all interested parties. It is Manitoba Hydro's practice to undertake consultations with First Nations and Aboriginal communities in a manner that is respectful and responsive to the needs of the particular First Nation and community. As such, each consultation will take on its own characteristics, based on the needs of a particular First Nation and community.
CNF-S-59	p13 (4) & p14 (4)	similar points (i.e. wording) as indicated on p15,16 and 17	Does not provide specifics of meetings with IRMT	The EIS …"does not provide the necessary specifics of the meetings with the Manitoba Conservation regional Integrated Resource Management Team (IRMT). " (p13 para. 4) "…it is recommended that Manitoba Conservation provide general details of the IRMT itself (i.e. membership list), as well as details on each of the meetings held that directly or indirectly relate to the proposed Wuskwatim projects." (p14 para. 4).	Meetings with the IRMT are summarized in the EIS, Volume 1, Chapter 5. As the IRMTs are comprised of representatives from Manitoba Conservation in each of its districts, membership lists would be available from Manitoba Conservation.

Comnt. No.*	Nature of CNF Review Comments				
	Page (Para)		Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
	Generation Project	Transmission Project			
CNF-S-60	p13 (5) & p14 (5)	similar points (i.e. wording) as indicated on p15,16 and 17	No documentation of community consent to project	"The EIS does not provide any documentation that affected communities have consented to the proposed project. There is also no reference or documentation on whether the Nelson House Resource Management Board (RMB) has approved the preferred access road route." (p13 para. 5) It is recommended that "...Manitoba Hydro provide any form of documentation such as official letters of support that confirms community approval of the proposed routes. If it does not have letters of other forms of documentation, Manitoba Hydro should state this explicitly in the EIS." (p14 para. 5)	NCN has been involved with Manitoba Hydro in joint planning activities as described in the EIS, and as provided for in the 1996 NFA Implementation Agreement, including development of an Agreement-in-Principle (AIP) and eventually a Project Development Agreement (PDA). As documented in the EISs, referenda involving all NCN voters at both the AIP stage and ultimately the PDA stage are preconditions for the Wuskwatim Projects to proceed at this time. (The AIP was ratified in 2001, indicating that members wanted to continue to the next stage of the Wuskwatim planning process. The relevant AIP documentation has been provided with the EIS, e.g. the AIP is provided in the Generation EIS, see Appendix 5 of Volume 8.) Nelson House RMB approvals have been, and will be, required as provided for in the 1996 NFA Implementation Agreement, e.g., the Nelson House RMB approved permits needed for exploratory activities related to the preferred access road selected by NCN and Manitoba Hydro. Manitoba Hydro and NCN have consulted with other potentially affected communities to provide information on the proposed Projects and to identify ways in which benefits associated with the proposed Projects can be enhanced and negative impacts can be reduced or mitigated. Some communities involved in the Transmission Project consultations, including NCN and OCN, have chosen to formally indicate their support of proposed preferred transmission routes in their areas. These cases have been noted in the Transmission EIS (Volume 1, Chapters 5 and 6).
CNF-S-61	p14 (6)	similar points (i.e. wording) as indicated on p15,16 and 17	Need for clarification of MB Hydro's role/responsibilities in consultation	"It is recommended that Manitoba Government and Federal Government provide public information as to the status of consultations required under Section 35 of the Constitution Act, 1982, and consultations required under Article 9.1 and 9.2 of the 1977 Northern Flood Agreement (NFA) regarding Wuskwatim. This information should be filed in the public registry files for the projects and include clarification of Manitoba Hydro's role/responsibilities in these consultations."	See response to CNF-S-56. This recommendation is made to the federal and provincial governments and not to the proponents.
CNF-S-62	P18 (7, last sentence)		Need for letters of support for proposed route	Manitoba Hydro should provide…"support letters or other forms of endorsement of the proposed routes by affected parties".	See response to CNF-S-60.
CNF-S-63		P17 (2)		Manitoba Hydro should provide…"any form of documentation such as official letters of support that confirms community approval of the proposed routes".	See response to CNF - S-60.
CNF-S-64	p43 (3)		Description of comments received from the public	"The EIS does not provide a description of the consideration of comments received from the public during the environmental assessment (EIS Guidelines Section 2.3.1 and Section 4.0)."	All concerns, questions and issues raised by the public were given careful consideration in the environmental assessment process, and as appropriate, incorporated into planning for the two Wuskwatim Projects. For related information pertaining to the Wuskwatim Generation Project see Volume 1, Sections 3.2 and 3.3.4. For related information pertaining to the Wuskwatim Transmission Project, see Volume 1, Chapter 5, Sections 5.2 and 5.3.
CNF-S-65		p46 (2)	Limited description of consideration of public comments	"The EIS provides a very limited description of the consideration of comments received from the public during the environmental assessment (EIS Guidelines Section 2.3.1 and Section 4.0)."	Chapters 5 and 6 of the EIS, Volume 1 outline the public involvement program and the evaluation of alternative routes for the proposed transmission lines. These chapters, in particular, outline how comments received during the public involvement program assisted in the identification of alternative routes and the selection of the proposed routes.

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CNF-S-66	p43 (6)	p46 (5)	Insufficient description of unresolved First Nation issues	"The EIS does not provide a sufficient description of the unresolved issues that have affected consultation activities with Pimicikamak Cree Nation (PCN), South Indian Lake, Nelson House Northern Affairs community, and Mosakahiken Cree Nation (MCN) (EIS Guidelines Section 4)	Both the Cross Lake First Nation and the community of South Indian Lake (SIL) are involved in separate and ongoing consultation work plan processes with Manitoba Hydro and/or NCN regarding the Wuskwatim Projects. The consultation work plans are designed to assist the communities in their review of the proposed Wuskwatim Projects and/or to address concerns associated with the Projects. Documentation of consultation activities undertaken with the Cross Lake First Nation can be found in Volume 1, Section 3 and in Volume 2 (see summary of activities tables in Appendix 4, 5 and 6, and also correspondence with the Cross Lake First Nation in Appendix 5 and 6). Documentation of consultation activities undertaken with the community of South Indian Lake can be found in Volume 1, Section 3 (Round One beyond NCN meeting with elected officials, and NCN community consultations including survey of members living in South Indian Lake) and in Volume 2 (see summary of activities tables). In addition, the majority of SIL residents are NCN members. Two community consultants have been communicating with the community regarding the project. Documentation of consultation activities undertaken with the Nelson House Northern Affairs community can be found in Volume 1, Section 3 and in Volume 2 (see summary of activities tables in Appendix 4, 5 and 6, and also meeting notes in Appendix 4 and 5). See response to CNF - S-69 for information pertaining to consultation activities undertaken with the Mosakahiken Cree Nation.
CNF-S-67		p16 (4)	Inconsistent participation opportunities for route selection input	"…NCN played a significant role in choosing the preferred routes of Segment 1 [and 2] of the proposed [T-line]. However a similar approach was not administered for Opaskwayak Cree Nation (OCN) or other affected Aboriginal communities…not given an opportunity to be part of a similar 'Alternative Committee'."	OCN, Cormorant, Snow Lake and Herb Lake Landing were an integral part of the transmission route identification and selection process through their respective areas of interest (see EIS, Volume 1, Chapters 5 and 6). The Alternatives Committee was formed because of potential partnership of NCN in the generating station project and assisted in review of siting and development alternatives for not just the transmission lines, but for generating station infrastructure. This committee became an effective way for NCN to participate in the routing process. Although "Alternatives Committees" were not formed with the other communities, there were numerous meetings and public open houses (the latter were also held in Nelson House) which facilitated input into the route identification and route selection process. Other communities were consulted with respect to how input into the route selection process would best be made.
CNF-S-68		P17 (3)	Explanation needed for unequal consultation for other affected First Nation communities	"It is recommended that Manitoba Hydro provide a written explanation of why other affected First Nation and Aboriginal communities were not given the same level of opportunity to manage the route selection process."	See response to CNF - S-67.
CNF-S-69		p17 (4)	Omission of Mosakahiken Cree Nation from certain consultation processes	"It is recommended that Manitoba Hydro provide details as to why Mosakahiken Cree Nation (MCN) was left out of the Round 1-3 consultation process given their presence within the PIP Project Region as well as their participation at the February 19, 2002 Clean Environment Commission (CEC) public meeting."	The Mosakahiken Cree Nation is not located within the Wuskwatim Project Region as originally defined, i.e., this community was not anticipated to see itself as being potentially affected by Project-induced biophysical changes from any component of the Wuskwatim Projects construction or operation. Nevertheless, MCN was not left out of the PIP consultation process after NCN/Manitoba Hydro learned that MCN had concerns about potential biophysical effects from the Projects. A response to the concerns/questions raised by the Mosakahiken Cree Nation during the February 19, 2002 CEC public meeting was provided to the community (see letter to Mr. Jerry Ron Campbell in Volume 2, Appendix 5). Mosakahiken Cree Nation Chief and

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	Page (Para)				
	Generation Project	Transmission Project			
CNF-S-69 (cont'd)		p17 (4)	Omission of Mosakahiken Cree Nation from certain consultation processes		Council were invited to a Round 3 open houses in Opaskwayak in order to discuss these concerns. A representative from the community also attended the Round Four technical EIS review workshops held in Winnipeg in July 2003.
CNF-S-70		p21 (4) & p22 (1 1st sentence)	Need for additional information regarding Alternatives Committee and membership	"…the EIS does not provide details on who sits on the committee, its history of meetings, and the basis of how it makes its decisions." and "…does not provide a justification of why other affected communities were not offered membership on this committee." (p21 para. 4) "The EIS does not include details of the meetings held by the Alternatives Committee nor does it provide copies of support letter or other documentation that demonstrate formal community support of the proposed routes." (p22 para. 1)	The role of the Alternatives Committee and a description of how it assisted in the route selection process in the Nelson House RMA is described in Volume 1, Chapter 6.0. See above responses regarding other communities (CNF-S-67).
CNF-S-71		p22 (4)	Need for details of Alternatives Committee meetings	Manitoba Hydro should provide…"details of the meetings held by the Alternatives Committee (i.e. record of meetings and minutes) as well as copies of support letters or other forms of endorsement of the proposed routes by affected parties".	See response to CNF-S-60 and 70.
Terrestrial Environment					
CNF-S-72	P18 (2, 6)		Linear disturbance, maps	…the EIS does not sufficiently assess the overall linear disturbance impact on the Wuskwatim Lake region (with the exception of a short discussion in relation to cumulative impacts). (p.18 para. 2) ...also..."...provide appropriate maps (1:50,000 and 1:250,000 scales) that fully illustrate and document all proposed activities (including transmission activities) within the project region. Such maps should also provide clear documentation of VECs (especially woodland caribou habitat, calving areas, and foraging areas)." (p18 para. 6)	A map, as described under CNF-S-1, is provided that includes the proposed access road and transmission lines. Study area and VEC-specific boundaries were not included in the map as this information has been provided in map format in the various volumes and sections of the EIS and supporting volumes. The Wuskwatim GS terrestrial habitat assessment includes Road Density as an overview indicator of linear disturbance. A number of specific indicators of access road effects on habitat were considered in Vol. 6, Sec. 5.4.1. None of these effects were significant after mitigation. The effects of linear disturbances on VECs are discussed in Volume 6, Section 9.4.1. Specific information on calving grounds, winter foraging areas, etc. for woodland caribou has not been provided as the information could be detrimental to the species (e.g., increased harvest).
CNF-S-73	P25 (1)		"Sub-region" unclear	"It is unclear what sub-region was used for the terrestrial environment assessment."	The sub-region used for the terrestrial environment assessment is the sub-region identified in the map that is referred to (Vol. 1, Sec. 7.3.1, p. 7-4, Figure 7.2.1) in the summary of the terrestrial environment provided in the submission from CNF (p. 20). As indicated in Vol. 1, Sec. 7.2, p. 7-3, the sub-region for the terrestrial environment assessment is "a block of approximately 340,000 ha centering on the proposed development site". Details regarding study areas for the various terrestrial environment disciplines are provided in the respective sections of Vol. 7.

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CNF-S-74	p. 25 (2, 8) p43 (8)		Insufficient wildlife habitat mapping	"The EIS does not provide sufficient maps to identify wildlife habitat in relation to the proposed construction site and the access road"…or …"on the habitat and wildlife disturbances of the two linear disturbances (transmission corridor ROWs) associated with the Wuskwatim Transmission Project." (p25 para. 2) "It is recommended that Manitoba Hydro and NCN be required to provide sufficient maps (1:50,000 and 1:250,000 scale) capable of clearly indicating the location of wildlife habitat, foraging areas and breeding/calving/winter grounds (especially with respect to woodland caribou and moose)." (p25 para. 8) "The EIS does not sufficiently identify "known habitat and critical areas for woodland caribou and moose, including wintering calving areas". (EIS Guidelines Section 6.3.2)." (p43 para. 8)	See CNF-S-1 and CNF-S-72 Habitat maps for VEC wildlife species are provided in Vol. 6, Figures. 9.3-1 to 9.3-14.
CNF-S-75	p. 43 (9)		Insufficient information on wildlife populations and uses	"The EIS does not provide sufficient information on all wildlife populations and uses (EIS Guidelines Section 6.3.2)."	The assessment approach and use of Valued Ecosystem Components (VECs) in the assessment is provided in Volume 6, Section 2.0. The rationale for selecting mammal VECs included consideration of the importance of various species to the resource users. A description of resource use of terrestrial wildlife species is provided in Vol. 7 (Sec. 2, 4, 7, and 8). Details regarding the selection of terrestrial mammal VECs is found in Volume 6, Section 9.2.2. Compilation of detailed information, corresponding analyses, and data evaluation were conducted on ten mammal VEC's. In addition, Table 9.3-1(Vol. 6, Sec. 9.3.1, p. 9-17) provides a list of all mammal species captured in the sub-region during the conduct of the baseline studies (2000-2002). Appendix 9.10 (Vol. 6, Sec. 9., p. 9-156 to 9-159) provides a list of all mammal species that were recorded in the study area, all potential species occurring in the study area, and provides a further level of detail on the occurrence, degree of confidence, nature of occurrence, breeding status, and general distribution of all potential mammal species in the study area.
CNF-S-76		p46 (10)	Insufficient information on wildlife populations and uses	"The EIS does not provide sufficient information on all wildlife populations especially woodland caribou and moose populations (EIS Guidelines Section 6.3.2)."	See response to CNF-S-81 and 83.
CNF-S-77	P. 26 (2)		Mapping and explanation of various project regions/areas	"The specifics of: project region, project area (for both generation and transmission due to overlap), region, and sub-region should be mapped and explained, especially in relation to Manitoba natural regions and Environment Canada eco-regions for Manitoba."	The general rationale for selection of the terrestrial environment study areas for the Generating Station is provided in Vol. 6, Sec. 3.0, p. 3-1. Details regarding the rationale for the selection of study areas for the terrestrial environment are provided in Vol. 6, as follows: (1) terrestrial habitat (Vol. 6, Sec. 5.1.4, p. 6.5-14 to 6.5-15 and Sec. 5.2.2, p. 6.5-28 to 6.5-32); (2) insects and other invertebrates (Vol. 6, Sec. 6.2.1, p. 6-2); (3) amphibians and reptiles (Vol. 6, Sec. 7.1, p. 7-1 to 7-3 and Sec. 7.2.2, p. 7-3 to 7-8); (4) birds (Vol. 6, Sec. 8.2.1, p. 8-1 to 8-4); and, (5) mammals (Vol. 6, Sec. 9.2.1, p. 9-2 and Sec. 9.2.5, p. 9-6). Maps indicating the region and sub-region for the terrestrial environment studies are provided in numerous locations in Vol. 1 and Vol. 6. A general map of the region and sub-region for the terrestrial environment is provided in Vol. 1, Sec. 7.2, p. 7-4.

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	Page (Para)				
	Generation Project	Transmission Project			
CNF-S-77 (cont'd)	P. 26 (2)		Mapping and explanation of various project regions/areas		Please see responses provided under points CNF-S-17, CNF-S-26, CNF-S-35, and CNF-S-36 for details regarding protected areas and enduring features. The Wuskwatim GS and TL projects fall within the Boreal Shield Ecozone. Maps of these regions are provided in the Wuskwatim TL EIS and supporting Vol. 5 (see point CNF-S-41). A map of the project region, including T-lines and GS components has been provided.
CNF-S-78	p. 25 (3) p. 26 (1)		No reference to the 2000 Manitoba Conservation Woodland Caribou Conservation Strategy for Manitoba	"The EIS does not refer or even recognize the 2000 Manitoba Conservation Woodland Caribou Conservation Strategy for Manitoba." (p25 para. 3) "Manitoba Hydro should be required to include within the EIS a detailed summary of the Manitoba Conservation caribou strategy and provide information as to how it plans to achieve the Strategy's overall goals and objectives." (p26 para.1)	The "Woodland caribou (*Rangifer tarandus caribou*) Conservation Strategy for Manitoba" (Rebizant et al. 2000) is referred to in Volume 6, Section 9 (page 9-52) of the Wuskwatim Generation Project EIS. Manitoba Hydro has actively participated with Manitoba Conservation and other research partners to develop a woodland caribou database in boreal Manitoba. Manitoba Hydro is committed to continuing to support such research initiatives and in participating in caribou management programs through multi-stakeholder woodland caribou advisory committees. NCN, Manitoba Hydro and Manitoba Conservation are collaborative partners in the Wapisu woodland caribou monitoring program.
CNF-S-79		p29 (3)	See Comment CNF-S-78	"A…deficiency is the complete absence of any reference to the 2000 Manitoba Conservation Woodland Caribou Conservation Strategy for Manitoba"	The "2000 Manitoba Conservation Woodland Caribou Conservation Strategy for Manitoba" is referenced in Volume 4 of the Transmission Project EIS (Supporting Document to EIS, see Section 3.3.3.1 and Appendix D) as Rebizant (et. al. 2000). This was incorporated in the review of relevant literature. See also response to CNF-S-78.
CNF-S-80	p. 25 (4,5), p. 32 (5, 1st sentence)		Insufficient description of caribou herds and impacts to specific herds	"The EIS does not provide a sufficient description of woodland caribou in terms of specific ranges nor does it assess the specific Project impacts on a range-by-range or herd-by-herd basis." "The EIS does not sufficiently identify details about caribou populations"...i.e. herd boundaries, calving areas, winter foraging areas, prime or notable habitat, significant movement regions. "There is no information as to which woodland caribou herd is affected, and its current ranking for risks by Manitoba Conservation." (p32 para. 5)	Woodland caribou habitat, known use areas (that include movement corridors and general range), and important use areas (including critical calving and winter range) are presented in Figure 9.3-10 (Vol. 6, Sec. 9.3.2.2.1, p. 9-56). In the Wuskwatim GS EIS, project-specific impacts are presented only for the Wapisu woodland caribou found in the study Region. The three 'herds' in the general Wapisu range, include 'Partridge Crop Hill, Harding Lake, and Eagle Hill' animals (Volume 6, Section 9 page 9-55). As indicated in responses to CNF-S-72 and CNF-S-74, publicly providing information on specific calving grounds, winter foraging areas, etc. for woodland caribou can be sensitive as provision of this can be detrimental to a species (e.g., increased harvest). Maps presented in Volumes 1 and 6 were produced at a scale that protects the specific locations of critical winter ranges and calving sites. The current risk ranking is low (Rebizant et al. 2000).
CNF-S-81		p29 (1 1st sentence, 2 & 4) & p30 (5 1st sentence)		The EIS does not "…provide sufficient details on impacts [to woodland caribou]…" (p29 para. 1) "This is problematic given the fact that there are numerous scattered references throughout the EIS (including the EIS for the Wuskwatim Generation Project) on the existence of woodland caribou beyond the defined locations on the maps (especially in and around the Wuskwatim Lake	With respect to the Transmission Project, the route selection process sought to avoid caribou calving areas and other critical areas for woodland caribou. The EIS, Volume 1, Chapter 7.0 provides a summary of potential impacts and mitigative measures, and Volume 4 of the submission provides additional information. Further mitigation will be outlined in the Environmental Protection Plans which will be prepared prior to clearing and construction activities for the proposed transmission lines.

Comnt. No.*	Nature of CNF Review Comments: Page (Para) Generation Project	Page (Para) Transmission Project	Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
CNF-S-81 (cont'd)		p29 (1 1st sentence, 2 & 4) & p30 (5 1st sentence)		region). In many cases, the large maps do not accord with many of these references. There is a concern that the maps present a minimal illustration of the population and significance of woodland caribou in and around the Wuskwatim Lake region and through the transmission corridor." (p. 29, para. 2) "It is recommended that Manitoba Hydro provide a comprehensive presentation on affected woodland caribou herds in the project region including a detailed assessment of impacts to each specific herd." (p30 para. 5) "...on a range-by-range or herd-by-herd basis." (p29 para. 4)	
CNF-S-82	p43 (11)		Deficiencies in information regarding caribou and moose impacts not clearly stated	"The EIS fails to specify clear deficiencies in available information concerning potential effects on woodland caribou and moose population within the region (EIS Guidelines Section 7.0)."	Sufficient information is available to understand caribou and other wildlife populations in the project Region; this information was used to make an informed evaluation of potential project-related effects on these species in the project Region and Sub-region. Existing information pertaining to caribou and moose populations in the Wuskwatim GS EIS includes: population estimates; distributions; habitat (including critical calving and winter habitats especially for caribou); movements; life histories; and research on effects of stressors. In addition, over the last several years Manitoba Hydro has actively participated with Manitoba Conservation and other research partners to develop a woodland caribou database in boreal Manitoba. Manitoba Hydro is committed to continuing to support such research initiatives and in participating in caribou management programs through multi-stakeholder woodland caribou advisory committees. As stated in CNF-S-78, NCN and Manitoba Hydro (in consultation with Manitoba Conservation) are conducting a monitoring program on woodland caribou in relation to the Wuskwatim Generation Project area.
CNF-S-83		p46 (9)	Need to identify known habitat and critical areas for caribou and moose	"The EIS does not sufficiently identify "known habitat and critical areas for woodland caribou and moose, including calving areas"."	As indicated earlier (see response to CNF-S-72), publicly providing information on known habitat and critical areas for species, including calving areas can be sensitive as provision of this can be detrimental to a species (e.g., increased harvest). For the transmission studies, this applies to known concentration or sensitive areas for caribou and several other species. Regional biologists were contacted with respect to potential locations of critical areas and calving areas and this information was incorporated into the route identification process. This is also consistent with standard practices regarding the release of sensitive information and NCN with respect to provision of wildlife-related information documented in the Nelson House RMA.
CNF-S-84	p25, (6) & p26 (3)	p29 (6)	Need for information deficiency statement and conducting of outstanding research re: caribou	"Prior to any decision being taken on project approval, Manitoba Hydro should be required to submit a deficiency statement that outlines the type (quantity/quality) of information required to sufficiently understand caribou populations in the project region so as to better understand the project-related effects on them."...and...undertake and complete any outstanding research/study and submit such results as part of the EIS."	Sufficient information has been collected to describe the predicted effects of the Project on woodland caribou for both the Wuskwatim Generation and Transmission Projects. The effects potential are not considered to be significant. Additional site-specific information for the Generation Project area is currently being collected to provide additional baseline information. This information will be used to further enhance monitoring and mitigation programs during construction and operation of the Project. With regard to the Wuskwatim Transmission Project, existing information and databases, extensive field studies, and liaison with Manitoba Conservation, and others has been used to determine effects of the project on woodland caribou. Further mitigation will be outlined in Environmental Protection Plans which will be prepared prior to clearing and construction activities for the proposed transmission lines.

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CNF-S-85	p25 (9)		Information on caribou monitoring program	"It is recommended that Manitoba Hydro and NCN be required to provide all available information relating to its woodland caribou monitoring program."	Detailed reports on previous and current studies of woodland caribou will be provided prior to the CEC hearings. It should be noted, however, that site-specific information that could result in increased harvest (e.g., the location of calving areas) will not be provided. This information is being shared with Manitoba Conservation but is not being shared with the broader public. Information regarding the general monitoring program is provided in Vol. 1, Sec. 7 (p. 7-92) and Vol. 6, Sec. 9 (p. 9-142).
CNF-S-86		p29 (1 2nd & 3rd sentences & 5) & p30 (5 2nd & 3rd sentences) & p45,(2, last sentence)	Need for more details on caribou habitat maps	"The EIS maps…doesn't qualify the term "notable"." "Herd names and range areas are not on maps." (p29 para. 1) Manitoba Hydro should "…illustrate the boundaries of each of the four [caribou] herds, specific calving grounds, winter foraging areas, and overall movement patterns." and "...prime equivalent or notable habitat..." (p29 para. 5) and should "...include both the proposed and alternative routes of the transmission line right-of-ways and the proposed access road (as per the Wuskwatim Generation EIS including associated access trails)" (p30 para. 5). Documentation of map information needs to be "...consistent with the geographical references provided by resource users as references in the actual documents." (p45 para. 2).	As indicated earlier (see response to CNF-S-72 and CNF-S-83), publicly providing information on known habitat and critical areas for species, including calving areas and overall movements corridors can be detrimental to a species. As such, specific location of sightings, areas of concentrations, and potential calving areas are not provided on the maps. Maps illustrating wildlife and wildlife habitat are found in Appendix I of the Wuskwatim Transmission Project. The term “Notable” refers to areas known largely through consultation with local resource users or Manitoba Conservation personnel to be areas where animals are frequently observed.
CNF-S-87	p32 (4) & p33 (4)		No details provided for 'Woodland Caribou Conservation Awareness Program"	"The EIS makes reference to a potential 'Woodland Caribou Conservation Awareness Program' but does not include this program within the EIS nor does it provide any details of how this program would work." (p32 para. 4) "It is also recommended that Manitoba Hydro attach the [above named document] to the EIS...." (p33 para. 4).	The "Woodland Caribou Conservation Awareness Program" is not a document but rather a commitment to implement a program to inform NCN community members and employees of the Generation Project regarding the vulnerability of caribou.
CNF-S-88	p43 (4)	p46 (3)	Prov. Caribou management policies not reflected in EIS	"The EIS does not reflect provincial caribou management policies including goals and objectives with respect to The Land and Water Strategy (EIS Guidelines Section 2.3.1)."	The principles of the Land and Water Strategy and the policies of the provincial Wildlife Strategy are embodied in the EIA approach. Examples of these principles range from Manitoba Hydro's corporate sustainable development policies, avoidance of critical habitats wherever possible, careful consideration of alternative routes, detailed environmental protection planning and practices, and the development of monitoring programs, among others. Manitoba Hydro is committed to continuing to support research initiatives and is participating in caribou management programs through multi-stakeholder woodland caribou advisory committees.
CNF-S-89		p30 (6)	3rd party review needed for a more detailed caribou impact assessment	"…to deal with any risk of increasing harvest rates on woodland caribou…" an "…independent and 3rd party 'team'…review…" is recommended.	Caribou-related references in the EIS have been based in part on reviews and discussions with regional staff of Manitoba Conservation and with the IRMTs. The extent of these discussions has been described in response CNF-S-84. The regional Manitoba Conservation response to the EIS in relation to woodland caribou recommended continued research, monitoring and participating in a caribou management program. Manitoba Hydro’s response (see MBCons (SD)-S-5) in relation to comments from TAC reviewers acknowledges this request. Accordingly, an independent review is considered to have occurred. Further opportunity for independent review may occur in this course of the CEC hearing.

Comnt. No.*	Nature of CNF Review Comments: Page (Para) Generation Project	Page (Para) Transmission Project	Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
CNF-S-90		p30 (7)	Need for list of caribou studies Hydro has sponsored or participated in	"It is recommended that Manitoba Hydro provide a list of studies (i.e. woodland caribou-related studies, among others) that it has sponsored or participated in over the last five to ten years and to make these studies available to interested groups, and/or organizations."	All studies funded and/or conducted by Manitoba Hydro that are relevant to the environmental assessments of the Wuskwatim Generation and Transmission Projects are cited in the EIS documents.
CNF-S-91		p46 (11)	Need to clarify information deficiencies re: moose & caribou populations	"The EIS fails to specify clear deficiencies in available information concerning potential effects on woodland caribou and moose population within the project region (EIS Guidelines Section 7.0)."	The level of information and the methodology of its collection were designed to permit an assessment of project impacts. For the transmission project, this included: field work, Habitat Suitability Index model results, discussions with biologists and resource users, and an evaluation of available literature relevant to the assessment of potential effects of transmission lines on woodland caribou and moose.
CNF-S-92		p30 (2 2nd sentence)	Term "notable" not qualified on moose habitat maps	"The EIS maps…illustrate "notable moose habitat"…but does not qualify the term "notable"."	See response to CNF-S-86.
CNF-S-93		p46 (8)	No description of the threatened Wolverine	"The EIS identifies but does not describe the wolverine (listed as threatened by COSEWIC (EIS Guidelines Section 6.3.2)."	Wolverines are listed in COSEWIC (Committee on Endangered Wildlife in Canada) as a species of special concern, in Schedule 3 of SARA (Species at Risk Act), and as a furbearer in the Wildlife Act. It is not listed in MESA (Manitoba Endangered Species Act).
CNF-S-94		p22 (6)	Need to assess impacts of 60 and 110 m width T-line corridor	Manitoba Hydro should provide a "…discussion or assessment of the variation in impacts between a 60 and a 110-meter width for a transmission corridor."	The EIS includes assessment of both 60 metre rights-of-way (e.g., segment 1) and 110 metre rights-of-way (e.g., segment 2), and the conclusions in both cases are similar. The conclusions do not suggest that the variances between the two cases are significant in relation to impacts.
CNF-S-95		P30 (2 last sentence)	Insufficient public policy context	"Overall, there is insufficient public policy context regarding wildlife in Manitoba."	Relevant sections and guidelines were incorporated into the EIS. See response to CNF-S-4.
CNF-S-96		P30 (8)	Update EIS when *Species at Risk Act* is passed	"It is also recommended that Manitoba Hydro provide an update to its EIS to fully account for the passing of the federal *Species at Risk Act*."	The EIS was prepared and submitted for approvals/licensing prior to the passing of the act. Section 3.7.2.2 of Volume 4 of the EIS discusses application of SARA to the impact assessment.
CNF-S-97		p39 (1, 3, 4))	No management / mitigation plan for rare or uncommon plant species; additional fieldwork support documents before hearings	"There is no indication of a management or mitigation plan regarding the 6 rare or uncommon species identified in the EIS." "Additional fieldwork should take place; information on this aspect of the EIS is insufficient." "The field reports, rare plant survey and Environmental Protection Plan should be available prior to the hearings."	A botanical/rare plant survey will be undertaken along the rights-of-way, focusing on areas with the greatest potential for rare species. Locations of rare plants and recommended measures for mitigation will be specified in the Environmental Protection Plans, which will be prepared prior to clearing and construction of the lines.
CNF-S-98		p39 (5)	Need for continued monitoring of the T-line ROWs during operation	"Manitoba Hydro should resource continued monitoring of the rights of way during operation, given the acknowledgement of insufficient research and information."	The proponents did not suggest that the research and information was insufficient for the purpose of the environmental assessment of the project. As indicated in the EIS, site-specific EnvPPs will be prepared prior to the clearing and construction of the transmission lines. Follow-up monitoring requirements will be identified in the EnvPPs.
Aquatic Environment					
CNF-S-99	p32 (5, 2nd sentence) & p33 (1)		Mercury in Whitefish & other fish	"The EIS is not clear regarding mercury in whitefish in Wuskwatim Lake." (p32 para.5) "Clarity regarding mercury effects for all fish species in Lake Wuskwatim should be provided." (p33 para. 1)	Mercury levels were sampled for the three species in Wuskwatim Lake that are important in the diet of local resource users and for which data regarding mercury levels over time are available. One of these species is a benthic feeder (lake whitefish) while the other two are predatory species (walleye and northern pike). Present levels of mercury in fish and levels predicted to occur as a result of construction and operation of the GS are described in detail in Volume 5, Section 9. Two scenarios were developed for anticipated methyl mercury production as a result

Comnt. No.*	Nature of CNF Review Comments: Page (Para) Generation Project	Page (Para) Transmission Project	Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
CNF-S-99 (cont'd)	p32 (5, 2nd sentence) & p33 (1)		Mercury in Whitefish & other fish		of the Project. The minimum scenario incorporated the effects of the newly flooded area between Wuskwatim Falls and Taskinigup Falls. The maximum scenario incorporated additional inputs into Wuskwatim Lake from the erosion of shorelines and the die-off of peatlands (peatlands are not expected to die off; see Volume 5, Section 9.2.3 (p. 9-18) and Volume 6). Mercury levels in lake whitefish are predicted to increase from the current level (0.097 ug/g) to between 0.10 ug/g (minimum scenario) and 0.14 ug/g (maximum scenario). Mercury levels in walleye are predicted to increase from the current level (0.28 ug/g) to between 0.30 ug/g (minimum scenario) and 0.39 ug/g (maximum scenario). Mercury levels in northern pike are predicted to increase from current levels (0.37 ug/g) to between 0.40 ug/g (minimum scenario) and 0.56 ug/g (maximum scenario) (Volume 5 , Section 9.2.3, Table 9-6).
Socio-Economic Environment					
CNF-S-100	P37 (2)		No assessment of "boom-bust" socio-economic dynamic	"The EIS does not address the negative effects of a boom-bust dynamic typically associated with large short-term projects in northern regions. There is no indication of what will be expected to happen to many trained NCN workers, and the community as a whole, when the Wuskwatim construction phase is completed." (p37 para. 1) A "sensitivity analysis" regarding these matters is recommended (p38 para. 6)	The socio-economic assessment directly addresses the potential for negative "boom-bust" effects on the economy and labour force of the Local Region (see Volume 1, Section 9.3.4 and Volume 8, Section 3.2.3 of the Generation EIS) and the possibility of associated personal, family and community life effects (see Volume 1, Section 9.5.4 and Volume 8, Section 5.2.3 of the Generation EIS) at the completion of the construction phase. The EIS concludes that some degree of "boom-bust" effect is likely to be felt. The EIS also notes that NCN is actively working to reduce the potential for, and magnitude of, "boom-bust" effects. There are steps being taken, or under consideration, by NCN to use opportunities associated with this Project as a catalyst to build a skilled workforce and to actively pursue other economic development opportunities that can sustain work for local residents. These steps include: -An approach to training and construction employment that emphasizes the development of skills by local residents that are relevant in the region beyond opportunities presented by construction of hydroelectric dams; and - The pursuit of economic development opportunities that would coincide with the latter years of the construction phase. If measures by NCN are successful in extending economic opportunities beyond the Project, then the "boom and bust" effect of these opportunities will be lessened. As well, in the event that other hydro projects (e.g., Gull/Keeyask, Conawapa, Notigi) begin to be built during or immediately following Project construction, Aboriginal residents of the Local Region will have additional opportunities for construction employment.

Comnt. No.*	Nature of CNF Review Comments: Page (Para) Generation Project	Page (Para) Transmission Project	Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
CNF-S-101	p37 (4) & p38 (2,3,4,5)		Publishing names & treaty numbers may bias NCN Opinion Survey	Regarding the publishing of names and treaty numbers in the NCN Opinion Survey: …"There is a real possibility that some survey respondents may have been influenced…".	All survey participants in each of the three NCN Opinion Surveys were guaranteed anonymity. Names and treaty numbers were only recorded to keep track of who had been surveyed. It was necessary to keep track of who had been surveyed to ensure statistically valid survey results (i.e., no double-counting, accurate statistical sampling). Participants were informed at the start of the survey that personal responses would be anonymous. Once completed, surveys were assigned random numbers with the results compiled by an independent research company – names and treaty numbers were not included in the results compilation. Completed surveys were kept in sealed boxes at the law firm of Myers Weinberg for one year following the completion of each survey, after which they were destroyed. None of the three NCN Opinion Surveys asked respondents whether they supported the project. Rather, the surveys sought to gain an understanding of the benefits and concerns NCN members associated with these projects. The results of the surveys helped to inform project-related studies for the EIS (including scope of these studies) and NCN planning for the projects (e.g., survey results were used and are cited in the Agreement-in-Principle between NCN and Manitoba Hydro).
CNF-S-102	p37 (5)		Insufficient analysis of uncertain socio-economic related events/variables	"The EIS does not present a balanced analysis on issues dealing with uncertain events/variables…" (Burntwood Nelson Agreement, employment issues, equity partnership negotiations, future approval of other projects, proportion of NCN workers on Limestone project, Access Management Plan). A "sensitivity analysis" is recommended regarding these matters (p38 para. 2,3,4,5).	The socio-economic impact assessment deals explicitly with uncertainties in the assessment by: - Noting where assumptions have been made and indicating the possible implications to the analysis of using these assumptions; - Wherever practical and where uncertainty exists, identifying a likely range of anticipated effects; - Incorporating a variety of different data sources into the assessment (e.g., statistical data, knowledge from key person interviews) to provide for a more balanced analysis. In terms of uncertainty related to the specific events/variables referenced, the following are noted: - The BNA is currently being re-negotiated and this is noted throughout the socio-economic impact assessment. The assumptions about the re-negotiated BNA used in the EIS are believed to represent a reasonable forecast of the terms that may be included in the final agreement; any variations from the assumptions are not anticipated to result in substantially different employment effects. - The socio-economic impact assessment does not assume that other major hydro projects will be approved for construction over the next ten to fifteen years. Rather, as part of the cumulative effects assessment, the EIS considers the implications to the socio-economic environment of other projects being considered by Manitoba Hydro for possible construction within the next five to ten years – i.e. within the construction and early operations phases of the Wuskwatim Generation Project. The EIS recognizes that no decisions have been made to proceed with the hydro projects included in the cumulative effects assessment (see Volume 1, Section 2.3 and Volume 8, Section 2.2.7 of the Generation EIS); however, it was considered prudent to include these projects to ensure that the cumulative effects associated with their development were considered and incorporated into the assessment.

Comnt. No.*	Nature of CNF Review Comments: Page (Para) Generation Project	Page (Para) Transmission Project	Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
CNF-S-102 (cont'd)	p37 (5)		Insufficient analysis of uncertain socio-economic related events/variables		- Northern Aboriginal employment estimates for the Wuskwatim Generation Project are predicted to be higher (in percentage terms related to the total construction workforce) than those experienced during the Limestone Project in part because the project is considerably smaller than the Limestone Project, but primarily because of steps being taken (presently and planned for the future) to improve the hiring and retention of northern Aboriginal workers at the Wuskwatim site (e.g., new pre-project training opportunities, particularly in the case of NCN, on-the-job training opportunities, possible negotiated contracts with Nelson House-based businesses, establishment of an Advisory Committee on Employment) and because of greater heavy construction experience today compared to the earlier period among northern Aboriginal residents, especially Nelson House residents. The EIS notes that the influence of these factors, especially pre-project training, is uncertain. To account for this uncertainty, a range of employment estimates is presented for northern Aboriginal workers in the Local Region and Northern Regions based on a range of project training outcomes. - During the construction phase, maximum control of access via the access road is provided through a staffed gate near the junction of the access road and PR 391. For the operations phase, to retain the option of maximum control of access, Manitoba Hydro and NCN intend to pursue private ownership or the equivalent for the access road. The actual degree of control will be developed by Manitoba Hydro and NCN in consultation with the Nelson House Resource Management Board. (Please also see response to MbCons (BM)-3 and CNF-43.) - Based on the AIP agreed to between NCN and Manitoba Hydro, the option of no equity partnership was not considered for the Generation Project. The analysis does consider ranges for possible operations period effects from NCN ownership participation.
CNF-S-103	p38 (1)		Inconsistency in employment projections?	"An interesting note is the significant differences in employment projections between the graph presented in Newsletter #1 (page 3) and Figure 9.3-1 in Volume 1 Section 9.3.2.1 Page 16 of the EIS."	In the Fall of 2002, the design engineers for the Project revised the construction workforce estimates for Wuskwatim infrastructure development and major construction works from the estimates that were presented in Newsletter #1 prepared as part of the Public Involvement and Consultation process. The estimates were revised as a result of more advanced and detailed design work. The chart in Figure 9.3-1 of Section 9.3.2.1, Volume 1 of the Generation EIS shows the revised workforce estimates and was included in Newsletter #3 (prepared and distributed in November, 2002 as part of the Public Involvement Plan process), and associated presentations. In the revised estimates, the workforce requirements for the first stage of construction were significantly reduced, which particularly affected the non-designated trades occupations of labourers, heavy equipment operators and vehicle drivers. During the second stage of construction, the requirements for designated trades, such as carpenters, electricians, pipefitters and millwrights, increased significantly. These are the most current estimates that are available.

Comnt. No.*	Nature of CNF Review Comments: Page (Para) Generation Project	Page (Para) Transmission Project	Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
CNF-S-104	p38 (7)		Socio-economic impacts from existing projects not assessed in cumulative impacts?	"The EIS includes an assessment of cumulative effects in relation to other proposed hydro projects (i.e., Gull Rapids, Notigi, Bipole III, Conawapa) even though no decision has been made to proceed with these projects. However, in most other sections of the EIS, Manitoba Hydro does not provide a cumulative effects assessment in relation to these same projects on the basis that the projects are highly uncertain."(p37 p 6) "If future projected cumulative effects of projects not yet built exist, then cumulative impacts or existing impacts from existing projects should also be assessed." (p 38, para 1)	All sections of the Wuskwatim Generation Project EIS provide a cumulative effects assessment that includes consideration of other projects that are being considered by Manitoba Hydro for possible construction start within the next five to ten years (e.g., Gull/Keeyask, Notigi, Bipole III, Conawapa). The EIS recognizes that no decisions have been made to proceed with these hydro projects (see Volume 1, Section 2.3 and Volume 8, Section .2.2.7 of the Generation EIS); however, it was considered prudent to include these projects to ensure that the cumulative effects associated with their development were considered and incorporated into the assessment. (For more information, see Section 2.3, Volume 1 of the Generation EIS and the response to EnvCan-17 and 18.) As noted in Section 2.3.1, Volume 1 of the Generation EIS, past and current projects and activities were considered to form an integral part of the existing environment against which predicted effects of the Wuskwatim Project were assessed. As such, these past and current projects and activities, along with their projected future levels, were properly accounted for in the initial assessment of Project effects. Effects stemming from these projects and activities would be double-counted if considered again in the cumulative effects assessment. For a listing of the past and current projects and activities considered as part of the baseline setting conditions see Section 2.3.1, Volume 1 of the Generation EIS. Past and current projects and activities considered as part of the socio-economic impact assessment are outlined in Section 2.2.7, Volume 8 of the Generation EIS.
CNF-S-105	p38 (7)		Update socio-economic assessment with 2001 Census data	Much of the socio-economic data is based on 1996 *Statistics Canada* (approximately 7 years old). It is recognized that results of the 2001 Census will be released in the near future." (p37 para 3) "It is also recommended that Manitoba Hydro be required to provide a complete update of the socio-economic section once the 2001 Census data becomes available (irrespective of whether the project has been approved)." (p 38 para 7)	New data will not be incorporated into the EIS without an understanding of any potential concerns related to data quality and accuracy. A preliminary review indicates that population data from the 2001 Census for communities in the Local and Project Regions are not consistent with those available from other sources, suggesting that there may be errors with the data. Statistics Canada is preparing a technical review of data quality for the 2001 Census; however, this report is not expected to be available until the end of 2003 (i.e., after the CEC hearings in the fall of 2003). When available later in 2003, this report will be examined to determine the accuracy and quality of the 2001 Census data and possible use of these data for long-term socio-economic monitoring in the event that the Project is approved.
Physical Environment					
CNF-S-106	p41 (1,5,7)		No information provided on net impacts of reservoirs	"The EIS does not provide the current state of Manitoba Hydro knowledge regarding net impacts of reservoirs."	The response to this will be provided prior to the CEC hearings.

Comnt. No.*	Nature of CNF Review Comments		Issue	Summary of Comments	Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
	Page (Para)				
	Generation Project	Transmission Project			
CNF-S-107	p41 (4, 6)		Insufficient information re: climate change long-term effects	"The EIS does not provide information on the potential risks and potential costs associated with long-term climate change effects." "…they have not provided sufficient information within the EIS as to how…these models [have been assessed] in relation to the Wuskwatim Generation Project." (p41 para. 1) It is recommended that Manitoba Hydro provide a "sensitivity analysis" regarding "long-term risks associated with climate change." (p41 para. 5) "Manitoba Hydro should provide details on their climate change models application to these projects. Any internal studies should be provided for the assessment, and licensing decisions." (p41 para. 7)	See response to EnvCan-S-6.
CNF-S-108			No justification on how export energy and subsequent use affects GHG emissions	"The EIS does not provide justification on how exported energy would be used by export customers to substantiate its assumptions for displaced GHG emissions." (p41 para. 4) "It is recommended that Manitoba Hydro take appropriate steps to broaden its information on lifecycle GHG emissions by undertaking a thorough assessment of DSM as an option in relation to providing the 200MW for export." (p41 para. 6)	Displaced Emissions Energy added into a regional electricity system results in the displacement of resources with the highest incremental dispatch costs where fuel is a significant cost component. Most lower emission electricity resources such as renewable energy, nuclear generation have very low incremental dispatch costs and are not typically displaced by hydropower generation. As long as there is some fossil-fueled generation in the regional mix, the energy produced by the Wuskwatim project will result in the displacement of this generation. This will continue to be the case even if in the future there is considerably more energy delivered through renewable resources and DSM. There is some uncertainty as to what the specific mixture of coal and natural gas fuels and technologies will be. This will depend on many factors including natural gas prices and Canadian and US energy and environmental policy. While the actual displacement will contain a mixture of coal and natural gas sources at various efficiencies, Manitoba Hydro has conservatively assumed for that only the lowest emission, high efficiency combined cycle natural gas generation will be displaced. DSM Lifecycle Emissions While a small minority of DSM opportunities may have significant GHG implications imbedded within their lifecycle, Manitoba Hydro assumes that the majority of the DSM opportunities have very low GHG implications, comparable with Wuskwatim. As such, Manitoba Hydro views DSM opportunities as very attractive from an environmental perspective. The immediate assessment of the lifecycle GHG implications of various DSM options would do little to contribute to the Wuskwatim EIS.
CNF-S-109		P44 (3)	Limiting the climate change impact comparison to GHGs only	"The EIS appears to indicate that all climate change environmental impacts for the transmission project in Manitoba are not significant due to a decrease in GHGs within regions where Manitoba Hydro may export power (GHGs are not the only climate change environmental impacts for these projects)."	Refer to EIS Volume 1, Section 7.2.4. This statement was not made in the EIS.

Comnt. No.*	Nature of CNF Review Comments				Response from Manitoba Hydro and Nisichawayasihk Cree Nation (NCN)
	Page (Para)		Issue	Summary of Comments	
	Generation Project	Transmission Project			
CNF-S-110		p44 (1, 2 & 4)	Confidence intervals and uncertainties not provided for carbon value estimates	"The EIS does not provide a range of potential carbon value estimates that reflect the level of error in these types of calculations." (p 44 para. 1) "The EIS analysis [of carbon levels] does not...reflect / report on these uncertainties." (p44 para. 2) "It is recommended that Manitoba Hydro be required to provide a revised biomass carbon analysis and a revised soil organic carbon analysis using appropriate error assumptions or variance and provide a sensitivity analysis on the results showing high and low values in accordance with different error values." (p44 para. 4)	The carbon analysis as outlined in the EIS, Volume 1, looked at a “worst case” scenario. It assumed the maximum in terms of ROW clearing and the least amount of recovery. Even given this, the effect is small.

* The numbering system refers to reviewer organization (e.g. CNF = Canadian Nature Federation); S = Supplemental filing material, followed by the comment number in this table.

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APPENDIX A

ATTACHMENTS FOR

RESPONSES TO TAC COMMENTS

Comment No.	Response
HlthCan – S-1	Table 9-7. Weight (1st value) and number of meals (200 g of meat; 2nd value) of walleye (pickerel), pike, and whitefish that can be safely eaten by a 70 kg (154 lb) man in a week[a]. Values are calculated for fish from Wuskwatim, Leftrook and Footprint lakes assuming current (C; 1998-99) muscle mercury concentration for a fish of standard length. For Wuskwatim Lake, consumption values for post-Project (PP) predicted mercury levels also are given (0.12 $\mu g \cdot g^{-1}$ for whitefish, 0.35 $\mu g \cdot g^{-1}$ for walleye, and 0.48 $\mu g \cdot g^{-1}$ for pike).

Source	Walleye	Pike	Whitefish
Wuskwatim (C)	556 g ; 2.8	422 g ; 2.1	1616 g ; 8.1
Wuskwatim (PP)	448 g ; 2.2	327 g ; 1.6	1307 g ; 6.5
Footprint (C)	231 g ; 1.2	257 g ; 1.3	2340 g ; 11.2
Leftrook (C)	627 g ; 3.1	682 g ; 3.4	3920 g ;19.6

[a] More sensitive subgroups in the populations (i.e., women of child-bearing age, children and infants) should limit their mercury dose from consumption of walleye (pickerel), pike and whitefish to approximately half of the levels presented in the table for the general public. For a child weighing 20 kg, this translates to less than two weekly meals of 150 g of whitefish.

HLTH CAN - S-3 ATTACHMENT

Table 2-4. Estimated number of meals of meat obtained from the domestic harvest on an annual basis by NCN members.

	Harvest Calendar			Country Foods			Combined		
	Weight	# of Meals	% of Meals	Weight	# of Meals	% of Meals	Weight	# of Meals	% Total Meals
Cisco	618	3,089	1	29	143	1	647	3,233	1
Fish	747	3,733	2		-	-	747	3,733	2
Maria	56	281	<1		-	-	56	281	<1
Perch	30	151	<1		-	-	30	151	<1
Pike	2,181	10,905	5	151	754	3	2,332	11,659	5
Suckers	410	2,049	1	34	170	1	444	2,220	1
Walleye	3,133	15,665	7	222	1,110	4	3,355	16,775	7
Whitefish	1,945	9,723	4	2,829	14,145	51	4,774	23,868	10
Trout		-	-	17	84	<1	17	84	<1
Roe		-	-	<1	2	<1	<1	2	<1
Fish Total	9,119	45,596	21	3,282	16,408	60	12,401	62,005	26
Mallards	138	689	<1		-	-	138	689	<1
Black Ducks	3	15	<1		-	-	3	15	<1
Ducks	609	3,043	1	23	117	<1	632	3,159	1
Geese	879	4,396	2	68	338	1	947	4,734	2
Waterfowl Total	1,628	8,142	4	91	454	2	1,719	8,597	4
Grouse	104	520	<1		-	-	104	520	<1
Ptarmigan	2	9	<1		-	-	2	9	<1
Moose	24,841	124,207	57	678	3,389	12	25,519	127,596	53
Caribou	-	-	-	1,035	5,173	19	1,035	5,173	2
Elk	2,922	14,611	7	155	776	3	3,077	15,387	6
Deer	705	3,523	2	47	233	1	751	3,756	2
Big Game Total	28,468	142,340	67	1,914	9,571	35	30,382	151,911	63
Rabbit	1,269	6,345	3	14	71	<1	1,283	6,416	3
Squirrel	3	14	<1		-	-	3	14	<1
Small Game Total	1,272	6,358	3	14	71	<1	1,286	6,430	3
Beaver	1,865	9,323	4	201	1,004	4	2,065	10,327	4
Muskrat	-	-	-	<1	2	<1	<1	2	<1
Lynx	92	462	<1		-	-	92	462	<1
Trap Total	1,957	9,785	5	201	1,006	4	2,158	10,791	4
Total	42,550	212,751		5,502	27,511		48,052	240,262	100

Data from the Harvest Calendar (August 2001 to July 2002) and Country Foods Program (1994-2000). One meal of meat is defined as 0.2 kg of meat, and all weights are presented in kg.

Weight refers to estimated edible tissue weight.
*species not noted

MBCONS -S-6 ATTACHMENT

Table A6-1 Range of applicable Manitoba Water Quality Objectives for ammonia, for the protection of cold-water aquatic life and wildlife. Values calculated from algorithms provided in Williamson (2002) and the range of pH and water sample collection. Revised numbers are indicated in bold.

pH	Temperature (°C)	Ammonia Objective (mg/L)		
		Averaging Period		
		30-day	4-day	1-hour
7.04	0	5.82	14.54	23.25
	10	7.78	19.46	23.25
	15	5.64	14.10	23.25
	20	4.09	10.21	23.25
	25	2.96	7.40	23.25
8.25	0	1.65	**3.47**	3.47
	10	2.21	**3.47**	3.47
	15	1.60	**3.47**	3.47
	20	1.16	2.90	3.47
	25	0.84	2.10	3.47
8.61	0	0.90	**1.74**	1.74
	10	1.21	**1.74**	1.74
	15	0.88	**1.74**	1.74
	20	0.64	1.59	1.74
	25	0.46	1.15	1.74

APPENDIX B

ATTACHMENTS FOR

RESPONSES TO DFO COMMENTS

Table DFO-S-6. Summary tables listing projected average (Table 6.4-4) and average plus 50% (maximum)
(Table A6.3-1) erosion rates in Wuskwatim Lake with and without the project

A) Summary of average erosion rates used for modelling various time periods with and without the Project (Table 6.4-4)

With vs without the Project		Average Bank Erosion Rates for Various Time Periods (m/yr)								
	Shoreline Type	0 - 5 Years (2009-2014)			6 -25 Years (2014-2034)			26 - 100 Years (2035-2109)		
		Wave Energy			Wave Energy			Wave Energy		
		L	M	H	L	M	H	L	M	H
Without Project	LC_{lg}, BC_{lg}, FN	0	0	0	0	0	0	0	0	0
With Project	LC_{lg}, BC_{lg}, FN	0	0	0	0	0	0	0	0	0
Without Project	LC	0.35	0.65	1.00	0.35	0.65	1.00	0.35	0.65	1.00
With Project	LC	0.50	1.00	1.50	0.40	0.85	1.20	0.35	0.65	1.00
Without Project	LC/BR_l	0.15	0.35	0.50	0.15	0.35	0.50	0.15	0.35	0.50
With Project	LC/BR_l	0.50	1.00	1.50	0.15	0.40	0.65	0.15	0.35	0.50
Without Project	LC/BR_m	0	0	0	0	0	0	0	0	0
With Project	LC/BR_m	0.15	0.25	0.40	0.07	0.15	0.20	0	0	0
Without Project	LC/BR_h, BR	0	0	0	0	0	0	0	0	0
With Project	LC/BR_h, BR	0	0	0	0	0	0	0	0	0

Legend: Wave Energy Categories: Low (L); Moderate (M), High (H)
Table based on average bank-recession rates, shown in Tables 6.3-10 and 6.4-3

B) Summary of average plus 50% variability (maximum) erosion rates with and without the project (Table A6.3-1)

With vs without the project		Average Plus 50% Bank Erosion Rates for Various Time Periods (m/yr)								
	Shoreline Type	0 - 5 Years (2009-2014)			6 -25 Years (2014-2034)			26 - 100 Years (2035-2109)		
		Wave Energy			Wave Energy			Wave Energy		
		L	M	H	L	M	H	L	M	H
Without Project	LC_{lg}, BC_{lg}, FN	0	0	0	0	0	0	0	0	0
With Project	LC_{lg}, BC_{lg}, FN	0	0	0	0	0	0	0	0	0
Without Project	LC	0.50	1.00	1.50	0.50	1.00	1.50	0.50	1.00	1.50
With Project	LC	0.75	1.50	2.00	0.60	1.25	1.75	0.50	1.00	1.50
Without Project	LC/BR_l	0.20	0.50	0.75	0.20	0.50	0.75	0.20	0.50	0.75
With Project	LC/BR_l	0.75	1.50	2.00	0.25	0.60	1.00	0.20	0.50	0.75
Without Project	LC/BR_m	0	0	0	0	0	0	0	0	0
With Project	LC/BR_m	0.20	0.40	0.60	0.10	0.20	0.30	0	0	0
Without Project	LC/BR_h, BR	0	0	0	0	0	0	0	0	0
With Project	LC/BR_h, BR	0	0	0	0	0	0	0	0	0

Legend: Wave Energy Categories: Low (L); Moderate (M), High (H)
Table based on bank-recession rates shown in Tables 6.3-9 and 6.4-2

MH/NCN-EIS-DFO S-39

Effect of Wuskwatim on Operation of Churchill River Diversion (CRD) and Lake Winnipeg Regulation (LWR)

Introduction

The reservoirs and hydro generating stations owned by Manitoba Hydro are operated as a system with the primary hydroelectric objective being the meeting of firm load requirements. Once this primary hydroelectric objective has been met, the secondary hydroelectric objective is to minimize operating cost and maximize export revenue. Lake Winnipeg Regulation operation is constrained under high and low elevations to meet the social objectives of flood and drought control.

Changes in hydroelectric operations will occur over time. These changes are the result of many varying factors such as changes to the domestic load pattern, generation retirement or addition, and seasonal export price changes. The addition of Wuskwatim Generation will likely result in a change in system operations because the power generated by the facility likely will not perfectly match demand requirements - both domestic and export. The question is whether these changes will be significant, or even noticeable, in the operation of CRD and LWR as major components within the overall hydroelectric system.

In considering this question it is necessary to have an understanding of the purpose of LWR and CRD, how they are operated now and in the future without Wuskwatim and how they could potentially be operated with Wuskwatim Generation. It is also important to realize that the operation of LWR and CRD is not static, but changes regularly depending on numerous factors. The other factors influencing the operation of LWR and CRD are so significant in comparison to even the maximum potential influence of Wuskwatim that the influences of Wuskwatim will not, in reality, be perceptible.

Manitoba Hydro has looked closely at the potential effects of Wuskwatim on the operation of CRD and LWR. The purposes of LWR and CRD, their relationship to each other and to the major generating plants on the lower Nelson River, and their relationship to Manitoba Hydro's overall system are described below. Within that context, the present operation of LWR and CRD is reviewed, including analysis of the factors, and the relative significance of the factors, that influence decisions relating to the operation of LWR and CRD. Finally the realistic range of potential influence of Wuskwatim on the operation of CRD and LWR is reviewed and its relative significance on the operation of LWR and CRD is analyzed.

Reservoirs under Manitoba Hydro Control

Manitoba Hydro system has three major reservoirs that it controls in terms of seasonal storage and release of water – Lake Winnipeg, Cedar Lake (Grand Rapids) and Southern Indian Lake. Reservoirs that affect flows in the Winnipeg River are outside of Manitoba and not under the control of Manitoba Hydro. The generating plants on the Winnipeg River are "run of river" and do not have capability for seasonal storage. Figure 1 at the end of this document is a schematic of the major reservoirs and generation facilities in the Manitoba Hydro system.

The control of Lake Winnipeg was undertaken in the mid 1970's under the Lake Winnipeg Regulation project. This development was designed and constructed to mitigate the adverse effects of floods and droughts on Lake Winnipeg and to be used for hydroelectric production, within the range of Lake Winnipeg levels lying between 711 feet ASL and 715 feet ASL. Because the storage capacity of Lake Winnipeg between 711 and 715 feet ASL is very large, this is the single most important component for seasonal storage of water for hydro-electric production. Cedar Lake is the reservoir created by the development of the Grand Rapids Generating Station in 1965 and it is the second most flexible component in providing both seasonal storage as well as generation. The Churchill River Diversion was undertaken in the mid 1970's and consists of the Southern Indian Lake reservoir control structures together with diversion facilities that,

within licenced limits, have the capability of diverting a large proportion of the flow of the Churchill River to the lower Nelson River via the Rat and Burntwood Rivers.

The Lake Winnipeg Regulation Project and Jenpeg Operation

Manitoba Hydro controls releases of water from Lake Winnipeg at the Jenpeg Generating Station. In addition to the control at Jenpeg, the Lake Winnipeg Regulation Project includes channel improvements to increase outflow capability. Streamflows into the Manitoba Hydro system are highest in the spring and summer seasons and lowest in the fall and winter seasons, but domestic load requirements have an opposite distribution. Therefore, between the licenced elevations of 711 to 715 feet ASL, the primary hydro-electric purpose of Lake Winnipeg Regulation is to store some of the water flows from the spring and summer seasons so that they can be released in the fall and winter seasons. The operation of LWR is subject to licence constraints on maximum and minimum lake elevations as well as the rate at which changes to flow releases can be made. The ability to transfer spring and summer flows to the fall and winter is severely limited because winter ice restrictions in the outlet channels substantially reduce winter outflow capability (up to 50 %). Manitoba Hydro generally operates LWR at the maximum discharge possible during the ice cover period because load requirements are highest at this time.

The Jenpeg Generating Station controls nominally 85% of the outflows from Lake Winnipeg and has the capability to generate about 120 MW. The primary function of this facility is to control outflows to the much larger downstream generating stations that have a total capability of about 3700 MW. The travel time of water released at Jenpeg to the most downstream generating facilities is up to six weeks. Therefore, the power generated at Jenpeg is incidental as the effects at the downstream plants essentially drives the optimized overall system operation. With respect to daily and weekly operation, hydroelectric generating facilities generally have the characteristic of being able to operate at higher outputs during on-peak periods and at lower levels during off-peak periods by using reservoir storage immediately upstream of the facility. This results in a cycling operation in which most of the generating units are operating during the peak

electricity demand daytime hours and fewer units would operate in lower demand night hours. The Jenpeg Generating Station has very limited opportunity for daily/weekly cycling operations because of licence constraints on flow variations within a day (maximum variation of 15,000 cubic feet per second (cfs) compared to an average outflow at Jenpeg of 70,000 cfs).

In addition to the restriction in flow variation allowed by license, another factor that limits cycling operation at Jenpeg is that cycling is only useful when it will not reduce the ability to provide the required flows to the much larger downstream generating facilities. Therefore, a limited degree of cycling occurs at Jenpeg and this is usually restricted to the open water period and then only when inflows are not in flood condition. During flood inflows (when Lake Winnipeg is above a wind eliminated level of 715), the license requires that maximum outflows occur in order to minimize flood risk on Lake Winnipeg and cycling is not allowed. Similarly, cycling during winter ice conditions is not practical since it would reduce the ability to supply maximum flows downstream to the lower Nelson River stations.

The four modes of operation for Lake Winnipeg Regulation follow:

1. Elevation below license minimum of 711 feet. Outflow is directed by the Minister of Conservation.
2. Conservation mode. This applies during low inflow conditions. Outflow is based on the requirement to ensure energy supply security subject to minimum outflow licence constraint of 25,000 cubic feet per second (cfs).
3. Economic mode. Outflow is determined by relative value of energy on the export market in the near term compared to the longer term (while also considering the risk of spillage at downstream stations).
4. Water level above 715 feet. Outflow set at maximum discharge as required by licence.

Manitoba Hydro has flexibility to manage the storage/outflow operations for export purposes only when streamflows are such that operation corresponds to the economic mode. In low and high flow conditions, requirements other than exports dominate system operation.

The primary hydroelectric function of LWR is to modify the seasonal distribution of energy generation within the Manitoba Hydro system. A change in the seasonal demand for power such as a winter export sale would result in a modification in the seasonal release of water through use of facilities associated with LWR. However, a change in cycling demand for the system would not result in a change in cycling at Jenpeg since its maximum cycling capability is already being utilized. The change in LWR operation due to the addition of Wuskwatim will be discussed further below.

The Churchill River Diversion Project

The Churchill River Diversion Project consists of gated control structures at Missi Falls and at Notigi. The dam at Missi Falls controls the outflow from Southern Indian Lake down the lower Churchill River subject to a set of licence constraints on minimum flow releases and maximum and minimum elevation constraints on the lake. The Notigi Control Structure is operated to control the water diverted from the Churchill River into the Nelson River through the Rat and Burntwood Rivers. A set of water elevation and flow constraints along the diversion route is specified in licences and agreements.

The purpose of the CRD project is to supplement water flows to the Lower Nelson River, which has 70% of Manitoba Hydro's generation (about 3,500 MW) consisting of the Kettle, Long Spruce and Limestone Generating Stations. Since the ice restrictions at the outlet of Lake Winnipeg severely restrict winter outflows, CRD is operated to maximize diversion flows in the winter months. Inflows into Southern Indian Lake are highest in the spring and summer seasons and lowest in the fall and winter seasons. In order to maximize winter diversion flows, Southern Indian Lake is operated such that some spring and summer inflows are stored in the lake in order to fill the reservoir close as possible to its upper license limit of 847.5 feet. The storage in Southern Indian Lake is utilized over

the fall and winter seasons to maximize diversion flows. This typically results in a drawdown in the elevation of Southern Indian Lake to its specified minimum of 843 feet by the end of winter.

The annual pattern of filling and drawdown of Southern Indian Lake within its licence constraints for the period since 1983 is shown in Figure 2. It is noted that for some periods the typical pattern of filling and drawdown does not occur because of either a shortage of water available to CRD or because the Lower Nelson River generating plants already have sufficient water supply due to flood flows being released from Lake Winnipeg.

The travel time of water from Notigi to the Lower Nelson River generating plants is about five weeks. Therefore, CRD releases cannot be effective in meeting day-to-day and hour-to-hour variations in power requirements. In addition to physical and licence constraints, the operation of CRD is driven by the general objective of releasing as much water as possible to support downstream water flows in the winter season when ice restricts flow at the outlet of Lake Winnipeg. A secondary objective is to support downstream flows in all seasons during periods when LWR is not able to provide sufficient flows.

Effect of Wuskwatim on Operation of CRD

The addition of Wuskwatim will not affect operation of the CRD. The Wuskwatim Generating Station (capacity of 200 MW) is equivalent to about 6% of the generation at the Lower Nelson River. The objective of maximizing CRD flows, particularly in the winter season, does not change with the addition of Wuskwatim. There is no incentive for Manitoba Hydro to attempt to modify operation of CRD in order to increase Wuskwatim energy production because it is a small plant and the water supply can be utilized much more effectively at the large downstream plants.

It is useful to analyze the operation of CRD before and after the installation of the Limestone Generating Station in 1992 in order to demonstrate that the addition of

generation does not affect CRD operation. An analysis of the historic elevation patterns on Southern Indian Lake pre and post the Limestone G.S. illustrates that the frequency of the various lake elevations did not change materially after the addition of Limestone (see Figure 3). In a similar manner, Wuskwatim, which is a much smaller plant, will also not have an effect on CRD operation. This is because neither of these projects have an effect on the primary purpose of CRD, which is to augment winter flows.

Operation of the Wuskwatim Generating Station

It is useful to describe the Wuskwatim Generating Station in terms of the daily/weekly cycling and seasonal distribution of the energy production.

The Wuskwatim Generating Station will consist of three generating units that will be operated under a "modified run-of river mode of operation" in order to minimize environmental impacts. This could be also referred to as a daily run-of river operation. This mode requires that outflows over a 24 hour period typically be equal to inflows and allows a modest cycling pattern in which more units are on during the daytime peak periods. This results in the ability to operate the units at their most efficient level and typically minimizes flow changes within a day to that corresponding to one unit. The modified run-of –the river mode of operation is restricted to only a modest amount of cycling.

The seasonal distribution of Wuskwatim energy production is directly related to CRD flows, which are predicated by the need to supply the large downstream Nelson River stations. The timing of the daily and seasonal energy production therefore may not be consistent with when it is most valuable to the overall system and export sales. In order to secure maximum overall system benefits made available by Wuskwatim, the various components in the Manitoba Hydro system that have operating flexibility can be utilized to re-shape the Wuskwatim power output into an optimal pattern. Further discussion on this re-shaping is provided below for both daily and weekly cycling as well as seasonal transfer.

Effect of Wuskwatim on Operation of LWR

The addition of Wuskwatim may have a very small effect on the operation of LWR or it may have no effect at all depending on how the power produced by the project is utilized. For example, if the Wuskwatim power is utilized in an hourly pattern exactly matching the pattern in which it is produced, there is no requirement for the system to re-shape the output and LWR would not change.

As a second example, if the power is utilized in a different pattern over a day or week, the re-shaping would not take place utilizing LWR, but instead would take place at the generating stations on the Lower Nelson River as it is done today. The Lower Nelson River stations are ideally suited for daily and weekly cycling because there is a significant reservoir at Stephens Lake immediately upstream of Kettle as shown in Figure 1 above. Kettle, Long Spruce and Limestone have the capability to operate in a cycling mode in tandem because the outflows from one plant can almost instantaneously be utilized at the next plant. The amount of additional cycling in the Lower Nelson River would be very small because of the relatively small amount of cycling capacity involved (re-shaping of 100 to 200 MW compared to about 3500 MW of Lower Nelson River generation). LWR could not be used for this type of re-shaping because, as described earlier, Jenpeg has limited ability to cycle and this capability is already used to its maximum. Therefore, operation of LWR would also not change to accommodate daily/weekly requirements.

As a third example, if the power from Wuskwatim is utilized in a different season from that in which it is produced, the re-shaping would in this case occur by modifying operation of LWR, since that is the primary purpose of the LWR. However, the degree of modification of operation of LWR would be very small since the output of a portion of a 200 MW facility would be re-shaped by 3500 MW of generating capability on the Lower Nelson River. For example, if the economic operation indicated that 50% of the energy production at Wuskwatim in a winter month was required instead in a summer month, the flow at Jenpeg in the summer month would have to be increased by 3%.

Manitoba Hydro has modeled several scenarios of utilization of Wuskwatim power in order to investigate the effect of Wuskwatim on operation of LWR. As an indicator of changes in LWR operation, the water levels at Cross Lake, which is immediately downstream of Jenpeg, were analyzed through computer simulation studies for two scenarios of export sales – 1) Base Case (2009 to 2020): firm sale for most of Wuskwatim power and 2) Sensitivity Case: all Wuskwatim power sold as non-firm export. The results of the simulation analyses are illustrated in the figures below. A third scenario is described in which Wuskwatim is utilized for domestic requirements. It is most likely that Wuskwatim energy will be utilized for a firm sale and for domestic requirements further out in time after domestic load has grown. The scenario of this energy all being utilized for non-firm sales is extremely unlikely, but this scenario has been included in order to provide an extreme case sensitivity.

Scenario 1 -Base Case Exports: This base case scenario consists of the firm annual energy from Wuskwatim being sold as a firm export sale that is uniformly distributed over the year and the remaining expected annual energy (non-firm) being sold as non-firm export sales. The simulation of this scenario indicates that the summer elevation of Cross Lake is expected to decrease by an average of 0.04 feet with a maximum decrease of 0.11 feet as shown in Figure 4(a). The low Cross Lake elevations on the left in the duration curve shown in Figure 4 are a result of low LWR releases while high elevations on the right correspond to high releases. The average winter elevation is expected to increase by 0.04 feet with a maximum increase of 0.12 feet. The reason for the slightly lower summer and slightly higher winter elevations is that the uniform distribution of the export sale requires a transfer of water from summer to winter to meet the firm sale obligation in all flow conditions. The magnitudes of these changes are so small that they will not be perceptible relative to the many other factors that affect outflows from Lake Winnipeg.

Scenario 2 – Sensitivity Case Exports: This sensitivity scenario consists of all energy production from Wuskwatim being sold as non-firm export sales. This simulation indicates that the summer elevation of Cross Lake is expected to increase by an average

of 0.12 feet with a maximum increase of 0.34 feet as shown in Figure 4(b). There is no increase in elevations in the upper quartile for the summer period, in fact there is some decrease as shown in Figure 4(b). In the summer lower quartile, there is no decrease in elevation, in fact there is some increase in elevations with Wuskwatim. The average winter elevation is expected to decrease by 0.08 feet with a maximum decrease of 0.20 feet. In the winter period, there is no perceptible change in elevation in both the upper and lower quartiles.

Scenario 3 –Domestic Load: This scenario consists of Wuskwatim energy production being utilized to serve domestic load growth. A simulation of impacts was not undertaken for this scenario, but the impacts on LWR and Cross Lake would be similar to Scenario 1 because this load pattern is not significantly different from a load pattern for firm export sales.

The reason for the higher summer and lower winter elevations is that the prices for non-firm sales are higher in summer, and as a result the system could transfer water from winter to summer periods to take advantage of these higher prices. The change in elevations is larger for the non-firm scenario because it has more flexibility to transfer energy to the highest value period. It is noted that the change for the non-firm scenario is in the direction of natural water levels before LWR. Little or no change in operations in high and low flow conditions are indicated because operation in these conditions is usually not driven by economic considerations but by license constraints related to drought and flood control.

Effect of Wuskwatim on Cross Lake Water Levels

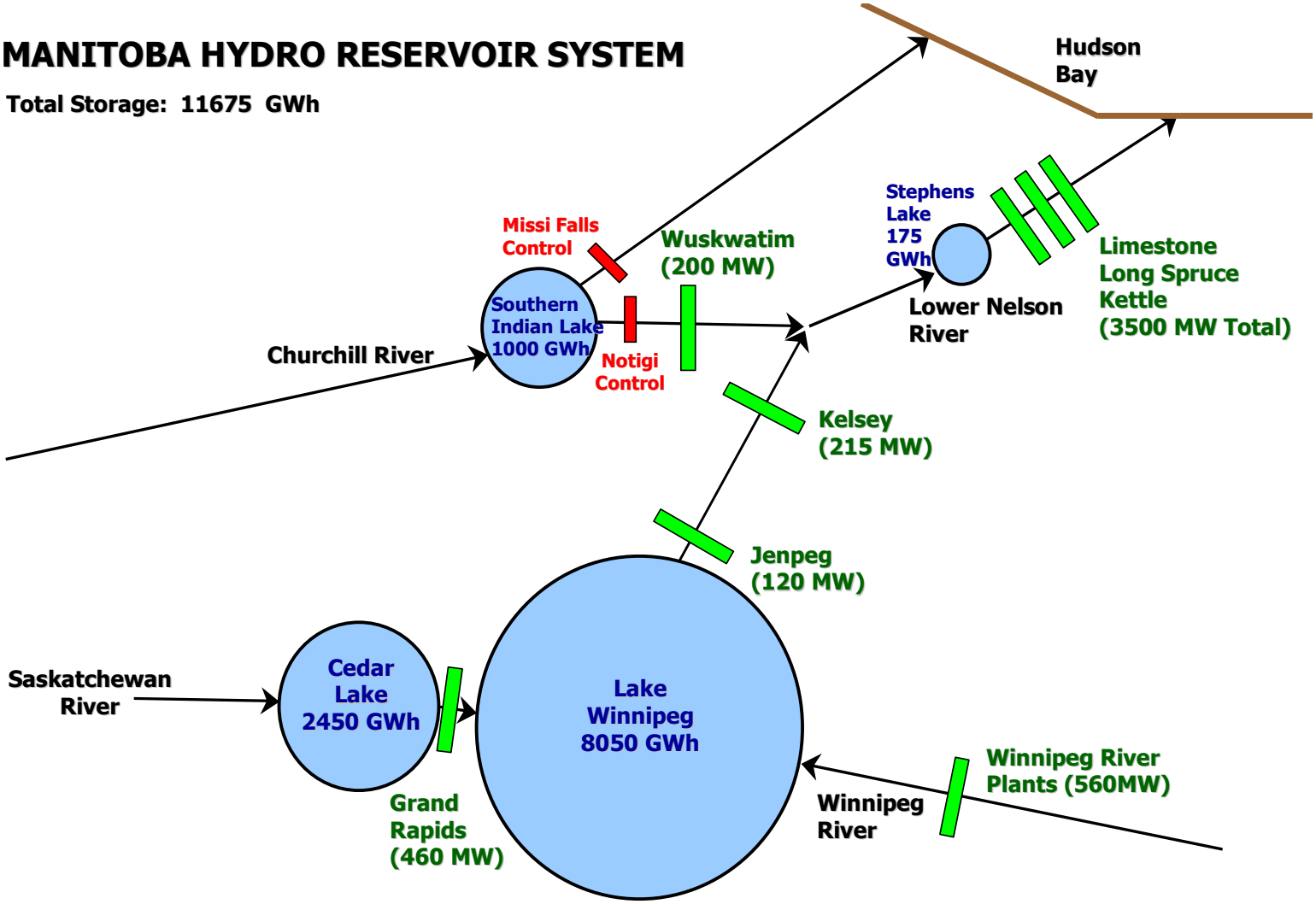
To put these potential changes into context, this section discusses the effects of LWR operational changes in the context of Cross Lake. The above-described changes are very small relative to the variations in Cross Lake water levels due to normal changes in water supply and operation. To illustrate, the year-to-year water levels in the month of July for the period of 1977 to 2002 show a range of 13 feet pre-weir and 8 feet post-weir. Furthermore, within each year, the water levels vary by an average of 4 feet post-weir.

Short-term variations in water levels due to other factors such as wave uprush (4 feet), ice staging (0.8 feet) and wind set up (0.5 feet) are also much more significant than the small changes that may occur with Wuskwatim.

Conclusion

In conclusion, Wuskwatim will not affect the operation of CRD but there are likely to be situations in which the addition of Wuskwatim will have a small effect on operation of other components of the Manitoba Hydro system. The effects associated with changes in operation of LWR in the most likely case of Wuskwatim energy being sold as a firm sale or used for domestic load are so small that they will not be perceptible. Even in the extremely unlikely case of all Wuskwatim energy being sold as a non-firm sale, the effects are very small relative to other factors that result in much more significant changes to outflows from Lake Winnipeg.

There may be a small increase in the frequency of daily and weekly cycling operation at the lower Nelson River generating stations. Although the frequency of this cycling may increase, this cycling will take place within the current range of water levels.



DFO S-39.
Figure 1

Figure 2
DFO-S-39: Southern Indian Lake Water Levels

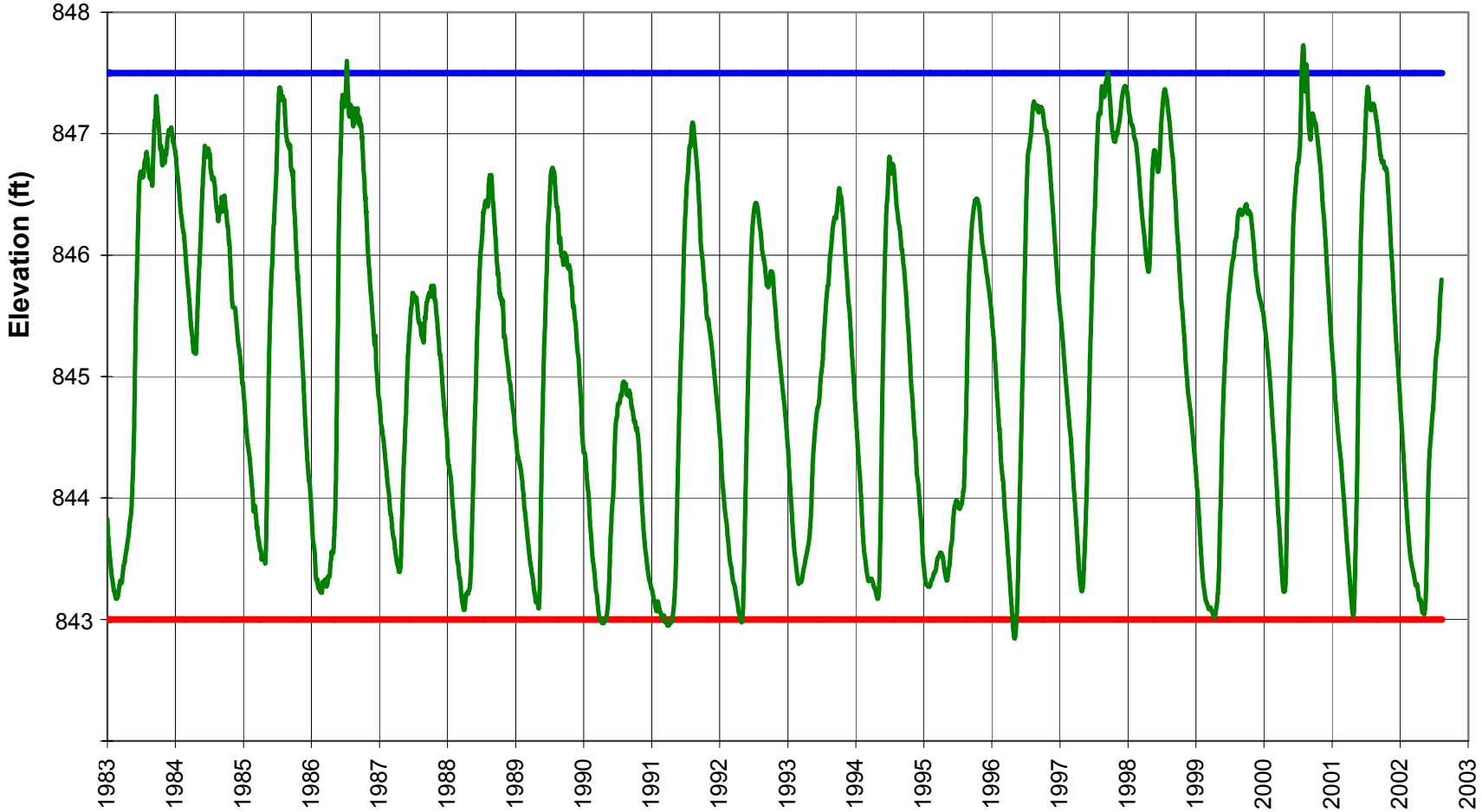


Figure 3
DFO-S-39: Southern Indian Lake
Pre and Post Limestone (1980 – 2003)

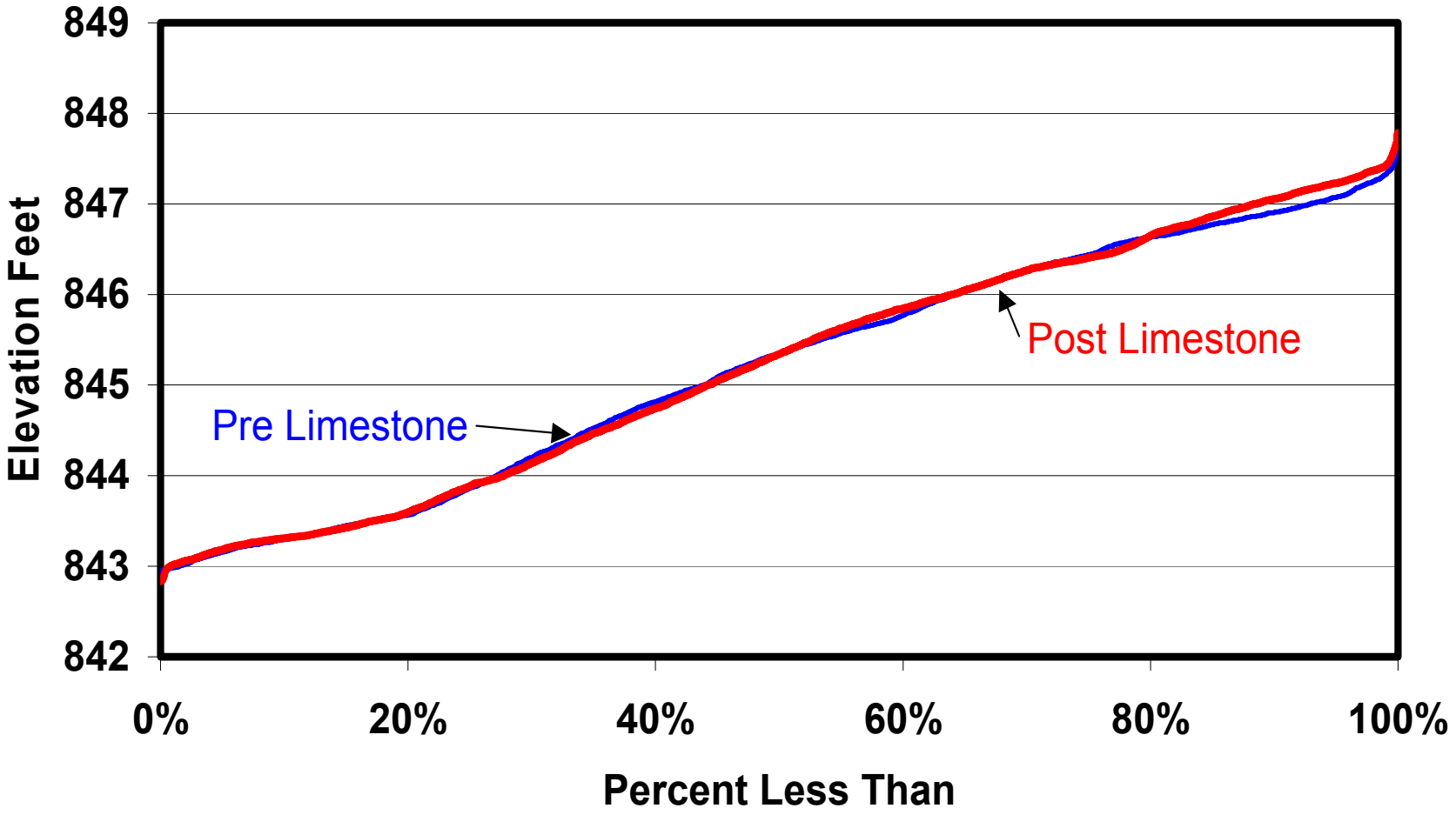
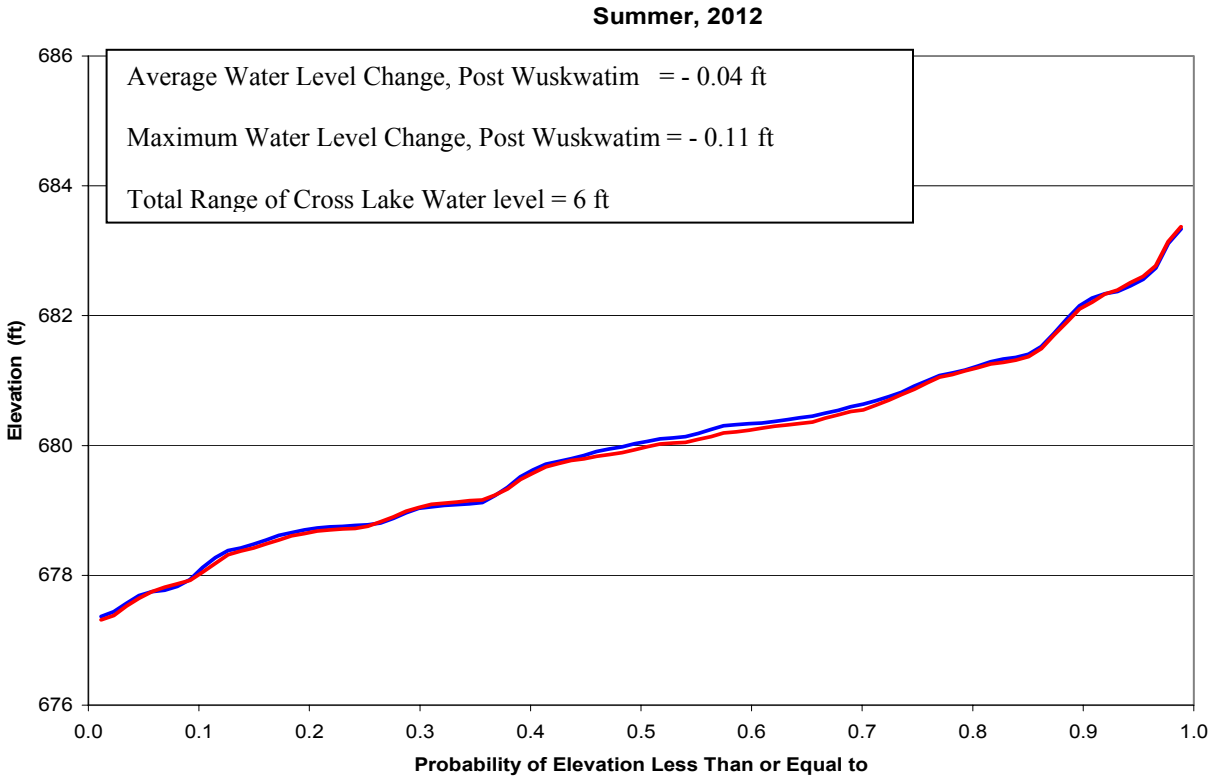


Figure 4(a)
DFO-2-39: Elevation Duration Curve Cross Lake
Wuskwatim Energy Marketed as Firm Energy Sale



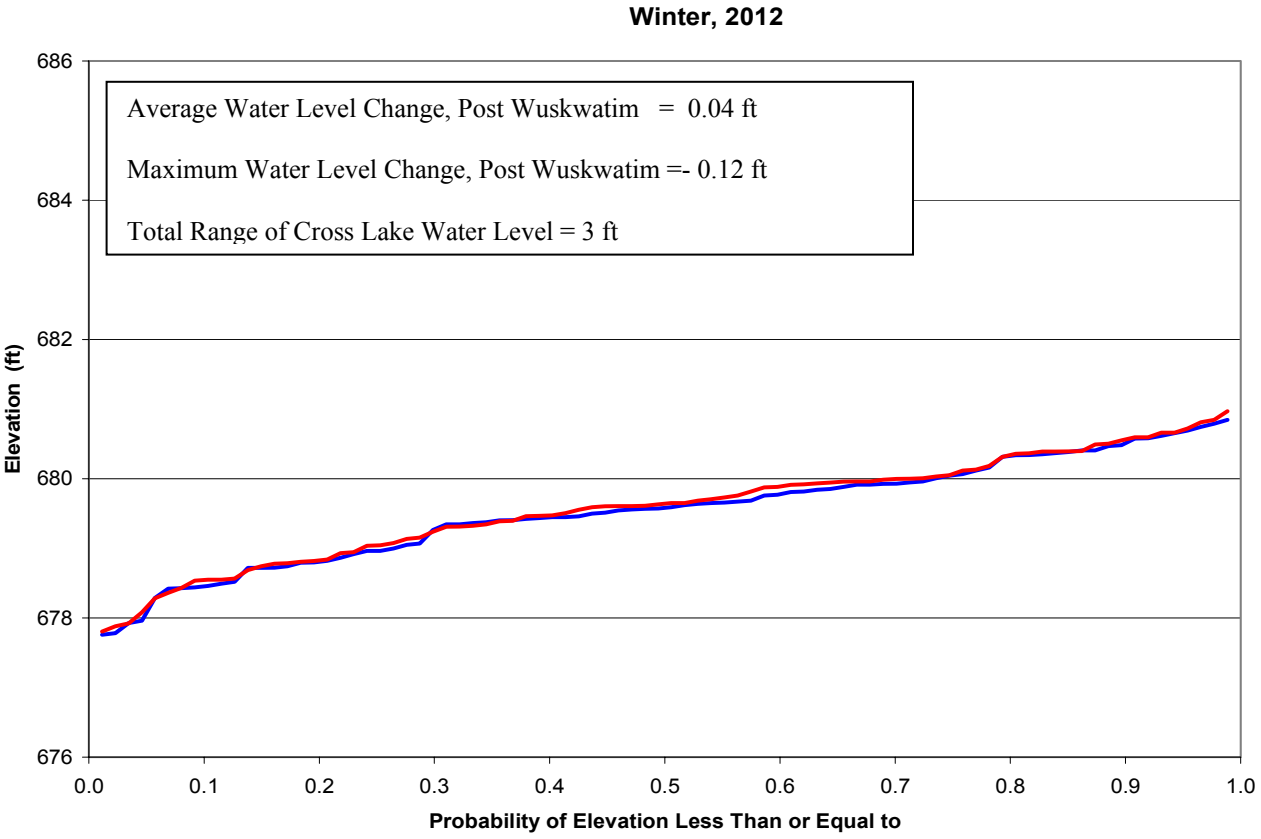
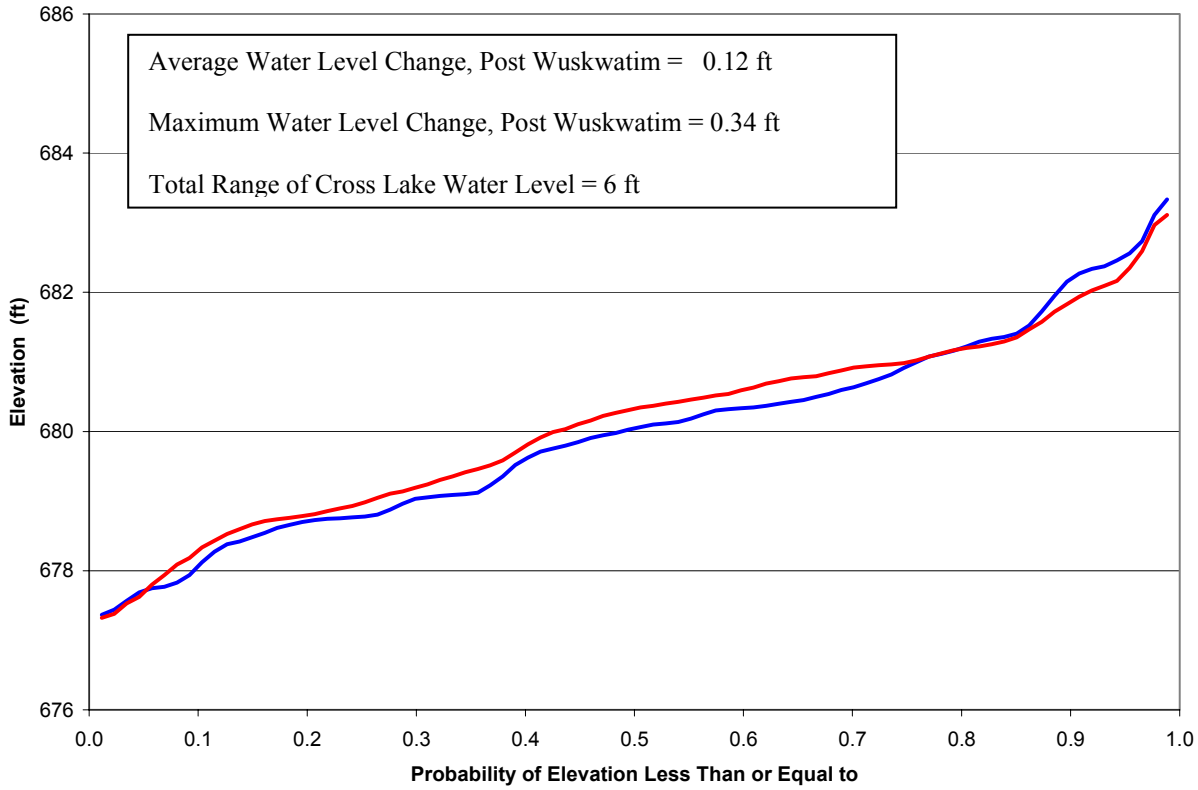
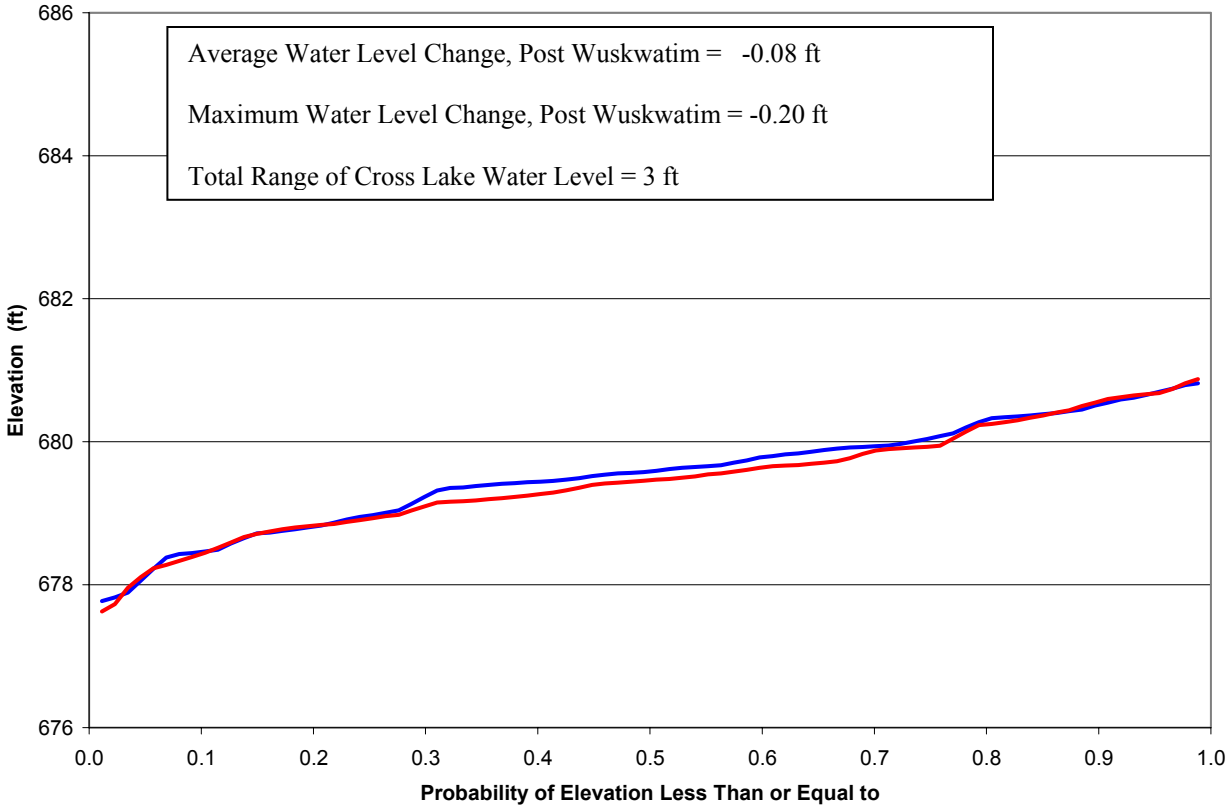


Figure 4(b)
Elevation Duration Curve for Cross Lake
Wuskwatim Energy Marketed as Non-Firm Energy Sales

Summer, 2012



Winter, 2012



DFO-S-41 Summary Of Historical Monitoring And Studies Of Aquatic Ecosystems, In Relation To Wuskwatim Study Area

Description	Parameters Measured	Study Area	Period of Data Collection	Reference	Location of Reference to Study in EIS
AQUATIC ENVIRONMENT					
1. Water and Sediment Quality					
Sediment quality	Copper, zinc, cadmium, nickel, lead, and mercury concentrations in surficial sediments (i.e., upper 1-3 cm).	Burntwood River at Thompson (WQ093)	August 1979	Williamson (1980)	Vol. 5: - Sec. 5.2.2, p. 5-8 to 5-9; - Sec. 5.3.2.2, p. 5-24; - Sec. 5.3.3.2, p. 5-29; - Sec. 5.3.5.1, p. 5-86
Surface water quality	Parameters included: pH; dissolved oxygen; conductivity; total dissolved solids; hardness; chlorophyll a; secchi disk depth; turbidity; TSS; true colour; alkalinity; carbon (various forms); ammonia; nitrate/nitrite; phosphorus (dissolved, particulate, and total); kjeldahl nitrogen (total and dissolved); sulphate; chloride; and numerous metals/metalloids and major elements (Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mn, Mg, Hg, Mo, Ni, K, Se, Ag, Na, Sr, Tl, Sn, U, V, and Zn).	Burntwood River at Thompson (Manitoba Conservation water quality monitoring station WQ0093.00)	- Open-water season: June 1980 to August 2000 - Ice-cover season: January 1980 to February 2000 (note that metals data covered the period of 1980 to 2001)	Manitoba Conservation (2001)	Vol. 5: - Sec. 5.2.2, p. 5-8 to 5-9; - Sec. 5.3.2, p. 5-22 to 5-24; - Sec. 5.3.3.1, p. 5-26; - Sec. 5.3.4.2, p. 5-58 to 5-59; - Sec. 5.3.4.3, p. 5-68; - Appendix 1, p. A1-1 (provided on CD - detailed data)

Description	Parameters Measured	Study Area	Period of Data Collection	Reference	Location of Reference to Study in EIS
Surface water quality	Parameters included: pH; conductivity; total dissolved solids; hardness; chlorophyll a; turbidity; TSS; true colour; alkalinity; carbon (various forms); fluoride; chloride; ammonia; nitrate/nitrite; phosphorus (dissolved, orthophosphate and total); nitrogen (total and dissolved); and numerous metals/metalloids and major elements (Al, As, Ba, Cd, Ca, Co, Cu, Fe, Pb, Mn, Mg, Ni, K, Se, reactive silica, Na, V, and Zn).	Burntwood River at Thompson and the Burntwood River at Split Lake	January 1987 to October 1989	Ramsey (1991)	Vol. 5: - Sec 5.2.2, p. 5-8 to 5-9; - Sec. 5.3.2.1, p. 5-22 - Sec. 5.3.3.1, p. 5-26; - Sec. 5.3.4.2, p. 5-47, p. 5-60; - Sec. 5.3.4.3, p. 5-70; - Sec. 5.4.2.2, 5-131; - Appendix 1, p. A1-1 (provided on CD – detailed data)
Surface water quality	Water quality index	Numerous water quality monitoring stations in northern Manitoba	1991-1994	Manitoba Environment (1997)	Vol. 5: - Sec. 5.3.2, p. 5-23 to 5-24; - Sec. 5.3.3, p. 5-27 to 5-28; - Sec. 5.3.6, p. 5-88, p. 5-91; - Sec. 5.4.2.2, p. 5-130
Surface water quality	Numerous parameters including: conductivity; pH; alkalinity; hardness; calcium; magnesium; potassium; sodium; total phosphorus; chloride; sulphate; total kjeldahl nitrogen; nitrate/nitrite; total organic and inorganic carbon; colour; turbidity; non-fiterable residue; and, total and fecal coliforms.	Numerous areas, including Footprint Lake and the Burntwood River at Thompson	Pre- and post-1976	Playle and Williamson (1986)	Vol. 5: - Sec. 5.4.2.2, p. 5-130

Description	Parameters Measured	Study Area	Period of Data Collection	Reference	Location of Reference to Study in EIS
Surface water quality	Detailed summary of findings from major water quality studies (i.e., Ramsey 1991 and Playle and Williamson 1986, please see above) and MB Conservation water quality monitoring data	Burntwood River at Thompson	Various (pre-CRD up to 1992)	Williamson and Ralley (1993)	Vol. 5: - Sec. 5.3.4.2, p. 5-59 to 5-60; - Sec. 5.4.2.2, p. 5-130
2. Aquatic Habitat					
Morphometry	Morphometry of the Rat-Burntwood river system	Rat-Burntwood river system	1972/1973	Brown (1974)	Vol. 5: - Sec. 6.2.2, p. 6-3
Bathymetry	Bathymetric surveys of Threepoint and Wuskwatim lakes	Threepoint and Wuskwatim lakes	1988	Cherepak (1989)	Vol. 5: - Sec. 6.2.2, p. 6-3
Bathymetry	Bathymetric surveys of Threepoint and Wuskwatim lakes	Wuskwatim Lake	1990	Nortec Surveys (1990)	Vol. 5: - Sec. 6.2.2, p. 6-3
3. Lower Trophic Levels					
Benthic invertebrates	Standing crop and taxon (Order) abundance; physical variables	Three sites in open water areas of Wuskwatim Lake	June of 1973, 1977, 1981, 1983, and 1987	Wiens and Rosenberg (1994)	Vol. 5: - Sec. 7.2.2, p. 7-4
Algae, aquatic plants, and zooplankton	No historical data for locations relevant to this study				Vol. 5: - Sec. 7.2.2, p. 7-4
4. Fish Community and Movements					
Fish populations	Species composition, species distribution, growth, food, and condition of fish (including analysis of stomach contents, age, length-frequency composition, growth rate, condition, and CPUE)	Wuskwatim Lake (details of locations and net sets not provided)	1973	Ayles et al. (1974)	Volume 5: - Sec. 8.2.1 - 8.2.2, p. 8-3 and 8-4

Description	Parameters Measured	Study Area	Period of Data Collection	Reference	Location of Reference to Study in EIS
5. Fish Quality					
Mercury in fish	Total mercury in muscle tissue of lake whitefish	Wuskwatim Lake	1970	Derksen (1978a)	Vol. 5:- Sec. 9.2
Mercury in fish	Total mercury in muscle tissue of lake whitefish and walleye	Wuskwatim Lake	<1973	Derksen (1978b)	Vol. 5:- Sec. 9.2
Mercury in fish	Total mercury in muscle tissue of lake whitefish, northern pike, and walleye	Wuskwatim Lake	1970-1982	Bodaly et al. (1984)	Vol. 5:- Sec. 9.2
Mercury in fish	Total mercury in muscle tissue of cisco, lake whitefish, northern pike, walleye, sauger, white sucker, longnose sucker, shorthead redhorse, burbot, and yellow perch	Wuskwatim Lake, Birch Tree Lake	1979-1985	Green (1986)	Vol. 5:- Sec. 9.2
Mercury in fish	Total mercury in muscle tissue of lake whitefish, northern pike, and walleye	Wuskwatim Lake, Birch Tree Lake	1979-1985	Derksen & Green (1987)	Vol. 5:- Sec. 9.2
Mercury in fish	Total mercury in muscle tissue of cisco, lake whitefish, northern pike, walleye, white sucker, and longnose sucker	Wuskwatim Lake, Leftrook Lake	1992	Strange (1993)	Vol. 5:- Sec. 9.2
Mercury in fish	Total mercury in muscle tissue of cisco, lake whitefish, northern pike, walleye, white sucker, longnose sucker, and shorthead redhorse	Wuskwatim Lake, Leftrook Lake	1994	Strange (1995)	Vol. 5:- Sec. 9.2

Description	Parameters Measured	Study Area	Period of Data Collection	Reference	Location of Reference to Study in EIS
Mercury in fish	Total mercury in muscle tissue of cisco, lake whitefish, northern pike, walleye, white sucker, and longnose sucker	Wuskwatim Lake	1998	Strange and Bodaly (1999)	Vol. 5:- Sec. 9.2
Trace metals in fish	Muscle concentrations of 27 different trace metals			no known prior data	Vol. 5:- Sec. 9.3
Fish parasites	Cysts of *Triaenophorus crassus* in mussle tissue of lake whitefish	Wuskwatim Lake		Freshwater Fish Marketing Board (unpubl. Data)	Vol. 5:- Sec. 9.4

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LIST OF REFERENCES

AYLES, H., S. BROWN, K. MACHNIAK and J. SIGURDSON. 1974. The fisheries of the lower Churchill Lakes the Rat-Burntwood Lakes and the upper Nelson Lakes: Present conditions and the implications of hydroelectric development. Lake Winnipeg, Churchill and the Nelson Rivers Study Board. p. xii-100.

BODALY, R. A., R. E. HECKY, and R. J. P. FUDGE. 1984. Increase in fish mercury levels in lakes flooded by the Churchill River diversion, northern Manitoba. Can. J. Fish. Aquat. Sci. 41:682-691.

BROWN, S.B. 1974. The morphometry of the Rat-Burntwood diversion route and lower Churchill River lakes: present conditions and post regulation conditions. Lake Winnipeg, Churchill and Nelson Rivers Study Board. Technical Appendix 5, Volume 2. 51 pp.

CHEREPAK, B.C. 1989. The post-flood morphometry and bathymetry of Rat and Threepoint lakes, 1988. Manitoba Dept. Nat. Res. Fish. Br. MS Report No. 89-14. 21 pp.

DERKSEN, A. J. 1978. A report on the preliminary testing of mercury contamination in fishes from the Hudson Bay drainage system connected with Manitoba. Manitoba Departments of Northern Affairs, Renewable Resources and Transportation Services MS Report No. 78-70; 40 p.

DERKSEN, A. J. 1978. A review of possible natural sources of mercury contamination in Manitoba waters. Manitoba Departments of Northern Affairs, Renewable Resources and Transportation Services MS Report No.78-71: 71 pp.

DERKSEN, A. J., and D. J. GREEN. 1987. Total mercury concentrations in large fishes from lakes on the Churchill River diversion and Nelson River. Technical Appendices to the Summary Report "Canada-Manitoba Agreement on the Study and Monitoring of Mercury in the Churchill River Diversion"; Vol.4, Chap.17; Governments of Canada and Manitoba xi + 195 pp.

GREEN, D. J. 1986. Summary of fish mercury data collected from lakes on the Rat-Burntwood and Nelson River systems, 1983-1985. Manitoba Natural Resources, Fisheries Branch MS Report No.86-06 359 p.

MB CONSERVATION. 2001. Water Quality Management Section, Manitoba Conservation, 123 Main Street, Suite 160, Winnipeg, MB, R3C 1A5.

MANITOBA ENVIRONMENT. 1997. State of the environment report for Manitoba, 1997. State of the Environment Reporting, Manitoba Environment. http://www.gov.mb.ca/environ/pages/pages/soe97/soe97.html.

NORTEC SURVEYS (CANADA) INC. 1990. Survey report Wuskwatim Lake Manitoba. Prepared for Manitoba Hydro Surveys and Geotechnical Department by Nortec Atlantic Ltd.

PLAYLE, R.C., and D.A. WILLIAMSON. 1986. Water chemistry changes associated with hydroelectric development in northern Manitoba: The Churchill, Rat, Burntwood, and Nelson rivers. Water Standards and Studies Report No. 86-8. Manitoba Environment and Workplace Safety and Health.

RAMSEY, D.J. 1991. Final water quality report. Federal Ecological Monitoring Program, Technical Appendices, Volume 1. 320 p.

STRANGE, N. E. 1993. Mercury in fish in northern Manitoba reservoirs and associated waterbodies: results from 1992 sampling. Report by North/South Consultants Inc. Winnipeg, 76 pp.

STRANGE, N. E. 1995. Mercury in fish in northern Manitoba reservoirs and associated waterbodies: results from 1994 sampling. Report by North/South Consultants Inc. Winnipeg, 46 pp.

STRANGE, N. E., and R. A. BODALY. 1999. Mercury in fish in northern Manitoba reservoirs and associated waterbodies: results from 1998 sampling. Report by North/South Consultants Inc. Winnipeg, 56 pp.

WIENS, A.P. and D.M. ROSENBERG. 1994. Churchill River Diversion: Effects on benthic invertebrates in lakes along the lower Churchill and the diversion route. Can. Tech. Rep. Fish. Aquat. Sci. 2001: iv + 29 pp.

WILLIAMSON, D.A. 1980. Heavy metal concentrations in northern Manitoba lake and river sediments, August, 1979. Water Pollution Control Section, Environmental Control Branch, Department of Consumer and Corporate Affairs and Environment, March, 1980.

WILLIAMSON, D.A. and W.E. RALLEY. 1993. A summary of water chemistry changes following hydroelectric development in northern Manitoba, Canada. Manitoba Environment, Water Quality Management Section Report #93-2.

APPENDIX C

ATTACHMENTS FOR RESPONSES

TO CNF COMMENTS

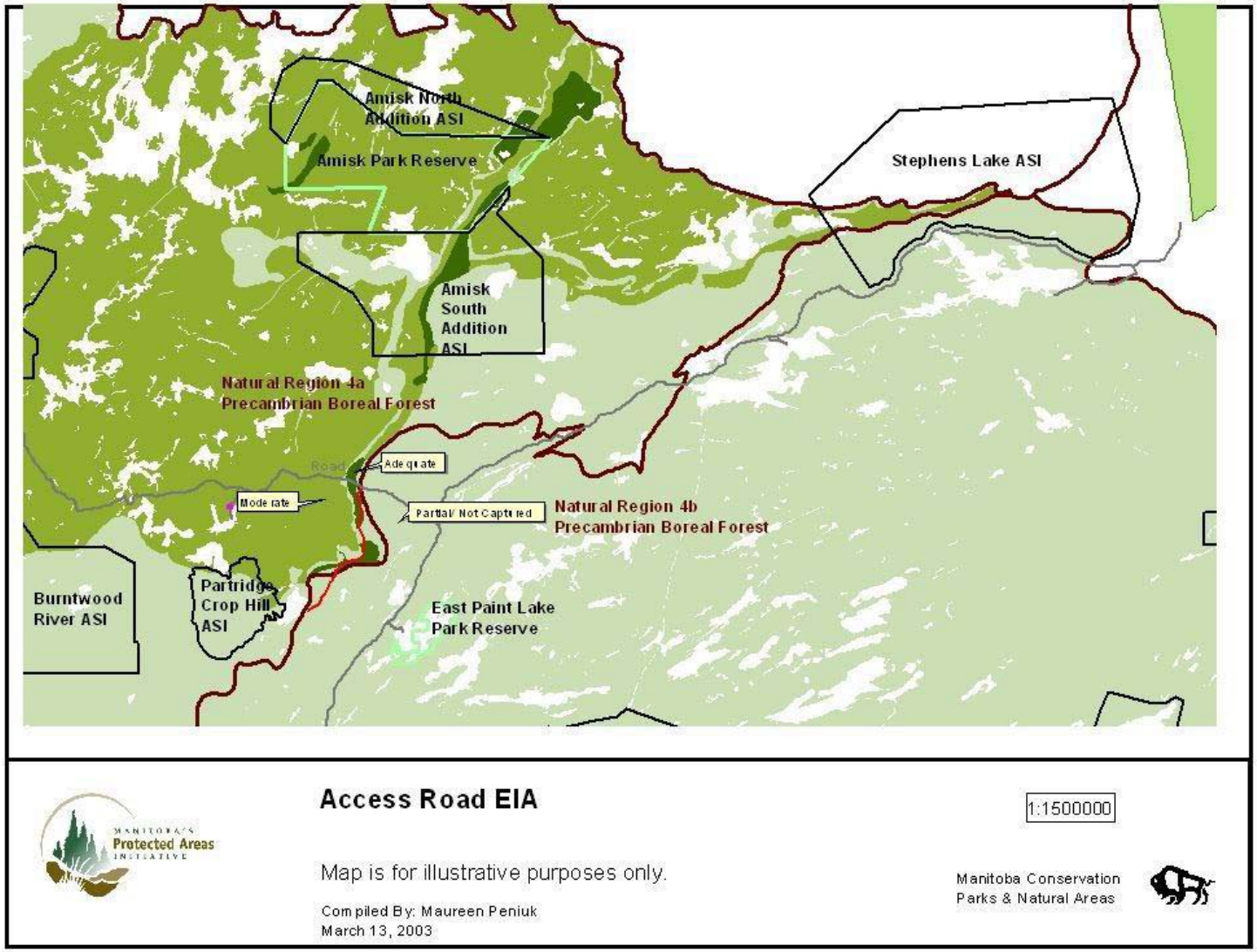


Figure CNF-S-17

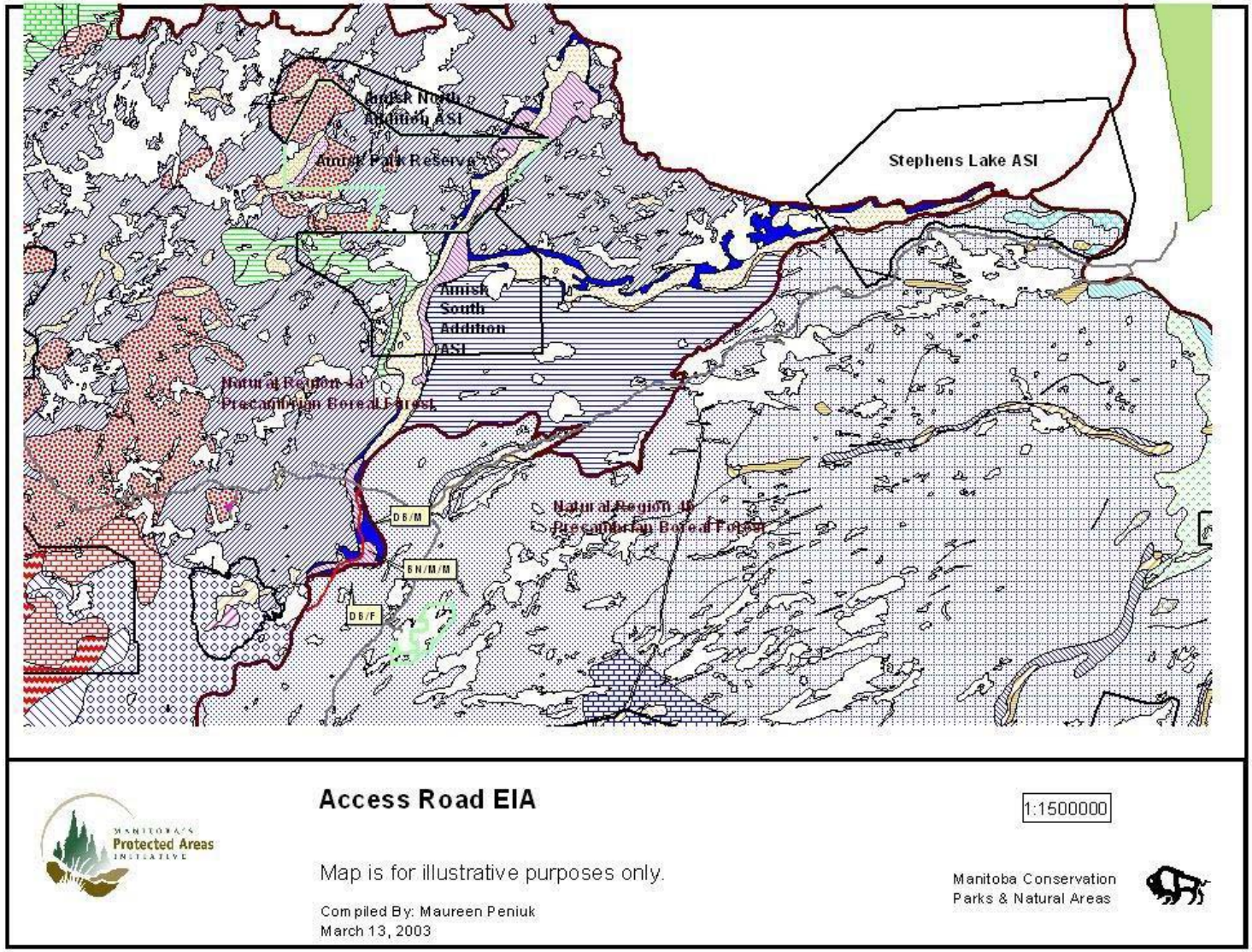


Figure CNF-S-17

Manitoba Hydro/NCN Response to
CNF Comments S-20 to S-26 Inclusive

These comments and related questions are directed to the basic Wuskwatim transmission concept, in particular to the proposal of three transmission line segments (S1, a single 230 kV line between Thompson and Wuskwatim; S2, twin 230 kV lines between Wuskwatim and Snow Lake; and S3, a single 230 kV line between Snow Lake and The Pas).

Wuskwatim Transmission Concept and Related Projects

The CNF comments suggest that:

1. S1 and the related switching stations at Wuskwatim and Thompson (the proposed Birchtree Station) would be more logically included in the Generation Project EIS.

2. Only S1 or S2 is required to "connect the WGP 200 megawatts (MW) to the provincial grid system and, through this grid, to the desired export markets"; that S3 is not required for this purpose; and that S1, being shorter, would be the preferable system connection.

3. Following from 2), Manitoba Hydro does not adequately justify either the need for S2 and S3, or the suggested requirement for S3 independently of Wuskwatim development.

4. The EIS definition of the Wuskwatim projects raises questions about their linkage with "other planned projects" such as Notigi and the East-West Power Grid.

The comments imply that the Wuskwatim transmission concept can be described and assessed independently of the integrated Manitoba Hydro transmission system. As outlined in the EIS, such an approach would be contrary to system planning fundamentals. In fact, with the exception of the three short feeder lines proposed to connect the Wuskwatim Generation Station to the Wuskwatim Switching Station, which will be dedicated solely to handling the flow of power from the Wuskwatim Generating Station to the Manitoba Hydro system, the various

components of the Wuskwatim transmission concept will be integral parts of the larger transmission system. Their operation will not be limited exclusively to transmission of power from Wuskwatim, but will support system performance and reliability more generally.
The EIS describes three fundamental considerations in respect to the proposed Wuskwatim transmission concept. The first is provision of the necessary capacity to deliver the additional 200 MW of power to the system. The second is provision of back-up capacity. The third is provision for broader support of system operation and reliability.

Depending on the specific circumstances, transmission of the 200 MW of power from Wuskwatim to the system might theoretically involve a single 230 kV line and a second back-up line, in which case the concept might simply involve twin lines from Wuskwatim to the nearest available point of system connection. However, that solution would require existing surplus capacity to be available to transmit the additional 200 MW beyond its point of connection further into and through the system, and it would essentially ignore any broader implications for integrated system operation.

If the point of system connection were more central to the existing network, there would be a relatively large number of connections available to provide the necessary 200 MW of transmission capacity. But Wuskwatim is located at the northern edge of the system, where there are few network links and limited surplus transmission capacity available. The normal flow of power in the provincial 230 kV transmission system in the Thompson vicinity is southerly. As illustrated in the Transmission Project EIS (Figure 3.1), there are a limited number of existing lines available to carry that flow. From Thompson, for example, there is only a single 230 kV line (to Ponton Station) available to transmit surplus power south (i.e., power not otherwise required by Inco, Thompson and other area communities), and essentially no excess capacity available to carry power from Wuskwatim. Hence, a single segment connection of Wuskwatim at Thompson (using two 230 kV lines to provide back-up capacity) would also require development of corresponding supplementary capacity on to Ponton and beyond.

Further into the system, at Ponton, there are two existing 230 kV connections (to Herblet Lake Station and to Grand Rapids) available to transmit power westerly and southerly, but the capacity

of these lines is needed not just for surplus power transmitted south from Thompson, but also for that generated at Jenpeg. A Wuskwatim connection at Ponton would still require development of supplementary transmission capacity. The situation is similar at Herblet Lake Station; a system connection from Wuskwatim would require additional capacity to transmit the power further into the system.

While there are no current plans to develop additional transmission capacity south from Ponton, system planning analyses have identified a system operation and reliability requirement for an additional connection between Herblet Lake Station at Snow lake and Rall's Island Station in The Pas. The development of a 230 kV line to provide that connection has previously been scheduled for a 2010 in-service date, independently of the Wuskwatim development. The additional transmission capacity provided by that line would be adequate to enable transmission of Wuskwatim power into the system beyond Snow Lake and, hence, the Wuskwatim transmission concept proposes to advance its development to match the Wuskwatim in-service date.

The inclusion of the 230 kV Thompson-Wuskwatim transmission line in the Wuskwatim transmission concept is initially to provide for construction power. Its ongoing function, in the integrated transmission system, will provide supplementary capacity and back-up for transmission of power south from Thompson and will enable advantage to be taken of the back-up capacity proposed to be developed in the two 230 kV lines linking Wuskwatim to Snow Lake. It will also provide backup capacity when one of the Wuskwatim-Snow Lake lines goes out of service.

In summary, all three segments of the Wuskwatim transmission concept are required from an integrated system planning perspective. And, although individual components may not presently be technically or economically justified in the absence of Wuskwatim, the complete concept will provide system operation and reliability benefits beyond the immediate requirements of the Wuskwatim project.

The preceding is a highly simplified explanation of the proposed Wuskwatim transmission

concept. The concept is supported by more detailed technical system planning analyses under both normal and transient conditions.

As to linkages with other "planned projects", there are no specific proposals or plans available on which to base a cumulative effects assessment of the East-West Power Grid. In the case of Notigi, development of which was deferred during initial consultation respecting the Wuskwatim transmission concept, the EIS concluded that there would be no significant effects relative to the Wuskwatim Transmission Project. In this context, the EIS identified the prospect that Notigi transmission requirements, if in addition to those proposed for Wuskwatim, would involve an additional transmission line south from Ponton, and might involve an additional connection between Notigi and Thompson.

Alternative Route Options and Configurations

The CNF comments included several suggestions as to additional route options and configurations (e.g., single vs. double line rights-of-way). Some of these would be viable only in the context of alternative Wuskwatim transmission concepts which, as explained in the preceding elaboration of the rationale for the proposed concept, would not be feasible.

Specific responses to several of the related CNF comments are provided in the matrix. The more general CNF recommendations suggest that, from an environmental perspective, combined or adjacent routing of linear facilities may be preferable to independent routing.

While this suggestion may be valid in some cases, it is subject to a number of limitations.

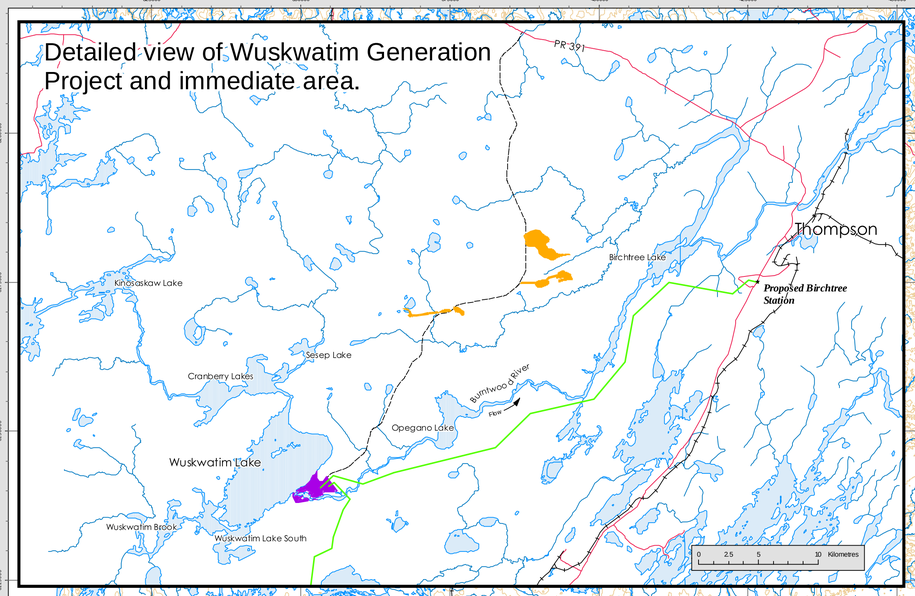
Routing parameters for transmission lines are quite different than those of other types of existing linear infrastructure in the region (i.e., roads and railways). Relative to a road or railway, a transmission line right-of-way is relatively straight and essentially unaffected by difficult terrain. For a transmission line to follow a road or rail alignment, there would generally be a substantial penalty in terms of line length, clearing requirements, the number of angle towers, and cost. Nonetheless, there can be a modest reduction in incremental disturbance and access where transmission lines are routed in the same general vicinity as existing road or rail infrastructure.

This principle was a significant consideration in routing for the proposed Snow Lake to The Pas transmission line, and figured as well in review of alternatives for the Thompson to Wuskwatim segment.

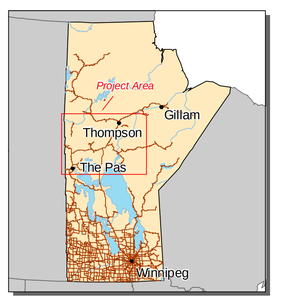
Where functionally feasible, parallel routing of transmission lines in a common corridor may be feasible and was a consideration in route selection for the Wuskwatim to Snow Lake transmission lines. There is a modest benefit in relation to fragmentation and the risk of access associated with the right-of-way. Benefits in relation to environmental disturbance are limited insofar as the additional line will require nearly as much cleared right-of-way as that of separate lines. And there is an offset in relation to system security, in that parallel lines may be vulnerable to common outage from a single event (e.g., severe winds or ice storms).

Wuskwatim Generation and Transmission Projects - CNF-S-1

Detailed view of Wuskwatim Generation Project and immediate area.



Wuskwatim transmission line
Railway lines
Provincial roadways
Mile 17 access road
Potential borrow pits
Approximate area of site disturbance by construction of generating station.



1:250,000 NTS Data Source

Datum: North American 1983
Projection: Universal Transverse Mercator Zone 14

0 10 20 40 Kilometres
0 5 10 20 Miles

Map prepared by: North/South Consultants Inc.
Map prepared on: August 5th, 2003