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"Engineering and Testing Solutions That Work for You"

April 29, 2020

File No.: 20-166-120

Fisher River Cree Nation
Box 367
Fisher River Cree Nation, Manitoba
R0C 1S0

ATTENTION: Chief and Council - Fisher River Cree Nation

RE: Engineering Consultant for Expert Review of the Environmental Impact Statement on the Lake Manitoba - Lake St. Martin Outlet Channels Project

Dear Harley Jonasson,

Thank you for the opportunity to present the First Phase of our assessment of the environmental impact statement of the Lake Manitoba / Lake St. Martin outlet on Fisher River Cree Nations.

Our analysis looked at hydraulic impacts these two (2) channels would have on Lake Winnipeg, as well as the traditional fishing territories of Fisher River Cree Nation.

The Phase 2 will be completed once federal Canadian Environmental Assessment Agency (CEAA) does a complete compilation of all the responses. At that time, we will be pleased to report our review of the final federal response for your consideration.

ENG-TECH trusts this is all the information you require. If you have any questions, please contact the undersigned.

Sincerely,
ENG-TECH Consulting Limited

Steve Topping, P.Eng.
Vice President

ST/mvw

Enclosure: Review of Environmental Impact Statement

Submitted to:

Fisher River Cree Nation

ENVIRONMENTAL

ENGINEERING CONSULTANT FOR EXPERT REVIEW OF THE ENVIRONMENTAL IMPACT STATEMENT ON THE L. MANITOBA – L. ST. MARTIN OUTLET CHANNELS PROJECT

LAKE MANITOBA / LAKE ST. MARTIN, MANITOBA



APRIL 2020

FILE NO.: 19-166-120



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ENGINEERING CONSULTANT FOR EXPERT REVIEW OF THE ENVIRONMENTAL IMPACT STATEMENT ON THE L. MANITOBA – L. ST. MARTIN OUTLET CHANNELS PROJECT

Introduction

Fisher River Cree Nation (FRCN) retained ENG-TECH Consulting Ltd. to provide expert review of:

- a) the Environmental Impact Statement (EIS) and EIS Summary submitted by Manitoba Infrastructure (MI) to the Canadian Environmental Assessment Agency (CEAA), pertaining to the Lake Manitoba and Lake St. Martin Outlet Channels Project August 2019 (“the LMB-LSM Project”), and
- b) the draft *Environmental Report and Conditions* to be prepared by CEAA following CEAA’s review of the LMB-LSM Project’s EIS, which will be informed and supported by comments submitted by FRCN and others.

The Consultant shall undertake the following activities and provide a final report to Chief and Council, Fisher River Cree Nation, on how the Lake Manitoba and Lake St Martin Channel Project may affect the waters in the Fisher River Cree Nation Traditional fishing territories.

- Review the Environmental Impact Statement (EIS) for accuracy and completeness with particular focus on project components affecting the waters and fisheries of Lake Winnipeg extending from the LSM Channel outlet to encompass the waters and lakeshore east to McBeth Point and the lakeshores north of Dauphin River,
- Identify information gaps and, where practical, provide recommendations on how to address the gaps in order to properly assess the environmental risk of the project to the Fisher River Cree Nation,
- Assess whether the environmental concerns and recommendations are adequately addressed in the EIS and, where feasible, recommend how any outstanding issues may be mitigated, and how FRCN should be accommodated for non-mitigated effects,
- Evaluate whether proposed mitigation measures and accommodations for non-mitigated concerns are fair and adequate, and
- Evaluate the alternative solutions that were considered and rejected by MI and provide other potential options if any.

The following areas of concern should be considered in the Fisher River Cree Nation EIS response to the Impact Assessment Agency of Canada.

Manitoba Infrastructure Hydraulic Simulations Review

In reviewing the EIS hydraulic simulations for a 212cms (7500 cfs) Lake Manitoba Outlet Channel (LMOC) and a 326 cms (11,500 cfs) Lake St Martin Outlet Channel (LSMOC) the following changes in existing conditions are expected for the waterways and lakes of the Lake Manitoba Basin water regime:

- Fairford River median flow will drop 21.8% from 1942 cfs to 1518 cfs

- Fairford River monthly flood flows, for 5% greater, will be 3000 to 4000 cfs lower, approximately 45% in April and 53% in October
- Dauphin River median flow will drop 16% from 2051 cfs to 1723 cfs
- Dauphin River monthly flood flows, for 5% greater, will be 4000 to 6000 cfs lower, approximately 43% in May and 54% in October
- In the drought extreme, 95% greater than, the monthly level of Lake Manitoba and Lake St Martin is virtually unchanged, Lake Manitoba general being 0.1 feet lower most of the year
- In the flood extremes, 5% greater than, the monthly level of Lake Manitoba will generally be 0.5 feet lower in the summer and 1.0 feet lower in the winter
- In the flood extremes, 5% greater than, the monthly level of Lake St Martin will generally be 0.2 to 1.2 feet lower in the summer and 1.3 to 2.1 feet lower in the winter
- On average, 50 percentile, the monthly level of Lake Manitoba will generally be 0.25 feet lower in the summer and 0.20 feet lower in the winter
- On average, 50 percentile, the summer monthly level of Lake St Martin will generally be 0.0 to 0.2 feet lower and in the winter 0.3 feet lower in the winter
- Lake Winnipeg for a 2011 flood with the channels in place would have experienced an increased peak by .07 metres in July 2011

The above statistics indicate that the greatest impact to water regimes will be to the Fairford and Dauphin Rivers. It is generally understood that the best year classes for the pickerel fishery is the high spring flood flow years. This may prove the same for white fish spawning in the fall.

In terms of Lake Winnipeg, a .07 meter (2.75 inch) increase in peak water level for the 2011 flood in July cannot be evaluated as to impact to lands as flood risk maps for Lake Winnipeg were not provided. If these flood risk maps had been provided, incremental flood impacted lands and infrastructure could be assessed under wind affected Lake Winnipeg levels.

Climate Change Impacts

In terms of climate change impacts to the project, based on historical flow records two conclusions can be derived:

- 1) The historical records reveal a predominance of floods from 1995 to 2014 in the Assiniboine and Lake Manitoba basin, which suggests that the outlet channels will be operated frequently in the future.
- 2) Based on simulations using the historical flow records the outlet channels will have to be operated an average of 4,000 cfs for each of the following winters (76/77, 06/07, 10/11, 11/12, 14/15/ 15/16, 17/18).

Both points 1 and 2 create a number of concerns in terms of operations and maintenance of the channels and the channels impact to the environment. These issues are summarized as follows:

- a) Given that the Lake Manitoba Outlet Channel (LMOC) will have water in the channel on a continuous basis in the reach between the control structure (just downstream of Highway 6) and Lake Manitoba, a permanent vegetative cover will not establish. This reach will be conducive to erosion and downstream sedimentation due to sustained, long duration, consecutive high flow flood events.
- b) The Lake St Martin Outlet Channel (LSMOC) will be a dry channel except during flood operations. During high sustained flows, a vegetative channel cover will likely not be adequate in areas of sandy soils requiring rock armour protection. The EIS does not mention erosion protection for addressing sandy soils.
- c) Given that rule 5 of the operating rules permits the operation of the channels in the winter months between the dates of December 1 to April 30th, ice jamming at control structures, drop structures and bridges could be a significant impact to reducing channel capacity, increased damage to infrastructure, potential over topping of channel banks causing overland runoff, potential impact to roads and increased erosion and sedimentation. The EIS does not mention ice jam mitigation measures.

Sediment Impact to Lake Winnipeg Fishery

Another impact to the Lake Winnipeg fishery is the release of sediment when the LSMOC is in operation. Spring operation will cause a sediment plume in the Sturgeon Bay area affecting spawning grounds due to sediment deposition on spawning substrate. Given that Lake Winnipeg north windstorm flows do move sediment north to south there is a possibility that a sediment plume can migrate south to McBeth Point, traditional commercial fishing grounds for Fisher River Cree First Nation. Satellite imagery (see imagery shown below - date of imagery unknown) for a year when the LSMEOC/Buffalo Creek which outlets to Dauphin River was not operated. Unfortunately, the author was unable to obtain imagery when the LSMEOC was in operation. It is evident from the imagery that the sediment plume moves south in Sturgeon Bay.

The impact of this potential northern transport of sediment to Fisher River Cree First Nation traditional fishing grounds is corroborated by the fact that Fishers have noticed an increase build up of moss and sediment on their nets impacting harvest yields. Fisher River Cree Nation are requesting that Manitoba Infrastructure provide satellite or aerial imagery taken during one of the years when the LSMEOC was in operation.



Alternative Flood Mitigation Infrastructure

An alternative that should be considered is the continuance of the Lake Manitoba flood mitigation programs that were initiated after the 2011 flood to capture the remaining flood mitigation benefits. Full uptake in this program did not take place as there was an expectation that a Lake Manitoba outlet would be built in the near future. To reduce the impacts of the upper Assiniboine Basin flood impacts on Lake Manitoba via the Portage Diversion, a large scale micro storage water retention incentive program should be instituted to reverse the impacts of on farm drainage in the Assiniboine River basin. This would require inter-jurisdictional co-operation with Saskatchewan to achieve this goal. The Red River Basin Commission, an international, multijurisdictional organization, has achieved significant water retention in the Red River Basin through the promotion and endorsement of wetland restoration and micro storage projects within the basin. Their ultimate goal is to retain one million acre-feet storage in the Red River basin to achieve flood reduction benefits on the main stem of the Red River.

The benefits of such a large scale program are numerous. Incremental and ongoing flood mitigation through out the Assiniboine and Lake Manitoba basin would be achieved. Further benefits would accrue such as restoration of drained wetlands and establishment of new wetlands for enhancement of wildlife habitat, reduction in greenhouse gases, drought protection, water quality improvements and reduced water conveyance infrastructure costs. Micro water retention may not be the full solution and would take a significant implementation period but it is a necessary step in restoring Manitoba watersheds.

Recommendations

ENG-TECH recommends that Fisher Cree Nation consider these concerns in the EIS response to the Federal Canadian Environmental Assessment Agency. ENG-TECH's review and conclusions to the draft *Environmental Report and Conditions* that will be prepared by CEAA review of the LMB-LSM Project's EIS responses will be submitted to Fisher River Cree Nation upon final review their report.

ENG-TECH trusts this is all the information you require. If you have any questions, please contact the undersigned.

Sincerely,
ENG-TECH Consulting Limited

Steve Topping, P.Eng.
Vice President

ST/mvw