



Rural Municipality of GRAHAMDALE

www.Grahamdale.ca

23 Government Road, P. O. Box 160, Moosehorn, Manitoba, R0C 2E0

June 8, 2020

Impact Assessment Agency of Canada (to be submitted via project website)

Bruce Webb
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Dear Sir/Madam,

Thank you for the opportunity to provide you with comments on March 2020 submission of the Lake Manitoba Lake St. Martin Outlet Channels Project Environmental Impact Statement (EIS)(Project), which follows guidelines provided previously by the Impact Assessment Agency of Canada and Manitoba Conservation and Climate.

Introduction

Manitoba Infrastructure is proposing the construction and operation of a new permanent flood control management system located in Manitoba. As proposed, the Lake Manitoba and Lake St. Martin Outlet Channels Project would consist of two new diversion channels each approximately 23 kilometres long: the first running northwards from Watchorn Bay on Lake Manitoba to Birch Bay on Lake St. Martin (Lake Manitoba Outlet Channel), and a second running northeast from Lake St. Martin to Lake Winnipeg, south of Willow Point (Lake St. Martin Outlet Channel). The project would also include the construction of two combined bridge and water control structures, a 24-kilovolt distribution line, and the re-alignment and/or construction of provincial highways, municipal roads and three bridge structures.

The Impact Agency of Canada (the Agency) has invited the public and Indigenous groups to comment on the potential environmental effects of the project and proposed measures to prevent or mitigate those effects as described in the proponent's summary of Environmental Impact Statement. Manitoba Conservation and Climate has similarly invited stakeholders to provide comment on the Environmental Impact Statement.

Lake Manitoba and Lake St. Martin Outlet Channels Project EIS Comments from the RM of Grahamdale

The Rural Municipality of Grahamdale (RM) did not have an opportunity to review the potential project effects or proposed mitigation/monitoring measures for the Project prior to the submission of the EIS in March 2020. Environmental protection and management plans have been identified throughout the EIS documentation as an important mitigation for project impacts but limited additional details have been shared to date with the RM other than communication that development of the Environmental Protection Plan and associated sub-plans will be developed at a later date to reflect commitments by the proponent and the conditions of the licence. The RM of Grahamdale feels that these management plans, their content, the process for their development, and the role RM and others have in the process is essential to ensure issues and concerns are appropriately addressed. The RM of Grahamdale feels these management and monitoring plans need to be confirmed by regulators prior to any issuance of licences or permits to proceed with the Project.

The RM of Grahamdale is aware that the Agency requested information from the proponent April 23, 2020 after identifying gaps in the information presented in the March 2020 submission. The RM has not reviewed responses to these information requests prior to this June 8, 2020¹ submission.¹ The RM did participate in the recent June 2 and 3 2020 Technical Advisory Group meeting hosted by the Agency and has tried where practical to incorporate additional information and clarifications provided in that process into the submission provided here. Outstanding questions and concerns raised by the RM at this meeting remain and the RM reserves the right to provide additional comment if and when responses are provided by the Proponent.

Scope of Review

The RM of Grahamdale has focused the review of the EIS to comments to issues and concerns previously identified and shared with the proponent. This information is provided below. The RM has also provided additional general observations about the EIS submission on hydraulic impacts and implications to the RM, and has been attached this to the submission (Attachment 1). This review includes suggestions on initiatives to reduce overall impacts of flooding such as upstream micro-storage retention.

As a guide for our submission, the RM has focused on answering the following questions:

- Question 1: Were the issues and concerns provided by the RM reflected in the EIS?
- Question 2: Did input and feedback provided by the RM contribute to alteration of the project design or approach?
- Question 3: Were the issues and concerns provided by the RM assessed in the EIS?
- Question 5: Do the proposed mitigation measures adequately address RM concerns?
- Question 6: Do the proposed monitoring and management activities adequately address uncertainty associated with projected effects and mitigation measures?

The RM has provided for reference a list of key interactions with the Proponent as well as a summary of the issues and concerns that were provided to the Proponent to confirm concerns.

¹ The RM is interested in the responses to a number of questions including those related to water quality, surface water quality, drainage and sufficient additional detailed description of mitigation plans to properly consider their adequacy in mitigating potential adverse effects.

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 Comments from the RM of Grahamdale

Table 1 summarizes key interactions between the RM and Manitoba Infrastructure from May 2017 to August 2019.

Table 1: Key Interactions between RM of Grahamdale and Manitoba Infrastructure (May 2017 to August 2019)

Date	From	To	Description
May 9, 2017	RM Grahamdale	Minister of Infrastructure Blaine Pedersen	Identification of interests: <ul style="list-style-type: none"> - No supporting information on the proposed Route "D" to RM - Never consulted on a preferred route. - Lack of information on wells, properties, agricultural viability, routing, severing - Lack of socio-economic considerations in the assessment of options. - Lack of design information (PTH 239) - Lack of clarity on the anticipated Environmental assessment process.
June 29, 2017	RM Grahamdale	Minister of Infrastructure Blaine Pedersen	Meeting to discuss issues
October 3, 2017	RM Grahamdale	Minister of Infrastructure Ron Schuler	Letter describing principled approach to assessing the impacts to the RM and requesting participation funding support.
November 9, 2017	RM Grahamdale	Minister Infrastructure Ron Schuler	Request repeated for process and socio-economic assessment funding support. Request to provide input into socio-economic assessment scope Request that economic benefits of ongoing work be distributed to local firms.
December 15, 2017	RM Grahamdale	Christine Baljko	Provided an initial list of areas of concern and interest associated with the proposed project.
February 26, 2018	RM Grahamdale	Minister Infrastructure Ron Schuler	Meeting and presentation focused on project principles as previously shared in 2017, a proposed process for the project processes moving forward, the consideration of a multi-year infrastructure fund to offset anticipated impacts, and a summary of local and regional concerns associated with the project, including: <ul style="list-style-type: none"> - Emissions, discharges and waste - Access to emergency services - Municipal transportation services - Municipal drainage system - Shoreline erosion - Fishing (commercial/outfitting) - Agricultural operations - Well water access

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			<ul style="list-style-type: none"> - Groundwater and surface water quality - Lake Manitoba (elevations, quality) - Municipal aggregate resources
March 8, 2018	RM Grahamdale	Minister Infrastructure Ron Schuler	Letter outlining ongoing project activities that overlap with the requirement of the RM to participate without funding support from the province. Requesting participation funding to ensure residents are represented.
May 14, 2018	RM Grahamdale	Minister Infrastructure Ron Schuler	Acknowledgement of March 22 letter from Min Schuler and meeting with DM Strain. Request to cover project related process costs the RM is incurring.
May 18, 2018	Christine Baljko	RM Grahamdale	Response to May 14 email from RM requesting an update. Reply email explains Local Assessment and Regional Assessment areas. Also advised that baseline work is underway on socio-economic areas, including anticipated key person interview program.
June 26, 2018	RM Grahamdale	Christine Baljko	Comment and suggestions for stakeholders to conduct key person interviews with.
August 10, 2018	Christine Baljko	Project Stakeholders	Cover letter and accompanying 22 question socio-economic survey instrument organized under "Economy", "Land Use and Development", "Infrastructure and Services", and "Personal, Family and Community Life". Cover letter noted that summary of the results may be used in the EIS. ²
August 21, 2019	Manitoba Infrastructure	RM Grahamdale	<p>Meeting with RM of Grahamdale. MI presented information on the overall environmental assessment approach and human environment.</p> <p>Human environment section described for five valued components engagement process outcomes, study boundaries, potential pathways of effect, data sources, and assessment methods. Preliminary effects or proposed mitigation measures were not reviewed.</p>
August 30, 2019			MI formally submits EIS to Manitoba and Canada

From these interactions with the Proponent and understanding of the Project, the RM identified a number of project-related issues and concerns. Table 2 provides a list issues and concerns that have been shared with the Proponent.

Table 2: RM of Grahamdale Issues and Concerns

Valued Component	Issue/ Concern	Description	Where reflected in EIS
Atmospheric Environment	Emissions	Discharges and waste generated during construction phase	EIS Summary (Attach A) EIS Summary 6.1.1.2

² Note these categories differ from the proposed socio-economic valued components shared during the Round Three Open House process June 19-21, 2018 (Resource Use, Agriculture, Recreation and Tourism, Infrastructure and Services, Economy, Heritage and Archaeological Resources, Human Health and Safety).

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Groundwater and Surface Water	Water Quality	Impacts on surface and ground water quality.	EIS Summary (Attach A)
Infrastructure and Services	Transportation Infrastructure	Increased traffic on Provincial Road network	EIS Summary (Attach A) Page 9.115
		Road safety during construction	EIS Summary (Attach A)
		Severance effects on municipal road network	EIS Summary (Attach A) EIS, Vol 1, p 4.10 Section 9.3.4.4
		Changes to road drainage systems	Section 6.4/9.2
		Changes to agriculture drainage systems	Section 6.4/9.2
	Utilities and Communications Infrastructure	Cellular services	Page 9.116 Section 9.3.4.5
	Waste and Water Infrastructure	Effects of groundwater on wells	EIS Summary (Attach A) Section 9.3.4.3
	Emergency Services	Increased need for RCMP services Increased Fire/EMS demands on volunteer service	EIS, Vol 1, p 4.10 Section 9.3.4.3
	Community Services	Effects on landfill site Effects on recycling services	Section 9.3.4.3
Economy	Benefits	Economic participation during construction if capacity to participate Local spending	EIS Summary (6.10.2.2)
	Increased RM resource demands	Increase demand for legal, staff, council requirements	
	Tax revenue	Loss of tax revenue from land taken by expropriation	EIS Summary (Attach A)
	Commercial Fishing	Impacts to commercial fishing	EIS Summary (Attach A)
	Fishing and Outfitting	Impacts to fishing and outfitting	EIS Summary (Attach A)
	Tourism	Tourism impacts to RM	EIS Summary (Attach A)
Land	Between Birch Creek and the channel	Concerns land will be degraded due to seepage.	
	Shoreline erosion	Impact on Lake Manitoba shoreline from operations	EIS Summary (Attach A)
	Agricultural	Impacts on both crop and livestock operations along channel.	EIS Summary (Attach A)
	Between Lake Manitoba and Control Structure	Concerns of flooding due to wind setup	
Resource Use	Aggregate resources	Impact on municipal road maintenance costs from depletion of aggregate resources	Section 9.2
		Effects on other resource uses	EIS Summary (Attach A)

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Recreation and Tourism	Watchhorn Provincial Park impacts	Impact on beaches from gabion groin operation.	EIS Summary (Attach A)
	Snowmobile and other travelways	Impact on ability to move within the RM with channel presence.	Page 9.9
	Tourism	Impact on tourism	EIS Summary (Attach A)
Heritage Resources	Concerns	Effects on archaeological and heritage resources.	EIS Summary (Attach A)
Others	Economic	RM not eligible for work on the access road construction.	
	Wildlife	Effects to wildlife crossing the channel	EIS Summary (Attach A)

Question 1: Were the issues and concerns provided by the RM reflected in the EIS? Attachment A to the EIS Summary provides a summary of public issues and concerns raised during the engagement process. Table 2 above highlights where issues and concerns provided by the RM appear to be referenced within the EIS Summary. Where a reference was not readily provided in the EIS Summary, the accompanying volumes of the EIS were reviewed.

This review has highlighted where there are issues that were identified by the RM that do not appear to have been reflected in the EIS. These include issues and concerns relate to:

- Additional RM resources required support the Project construction and operation phases;
- Increased infrastructure maintenance costs to the RM;
- Land quality degradation associated with seepage;
- Flooding risks associated with wind set up; and
- Ability to participate in economic opportunities such as the access road construction.

The RM is unable to assess whether or not the proponent recognized these concerns in the EIS as they were not readily located with the information as filed. Concerns about increased costs to the RM related to asset maintenance and provision of services, flooding risks associated with wind setup, and land quality degradation were raised again during the June 2 /2 2020 TAG Meeting so that the proponent might be able to direct where in the EIS these concerns were addressed.

Question 2: Did input and feedback provided by the RM contribute to alteration of the project design or approach?

The proponent has indicated that engagement with the public and stakeholders was integrated throughout the EIS including:

- Confirmation of the need for permanent infrastructure;
- Definition of the project description;
- Rationale for the overall approach to the evaluation, including selection of valued components; and
- A review of conclusions such as potential effects and mitigation measures were provided through meetings, open houses, and other forms of communication with opportunity for feedback. (Chapter 5)

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The RM has not been able to readily identify where in the EIS the Project has been altered in design or approach as a result of public input. As a result, the RM is unable to determine whether or not the Proponent adjusted the EIS as a result of input. Information that would indicate this has not been shared with the RM to date.

The RM has reviewed materials shared by MI during meetings and public open house materials used in the four rounds of public engagement, as well as materials included in the EIS submission.

Round Three open house materials shared in June 2018 sought feedback on proposed valued components, provided preliminary land use mitigation measures, and matrices identifying preliminary interactions between project components and the environment and people. Environmental effects assessment details were not included in the Round Three open house materials, but were noted to be a topic for future discussion.

Round Four open house events held in June 2019 included updates to the project description and highlighted interactions between valued components and the Project. Information on Project effects and potential mitigation measures to address these effects was not available to review or provide feedback on.

Section 2.3.2.1 of the EIS (page 2.13) notes that there are ongoing and future meetings planned with the RM including a proposed public open house, meetings with local stakeholders and that this information will be collected and shared with the Agency. The proponent further states that after receipt of necessary regulatory approvals, engagement will continue to further develop understanding of the interests and concerns of people and communities potentially affected the proposed Project. This will include opportunities to comment on detailed design, construction, and operation and maintenance. There has been no further project information shared by the proponent with the RM since the August 21, 2019 overview presentation.

Question 3: Were the issues and concerns provided by the RM assessed in the EIS? Do proposed mitigation measures address these concerns?

The RM has reviewed the EIS Summary material and the assessment and mitigation measures for each issue and concern raised by the RM. These comments, including those contained in the attached review of hydraulic issues, include the following comments:

Hydraulic Concerns

The document attached to this submission reviews proposed hydraulic impacts of the project, including review of the hydraulic model simulations. It identifies a concern with the hydraulic modelling of water within Lake St. Martin in that it did not accurately reflect the differences between the south and north basins of the lake. During the June 2/3 TAG workshop, the proponent acknowledged that this was something that they were taking steps to address, including placement of a temporary water gauge within the south basin to complement information collected from the gauge in the north basin. During specific water events the difference between the two basins could be as great as 3 feet (not adjusted for wind event). Incomplete modelling contributes to incomplete project design and suggests that project design and associated operating rules should not be

finalized until such time as water volumes are better understood and the impacts appropriately considered.

Winter Operations

The proponent plans to operate a wet channel year-round, including potential for operations in the winter. The implications of these operations on the physical operation of the water control structure with the presence of ice and potential for ice jamming have not been thoroughly considered. The impacts of winter operations on the region also need to be considered including the potential for impacts on RM infrastructure, erosion implications, and impacts on resource users such a commercial fisher operations on Lake St. Martin. More information, ideally included within an ice management and mitigation plan, needs to be developed reviewed and approved by regulators and stakeholders.

Flood Easements

The proponent is concluding settlement agreements with First Nation communities to resolve all litigation between parties. These agreements are expected to include a flood easement granted to Manitoba to allow for some inundation (to 806 feet elevation) for reserve land in the course of operating flood control infrastructure in the public interest. The RM is not aware whether all property owners are involved in this process to provide an easement for inundated lands impacted by the operation of flood control infrastructure. If all landowners are not equally involved in the process, the RM feels that they should be included or plans provided showing how all property owners that may be subject to inundation will be mitigated. The proponent acknowledges that future operation of the project may reduce future flood events and allow for these easements to be reduced.³

Atmospheric Environment (Section 6.1)

- Construction phase waste and discharges
 - Section 6.1.2.2 – mitigation as described appears adequate to address RM concerns

Groundwater and Surface Water Quality (Section 6.3/6.4)

- Dewatering to reduce pressure on the underlying aquifer prior to construction and may adversely impact local area wells.
- Surface Water Management Plan will be developed and implemented.

Both Groundwater modelling and Surface water modelling should be revisited and reconsidered before developing associated management plans. Presentation and discussion during the June 2/3 TAG meeting highlighted that maintaining water quality, including sustaining the existing aquifer, is a priority for all regional stakeholders. The potential for groundwater/surface water interface and contamination is a considerable issue of concern. The Proponent's intent of operating a wet channel year-round, the impediment to vegetation cover recovery with a wet channel, resulting increased erosion and increased sediment transfer, and the depressurizing of wells to manage water levels are all considered threats to existing water supply and quality. Modelling of the interface between groundwater and surface water does not appear to have been completed to accurately determine how water quality may be impacted. Mitigation for water quality, in addition to

³ Section 2.3.1.2, Page 2.9

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development of associated management plans, focuses largely on re-drilling water wells where water levels have dropped substantially.

Surface Water Management Plans need to ensure that the proponent adequately addresses concerns with how Birch Creek and Watchorn Creek systems will function with the substantive changes with drainage, impact to associated wetlands important to regional landowners, and the increased potential for erosion that may result from these changes. The RM is not comfortable with the current level of explanation in the EIS or the adequacy of the assessment given the risks this may have to water quality and the functional operation of Birch Creek and Watchorn Creek drainage systems.

Infrastructure and Services (Section 6.9)

- Traffic and roadways and Road safety to be addressed through a Traffic Management Plan
- Drainage
- Cellular interference
- Wells
- Emergency Services
- Community Services (landfill/recycling)

The RM has not been able to readily identify in the EIS where the potential interference with cellular connectivity as a result of the project is addressed.

Comments on drainage are provided elsewhere though impacts to municipal infrastructure as a result of drainage impacts has not been considered within the EIS. Similarly concerns about the impact to community services such as landfill capacity is not clearly addressed in the EIS. ⁴

Economy (Section 6.10)

- Economic benefit participation
 - The RM is pleased to see a commitment to the development of work packages that are consistent with the capabilities of local and regional businesses, the development of a labour and training strategic action plan, and the commitment to work with local communities to develop training programs in advance of the project.
- Increased RM resource demands have not been addressed in the EIS.
- Tax revenue losses
 - The proponent commits to pay a grant in lieu of property taxes. This should mitigate tax revenue loss associated with loss of property to expropriation.
- Commercial fishing
 - The EIS state that fish stocks are expected to remain constant throughout the construction and operation and maintenance phases.

The proponent has acknowledged that the existing fish ladder at the Fairford Control Structure is not effective and has proposed the structure be removed to improve outflow capacity. The operation of the new control structure when completed will effectively be a physical impediment to the fish movement between Lake St. Martin and

⁴ Page 9.141

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Lake Manitoba. The project needs to incorporate a proper fish ladder to facilitate the continued movement of fish.

Implications of year-round operation of the control structure on Lake St. Martin water elevations and the operation of the commercial fishery is not clear in the EIS. Changes in water elevation on Lake St. Martin could impact the winter fishery. Implications to fish stocks and the sustainability of the commercial fishery with the removal of the existing fish ladder are similarly not clear.

- Tourism
 - Impacts to Watchorn Provincial Park, including the potential degradation of park areas and beaches was identified by the RM. Other recreational and tourism activities such as fishing, hunting, and snowmobiling were also shared. These topics were assessed in the EIS and mitigation has largely focused on the development and implementation of management plans.

Land and Resource Use (Section 6.8)

- Seepage impacts on land value
- Shoreline erosion
- Agriculture
 - The EIS states that with mitigation measures, adverse effects are not anticipated to degrade or disrupt activities such that they cannot continue near the baseline level within the LAA overall. The RM is unclear whether the statement means that in the event that adverse effects, though not anticipated, occur, the Proponent will take actions to ensure there will be no degradation or disruption to activities as they occur today.
- Flooding associated with wind set-up events on adjacent landowners is not clear.
- Aggregate resource use impacts on municipal road maintenance costs
 - The EIS notes that 100% of the aggregates required for the project will be procured within the LAA. The RM has expressed concern that this would deplete available supplies and could increase road maintenance costs. This issue does not appear to have been addressed with the EIS as submitted.
- Snowmobiles and other travelways along outlet channels
 - Recreation will not be allowed along the outlet channels through the life of the Project.

Question 4: Do the proposed monitoring and environmental protection measures address RM concerns?

The EIS describes measures intended to mitigate project related impacts in the construction phase and operation and maintenance phase. The level of uncertainty is high in many of the predicted outcomes. Stakeholders are concerned that the implications of getting these project impacts or mitigation measures wrong could place substantial hardship on the RM and constituents. The RM strongly encourages appropriate effort and time be applied to ensure all monitoring and environmental protection measures are in place prior to construction licensing and permitting.

Monitoring programs during these Project phases can help test the predicted effects of the EIS, help identify unanticipated effects related to the Project, monitor mitigation measure effectiveness, and help determine whether adaptive management is required when actual results are different than

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what had been predicted. It is reasonable to consider that monitoring and management of changes to the environment during the subsequent phases of a project should occur and this is consistent with good assessment practice. It is understandable that specific monitoring and effects management plans remain to be developed but the RM provides the following comments below and notes that given the scope of the project, the sensitivity of the receiving environment to adverse impacts, and a history of substantial and negative impacts causing in some cases irreparable harm to communities and landowners, environment management plans and the modelling studies that support these plans, should be peer reviewed.

- Atmospheric Environment:
 - No follow-up monitoring plans proposed for air quality but noise monitoring may be required if concerns are raised. It is unclear what level of concern will need to be present before follow-up monitoring plans are implemented.
- Groundwater and Surface Water:
 - Groundwater Management Plan will be developed to address effects of dewatering and enumeration of wells.
 - Aquatic Effects Monitoring Plan (AEMP) states there will be continued surface water quality sampling.
 - Environmental Management Plan is being developed and will outline mitigation methods and measures to reduce or prevent potential effects to surface water.
- Infrastructure and Services
 - No follow-up monitoring plans are proposed but the Proponent cites the implementation of a Traffic Management Plan to facilitate and manage change during the construction phase. An Access Management Plan will be developed to address access related issues expressed by directly affected stakeholders. An Emergency Response Plan will be developed to include measures to address waste disposal, emergency response communications, and fire response and evacuation.

The RM has not to date received information from the proponent on how project-related changes to municipal asset maintenance and services costs will be mitigated.
- Economy
 - No follow-up monitoring plans proposed to ensure the proposed implementation plans and economic benefits, particularly in the regional study area, are realized.

Next Steps

Engagement Next Steps (Section 5.25) – the proponent indicates engagement with others (such as the RM of Grahamdale) will continue during the development of the proposed Project and that this engagement will inform ways to minimize potential adverse effects and enhance positive effects where possible. MI will receive this input and consider whether this information alters the effects assessment and/or warrants modifications to proposed EIS mitigation measures.

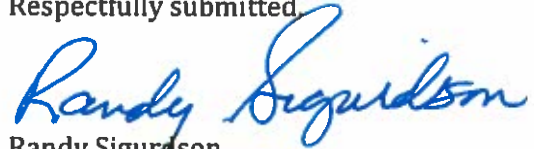
The RM is supportive of collaboratively developing the LMOC Environment Protection Plan with Manitoba Infrastructure to address project impacts anticipated during the construction and operation phases of the project.

This plan will address multiple project impacts for both construction and operation and maintenance phases of the Project. The EPP will have numerous subplans which will address short term and long term monitoring programs for erosion and sediment control, vegetation

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management, surface water, ground water, Lake Manitoba shoreline, community impacts to the road network, community emergency services, communication network and community infrastructure such as the landfill and sewage lagoon. The EPP will also address emergency response measures such as fire and spill response. The EPP must be relevant and adaptive. The RM of Grahamdale being a major stakeholder for the LMOC must be involved in all facets of the development and implementation of the EPP. Support funding from the proponent for the Municipality is crucial for the successful development and implementation of the EPP.

Respectfully submitted,



Randy Sigurdson
Deputy Reeve
R.M. of Grahamdale

Attachment 1: Expert Review Comments Regarding Hydraulic Impacts



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"Engineering and Testing Solutions That Work for You"

May 22, 2020

File No. 19-169-01

RE: Lake Manitoba and Lake St. Martin Outlet Channel Project Environmental Impact Statement Expert Review Comments Regarding Hydraulic Impacts

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 change 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.
- It is noted that the historical hydraulic simulations provide three scenarios. The scenarios are: existing condition without Lake St Martin Emergency Outlet Channel (LSMEOC), existing condition with LSMEOC and the final scenario being proposed project with LMOC and LSMOC in place. Given that the LSMEOC can only be operated under federal License approval for an emergency flood event, this scenario should not be used for comparative purposes in demonstrating the incremental hydraulic impacts of the proposed project.

The above statistics indicate that the greatest impact to water regimes will be to the Fairford and Dauphin Rivers. Both median flows and October fall flood flows on both of these rivers will see significant reductions. The Dauphin River and Fairford River will also see significant May spring flood flow reductions. 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.

Both Lakes Manitoba and Lake St Martin will generally be unchanged pre and post project under the median and low flow conditions. As the Lake Manitoba Outlet Project is being designed and operated to reduce flooding on both Lake Manitoba and Lake St Martin, in general these lakes will experience significantly lower levels during flood events.

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 flow rate of 4,000 cfs for each of the following winters: 76/77, 06/07, 10/11, 11/12, 14/15, 15/16, and 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. Deposition of sediment on fish spawning substrate will occur in the Lake St Martin south basin in the vicinity where the LMOC discharges. Based on the bathymetry provided in the EIS, the lake water depths are less than 2.0 metres up to 800 metres from the outlet of the LMOC. It is anticipated that a silt deposition delta will establish over time, filling the southernmost portion of the Lake St Martin basin. It is expected that boat navigation will be impacted and less aquatic habitat would be available for fish due to the silt deposition. Rock armour protection on channel side slopes and bottom may be necessary to limit the erosive forces of flood flows in the channels. The EIS does not mention erosion protection of the channel.

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 for the LSMOC.

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, increasing damage to channel infrastructure, potential over topping of channel banks causing overland runoff, potential impact to roads and increased erosion and sedimentation. Bridges need to be designed for ice jam conditions. The EIS does not mention ice jam mitigation measures.

Winter operations could be very detrimental to Lake St Martin winter ice levels as there will be little ability to adjust channel inflows and outflows during the winter for fear of disrupting both the LMOC and LSMOC channel ice covers. As Lake St Martin is small body of water the levels of the lake are very sensitive to inflows and outflows being out of balance. Any disruption of the balance of inflow and outflow due to LMOC and LSMOC channel adjustments or Fairford flow adjustments

to deal with ice impacts may cause shifting ice on Lake St Martin or ice jamming on the Fairford river. These shifting Lake St Martin and Lake Pineimuta ice cover levels can severely impact commercial fishing operations due to nets freezing in place or unstable ice conditions.

The LMOC literally bisects the Birch Creek watershed disrupting the flow of surface water in reaching the Birch Creek. There is no detail in the EIS as to how surface water will be managed. It is important that agricultural lands upslope of the channel have an outlet either into the channel or a syphon beneath the channel to outlet to Birch Creek. The design capacity of channel interceptor drains and outlets must be adequate to protect agricultural crops during the growing season. Likewise, the higher flow spring runoff must not back up to flood residential and farm infrastructure due to limited capacity drainage outlets. To be consistent with Provincial flood protection guidelines of 1:200 year flood levels, the drainage outlets must be designed for this level of flood protection. The Birch Creek wetlands may shrink in size or be negatively impacted during drought due a significant inflow being intercepted from the LMOC. The significant reduction of contributing watershed to Birch Creek drain, agricultural drainage design standard and spring flood flows must be addressed in the Surface Water Management plan.

The LMOC is being designed to have water within it on a continuous basis from Lake Manitoba to the control structure just downstream of Highway 6. The intent is to surcharge the artesian aquifer to prevent blow outs in the LMOC. The invert of the LMOC intercepts the bedrock in a number of locations which will be the point of aquifer discharge into the channel. This aquifer is a source of drinking water for a number of farms and residences within the vicinity of the LMOC. When surface water is allowed to discharge to a drinking water aquifer it is classified as a Groundwater Under Direct Influence (GUDI) under the Manitoba Drinking Water Act. Surface water contamination of a drinking water source will require mitigation measures such as chlorination of drinking water wells, water haulage or supply of water to a rural potable water pipeline.

There is also a concern that sustained aquifer depressurization measures during construction will impact private wells due to lowering of the groundwater table. The EIS does not provide for the analysis of aquifer depressurization or the long term GUDI effects of Lake Manitoba water on water quality of the aquifer. A groundwater model would be effective in understanding the extent of drawdown during aquifer depressurization and contamination plume extent and concentration for a range of LMOC operations. The ground water model results would be useful in developing the Ground Water Management Plan with would provide for well remediation requirements,

strategies for restoration of potable drinking water supplies for residences and the design of a long term groundwater level and water quality testing program.

A review of the LMOC profile indicates between station 215+00 and 220+00 just upstream of the control structure the east embankment will be in fill approximately 3.0m above prairie level. A portion of this fill will have a continuous head of water from the LMOC due to the range of normal operation of Lake Manitoba. This embankment will have to be designed to be impervious as there is a high seepage potential to agricultural lands east of the LMOC.

The EIS is vague on the description of the configuration of the LMOC entrance at Lake Manitoba. The EIS indicates the inlet channel will be flared into Lake Manitoba extending up to 500 metres. Rock jetties or groins would extend both sides of the channel flare. There is a concern that a combination of the depended channel, and groins will disrupt the southerly littoral drift of shoreline sand caused by predominantly North West storms. This southerly movement of sand is what sustains the beautiful beaches of Watchhorn Provincial Park. Groins projecting out into Lake Manitoba trap sand on the northern side of the groin preventing the movement of the sand to the south. In fact, a new, wider beach forms to the north of the groin severely impacting the natural aquatic habitat. This is common phenomenon that is impacting the integrity of Lake Winnipeg and Lake Manitoba beaches. EIS does not identify any modelling of Lake shoreline processes. This 2-D or 3-D modelling would be extremely useful in determining the optimum inlet configuration which would minimize aquatic habitat impact, minimize channel inlet deposition and disruption of sand movement. Watchhorn Provincial Park Beach should have a minimum 10 year monitoring program which would include pictures of beach reaches, survey of cross sections of the beach to monitor aggregation or erosion of the beach. These cross sections should be surveyed after every major wind storm event to monitor the extent of change to the beach.

A mitigation alternative that should be considered to reduce the impacts of the upper Assiniboine Basin flood impacts on Lake Manitoba via the Portage Diversion is a large scale micro-storage water retention incentive program. Financial incentives for establishment of wetlands and micro-storage projects 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, multi-jurisdictional 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 largescale program are

numerous. Incremental and ongoing flood mitigation throughout 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.

The water balance hydraulic model as presented in the EIS has a significant oversight in that it did not take into account the narrows between the south and north basin of Lake St Martin. Lake St Martin in essence is two lakes connected by the Narrows. As a result of diverting an additional 7500 cfs via the LMOC and the increased contributions of 3200 cfs for the removal from the Fairford Control Structure fish ladder into the south basin, for a 2011 flood event, the south basin will likely be 2 to 3 feet higher than the north basin. This is because the narrows is a restriction between the two basins, restricting flow going north. This will impact the design capacity of the channels making them less effective for flood mitigation on both Lake Manitoba and Lake St Martin. There is only one water level measurement gauge on the south basin of Lake St Martin. There needs to be a second gauge installed in the north basin to better define the Lake St Martin out flow performance (ie Dauphin River and LSMOC).

This is a serious deficiency in the modelling. The Province of Manitoba is negotiating for an 806 feet flood easement on Lake St Martin First Nation reserves to contain extreme flood events. The Province to this date, has not pursued a flood easement on Lake St Martin for deeded lands on Lake St Martin. With the current configuration of the outlet channels and the omission of the Narrows hydraulic restriction in the model a greater number of exceedances of the flood easement upper limit will occur than was predicted in the EIS for extreme flood events.

The RM of Grahamdale is supportive of developing the LMOC Environment Protection Plan in collaboration with Manitoba Infrastructure. This plan will address multiple project impacts for both construction and post construction phases of the project. The EPP will have numerous subplans which will address short term and longterm monitoring programs for erosion and sediment control, vegetation management, surface water, ground water, Lake Manitoba shoreline, Community impacts to the road network, community emergency services, communication network and community infrastructure such as the landfill and sewage lagoon. The EPP will also address emergency response measures such as fire and spill response. The EPP must be relevant and

adaptive. The RM of Grahamdale being a major stakeholder for the LMOC must be involved in all facets of the development and implementation of the EPP. Support funding from the proponent for the Municipality is crucial for the successful development and implementation of the EPP.

If there are any questions, please contact this office.

Sincerely,
ENG-TECH Consulting Limited

Steve Topping, P.Eng.

Vice President

SDT/mvw

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