**Submitted by:** **Lake St. Martin First Nation**

# REVIEW OF ENVIRONMENTAL IMPACT STATEMENT FOR LAKE MANITOBA AND LAKE ST. MARTIN OUTLET CHANNELS

**With Contributors:**

WERI
WINNIPEG ENVIRONMENTAL REMEDIATIONS INCORPORATED
"An integration of ideas and technology to provide sound environmental solutions."

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## Project History and Overview from the Lake St Martin First Nation Perspective

The Lake Manitoba and Lake St. Martin Outlet Channels project primary objective is to bolster flood protection to the communities near Lake Manitoba and Lake St. Martin. The expansion of the Fairford River capacity from Lake Manitoba to Lake St Martin in the early 1960's was to compensate for the increased flows contributed from the Assiniboine River by the Portage Diversion. But no outlet improvements were completed from Lake St Martin to Lake Winnipeg. This is a fundamental flaw in the Provincial Flood Protection Infrastructure that protects the City of Winnipeg. As a result Lake St Martin First Nation (LSMFN) has been experiencing artificial flooding since the early 1960's resulting in increased damages to community and residential infrastructure, agricultural impacts, elevated ground water tables, loss of fisheries and fur trapping resource harvesting, lost opportunity in economic development, community disruption and evacuations due to flooding and significant flood fighting costs. To date, LSMFN has not been compensated for the past flood damages or for the damages of the 2011 and 2014 floods.

The record flood events that occurred in 2011 and 2014 resulted in the Portage Diversion exceeding it's design capacity and contributing higher flood volumes to Lake Manitoba and to the downstream First Nation communities around Lake St Martin and on Dauphin River. . In 2011, water levels in Lake Manitoba reached a record-high of 817.2 feet above sea level; which is 4.6 feet higher than the top of the desirable range. As a result, the outflows of Lake Manitoba to Lake St. Martin increased, which contributed to the flooding on Lake St. Martin. The KGS, Assiniboine River and Lake Manitoba Basins Flood Mitigation Study, January 2016 study commissioned by the Province of Manitoba recommends an increase in the design capacity of the Portage Diversion resulting in a future increase in flood volumes to Lake Manitoba and Lake St Martin. No consultations as to these recommended improvements to the Provincial Flood Control System has taken place with LSMFN to date.

The Province of Manitoba is proposing securing a flood easement up to 806 feet on Lake St Martin to contain future floods within this easement. This flood easement is integral and necessary for the Lake Manitoba and Lake St Martin Channel project proposed operating regime. The Federal-Provincial Comprehensive Settlement Agreement (CSA) which addresses past flooding, compensation for the flood easement, restoring the LSMFN community housing and community infrastructure and addressing lost economic development opportunity is still under negotiation. In fact, negotiations have stalled as neither Federal or Provincial governments are willing to meet to resume negotiations. As a result of not being able to fulfill the proposed elements of the CSA, LSMFN is unable to repatriate their community with the 2011 flood refugees that are currently living in Winnipeg as community housing projects are not completed and community infrastructure such as the Health Center, church, band office, recreation center and landfill upgrades are not in place. In fact, there are many cleanup items and deficiencies outstanding after the 2011 flood. It is LSMFN's position that a Federal Environmental license canot be awarded for this project until the Lake St Martin Flood Easement is negotiated and compensated for.

LSMFN is also of the position that the flood easement must be in place for the continued operation of the Fairford Control Structure and the interim operations of the Lake St Martin Emergency Outlet Channel as the Province is continuing to trespass on LSMFN reserve lands.

It is in the spirit of co-operation that LSMFN is providing comprehensive, constructive feedback on the Lake Manitoba and Lake St. Martin Outlet Channels project EIS. This project will have a significant impact both during construction and through future operations on the people of LSMFN. It significantly impacts the Lake St Martin aquatic and terrestrial eco-system, infringes on

established traditional and treaty rights and will negatively and positively impact our community for generations in the future. The socio-economic impacts to LSMFN for the past and future must be addressed.

## Introduction

LSMFN retained three consultants to provide expert advice on the review of the EIS for the Lake Manitoba and Lake St. Martin Outlet Channels project.

ENG-TECH Consulting Ltd, WERI and Infinyt Development Group terms of reference were as follows:

ENG-TECH Consulting Ltd

- Review the Environmental Impact Statement (EIS) for accuracy and completeness with particular focus on project components affecting the waters of Lake Piniemuta, Lake St Martin, Dauphin River and Lake Winnipeg.
- 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 surface water, ground water, wetlands and terrestrial environments on the reserve and traditional use lands of the LSMFN

WERI Contract Ltd

- Review the Environmental Impact Statement (EIS) for accuracy and completeness with particular focus on project components affecting the fisheries of Lake Manitoba, Lake Piniemuta, Lake St Martin, Dauphin River and Lake Winnipeg.
- 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 Lake St Martin First Nation (LSMFN) traditional fishery grounds, fisheries resource and the aquatic habitat.
- 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 endangered species
- 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 promoting aquatic invasive species.
- 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 wildlife and migratory birds.
- 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 endangered traditional lands and native plant species.

Infinyt Development Group

- Review the Environmental Impact Statement (EIS) for accuracy and completeness with particular focus on project components impacting the Lake St Martin First Nation (LSMFN) established aboriginal or treaty rights, the basic health and wellness of the community members, economic structures, socio-economic conditions, physical and cultural heritage
- Identify technical and traditional knowledge information gaps with a lens specifically on INDIGENOUS RIGHTS IMPACTS ASSESSMENT criteria, and where practical, provide recommendations on how to address the gaps in order to properly assess the environmental risk of the project to the Lake St Martin First Nation (LSMFN) established treaty rights, the indigenous peoples health, socio-economic conditions, physical and cultural heritage.

All consultants were to address

- 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 LSMFN should be accommodated for non-mitigated effects; and
- Evaluate whether proposed mitigation measures and accommodations for non-mitigated concerns are fair and adequate to address the predicted changes and whether residual effects are manageable.
- Evaluate the alternative solutions that were considered and rejected by MI and provide other potential options if any.

The Lake Manitoba and Lake St. Martin Outlet Channels Project EIS document consisted of six separate files. The summary and volumes one through six were analyzed. The summary and the first four volumes comprised of approximately 2500 pages of material studied. Volume one detailed the projects description, justification, environment and socio-economical assessment. Volumes two, three and four describe the assessment of potential effects on the aquatic, terrestrial and human environments respectively. Lastly, the examined volume five provides details on the cumulative effects of the proposed project. Cumulative effects on wildlife, land, infrastructure, economy, human health, indigenous health, traditional land use is all available in this document. Each Consultant's input is a s follows:

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ENG-TECH Consulting Limited (ENG-TECH) a partner in the Lake St Martin Joint Venture was retained to provide an expert review of the Lake Manitoba and Lake St. Martin Outlet Channel Project Environmental Impact Study, on the affecting the waters of Lake Piniemuta, Lake St Martin, Dauphin River and Lake Winnipeg. Our findings are as follows:

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 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.

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. Sediment transport modelling would be useful in determining the infill of sediment in the south basin of Lake St Martin over a hundred year period.

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 30$^{th}$ , 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.

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 literal 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.

The lake St Martin First Nation is concerned that the LMOC and the LSMOC Environment Protection Plan (EPP) must yet be developed to finalize many of the project components and to establish numerous mitigation measures. This plan is expected to 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 long term monitoring programs for erosion and sediment control, vegetation management, surface water, ground water, Lake St Martin

shoreline alterations, community impacts to the road network, community emergency services and communication network. The EPP will also address emergency response measures such as fire and spill response. The EPP must be relevant and adaptive. The Lake ST Martin First Nation being a major stakeholder for the LMOC and LSMOC must be involved in all facets of the development and implementation of the EPP. Support funding from the proponent for the LSM FN is crucial for the successful development and implementation of the EPP. An environment license should not be issued until the EPP is finalized.

It is our understanding that the hydraulic inflow available for outflow model was developed and calibrated by the Provincial government. An independent peer review should be conducted on the model to determine the degree of accuracy in calibration. One area of specific concern of the model is that it does not address the hydraulics of the restriction at the Narrows which separate the north and south basins of Lake St Martin. The Narrows can be characterized as a short river or channel flowing north between the two basins. Given that the LMOC will contribute substantial additional flows to the south basin in addition to the Fairford River contributions there may be a significant incremental hydraulic differential between the two basins. The magnitude of head differential between the basins would be greatest (estimated to be in the order of 3 feet) for large flood events such as the 2011 flood. This differential in elevation between the two basins will complicate the operating rules and may compromise the 806 feet flood easement in the south basin.

Only one gauging station exists on Lake St Martin. A second gauging station will be required to monitor each basin's water level independently. One of the end results of the incremental head loss will be the reduction in discharge performance of the North Basin outlets, LSMOC and the Dauphin river. An incremental head loss between the two basins will result in an overall reduction of project flood damage reduction benefits if the configuration of the LMOC and LSMOC are not altered. Given that the Narrows is bounded by LSMFN reserve, blasting and dredging of the Narrows to improve hydraulic performance will specifically require LSMFN special authorization.

Given that the model accuracy is in question, additional lidar or bathymetric data may be required to develop the Digital Elevation Model (DEM) for.a 2-D hydrodynamic model. The bathymetric survey that was performed on Lake St Martin combined with the model delineates the flood plain and was instrumental in setting out the proposed flood easement limits and developing the channel and Fairford River operating rules. The suggested LSM easement level of 806 feet includes wind setup and wave uprush. The accuracy of the model is of paramount importance in establishing the hydraulic regime of the channels and the operating levels of the lakes. Further work also needs to be done linking the hydraulic model to other models which quantify the environmental impacts such as fisheries, wildlife, lake marshlands, establishing the altered ground water regime and the social economic impacts. The province has not applied this hydraulic model output to its full extent.

Impacts to wetlands and aquatic habitat is not quantified in the EIS. It is understood that Lake St Martin and Buffalo lake will likely be operated at lower water levels than has historically occurred.

LSMFN does not understand what will be the net effect on wetland and aquatic habitat, post construction and with water level regulation on these two lakes. LSMFN believes that both aquatic habitat and wetlands will degrade and retract in size and area. How this effects the fishery, wildlife and migratory birds is unknown but needs to be compensated for. Further compensation should be considered for terrestrial vegetation removed by the channels and vegetation around Lake St Martin and Buffalo Lake, affecting the traditional harvesting of herbs and plant for medicine for our First Nation community.

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.

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Winnipeg Environmental Remediation Incorporated (WERI) a partner in the Lake St Martin Joint Venture was retained to provide an expert review of the Lake Manitoba and Lake St. Martin Outlet Channel Project Environmental Impact Study, on the:

- Assessing the environmental risk of the project to the Lake St Martin First Nation (LSMFN) traditional fishery grounds, fisheries resource and the aquatic habitat
- assessing the environmental risk of the project to endangered species
- assessing the environmental risk of the project to promoting aquatic invasive species
- assessing the environmental risk of the project to wildlife and migratory birds
- assessing the environmental risk of the project to endangered traditional lands and native plant species

Our findings are shown in the following tables:

**Lake Manitoba and Lake St. Martin Outlet Channels Project**
**Information Requirements from Environmental Impact Statement Review**

## INTRODUCTION

On March 9, 2020, the Impact Assessment Agency of Canada commenced the technical review of the Environmental Impact Statement for the Lake Manitoba and Lake St. Martin Outlet Channels Project. The table below is to assist in the preparation of Information Requests that support full understanding of the Project's potential for significant adverse environmental effects and potential impacts to rights.

**Lake Manitoba and Lake St. Martin Outlet Channels Project**
**- Technical Review Information Requirements March 2020**

| Reference IR# | Expert Dept. or group | EIS Guideline Reference | EIS Reference | Context and Rationale | The Proponent is Required to … |
|---|---|---|---|---|---|
| **Topic or Valued Component (e.g. Project Overview; Environmental Assessment Methodology; Fish Habitat; etc.)** | | | | | |
| Nation or department name – IR number (Ro<br><br>e.g. IAAC-01 | Nation or department Name<br><br>e.g. IAAC | Reference the section(s) of the EIS Guidelines that relate to your comment, concern, or information request.<br><br>e.g. Part 2, Section 7.1.5 Fish and Fish Habitat | Reference the section(s) of the EIS that speak to your comment, concern, or information request. | Identify what the EIS Guidelines require and/or the link to the *Canadian Environmental Assessment Act*, *2012* (section 5 or section 19).<br><br>Briefly identify what the EIS presents and the information gap, inconsistency, or challenge.<br><br>Explain why filling that information gap is necessary to understanding potential significant adverse environmental effects to areas of federal jurisdiction or impacts to rights. | Describe the information required. Focus on the essential information, explanation, or justification required. |
| | | | | | |
| | | 3.2.1 Changes to the Environment | Reference the section(s) of the EIS that speak to your | Identify what the EIS Guidelines require and/or the link to the *Canadian Environmental Assessment Act*, *2012* (section 5 or section 19).<br><br>Briefly identify what the EIS presents and the information gap, inconsistency, or challenge. | Describe the information required. Focus on the essential information, explanation, or justification required. |

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| | | | comment, concern, or information request. | Explain why filling that information gap is necessary to understanding potential significant adverse environmental effects to areas of federal jurisdiction or impacts to rights. | |
| | | 3.2.3 Spatial and temporal boundaries | Reference the section(s) of the EIS that speak to your comment, concern, or information request. | Identify what the EIS Guidelines require and/or the link to the *Canadian Environmental Assessment Act*, *2012* (section 5 or section 19).<br><br>Briefly identify what the EIS presents and the information gap, inconsistency, or challenge.<br><br>Explain why filling that information gap is necessary to understanding potential significant adverse environmental effects to areas of federal jurisdiction or impacts to rights. | Describe the information required. Focus on the essential information, explanation, or justification required. |
| | | 4.2.2 Community Knowledge and Indigenous Knowledge | Reference the section(s) of the EIS that speak to your comment, concern, or information request. | Identify what the EIS Guidelines require and/or the link to the *Canadian Environmental Assessment Act*, *2012* (section 5 or section 19).<br><br>Briefly identify what the EIS presents and the information gap, inconsistency, or challenge.<br><br>Explain why filling that information gap is necessary to understanding potential significant adverse environmental effects to areas of federal jurisdiction or impacts to rights. | Describe the information required. Focus on the essential information, explanation, or justification required. |
| | | 4.3 Study Strategy and Methodology | Reference the section(s) of the EIS that speak to your comment, concern, or information request. | Identify what the EIS Guidelines require and/or the link to the *Canadian Environmental Assessment Act*, *2012* (section 5 or section 19).<br><br>Briefly identify what the EIS presents and the information gap, inconsistency, or challenge.<br><br>Explain why filling that information gap is necessary to understanding potential significant adverse environmental effects to areas of federal jurisdiction or impacts to rights. | Describe the information required. Focus on the essential information, explanation, or justification required. |

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| | | Part 2. 2.2 Alternative Means of carrying out the project | Reference the section(s) of the EIS that speak to your comment, concern, or information request. | Identify what the EIS Guidelines require and/or the link to the *Canadian Environmental Assessment Act*, *2012* (section 5 or section 19).<br><br>Briefly identify what the EIS presents and the information gap, inconsistency, or challenge.<br><br>Explain why filling that information gap is necessary to understanding potential significant adverse environmental effects to areas of federal jurisdiction or impacts to rights. | Describe the information required. Focus on the essential information, explanation, or justification required. |
| | | 3.2.1 Site Preparation and Construction | Reference the section(s) of the EIS that speak to your comment, concern, or information request. | Identify what the EIS Guidelines require and/or the link to the *Canadian Environmental Assessment Act*, *2012* (section 5 or section 19).<br><br>Briefly identify what the EIS presents and the information gap, inconsistency, or challenge.<br><br>Explain why filling that information gap is necessary to understanding potential significant adverse environmental effects to areas of federal jurisdiction or impacts to rights. | Describe the information required. Focus on the essential information, explanation, or justification required. |
| | | 4. Public Participation and Concerns | Reference the section(s) of the EIS that speak to your comment, concern, or information request. | Identify what the EIS Guidelines require and/or the link to the *Canadian Environmental Assessment Act*, *2012* (section 5 or section 19).<br><br>Briefly identify what the EIS presents and the information gap, inconsistency, or challenge.<br><br>Explain why filling that information gap is necessary to understanding potential significant adverse environmental effects to areas of federal jurisdiction or impacts to rights. | Describe the information required. Focus on the essential information, explanation, or justification required. |

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| | | 5. Engagement with Indigenous groups and Concerns raised | Reference the section(s) of the EIS that speak to your comment, concern, or information request. | Identify what the EIS Guidelines require and/or the link to the *Canadian Environmental Assessment Act*, *2012* (section 5 or section 19).<br><br>Briefly identify what the EIS presents and the information gap, inconsistency, or challenge.<br><br>Explain why filling that information gap is necessary to understanding potential significant adverse environmental effects to areas of federal jurisdiction or impacts to rights. | Describe the information required. Focus on the essential information, explanation, or justification required. |
| | | 7.1.8 Migratory birds and their habitat (p.26) | Reference the section(s) of the EIS that speak to your comment, concern, or information request. | Identify what the EIS Guidelines require and/or the link to the *Canadian Environmental Assessment Act*, *2012* (section 5 or section 19).<br><br>Briefly identify what the EIS presents and the information gap, inconsistency, or challenge.<br><br>Explain why filling that information gap is necessary to understanding potential significant adverse environmental effects to areas of federal jurisdiction or impacts to rights. | Describe the information required. Focus on the essential information, explanation, or justification required. |
| | | 7.3.2 Migratory Birds | Reference the section(s) of the EIS that speak to your comment, concern, or information request. | Identify what the EIS Guidelines require and/or the link to the *Canadian Environmental Assessment Act*, *2012* (section 5 or section 19).<br><br>Briefly identify what the EIS presents and the information gap, inconsistency, or challenge.<br><br>Explain why filling that information gap is necessary to understanding potential significant adverse environmental effects to areas of federal jurisdiction or impacts to rights. | Describe the information required. Focus on the essential information, explanation, or justification required. |
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| | | 9 Follow Up and Monitoring | Reference the section(s) of the EIS that speak to your comment, concern, or information request. | Identify what the EIS Guidelines require and/or the link to the *Canadian Environmental Assessment Act*, *2012* (section 5 or section 19).<br><br>Briefly identify what the EIS presents and the information gap, inconsistency, or challenge.<br><br>Explain why filling that information gap is necessary to understanding potential significant adverse environmental effects to areas of federal jurisdiction or impacts to rights. | Describe the information required. Focus on the essential information, explanation, or justification required. |
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| Reference IR# | Expert Dept. or group | EIS Guideline Reference | EIS Reference | Context and Rationale | The Proponent is Required to … |
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| | Arman | | Section 6.1 Air Quality | As mentioned in the report, dust and particularly small particles might be carried away from site by wind. Just loading and unloading will create particles that will be carried away by wind. It is not mentioned what will be done to mitigate the risk. | - Notice should be given to all surrounding properties regarding the potential existence of dust in the area. Particularly those who may be vulnerable (e.g. seniors or children or pregnant women) should be informed. Same information should be given regarding noise.<br>- A plan to address complaints. |
| | Arman | | Section 6.2 Soil Quality | It is mentioned in the report that the soil quality changes during the project. There are positive effects due to flood control as well. However, with no scientific proof it is not possible to know if the overall effect is positive or negative. At a very minimum, the agricultural capacity of the disturbed areas will be reduced during the construction of the project. It is understood that there will be efforts to reclaim the soil after the completion of construction. However, during the construction the way of life of people is changed and is affected which is not addressed in the report. Many First Nation communities use some medicinal plants. They have not been researched in the report and we do not know if they will be affected by soil quality. | - Consult with local communities regarding ways that the effects can be minimized.<br>- Providing fertilizers, topsoil, etc. to those who may be affected to help offset the adverse effects. |
| | Arman | | Section 6.2 Groundwater | Groundwater monitoring and management plans are suggested. However, there is no specific schedule for groundwater testing and monitoring. It is also not clear what will be done for those landowners who are directly or | - Give notice to all landowners who may use groundwater for any purposes.<br>- Provide a detailed schedule of groundwater monitoring during the |

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| | | | | indirectly affected. It is mentioned that "mitigation could include lowering existing pumps, supplying new pumps, or drilling new wells". If the water quality is affected, how a new well or new pump is going to address the issue? | construction and operation of the project.<br>- Affected landowners will receive good quality water supply. |
| | Arman | | Section 6.4 Surface Water | 1- It is obvious that the change in the water level in lakes and bays will change the shoreline geomorphology. In the report there are contradicting comments regarding change in shoreline. Change in shoreline geomorphology may alter access to water (or ice) and may affect those who may have properties or activities on shorelines. In short, any change in water level may alter the way of life for people. This is not well studied.<br>2-The hydrology of watersheds will be altered. This is somehow explained in the report. The change in water level in wetlands particularly can affect wildlife and vegetation and even can affect the migration paths of birds. (I am writing this here because I am not sure if this is discussed later) | - Consult with local communities regarding ways that the effects can be minimized.<br>- Model the change of water level more accurately and provide details of lands and shorelines that may be affected. |
| | Arman | | Section 6.5 Vegetation | 1- There is no direct research on medicinal plants<br>2 - No plan for re-vegetation and rehabilitation | - More research in medicinal plants that may be used by local people<br>- It will be appropriate to have a plan for seeding and re-vegetation to compensate lost vegetation |
| | Arman | | Section 6.7 Wildlife | 1 - Movement of wildlife is an important issue. Large mammals may not be able to cross the channel and they may be at risk.<br>2 - It is mentioned that the project does not change the pathways of migratory birds. The construction of channels will result in significant | Vegetated bridges can be constructed for movement of large mammals. |

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| | Arman | | Section 6.9 Infrastructure and Services | 1- The report mentions that during peak construction 575 workers will be in the region which will affect response time to emergency services (police, paramedics, fire, etc.). The report does not specify the percentage of locally hired workers. Also I could not find anywhere in the report that mentions the population density and the percentage in population as a result of workers. Hospitals and health care will be significantly affected due to increase in population.<br>2-Roads can be damaged due to additional traffic caused by vehicles. The effects are not properly studied or estimated. | - Creating a temporary health clinic for workers. Alternatively help the nearest health clinic to hire additional doctors, nurses, etc. and to expand their facility to accommodate the increased population during the construction.<br>- Supply designated ambulances for the construction site and hire paramedics.<br>- Assist the local Police station to hire additional staff during the construction period.<br>- Estimate the potential damage to roads and prepare a plan for repairing after the completion of construction. |
| | Arman | | Section 6.10 Economy | 1. It is mentioned that local employment will be encouraged. Also it is mentioned that a certain number of workforce “could be” satisfied by local residents. There is no commitment for local job creation by the project. According to 2016 numbers (used in report) 17% of people over age of 15 are unemployed which is a higher rate compared to Manitoba. Local training and employment can positively improve this situation.<br>2. Tax revenue that is lost due to acquisition of properties is not estimated. The lost tax revenue is a permanent loss to the RMs. How is the compensation calculated?<br>3. People (fishers, hunters, guides, local businesses selling related products) might lose business and income due to lost fish habitat, lost fish species, disturbing birds and fish habitats, change of wildlife movement, etc. This is not studied and/or addressed properly. There is no data showing if there is any tourism | - Have a binding agreement in place to commit to train and hire a certain percentage of local workforce.<br>- The total lost tax needs to be estimated. The lost tax will be a permanent loss, so the amount of lost tax revenue and compensation needs to be estimated and shared with local affected RMs.<br>- Studies should be done on lost revenue due to change in fish and wildlife habitat. Mitigation measures should address the negative effects on people and the way of life of local residents. First Nation communities and local RMs should be consulted.<br>- Also report should include the anticipated lost revenue and how the affected people will be compensated. |

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| | | | | and how much revenue may be lost during the construction period.<br>4- During the construction and operation of a project, people's movement can be affected. The project can be a barrier for movement. Do people use any pathway for snowmobiling during winter? | |
| | Arman | | Section 6.11 Human Health | The risk of increased contagious diseases is not addressed | Refer to section 6.9. (infrastructure) for mitigation measures |
| | Arman | | Section 6.13 Indigenous People | 1- In this section it is mentioned that fish and wildlife habitat is affected by the project. It is also mentioned that people's movement can be affected. However, it is not mentioned how these changes can affect people financially.<br>2- At peak, 575 new workers will work in the region. Since there is no commitment on how many of these workers will be hired locally, a conservative assumption is that potentially a group of 575 young non-local male dominated workers will be added to the region that can significantly change the population density and population demography of the region. Such a drastic change can potentially alter the way of life for local residents. The report does not address potential risks such as change driving behavior, crime rate, sexual harassment, etc. | - Financial impacts of projects on people due to lost wildlife/fish habitat, lost vegetation, and lost pathways should be studied and estimated. Compensation may be needed and it should be clear how affected communities will be compensated.<br>- Programs for training workforce to reduce risks for crime, sexual harassment, driving, etc. can be implemented.<br>- Commitment for hiring a certain percentage of people of indigenous communities |
| | Arman | | Section 6.5 Vegetation | …. | …. |

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| | Arman | | Section 6.7 Wildlife | …. | …. |
| | Keen | | Section 7.2.4.2 Section 7.2.2.2 | It is mentioned that “Rainbow Smelt typically disperse in a downstream direction” Assessment has been low but in determining possible negative outcomes of AIS, possible compensation or remuneration (monitoring) should be considered for Indigenous People. | Mitigation includes more area in fish habitat, but does not list countermeasures or monitoring Rainbow Smelt in upstream areas such as Lake Manitoba or Lake St. Martin.<br>Although the risk of invasive Rainbow Smelt going upstream is low, the risk is there and impact is high in magnitude as with zebra mussels and spine flea. A monitoring or research plan should be set up. |
| | Keen | | Section 7.2.4.2 | MI has predicted that “excavation sites at each location… that habitat would be restored in two months to two years. Currently, it is unknown the exact sizes of the structures and therefore may affect recreational activities of the locals in the LAA. Although the population of fish may be predicted to remain stable, it should be noted that there may be socio-economic and recreational impacts to the Indigenous peoples. | Additional efforts should be used and gather more input and research on local uses of surrounding LAA. If possible a tighter time frame or review on the jetties should be researched. |
| | Keen | | Section 6.5.1.4 Section 7.2.4.2 | “Increased risk of dispersions of these AIS is not expected to substantially increase” From prior research zebra mussels and spiny water flea can have negligible risk of dispersion but that is for going upstream. These risks can be amplified if employees on site are unaware of proper mitigation measures and training or not all equipment and vehicles used are encompassed in proper mitigation measures | Monitoring during and after project completion is recommended to ensure no AIS reach uncontaminated waters. Testing is recommended and engagement with locals for prior environmental conditions would be of great asset. Although risk is low, a mitigation strategy may need to be present. |

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| | Keen | | Section 6.4.1.1 Section 7.2.4.2 | Table 6D. 5. Recreational activities from project roads, trails, waterways may increase traffic from locals and project employees. As with increased traffic the risk of AIS extending beyond current locations may be unavoidable. | Employees and locals may need to contribute to current preventative measures that are already in place as much as possible, following guidelines and providing feedback and being educated on the subject. Including current MI procedures already in place to wash heavy equipment after use, project employees should a keep close watch on smaller vehicles that are used for the job. Smaller vehicles used for travel such as for surveying may be a vector for AIS. |
| | Keen | | Section 8.3.6.2 | "Upland berms along LMOC may provide habitat for species at risk… Project infrastructure may provide suitable nesting structures. It is stated that "there are no pathways for adverse effects resulting from the operation of the project on SAR as it relates to a change in habitat" however, there may be a change in habitat along the channels that could affect local flora and fauna, its diversity and density | -It should be noted that along the areas of significance whether the ecosystems may change. As for First Indigenous Peoples, wildlife productivity and breeding habits and grounds may be altered, potentially affecting recreational and subsistence activities for locals of LAA and even RAA |
| | Keen | | Section 10.2.2.4 Section 7.2.2.2 | Kinonjeoshtegan First Nation reported subsistence and recreational fishing occur"<br><br>Although Lake sturgeon from research and studies is known to be mostly in the Sturgeon Bay area, it has been noted that the water way is very likely to increase traffic in these regions (add page/vol #). The recreational activities may serve as a vehicle to disturb Kinonjeoshtegan peoples in a multitude of arrays including; recreational and subsistence fishing, as well as ecosystems in LAA and possibly RAA. Possible changes in the areas are not | First Nation traversing to the Sturgeon Bay area may desire essential information on whether additional volume of flood water may affect dynamics in the current ecosystems, social aspects, as well as environmental and economical. If Lake Sturgeon are potentially driven from the bay to non-native areas, compensation would deem appropriate. |

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| | | | | listed extensively and vague messages of “possible disturbance” only mentioned. | |
| | Keen | | Section 7.2.3 | “Construction of the channels will create new fish habitat during operations at inlets”<br><br>With the potential for diversion, dewatering or filling in existing creeks and drains, there is a possibility that there will be newly formed habitats; these habitats will have effect in the local areas.<br>eg) new/increased fish population could affect resource and production of another species through competition, prey/predator relationships, etc. A new population in another area could increase the predator numbers in one location. | Is it possible that these new habitats could somehow affect the relationship and connection the First Nations people have currently? If possible, models or research on these changes would be helpful, if it is not practical, the locals should be notified of the possible risk, whether positive or adverse. |
| | Keen | | Section 10.2.44<br>Section 10.2.4.6 | “Opportunities will be provided for interested groups to harvest traditionally”<br><br>It has been stated that First Nations people will be allowed to access areas of interest for harvesting on traditional lands; native plant species, for subsistence and medicinal purposes, etc. There hasn't been much information on how, when, or where locals can harvest. When and where it will be safe to do so. | During/after the project it should be discussed with indigenous groups when and where it would be possible for harvesting. As it was not explicitly mentioned, locals in LAA may miss out on opportunities to gather resources. Construction may remove that opportunity altogether if not timed. Signage and postings is recommended to help alleviate potential issues. |
| | Keen | | | Infectious diseases need to be explained more. Currently there is no mention of protection and measures of avoidance for project employees. As these mitigation measures would protect employees, it would in turn add preventative measures and peace of mind for the Indigenous People. | Proper research should be conducted as to determine the scope of possible infectious diseases that are of risk during the operation and construction of the project |

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| | Keen | | Section 11.12.22<br>Section 10.2.6.4<br>Section 7.2.2.2<br>Section 8.3.10 | "Project-specific environmental management plans and monitoring programs will be developed and implemented to mitigate potential Project-related effects on wildlife"<br><br>Would like to consider the size and scope of the mitigation measures to be designed. It seems that in multiple sections it is mentioned an environmental management plan will be designed for the project. It is mentioned that it will be done for potential project related effects but nothing specific. It would be helpful to know in more detail if there will be plans prior to starting the project and what will be done and/or if during the project the procedures to commencing the start of a mitigation plan. | As with the value of traditional lands encompassing the way of life for the Indigenous groups, it would be beneficial to start guidelines for base planning of implementing mitigation measures. As with organizing these procedures in case of emergency, it would be beneficial streamline mitigation measures this way |
| | Dennis | | 7.80 Page<br>Volume 3<br>General point<br>Table 8.2.1<br>Page 8.8 | " Assessment of Potential impact on terrestrial environment"<br>Address Wildfires<br>Increased activity<br>Potential for fire 8.7 | If wildfires were to occur, currently there is no plan of mitigation and suppression. As excavation commences, there is an increased potential for a wildfire. |
| | Dennis | | Address Wildfires<br>Increased activity<br>Potential for fire 8.7<br><br>Volume 3<br>8.33 | "Table Potential effects<br>Effect pathways + measurable form<br>Pathway direct Loss to fire indirect change in surface"<br><br>Does not appear in any discussion on potential accidental grass/wildfires that could occur from construction activities other than burning clearing material | As there is no mention for accidental grass/wildfires, prevention and plans to combat/suppress fires resulting from construction works should be considered. |
| | Dennis | | EIS<br>Volume 3<br>7.68 Page | Project pathways<br>Change in passive or active movement | Require pre/post/during monitoring + provide plan for fish crossings to maintain fish species |

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| | Dennis | | Table 7.27<br>EIS<br>Volume 3 | Change in fish passage state entire table potential effect<br>7.2.6 as above mitigate potential permanent alteration | Mitigation should state monitoring during, before, and after possibly bringing fish from outside source and or start up the dauphin fisheries |
| | Dennis | | 762<br>Volume 3 | Report states no mitigation possible<br>This is a gap there are alternatives possible restocking | Management plan for worker quote legislation Also could use local aboriginal people could run dauphin river hatchery to promote fish replacement or import fish from other hatchery monitoring post project |
| | Dennis | | Volume 3<br>Pg 7.65<br>Change in habitat | Proponent is making statement such as no measurable effect on population or habitat<br>there is no explanation on divert and isolation of the species | Require pre project during project and after monitoring list studies<br>required |
| | Dennis | | Table 7.2-1<br>Volume 3 | Issues of construction<br>LSM missing from table indicating consulting re-effect issue of concern | Need to consult with LSM to discuss issue of concern identified in traditional<br><br>knowledge with csn |
| | Dennis | | Volume 3<br>Page 7.34 | Gap use of fair ford river showing might Fall movement hoop netting Survey done in 2007 | Need to conduct fall site specific inventory before and after the project to determine project impact for current info |
| | Dennis | | Volume 3<br>Pg 7.35 | Pineimuta Lake<br>Report states little is known about | Require before and after project open water and winter studies for species |
| | Dennis | | Volume 3<br>Pg 7.6 | Lake St Martin and<br>tribute..??<br><br>Require information statement that after project inventory study be conducted to | Inventory to determine species type and quantity |

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| | | | | determine impact on spawning and migration | |
| | Dennis | | Volume 3<br>Pg 745 | Lake st martin<br>Dauphin river<br><br>EIS States no recent data available on sport fishery since 1979 show gap in sport<br>fishing data | Suggest a angling survey before project begins and post |
| | Doug | | Volume 1 – Environmental Effects - Section 6 | Appears that “Physical Environment” – Significance of effects not to be determined. Significance was determined for VCs that are receptors in the Physical Environment May need to be looked at a little further. i.e. As pathways don’t appear to be assessed? (p.31) However may be looked at in further volumes of the EIS. Pathways will change due to the extensive project works. Section 6.1.3 addresses Residual Effects. | |
| | Doug | | Volume 1 Section 6.2 Geology and Soils | Comment on Terminology used i.e. laciolacustrine sediments for example is a geological term and should be explained what it means; as the EIS is a public document and the public will not understand such terminology. | |
| | Doug | | Volume 1 p. 42 | “Low to severe wind erosion Risk? This should be explained a bit more as there is quite a difference from Low to severe? | |
| | Doug | | Volume #1 – Section 6.2.2.3 Residual Effects | It appears that significance of effects is not defined for geology and soils? Terrain Conditions are considered to be adverse and persistent through project operations and irreversible. “Effects to | |

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| | | | | natural vegetation will be adverse.<br>Effects to soil quantity and quality Is not anticipated to limit the ability to reclaim and rehabilitate areas disturbed by project? Confusing as the project area will permanently be altered? Agricultural land was questionable; then say – state of agricultural land and , crop production and natural vegetation will be affected adversely<br>Better explanation may help be more definitive. | |
| | Doug | | Volume 1 Section 6.3.2.1 Effects to Groundwater | Comment - Project work will decrease loss of water source to wetlands affecting biodiversity. Water well conditions or if they are in use or not has not determined. There are an estimated 273 water wells in the area. Wells will be affected in flood prone areas. | |
| | Doug | | Volume 1 – Section 6.3.2.2 - Mitigation | Didn't see if there was any groundwater modeling done. Ground water significance of residual effect appears to not be determined; nor if there be any monitoring with regards to groundwater or surface water quality. Residual effect on site hydrology and surface water appears to not be determined. | |
| | Doug | | Volume 1 – Section 6.5 | Comment Fish habitat will be altered and significance determined effects on indigenous harvesting. | |
| | Doug | | Volume 1 – Section 7.0 Follow-up Monitoring Program | Comment - 7.3 – no follow up on geology and changes to groundwater. | |

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| | Doug | | Volume 1 - Section 7.5 | Comment – no predictable changes to surface water and how it will monitor. | |
| | Doug | | Volume 1 - Conclusion – Section 8 | Comment – Effects determined not to be significant. It should state how this conclusion was justified.<br>Summary is 143 pages; quite long for a summary section?<br>Tables and Appendixes not titled. | |
| | Doug | | Volume 2 – Physical Environmental Effects | p. 122. Natural surface and shallow subsurface drainage flow may be affected along the entire approximately 24 km length of LSMOC, with effects to drainage not expected to occur beyond 500 m upgradient or downgradient of the channel (see Section 6.4 Groundwater and Surface Water). This would be expected to affect drainage over an area of up to approximately 1,200 ha on either side of the channel (or 2,400 ha in total). Addresses concerns about for Surface Water and subsurface drainage flows identified in Volume 1. | |
| | Doug | | Volume 2 – Section 6.3.4..1 | Addresses changes to soil quality and quantity that were identified in Volume 1. | |
| | Doug | | Volume 2 – p 124 | Project Pathways: Construction and presence of Project components and infrastructure will affect soils and in turn, the agricultural capability and reclamation suitability of these soils/ There are multiple pathways for Project effects through the construction and operations phases of the Project. Project pathways addressed that were identified in Volume 1 | |

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| | Doug | | Volume 2 - P. 126 | provides mitigation for project pathways | |
| | Doug | | Volume 2Table 6.3-21 | Summarizes the residual environmental effects on geology and soil during construction and operations. Addresses issue from Volume 1 | |

Work in progress:

**LSMOC EIS Review p1**

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| | | | Section 6.5 Vegetation | 1- There is no direct resend rehabilitation | - More regetation |
| | | | Section 6.7 Wildlife | 1 - Move | Vegetated bridges can be constructed for movement of large mammals. |
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**LMSOC EIS Review P3**

| Reference IR# | Expert Dept. or group | EIS Guideline Reference | EIS Reference | Context and Rationale | The Proponent is Required to … |
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| **ed Component (e.g. Project Overview; Environmental Assessment Methodology; Fish Habitat; etc.)** | | | | | |
| | | | Section 7.2.4.2 Section 7.2.2.2 | It is mentioned that "Rainbow Smelt typically disperse in a downstream direction" Assessment has been low but in determining possible negative outcomes of AIS, possible compensation or remuneration (monitoring) should be considered for Indigenous People. | Mitigation includes more area in fish habitat, but does not list countermeasures or monitoring Rainbow Smelt in upstream areas such as Lake Manitoba or Lake St. Martin. Although the risk of invasive Rainbow Smelt going upstream is low, the risk is there and impact is high in magnitude as with zebra mussels and spine flea. A monitoring or research plan should be set up. |
| | | | Section7.2.4.2 | MI has predicted that "excavation sites at each location… that habitat would be restored in two months to two years. Currently, it is unknown the exact sizes of the structures and therefore may affect recreational activities of the locals in the LAA. Although the population of fish may be predicted to remain stable, it should be noted that there may be socio-economic and | Additional efforts should be used and gather more input and research on local uses of surrounding LAA. If possible a tighter time frame or review on the jetties should be researched. |

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| | | | | recreational impactments to the Indigenouse peoples. | |
| | | | | | |
| | | | Section 6.5.1.4 Section 7.2.4.2 | “Increased risk of dispersions of these AIS is not expected to substantially increase” From prior research zebra mussels and spiny water flea can appear to have negligible risk of dispersion, but can be amplified if employees on site are unaware of proper mitigation measures and training. | Monitoring during and after project completion is recommended to ensure no AIS reach uncontaminated waters. Testing is recommended and engagement with locals for prior environmental conditions would be of great asset. Although risk is low, a mitigation strategy may need to be present. |
| | | | Section 6.4.1.1 Section 7.2.4.2 | Table 6D. 5. Recreational activities from project roads, trails, waterways may increase traffic from locals and project employees. As with increased traffic the risk of AIS extending beyond current locations may be unavoidable. | Employees and locals may need to contribute to current preventative measures as much as possible, following guidelines and providing feedback and being educated.TInclusive on current MI procedures to wash heavy equipment after use,project employees should keep close watch on smaller vehicles. Smaller vehicles used for travel such as for surveying. |
| | | | | | |
| | | | Section 8.3.6.2 | “Upland berms along LMOC may provide habitat for species at risk… Project infrastructure may provide suitable nesting structures. It is stated that “there are no pathways for adverse effects resulting from the operation of the project on SAR as it relates to a change in habitat” however, there may be a change in habitat along the channels that could affect local flora and fauna, its diversity and density | -It should be noted that along the areas of significance whether the ecosystems may change. As for First Indigenous Peoples, wildlife reproductivity and breeding habits and grounds may be altered, potentially affecting recreational and subsistence activities for locals of LAA and even RAA |

| | | | | | |
|---|---|---|---|---|---|
| | | | Section 7.2.2.2 Section 8.3.10 | "a monitoring program for wildlife will be implemented as part of the Eng. Mgmt. Plan. | …. |
| | | | | | |
| | | | | | |
| | | | | | |



| Reference IR# | Expert Dept. or group | EIS Guideline Reference | EIS Reference | Context and Rationale | The Proponent is Required to … |
|---|---|---|---|---|---|
| **ed Component (e.g. Project Overview; Environmental Assessment Methodology; Fish Habitat; etc.)** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | | 7.80 Page Volume 3 General point Table 8.2.1 Page 8.8 | Table Potential effects Effect pathways + measureable form | Address Wildfires Increased activity Potential for fire 8.7 | Discuss the impact of fire on veg Increase potential during excavation Mitigation fire fighting prevention + suppression |
| | | Address Wildfires Increased activity Potential for fire 8.7 | Address Wildfires Increased activity Potential for fire 8.7 | | |
| | | | | | |
| | | Potential Effect | Pathway direct Loss to fire Indirect change in surface | Address Wildfires Increased activity Potential for fire 8.7**** | Address Wildfires Increased activity Potential for fire 8.7***** |
| | | Volume 3 8.33 | Assessment of Potential impact on terrestrial environment | Does not appear in any discussion on potential accidental grass/wildfires that could occur from construction activities other than burning clearing material | Require fire prevention and suppression |
| | | | | | |
| | | | Section 8.3.6.2 | “Upland berms along LMOC may provide habitat for species at risk… Project infrastructure may provide suitable nesting structures. It is stated that “there are no pathways for adverse effects resulting from the operation of the project on SAR as it relates to a change in habitat” however, there may be a change in habitat along the channels that could affect local flora and fauna, its diversity and density | -It should be noted that along the areas of significance whether the ecosystems may change. As for First Indigenous Peoples, wildlife reproductivity and breeding habits and grounds may be altered, potentially affecting recreational and subsistence activities for locals of LAA and even RAA |

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|---|---|---|---|---|---|
| | | | Section 7.2.2.2<br>Section 8.3.10 | “a monitoring program for wildlife will be implemented as part of the Eng. Mgmt. Plan. | …. |
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Dennis Antony.

Winnipeg Environmental Remediation Inc.

INFINYT
DEVELOPMENT GROUP

ID reviewed the Environmental Impact Statement (EIS) focused on project components affecting the Lake St Martin First Nation (LSMFN) established aboriginal or treaty rights, the indigenous peoples health, socio-economic impacts and condition, physical and cultural heritage is as follows:

# Socio-economic Implications of Lake St. Martin Outflow Channel

### Fisheries Impacts

- High spring flood flows tend to be good for the health of fish populations, specifically Pickerel. Reductions in water levels during spring, as a result of the outflow channels will seriously impact spawning duration and quality. This will have a negative effect on the population of pickerel in Lake St Martin, similar in nature to Playgreen Lake impacts. This impact will need further review under an Indigenous Rights Impacts Assessment model (IRIA) prior to community approval

- Fish passage through the lake will be highly affected by changes in flow of water and its velocity as it passes. This will drastically affect the mobility of certain key fish species (e.g. pickerel and northern pike) that are essential to commercial and subsistence fish harvesting. Disruption to fish habitat and movement will impact harvesting operations in terms of locating fish species and capturing sufficient quantities.

    - Further to this, a control structure needs to be constructed at the mouth of the Fairford River downstream of Lake Pineimuta, which will result in loss of fish habitat as will shoreline dredging and excavation. Although there is speculation that new fish habitat may be created within the channels themselves, there are no assurances that this will occur and has been proven a false premise in the case of 2 Mile and 8 Mile Channels north of Lake Winnipeg. Furthermore, periods of low water in the channels will eradicate that habitat, making it unsustainable over the long term.

    - According to the KGS Final Report (p. 704), fish passage was not a consideration when formulating options on channel development, when in fact it should remain one of the pre-eminent considerations in outlet channel development. Consideration should be given to the development of structures that can accommodate the migration patterns of fish in the

region and mitigate the impact of the channel development on species population, spawning activity and diversity. Within a context of an Impact and Benefit Agreement Structure, funding should be made available to mitigate and support the downturn cycles in the fishery as a result of the clear impacts.

- The effect on the spawn would be compounded by increased sedimentation on key fish spawning habitat in the south basin of Lake St. Martin (LSM), where the Lake Manitoba Outlet Channel discharges. Sediment accumulation is caused by the sustained, long duration consecutive high flood events. These occurrences prevent permanent vegetative development in the immediate area, contributing to increased erosion and run-off. This compounds the effect on the fishery that will also be affected during outlet channel construction due to leaching and decomposition of organic materials caused by floodwaters in the channel areas.

- Silt deposition filling the basin will irreparably damage the fishery, particularly an impact on "the littoral zone habitat used by many species of fish for rearing and feeding and could result in a temporary redistribution of fish to other areas within the watershed or to adjacent, unaffected watersheds" (KGS Final Report, p. 701). These events will occur and create a significant effect on overall lake health, species preservation and diversity and considerably economic impacts on the commercial fishing sector in the area. Biology studies the have been conducted previously in other locations support this eventuality.

- Sedimentation will result in decreasing oxygen levels, increased turbidity and sediment accumulation. Soil and vegetation along portions of the Lake St. Martin shoreline, leaving only bare rock visible. Trees can collapse into the lake as their root structures are compromised, adding to serious navigational hazards that make travel on the water considerably dangerous. The net result will be a reduction in fish populations available for harvest and greater challenges in accessing the water to harvest the remaining extant population.

- The outflow channels are likely to create ice jamming and thick ice cover levels in the winter that can severely impact commercial operations due to nets freezing in place and becoming irretrievable or unstable ice conditions that prevent access by fishers themselves.

- Reduced access to lakes areas and diminished numbers of pickerel would impact commercial fishing operations for community residents. Smaller harvests mean fewer employees and lower annual revenue/income.

    - This occurrence has already been well-documented in both Playgreen and Kiskittogisu Lakes near Norway House Cree Nation. The development of Two Mile and Eight Mile Channels by Manitoba Hydro in the 1970s to control water levels in Lake Winnipeg inevitably created sediment deposition that destroyed fish habitat in the lakes. Shoreline erosion created significant navigational hazards for boats as well as ecosystem damage to terrestrial wildlife. The net results were serious

ecological damage and a commercial fishing industry and traditional economy that have yet to recover. Historical commercial fishing records show a steady decline in quota species from 360,000 kgs annually (pickerel ) to as little as 37,000 kgs annually (NHFC DATA SOURCE) . The impacts to the Indigenous Treaty Rights of Lake St Martin First Nation will need to be studied further under an Indigenous Rights Impact Assessment model to ascertain any mitigation strategy on the matter.

- Waters would be reduced each spring due to the outflow, thereby having a permanent and cumulative negative impact on fish species going forward. A decline in fish population would contribute to ecological damage to the fishery, lake health and species diversity. This would severely impact the local economy, with likely irreversible damage to the commercial fishing industry for Lake St. Martin fishers.

- Prior to the flood damage of 2011 and the implementation of the outflow channel that destroyed the community; the commercial fishing sector for the Lake St. Martin First Nation represented an average annual harvest of 230,000 kg of fish, worth an average of $3.75/kg or $862,500 annually ($974,625 in 2020 dollars). This industry has been significantly impeded by the previous flooding and the outflow generated through the Fairford water control structure, which has created greater sedimentation and affected the currents in the water body. This has contributed to the loss of fishing nets and the destruction of fish habitat, causing grave economic consequences to a once thriving industry sector. Attempts to restore commercial fishing activities would be further curtailed by the development of another outflow channel that would serve to compound the problems already faced by the citizens in the area that have yet to be adequately resolved.

- The loss of the fishery would result in higher unemployment in the area, loss of traditional economy, greater dependence on social assistance and community and family instability caused by long-term unemployment and business failure. Such outcomes will also have a lasting effect on cultural and spiritual preservation within the community.

- A diminished fishery would affect the people's collective identity, leading to significant psycho-social implications for current and future generations similar to what has already taken place over the course of history for First Nations peoples.

- Mitigation and compensation costs have been considered as part of the KGS Final Report (p. 689) in terms of damage to fish habitat and compensation to fishers active in the region. Fish harvesting has been part of the traditional economy of Lake St. Martin for generations, while the commercial aspect of fishing represents an economic factor for the community and its citizens. The long-term impact of loss of fish habitat needs to be more deeply considered, particularly in terms of time.

    - Habitat and ecological changes that resulted from the construction of 2-Mile and 8-Mile Channels produced significant impacts to the fishery in Playgreen Lake and the economy of Norway House Cree Nation that persist today.

    - There needs to be a generational outlook on the impacts on the fishery in the vicinity of Lake St. Martin First Nation in order to identify an appropriate accommodation to channel development.

- 

## Agricultural Impacts

- Agricultural capacity will be reduced during the construction project. Post-project reclamation may restore some of the viability of the crop and range land areas. However, the construction phase is expected to significantly disrupt community members' ways of life.

- Flood waters may eventually recede following spring inundation and the regular operation of the outlet channels. However, cumulative soil damage may ultimately persist due to changes in salinity due to saturation of the ground. Nutrient runoff is bound to occur as flood waters carry away valuable nitrogen and phosphorus necessary for successful crop production. Provided the soil remains viable post-high water, these nutrients would need to be replaced. Letting it lie fallow would not be an option given the annual high water flooding and its repeated damage. Annual application of commercial fertilizers would be the only option, representing a significant cost in terms of viable farming operations.

- In addition, it has been recognized that the downgradient side of the channels will see increased dryness in the soil. This will ultimately reduce soil capability and productivity that will become as much of an impediment to agriculture and harvesting of traditional foods and medicines as inundation will on the upgradient side of the channels (Lake Manitoba and Lake St. Martin Outlet Channels Project Environmental Impact Assessment. Government of Manitoba, March 2020, pp. 42-43 (Summary)).

- Lake St. Martin's agricultural activity previously supported 25 families in the community with over 400 head of cattle and who produced an average of 300 acres of winter wheat. In 2011, the average closing price for what was $7.14 per bushel. At 37.1 bushels per acre, this represented an overall average value of $79,512 annually ($89,848 in 2020 dollars). The previous flood event and the construction of the outlet from Lake Manitoba drastically impeded those industries.

- Crop and pasture areas became inundated, severely limiting crop production and making it increasingly difficult for ranchers to support livestock in the area. Securing appropriate land area to enable crop production and livestock to resume has proven challenging in terms of ownership and arable land. Any progress made in the wake of the previous flood and mitigation effort will be undermined by the new development project that will again put land access and management at risk. The net result becomes a "start and stop" approach that is detrimental to economic development as people become angry and discouraged by repeatedly missed opportunities. Current usage rates , food categories, and traditional medicines needs further analysis.

- Residual effects on soil capability and productivity following all efforts to mitigate environmental impacts will be irreversible and will continue throughout the operation of the channel infrastructure. This means that there will be permanent damage to the land on which the people of Lake St. Martin depend for their lives and livelihood (Lake Manitoba and Lake St. Martin Outlet Channels Project Environmental Impact Assessment. Government of Manitoba, March 2020, pp. 45-46 (Summary)).

## Community Safety and Racism

- The Lake St. Martin First Nation community has serious concerns regarding the development of the outflow channels and the safety of the community members. In previous heavy construction projects throughout Canada, including Manitoba, there have been numerous accounts of racism directed toward Indigenous peoples in the surrounding area.

- There have been dozens of reports from Manitoba of racist incidents and sexual abuse/assault throughout the 1960s and 1970s, as reported by Manitoba's own Clean Environment Commission (CEC). More recently, there were multiple allegations of racist incidents, assaults and sexual violence over the life of the Keeyask project.

    - The reaction by Manitoba Hydro to allegations and concerns raise during the Keeyask project tended toward an inherent racism , in that concerns were not taken seriously and efforts were made to silence those who sought to speak out.

- Lake St. Martin First Nation expectations of the outlet development projects are that a similar level of racism would be equally pervasive and the community does not necessarily trust the construction authority to properly address or mitigate it. Further, the Royal Canadian Mounted Police (RCMP) has been repeatedly accused of ignoring allegations throughout the history of infrastructure projects in Manitoba. LSM First Nation therefore has little trust in law enforcement to properly or effectively address these issues.

    - They must be dealt with upfront by acknowledging they will happen again, specifically during the outlet construction and dedicating resources to a strategy that will proactively address racism and other social issues that are bound to happen.

- Government assurances – whether Federal or provincial – that such issues would be addressed or mitigated are common, yet do not tend to materialize as work camps established near First Nation communities throughout Canada continue to present safety issues for residents over and over again.

- The main mitigation tool for community safety and racist is Project Management / Partnership agreements with the private sector construction firms that have pre determined protocols for community benefit and engagement. Placing the community in a senior management role for the duration of the project.

## Traditional Knowledge, Culture and Community

- Like most indigenous populations in Canada, Lake St. Martin has a close, almost symbiotic relationship and history with the land they occupy and the wildlife they share it with.

- It is part of their home in as much as any dwellings and township structure may be. This relationship was significantly disrupted during the 2011 flood, the subsequent destruction of the LSM community and the relocation of the citizens – many of whom have still been unable to return to the area even nine years later.

- This relocation effort has resulted in a significant struggle to re-establish the Lake St. Martin community and the people's identity and cultural grounding. After many years, the community members continue to live in uncertainty. While continuing to work at bringing their people home and rebuilding the traditions that made them who they are. LSM again faces considerable uncertainty as plans get underway for two more outlet channels that will again alter the flow of water in the area, disrupt economic development efforts, upend traditional knowledge, impede mobility on the land and introduce social influences due to large, non-indigenous construction crews. DUE TO THIS CONDITION , accurate assessment of impacts of the project have not been subject to fulsome engagement under the Indigenous Rights Impacts Assessment process.

- Engineering and construction impact studies have provided an assessment of the costs of revegetation (KGS, Manitoba Infrastructure and Transportation Assiniboine River and Lake Manitoba Basins Flood Mitigation Study. Final Report, p. 688). The cost estimate refers to "weed" control and "vegetation cover" at approximately $8,000 to $11,500 per hectare. This includes overburden, seed bed preparation, embankment shaping, site access, seeding, etc.

    - This estimate fails to address the cost of loss of pre-existing plant life, a great deal of which was used for traditional medicines, teas and food sources for both humans and wildlife species.

    - The provincial EIS has estimated that there will be a total disruption of 2,108 ha of terrestrial and aquatic habitat resulting from clearing and excavation. This includes 1,205.8 ha of wetland habitat, 298.7 ha of forest and 410 ha of grassland.

    - The provincial EIS also reports that fluctuating water levels during channel outlet operations will directly change the wildlife habitat. The balance of water between lakes, rivers and the channel outlets will directly impact the habitat for numerous species inhabiting "lake margin" areas (e.g. muskrat and colonial water birds.

- The loss of these native plant species in the area results in wildlife such as deer being forced to range further away. Waterfowl that are traditionally hunted that will be displaced by human presence, construction activity and loss of food sources. Muskrat populations that were previously trapped by local citizens to search for habitat elsewhere or ultimately face the prospect of dying off. This ultimately forces harvesters to track further from home to find sustenance. Likewise, harvesting of traditional medicines, etc. is also forced further afield.
- The economic, social and cultural costs of these effects have yet to be properly assessed under a Indigenous Rights Impacts Assessment (IRIA) and as such it is the opinion of the community leadership that detailed study process should be undertaken immediately to inform the stakeholders under the aim of free, prior, and informed consent.

Lake St Martin First Nation has SIGNIFICANT concerns with the following table assessment. The metrics used are incomplete and subjective, with little or no consideration to the IRIA Process. Placing moderate beside Species Composition is not acceptable as channel operations in the Manitoba Region have been found to eliminate the species within a region, such as sturgeon.

**Table B**
**Summary of Environmental Concerns**

| Criteria | Lake Manitoba Outlet Channels | | Lake St. Martin Outlet Channels | | | |
|---|---|---|---|---|---|---|
| | C | D | R1 | R2 | R3JB | R3WP |
| **Biophysical Environment** | | | | | | |
| Surface Water Quality | | | | | | |
| - Flow Rate | neg | neg | min | min | min | min |
| - Flooding | neg | neg | min | neg | neg | neg |
| - Erosion/Sedimentation | min | mod | mod | min | mod | mod |
| Groundwater | **maj** | mod | min | min | min | min |
| Terrestrial Environment | | | | | | |
| - Vegetation | min | min | min | neg | min | min |
| - Wildlife/Habitat | mod | min | mod | min | mod | mod |
| Fish Habitat | min | min | mod | min | mod | mod |
| Fish Resources | | | | | | |
| - Habitat Change | min | min | mod | mod | min | min |
| - Species Composition | min | min | mod | mod | mod | mod |
| **Social Environment** | | | | | | |
| Land Use/Ownership | mod | mod | neg | neg | mod | min |
| Access | **maj** | mod | min | min | min | min |

Notes: Level of effect is shown as: neg = negligible; min = minor; mod = moderate; and **maj** = major

INDIGENOUS RIGHT IMPACTS ASSESMENT CRITERIA
**LAKE ST MARTIN FIRST NATION'S POSITION AS AT MAY 2020**

- Current assessment data from the Province of Manitoba is challenged based on following principles
    - Primarily focused on biophysical components only
    - Cumulative effects is not fully contemplated until the project implementation
    - Culture impacts are not deeply engaged and are marginal to the existing process
    - Assessment is focused on current use and not indigenous rights (past present and future)
- Traditional knowledge engagement based on current and future consumption and usage of ALL ASPECTS of traditional community sustenance
    - 9 Principles for the assessment
    - Would need to start immediately
    - Outcomes will form foundation of Impact and Benefit Agreement

Contributors

INFINYT
DEVELOPMENT GROUP

Langford Saunders , Past president Norway House Fisherman's COOP
Bill Galbraith – Former Fisheries Advisory – Province of Manitoba
Brad McAllister – Former Senior Policy Analyst – Manitoba Metis Federation
Kyla Warren – Senior Biologist Skeena Fisheries
Blake Russell – Senior Indigenous Rights Impacts Assesment President Infinyt Development Group

# Contributing Consultant CVs

Steve Topping, P. Eng.
Vice President, ENG-TECH Consulting Ltd.

Mr. Topping has worked in Water Resources and Environmental Management field for 40 years and been responsible for designing farm drainage systems, project management, overseeing the Drainage Regulation Section for the licensing and enforcement of land drainage and water control works in accordance with the Water Rights Act, handling managerial responsibilities in ensuring and maintaining reduction in flood damages due to proper emergency planning by all levels of government in the planning and design of new developments and subdivisions. Mr. Topping has worked in various leadership capacities as Executive Director of Hydrologic Forecasting and Water Management as well as Executive Director, Regulatory and Operational Services with the province. Mr. Topping has also been involved in providing leadership guidance to professional and technical personnel in the above related items and projects. In 2017, Mr. Topping joined the Management team of ENG-TECH Consulting Limited as the Vice President of the company.

**Experience**

- Responsible for a $30 million annual operating, maintenance and capital budget exclusive of special infrastructure projects such as the $130M 1997 Flood Protection Program.
- Managed all aspects of irrigation infrastructure projects, including the preparation of preliminary reports for Irrigation Council approval, hydraulic design of pipelines and irrigation structures and preparation of contract specifications and tender documents.
- Supervised the construction and contract administration of Alberta Irrigation Capital Works. Projects for the Bow River Irrigation District.
- Developed long term plans for the water resources of the Province by anticipating future challenges and opportunities.
- Provided leadership to the Water Stewardship management team in the development of annual goals with quantifiable and qualitative target expectations.
- Supervised an engineering team in the preliminary through to construction stages of Manitoba Water Control Works.
- Provided project expenditure and status reports and conducted hydrology and drainage studies for the Provincial government
- Involved in designing, facilitating and coordinating many significant public consultation initiatives such as the Revision of the Red River Floodway Operating Rules, Fifteen Community Consultations for the 1997 Flood Protection Upgrades for Communities in the Red River Valley and the Public Consultation for the Assiniboine River-Lake Manitoba Flood Protection Basin Study Recommendations.
- Provincial Media Spokesperson for Manitoba's Flood response and Water Management Programs.

- Provincial technical expert for numerous water resource litigation cases
- Dam Safety Manuals and Emergency Preparedness Plans to respond to environmental disasters and dam failures for Alberta and Manitoba dams.

Outlined below are some of the projects Mr. Topping has been involved in:
*Water Resources and Environmental Management*

- Water Power License award and First Nation-Crown Consultations Wuskwatim Project, Winnipeg MB
- 2009 Flood Fighting Response, Media Communications, RMs of St Clements and St Andrews home buyout programs, 2010 Flood Mitigation Program, Winnipeg, MB
- 2011 Flood Fighting Response, Media Communications International Secondment, South Australia Flood Forecasting and Flood Response Evaluation, Winnipeg, MB
- Amendments of the Water Rights Act and the development of the Drainage Regulation Branch, Winnipeg, MB
- Amendments of the Drinking Water Safety Act and the development of the Drinking Water Office, Winnipeg, MB
- Development of the Water Power Section, Winnipeg, MB
- Federal Provincial Negotiations - Peguis First Nations Flood Protection Agreement, Winnipeg, MB
- 2005 Flood Fighting Response, Media Communications, Lake Winnipeg Diking Initiative, Winnipeg, MB
- Manitoba Water Strategy, Winnipeg, MB
- Federal Provincial Negotiations - Assiniboine Dikes Transfer Agreement, Winnipeg, MB
- Provincial Flood Response Co-ordinator for the 1997 Flood - Flood Fighting Response, Media Communications, Flood Mitigation Program, Winnipeg, MB
- Federal Provincial Negotiations and Feasibility Implementation for the Red River Floodway Expansion Project, Winnipeg, MB
- Federal Provincial Negotiations Shellmouth Reservoir Enhancement Project, Winnipeg, MB
- Provincial Land Drainage Review, Winnipeg, MB

ENG-TECH Consulting Ltd Projects

- Project Manager, design and tendered civil works for a 30 acre Greenhouse in Dauphin, MB
- Hollow Water First Nation Landfill closure designs
- Project Manager Redditt, Ontario community water distribution system

**Professional Memberships and Affiliations**

Association of Professional Engineers and Geoscientists of Manitoba (APEGM)
Canadian Water Resources Association

**Professional Publications & Presentations**

Numerous water resource presentations to Manitoba stakeholders, municipalities and Associations.

# Dennis Antony, C.E.T. – Vice President of Projects - W.E.R.I.

Mr. Antony is the Vice President of Projects at Winnipeg Environmental Remediations Inc., and is responsible for managing the daily operations. Mr. Antony has a Bachelor of Science degree in Environmental Science (B.Sc.), a Renewable Resource Diploma (R.R. D.) and has received his C.E.T. designation in September of 2017 from the Certified Technicians and Technologists Association of Manitoba (CTTAM). He is also a certified professional in Erosion and Sediment Control (CPESC). Mr. Antony has twenty two years of environmental, construction project management, and resource management experience, gained in the Northwest Territories, Nunavut Territory, Yukon Territory, Manitoba and other remote northern communities. Mr. Antony has overseen the construction of new winter roads in Manitoba and the Northwest Territories for various projects. He is proficient in a wide variety of soil, water and biomass field sampling techniques and the development and implementation of best management practices for erosion and sediment control. Mr. Antony has comprehensive knowledge of the general operating practices, procedures and policies of federal, provincial and territorial environmental programs and management of environmental remediation projects involving different substances including petroleum hydrocarbons, polychlorinated biphenyls (PCBs), asbestos, metals and other hazardous materials.

## Education Qualifications

- May 1987 – B.Sc Environmental Science, University of Winnipeg
- May 1981 – Renewable Resource Diploma, Kelsey Institute

## Professional Affiliations

- Certified Engineering Technologist (C.E.T.) via Certified Technicians and Technologists Association of Manitoba (CTTAM)
- Certified Professional in Erosion and Sediment Control (CPESC)
- Former Certified Environmental Site Assessor

## Training

- COR Safety Training developed, ISN Safety Program for WERI
- Northern Affairs Program Fire Control Manager's Courses I-IV
- Association of Environmental Site Assessors in Canada (AESAC)
- Workplace Materials Hazardous Information System (WHMIS)
- Soil and Groundwater Remediation Technologies
- Canadian Coast Guard Oil Spill Training Course
- Northern Affairs Environmental Health & Safety Train-the-Trainer (80 hour course)
- Former St. John's Ambulance First Aid Trainer
- Emergency Response Training
- Hazardous Waste Training

## Training, continued

- TDG Training
- H2S Safety Awareness
- Renewable Resources Hazardous Materials Awareness (40 Hour)
- Toronto Police Department Train-the-Trainer Ice Rescue Course (40 Hour)

- Certified as a Heavy Equipment Operator Trainer under MB Heavy Construction
- Hazwopper

# Recent Work History

WERI– VP of Projects (1996 – Present)

Responsible for the oversight of daily activities at Winnipeg Environmental Remediations Inc. which includes but is not limited to the following:

- Responsible for business development, marketing, client relations, aboriginal liaison, interaction with multiple government departments
- Level 1 National Security Program Officer, assists in organizing and completing required information or applications, for both provincial and federal governments
- Accomplishes human resource objectives by recruiting, selecting, orienting, training, assigning, scheduling, coaching, counseling, and disciplining employees; communicating job expectations; planning, monitoring, appraising, and reviewing job contributions; planning and reviewing compensation actions; enforcing policies and procedures.
- Achieves operational objectives by contributing information and recommendations to strategic plans and reviews; preparing and completing action plans; implementing production, productivity, quality, and customer-service standards; resolving problems.
- His experience and technical expertise of 22 years has come from working in Manitoba and northern Canada, including remote northern communities
- Enhances department and organization reputation by accepting ownership for accomplishing new and different requests; exploring opportunities to add value to job accomplishments.
- A committed environment, health and safety professional with a communicative leadership style focused on key issues, trends and practices. Management of the Safety Coordinator to ensure day to day safety issues are actioned, ensure all safety procedures and policies are adhered to, oversee the Safety Training Program, auditing policies and procedures to ensure compliance with Manitoba Legislation for COR certification.

# WERI Project Experience

## Enbridge – Line 3 Replacement – Civil Earthworks (May 2018 – Ongoing)

Construction Manager

Work included the Industrial Construction within 4 active plant sites consisting of:

- Excavation and backfill around high-pressure natural gas and crude oil lines
- Adherence to strict environmental, health and safety, and site control requirements
- Site grading and import and installation of 50,000 tonnes of clay and aggregates as engineered fill and backfill liner.
- Placement of backfill for slab support around piping structures
- Placement and installation of synthetic liners, textiles and geo composite materials

- Project Value: $5.0 million

## Hollow Water WERI Construction Ltd.

Project Manager, Playgreen Point, MB (February 2017 – March 2017 and February 2018 – March, 2018)

- Construction of 12 kilometers of winter road, including one 500 m river crossing, to provide access to the site and for hauling of core stone and armour rock.
- Construction of new dock.
- Construction of ice road leading from the lake shoreline to the start of the breakwater. This included frequent flooding events to ensure a minimum of 100 cm of ice to permit the travel of up to 40 tonnes on the ice surface.
- Installation of 200 m of turbidity curtain to prevent the migration of sediment during the construction of the breakwater.
- Ice cutting on the lake in small sections to permit the installation of rock into the water.
- Construction of 80 m long breakwater using 4000 tonnes of core stone and 4000 tonnes of armour rock.
- The construction of the dock and the breakwater had to be conducted over two winter seasons due to unseasonably warm weather during the inaugural winter that precluded the construction of the ice crossing to the required thickness

## Winnipeg Airport Authority

Project Manager, Winnipeg, MB (June, 2017 – August, 2017)

- Interior demolition of the pedestrian bridge including the removal of mechanical/electrical equipment and window panes.
- Using a 60 tonne crane to suspend one half of the pedestrian bridge while the bridge was cut in two. Each section of the bridge was lifted by the crane and lowered onto a flat deck trailer. The secured section of the bridge was hauled off site for processing and subsequent disposal of the bridge at a licensed metal recycler.
- Traffic control including the re-routing of traffic using flagpersons was required during the hoisting of each section of the pedestrian bridge.
- Demolition of the ancillary elevator building.
- Concrete and steel was recycled.
- Removal of concrete piles to a depth of 3 m below ground surface.
- Installation of a new catch basin connector piping.
- Affected paved areas were re-paved with asphalt.

## Public Works and Government Services – Forks National Park

Project Manager, Winnipeg, MB (August, 2016 – June, 2017)

- Bathroom upgrades, heritage signage, restoration or interpretive features
- New access path and road construction, hard and soft landscaping
- Riverwalk consisted of the removal of river silt from the Parks Canada site walkways. The silt was excavated with various machinery and hauled offsite

- Pavement areas were washed and disturbed areas were seeded and sodded as required
- Construction of a canoe launch to allow recreational canoes and walkers to view the river
- Clearing, grubbing and river bank stabilization to create a suitable river path access
- Construction of flagstone walkway and patio areas and installation of interpretive signage
- Excavating and placing of both existing and new materials to include installation of granular material
- Compacting and placing of Gabion baskets
- Reshaping dike and stone stairway construction

## Dauphin River First Nation – Phase 1 Project Return Home

VP of Projects (2014 – Ongoing):

- Phase 1 of Project Return Home is to rebuild the Dauphin River First Nation Community. Work included demolition of 38 single family homes. Construction of 44 new homes on an engineered concrete foundation system. Included the relocation of 44 RTM style residences from a site 100km from the project site. All homes were set on foundations and connected to local sewer and water.

## EAG – Various Sites

VP of Projects (2014 – Ongoing)

- Building demolition, hazardous materials disposal, onsite soil remediation and relocation of hydro-carbon impacted soil at various locations across North West Ontario, Manitoba, Saskatchewan and Alberta. Approximately 20 plus sites have been completed to date including remediation. By the end of September 2015 approximately 200,000 TN of soil will have been remediation by WERI.

## Fountain Tire – Shop Construction

Project Manager, Winnipeg, MB (2013)

- Project manager for the complete design build and site development of 17,000 square foot steel building
- Involved trades coordination, overall site safety, applying for and managing permits Hydrocarbon soil removal

# WERI Project Listing

| DATE | CLIENT | LOCATION | DESCRIPTION |
|---|---|---|---|
| December 9, 2018 - Ongoing | Sustainable Development | Talbot Lake, MB | Camp Remediation |
| July 5, 2017 – Ongoing | Vomar Industries | La Salle, MB | Tank Removal |
| August, 2016 – June, 2017 | Parks Canada | Winnipeg, MB | Riverwalk |
| June, 2017 – August, 2017 | Winnipeg Airport Authority | Winnipeg, MB | Skywalk Demolition |
| April 17, 2017 – May 1, 2017 | Hollow Water FN – WERI Construction Ltd. | Hollow Water, MB | Brushing |
| February 19, 2017 – March 31, 2018 | Webequie First Nation | Webequie First Nation, ON | Community Remediation |
| February 9, 2017 - Ongoing | Penn-Co Construction Ltd. | Bisette, MB | Sewage Treatment Plant & Lagoon Upgrade |
| June 1, 2017 – August, 2017 | International Peace Garden (Manitoba) Inc. | Boissevain, MB | Wastewater Servicing Upgrade |
| February, 2017 – March 2017 / February 2018 – March 2018 | Hollow Water WERI Construction Ltd. | Playgreen Point, MB | Breakwater Construction |
| 2017 - Ongoing | Enviro Analytics | Western Canada | Site Remediation |
| January 4, 2017 – January 31, 2017 | Public Works and Government Services Canada | Prophet River, MB | Remedial Excavation & In-Situ Treatment |
| October 5, 2016 – November 30, 2016 | Public Works and Government Services Canada | Whitehorse, YK | North Apron Land Treatment |
| August, 2016 – June, 2017 | Public Works and Government Services Canada | Winnipeg, MB | Infrastructure Upgrades |
| July 15, 2016 – September 15, 2016 | Public Works and Government Services Canada | Stony Mountain, MB | Watermain & Sewer Pipe Replacement |
| July 2, 2016 – | Town of Waterhen | Waterhen, MB | Waste Disposal Site |
| June 24, 2016 – June 30, 2016 | Pinchin Environmental | Morden, MB | 301 South Railway Remediation |
| June 16, 2016 - Ongoing | Enviro Analytics | Western Canada | Various Soil Remediation Projects |
| June 13, 2016 - Ongoing | Enviro Analytics | Manitoba | Site Remediation |
| June 10, 2016 – November, 2016 | Public Works and Government Services Canada | Stony Mountain, MB | Watermain & Sewer Pipe Replacement |
| April 15, 2016 – August, 2016 | Valard | Hollow Water, MB | Crushing 15,000 Tonnes |

| | | | |
|---|---|---|---|
| June, 2016 – August, 2016 | Manitoba Infrastructure & Transportation | Morden, MB | Dam and Safety Boom |
| March 1, 2016 – March 15, 2016 | Hollow Water FN Esrac | Hollow Water, MB | Clearing KM1 – KM9 |
| January 18, 2016 – Ongoing | Town of Waterhen | Waterhen, MB | Waste Disposal Site |
| 2016 | Manitoba Hydro | Great Falls, MB and Bird River, MB | Riverbank Stabilization |
| February 19, 2016 – March 31, 2018 | Webequie First Nation | Webequie, ON | Community Remediation |
| February 5, 2016 - | Public Works and Government Services Canada | Indian Head, SK | Soil Remediation & Restoration |
| January 7, 2016 – March 21, 2016 | Manitoba Water Services Board | Virden, MB | Waste Water Tank Removal |
| January 2, 2016 - | Nelson River Construction | Winnipeg, MB | Rock Truck Rental |
| 2016 | Buhler Versatile Inc. | Winnipeg, MB | Tank Cleaning |
| 2016 | Manitoba Hydro | Great Falls and Bird River, MB | Riverbank Stabilization |
| 2016 - Ongoing | Bristol Aerospace | Winnipeg, MB | General Works |
| December 7, 2015 - | Maple Leaf | Killarney, MB | Site Tank Removal & Remediation |
| August 22, 2014 – | RM of St. Clements | St. Clements, MB | Dyke Build |

# Keen Wong – Project Coordinator - W.E.R.I.

Mr. Wong is a graduate of the University of Winnipeg and Red River College. He acts as a support to the Project Management ream and is responsible for assisting in the gathering, distributing and organizing information in relation to estimating, reporting, proposal submissions, safety, profitability and costing.

As a graduate of Environmental Sciences and Civil Engineering Technology Environmental stream, he has been exposed to many different fields. They include Environmental Impact Assessment, water resources, soil sciences, water and wastewater treatment, atmospheric sciences, project management, knowledge in chemistry, biology and physics.

## Education Qualifications

- June 2018 – B.Sc Environmental Science, University of Winnipeg
- June 2018 – Civil Engineering Tech. Environmental - Diploma, Red River College
-

## Training

- COR Safety Training developed, ISN Safety Program for WERI
- Workplace Materials Hazardous Information System (WHMIS)
- Soil and Groundwater Remediation Technologies
- First Aid Training Level 3
- Confined Space Entry Training
- Emergency Response Training
- Hazardous Waste Training
- Leadership in Safety Excellence
- Incident Investigation
- Construction Safety Training System
- Transportation of Dangerous Goods
- Survey – *Winnipeg Environmental Remediations Inc*
    - Utilized GPS survey unit for site layout and staking
    - Used Trimble Business Center for creating design layout, surveying and quantity calculations, post data processing
    - Used Microsoft Office Programs to make different reports

## WERI Project Experience

### Eabametoong First Nation – Broadband Line (Rohl Enterprises)

Project Coordinator, Fort Hope, Ontario (February 2020 – March 2020)

- Construction of 120 kilometers of tree clearing, including multiple 500 m river crossings, to provide pathway
- Construction of ice road leading from the lake shoreline to the start of the winter roads. This included flooding events to ensure a minimum of 100 cm of ice to permit the travel of up to 40 tonnes on the ice surface.
- Ice cutting on the lake in small sections calculate weight capacity of lake crossings
- Provided logistic efforts in remote locations where cellular service was not available to ensure work continues
- Exceptional planning was required as shipments to First Nations Reserve would need to be coordinated with getting supplies to crews where they could not be reached by cellular means

### Poplar Hill First Nation – Landfill Cell Construction and Community Remediation

Project Coordinator, Poplar Hill, Ontario (October 2019 - Ongoing)

Work included the Industrial Construction within 4 active plant sites consisting of:

- Excavation and backfill around high-pressure natural gas and crude oil lines
- Survey work, including the use of Trimble GPS to mark proper boundaries
- Adherence to strict environmental, health and safety, and site control requirements
- Placement of material for remediation in older landfill site
- Placement and installation of synthetic liners, textiles and geo composite materials
- Project Value: $5.0 million

## WERI Project Listing

| DATE | CLIENT | LOCATION | DESCRIPTION |
|---|---|---|---|
| February 2020 – March 2020 | Eabametoong – Broadband Line | Fort Hope, ON | Camp Remediation |
| October 2020 – Ongoing | Poplar Hill – Landfill Construction | Poplar Hill, ON | Tank Removal |

**Arman Vahedi, P. Eng.**
Phone: +1 (204) 2976620
Email: arman@strategiccc.ca

## QUALIFICATIONS

- Professional Engineer
- 5 Years of field engineering and consulting experience in civil and environmental engineering
- 8 Years of applied research and teaching experience in water, wastewater, and waste management
- 4 Years of research and laboratory experience in water quality and water & wastewater treatment
- Experience in planning, designing and analyzing waste management programs including recycling, composting, and hazardous & special waste management.
- Experience in designing landfills, landfill closure plans, and transfer stations
- Practical knowledge of planning and design of water treatment and wastewater treatment processes
- Practical knowledge of phase I & II environmental site assessment, contaminated soil & groundwater chemistry, and soil remediation
- Experience in socio-economic analysis of engineering projects

## PROFESSIONAL EXPERIENCE

### Environmental Engineering Consultant

**Strategic Community Consulting** Winnipeg, Canada, 03/2020 – Present

- Worked with R&D to develop and implement innovative solutions in water & wastewater and waste management.

**Dillon Consulting Ltd. (project-based)** Winnipeg, Canada, 08/2017-03/2020

- Worked with the waste management group on multiple waste management projects including integrated solid waste management plans, landfill design, transfer station design, and hazardous waste management projects.

**Freelance Environmental Engineering Consultant,** Winnipeg, Canada, 02/2014-08/2017

- Provided engineering solutions for water, wastewater and waste management problems.
- Provided consulting services mainly in the areas of waste management, and wastewater treatment to local contractors.

### Faculty Member & Applied Research Coordinator

**Red River College,** Winnipeg, Canada, 09/2011-Present

- Coordinated applied research projects (ARP) as the capstone project for environmental technology program
- Created a strong network with local, national and international partners through applied research projects
- Supervised several research projects
- Administered the design and construction of a new wastewater treatment laboratory at Red River College

- Taught a number of courses including hydrology, waste management, environmental analysis, soil remediation, water quality management, air pollution control, and engineering economics

**Research Assistant & PhD Candidate**

**University of Manitoba,** Winnipeg, Canada, 05/2007-09/2011

- Conducted laboratory experiments as required for the PhD project and published the results of the project in peer reviewed journal papers
- Attended and presented the results of projects in various national and international conferences
- Trained and supervised, M.Sc. and undergraduate students
- Worked on two industry research projects to optimize the drinking water treatment and water distribution systems for two local municipalities in Manitoba

**Municipal Engineer**

**City of Ghazvin, Ghazvin**, Iran, 10/2005-11/2006

- Coordinated and supervised the design and construction of a new landfill
- Managed a number of water/wastewater projects

**Water Resources Consultant**

**City of Tehran, Tehran**, Iran, 09/2004-10/2005

- Prepared a groundwater quality audit for two subdivision of the of Tehran
- Coordinated a water quality management advisory committee for water related managers and academic researchers in Tehran

**Education**

- PhD, Environmental Engineering, University of Manitoba, Winnipeg, Canada, 2011

## Contact

2049180311 (Mobile)
blake@infinyt.com

www.linkedin.com/in/blake-v-russell-7098774b (LinkedIn)
www.infinyt.com (Company)


## Top Skills

Indigenous Development
Economic Growth - Indigenous and Private Markets
Negotiation

## Certifications

CIM (Hons) , PGM

# Blake V Russell

President and CEO INFINYT DEVELOPMENT GROUP
Winnipeg, Manitoba, Canada

## Summary


Focused on improving the Economic Condition of Indigenous Communities through proven Economic Development Strategies and innovative Economic Partnerships with the public and private sector, in all Markets.


## Experience

### INFINYT DEVELOPMENT GROUP

CEO

March 2006 - Present (14 years 3 months) Canada

### METIS ECONOMIC DEVELOPMENT ORGANIZATION

CEO

April 2009 - November 2014 (5 years 8 months) Winnipeg, Canada Area

### TRIBAL MARKETING

CEO

February 2007 - March 2009 (2 years 2 months) Winnipeg Manitoba

An Investment of Tribal Councils Investment Group, TRIBAL participated in National Corporate and Community Marketing and Communications Services focused on sustainability and economic particaption of the 63 First Nation Community owners

## Education

### Grant MacEwan University

Bachelor of Business Administration (BBA), Business Administration and Management, General · (1995 - 1998)

### MacEwan University

Business/Managerial Economics