

**Comments on Public Registry File: 5991.00 - Canadian Premium Sand Inc.
Environmental Act Proposal - Wanipigow Sand Extraction Project
Submitted by Don Sullivan on behalf of What The Frack Manitoba Inc.**

February 11, 2019

Accuracy of Information Provided by the Proponents in its EAP Submission:

The use of the project proponents 2014 NI 43-101 Technical Report, and other key company documents, are absolutely necessary to determine the accuracy of information provided by the project proponents to the provincial regulatory in its EAP Submission:

The Environmental Act Proposal (EAP) submit by AECOM on behalf of its client Canadian Premium Sand Inc.(the Company) is most interesting for what it omits and will require the Company to submit substantially more detailed operational information before proceeding to the next stage of the Environmental Licensing process.

One has to take pause to scrutinize carefully the accuracy of the information contained in the Company's EAP submission when the consultants (AECOM), contracted to do the work on behalf of the Company, have to attach such a lengthy and exhaustive *Statement of Qualification and Limitations* rider to the main EAP submission document and to Appendix E (Air Quality Report), F, (Noise Impact Assessment Report and to G (Traditional Ecological Knowledge Report),

What The Frack Manitoba Inc. has undertaken to compare the information contained in the Company's EAP submission with the information contained, about this proposed development project, in the Company's *2014 NI 43-101 Preliminary Economic Assessment Technical Report* (2014 NI 43-101. Technical Report) and other key Company documents. What The Frack Manitoba Inc. found a number of inconsistencies, omissions and inaccuracies between these two documents, and other key Company documents, that will require the Company to submit additional detailed operational information to clarify these inconsistencies, omissions and inaccuracies that are outlined in our submission.

What The Frack Manitoba Inc. used the Company's 2014 NI 43-101 Technical Report, as it is the most transparent and accurate documentation produced by the Company, to date, regarding the full details of the entire operation of its proposed frac sand mine, processing facility and all of the related physical activities associated with proposed development project.

The rationale for using of the Company's 2014 NI 43-101 Technical Report, and other key Company documents, to ascertain and verify the accuracy of the Company's information contained in its EAP submission, is very simple, all mining companies trading on the stock exchange in Canada must legally submit National Instrument (NI) Reports known as NI 43-101 Technical Report, which is an instrument for the *Standards of Disclosure for Mineral Projects* within Canada. The NI Reports is a codified set of rules and guidelines for reporting and displaying information related to mineral properties owned by, or explored by, companies which report these results on stock exchanges within Canada.

In short, the purpose of NI 43-101 Technical Report is to ensure that misleading, erroneous or fraudulent information relating to mineral properties is not published and promoted to investors on the stock exchanges overseen by the Canadian Securities Authority. There are legal ramification should a NI 43-101 Technical Report not be in compliance, no such legal requirement is placed on the Company for its EAP submission.

What The Frack Manitoba Inc, also used two additional publicly available documents (*attached*) produced by the Company for comparison purposes to determine the accuracy of information contained in the Company's EAP submission. The First is the *Claim Post Resources Inc Seymourville Frac Sand Project Investors Presentation, dated March 2018* . And second document, is *Claim Post Resources Inc. Seymourville Frac Sand Project – Financing Roadshow, dated February 20, 2015*.

A more in depth analysis of the various inconsistencies, omissions and inaccuracies of information contained in the Company's EAP submission, when compared to other key Company documents, can be found in Dennis LeNeveu EAP comments document and is attached as - *Supplemental Comment document 1-* to this document. A second supplemental comments document written by M.J. McCarron, dealing Traditional Ecological Knowledge issues as it relates to the Company's EAP submission also attached (*Supplemental Comment Document 2*)

The reason for attaching these supplemental comments documents to this submission, is that What The Frack Inc. submitted extensive documentation to the Canadian Environmental Assessment Agency on January 31, 2019, much of that information and research for the Canadian Environmental Assessment Agency submission was undertaken by these individuals, who are both members of What The Frack Manitoba Inc.

What the Frack Manitoba Inc. has now learned, based on a January 23, 2019 news release by the Company (*attached*), will be replacing its 2014 NI 43-101 Technical Report with *a* new NI 43-101 Technical Report, which is anticipated to be finalized in March 2019. "The new NI 43-101 Technical Report will replace and supersede the previous Report and Resource Estimate that was filed in 2014. In conjunction with the new 2019 NI 43-101 Technical Report, CPS will be updating all financial and feasibility information previously released for the project." This despite the Company having committed to this updated "National Instrument 43-101 Report", being completed prior to year-end (December 2018), in a October 3, 2018 Company News Release. (*attached*)

What The Frack Manitoba firmly believes that the Company failed to uphold certain provisions of the Province of Manitoba's *Licensing Procedures Regulation under Section 1(1)(i)* by not providing the regulator with all previous studies and activities relating to the feasibility respecting this proposed development project, by not including its 2014 NI 43-101 Technical Report, or its new updated NI 23-101 Technical Report, which was originally scheduled to be completed at the end of 2018, nor the Claim Post Resources Inc Seymourville Frac Sand Project Investors Presentation document, dated March 2018, and the Claim Post Resources Inc. Seymourville Frac Sand Project – Financing Roadshow document, dated February 20, 2015 as appendices to its EAP submission.

Therefore What The Frack Manitoba Inc. recommends that the Director of Environmental Approval exercise the powers given to the Director under Section 11(9) of the Manitoba Environment Act and request that the proponents (the Company) provide additional information including, but not limited to, the Company's new NI 43-101 Technical Report before proceeding to the next stage of the environmental review and licensing process, as this new NI 43-101 Technical Report may alter the proponents proposed development project significantly. Therefore a failure to request this new NI 43-101 Technical Report could severely undermine the integrity of the entire environmental review and licensing process currently underway by the Province of Manitoba with respect to this proposed development project.

The Director of Environmental Approval Branch would not be in breach of his/her duties as prescribed under the Licensing Procedures Regulation under Section 3(2) as the Company has stated in its January 23, 2019 news release the new NI 43-101 will be finalized in March of 2019 and is well within the 60 day window for the Director of the Environmental Approval Branch to make such an additional information request of the Company as per his or her authority to do so under Section 11(9) of the Manitoba Environment Act.

Project Life Expectancy:

In its EAP submission, the Company states that the anticipated life of the Project will be 54 years which will provide substantial long-term economic and employment benefit to the local communities. (pg.1 EAP General Project Information 1.1).

No further explanation is provided in the Company's entire EAP submission on how the Company derived this 54 life expectancy figure for the project.

We do from the Company 2014 NI 43-101 Technical Report that the Company estimated that the project life expectancy would be approximately 18 years. (pg.10)

Again in the 2014 NI 43-101 Technical Report states, based on a flowsheet schedule, in order to produce 1.0 Mt of frac sand, the target sand extraction rate is approximately 1,430,000 tonnes per annum. In the first two years of operation the quarry production will be ramping up and will produce approximately half of the target production. The quarry life is anticipated to be about 18 years, given the currently defined resource (see Table 16.2) (pg.69)

This quarry life expectancy figure of 18 years is also reaffirms in the Company's Seymourville Frac Sand Project Investors Presentation-March 2018 on page 15 and again in the. Seymourville Frac Sand Project – Financing Roadshow – February 20, 2015 document on page 25 (***both attached***).

The Company also noted in the NI 43-101 Technical Report on pages 116 and 129 that they intend to expand their operation to two million tonnes per year, and based on this proposed expansion the quarry life expectancy was estimated by the Company in its Seymourville Frac Sand Project Investors Presentation-March 2018 on page 15 that the life expectancy at 2 million tonnes year would be 8.5 years.

What The Frack Manitoba Inc. requests that the Director of Environmental Approvals Branch request that the Company provide a much more detailed explanation as to how the Company derived at a 54 years life expectancy figure for the proposed project, and that this request for further information on the life expectancy be based on information contained in the new NI 43 101 Technical Report to be filed in March of 2019 with The System for Electronic Document Analysis and Retrieval SEDAR, the official site that provides access to most public securities documents and information filed by issuers with the thirteen provincial and territorial securities regulatory authorities.

Frac Sand Production:

In the Company's EAP submission it states that the project will have a lifespan of 54 year and an estimated production capacity of approximately 1 million tonnes per year (pg. 7 EAP)

Once again no other details are provided in the Company's EAP submission on how the Company derived at this production capacity figure.

However, one can reasonably assume if the lifespan of the project is supposedly 54 years as stated, with a estimated yearly production of 1 million tonnes per year of frac sand, this would equate to roughly 54 million tonnes of frac sand being produced over the lifespan of the project.

In the Company's 2014 NI 43-101 Technical Report it states that the current quarry configuration as modelled is based on drilling to date and is approximately 4 km long (pg.2) and is divided into six larger Production Blocks with approximately 21.8 tonnes of overburden and 23.4 million tonnes of frac sand in total (figure 16.1 p. 68)

However, in the 2014 NI 43-101 Technical Report states it is expected that with further definition drilling the size and shape of the quarry will expand.(pg.4)

In the Seymourville Frac Sand Project Investors Presentation-March 2018 the Company states that its current quarry configuration is approximately to 200 acres in size and that Company has the quarry right to 2, 770 acres which represent 62 percent (372 million tonnes) of known sand resource.

We also now know based on the Company's January 23, 2018 news release (*attached*) that the "Company has successfully completed a fall/winter 2018 drill program that included 93 new sonic drill holes totalling 1,574 metres across its Wanipigow Sand Project site. The results of the analytical work will provide CPS with a thorough understanding of its entire silica sand deposit including size, quality, depositional characteristics and recoverability."

"The information gathered from this extensive program also provides the necessary information to complete an updated NI 43-101 Technical Report, anticipated to be finalized in March 2019. The Report will replace and supersede the previous Report and Resource Estimate that was filed in 2014. In conjunction with the 2019 NI 43-101 Technical Report, CPS will be updating all financial and feasibility information previously released for the project. "

What The Frack Manitoba Inc. requests that more information and details be given by the proponents as it relates to entire quarry production cycle and calculation methodology used to determine just how much frac sand will be produced on both a yearly basis and over the lifespan of the project using information contained in the new NI 43-101 Technical Report to be finalized in March 2019.

Water Consumption Issues:

Again we learn from information gleaned for the Company's 2014 NI 43-101 Technical Report that large volumes of water will be potentially required, on an annual basis, to sustain the Company's proposed operations.

This information is not at all forthcoming in the Company's EAP submission. In fact, the Company has not even undertaken the necessary hydrogeological studies and pump tests for groundwater conditions to determine the feasibility and sustainability of groundwater use for Project entire operations even though the Company has had year to do so..(pg.7 EAP submission – 1.7.2 Other Approvals)

Section 2.9 Water Usage on page 16 of the Company's EAP submission woefully underestimates the entire operation's water usage, by failing to properly identify all of the elements or components of this proposed development project that require water. The Company also fails to provide in its EAP submission a breakdown of the volume of water required for each element or component of its operation that do require water.

The only real data on water usage, for the proposed operation, is from the 2014 NI 43-101 Technical Report, where the actual volume of the process feed tank and the process water tank were given but that data was for the production based on 500,000 tonnes per year and not on 1 or possibly 2 million tonnes per year production, as is anticipated. These water usage figures may very well change based on new information contained in the new NI 43-101 Technical Report that the Company is now only in the process of finalizing.

A grossly underestimated figure of water usage by the proposed operation of 6221 cubic meters was derived by using incomplete data contained in the 2014 NI 43-101 Technical Report and was based on 500,000 tonnes per year production, this estimated water usage figure can be found in the ***supplemental comment document 1*** on page 25 Table 1.

In fact what is more disturbing, is that there is no engineering design work, as yet, for the plant, so the company does not even know how much water will be required to charge the plant and this type of engineering design information on the processing facility should have been included in the Company's EAP submission.

In a 2012 report prepared by the Wisconsin Department of Natural Resources entitled - **Silica Sand Mining in Wisconsin** - it was noted on page 21 that “***..expected average water use ranges from 420,500 gallons per day to 2 million gallons per day (292-1380 gpm). These volumes are typical of closed-loop processing systems, where evaporation and incorporation into product are the main sources of water loss.***”

Finally, the 2014 NI 43-101 Technical Report states that the wash plant will only run 180 days of the year (Table 17.1 pg. 78 2014 NI 43-101 Technical Report) and will not operate during the winter months. This may very well lead to the need to water recharge a portion of the wet plant operation every spring, and what volume of water will be required to recharge is not known as this information is also not contained in the Company's EAP submission. Also the Company does not account for the water loss in its EAP submission regarding the mud rejects. 30% is rejected at 30% water that is about 120,000 cubic meters of water a year - that is at least another 27 cubic meters per hour for 180 day operation.

Finally, the Company states that if they fail to find adequate sources of groundwater from their, as yet completed hydrogeological studies, they intend to supplement their water (as required) by trucking the water to site from a licensed source.

This begs the question - and really does need a definitive answer from the Company - from where will this trucked in water come from and just how much will be required? The answer to this question must be provided by the Company before any Environmental Licence is issued by the Province.

What The Frack Manitoba Inc. requests that the EAB contact person assigned to this project request that the Company provide the following additional information.

A detail breakdown of the operation's water requirements based on a completed engineering design of the components of processing plant that require water to operate.

That the Company provide information to EAB based on a completed hydrogeological studies and pump tests for groundwater to determine the feasibility and sustainability of groundwater use for Project operations. These studies and the information needs to be provided by the Company prior to any issuance of an Environmental Licence for this proposed development project. Frankly, the Company has had years to complete these studies and have failed to do so.

That additional information request be made to the Company about where the Company intends to source its water requirements should they need to truck in make up water to the processing and mine site and how many estimated truck loads maybe required if required.

An additional information request must also be made to the Company about the volume of water required to recharge elements of processing plant at the beginning of start up after winter shut down. In particular, as it pertains to the operation of the wet plant

Again an informational request must be made of the Company to make public their new 2019 NI 43-101 Technical Report, as water usage may alter significantly based on new information about the entire operation in the new 2019 NI 43-101 Technical Report.

Truck Traffic Issues:

As stated in the Company's EAP submission during the operation phase, 3 to 4 trucks per hour will be loading sand at the facility for transportation to Winnipeg for distribution.(pg 17)

Once again, when compared to the to figures cited in the Company's 2014 NI 43-101 Technical Report for sand hauling trucks needed to transport the final product to Winnipeg we get an entirely different figure.

On page 91 of the Company's NI 43-101 Technical Report Table 19.5 states it will require approximately 14 sand haul trucks, making 4 trips per truck in a 24 hour period every day of the year to haul 500,000 tonnes of frac sand product to Winnipeg on annual basis.

The Company states in its EAP submission that they will be producing and truck hauling 1 million tonnes of frac sand per year to Winnipeg, than these figures must therefore double.

In other words, this would mean 28 sand haul trucks will be required, with each sand haul truck making four trips one way to Winnipeg in a 24 hour period, every day of the year, to haul 1 million tonnes of frac sand product to Winnipeg, making for a total of 28 sand haul trucks at 4 trips per truck in a 24 hours period, which equates to 112 one way trips per day or 224 round trip in a 24 hour period, or just over 9 sand haul trucks every hour coming and going from the processing facility to Winnipeg and back.

As indicated in both 2014 NI 43-101 Technical Report (pages 116 &129) and also in the Seymourville Frac Sand Project Investors Presentation document, dated March 2018 (page 15) the Company has indicate it wants to ramp up production to 2 million tonnes per year and this increase in production would require 56 sand haul trucks, each sand haul truck making 4 trips per 24 hour period, every day of the year, for a total of 224 trip one way to Winnipeg, or 448 round trips in a 24 hour period, which turn works out to almost 19 trucks per hour coming and going from the processing facility to Winnipeg and back.

These are conservative estimates, as there very well could be an increase in these numbers if road weight restriction are not lifted during the spring months on Hwy. 304.

Additionally there is no break down in the Company's EAP submission of trucks trips needed if water is required to be transported onsite from a as yet unknown source destination and also how many propane and diesel fuel truck will be required is not figured into the Company's EAP submission.

In short, the traffic flow numbers provided in the Company's EAP submission are overwhelmingly underestimated. In fact, all of these traffic flow figures may very well change significantly once the Company produces its new NI 43-101 Technical Report and this and the traffic flow deficiencies identified above must be addressed as an additional information request, to the Company, by the EAB contact person assigned to the project.

Issuance of Work Permits:

The Company is seeking work permits under The Crown Lands Act of Manitoba under Section 7(1)(c) to undertake site clearing and infrastructure construction sometime in February/March 2019. (EAP submission Part 1 Executive Summary).

Should these work permits be issued, under the Crown Lands Act of Manitoba before receiving an Environmental Licence from the Province for its project, it may pose some serious legal liabilities for both the Company and the Province of Manitoba, as that project area is designated as a registered Hollow Water First Nation community trapline.

Issuing such work permits with out the prior, free and informed consent of the community of Hollow Water First Nation and before the Section 35 Consultation process has concluded would certainly be a clear infringement on Section 35 Rights of Hollow Water First Nation community members.

Furthermore, the issuance of such work permits under the Crown Lands Act by the government of Manitoba, allowing the Company to undertake such activities, without prior, free and informed consent from the community of Hollow Water First Nations would be a clear violation of the Crown's legal and fiduciary obligation to uphold these Section 35 rights.

Therefore What The Frack Manitoba would request the the Province deny the Company any request for work permits under the Crown Lands Act of Manitoba prior to receiving a Environmental Licence from the Province for the project, and certainly not before the Section 35 Consultation process has concluded and must include the prior, free and informed consent ro do so by the community of Hollow Water First Nation.

Concluding Remarks and Recommendations:

These are but a few examples of the clear inconsistencies contained in the Company's EAP submission when compare to other publicly available documents that the Company has produced to date, in regards to its frac sand mine and processing facility, but failed to include these publicly available documents as appendices to it EAP submission.

As mentioned previously, What The Frack Manitoba has attached a more exhaustive supplemental comments documents outlining a number of other important omissions, deficiencies and inaccuracies of information as it relates to the Company's EAP submission, prepared by members of our organization, that will also need to be address by the Company and before any Environmental Licence is issued to the proponents by the Province of Manitoba.

What The Frack Manitoba Inc. has provided compelling evidence to demonstrate that there are numerous concerns with respect to the Company's EAP submission that are outlined both in this document and in the attached two supplemental comments documents, prepared by our members, to warrant the assigned EAB contact person to request additional information (once all public comments and TAC committee comments have been reviewed) from the Company to address these substantive concerns before proceeding to the next stage of the environmental review process under the Manitoba Environment Act.

Given these concerns, we also request that, as per the 2018 Information Bulletin – Environmental Assessment and Licensing under The Environment Act, that guidelines be issued to the Company to prepare a full Environmental Impact Statement (EIS) for its proposed frac sand mine, processing facility and access road . These EIS guidelines must address the numerous information gaps that are outlined in this document and in the two attached supplemental documents.

Finally, What The Frack Manitoba has garnered over 3,000 signatures, in just over 90 days, on a petition, which clearly demonstrates a high level of public concerns with respect to this propose development project. (<https://www.change.org/p/a-request-for-a-joint-federal-provincial-environmental-panel-review-process-of-a-proposed-frack-sand-mining-operation-in-manitoba>)

The petition calls on both the Provincial and Federal governments (as we have provided significant evidence to the federal government that there may be significant adverse impacts under federal jurisdiction to warrant a review of the proposed development project under the Canadian Environmental Assessment Act) to undertake a joint Federal/Provincial public panel environmental review of the proposed development project.

Therefore, What The Frack Manitoba calls on the Director of the Environmental Approval Branch to exercise his/her authority under Section 11(9)(e) of the Manitoba Environment Act and request the Minister to direct a public hearing on this proposed development project in accordance with Canada-Manitoba Environmental Assessment Cooperation Agreement.

Comments on Public Registry File: 5991.00 - Canadian Premium Sand Inc. - Wanipigow Sand Extraction Project

By

D.M. LeNeveu M.Sc. Bs. B.Ed.

February 04, 2019

1. Preamble

Many of my comments refer to the Environmental Act Proposal (E.A.P.) prepared by AECOM Canada Ltd. on behalf of Canadian Premium Sand Inc. Public Registry File: 5991.00 (AECOM EAP)

I bring forward new and existing information, not included in the AECOM EAP that gives reasons for the necessity of an independent environmental assessment. I give links to all references for all the information I present. As such the information is not opinion, but evidence supported by third party credible sources subject to scientific rigour. Much of the information comes from an original technical document entitled Technical Report and Preliminary Economic Assessment of the Seymourville Silica Sand Project, Manitoba, Canada, NI-43-101 & 43-101F1, for Claim Post Resources (CPS Technical Report) filed on the Sedar.Com site in 2014. Claim Post Resources has been renamed to Canadian Premium Sand Inc. (CPS).

Several matters of concern for designating a Project under the Canadian Environmental Assessment Act (CEAA 2012) listed below are relevant. (<https://www.canada.ca/en/environmental-assessment-agency/services/policy-guidance/designating-project-under-canadian-environmental-assessment-act-2012.html>)

1. *“Whether there is potential for adverse environmental effects within federal jurisdiction, as set out in section 5 of CEAA 2012, and the anticipated nature and extent of those effects*
2. *Whether there are public concerns about the adverse environmental effects*
3. *Whether there are potential impacts to Aboriginal peoples and to potential or established Aboriginal and Treaty rights*
4. *Whether the project is near the threshold set in the Project List*
5. *Whether standard design features and mitigation would address the anticipated adverse effects*
6. *Whether the project involves new technology or is a new type of activity*
7. *Whether the potential adverse effects can be adequately managed through other existing legislative or regulatory mechanisms*
8. *Whether an assessment of environmental effects would be carried out by another jurisdiction*
9. *Whether the project may cause adverse environmental effects because of its location and environmental setting*
10. *Whether there are proposals for multiple activities within the same region that may be a source of cumulative effects”*

There are legitimate concerns pertaining to each and every one of the matters listed above. I briefly discuss the concerns below. A thorough discussion of these matters is given in the remainder of this document.

1. There are adverse environmental effects within federal jurisdiction as set out in section 5 of CEAA 2012 due to potential acid rock drainage, sediment migration and disruption of the water table and local drainage. Adverse effects may occur to fish and fish habitat, aquatic species at risk such as Chestnut Lamprey, Lake Sturgeon, Shortjaw Cisco, Silver Chub, Bigmouth Buffalo, Mapleleaf

Mussel and Lake Winnipeg Physa Snail, bird species at risk such as the Canada Warbler, Chimney Swift, Common Nighthawk, Rusty Blackbird and the Olive-sided Flycatcher (<https://www.gov.mb.ca/sd/eal/registries/2435-40sangold/report-text.pdf>, <https://ceaa-acee.gc.ca/050/documents/50022/50022E.pdf> and migratory birds in wetlands, two unnamed creeks, the Wanipigow and Manitogagan Rivers and Lake Winnipeg nearby the Project. With respect to aboriginal peoples, there are adverse effects (see item 3) that may be caused to the environment on health and socio-economic conditions and the current use of lands and resources for traditional purposes.

2. Public concern on the environmental effects of the project has been expressed in an online petition of "What the Frac Manitoba" that has garnered 3000 signatures.
3. Potential detriment to aboriginal peoples of Wanipigow, Manigotagn, Aghaming, Seymourville and Hollow Water include adverse effects on hunting, fishing trapping on traditional lands of, exposure to respirable silica dust, and risk of injury and death due to increased Project truck traffic.
4. The project is near or above the Regulation threshold of 3.5 million tonnes per year for the total amount extracted from a quarry or sand pit (<https://laws-lois.justice.gc.ca/eng/regulations/sor-2012-147/page-1.html#docCont>) and far above the threshold of one million tonnes per year from the 1992 regulations that were applied to the similar BURSCO Project sediment (https://ceaa-acee.gc.ca/050/evaluations/document/121281?culture=en-CA#_Toc079). To fully exploit the estimated 372 million tonnes of Project sand resource, the production capacity would have to eventually increase to over the threshold for quarry or sand pit of 3.5 million tonnes per year (https://www.canadianpremiumsand.com/images/Claimpost_FracSand_Presentation_DISPLAY_v3-21.pdf).
5. Standard design features such as covering outdoor sand stockpiles, use of respiratory protection for workers, dust mitigation techniques such as wetting of dust rejects, use of barge to rail instead of trucks, isolation and protection from drainage of wash plant rejects and overburden containing pyrite, and offsets for potential damage to fish habitat, could be applied.
6. The Project is a new type of activity in Manitoba, namely a frac sand mine.
7. Potential adverse effects cannot be comprehensively managed through other existing legislative or regulatory mechanisms due to the extensive and interacting nature of the effects, including some effects under federal jurisdiction such as fisheries and effects on aboriginal people.
8. The assessment of environmental effects could be carried out under a joint assessment with the Canadian Environmental Assessment Agency and provincial authorities.
9. The project may cause adverse environmental effects because of its location and environmental setting on an elevated peninsula with natural drainage into two unnamed creeks, two major rivers and Lake Winnipeg. The Project is proximal to five local settlements with significant aboriginal population and is within the traditional lands of these aboriginal people.
10. There have been activities associated with mining in the Bissett region that may be a source of cumulative effects (<https://www.gov.mb.ca/sd/eal/registries/2435-40sangold/report-text.pdf>, https://www.gov.mb.ca/sd/eal/registries/2435-40sangold/sangold.summ_2628rr_jw.pdf). Continuing effects from the Lake Winnipeg East Side Road Project such as suspended sediment from crossings on the Wanipigow River watershed may also result in cumulative effects (<https://ceaa-acee.gc.ca/050/documents/50022/50022E.pdf>). There are likely to be future activities such as mining and logging within the Manigotagan and Wanipigow watersheds that could be a source of cumulative effects.

Of relevance is the Lake Winnipeg East Side Lake Project that underwent a joint environmental impact assessment under Manitoba's Environment Act and under CEAA 2012. An evaluation of the environmental effects of the East Side Road Project was carried out in consultation with Department of Fisheries and Oceans, Transport Canada, and Indian and Northern Affairs Canada. Additional expert advice was provided

by Environment Canada, Health Canada, and Parks Canada. The East Side Road crosses the Wanipigow River not far upstream from the area affected by this Project. Some of the potential adverse effects of the East Side Lake Project are similar to this Project including the potential for suspended sediment that can negatively affect both fish and fish habitat. The East Side Lake Road Project states,

“The potential for adverse effects would exist until vegetation cover has been established on disturbed soils adjacent to watercourses”

The same potential for adverse effects from this Project may occur from overburden removal and stockpiling of rejected material from the sand deposit until vegetative cover has been established. Other environmental effects common to the two projects include potential detriment to hunting and fishing of nearby aboriginal peoples on traditional lands and detriment from road traffic.

2. Overview

Comments are made regarding a change that may be caused to the following components of the environment, a change in fish and fish habitat, aquatic species at risk, and migratory birds. Comments are made on a change with respect to aboriginal peoples on the current use of the land and resources for traditional purposes and on health and socio-economic conditions. The health of the aboriginal people may be affected by traffic accidents due to the large increase in truck traffic on highway 304 that is used extensively by the nearby aboriginal people and others. Workers and nearby residents may be exposed to harmful respirable silica dust emitted by the Project. Release of process water containing residue of toxic flocculants and acid drainage from pyrite in sand rejects and overburden may adversely affect fish, fish habitat, aquatic and bird species at risk, migratory birds and drinking water. Process water containing detrimental material may be released from the disposal of rejected mud from the wash plant, leakage and spillage from the settling pond and from drainage of the wash plant for winter shut down. Flocculent toxins and acid from acid drainage collected from active quarry cell will tend to concentrate as the water is recycled.

The influx of outside workers and truckers into the community from the Project may have some detrimental effects on socio-economic conditions. With respect to the aboriginal people of the Brokenhead Reserve a change may be caused to the environment on the cultural heritage of gaming as embodied by the South Beach Casino business on the reserve. Sand truck traffic may have a detrimental effect of on the casino business and may increase in injury and death of residents from traffic accidents.

At least five sand trucks per hour and two water trucks per hour are anticipated plus two propane tanker trucks per day, together with an unspecified number of employee commuter vehicles and diesel fuel tanker trucks.

Mitigation measures such as use of barges across Lake Winnipeg to the Lakeline Railway, covering of stockpiled sand, silica dust monitoring and effective worker respiratory protection are not likely to be effected without being mandated by an independent assessment.

The primary market for the sand from the Project is for hydraulic fracturing of oil and gas wells. The burning of the hydrocarbons from such wells is primarily responsible for the global increase in greenhouse gas causing detrimental climate change. Detriment from climate change may adversely affect all components of the environment. The Project has a relatively large carbon footprint in itself from the large volume of truck traffic, from propane drying of the sand and other activities. Use of barges to rail would substantially lessen the carbon footprint.

The production capacity of the Project is likely to increase in future for full exploitation of the estimated 372 million tonne sand resource increasing all aspects of the risk due to the Project.

An independent environmental assessment of the Project is essential to protect the environment, affected aboriginal people and the public.

3. The Size of the Project

In the AECOM EAP, the production capacity of final silica sand product for the Project is given as one million tonnes per year. The anticipated lifetime of the Project is 54 years. On page 5 of the CPS Technical Report 2014 the recoverable tonnage of the quarry is estimated as 23.4 million tonnes based on the drilling completed at the time. It is stated on page 4 of the Report,

“The proposed quarry area is based on the drilling completed to date; however, it is expected that with further definition drilling the size and shape of the quarry will expand.”

The AECOM EAP implies the recoverable amount is at least 54 million tonnes. In Economic Geology Report ER84-2 1985, Silica in Manitoba, by D.M. Watson, Manitoba Energy and Mines Geological Services the Seymourville silica deposit is estimated to contain 600 million tonnes of silica sand averaging 95% SiO₂ over an area of 1800 hectares (<https://www.manitoba.ca/iem/info/libmin/ER84-2.pdf>). A CPS investor presentation of March 2018 states Claim Post (CPS) controls 2,770 acres (1120 hectares) representing 62% (372 million tonnes) of the sand resource.

(https://www.canadianpremiumsand.com/images/Claimpost_FracSand_Presentation_DISPLAY_v3-21.pdf).

On page 103 of the CPS Technical Report 2014 an option of expansion of production to 2 million tonnes per year is examined. This establishes future increases in production rate could occur. The company would not have invested in acquiring a resource of 372 million tonnes of sand if they do not intend on full exploitation. The time frame for exploitation may well be curtailed by climate change mitigation measures adding further incentive to increase the production rate. For instance the estimated silica sand resource of 372 million tonnes at a production rate of 4 million tonnes a year would result in a project lifetime of 93 years for full exploitation. A future increase in production of four million tonnes per year or greater would greatly increase all components of risk due to the Project and necessitate the requirement for a comprehensive assessment.

4. Changes to Fish and Fish Habitat, Aquatic Species at Risk and Migratory birds

The AECOM EAP in the executive summary and in section 4.6.4.4 states,

“No Project components or activities occur in or immediately adjacent to fish-bearing waterbodies and no Project effects to fish-bearing waterbodies, including Lake Winnipeg, are anticipated.”

The conclusion of the AECOM EAP states,

“Considering the Project Site does not have rare or particularly sensitive land cover and the existing land cover is common within the Lac Seul Upland Ecoregion within which the Project is located, long-term adverse effects to vegetation and regional wildlife populations, including species at risk populations, are not anticipated. There is no fish habitat within the Project Site; therefore, adverse impacts to fish or fish habitat are not anticipated.”

Vegetation clearing, including quarry overburden stripping and stockpiling will not take place during the peak breeding bird season for this 'Zone C5' area: pre-clearing nest searches will be conducted no more than 5 days prior to clearing during the 'shoulder' nesting season outside of this 'peak'."

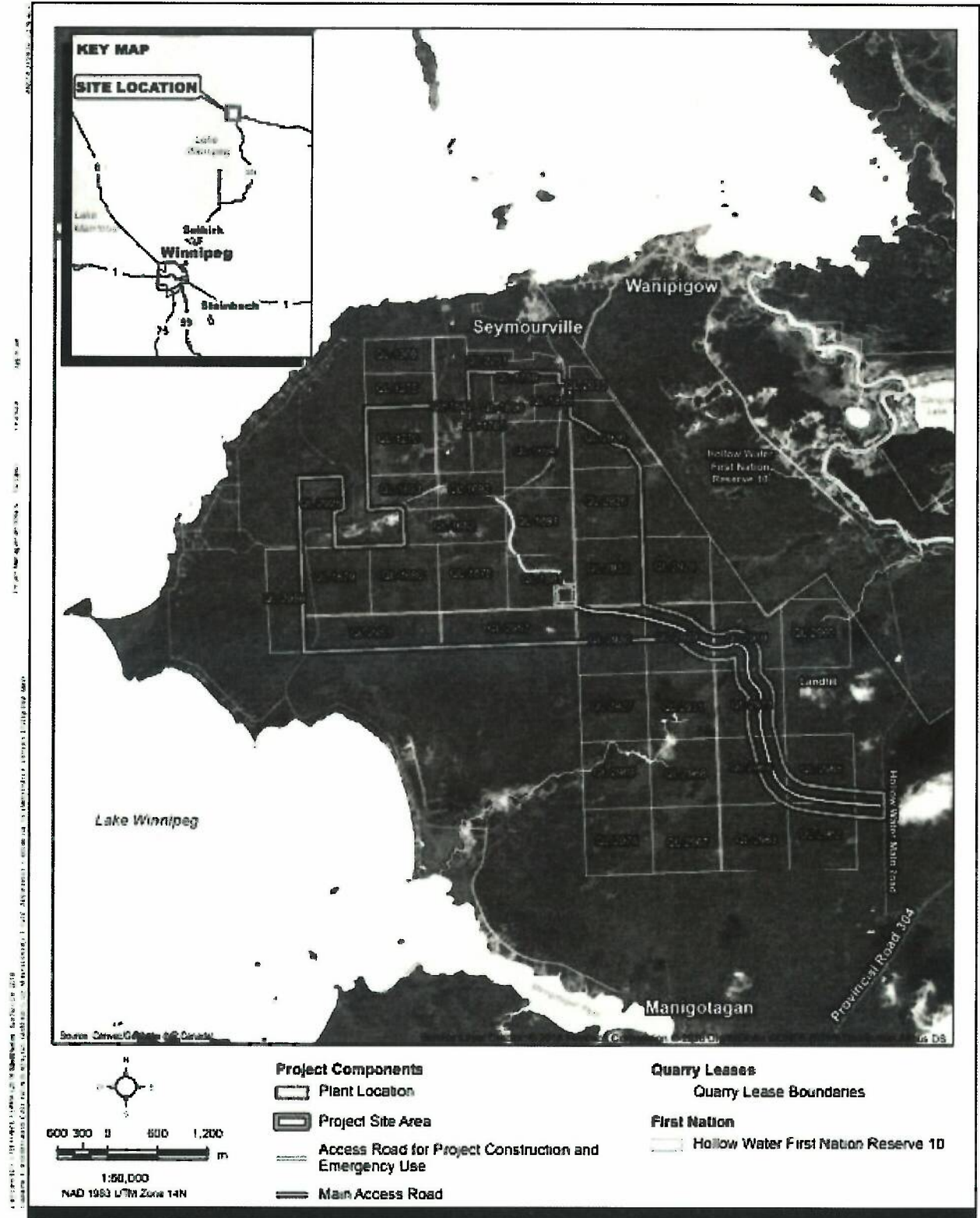
Section 6.4.3 of the AECOM EAP states,

"Of the species of conservation concern that potentially occur in the Regional Project Area (Section 4.3.3; Appendix D) and may be adversely affected by Project activities, no species of conservation concern is expected to experience a substantial decrease in regional populations as a result of Project activities. This is primarily due to the limited amount of cleared vegetation/habitat that will be required for the Project (Section 6.4.1), prevalence of similar cover types within the Regional Project Area, and the application of measures as indicated in Section 6.4.2 to mitigate adverse effects of the Project on wildlife in general. Therefore, the Project impacts to regional populations of species of conservation concerns are assessed as minor to moderate, depending on the species of conservation concern and their habitat preferences"

Appendix D of AECOM EAP lists the species of concern in the Lac Seul upland Ecoregion that is consistent with the species at risk identified in the Lake Winnipeg East Side Road Project such as Canada Warbler, Chimney Swift, Common Nighthawk, Rusty Blackbird and the Olive-sided Flycatcher. No information could be found in the AECOM EAP of the prevalence of these species in the Project vicinity.

The measures to protect terrestrial habitat such as re-vegetation and remediation and pre-clearing nest searches may be beneficial but other disruptive effects such as noise and project traffic and machinery are likely to be pervasively detrimental to local wildlife populations over the 54 year duration of the Project. On going disruption over the long duration of the Project is likely to permanently drive wildlife away from the area. Off-setting measures mandated by a comprehensive assessment may well be required.

The fish and fish habitat that may be affected by the Project include sections of the Wanipigow River, Manigotagan River mouth, Lake Winnipeg and two unnamed Creeks shown in **Figure 1**.



SEYMOURVILLE SAND EXTRACTION PROJECT
CLAIM POST QUARRY LEASES AND PROJECT SITE LOCATION
CLAIM POST RESOURCES INC.



Figure 1 Project layout showing water bodies that may be affected by the Project including two unnamed creeks draining the southern Project area. **Figure 1** is reproduced from the AECOM EAP (Figure: 1-1).

The Wanipigow River, classified as a Class 1 system, has a high capacity for the production of fish. (https://www.gov.mb.ca/sd/eal/registries/2435-40sangold/sangold.summ_2628rr_jw.pdf). The Manigotagan River and Lake Winnipeg areas near this Project also support fish (<https://huntfishmanitoba.ca/blog/2017/05/10/top-5-early-season-walleye-destinations-manitoba>).

The unnamed creeks have not apparently been evaluated for fish, and fish habitat. Such an evaluation should be made as part of this Project as the water flow and fish habitat in these creeks may be adversely by drainage from the Project. Portions of the unnamed creeks are within the quarry lease boundaries of the Project as shown in **Figure 1**. Should there be fish habitat within these creeks, the claim in the AECOM EAP that there is no fish habitat within the Project site would be inaccurate.

A comprehensive environmental assessment under the Manitoba Environment Act and CEAA 2012 was conducted for the Lake Winnipeg East Side Road Project 2011 (<https://ceaa-acee.gc.ca/050/documents/50022/50022E.pdf>). Fisheries and Oceans Canada and Transport Canada determined that each would have regulatory decisions to take with respect to the Project under the Fisheries Act and the Navigable Waters Protection Act, respectively. There were fifteen named watercourses in the Lake Winnipeg East Side Road Project study area including the Manigotagan River and Wanipigow River which may be affected by this Project.

In the East Side Road Project assessment it is stated,

“Suspended sediment can negatively affect both fish and fish habitat, and can adversely affect fish productivity if the sediment is deposited on fish-spawning habitat. The potential for adverse effects would exist until vegetation cover has been established on disturbed soils adjacent to watercourses. To mitigate adverse effects, all watercourse crossings would be developed in accordance with federal and provincial advice and regulations to avoid impacting fish and fish habitat. As noted in Section 6, five fish species (Chestnut Lamprey, Lake Sturgeon, Shortjaw Cisco, Silver Chub, and Bigmouth Buffalo) and two mollusc species (Mapleleaf Mussel and Lake Winnipeg Physa Snail) either occur or have the potential to occur in the Project study area and have been assessed by COSEWIC as endangered.

The existence of regulatory instruments to ensure the effectiveness of the mitigation measures, including but not limited to Fisheries Act authorizations which will require compliance monitoring to determine effectiveness of mitigation measures in protecting fish and fish habitat.”

I present evidence that suspended sediment from this Project may negatively affect both fish and fish habitat. In addition, I present evidence that the Project may cause acid drainage from pyritic shale in the overburden, and from pyrite and marcasite (crystalline pyrite) in the sand and sand rejects. Potential discharge of process water containing sediment from and toxic flocculants from the wash plant may also occur. Acid drainage and discharge of process water can damage fish habitat. To be consistent with the East Side Road Project this Project should require an assessment under the Manitoba Environment Act.

4.1 Pyritic Shale

The AECOM EAP states in section 6.2.3, Groundwater, page 62,

“Due to the absence of potential acid-generating rock and non-reactive silica sand within the quarry areas to be excavated, the probability of acid / heavy metal contamination of groundwater is negligible.”

One well known source of acid rock drainage (ARD) is pyrite. A geology Textbook, Physical Geology by Steven Earle, states in section 5.2 states.

“even a rock with 1% or 2% pyrite can produce significant ARD. Some of the worst examples of ARD are at metal mine sites, especially where pyrite-bearing rock and waste material have been mined from deep underground and then piled up and left exposed to water and oxygen.”

<https://opentextbc.ca/geology/chapter/5-2-chemical-weathering/>

A Report of Activities 2016, Manitoba Growth, Enterprise and Trade, by K. Lapenskie states,

“Two major lithological units occur on Black Island, a lower sandstone unit overlain by a pyritic shale. In places, the shale is composed of up to 50% pyrite nodules”

(<https://www.manitoba.ca/iem/geo/field/roa16pdfs/GS-17.pdf>).

The shale layer and sulphide staining from dissolution of the pyrite in the overlying shale is illustrated in **Figure 2** reproduced from the 2016 Report.

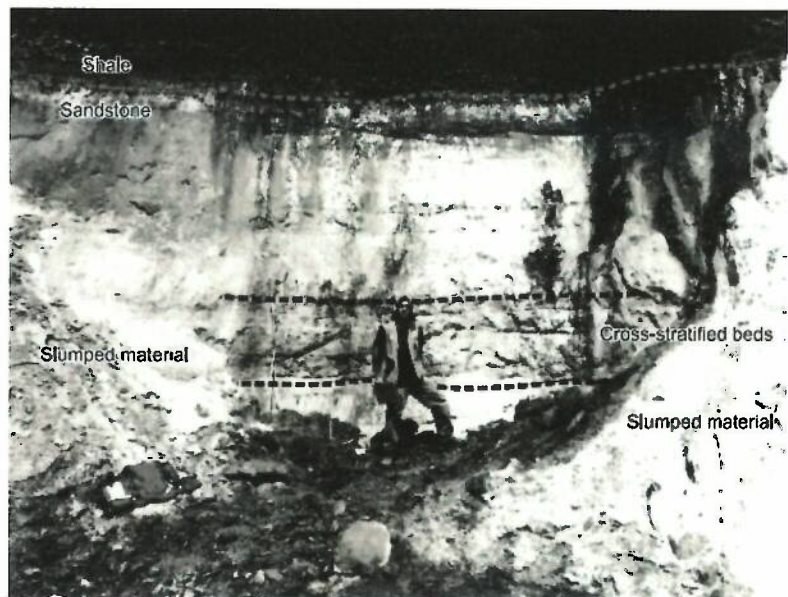


Figure GS-17-2: Section of the Winnipeg Formation in the Black Island quarry. Cross-stratified bed is approximately 1.75 m thick. Slumped sand from the lower unit occurs on either side of the exposure. Sulphide staining is visible below the contact between the lower sandstone and upper shale.

Figure 2 Pyritic shale layer overlying the sand deposit on Black Island

That the same pyritic shale occurs on the mainland overlying the sand deposit to be exploited by CPS is documented in the CPS Technical Report such as in this statement on page 93,

“Scrubbing and acid wash will remove the yellow colour staining from black shale horizons.”

The AECOM EAP states that overburden will be stockpiled and also placed in berms to attenuate noise. This is the classic scenario for acid drainage where waste rock or overburden containing pyrite is stockpiled and

made available to air and rain water that will oxidize and dissolve the pyrite to form sulphuric acid that may run off to nearby water bodies.

A second source of pyrite susceptible to acid drainage is the sand from the deposit. In the preliminary sand analysis documented in the CPS Technical Report, pyrite and marcasite were identified as the main impurities in the sand. A composite sand sample was subject to an acid base accounting test to determine the potential for acid leaching. The NP/AP ratio for the test was less than 1 (0.73) (Table 9 of page 164 of CPS technical Report) indicating there was a potential for acid drainage. (https://pubs.usgs.gov/of/2003/ofr-03-210/Section508/IX_Acid-base_Accounting-508.pdf) Additional testing that was suggested in the CPS Technical Report includes net acid generation (NAG) testing and humidity cell testing.

The pyrite will be removed in the wash plant primarily by attrition scrubbing and concentrated in the wash plant reject material that will be stockpiled for spreading out in the reclamation area. This plant reject material is a second prime source for acid drainage.

A third source is the sand layer with up to 75% pyritic oolite underlying the sand minable deposit. The pyritic oolite will be exposed in the excavation. (pages 9, 37 and 38 of the CPS Technical Report). This pyrite oolite/sand layer will be deep in the pit but is expected to be permeable so susceptible to rapid leaching that may carry acid.

Examples of assessments under CEAA 2012 where mitigation measures were specified for acid rock drainage include the Sisson Mine project 2016, an open pit tungsten and molybdenum mine, (<https://www.ceaa-acee.gc.ca/050/documents/p63169/113759E.pdf>) and the Rainy River Project 2015, an open-pit and underground gold mine (<https://www.ceaa.gc.ca/050/documents/p80007/100886E.pdf>)

Mitigation measures to control acid rock drainage for Rainy River Project include,

- *“Lining the former Clark Creek channel (under the east mine rock stockpile) with non-potentially acid generating material to provide drainage of effluent,*
- *sorting waste rock into non-potentially acid generating and potentially acid generating rock stockpiles through the development and implementation of a detailed mine rock segregation program using provincial criteria for determining potentially acid generating material,*
- *using potentially acid generating material for construction only where saturated conditions can be maintained,*
- *placing an engineered cover over the east mine rock stockpile, and any remaining ore stockpiles, at the decommissioning phase, and*
- *covering the tailings beach with overburden, and the tailings with two metres of water, maintaining the tailings in a perpetually saturated state.”*

An assessment should be carried out to determine similar mitigation measures to prevent acid drainage from the pyritic shale, wash plant rejects and the pyritic oolite of the CPS Project.

4.2 Process Water Discharge

There are reports of overflow from ponds and run off from stockpiles affecting fish habitat in Wisconsin. (<http://www.startribune.com/pollution-worries-abound-in-frac-sand-waste-streams/215335701/>)

The AECOM EAP states,

"No process water will be discharged from the operation."

Contrary to this assertion, potential causes of process water discharge are described below.

4.2.1 Winter Shutdown of Wash Plant

In Wanipigow the sand deposit is below the water table and will not be quarried in winter. A propane heated winter storage plant to hold 250 000 tonnes of wet sand destined for the wash plant from the quarry is described in the CPS Technical Report. No mention of a large heated winter wet sand storage plant is made in the AECOM EAP. However, three large 70 meter high outdoor sand stockpiles are shown in the process flow sheet for the wet plant in appendix A of the AECOM EAP reproduced in **Figure 3**.

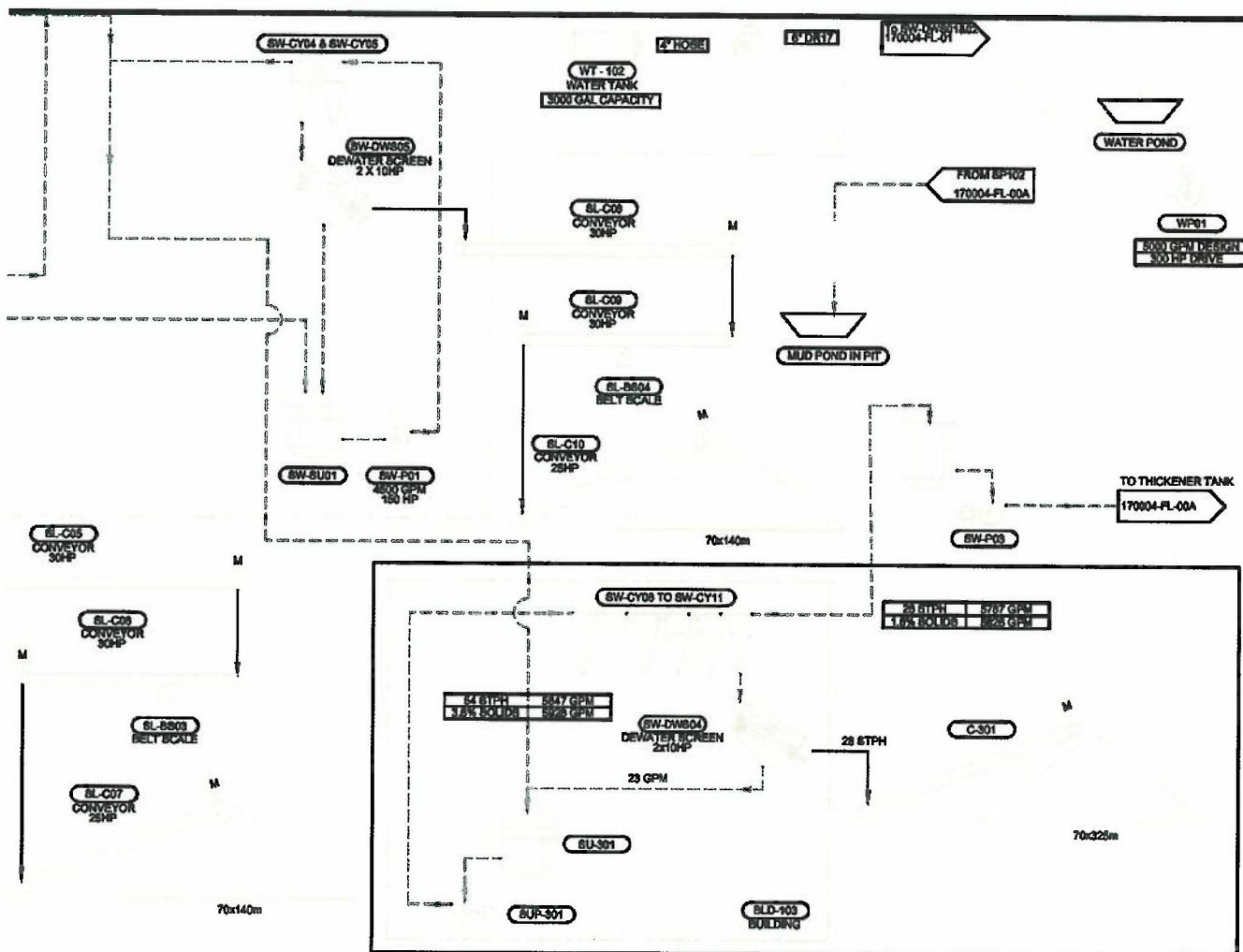


Figure 3 Process flow sheet for wet plant from Appendix A of AECOM EAP showing three sand stockpiles each 70 meters in height with two having a 140 meter base and the third a 325 meter base

Consistent with the practice in Minnesota and Wisconsin to operate the wash plant during the warm months only (<https://superior-ind.com/testimonials/soaring-silica-sand/>), Appendix X of the CPS Technical report states that the wash plant will operate 180 days a year at 80% capacity. The wash plant will likely be drained in the winter to prevent freezing damage to equipment. Winter heating of the wash plant is possible but

costly. The water in the sand slurry in the scrubber, hydrosizers and storage tanks would likely evaporate. The dried sand could solidify and render re-hydration next to impossible unless the sand is kept wet all winter. Corrosion of the tanks would like occur as the water inside would be static and may contain acid from the pyritic acid drainage collected in the active quarry cell sump pit. It would seem that drainage of the wash plant will be necessary.

There is no mention in the AECOM EAP of the disposition of the drained wash plant water or the amount of water required for recharging of the wash plant every spring. Not enough information is supplied in the AECOM EAP to determine the volume of water that would have to be drained from the wet operation to prevent freezing in winter. This water will be to some extent will contain toxic flocculants, acid (from collected pyritic acid drainage) and sediment all of which would be harmful to fish habitat should run off or spring melt water carry the drained water to the creeks, rivers or lake. Since the wash water from the plant is recycled, toxic flocculants and acid will be expected to accumulate and concentrate as time goes on increasing the risk to fish habitat. Evaporation of process water from the settling pond and numerous tanks, hydrosizers and cyclones will further concentrate acid and toxins.

4.2.2 Water Settling Pond

Another potential source of process water discharge into nearby water bodies that can impact fish habitat is from the water settling pond. The location and size of this pond is not given in the AECOM EAP. It is appears as a small tray labelled “*water pond*” in the process flow sheet of the wet plant as shown in **Figure 3**.

Water ponds shown in Figure 1.2 of the CPS Technical Report are reproduced here as **Figure 4**.

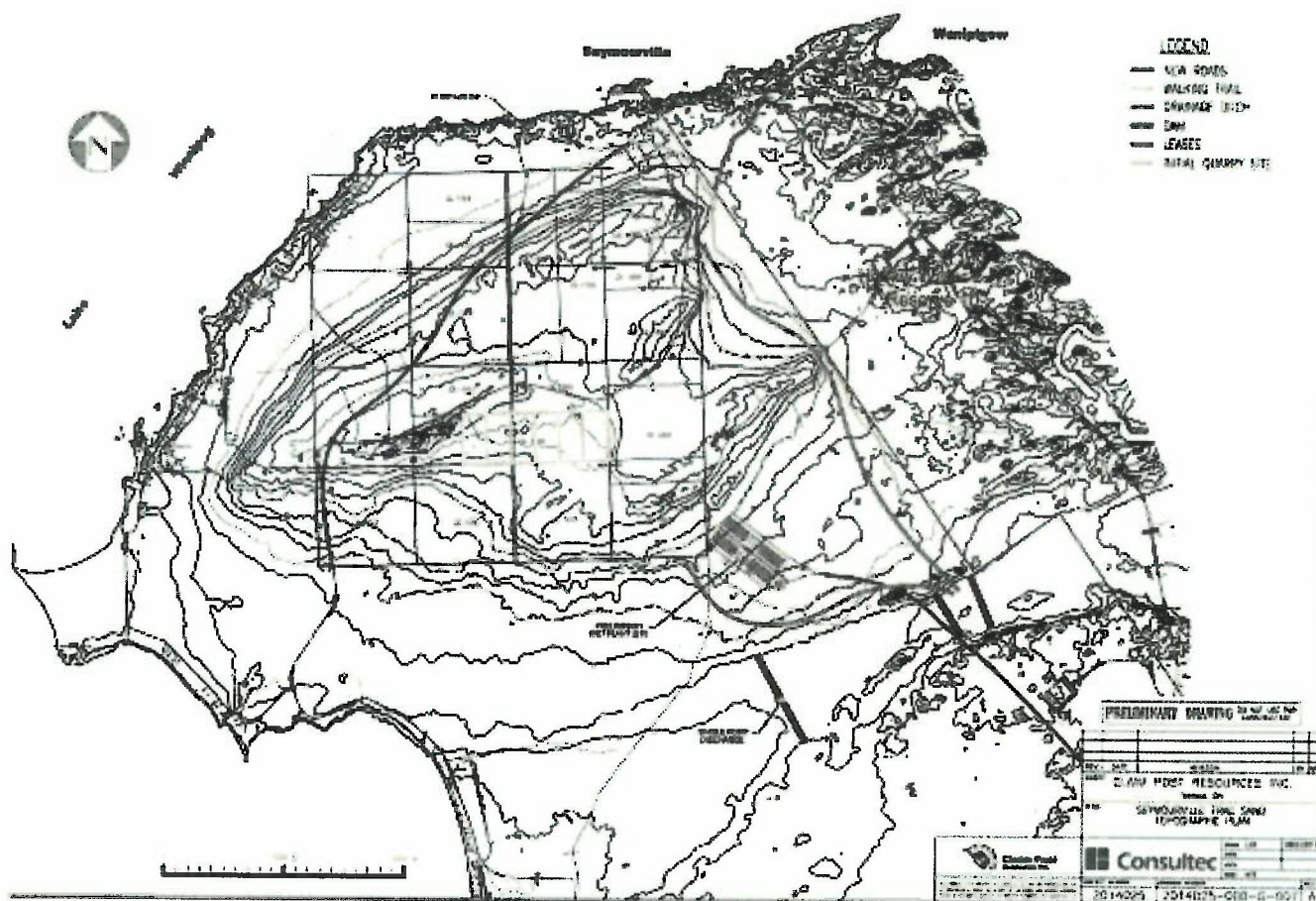


Figure 4 Plant layout showing dams (blue lines) to hold settling pond

The ponds, confined by three dams, are in a swampy area south of the plant buildings. This swampy area is drained by one creek flowing west into the mouth of the Manigotagan River and another creek flowing east to the Wanipigow River as shown in **Figure 1**. The design shown in **Figure 4** may be outdated, however, the swampy area appears to be the only feasible location for the settling pond as other available plant areas are either quarry site or steep down slopes as indicated by the contour lines in **Figure 4**.

The west most dam has a single point discharge presumably for overflow in case of heavy rains or spring melt water. Such discharge would carry plant process water containing sediment and flocculants that would be harmful to fish habitat in the unnamed creeks, Manigotagan mouth, Wanipigow River and in Lake Winnipeg.

Figure 4 shows that acid drainage from the pyrite in the overburden, sand rejects and pyritic oolite in the pit bottom or winter drainage process water would likely flow down slope towards the two creeks and two rivers or to Lake Winnipeg.

On page 386 of the CPS Technical Report the total capacity of the settling pond is given as 6250 m³ with a length of 50 m and a width of 25 m. The pond is to have a clay liner. Access for a backhoe is provided for pond cleanout. The sediment may contain toxic flocculants and sulphuric acid from pyrite acid leaching. These sediments, spread out on the reclamation area, may be a source of contaminated run off.

The pond itself may leak through the bottom containing acid and toxic flocculants into the near by creeks especially if the clay liner has been breached during dredging.

Clearly there is a potential for release of process water from pond spillage and leakage and possible drainage from winter wash plant shut down. Drainage of the released process water to nearby water bodies may affect fish and fish habitat.

4.2.3 Thickener Tank Mud Rejects

Before reaching the settling pond flocculent and reject material goes through a thickener tank. The dimensions of the thickener tank in the CPS technical report page 379/393 is 17 meter diameter and 5 meter in height. The feed rate of wash plant thickener rejects is 55 t/hour (page 384/393) at 20% solids. The underflow is 60% solid with an underflow discharge rate of 58 m³/h with the destination given as wash plant rejects storage (Appendix X of the CPS technical report). The production rate given in appendix X of the CPS Report is 500,000 t/year or half of that for the AECOM EAP. Thickener underflow (mud rejects) rate for a production rate of 1 million tonnes per year will be about 110 t/h with about 44t/h (44 m³/h) process water. Appendix A of the AECOM EAP gives a raw sand feed rate of 600t/h at ~35% water by weight (from input conveyor data - 600 t/h @ > 30% moisture). With a 30% reject portion (page 7 CPS Technical Report) the flow to the thickener tank based on the AECOM EAP sand feed rate of 600 t/h would be about 117 t/h, which is consistent with the rate determined for the CPS Technical Report.

The output from the thickener tank in the thickener area process flow sheet of the AECOM EAP is shown going to a mud pond in pit. The yearly input to the mud pond of twice 58 m³/h for 180 day operation of the wet plant at 80% availability (Appendix X CPS technical report) would be 400 000 m³. A 20 meter deep mud pond in a quarry pit would require an untenably large surface area of 2 hectares every year. The only sensible conclusion is the rejects from the thickener tank are stockpiled with the overburden for later reclamation. This is consistent with CPS Technical Report that states the thickener mud is sent to storage. The process water in thickener rejects carrying toxic flocculants, acid and suspended sediment would be available for run off in to nearby water bodies from rain and snowmelt. Also the pyrite impurity in the sand would be concentrated in the rejects and available for acid drainage.

The EAP dismisses the potential for discharge of process water. As described here, discharge of process water carrying toxins from flocculants, sulphuric acid from pyrite, and suspended sediment, may occur.

4.2.4 Toxins in Flocculants

Appendix B of the AECOM EAP outlines the potential detriment effects of the polyacrylamide (PAM) flocculent. PAM contains low levels of the acrylamide monomer which is a cumulative neurotoxin and a carcinogen (www.who.int/water_sanitation_health/dwq/chemicals/acrylamide.pdf) (<http://www.inchem.org/documents/ehc/ehc/ehc49.htm>). The environmental effects of the diallyldimethylamonium, the monomer in the flocculent poly-DADMAC is not generally known. One report states that there are possible long tem adverse effects in the aquatic environment. Unlike acrylamide that can biodegrade fairly readily, the DADMAC monomer is likely stable. (<https://www.cleartech.ca/ckfinder/userfiles/files/CSN53.pdf>). A report from South Africa states, “Recent work has shown that polyelectrolytes, like poly-DADMAC, can be toxic to aquatic-organisms at levels exceeding 50µg/L” (<https://smjournals.com/public-health-epidemiology/download.php?file=fulltext/...>).

Appendix B of the AECOM EAP states levels of the toxic acrylamide monomer are very low in wash water - in the ppb range - and is likely to be diluted further in a water body in case of a release.

Acid drainage from the pyritic shale in the stockpiled overburden and stored mud from the thickener tank recovered in the sump pit in the active quarry cell will be mixed with process water some of which will evaporate in the settling pond and inside the wet plant. As process water evaporates the acid and toxins from the flocculants will concentrate.

(https://www.amazingrust.com/Experiments/how_to/Concentrating_H2SO4.html)

Process water will continually receive fresh acid from the active cell sump pit and fresh flocculants added to the floccage tank (AT101 appendix A AECOM EAP). As time goes on the acid and flocculent toxins in the process water would concentrate further exacerbating the problem of off site drainage from the thickener mud and leakage and discharge from the settling pond. Therefore the concentrations of toxins from flocculants could be much higher than estimated in Appendix B of the AECOM EAP. The National Inventory of Pollutant Release (NPRI) limit for acrylamide is zero. According to NPRI regulations the release of acrylamide must be measured and reported. (http://publications.gc.ca/collections/collection_2017/eccc/En81-14-2016-eng.pdf)

Clearly there is a potential for release of toxins from the Project to near by water bodies by Project activities that should be further investigated by an assessment under the Manitoba Environment Act.

4.3 Suspended Sediment

The AECOM EAP in Section 6.3 details the following measures to control surface run-off containing suspended sediment. Section 6.3 of the AECOM EAP states,

“6.3 Aquatic Environment

Removal of existing vegetation also poses a risk to the surface water quality as more sediment will be exposed to surface water drainage, potentially resulting in sediment laden runoff water. The following mitigation measures will be implemented to avoid or minimize potential effects on surface water quality:

• Construction of culverts along Project access roads, as required, will assist in directing runoff flow and maintaining natural drainage pathways through low areas such as bogs. • Project Site ditching will contain water runoff from disturbed areas and will direct runoff water to a sump pit in the active quarry cell for use in the sand wash plant for process water. • As per Section 2.5.1, wastewater from washroom, shower and cafeteria facilities will be directed to a septic holding tank, to be pumped out by a licensed local contractor for proper disposal, as a means to prevent potential contamination of local waterbodies with potentially harmful substances. • The fuel depot will be constructed as per regulatory procedures and will include appropriate spill prevention measures to mitigate environmental contamination to surface water in the unlikely event of a spill. With the application of the above described mitigation measures, the impacts on surface water are assessed as minor. 6.3.2 Fish and Fish Habitat Due to the lack of fish habitat within the Project Site and application of an Erosion and Sediment Control Plan as indicated in Section 6.2.2.1, Project related impacts on fish and fish habitats are not anticipated.”

It will be next to impossible to direct all run-off from overburden piles and thickener tank rejects entirely to a sump pit in the active quarry cell as the cell is shifted from year to year requiring rerouting of drains. Routed drainage will likely be compromised by local undulations illustrated in the complex topography of Figure 4. Run-off recovered in a sump and recycled will be subject to further discharge from settling pond overflow and leakage. Discharge of process water from the settling pond carrying suspended sediment will likely

follow the natural drainage into the two unnamed creeks and hence to the Wanipigow and Manigotagan River Mouth.

4.4 Changes to Water Levels in Two Unnamed Creeks

The collection of water in pit sum pumps for use in the Project wash plant as described in section 6.3 of the AECOM EAP will likely affect the water levels in the two unnamed creeks. This unnatural fluctuation in water levels may disrupt fish and fish habitat and potential spawning in the creeks. The potential detriment is unknown without a proper assessment of the fish habitat in the creeks. Similar disruption of fish habitat in a similar BURNCO Aggregate Mine Project 2017 (https://ceaa-acee.gc.ca/050/evaluations/document/121281?culture=en-CA#_Toc079) was assessed by the Canadian Environmental Assessment Agency and mitigation measures were prescribed.

4.5 Migratory Birds and Bird Species at Risk

The Lake Winnipeg East Side Road Project states, (<https://ceaa-acee.gc.ca/050/documents/50022/50022E.pdf>)

“A number of bird species such as the Canada Warbler, Chimney Swift, Common Nighthawk, Rusty Blackbird and the Olive-sided Flycatcher have potential summer breeding ranges along the east side of Lake Winnipeg and are listed in Schedule 1 of the SARA.”

Also migratory bird habitat may be disrupted by potential acid drainage and water level fluctuations from the Project.

Potential detrimental environmental effects to migratory birds and bird species at risk should be assessed as was done in the East Side Road Project.

4.6 Assessment is required to protect Fish and Fish Habitat and Aquatic and Bird Species at Risk

A comprehensive assessment under the Manitoba Environment Act is required to evaluate the potential for and mitigation of acid leaching, suspended sediment discharge, loss of process water containing toxins, and fluctuations in water levels caused by surface water drainage, all of which may adversely affect migratory bird habitat and fish and fish habitat including that of aquatic species at risk.

5. Changes in the Environment affecting Hunting, Fishing and Trapping on the Traditional Lands of the Aboriginal People of the Hollow Water Area

5.1 Hunting and Fishing

The AECO EAP makes the following statements about hunting and fishing.

“4.6.4.4 Fishing

No Project component or activities occur in or immediately adjacent to fish-bearing waterbodies and no Project effects to fish-bearing waterbodies, including Lake Winnipeg are anticipated (Section 6.3). Therefore, the potential socioeconomic effects of the Project on fishing will not be assessed in this document.

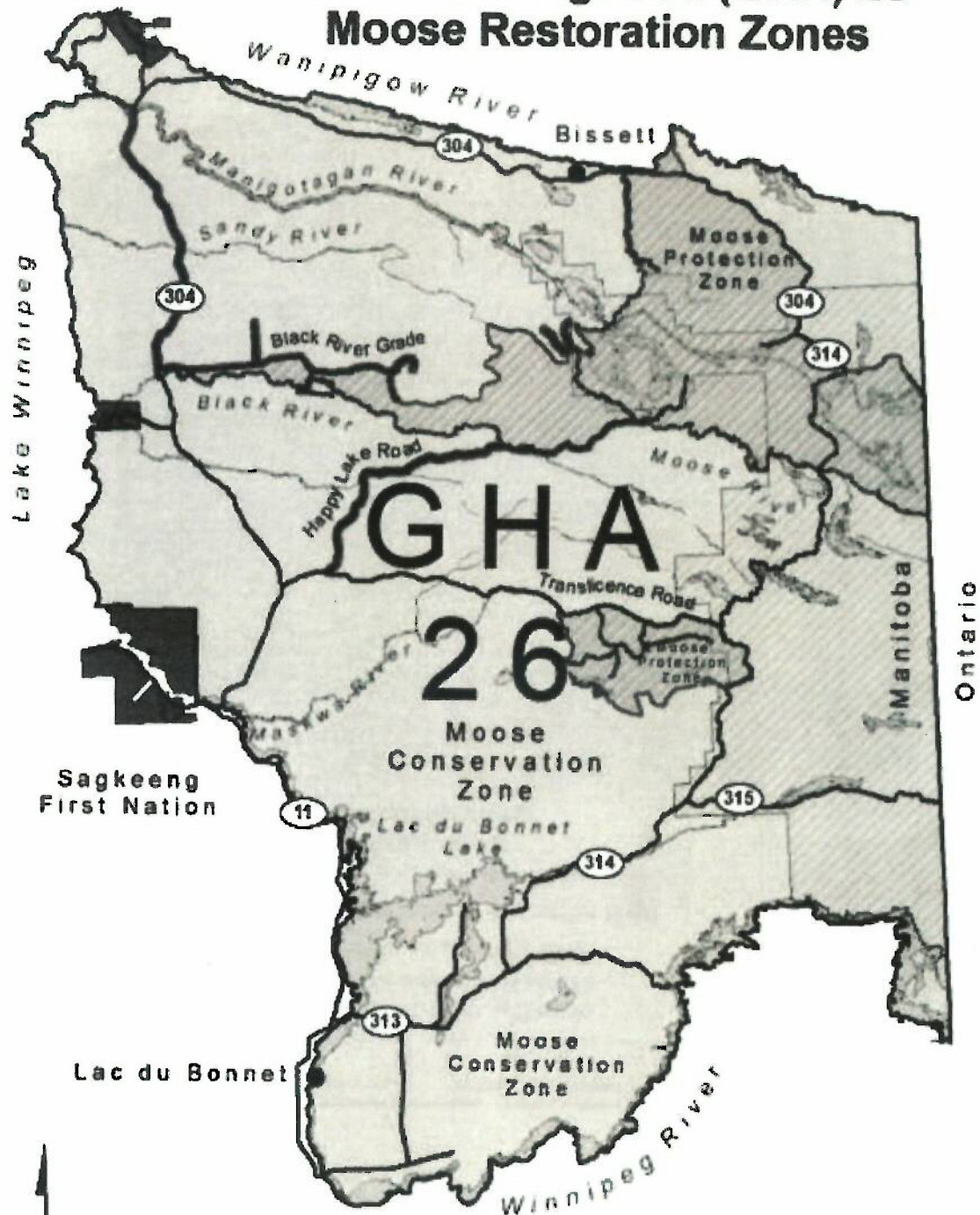
4.6.4.2 Hunting

Moose The Local Project Area falls within GHA 26, Moose Conservation Zone, where licenced moose hunting is prohibited (Province of Manitoba n.d.). Considering moose hunting is not currently conducted in the Local Project Area, the potential socioeconomic effects of the Project on moose hunting will not be assessed in this document. ”

Adverse effects to fish and fish habitat in the areas adjacent to the Project are described in the previous sections. The traditional fishing activity of the aboriginal people would be adversely affected due this detriment to the fish and fish habitat. Examples of mitigation measures that would apply to the pyritic shale in the overburden are given above.

Moose hunting including for indigenous people is prohibited only in moose protection zones and not in the entire area GHA 26 around Wanipigow as shown in **Figure 5** . (<http://www.sagkeeng.ca/wp-content/uploads/2018/11/Moose-Restoration-Zones.pdf>)

Game Hunting Area (GHA) 26 Moose Restoration Zones



0 2.5 5 10 15 20
Kilometres

-  Moose Protection Zone - All Moose Hunting Prohibited
-  Moose Conservation Zone - Licenced Moose Hunting Prohibited
-  Nopiming Provincial Park

Figure 5 Moose Hunting Zones near Wanipigow

According to the Manitoba Wildlife Branch all licensed moose hunting seasons have been suspended in GHA 26 but Rights based hunting can continue subject to harvest restrictions.

(https://www.gov.mb.ca/sd/wildlife/moose_initiative.html)

The moose population is already at risk in GHA 26 traversed by highway 304. Increased moose road kills will further endanger the population and adversely affect hunting of the nearby aboriginal people.

(<https://winnipeg.ctvnews.ca/we-really-are-grateful-manitoba-family-survives-moose-crash-mpi-warns-of-wildlife-collisions-1.4154766A>) (<https://www.cbc.ca/news/canada/manitoba/deer-crash-mpi-eastman-1.4371893>). A mitigation measure would be to use barge transport to the west shore of Lake Winnipeg and transfer to the Lakeline Railway. (<https://www.producer.com/daily/new-shortline-railway-opens-in-manitobas-interlake-region/>)

5.2 Trapping

Section 3.1.3 of Appendix G1 of the AECOM EAP states

“The area within the CPS quarry lease boundaries is an area that is used by community members for snaring rabbits. Traps have been set up for marten, mink, lynx and occasionally for wolf, coyote and fox. Traps are typically set adjacent to roads and trails”

Appendix I of the AECOM EAP states,

“Based on field observations, as well as anecdotal evidence associated with Traditional Ecological Knowledge (TEK) discussions with local elders conducted by the client, it is apparent that the project area has been historically utilized for multiple natural resources (blueberry picking and grouse hunting areas, trapping lines, and logging activities were noted in particular), however permanent occupations are concentrated closer to significant water sources (Lake Winnipeg, and the Wanipigow and Manigotagan Rivers), all of which lie well outside the project area”

There appears to be no discussion of mitigation of the effects of the Project on the trapping in the area.

Figure 6 shows the registered traplines in the Wanipigow area. The Hollow water Seymourville Community Trapline will be adversely affected by the Project. This disruption in itself should trigger an assessment.

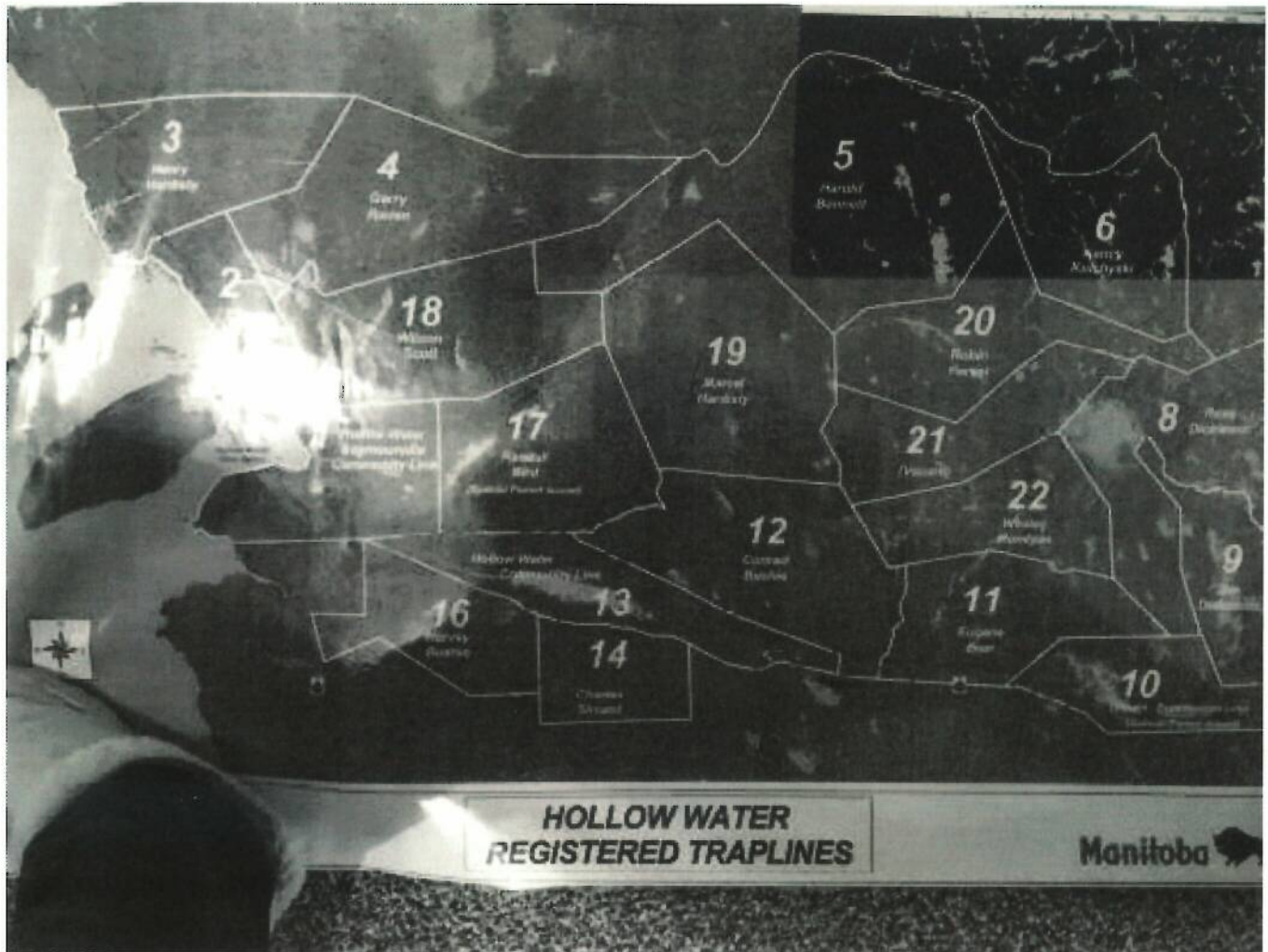


Figure 6 Registered traplines in the Wanipigow area

6. Changes in the Environment affecting to the Socio-economic Conditions for Hollow Water

Section 2.8 of the AECOM EAP states,

“There will be no worker camp on-site.”

Accommodation and meals for the up to 50 truck drivers coming off shift and having mandatory rest periods is not mentioned in the AECOM EAP. There may well be a camp like mentality associated with these transient workers.

The daily influx of workers resident in outside communities such as Pine Falls will increase the traffic risk on the roads and may strain the local character of the community. Outside workers could benefit from cultural sensitivity training as mandated by an assessment.

7. Changes to the Environment affecting the Cultural Heritage of the Aboriginal People of Brokenhead

Sand haul trucks will travel along highway 59 through the Brokenhead reserve. This could impede traffic to the casino and endanger casino patrons due to increased risk of traffic accident thereby negatively impacting the business. The casino business in Brokenhead was developed in part due recognition of the aboriginal gaming cultural heritage. (http://publications.gc.ca/collections/collection_2016/bcp-pco/Z1-1991-1-41-58-eng.pdf)

8. Changes to the Environment affecting the Health of Aboriginal People of the Hollow Water Area, Nearby Residents and Workers

Project detriment to the health of aboriginal people of Hollow Water, nearby residents and workers includes exposure to silica dust, injury and death from increased traffic, and exposure to toxins in the drinking water.

8.1 Silica Dust exposure PM10 and PM2.5

One of the major concerns in a silica sand operation is exposure to respirable silica dust, namely particles less than 10 microns in diameter. Inhalation of these small silica particles is associated with the development of silicosis and cancer. (https://earthworks.org/issues/frac_sand_health_and_environmental_impacts/)

In Appendix E of the AECOM EAP, air dispersion modelling to determine the Project risk of exposure to respirable silica dust, is described. The model dust sources for particles less than 2.5 microns and 10 microns (PM2.5 and PM10) are 13 stacks from haul trucks, dozers loaders and dump trucks, the dryer, and two bag houses, four sand silos, overburden and overburden embankment as given in Tables 10, 11 and 12 in appendix E.

Predicted model results for PM2.5 and PM10 at sensitive receptors of Aghaming, Semourville, Manigotagan, Wanipigow and the nearest residence were between 2 times and 5 times recommend limits (MAAQC), as shown in Table 14 and Table 15 of Appendix E. The predicted maximum airborne respirable silica dust for a 24 hour averaging period was within the facility boundary, adjacent to operations. Astonishingly no mention is made in the AECOM EAP of respiratory protection for workers onsite or for mitigation measures for silica dust exceedances in the nearby communities. Some of the adversely affected residents and workers will be aboriginal peoples from the nearby settlements.

The onsite disposal of dust from the two bag houses and from the dry plant dust collection system routed to a 500 ton rejects bin is not included in the model source. The rejects bin is shown in Figure 7 taken from an excerpt from the process flow sheet of the storage and loading area of appendix A of the AECOM EAP. Output from the 500 ton rejects bin is shown to be split with some loaded on a truck and some routed off page. The off page route is likely onsite disposal as is the practice in silica mines in Wisconsin (<https://dnr.wi.gov/topic/Mines/documents/SilicaSandMiningFinal.pdf>). Onsite disposal of dust in the 500 ton reject bin may create large amounts of airborne respirable PM2.5 and PM10 that would be a hazard to workers and surrounding communities. The destination of trucks loaded with respirable silica dust is not described. Unloading of the trucks may involve a risk of exposure to silica dust.

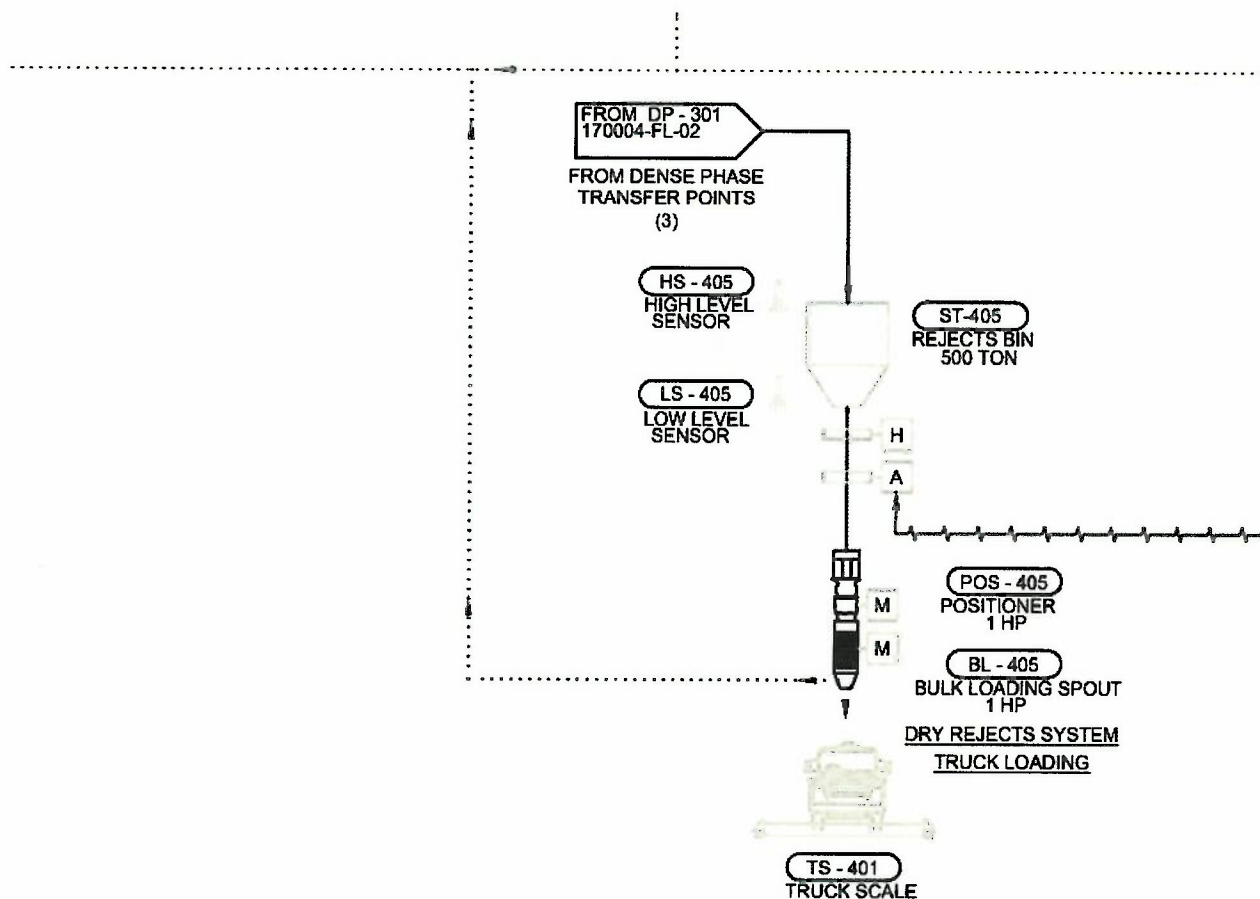


Figure 7 Dust Collection from two Bag Houses and all Dry Plant Building

National Institute of Occupational Safety and Health (NIOSH) researchers identified at least 7 major sources of fugitive silica dust release in silica sand operations: – Thief hatches on top of sand movers – Uncapped side fill ports – Vehicular traffic – Transfer belt under sand movers – Sand dropping or mixing in belt or blender area – Transfer belts from sand movers to blenders – End of sand mover conveyor belt.
http://www.ucdenver.edu/academics/colleges/PublicHealth/research/centers/CHWE/Events/Documents/Plenary_June22_BAlexander_State_of_the_Science_2017.pdf

Of particular importance is the thief hatches as shown in **Figure 8**.
<http://elcosh.org/document/3780/d001293/worker-exposure-to-silica-during-hydraulic-fracturing.html>



Figure 8 Worker exposure to dust from thief hatches

NIOSH researchers found that new technology reduces the amount of airborne respirable crystalline silica around sand movers by 79 to 99 percent (<https://synergist.aiha.org/201601-mini-baghouse-dust-controls>). Of the NIOSH named sources only dust from vehicles is included in the AECOM modelling.

A third major source of silica dust excluded from the modelling is wind blow dust from three 70 meter high sand stockpiles on site as shown in **Figure 3** which is an excerpt from the process flow sheet of the wet plant given in appendix A of the AECOM EAP (<http://www.mfe.govt.nz/sites/default/files/media/Air/good-practice-guide-dust-2016.pdf>).

An example of silica dust blowing from stockpiled frac sand is illustrated in **Figure 9** (<https://www.uwec.edu/academics/college-arts-sciences/departments-programs/watershed-institute/explore-opportunities/sand-mining-research/resources/photo-gallery/>)

It should also be mentioned that the safe angle of repose has not been considered for the stockpiles. The two stockpiles having a base of 140 meters would have a slope angle of 45° which is above the angle of repose for dry sand of 34° (https://en.wikipedia.org/wiki/Angle_of_repose). Sand slide may endanger workers (https://www.hsa.ie/eng/Your_Industry/Quarrying/Stockpiles_Tips_and_Lagoons/Management_of_Tips_and_Stockpiles/). This is another example of the lack of due diligence and planning by the proponent pertaining to worker safety and human health.



Figure 9 Silica dust blowing from stockpiled sand in Bloomer Wisconsin

Another source of silica dust would be from the outdoor vibrating feeder and sand crusher shown in the primary wet thickener area process flow sheet of Appendix A of the AECOM EAP. Dust control measures are available for crushers but no mention of the application of such measures is made in the AECOM EAP. Dust from the sand crusher shown in the AECOM primary wet thickener area process flow sheet is not included in the airborne dust dispersion modelling. (<https://www.tortenda.it/tag/8977/mobile-crushing-system-silica-sand.html>)

Failure to include fugitive dust from the dry plant dust collection system, dust from the outdoor sand crusher, dust from the onsite disposal from the 500 ton rejects bin, and windblown dust from the 70 meter high stockpiles in the air dispersion modelling is a serious omission. If these sources were taken into account the respirable dust levels on site and in the nearby communities would be higher and certainly unacceptable. Health detriment from silicosis will almost certainly result for workers and residents and is sufficient reason for the project not to proceed without independent environmental assessment that would mandate adequate mitigation measures. Such measures include better filtration of stacks, wetting of dust disposal activities and construction of sand storage buildings. In the CPS Technical Report describes a storage building of 250,000 tonne capacity (Section 17.4) but no mention is made of sand storage buildings in the AECOM EAP.

Respiratory protection for workers is not mentioned in the AECOM EAP. Real time PM10 and PM2.5 monitors to measure silica dust exposure are not mentioned in the EAP. At an information session in Manitowishago on December 5, 2018 in response to a question, CPS representatives stated that outdoor monitoring of silica dust would be performed and if levels were above allowed limits the plant would be shut down to protect the public. No mention of such safeguards is made in the AECOM EAP.

The seriousness of the threat of exposure to silica dust to workers and nearby residents cannot be overemphasized and certainly must not be neglected or dismissed without reason. An independent

assessment is required to evaluate the risk of exposure to silica dust and to mandate monitoring and control measures.

8.2 Drinking Water

Discharges of process water and run off from sand rejected material would contain some level of toxic flocculants. One of the flocculants polyacrylamide will likely have residual amounts of acrylamide monomer from manufacturing. The monomer can be generated from shear forces in the plant flocculent tanks and from attrition scrubbing, or can be formed from photo oxidation and biodegradation outdoors. The acrylamide monomer is a cumulative neurotoxin and a carcinogen.

(www.who.int/water_sanitation_health/dwq/chemicals/acrylamide.pdf)

Acrylamide must be reported under the National Pollutant Release Inventory (NPRI) regulations for a pit or quarry producing more than 500,000 tonnes per year (<https://www.canada.ca/en/environment-climate-change/services/national-pollutant-release-inventory/report/pits-quarries-guide.html>). As mentioned previously, the NPRI acrylamide release limit is zero.

(http://publications.gc.ca/collections/collection_2017/eccc/En81-14-2016-eng.pdf). This means that acrylamide release must be measured and prevented.

The drinking water of the Aghaming aboriginal settlement takes its drinking water from the Wanipigow River downstream of the creek draining eastward from the plant settling pond as shown in **Figures 4 and 5** (https://www.gov.mb.ca/inr/publications/community_profiles/pubs/aghaming-2016.pdf). The health of these aboriginal people may be adversely affected by the toxic discharge from the Project.

8.3 Traffic affecting the Health of Aboriginal People and the General Public

The large increase in traffic from sand haul trucks, propane tanker trucks, diesel fuel tanker trucks, water trucks and employee vehicles will lead to increased injury and death.

8.3.1 Haul Trucks

In section 2.4 the AECOM EAP states 3 to 4 trucks per hour will carry sand from the Plant 7 days a week. The hand out given at the community meeting in Manigotagan on Dec. 5 states 3 to 5 trucks an hour will transport sand. In the CPS Technical Report 54 truck loads per day are specified in Table 19.4 for 500,000 tonnes per year of production. For the 1, 000,000 tonnes specified in the AECOM EAP 108 trucks per day would be required or 4.5 per hour. It appears that ~5 trucks per hour is the most likely scenario.

8.3.2 Water Trucks

Water tanker trucks required to replenish process water losses primarily from evaporation in the sand dryer will add to the truck traffic. In the AECOM EAP the water loss is estimated at 45 m³ per hour. The EAP states

“Water for the processing of silica sand will be sustainably sourced from a combination of groundwater, water from seepage within the annual open quarry pit, and supplemental water (as required) that will be trucked to the Project site from a licenced source. Hydrogeological testing will be conducted in January, 2018 to confirm the sustainability of the local groundwater supply.”

The hydraulic conductivity of the sand deposit is given in the CPS Technical Report as 1.37×10^{-6} m/s (section 2.2.3 page 165). The sand deposit thickness is up to 20 m (page 2 of the CPS Technical Report). The maximum transmissivity of the deposit given by the product of hydraulic conductivity and thickness is 27.4×10^{-6} m²/s or 2.37 m²/day. If the transmissivity < 5 m²/day the potential for water extraction is negligible (<https://www.sciencedirect.com/topics/earth-and-planetary-sciences/transmissivity>). This means the majority of make up water must come from water trucks. The capacity of a tanker truck is 34,447 litres (<https://sciencing.com/capacity-tanker-truck-7505350.html>). The number of trucks per day required to supply 45 m³ per hour of make up water assuming 24 hour operation is 31. There will be at least one water truck per hour required (assuming less than 22% of make up water comes from onsite).

To replenish the water lost from the thickener tank mud and evaporation from the settling pond and elsewhere and leakage from the setting pond and elsewhere would require at least another water truck per hour as calculated above. In total there would be at least two water trucks per hour.

Every spring the wash plant will likely be recharged with water. The volume of water required for the wash plant is not given in the AECOM EPA. In the CPS Technical Report some information is given. An estimate of the water required to recharge the wash plant in the spring based on available data is given in Table 1

Table 1 Available information of water volume required to recharge wash plant

Tank	Water volume in m ³	Source of information
Slurry feed tank	2108	CPS
Process water tank	700	CPS
Hydrosizer 1 and 2	~1100	AECOM (based on incomplete data)
Hydrosizer 3	~1357	AECOM (based on incomplete data)
Thickener tank	907	CPS
Sump tank SU203	22.7	
Sump tank SU204	26.5	
Flocage Tank AT101	?	AECOM
Mix Tank101	?	AECOM
Water Tank101	?	AECOM
Many other unquantified tanks		AECOM
Total from available data	6221	
Total number of water trucks	181 (large underestimate)	much information missing

The number of water trucks required will be well in excess of 181 as much of the information on water storage in the wash plant was unavailable.

The route of the water trucks is unknown but this truck traffic will add to the risk of death and injury..

8.3.3 Employee Traffic

Section 2.8 of the AECOM EAP states,

“Employees required for Project construction and operation will be housed in their current homes, or additional housing may be provided by CPS in local communities while CPS is supporting the development of permanent affordable housing for Project employees in the local area. If transportation of local employees

to the Project site is deemed to be necessary, bus service will be provided to transport local community workers to and from the Project Site, during all Project phases, as required."

The nearest communities outside of the Wanipigow area would be Bissett, Black River, Powerviw-Pine Falls, Sagkeeng, and St. Georges. Bus or employee vehicles from these communities would increase the traffic on highway 304 and increase the risk of accident and death.

8.3.4 Tanker Traffic

Tanker traffic carrying propane and diesel fuel to the Project will increase the risk of accident. This traffic and resulting accident risk has not been mentioned or quantified in the AECOM EAP. Diesel fuel trucks will also be required at the rail loading terminal on Redonda Street via Gunn Road.

Five sand haul trucks an hour on highways 304, 59, perimeter highway, Gunn Road and Redonda Street is one truck every 12 minutes. On the highways approaching vehicles will encounter an oncoming truck about every 6 minutes and be required to pass trucks into this oncoming traffic. Near the Plant an extra two water trucks an hour are to be encountered depending on the route of the water trucks. Vehicles may see an oncoming haul truck or water truck almost every four minutes. They will also encounter propane trucks and diesel fuel trucks and perhaps an employee bus. There will certainly be congestion and delay at choke points especially at the junction of the Manigotagan and highway 304 and at other intersections.

8.3.5 Fatality and Injury Risk from Truck Traffic

The increased injury and death from this volume of traffic particularly on the two lane road portions is difficult to predict but will not be inconsequential. Of particular concern is the conflict with beach traffic on highway 59 on weekends in the summer. Highway 304 is heavily travelled by the aboriginal people of the Hollow Water Area and of the Black River First Nation. Certainly there will be increased injury and death to aboriginal people as well as other nearby residents and the general public.

It is difficult to predict the increase in injury and death from the increase in truck traffic due to the Project. One statistic used is the injury and fatalities per 100 million vehicle travel miles (VTM). The statistics are dependent on traffic volume and road conditions and rise sharply as the traffic increases and road conditions worsen. Perhaps the most applicable rates are from oil truck traffic in North Dakota. The injury and fatality rates are higher in the counties with a high volume of oil truck traffic (<https://www.ugpti.org/resources/reports/downloads/dp-253.pdf>).

In 2011 there were 22.1 injury crashes and 1.77 fatalities per 100,000,000 VMT in the oil counties of North Dakota, almost twice as many as in other parts of the state (11.7 injury crashes and 0.93 fatalities per 100,000,000 VMT). The fatalities in the central core region of the oil zone was higher still at almost 5.5 per 100,000,000 VMT. Of the 15 western North Dakota oil counties studied, the mean number of trucks on the road each day is 61. This is much less than the 108 trucks haul per day determined in the CPS Technical Report 2014, not including water trucks, propane trucks, fuel trucks and employee busses and not including future potential increases in the sand production rate. The doubling production discussed in the CPS Technical Report would increase the truck traffic per day to over 216. Based on 108 trucks per day, two trips per day, at 185 km per trip and the North Dakota oil truck statistics for 2011, there will be 2 injury crashes and 0.16 fatalities for the haul trucks from the Project per year. Using the four core oil county statistics, there will be 0.5 fatalities from the Project haul trucks per year or 1 fatality every two years. If production doubles the fatalities could be one every year or more. The rates will be higher if all Project traffic is considered.

8.3.6 Traffic Mitigation Measures

A mitigation measure would be to barge the sand to a terminal on the west shore of Lake Winnipeg for loading on the Lakeline Railway. Peter Brook of Lakeline Railway has been contacted and has verified that this would be feasible. (phone 204 8784530).

Section 6.0 of the CPS Technical Report describes the mining of silica sand on Black Island from 1928 to 2003. The sand was barged from Black Island to Selkirk (Section 23 on page 121). Barging and rail are proven and much cheaper and safer forms of transportation than trucking. For instance studies have shown a barge can move one ton of cargo 647 miles, rail, 477 miles and truck 145 miles on a gallon of diesel fuel. (<https://www.maritime-executive.com/article/barge-transport-wins-on-fuel-efficiency>) A barge is about 4.5 times more fuel efficient than truck and much safer in terms of public risk.

A National Waterways Foundation study found for each member of the public injured in a barge accident, 125.2 are injured in rail accidents and 2171.5 are injured in truck accidents. For fatalities, the rates are 155 trucking fatalities and 22.7 rail fatalities for every barge related fatality. (<http://thecyberdaily.com/2015/12/barge-versus-railroad-comparison/>)

The barge to rail option would require stockpiling of finished sand at a rail loading terminal on the west shore of Lake Winnipeg. Stockpiling of sand on the Project site has been planned (**Figure 3**). There should be no impediment to similar stockpiling on the west shore. Building of a truck to rail loading facility on Redonda Street in Winnipeg is planned as described in Section 2.4 of the AECOM EAP. Substituting a barge to rail loading facility on the west shore of Lake Winnipeg should be feasible.

At the information session in Manigotagan on Dec.5, 2018, when asked about the barge option, the company representatives expressed resistance.

In the BURNCO Lake Project assessment road, rail and barge options were considered for the transport of sand and aggregate. Barge was identified as the best option (https://ceaa-acee.gc.ca/050/evaluations/document/121281?culture=en-CA#_Toc079).

The barge to rail option will save lives, prevent injury and be much less expensive but will only occur if mandated as a mitigation measure by an independent assessment.

9. Changes to the Environment affecting the Health of Aboriginal People of Brokenhead and Black River

The increased truck traffic from the Project on highway 59 through the Brokenhead Reserve will increase the risk of injury and death to residents including school children and to casino patrons and workers. The residents of the Black River First Nation will be exposed to a much higher risk of accident and death on highway 304 due to Project truck traffic.

10. Greenhouse Gas Effects

The Greenhouse gas (GHG) foot print of the Project is discussed in section 6.5.3 of AECOM EAP. Climate change caused by increase in GHG is an existential threat to the environment and all life on earth. The primary market for the sand from the Project is hydraulic fracturing of oil and gas wells. The burning of the hydrocarbons from such wells is primarily responsible for the global increase in GHG causing detrimental

climate change. The Project plan is to continue this detrimental activity for 54 years. There is no consideration for a decrease in supply consistent with the climate change mitigation measures of the Paris agreement that are generally accepted globally as necessary. The detriment attributed to the global environment due to the frac sand from the Project is difficult to evaluate but is certainly not insignificant. To base the economic viability of the Project on 54 years of sustained or even increasing production seems irresponsible and risky. The Project might not be viable if the effect of long term decrease in market demand due to global climate mitigation measures were taken into account. The typical mentality of the fossil fuel industry is to continue to invest in infrastructure based on continuing and even increasing predicted global demand for fossil fuels despite proposed global GHG climate change mitigation.
(https://www.parklandinstitute.ca/boom_bust_and_consolidation)

In Section 6.5.3 of the AECOM EAP the GHG footprint of the Project is quantified and deemed to be insignificant. Many components of the footprint have been omitted including emissions from the water trucks, propane supply trucks, diesel fuel supply trucks, employee commuter traffic, and propane building heating. Evidence given here will demonstrate that the emissions from the propane rotary sand dryer are substantially more than given in Table 6-4.

The EPA CO₂ emission factor for an oil fired rotary dryer sand dryer 13 kg/Mg. The emissions of CO₂ per million BTU for propane is 139 pounds and for heating oil, 161.3. Using a propane correction factor of 139/161.3, the CO₂ emission factor for propane fired sand dryer is 11.2 kg/Mg
(<https://www3.epa.gov/ttnchie1/ap42/ch11/bgdocs/b11s19-1.pdf>
<https://www.eia.gov/tools/faqs/faq.php?id=73&t=11>).

For a sand production of one million tonnes per year the CO₂ emissions from a propane fired sand dryer, using the EPA emission factor, is 11 200 tonnes per year rather than 230 tonnes per year given in Table 6-4. At 34,447 litres per tanker truck and a propane density of 0.493 kg/L, 659 tanker trucks per year would be required to supply the rotary drier or almost 2 tanker trucks a day.

This can be substantiated by an estimation using the latent heat of vaporization of water of 2.256 MJ/kg, the energy content propane of 25.3 MJ/L and the emission factor of propane of 1.515 kg/L. The initial water content of the sand for the dryer is about 5% (Section 2.3.2 AECOM EAP) and the final about 0.5%
(<http://www.ventilex.com/frac-sand-dryer/>).

To vaporize 45000 tonnes of water in one million tonnes of sand by propane heating at 100% efficiency would emit 6,000 tonnes of CO₂. Considering heat loss and heat absorbed by sand in addition to the heat required to vaporize the water the 11 200 tonnes per year of CO₂ obtained from the EPA emission factor appears to be reasonable.

(data.ec.gc.ca/data/substances/monitor/national...emission.../Emission_Factors.docx)

(https://www.toolkit.bc.ca/sites/default/files/2014_best_practices_methodology_for_quantifying_greenhouse_gas_emissions%20%281%29.pdf)

This can be substantiated further by internet sources pertaining to sand drying (<http://www.concrete-sprayingmachine.com/sale-10416941-low-fuel-consumption-sand-dryer-machine-rotating-drum-dryer-with-burner-natural-gas.html> and http://www.palmermachinery.com/sand_dryers/index.htm).

Using 11 200 tonnes CO₂e per year for the propane dryer the total emissions from Table 6-4 should be corrected to 37 496 tonnes per year. This does not include emissions from water, propane and diesel fuel tanker trucks or employee commuter vehicles.

Furthermore the onsite quarry equipment requirements listed in Table 6-4 of the AECOM EAP are less than those listed in Table 16.3 of the CPS Technical report reproduced in Figure 10.

TABLE 16.3 QUARRY EQUIPMENT FLEET																		
YEARS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Dozer (Sand) Fleet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Dozer (OB+reclam) Fleet	1	1	1	2	2	2	3	3	4	4	4	3	2	2	2	2	2	1
Backhoe (Sand) Fleet	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
ADT (25t)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Dozer D6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4x4 Pickups	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Fuel/Mtce/ Hiab Trucks	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Grader	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Figure 10 Quarry Equipment Requirements from CPS Technical Report 2014 for 500,000 tonne production

This can be compared to Table 6-4 of the AECOM EAP shown in Figure 11

Table 6-4: Greenhouse Gas Annual Emissions (CO₂e)

Equipment	Equipment Count*	CO ₂ (tonnes/year)	CH ₄ (tonnes/year)	N ₂ O (tonnes/year)	CO ₂ e (tonnes/year)
Dozer	1	586	0.057	0.026	596
Loader	1	46	0.0045	0.00204	46.7
Dump Truck	2	221	0.0215	0.00980	225
Rotary Dryer	1	230	0.28	0.67	436
Haul Trucks	54	24,835	2	1	25,223
Total per Annum					26,526

*Equipment operating at any one time.

Figure 11 AECOM EAP Greenhouse Gas Emissions

If the onsite emissions for the full complement of quarry equipment listed in the CPS technical report were included together with emissions from water, propane and diesel fuel tanker trucks and employee commuter vehicles the total emissions would be expected to approach 40kt per year.

Although not large compared to the 2017 total emissions for Manitoba of 20.9 Mt, the Project emissions are still very high in comparison other emitters. The emissions from the Project are approaching the 50kt designation for large final emitters (LFE) for Manitoba. In 2016 there were only nine LFE (<https://climatechangeconnection.org/emissions/manitoba-ghg-emissions/manitoba-large-final-emitters-lfe/>).

A common excuse by any GHG emitter is that their emissions are a small fraction of national or global emissions and therefore do not require reduction. According to this logic no GHG reduction would ever be implemented. This logic should not be accepted by any responsible government.

The 2017 and 2018 GHG reporting requirements issued by Environment and Climate Change Canada under its GHG Reporting Program apply to any facility with annual GHG emissions exceeding 10 kilotonnes (in CO₂ equivalent) (<https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting/reporting/questions-answers.html>). Consequently emissions for this Project are not inconsequential and must be accurately determined for all sources and reported.

A very large mitigation of emissions could be obtained by the barge to rail option discussed above. There seems to be no credible reason why this option should not be implemented.

11. Cumulative Effects

There have been activities associated with mining in the Bissett region (<https://www.gov.mb.ca/sd/eal/registries/2435-40sangold/report-text.pdf>, https://www.gov.mb.ca/sd/eal/registries/2435-40sangold/sangold.summ_2628rr_jw.pdf) and the Lake Winnipeg East Side Road Project that may be a source of cumulative effects. Road crossings and mine tailings on the Wanipigow River watershed may be a source of suspended sediment that could contribute to suspended sediment from the Project (<https://ceaa-acee.gc.ca/050/documents/50022/50022E.pdf>). There are likely to be proposals for other such activities such as mining and logging within the Manigotagan and Wanipigow watersheds that could be a source of cumulative effects in the future.

12. Conclusion

An independent assessment is required for the Project based on the following;

1. The Project production capacity can be expected to increase to well above one million tonnes per year for full exploitation of the estimated 372 million tonne sand resource. The traffic hazard and emissions of silica dust, suspended sediment, toxic flocculants and acid drainage would increase as production increases
2. The Project may cause a detrimental change to fish and fish habitat, species at risk and migratory birds from the release of toxic flocculent chemicals including acrylamide from wash plant water, acid from acid drainage of pyrite in overburden shale and sand rejects and sediment from run off from overburden and mud reject stockpiles and the settling pond and fluctuations in creek water levels.
3. The Project may detrimentally affect the health of the nearby residents and aboriginal people from exposure to respirable silica dust released from the Project.
4. The Project may detrimentally affect the health of the settlement of Aghaming through release of toxic flocculant chemicals and acid to the drinking water.
5. The Project may detrimentally affect the health of the aboriginal people of Hollow Water Area, Brokenhead First Nation and Black River First Nation and the general public from road accidents due to the increased traffic caused by the Project.
6. The Project may detrimentally affect the current use of lands and resources of the aboriginal people of Hollow Water Area for traditional hunting and fishing.
7. The Project may detrimentally affect the economic conditions of the aboriginal people of Brokenhead through disruption of the casino business due to the increase in Project truck traffic on highway 304.
8. The Project may detrimentally affect the socio-economic conditions of the aboriginal people of Hollow Water Area from the influx of offsite employees and truck drivers.
9. The Project may detrimentally change the all components of the environment due to the effects of climate change associated with the Project.

It is difficult to conceive of a Project that may cause more detrimental changes to the environment. Without an independent assessment many detrimental changes to the environment will not be mitigated. The health and the lives of nearby aboriginal people and the public are also at risk from the Project. If an assessment is not done for this Project, a precedent will be set for circumventing an assessment for any future Project.

**Additional Comments on the use of Traditional Ecological Knowledge in
Public Registry File: 5991.00**

**Canadian Premium Sand- Wanipigow Sand Extraction Project
by M.J. McCarron [REDACTED]**

February 06, 2019

Preamble

Any response to the incorporation of TEK into an EAP submission must first acknowledge the Indigenous worldview of the environment. There is much controversy in the way TEK is used in Western compartmentalized ecological assessments. Leanne Simpson reminds us that "the ecological component of our knowledge is emphasized, rather than its spiritual foundation." *Traditional Ecological Knowledge Marginalization, Appropriation and Continued Disillusion*. Indigenous Knowledge Conference, 2001. portal.usask.ca

Physical Environment

6.6.2.1 Soil Erosion

Reference is made to halting quarrying and stripping activities during high wind and rain events. High wind and rain events need to be defined.

6.2.3 Groundwater and 6.3.1 Surface Water Quality

In 2003 Anishinabe women initiated Water Walks around Lake Superior carrying copper pails (due to its sacred and healing properties) to draw attention to the need for action regarding water issues. Katherine Morrisseau-Sinclair was inspired by this sharing of traditional knowledge to complete a walk around Lake Winnipeg. Her main purpose was to raise awareness of the traditional role and responsibility of women to speak and care for the water. Ceremonies before and at the conclusion of the walk were performed with the assistance of HWFN residents (see pictures). In recognition of that work, Morrisseau-Sinclair received the 2014 Champion for Sustainability Award from the Manitoba Round Table for Sustainable Development and the Department of Conservation and Water Stewardship.



Final Ceremony at the end of the Lake Winnipeg Water Walk on a Manigotogan Beach



HWFN residents gifting Katherine Morrisseau-Sinclair including a locally made traditional star blanket.

The number one environmental concern expressed by respondents in the EAP is for CPS to maintain water quality. Manitoba Conservation has acknowledge that Indigenous interactions with the environment are more than just resource harvesting when revising trapping policies (see Figure 5-3 page 53) and 6.6.3.1 in this document. If this is truly the case, then water use and discharge by the plant must be given the most careful consideration in light of the number of residents who have expressed concern.

There are a number of concerns with the information provided in the EAP:

- Creeks that drain into the Wanipigow and Manigotogan Rivers from the proposed quarry site are fish bearing. HWFN elders and biologists I have consulted with have identified surface water connectivity. The company claims these creeks are outside the parameters of the current mine and therefore, there is no concern. I am deeply concerned by the following:
- The company has not identified a source for make-up water for the plant. Documents list wells, dammed reservoirs, and purchasing water from local water treatment plants as potential sources of water for operations. Submitting an EAP without finalizing this information is extremely concerning.
- This project should not go forward until there has been a thorough investigation of the effect of the quarry on fish habitat and until proper hydrogeological studies have been completed and shared. Due to the sacred nature of water, there should be a truly free and informed Section 35 consultation process that is community driven to discuss whether or not the company is implementing measures that define good water stewardship.

6.5 Atmospheric Environment

6.5.1 Air Quality

- *The model used predicted exceedances for the MAAQC particulate matter and this prediction considered the dust mitigation measures as listed in Section 6.4.1*
- Sensitive air quality receptors were not placed around the perimeter of the quarry site. (see map) and the lack of data from the Manigotogan Bridge to the mouth of the Manigotogan River and around to Montago Bay and Second Beach are concerning as permanent and summer residences of HWFN members can be found in these locations.
- The air dispersion modeling exercise used data from land locked prairie locations which does not reflect the micro-climate including lake effect winds. The quarry site is surrounded on three sides by Lake Winnipeg. Hot dry winds are the norm. The company needs to provide a policy specifying under what exact conditions the plant will be closed during weather events.



Air sensor locations are in green. Area of concern is highlighted in yellow

6.6.3.Land and Resource Use

6.6.3.1. Hunting and Trapping

Hunting

- Moose have been photographed on CPS property. In the EAP, interviewed Elders confirm that moose tracks have been seen in the area. TEK not previously shared by HWFN residents has identified areas within the proposed mine site as a travel corridor and refuge for moose. The moose are chased by wolves from the south side of the mouth of the Manigotagan River

and travel along the back road area where they enter the mine site via the "old Ferry Road."



Trapping

Manitoba Conservation, in their "Public Review of the Furbearer Management Policy" acknowledges that *Indigenous interactions with the environment are more than just resource harvesting.*

- CPS does not account for the repeated infringement and cumulative effect on trapping as a Section 35 Treaty Right as the result of cottage development and mining.
- HWFN trappers have previously lost a portion of the Community Trapping Line #1 to cottage developments such as Pelican Harbour, Ayers Cove, and Blueberry Point.
- Registered Trapline 11 and part of Registered Trapline 12 have been lost as the result of mining activity by San Gold
- Community traplines have a different function than Registered Traplines that are trapped by individuals.

6.6.3.2 Berry and Plant Gathering

- 3 Elders were taken to 3 representative plots to identify traditional medicinal plants on October 28, 2018. October 28 is not known for being an optimal time to identify growing plants.
- Two plants located on the mine site that are not medicinal but should be noted because of conservation concerns include:

Cypripedium	Purple Moccasin	S3S4
Cypripedium arietinum	Ram's Head Lady's Slipper	S2S3

Other

- A spring located on the company mine site that elders said they could no longer find was readily located on a map of the area by a seasoned trapper.

6.6.5 Human Health and Well-being

Cumulative Effects - Air Quality

- The back road from Manigotogan, through the project site to Seymourville and Wanipigow is gravel. Since the company plans to build accommodations for outside employees in Seymourville, and place additional employees throughout the communities, the dust from the back road must be factored into any air quality study. The cumulative effect of dusty roads and particulate matter that already exceed acceptable levels is most concerning. As well, portions of the road are close to the rivers and dust is already a problem on evenings when cottage travel is at its peak. People with asthma, the young, and elderly are particularly at risk. Clouds of dust hang over the bays.
- In addition, the company plans to burn brush to clear the site. Smoke will be a health hazard to those with asthma due to the proximity of the site to residential areas.

Road Safety

- Elders are concerned about the increased use of gravel roads by the influx of workers living in the communities. Elders and youth frequently walk these

roads and there have been several fatalities in recent memory. CPS acknowledges this concern and refers readers to sections 6.4.1 and 6.7 of the report. However, these sections promise mitigation for roads used by company trucks to transport their sand, not the local community roads the Elders mention.

- Highway 304 is of particular concern due to the extremely winding terrain approximately 30 km before and 20 km after Pine Falls in addition to their general poor state of repair for the use outlined in the EAP unsuitability. Specifically:
 - There are no shoulders on 304
 - There is severe pavement drop off on each side of the road
 - Ditch/embankment slopes are too steep
 - Curves have a super elevation and the grade is too low on the outside of the curves. The super elevation creates a tendency for vehicles to drift to the center of these curves.

Agreements with the Province regarding the highway infrastructure must be finalized and with band members from Hollow Water First Nation before informed consent can be given, as the safety and well being of band members is at risk.

I look forward to receiving additional information as this process evolves. At this point, with the number of outstanding concerns, informed consent cannot be obtained.

Sincerely,

M.J. McCarron