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Table 1, Attachment C

Wanipigow Sand Extraction Project
Cumulative Effects Assessment Report

AECOM Imagine it. Delivered.

Canadian Premium Sand Inc.

Wanipigow Sand Extraction Project

Cumulative Effects Assessment

Prepared by:
AECOM Canada Ltd.
99 Commerce Drive
Winnipeg, MB, Canada
R3P 0Y7

Prepared for:
Canadian Premium Sand Inc.
400, 522 11th Ave. S.W.
Calgary, AB T2R 3P2

Date: February 7, 2019
Project #: 60588114

Distribution List

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	✓	Canadian Premium Sand Inc.
	✓	Canadian Environmental Assessment Agency
	✓	AECOM Canada Ltd.

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Robert Archibald
Chief Operating Officer
Canadian Premium Sand Inc.
400, 522 11th Ave. S.W.
Calgary, AB T2R 3P2

February 7, 2019

Project #
60588114

Dear Mr. Archibald:

Regarding: Wanipigow Sand Extraction Project Cumulative Effects Assessment

AECOM Canada Ltd. (AECOM) is pleased submit our report regarding the above-referenced project. If you have any questions, please do not hesitate to contact Marlene Gifford directly at 204-928-9210.

Sincerely,
AECOM Canada Ltd.

Marlene Gifford, M.Sc., P.Biol., R.P.Bio.
Biologist, Environmental Assessor
marlene.gifford@aecom.com

Clifton Samoiloff, B.Sc., EP(CEA)
Mining Market Sector Lead, Canada
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MG:rz

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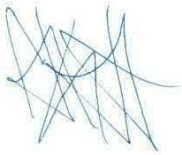
AECOM: 2015-04-13

Quality Information

Report Prepared By:

Marlene Gifford, M.Sc., P.Biol., R.P.Bio.
Biologist, Environmental Assessor

Report Reviewed By:



Clifton Samoiloff, B.Sc., EP(CEA)
Mining Market Sector Lead, Canada
Senior Environmental Scientist

Executive Summary

This report describes the cumulative effects assessment of the Wanipigow Sand Extraction Project (the Project) proposed by Canadian Premium Sand Inc. (CPS), a Canadian-based, publically held company. The Project would consist of development and operation of facilities and infrastructure for extraction of high-grade silica sand from provincial Crown land, substantially within the geographic boundaries of the Incorporated Community of Seymourville, located on the east side of Lake Winnipeg, and approximately 160 km northeast of the City of Winnipeg. The Project is being developed for the purpose of supplying silica sand to a variety markets, such as oil and gas operations and the glass production industry. The Project will have an annual production rate of approximately one-million tonnes of silica sand that will be processed on-site (washed and dried) and trucked to Winnipeg for loading onto rail cars for shipping to markets in Canada and the United States of America.

Key components of the Project will include:

- An active open pit sand quarry averaging 5 ha each year of operation, including progressive annual site reclamation of closed quarries;
- Silica sand production process infrastructure, including a fully enclosed sand wash and dry facility;
- Ancillary facilities, including a permanent office and storage buildings;
- A paved main access road approximate 6 km long; and
- A gravel access road approximately 1.5 km long for use during Project construction and for emergencies during Project operation.

Details regarding Project components are provided in Section 2 (Project Description) of the Environment Act Proposal (EAP) submitted to Manitoba Sustainable Development on December 18, 2018, and to the Canadian Environmental Assessment Agency (CEA Agency) on December 20, 2018. On December 20, 2018, after the CEA Agency received the EAP document, CPS received a letter from the CEA Agency requesting any updated information about the Project, including potential adverse environmental cumulative effects on fish and fish habitat, migratory birds, Species at Risk, federal lands, lands outside of Canada, and Indigenous peoples. This cumulative effects assessment report was prepared to address the CEA Agency request for cumulative effects.

After a process of scoping the Valued Components (VCs) assessed in the EAP as having the potential to be subject to residual adverse effects after mitigation, it was determined that effects on the following VCs warranted further assessment of cumulative effects: groundwater, vegetation, moose (a specific sub-component of the 'Wildlife' VC) and air quality (specifically dust and greenhouse gases). The cumulative effects analyses for these VCs considered the proposed mitigation measures and monitoring programs described in the Project EAP.

In consideration of the spatial and temporal boundaries defined for this cumulative effects assessment, and the past, present and reasonably foreseeable physical activities within those spatial and temporal boundaries, it was determined that the potential for adverse cumulative effects on groundwater, vegetation, moose, and air quality was not significant. Considering the effects pathways that would interact with these valued components are linked to those that would potentially affect federal lands, Indigenous peoples, migratory birds and Species at Risk, no significant cumulative effects are anticipated for those components of federal jurisdiction. In summary, AECOM anticipates no significant adverse cumulative effects on any VC, including those within areas of federal jurisdiction as per section 5 of CEAA 2012 (i.e., fish and fish habitat, migratory birds, species at risk, federal lands, lands outside of Canada and Indigenous peoples). Should the results of monitoring studies proposed in Section 8 of the EAP,

‘Monitoring and Follow-up’ indicate that adaptive management measures are required to mitigate unforeseen adverse effects, CPS will consult with Manitoba Sustainable Development to sufficiently address unacceptable adverse effects.

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Appendices

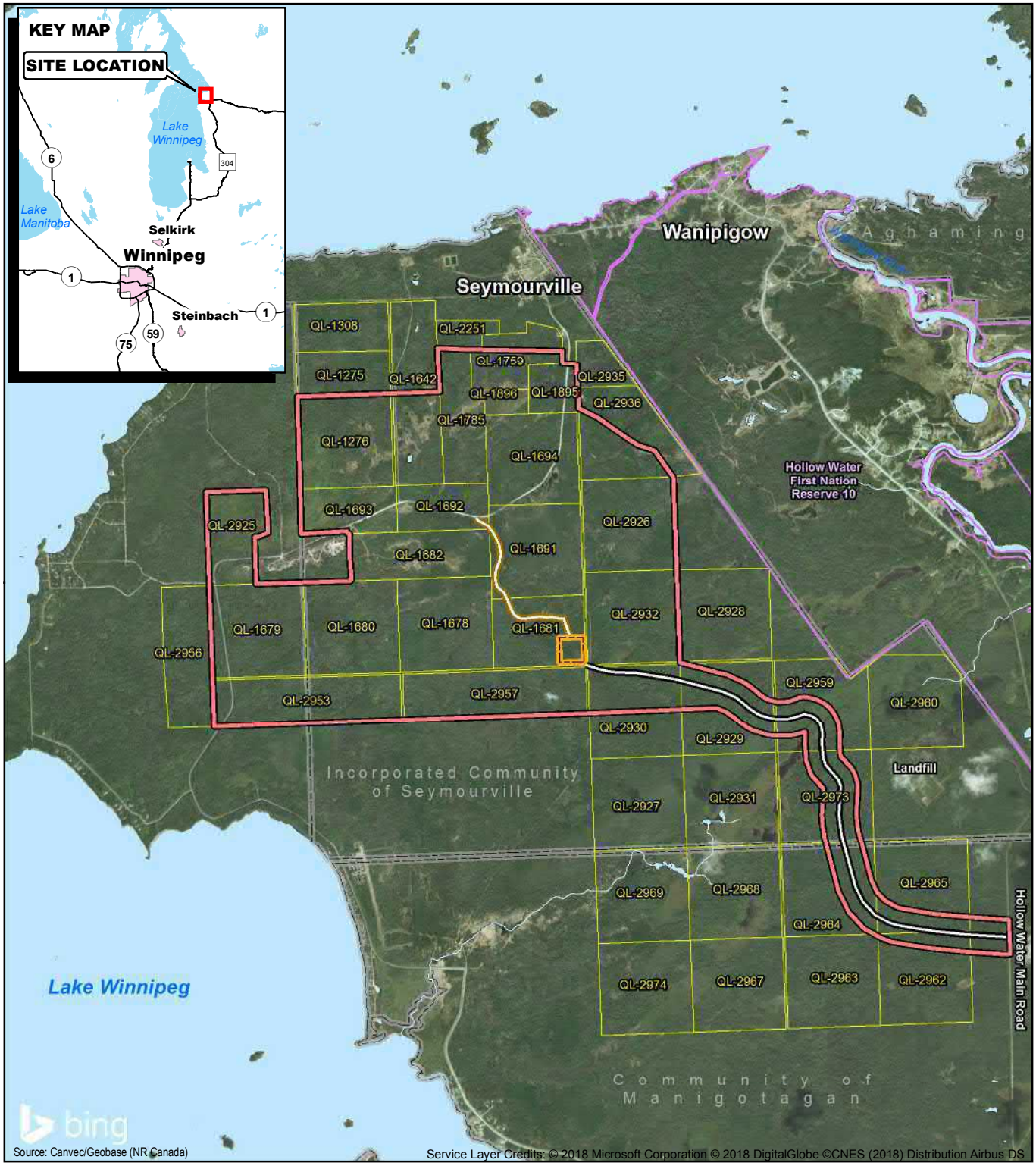
1. Background

This report describes the cumulative effects assessment of the Wanipigow Sand Extraction Project (the Project) proposed by Canadian Premium Sand Inc. (CPS). The Project would consist of development and operation of facilities and infrastructure for the sustainable extraction of high-grade silica sand from provincial Crown land substantially within the geographic boundaries of the Incorporated Community of Seymourville, located on the east side of Lake Winnipeg, and approximately 160 km northeast of the City of Winnipeg. The Project site is west of federal lands held in trust for Hollow Water First Nation, being the Hole or Hollow Water 10, Reserve No. 6363 ('Hollow Water First Nation reserve'). The Project is within the core area of Hollow Water First Nation's Traditional Territory, commonly referred to as Hollow Water First Nation's Home Block (**Figure 1-1**). The Project is being developed for the purpose of supplying high-quality silica sand for use in a variety of markets such as oil and gas operations and the glass production industry. The sand resource for this Project has been tested and meets the American Petroleum Institute rigorous specifications for sand suitable for use in hydraulic fracturing. The quality of sand from this Project area is rare in North America, a factor that substantiates the need for this Project. The Project life is anticipated to be 54 years, with an annual production rate of approximately one-million tonnes of silica sand at full operation. The sand will be processed on-site (washed and dried) and trucked to Winnipeg for loading onto rail cars for shipping to markets in Canada and the United States of America.

Key components of the Project will include:

- An active open pit sand quarry averaging 5 ha each year of operation, including progressive annual site reclamation of closed quarries;
- Silica sand production process infrastructure, including a fully enclosed sand wash and dry facility;
- Ancillary facilities, including permanent office and storage buildings;
- A paved main access road approximate 6 km long; and
- A gravel access road approximately 1.5 km long for use during Project construction and for emergencies during Project operation.

Details regarding Project components are provided in Section 2 (Project Description) of the Environment Act Proposal (EAP) submitted to Manitoba Sustainable Development on December 18, 2018. The Canadian Environmental Assessment Agency (CEA Agency) was provided an electronic copy of the EAP on December 20, 2018. On December 20, 2018, after CEA Agency received the EAP document, CPS received a letter from CEA Agency requesting any updated information about the Project, including potential adverse environmental cumulative effects on fish and fish habitat, migratory birds, species at risk, federal lands, lands outside of Canada, and Indigenous peoples. The purpose of the CEA Agency request for additional Project information is to assist CEA Agency in their review of potential adverse effects of the Project to inform the preparation of CEA Agency's letter of advice to the federal Minister of Environment and Climate Change recommending whether to designate the Project as requiring environmental assessment under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012).



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Project Components
- Sand Wash and Dry Facility Location
- Project Site Area Boundary
- Access Road for Project Construction and Emergency Use
- Main Access Road

Quarry Leases
- Quarry Lease Boundaries

Communities
- Municipalities/Local Government Districts

First Nation
- Hollow Water First Nation Reserve 10

ANSI A 215.9mm x 279.4mm
Approved:
Checked:
Designer:
Project Management Initials:
Last Plotted: Mon Dec 17, 2018
Last saved by: KNOTTJ (2018-12-17)
Filename: P:\60588114\900-CAD_GIS\920-929 (GIS-GRAPHICS)\02_MXDS\PROJECT_SITE_AREA\H001-1_60588114_SEYMOURVILLE_PROJECTSITEAREA.MXD

WANIPIGOW SAND EXTRACTION PROJECT
CLAIM POST QUARRY LEASES AND PROJECT SITE LOCATION
CANADIAN PREMIUM SAND INC.

AECOM

Figure: 1-1

2. Introduction

AECOM has conducted a cumulative effects assessment of the proposed Project to provide the CEA Agency with additional information for this Project and assist the CEA Agency in informing their letter of advice to the Minister regarding whether the Project should be 'designated' under CEAA 2012. The purpose of this cumulative effects assessment is to identify and assess residual adverse Project effects on Valued Components (VCs), regardless of their significance, which may become significant when they interact with potential effects of past, present, and reasonably foreseeable future physical activities in a regional assessment area.

Although the latest CEA Agency interim technical guidance regarding assessing cumulative environmental effects under the CEAA 2012 does not specifically define 'cumulative effects' (CEA Agency 2018), the CEA Agency has previously defined cumulative effects as "*changes to the environment due to the project combined with the existence of other past, present and reasonably foreseeable physical activities*" (CEA Agency 2015). As indicated in the CEA Agency's December 20, 2018, letter to CPS, assessment of potential adverse effects of the Project is to consider cumulative effects within areas of federal jurisdiction as per section 5 of CEAA 2012 and should therefore consider cumulative effects on fish and fish habitat, migratory birds, species at risk, federal lands, lands outside of Canada and Indigenous peoples.

As per the latest CEA Agency technical guidance (CEA Agency 2018), assessment of cumulative effects follows a five-step approach:

Step 1 – Scope the assessment of cumulative effects, to determine the VCs to be considered in the analysis and to orient and focus the cumulative effects assessment;

Step 2 – Analyze how physical activities of the Project, combined with past, present, and reasonably foreseeable physical activities, may affect selected VCs within the spatial and temporal boundaries of the cumulative effects assessment;

Step 3 – Identify technically and economically feasible mitigation measures to eliminate, reduce, or control adverse cumulative effects;

Step 4 – Determine the significance of adverse environmental effects remaining after the application of mitigation measures (i.e., residual effects) that are likely to result from the Project in combination with other physical activities; and

Step 5 – Develop a Follow-up Program to verify the accuracy of the EIA and effectiveness of mitigation measures applied to address both Project-specific environmental effects and cumulative effects.

In accordance with CEA Agency (2018) guidance, and using criteria and methods similar to those used for the cumulative effects assessment for an all-season road within a similar boreal landscape (Manitoba East Side Road Authority 2016), this report provides an assessment of the anticipated cumulative effects of the Project.

3. Scoping

To orient and focus the cumulative effects assessment, the Project-specific assessment of cumulative effects was scoped in consideration of the predicted residual effects on valued components (VCs) of the biophysical and socioeconomic environment as provided in Section 6 of the EAP for this Project (AECOM 2018). Specifically, scoping consisted of:

- Identifying Valued Components (VCs), which include Species at Risk, on which adverse residual environmental effects from the Project are anticipated (**Section 3.1**); in accordance with CEA Agency guidance, VCs that would be affected positively by the Project (along with those on which there are no residual effects) are omitted from the cumulative effects assessment (CEA Agency 2018);
- Determining the spatial and temporal boundaries to capture potential cumulative environmental effects on VCs that may be subject to residual effects; and
- Identifying the past, present, and future physical activities that are anticipated to contribute to the residual environmental effects of the Project on VCs.

The scoping steps are described in **Sections 3.1** to **3.3**.

3.1 Valued Components

VCs considered for screening to be included in this cumulative effects assessment are among those assessed during the EAP for this Project, and also overlap with those required for consideration in accordance with the CEA Agency's December 20, 2018, letter to CPS. **Table 3-1** provides a cross-reference of VCs considered in the EAP for this Project as compared to the components of federal jurisdiction that require consideration in a cumulative effects assessment for this Project.

Table 3-1: Cross-reference of EAP VCs and topics of Federal Jurisdiction to be considered in a Cumulative Effects Assessment

EAP VCs Considered in the Environmental Assessment	Potential Link to Topics of Federal Jurisdiction to be considered in a Cumulative Effects Assessment for this Project
Groundwater	- Federal Lands - Indigenous Peoples - Migratory Birds - Fish and Fish Habitat - Species at Risk
Surface Water Quality	- Fish and Fish Habitat - Migratory Birds - Species at Risk - Indigenous Peoples
Fish and Fish Habitat	- Fish and Fish Habitat - Indigenous Peoples
Vegetation	- Migratory Birds - Species at Risk

EAP VCs Considered in the Environmental Assessment	Potential Link to Topics of Federal Jurisdiction to be considered in a Cumulative Effects Assessment for this Project
	- Indigenous Peoples
Wildlife	- Migratory Birds - Indigenous Peoples
Species of Conservation Concern	- Species at Risk - Indigenous Peoples
Air Quality	- Indigenous Peoples - Species at Risk - Migratory Birds - Federal Lands
Noise	- Indigenous Peoples - Species at Risk - Migratory Birds
Climate/Greenhouse Gases	- Indigenous Peoples - Species at Risk - Migratory Birds - Federal Lands - Lands Outside of Canada
Land and Resource Use	- Indigenous Peoples
Human Health and Well-being	- Indigenous Peoples
Effects on Indigenous and Treaty Rights	- Indigenous Peoples
Heritage Resources	- Indigenous Peoples

Note: The VCs listed include those that potentially occur on, or that may potentially be affected on federal lands, or otherwise potentially fall under federal jurisdiction.

If it is expected that all effects on a VC will be mitigated, and that no residual adverse effects of the Project on that VC will remain, that VC is screened-out from further consideration in a cumulative effects assessment (CEA Agency 2018). Considering the environmental assessment within the EAP for this Project, AECOM has determined that there will be no residual environment effects of the Project on fish and fish habitat (refer to Sections 4.2.2 and 6.3.2 of the EAP). Therefore, fish and fish habitat have been screened out of this cumulative effects assessment.

Residual adverse effects of the proposed Project on Indigenous and treaty rights are also not anticipated as a result of this proposed Project, and have been screened out of this cumulative impact assessment. Rationale for this conclusion is based on the location of the Project being within the core area and 'Home Block' Traditional Territory of Hollow Water First Nation, and the support for the Project received by CPS from Hollow Water First Nation in the form of both a letter of support and an executed Economic Participation Agreement. Aboriginal and Treaty Rights protected under Section 35 of the *Constitution Act, 1982*, are essentially communal rights. The proponent respects that the duly elected Council of Hollow Water First Nation is the body that speaks for the communally held rights of its people. Letters of support have also been issued for the Project by the local potentially impacted communities, including the Incorporated Community of Seymourville (Seymourville), the Community of Manigotagan (Manigotagan) and the Northern Affairs Settlement of Aghaming (Aghaming). Furthermore, CPS and the governments of the Incorporated Community of Seymourville and the Community of Manigotagan have agreed in principal on the essential terms of separate Participation Agreements, and are currently finalizing documentation for these agreements.

Table 3-2 provides a list of the VCs that are linked to topics of federal jurisdiction (**Table 3-1**) and are predicted to be subject to residual environmental effects of the Project.

Table 3-2: VCs Predicted to be Subject to Residual Environmental Effects of the Project

Valued Component	Location of Project Effects Assessment information in EAP	Summary of Residual Project Effects and Rationale
Groundwater	Section 6.2.1	**Minor:** Use of a closed-loop sand wash system will minimize the quantity of groundwater required for annual Project operation processes. Hydrogeological studies are currently underway to determine whether the required volumes of water can be obtained from the groundwater aquifer. The results will be used to confirm the magnitude and extent of any adverse effects of dewatering resulting from groundwater seepage to the active quarry and from groundwater extraction. The spatial extent of the drawdown cone surrounding the quarry will be determined by the aquifer properties, groundwater recharge rates and quarry development schedule. It is anticipated that passive seepage to the quarry will result in localized lowering of the groundwater table, which may affect the water balance of wetlands within, and in close proximity to, the Local Project Site Area (as described in the EAP). Although no effects on domestic well users are anticipated, any groundwater supply wells within the drawdown cone surrounding the quarry may also be affected by dewatering. If hydrogeological studies indicate a low potential for groundwater supply development within the Local Project Site Area, process water will be obtained from an alternative licensed water source. This consideration will limit residual effects on groundwater quantity to those associated with passive seepage from the quarry walls and floor, and the resultant drawdown cone surrounding the quarry. Residual effects on groundwater quality are anticipated to be minor due to the relatively benign geochemical properties of the bedrock, and the application of mitigation measures for the protection of surface water quality.
Surface Water Quality	Section 6.3.1	**Minor**: There will be a minor modification of surface water drainage at the Project Site due to the creation of ditches and culverts, as needed, to direct water runoff at the Project Site and equalize water flow on each side of the proposed access roads. Mitigation that will include construction of culverts, ditches along Project access roads, installation of a sump pit and pump in active quarry cells to use water runoff and quarry seepage water in the sand wash process, and the implementation of regular monitoring and spill-prevention measures, will together reduce the effects on surface water quality. During all

Valued Component	Location of Project Effects Assessment information in EAP	Summary of Residual Project Effects and Rationale
		Project phases, erosion and sediment control measures will be applied to minimize potential effects on surface water quality. Therefore, potentially silt-laden run-off water will be restricted to the Project Site Area, mitigating any potential for contamination of adjacent Local Project Area waterbodies, such as Lake Winnipeg (1 km distance from Project Site). During excavation activities, any overburden strata with pyritic minerals that have the potential to result in acid drainage will be isolated and managed under the direction of a geochemist. This may include placement of materials in a clay-lined pit, and capped with limestone to mitigate the potential for groundwater contamination.
Vegetation	Section 6.4.1	**Moderate** – The footprint area of the Project infrastructure (i.e. wash and dry facility, access roads and associated infrastructure) will be 78 hectares (ha), with annual quarry areas averaging 5 ha, followed by revegetation of the active quarry cell each subsequent year. The total cleared area of 83 ha (which includes the annual active quarry cell) represents 3.6% of the 2,289 ha of CPS quarry lease areas (Figure 1-1 of EAP). The total area to be disturbed over the life of the Project, notwithstanding the annual quarry cell progressive revegetation, will be 353 ha which represents 15% of the 2,289 ha of CPS quarry lease areas, and 0.00002% of the Lac Seul Ecoregion area. The majority of the land cover that will be cleared is deciduous dominant mixed-wood forests which are common within the Lac Seul Upland Ecoregion (Lowe et al. 1996; Smith et al. 2001).
Wildlife	Section 6.4.2	**Moderate** – Adverse residual effects on wildlife will include habitat loss (as described above for 'Vegetation'), alteration and fragmentation of habitat, and sensory disturbance within the Local Project Area. Implementation of mitigation measures, such as minimizing clearing to the extent feasible, clearing vegetation only during winter to avoid disturbing breeding birds and other spring-breeding wildlife species, annual progressive revegetation of quarries, use of appropriate noise and dust control measures within the Project Site area, use of directional lighting fixtures, gated road access to the Project Site, and posting of speed limit and wildlife warning signage as appropriate, will minimize adverse effects on wildlife. Therefore, no measurable adverse effects on regional wildlife populations that could be attributed to the Project are anticipated.
Species of Conservation Concern	Section 6.4.3	**Minor to moderate** - Of the species of conservation concern that potentially occur in the Regional Project Area (Section 4.3.3 and Appendix D of the EAP) 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 conclusion is primarily due to the limited amount of cleared vegetation contributing to habitat that will be required for the Project (Section 6.4.1 of the EAP), prevalence of

Valued Component	Location of Project Effects Assessment information in EAP	Summary of Residual Project Effects and Rationale
		similar cover types within the Regional Project Area and Lac Seul Upland Ecoregion, and the application of measures as indicated in Section 6.4.2 to mitigate adverse effects of the Project on wildlife in general. Therefore, residual Project effects on regional populations of species of conservation concern are assessed as minor to moderate, depending on the habitat preferences of each such species.
Air Quality	Section 6.5.1	**Minor to moderate** – Expected effects on air quality resulting from Project activities were assessed by air dispersion modelling (Appendix E of EAP) conducted in accordance with the Draft Guidelines for Air Quality Dispersion Modelling Manitoba using AERMOD to predict maximum ground-level concentrations of selected parameters, and maximum predicted concentrations at selected nearby sensitive receptors. While the model predicted maximum concentrations of SO_2 and CO below the Manitoba Ambient Air Quality Criteria, particulate matter (PM) and NO_2 exceedances were expected due to the trucking, dust-generation, and use of equipment requiring gas, diesel or oil for operation. Application of mitigation measures, such as enclosing the wash and dry facility, use of negative pressure inside the wash and dry facility to collect fine particles for minimization of dust projection, use of waterproof seals on sand truck load covers to prevent dust dispersion during transport, use of paved roads for product transport, regular equipment maintenance, and use of hydro-power, will assist in minimizing residual Project effects on air quality. During the Project operation phase, air quality will be monitored in the vicinity of potential receptors closest to the Project activities. Air quality reports will be submitted to Manitoba Sustainable Development at the frequency required by that agency. Should air quality issues arise that require mitigation, CPS will engage with Manitoba Sustainable Development to determine appropriate adaptive management to resolve issues, as required.
Noise	Section 6.5.2	**Moderate** – As described in a Noise Impact Assessment completed for this Project (Appendix F of the EAP), the nearest residence is located over 2 km from the wash and dry facility. However, the annual active quarry site maybe closer than 2 km from the nearest residence. The surrounding forest and variations in elevation within the Project Site area will contribute to natural noise attenuation, reducing any residual Project noise remaining after other mitigation. Noise generated from quarry operations will also be attenuated by the surrounding 10 m to 30 m high 'walls' within the active quarry cell. Additional attenuation measures, such as material overburden stockpiling adjacent to the active quarry cell, enclosure of the wash and dry facility, use of strobe lights at nighttime as replacements for back-up warning alarms or beepers, offsetting active use of heavy equipment types, implementation of noise dampening materials, such as noise curtains

Valued Component	Location of Project Effects Assessment information in EAP	Summary of Residual Project Effects and Rationale
		and liners, and fitting mufflers on construction equipment and vehicles, will be implemented as needed to minimize potential residual Project noise. CPS will engage with the local community to determine feasible solutions to adaptively manage noise levels resulting from Project activities, should complaints be brought to the attention of CPS.
Climate/ Greenhouse Gases	Section 6.5.3	**Minor** – An estimated annual generation of 26,565 tonnes of CO_2e has been calculated after the application of mitigation measures, a level equivalent to 0.13% of the total Manitoba emissions reported for 2017. The potential for residual Project effects relating to climate and GHGs will be mitigated to the extent feasible by regular maintenance of equipment and vehicles, minimizing vehicle idling, employing the use of vehicles that meet required emission standards, and obtaining hydro-power for long-term use for operation of the Project to reduce the need for diesel generators.
Land and Resource Use	Section 6.6.3	**Minor to Moderate:** ▪ Some of traditional blueberry and medicinal-plant gathering areas within the the Local Project Area will be affected by Project construction and operational activities. However sequential rehabilitation of the landscape will mitigate the effects of vegetation clearing. Traditional Ecological Knowledge (TEK) / Indigenous Knowledge studies and Project Site walkthroughs with a local Elder experienced in traditional plant medicines indicated that, due to the abundance of blueberry and medicinal plant species, the Project would have a minimal effect on berry and plant gathering. ▪ There will be moderate residual Project effects on hunting and trapping activities in the Local Project Area, primarily due to the residual Project effects on wildlife from effects of vegetation clearing and sensory disturbance (e.g., noise and human presence). Regional TEK information provided in Appendix G2 of the EAP indicates that both hunting and trapping occur more frequently within the Regional Project Area than in the Project Site Area. Consideration of potential adverse effects on trapping are addressed in the Economic Participation Agreement with Hollow Water First Nation (Appendix M in the EAP), and will be addressed in pending Participation Agreements with the Incorporated Community of Seymourville and the Community of Manigotagan, both of which have agreed in principal on the essential terms of agreement.
Human Health and Well-being	Section 6.6.5	**Minor to moderate** – Adverse residual effects on human health and well-being include: ▪ Increased truck traffic resulting in increased emissions from trucks and negatively affecting Local Project Area air quality, and increasing risk of vehicular collisions;

Valued Component	Location of Project Effects Assessment information in EAP	Summary of Residual Project Effects and Rationale
		▪ Minor to moderate amounts of dust and noise generated by Project activities; ▪ Potential minor residual effects on groundwater quality and quantity; ▪ Reduced access to hunting and trapping areas; and ▪ Disruption of natural areas, which is contrary to Indigenous traditional teachings (Appendix G1 'Project Site TEK Report' in the EAP). Positive effects of the Project are not to be considered in a federal cumulative effects assessment, and are therefore not provided in this report, but are described in Section 6.6.5 of the EAP.
Heritage Resources	Section 6.6.7	**Minor** – The completion of a Heritage Resource Impact Assessment (Appendix I in the EAP) and Traditional Ecological Knowledge studies (Appendix G in the EAP) have indicated that, while no archaeological artefacts or features were identified, there is still potential for archaeological artefacts or features to be discovered throughout ongoing Project activities, which may result in residual adverse effects on heritage resources. Measures that will be implemented to protect heritage resources, such as a marked 100 m buffer area around heritage resources, development of a Cultural and Heritage Resources Protection Plan for review with Project heavy equipment operators prior to Project initiation and new annual quarry excavations, and establishment of an Operational Oversight Committee consisting of members of surrounding communities to conduct a site visit for the purpose of identifying potential heritage resources, are intended to mitigate potential adverse effects on undiscovered heritage resources within the Project Site Area. If heritage resources are discovered within the Project Site, work will be stopped, Historic Resources Branch of the Department of Sport, Culture and Heritage, and lead representatives from local communities will be advised, and the historic resources discovered will be recorded by an archaeologist and adequately protected and blessed in a traditional ceremony if required. Application of the above procedures and protocols, therefore, will together minimize any potential risk of residual Project effects on heritage resources.

Note: A summary of mitigation measures to avoid or minimize potential adverse Project effects, and the overall anticipated level of remaining residual effects, is provided in Table 6-5 of the EAP.

To determine whether there is any potential for adverse cumulative effects on VCs that would warrant further assessment, scoping criteria were applied in consideration of CEA Agency guidance on assessing cumulative effects (CEA Agency 2018). For a VC to be carried forward for further cumulative effects analysis the VC must be:

- Subject to residual effects of the Project;

- Likely to be adversely affected by other past, present, or future physical activities within the spatial and temporal boundaries (defined in Sections 3.2 and 3.3 that follow); and
- Subject to concerns warranted by one or more of the following considerations:
  - Potential for significant adverse cumulative effects after application of mitigation measures;
  - Feedback from the Engagement Program (e.g., concern consistently expressed by a substantial number of individuals potentially affected); and
  - Need for monitoring programs or follow-up.

The scoping criteria used to determine the VCs that warrant further assessment are illustrated in **Figure** 3-1.

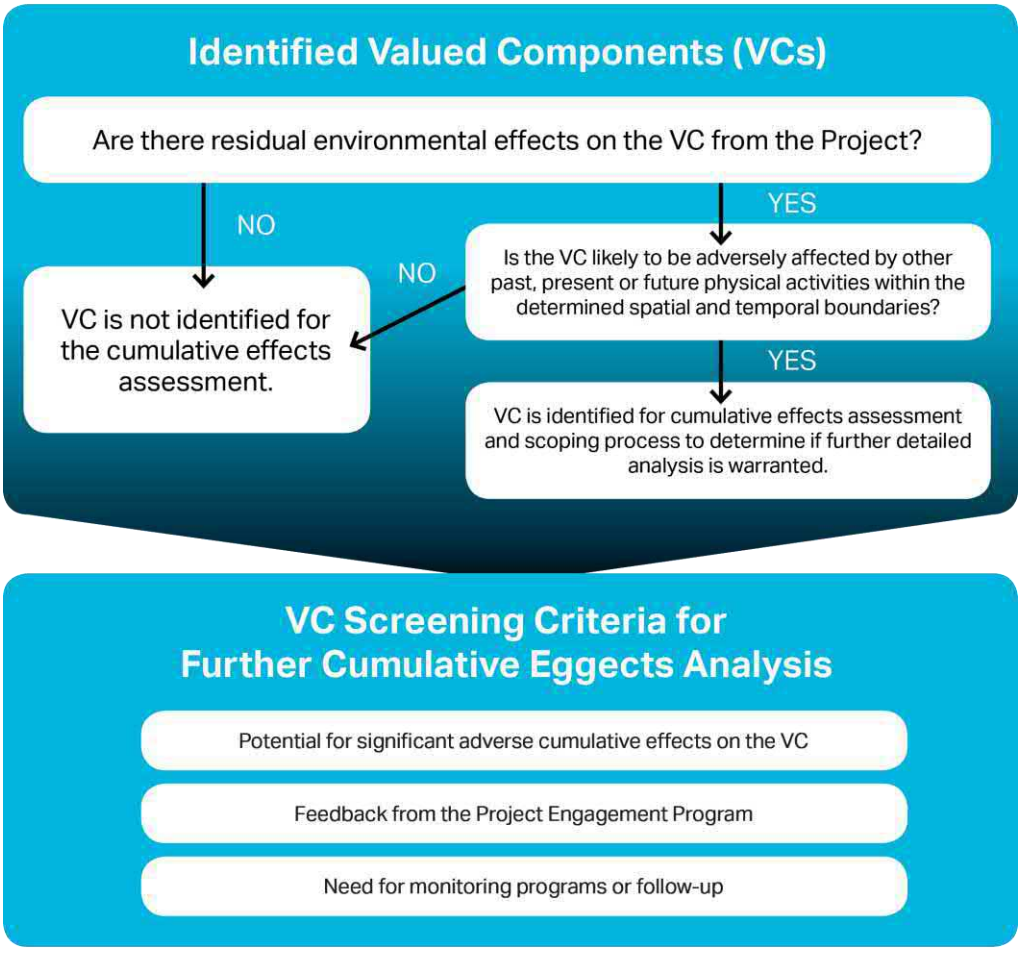


Figure 3-1: Approach to Scoping and Screening of VCs for further Cumulative Effects Analysis

3.2 Spatial Boundaries

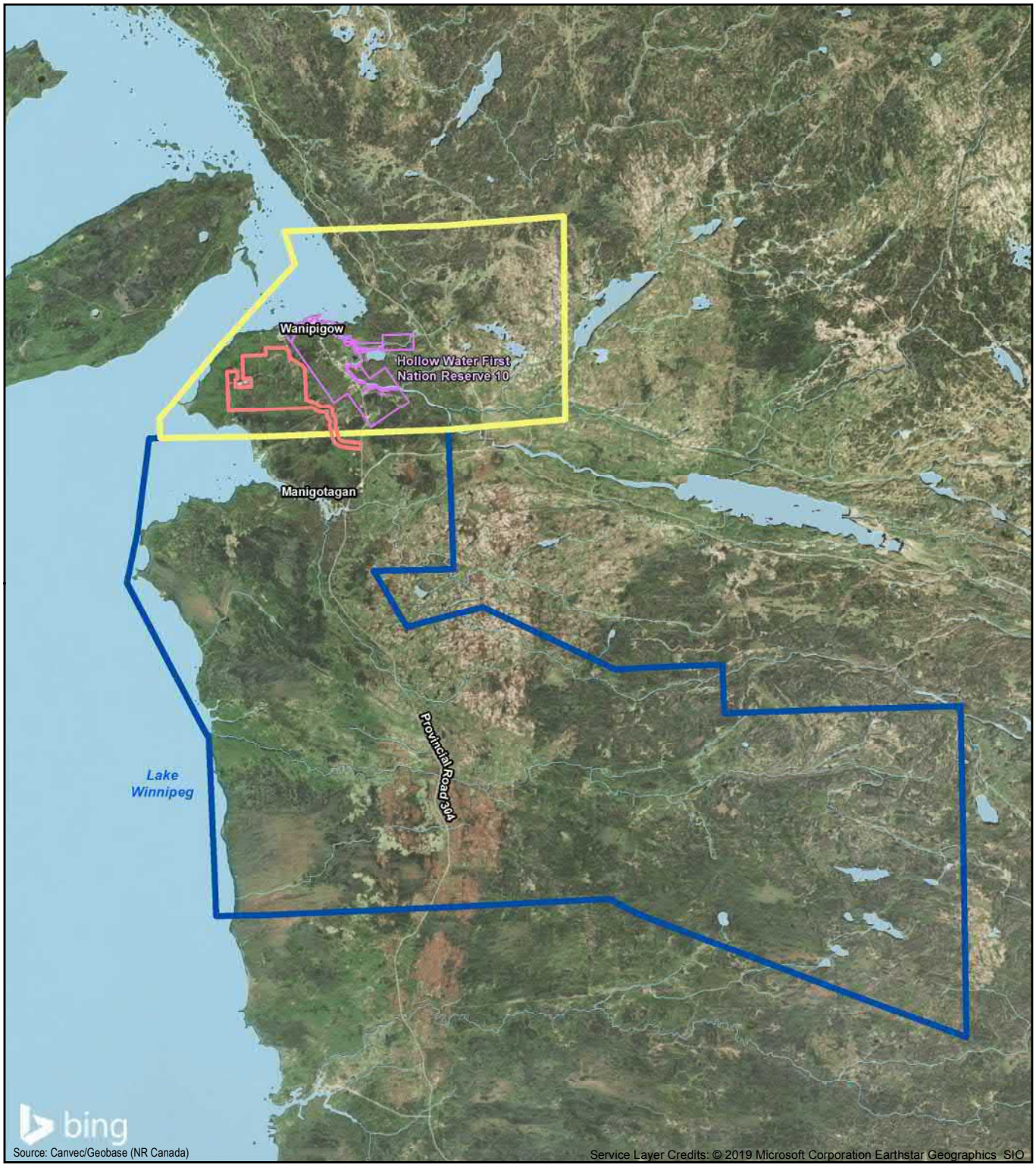
In consideration of the Project location on provincial Crown land, as illustrated in **Figure 1-1**, the Project footprint will not directly affect federal lands, including the adjacent Hollow Water First Nation. However, there may be potential adverse cumulative effects of the Project on migratory birds, species at risk, federal lands, and Indigenous peoples. Due to the Project location (**Figure** 1-1), measurable residual Project effects on lands outside of Canada are not expected, considering the nearest land outside of Canada is beyond the Manitoba–USA border, located 237 km south of the Project Site. Therefore, cumulative effects of the Project on lands outside Canada are not considered further in this cumulative effects assessment.

Selection of the spatial boundaries considered in this cumulative effects assessment was based on the regional management areas most applicable for the VC being assessed**. Table 3-3** provides the general spatial boundaries considered applicable for the VCs that may be receptors of residual adverse effects of the Project.

Table 3-3: Cumulative Effects Spatial Boundaries for VCs

Valued Component	Cumulative Effects Spatial Boundary
Groundwater	Underlying regional aquifer
Surface Water Quality	Manigotagan River/Wanipigow River watershed within the Lake Winnipeg Basin
Vegetation	Lac Seul Upland Ecoregion
Wildlife (including migratory birds)	Lac Seul Upland Ecoregion
Species of Conservation Concern (federal species at risk)	Lac Seul Upland Ecoregion
Air Quality	Regional Project Area as defined in Section 3.2 of the EAP
Noise	Regional Project Area as defined in Section 3.2 of the EAP
Climate/Greenhouse Gases	Regional Project Area as defined in Section 3.2 of the EAP and potential for Global measurable effects
Land and Resource Use	Hollow Water First Nation Traditional Territory Home Block (represented by Trapline Area #1) and the Manigotagan Community Trapline Area #28 (Figure 3-2)
Human Health and Well-being	Hollow Water First Nation Traditional Territory Home Block (represented by Trapline Area #1) and the Manigotagan Community Trapline Area #28 (Figure 3-2)
Heritage Resources	Hollow Water First Nation Traditional Territory Home Block (represented by Trapline Area #1) and the Manigotagan Community Trapline Area #28 (**Figure 3-2**)

Potential cumulative effects on VCs may extend beyond specific boundary-defined areas defined in **Table 3-3**. Also, potential cumulative effects on VCs may be limited to a small portion of the cumulative effects boundary-defined areas indicated in **Table 3-3**.



N
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km

1:300,000
NAD 1983 UTM Zone 14N

Project Components

Project Site Area Boundary

First Nation

Hollow Water First Nation Reserve 10

Traplines

Trapline 1: Hollow Water First Nation Home Block - Seymourville

Trapline 28: Manigotogan Community

ANSI A 215.9mm x 279.4mm

Approved:

Checked:

Designer:

Project Management Initials:

Last Plotted: Wed Jan 30, 2019

Last saved by: PAIGE.CROSSMAN (2019-01-30)

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WANIPIGOW SAND EXTRACTION PROJECT
SPATIAL BOUNDARY OF TRAPLINE AREAS #1 AND #28
CANADIAN PREMIUM SAND INC.

AECOM

Figure: 3-2

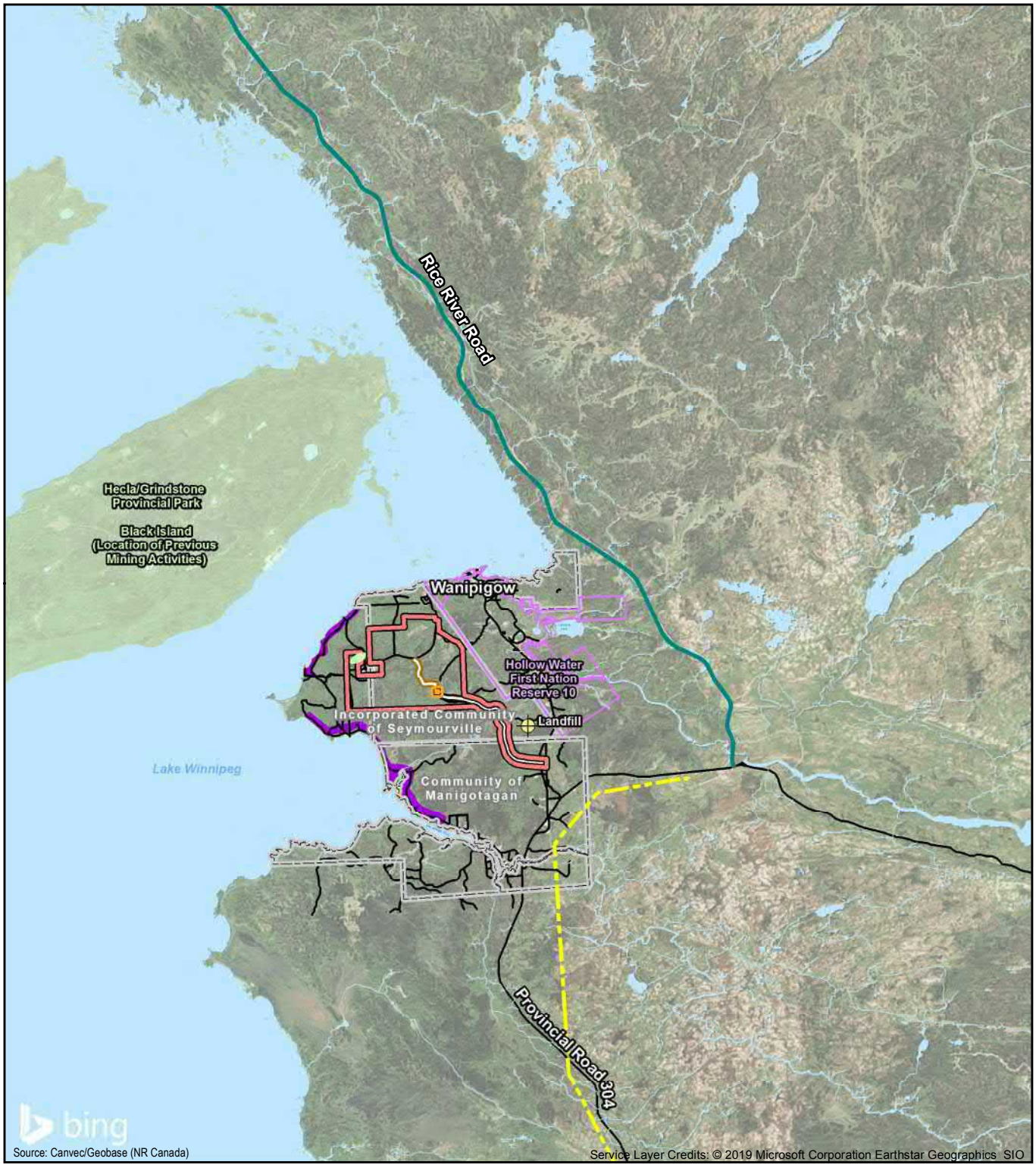
3.3 Temporal Boundaries

The temporal boundary for the cumulative effects assessment extends over a period of approximately 92 years, commencing in 1981 with the initial resource exploration activities in the Project Site Area, and extending to the end of the Project life in 2073 when the Project will be closed and decommissioned. A summary of the history of resource exploration at the Project Site area is provided in Section 1.3 of the EAP.

3.4 Physical Activities

The cumulative effects assessment has considered past and existing physical activities, and future physical activities that are 'certain and reasonably foreseeable' (CEA Agency 2007), in consideration of the spatial and temporal boundaries of this cumulative effects assessment. Certain and reasonably foreseeable physical activities are those activities that are have received funding to proceed. Current baseline conditions described in the EAP for this Project (AECOM 2018) represent the cumulative effects from previous and existing land-use practices and natural processes that have shaped the biophysical, cultural, and socio-economic components of the area during the period of human settlement. Currently, there are no available or certain plans by natural resource industries, such as forestry companies or consortia, to carry out projects or activities within the spatial or temporal boundaries of this cumulative effects assessment (see **Section 3.4.3** below, and 4.6.4.5 "Forestry" of the EAP; AECOM 2018).

Past, present, and future physical activities within the cumulative effects spatial and temporal boundaries are listed in **Table 3-4**. The general temporal distributions of the past, present, and future physical activities are illustrated in **Appendix A**. Past and present infrastructure and residential areas, including local communities, cottage development, and infrastructure development, such as roads and transmission lines, are illustrated in **Figure 3-3.** **Appendix B** provides information on the locations of mining claims and quarry leases representing past, present, or potential future quarry and mining activities within the Regional Project Area. **Appendix C** provides a map figure of the known locations of groundwater wells in the Local Project Area that has been updated from the Figure 4-3 in the EAP with the most recent information available from Manitoba Sustainable Development. It is not anticipated that groundwater wells beyond the area outlined in **Appendix C** will be subject to potential residual effects of Project related activities. Exploratory drilling activities related to this Project, including clearing for temporary access trails, have been occurring periodically since 1981, and are currently occurring within quarry lease areas (**Figure 1-1**) issued to Claim Post Resources Inc. (now Canadian Premium Sand Inc.) under provisions of *The Mines and Mineral Act* (C.C.S.M. c. M162). and under work permits in in accordance with *The Crown Lands Act* (C.C.S.M. c. C340) and applicable regulations.



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WANIPIGOW SAND EXTRACTION PROJECT
REGIONAL PROJECT AREA INFRASTRUCTURE AND RESIDENTIAL AREAS
CANADIAN PREMIUM SAND INC.

AECOM

Figure: 3-3

Table 3-4: Past, Present, and Future Physical Activities Considered in the Cumulative Effects Assessment

Category of Physical Activities	Specific Physical Activity	Description of Physical Activity
Past or Present Physical Activities that have been, or are being, Carried Out		
Quarrying- and Mining-Related Activities	Quarrying- and mining-related activities within Quarry Lease and Mining Claim boundaries or in accordance with casual quarry permits.	• Locations of regional mining claims and quarry leases representing past, present or potential future quarry and mining activities are provided in **Appendix B**. • Past and present (ongoing) exploratory drilling activities conducted by CPS under *The Mines and Minerals Act* at the Project Site Area • Past exploratory drilling activities conducted by others at the Project Site Area since 1981 (ref. Section 1.4 "Exploration History" in the EAP) • There is an active small community quarry within the Project Site Area
Infrastructure Development	Manitoba Infrastructure's all-season road from PR 304 to Berens River communities[1]	Construction of a 158-km new all-season road from PR 304 connecting to Bloodvein and Berens River First Nations (from 2011 to 2017) (Dillon Consulting 2018; Manitoba Post 2017).
	Lake Winnipeg East Transmission Line and existing regional distribution lines	The Lake Winnipeg East Transmission Line Project (Environment Act Licence #3210) was completed in 2018. This project was a new transmission line that extends from Pine Falls to a new substation, located near Manigotagan (Scurrah pers. comm. 2019).
	Roads and trails within the Project Site area	An existing network of community access roads and trails has been constructed within the Project Site Area. Refer to Appendix G1 'Project Site TEK Report' of the EAP.
	Groundwater Wells	Wells in the Local and Regional Project Area drilled for various purposes including domestic use.
	Hollow Water First Nation Lagoon	The Hollow Water First Nation Lagoon and Sewage Treatment Building Project was completed in November 2017 (Penn-co 2019a, 2019b). That project included decommissioning of one of the existing lagoons, upgrade of the second lagoon into two separate aerated lagoons, including a new dyke, two new SAGR cells, a 2,700 ft^2 aeration building, a 1.7 km lagoon discharge line to the Wanipigow River, and new road work (Penn-co 2019b). That project expanded the operating capacity of sewage treatment in Hollow Water First Nation.
	Seymourville Wastewater Lagoon Upgrades and Associated Works	Construction of new wastewater lagoon cells, upgrades of existing lagoon cells, access road redevelopment (Province of Manitoba 2017).
Forestry	Commercial forestry	Forest Management Licence (FML) #1 and independent

[1] *The first 48 km of the all-season road was an existing road that has recently been rebuilt from Hollow Water First Nation to Loon Straights.*

Category of Physical Activities	Specific Physical Activity	Description of Physical Activity
	activities; community wood harvesting	wood supply areas formerly overlapped with the cumulative effects assessment area. This FML previously held by Tembec from 1926 to 2009 no longer exists, and the operational infrastructure that supported the pulp mill located in Pine Falls has been decommissioned, which deters the market opportunity for future large-scale forestry activities in the area [Tembec was in operation from 1926 to 2009 (Winnipeg Free Press 2010a,b)]. Refer to Section 4.6.4.5 'Forestry' in the EAP. Limited community wood harvesting is undertaken within the cumulative effects assessment area and has occurred in the past within the Project Site Area.
Cottage Development	Development of cottage areas north of Manigotagan	Cottages are located along the eastern shore of Lake Winnipeg, west of Manigotagan, across the Manigotagan Bridge, and within 2 km of the Project sand wash and dry facility. The lots range in size; lake-front lots are 35 m x 75 m and back lots are 70 m x 70 m. Refer to Section 4.6.5.3 'Cottages' in the EAP.
Trapping	Licensed trapping of furbearing animals for commercial sale	For the 2018/19 trapping season, seven people received permits for Trapline 1 (Hollow Water First Nation Home Block), eight received permits to trap on Trapline 28 (Manigotagan Community Trapline), and four received permits for Trapline 13 (Hole River and Seymourville Community) (Berezanski, pers. comm. 2019). The majority of the Project Site Area overlaps Trapline 1, while 4.6% of the Project Site area overlaps Trapline 28 (**Figure 3-2**). Trapline 13 begins 5 km east of the Project Site Area boundary. Hollow Water First Nation members can exercise their Treaty Rights to trap, for personal use, within any area (Berezanski, pers. comm. 2019). Trapping activities are more common within the regional area as compared to the Local Project Area, as discussed in the Hollow Water First Nation TEK Report (Appendix G2 of the EAP). Also refer to Section 4.6.4.1 "Trapping" in the EAP.
Hunting	Traditional-subsistence and licensed hunting activities	The Regional Project Area falls within Game Hunting Area (GHA) 26, Moose Conservation Zone, where licensed moose hunting is prohibited (Province of Manitoba n.d.). Prior to the closure of GHA 26 for moose hunting in 2010, licensed moose hunting was limited to two weeks during the winter season, restricted to a bag limit of one bull, and vehicle use was restricted to designated routes (Manitoba Model Forest 2017). Hunting activities are more common within the regional area than in the Local Project Area, as discussed in the Hollow Water First Nation TEK Report (Appendix G2 of

Category of Physical Activities	Specific Physical Activity	Description of Physical Activity
		the EAP). Also refer to Section 4.6.4.2, “Hunting”, in the EAP.
Gathering	Traditional-subsistence plant and berry gathering activities	Plant and berry gathering activities are more common within the regional area than in the Local Project Area, as discussed in the Hollow Water First Nation TEK Report (Appendix G2 of the EAP). Also refer to Section 4.6.4.3, “Plant Use”, and Section 4.6.4.6, “Wild Rice”, in the EAP.
Future Physical Activities that are Certain and Reasonably Foreseeable		
Infrastructure Development	Rice River Road Upgrade	Rice River Road upgrade from km 13 to km 23. Start date anticipated to be summer 2019. This project includes a clearing and crushing contract. The crushing contract includes two identified aggregate quarry sources, to be located at km 15 and km 20 (Papadimitropoulous, pers. comm., 2019).
	Manitoba Hydro (substation upgrades; distribution line upgrades)	• Station upgrade at Pine Falls (Scurrah, pers. comm., 2019). • Potential upgrade of a 66-kV distribution line to Hollow Water First Nation, no current date for this upgrade. No planned transmission projects for 115 kV or above) within the cumulative effects assessment regional area (Scurrah, pers. comm., 2019).
	Groundwater Wells	Additional groundwater wells are expected to be established as future cottage development continues.
Cottage Development	Development of cottage areas in the Regional Project Area	Cottage development and renovation activities are expected on the existing lots owned by developers and cottage owners, and conditionally approved Crown lands allocated for cottage development (Shingler, pers. comm. 2019).
Trapping	Licensed trapping of furbearing animals for commercial sale	Past and present trapping activities are expected to continue into the future within the regional area and will be influenced by fur pricing as is the current situation. Trapping activities within the Local Project Area will be influenced by Project activities (refer to Section 6.6.3.1, “Hunting and Trapping”, in the EAP).
Hunting	Traditional-subsistence and licensed hunting activities	Past and present hunting activities are expected to continue into the future within the regional area. Hunting activities within the Local Project Area will be influenced by Project activities (refer to Section 6.6.3.1 ‘Hunting and Trapping’ in the EAP).
Gathering	Traditional-subsistence and plant and berry gathering activities	Past and present plant and berry gathering activities are expected to continue into the future within the regional area. Plant and berry gathering activities within the Local Project Area will be influenced by Project activities (refer to Section 6.6.3.2 ‘Berry and Plant Gathering’ in the EAP).

3.4.1 Infrastructure Development

Planned infrastructure development in the regional area includes the Rice River Road upgrade from km 13 to km 23. The road upgrade is anticipated to begin in summer 2019. This project includes a clearing and crushing contract. The crushing contract includes two identified aggregate quarry sources, to be located at km 15 and km 20, respectively (Papadimitropoulous, pers. comm. 2019). Road work planned for Pine Falls on PTH 11 has been postponed indefinitely (Mozel, pers. comm. 2019).

A new school is being considered for Hollow Water First Nation, and is currently in the feasibility stage. Funding is anticipated from Frontier School Division and INAC, but not yet confirmed. Therefore, this infrastructure project is not certain at this time and is not listed in **Table 3-4**. Pending funding, it is anticipated that construction of the new school will begin in the next five years within the Hollow Water First Nation reserve community (Seymour pers. comm. 2019).

3.4.2 Cottage Development

Information received from Northern Affairs Branch, Province of Manitoba (Shingler, pers. comm., 2019) has indicated that additional Crown Lands conditionally approved for cottage development are being considered for cottage development within the vicinity of Seymourville, Hollow Water First Nation, and Manigotagan. Lots in that regional area (both lake front and treed) continue to be sold and developed in the existing cottage communities described in Section 4.6.5.3 in the EAP.

3.4.3 Forestry

An Option Licence application has been submitted to Manitoba Sustainable Development to explore forestry development in eastern Manitoba by a First Nation Consortium that comprises Brokenhead Ojibway Nation, Sagkeeng First Nation, Black River First Nation, and Hollow Water First Nation (Mercer, pers. comm. 2019; Manitoba Sustainable Development 2018). The Option Licence area overlaps the Project Site Area, and is currently under consideration by the Province, and if issued does not represent a cutting right (Conrod, pers. comm., 2019). The consortium is also considering a wood chipping plant (Mercer, pers. comm., 2019). A Forest Management Licence for a currently undefined areal extent would then need to be applied for and issued before any harvesting. As indicated in Section 4.6.4.5 (“Forestry”) in the EAP, usable and merchantable timber will be cut and stacked at the Project site for local use as firewood, and/or potentially auctioned for merchantable timber, or both.

Development projects that clear forested lands can have a direct effect on the Annual Allowable Cut (AAC) for the Forest Management Unit (FMU) that they are within. The degree of any effect on the AAC is dependent on size, location, and permanence of the disturbance footprint (Conrod, pers. comm., 2019). During the discussion about the First Nations Consortium with Doug Mercer, Executive Director at the Southeast Resource Development Council (SERDC) and member of Hollow Water First Nation, the idea was raised that the consortium would be able to harvest the trees, prior to quarry activities, for CPS (Mercer, pers. comm., 2019). The pending Option Licence does not guarantee that this initiative will progress past the point of a new Forest Management Licence being issued (Conrod, pers. comm., 2019). Therefore, future forestry activities in the regional area are not certain and have not been included as a ‘Future Physical Activity’ in **Table 3-4**.

3.4.4 Physical Activities Summary

Beyond the CPS Sand Extraction Project, physical activities in the regional assessment area during the past, present, or future that would contribute to cumulative environmental effects are limited to existing

roads and trails, existing transmission and distribution line infrastructure, future road infrastructure upgrades on the Rice River Road, local community water and wastewater treatment upgrades, ongoing and future small-scale quarrying and mineral exploration, and past forestry activities and cottage development. Hunting, trapping, and gathering activities are anticipated to continue.

4. Analysis of Potential Cumulative Effects

The VCs that may be subject to adverse residual Project effects (**Table 3-2**) were evaluated using the scoping and screening process outlined in **Section 3**. Results of the scoping process, including the rationale for screening out or carrying forward VCs for further cumulative effects analysis, are presented in **Appendix D**. The following VCs were identified as requiring further cumulative effects analysis, primarily based on the need for ongoing monitoring (for groundwater, vegetation and air quality) and conservation concern for the regional moose population:

- Groundwater
- Vegetation
- Moose (a specific sub-component of the 'Wildlife' VC)
- Air Quality (specifically dust and GHGs)

Table 4-1 specifies the VCs that have been identified for further cumulative effects analysis, and the past, existing, and future physical activities that are anticipated to potentially affect those VCs.

Table 4-1: VCs Potentially Affected by Past, Present and Future Physical Activities

Physical Activity	VCs Carried Forward for Cumulative Effects Analysis			
	Groundwater	Vegetation	Moose	Air Quality (i.e., dust and GHGs)
Quarrying- and mining-related activities	✓	✓	✓	✓
Infrastructure Development: Roads and trails	✓	✓	✓	✓
Infrastructure Development: Transmission and distribution lines; substation upgrades	✓	✓	✓	✓
Infrastructure Development: Groundwater wells	✓	✓	✓	✓
Infrastructure Development: Water and wastewater supply and treatment facilities	✓	✓	✓	✓
Cottage development	✓	✓	✓	✓
Forestry	✓	✓	✓	✓
Trapping				
Hunting			✓	
Gathering		✓		

For the VCs carried forward for further cumulative effects assessment, **Table 4-2** describes the specific criteria by which the magnitude of adverse cumulative effects are categorized in consideration of the spatial and temporal boundaries described in **Section 3.2** and **3.3**.

Table 4-2: Criteria for Magnitude of Adverse Cumulative Effects for VCs

VC	Magnitude of Adverse Cumulative Effect		
	Low	Moderate	High
Groundwater	Cumulative effects are not expected to be definable, detectable or measurable beyond the existing variability of the baseline condition.	Cumulative effects are expected to have a measurable potential effect that can be detected by the proposed groundwater monitoring program, but changes to groundwater quantity and quality do not exceed regulatory thresholds for acceptable change.	Cumulative effects are expected to have a measurable potential effect that exceeds regulatory thresholds for acceptable change.
Vegetation	Cumulative effects are not likely to result in a significant change to vegetative communities within the Lac Seul Upland Ecoregion.	Cumulative effects are expected to result in a substantial long-term change to vegetative communities within the Lac Seul Upland Ecoregion, but do not exceed regulatory thresholds for acceptable regional change.	Cumulative effects are expected to result in a significant long-term change to vegetative communities within the Lac Seul Upland Ecoregion, and are expected to exceed regulatory thresholds for acceptable regional change.
Moose	Cumulative effects are not likely to have a definable, detectable or measurable potential adverse effect beyond the baseline regional moose population level (i.e., potential effect is within a normal range of variation).	Cumulative effects are expected to have a measurable potential effect that can be detected by the current Manitoba Sustainable Development moose population monitoring program, but is only marginally beyond a threshold of acceptable change.	Cumulative effects are anticipated to be easily observed, measured and described (i.e., readily detectable without a monitoring program), and are well beyond a threshold of acceptable change.
Air Quality (i.e. Dust and GHGs)	Cumulative contributions of GHGs to the global atmosphere are minor and do not result in a detectable increase in GHG accumulations within the global atmosphere. Dust particulate matter (PM_{10} and $PM_{2.5}$) remains below MAAQC at the boundary of the Project Site Area.	Cumulative contributions of GHGs to the global atmosphere result in a measurable increase in GHG accumulations within the global atmosphere, with the potential to have a minor to moderate overall influence to climate change. Dust particulate matter may occasionally exceed MAAQC within 500 m of Project Site Area boundary under worst-case-scenario conditions (e.g., hot, dry weather).	Cumulative contributions of GHGs to the global atmosphere result in a measurable increase in GHG accumulations within the global atmosphere, with the potential to have a substantial overall influence to climate change. Dust particulate matter frequently exceeds MAAQC within the Project Site Area and Local Project Area.

4.1 Groundwater

As described in Section 2.9 'Water Use' of the EAP, groundwater for the processing of silica sand will be sourced from a combination of groundwater, seepage within the active quarry and trucked water, as required, to meet the water needs of the plant (approximately 1,817 m^3/hr). The system will be operated as a closed loop, with makeup requirements (approximately 45 m^3/hr) to compensate for evaporative losses. To minimize seepage and evaporative losses, the quarry area will be limited to approximately 5 ha annually, and will be progressively rehabilitated as mining advances.

As described in Section 6.2.3 'Groundwater' of the EAP, the influence of quarry dewatering and groundwater extraction will locally lower groundwater levels and create a localized cone of depression around the active quarry. The depth and spatial extent of the drawdown cone will be influenced by the depth of the quarry, rate of quarrying/pumping, and proximity to the quarry. Aquifer properties (e.g. transmissivity and storativity) of the aquifer will determine the rate of groundwater discharge to the open quarry. The hydraulic conductivity of the bedrock and storage properties of the bedrock will determine the shape of the drawdown cone and the rate of its development in response to quarrying. Hydrogeotechnial investigations have been initiated to characterize water levels and aquifer properties in the vicinity of the Project Site Area.

Existing groundwater-reliant activities in the vicinity of the Project Site Area include groundwater extraction for domestic purposes and surface water extraction (**Appendix C**). The Hollow Water First Nation obtains water from a surface source, which is located several kilometers from the Project Site Area. Several domestic wells are located adjacent to Lake Winnipeg at a distance of over 1 km from the Project Site Area. Although two wells are reported in the provincial water well database to be closer to the Project Site Area, it is anticipated that the well locations have been incorrectly mapped due to the absence of roads, trails or structures in association with the well location in some cases (**Appendix C**). A field reconnaissance program is planned to verify the presence/absence of water wells that may be potentially affected by the Project.

Although the extent of the drawdown cone surrounding the quarry has not been predicted with exactitude, it would be unlikely for dewatering impacts to extend beyond 500 m beyond the perimeter of the quarry at steady state[2]. Several measures will be applied to mitigate the potential impacts of dewatering and groundwater extraction on local domestic water supply wells. The quarry is surrounded by relatively low permeability bedrock, which will limit the extent of the drawdown cone surrounding the quarry, and the resultant potential for impacts on surrounding well users. The existing domestic water supply wells are largely installed in bedrock, and are associated with cottages adjacent to the shores of Lake Winnipeg. The bedrock aquifer is inferred to be recharged by surface infiltration and recharge to the aquifer along the shores of Lake Winnipeg. As such, the domestic water wells are unlikely to be measurably affected by dewatering. Information from the initiated hydrogeotechnical investigations will be used to predict the potential extent of dewatering impacts surrounding the pit using a numerical groundwater model, if aquifer properties suggest the potential for broader scale impacts.

[2] *Steady-state refers to 'far-future' or 'equilibrium' conditions. It is when the drawdown cone around the quarry has stopped growing in response to development and pumping.*

As outlined in the Closure Plan in Section 8.4 of the EAP, the Project Site will be decommissioned at the end of Project life. Following closure, groundwater levels are anticipated to recover to near predevelopment levels, which would restore regional groundwater flow patterns to be similar to pre-development conditions.

4.2 Vegetation

As described in Section 6.4.1 of the EAP, the total disturbed footprint of the proposed Project during any given year of the life of the Project will be 83 ha, given that annual quarry areas will be limited to an average of 5 ha annually and will undergo progressive rehabilitation and revegetation.The total area to be disturbed over the life of the Project, notwithstanding the annual quarry cell progressive revegetation, will be 353 ha which represents 15% of the 2,289 ha of CPS quarry lease areas, and 0.00002% of the Lac Seul Ecoregion area (Lowe et al. 1996; Smith et al. 1998). Cumulative effects assessments, supported by baseline information about vegetation communities, were completed within Environmental Impact Statements (EISs) for the most recent major developments in the larger regional area, which included an all-season road project between Provincial Road 304 to Berens River (East Side Road Authority 2009) and also between Berens River and Poplar River (Manitoba East Side Road Authority 2016). Cumulative effects assessments for those two major all-season road projects in the regional area indicated that no significant adverse cumulative effects were anticipated for vegetation. Although the total amount of vegetation loss to additional developments in the regional area that were not assessed within these two major road project EISs is not known with precision, AECOM is not aware of any other past, present, or future developments that, when combined with the proposed Project, would likely result in significant adverse cumulative effects on regional vegetation communities.

The revegetation monitoring program for the proposed Project (Section 8.1 of the EAP) will report on the annual progress of revegetation efforts associated with this Project, with follow-up measures applied, as needed, to revegetate the Project footprint area to a condition acceptable by Manitoba Sustainable Development. At the Project end of life (i.e., after 54 years), the Project site will be decommissioned in accordance with a Closure Plan (Section 8.4 of the EAP) that will require the Project footprint to be rehabilitated and revegetated to a natural state.

4.3 Moose

As indicated in Section 4.3.2, ‘Wildlife’ in the EAP, Traditional Knowledge has indicated that moose are not common in the Local and Regional Project Areas. Cumulative effects assessments supported by baseline information regarding moose were included in Environmental Impact Statements for the most recent major developments in the larger regional area, which included an all-season road project between Provincial Road 304 to Berens River (East Side Road Authority 2009) and also between Berens River and Poplar River (Manitoba East Side Road Authority 2016). Cumulative effects assessments of those two major all-season road projects in the regional area indicated that no significant adverse cumulative effects on moose were anticipated in relation to cumulative effects due to habitat loss and fragmentation, hunting, predation, and vehicular collisions. No additional large-scale major projects are planned for the regional area that would result in additional cumulative effects beyond those that have already been assessed for these two major all-season road projects, and this current Project, in the regional area. Although the potential for cumulative effects on moose related to vehicular collisions may increase with the increased truck traffic associated with this proposed Project in combination with the current vehicular traffic on local and regional roads and highways, vehicular collisions with moose are unlikely to result in a

significant effect on the regional moose population, considering the regional moose population is currently low, which has resulted in an on-going licensed moose hunting prohibition in Game Hunting Area 26, within which lies the Local Project Area (see Section 4.6.4.2, 'Hunting', in the EAP). Information regarding existing moose-vehicle collision frequency for the regional Rice River Road has indicated a very low collision rate of only one known moose-vehicle collision during monitoring studies between 2011 and 2016 (Manitoba East Side Road Authority 2016).

4.4 Dust and Greenhouse Gases

As indicated in Section 6.5.1 'Air Quality' in the EAP, adverse effects of dust (particulate matter) generation from Project activities are expected to be minor-to-moderate after application of key mitigation measures. Those measures include a fully enclosed sand wash and dry facility under negative pressure to prevent migration of dust from building openings. The facility ventilation system will include a baghouse designed to remove particulate matter from the air, with a minimum 95% removal efficiency. All sand transport truck access roads will be paved and sand truck loads will be completely sealed with waterproof load covers.

Local and regional gravel roads are the other primary sources of dust within the regional area that would contribute to cumulative local and regional dust emissions. The topic of air quality related to dust emissions was frequently mentioned during the Engagement Program and on-going public inquiries related to this Project. As a result, CPS has committed to mitigation measures and to air-quality monitoring at the Project Site and Local Project Area during the operation phase. The air quality monitoring program will help determine whether the Project is substantially contributing to cumulative adverse effects on air quality. Refer to Section 8.3. 'Air Quality Monitoring' in the EAP for details of the proposed program. Should air quality issues arise that require additional mitigation measures, CPS will engage with Manitoba Sustainable Development to determine appropriate adaptive management strategies to resolve issues as required.

The potential effects on greenhouse gas (GHG) emissions from the proposed Project were described in Section 6.5.3 'Climate/Greenhouse Gases' of the EAP and are further clarified in the response to the CEA Agency additional information request provided in Attachment B of the CPS response letter to CEA Agency, dated February 8, 2019[3]. The construction phase and decommissioning phase have been estimated to generate 929 tonnes and 341 tonnes of CO_2e, respectively. The emissions in these Project phases would not represent a significant overall contribution of GHGs as compared to the 54-year operation phase. During the operation phase, it is estimated that the Project would generate 13,359 tonnes of CO_2e annually, with application of the relevant mitigation measures. This emissions level equates to 0.06% of Manitoba's reported emissions in 2017, which were 20.9 Mt CO_2e. In the context of Canada's 2017 reported emissions of 704 Mt CO_2e, the project would contribute 0.002%. In conclusion, the GHG emissions from the Project are considered minor and a GHG Management Plan or any monitoring, follow-up, and adaptive management further to the existing federal GHG Reporting Program have not been proposed, or required from applicable regulatory authorities to date.

[3] *This Cumulative Effects Assessment Report is 'Attachment A' of the CPS response letter to CEA Agency dated February 8, 2019*

5. Mitigation

The mitigation measures and monitoring programs proposed for this Project, as summarized in Table 6.10 'Summary of Environmental Effects and Mitigation Measures' and Section 8 'Monitoring and Follow-up' in the EAP, are predicted to be sufficient to mitigate adverse cumulative effects on groundwater, vegetation, moose, and air quality (i.e., dust and GHGs), as no such effects were considered significant. The Project will be constructed, operated, and decommissioned in accordance with provisions within an Environment Act Licence, and a Closure Plan approved by Manitoba Sustainable Development. Should deficiencies arise during the Project monitoring programs proposed for revegetation, groundwater and air quality, CPS will engage with Manitoba Sustainable Development to determine adaptive management methods to address unexpected adverse effects and sufficiently mitigate cumulative environmental effects.

6. Significance Conclusions

Based on the cumulative effects assessment criteria described in **Section 3**, the analysis and descriptions of anticipated cumulative effects (**Section 4**) and the mitigation measures summarized in **Section 5** and within Section 6.10 of the EAP and applied for each of the four VCs assessed, adverse cumulative effects on groundwater, vegetation, moose, and air quality (i.e. dust and GHGs) are not expected to be significant. This conclusion and rationale is summarized in **Table 6-1** for each VC and is based on the criteria that adverse cumulative effects are not considered significant if the magnitude of those effects are assessed as being low or moderate in magnitude.

Table 6-1: Cumulative Environmental Effects Significance Conclusions for Groundwater, Vegetation, Moose and Air Quality

VC	Cumulative Effects Analysis	Magnitude of Adverse Cumulative Effect*	Cumulative Effect Significance Conclusion
Groundwater	If on-going hydrogeological testing indicates that groundwater (including seepage to the active quarry) can be sustainably used to meet the water demand of the wash plant process, the use of groundwater may result in a detectable change to groundwater quantity. However, it is not expected to exceed regulatory thresholds for acceptable change. Considering that the water used in the wash plant process will be recycled within a closed-loop system, no water used in the wash-plant process will be discharged to the environment, and the potential for groundwater contamination from plant operations is considered to be negligible. Prior to excavation, overburden strata will be tested and classified to determine the potential for acid drainage and metal leaching. During excavation activities, any overburden strata with pyritic minerals that have the potential to	Moderate	Not Significant

VC	Cumulative Effects Analysis	Magnitude of Adverse Cumulative Effect*	Cumulative Effect Significance Conclusion
	result in acid drainage will be isolated and managed under the direction of a geochemist. This may include placement of materials in a clay-lined pit, and capped with limestone to mitigate the potential for groundwater contamination.		
Vegetation	As indicated in **Section 4.2**, the total area to be disturbed over the life of the Project, notwithstanding the annual quarry cell progressive revegetation, will be 353 ha which represents 15% of the 2,289 ha of CPS quarry lease areas, and 0.00002% of the Lac Seul Ecoregion area. Considering that no uncommon vegetative communities would be potentially affected by the Project, and rural nature of the regional area, which has limited other past, present, and future physical activities that could affect vegetation communities, cumulative effects on vegetative communities in the Lac Seul Uplands Ecoregion are not anticipated to result in a significant change to vegetative communities within the Lac Seul Upland Ecoregion.	Low	Not Significant
Moose	The contribution of the Project to cumulative effects on moose habitat loss, habitat fragmentation, and potential for vehicle-moose collisions is not expected to result in a definable, detectable or measurable effect on the regional moose population in the regional moose GHA 26. This conclusion is based on the application of measures to mitigate adverse effects on wildlife, as described in Section 6.4.2 of the EAP.	Low	Not Significant
Air Quality (i.e. Dust and GHGs)	Results of air quality modelling provided in Appendix E of the EAP have indicated that particulate matter (dust) is unlikely to exceed regulatory thresholds under a “worst-case-scenario” beyond the Local Project Area. However, there may the potential for dust generated by Project activities (quarrying and truck traffic on dry windy days) to contribute to adverse cumulative effects from other sources of dust (local traffic on gravel roads) within the Local Project Area. With on-going air quality monitoring and the application of additional adaptive management mitigations measures should air quality issues arise, significant cumulative effects on air quality resulting from dust are not anticipated. Contributions of Project-generated GHG emissions to the atmosphere during all Project phases is estimated to represent 0.002% of Canada’s 2017 reported emissions of 704 Mt CO_2e, and therefore does not represent a significant contribution to national or global GHG emissions, or significant influence on climate change.	Low (GHGs); Moderate (Dust)	Not Significant

*Definitions for the magnitude of adverse cumulative effects are provided in **Table 4-2**.

7. Follow-up

Considering no significant adverse cumulative effects are anticipated from past, present and reasonably foreseeable future physical activities, it is not expected that follow-up studies will be required. Should the results of monitoring studies proposed in Section 8 'Monitoring and Follow-up' in the EAP indicate that adaptive management measures are required to mitigate unforeseen adverse effects, CPS will consult with Manitoba Sustainable Development to sufficiently address unacceptable adverse effects.

8. Conclusion

In consideration of the spatial and temporal boundaries defined for this cumulative effects assessment, and the past, present and reasonably foreseeable future physical activities with the spatial and temporal boundaries, it was determined that the potential for adverse cumulative effects on groundwater, vegetation, moose and air quality will not be significant. Considering the effects pathways that would affect these valued components are linked to the effects pathways that would potentially affect federal lands, Indigenous peoples, migratory birds and Species at Risk, no significant cumulative effects are anticipated for those components of federal jurisdiction. In summary, the results of this cumulative effect assessment for this Project support a conclusion that significant adverse cumulative effects are not anticipated for any VC, including areas of federal jurisdiction as per section 5 of CEAA 2012, i.e., fish and fish habitat, migratory birds, species at risk, federal lands, lands outside of Canada, and Indigenous peoples.

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Mercer, Doug. January 24, 2019. Phone conversation between Doug Mercer, Executive Director at SERDC, and Crista Gladstone, Community Engagement Specialist with AECOM on January 24, 2019.

Mozel, Kristin. January 8, 2019. Email communications with Kristin Mozel, Ecologist, Manitoba Infrastructure, Province of Manitoba, and Crista Gladstone, Community Engagement Specialist with AECOM on January 8, 2019.

Papadimitropoulous, Prokopis. January 10, 2019. Email communication between Prokopis Papadimitropoulis, Construction/TSE Engineer, Manitoba Infrastructure, Province of Manitoba and Crista Gladstone, Community Engagement Specialist with AECOM on January 10, 2019.

Scurrah, Fiona. January 25, 2019. Email communication between Fiona Scurrah, Senior Environmental Specialist, Manitoba Hydro, and Crista Gladstone, Community Engagement Specialist with AECOM on January 25, 2019.

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AECOM Imagine it. Delivered.

Appendix A

Temporal Distribution of Physical Activities

Appendix A: Temporal Distribution of Projects and Activities

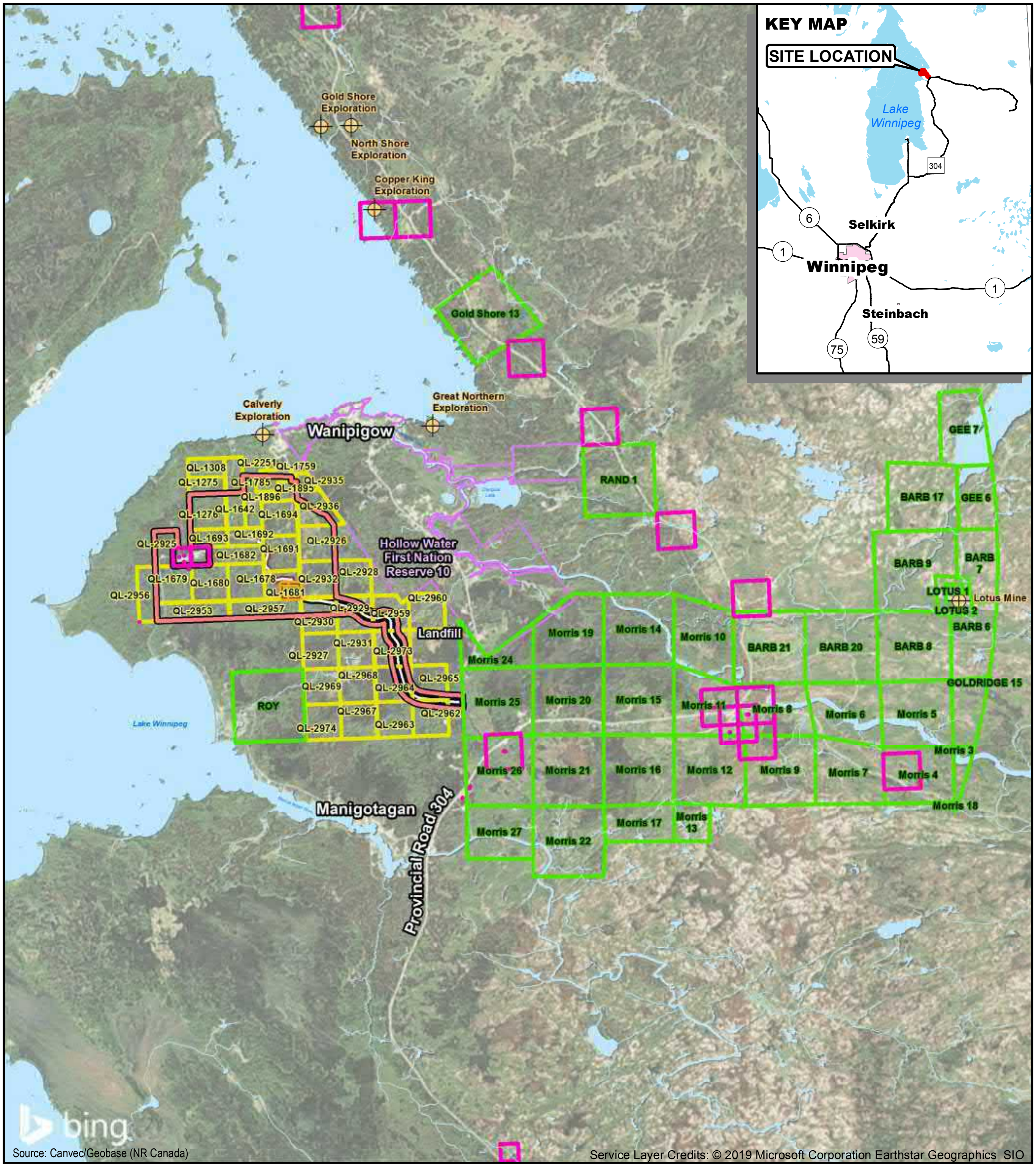
Activities	Pre-Project: 1981-2018	2019 (Project Construction and Initial Production)	2020-2030	2031-2040	2041-2050	2051-2060	2061-2073*
Past, Present or On-going Physical Activities							
Quarrying and mining related activities							
Infrastructure development: Manitoba Infrastructure's all-season road from PR 304 to Berens River communities	Construction completed: 2017	Operation and maintenance					
Infrastructure development: Lake Winnipeg East Transmission Line and existing regional distribution lines	Transmission line construction completed: 2018	Operation and maintenance					
Infrastructure development: Roads and trails within the Project Site area							
Infrastructure development: Groundwater wells							
Infrastructure development: Hollow Water First Nation Lagoon							
Infrastructure development: Seymourville Wastewater Lagoon Upgrades and Associated Works							
Forestry – large scale commercial forestry	Ended in 2009						
Forestry – limited community wood harvesting							
Cottage development							
Trapping							
Hunting							
Gathering							
Future Physical Activities							
Infrastructure development: Rice River Road upgrade							
Infrastructure development: Manitoba Hydro (substation upgrades; distribution line upgrades)							
Infrastructure development: Groundwater wells							
Cottage development							
Trapping							
Hunting							
Gathering							

*Project decommissioning: 2073

	No activity
	Activities contributing to cumulative effects

Appendix B

Regional Mining Claims and Quarry Leases



Project Components
- Sand Wash Plant and Other Infrastructure
- Project Site Area
- Main Access Road
- Access Road for Project Construction and Emergency Use

Mining Claim
- Mining Claim Boundaries
- Exploration Developments

Quarry Leases
- CPS Quarry Lease Boundaries
- Casual Quarry Permits

First Nation
- Hollow Water First Nation Reserve 10

N W E S

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1:130,000
NAD 1983 UTM Zone 14N

ANSI A 215.9mm x 279.4mm
Approved:
Checked:
Designer:
Project Management Initials:
Last saved by: PAIGE.CROSSMAN (2019-01-07) Plotted: Fri Jan 25, 2019
Filename: P:\60581141\900-CAD_GIS\920-929 (GIS-GRAPHICS)\02_MXDS\QUARRYLEASES_MININGCLAIMS\H00X-X_60588114_SEYMOURVILLE_MININGCLAIMS_QUARRYLEASES.MXD

WANIPIGOW SAND EXTRACTION PROJECT
REGIONAL MINING CLAIMS AND QUARRY LEASES
CANADIAN PREMIUM SAND INC.

AECOM

Regional Mining Claims and Quarry Leases

Regional Mining Claims

Claim Name	Mining Claim Number	Permit Holder	Staking Date	Date Recorded	Expiry Date	Hectares
Morris 25	MB13671	Havilah Mining Canada	7-Jan-2019	---	---	256.0
Gold Shore 13	MB10931	John Duvenaud	13-Jun-2012	25-Jun-2012	24-Aug-2019	256.0
Morris 21	MB13668	Havilah Mining Canada	30-Dec-2018	---	---	256.0
Morris 16	MB13664	Havilah Mining Canada	29-Dec-2018	---	---	256.0
Morris 11	MB13658	Havilah Mining Canada	27-Dec-2018	---	---	256.0
Morris 7	MB13653	Havilah Mining Canada	26-Dec-2018	---	---	256.0
Morris 9	MB13655	Havilah Mining Canada	27-Dec-2018	---	---	256.0
Morris 6	MB13652	Havilah Mining Canada	26-Dec-2018	---	---	256.0
GOLDRIDGE 15	MB5455	Havilah Mining Canada	17-Mar-2004	2-Apr-2004	1-Jun-2019	256.0
Morris 22	MB13669	Havilah Mining Canada	2-Jan-2019	---	---	256.0
BARB 9	MB11233	Madeira Resources Ltd.	26-Oct-2014	27-Oct-2014	26-Dec-2019	243.0
Morris 24	MB13670	Havilah Mining Canada	7-Jan-2019	---	---	105.0
Morris 15	MB13663	Havilah Mining Canada	29-Dec-2018	---	---	256.0
RAND 1	MB12052	Randall Gary Ducharme	22-Sep-2016	20-Oct-2016	19-Dec-2018	256.0
Morris 13	MB13661	Havilah Mining Canada	28-Dec-2018	---	---	64.0
Morris 10	MB13657	Havilah Mining Canada	26-Dec-2018	---	---	256.0
BARB 20	MB12337	DLM Gold Ventures Inc.	17-Sep-2017	4-Oct-2017	3-Dec-2019	256.0
BARB 6	MB10431	Madeira Resources Ltd.	21-Jul-2011	4-Aug-2011	3-Oct-2019	208.0
BARB 21	MB12338	DLM Gold Ventures Inc.	8-Dec-2017	20-Dec-2017	18-Feb-2020	256.0
LOTUS 1	W53445	Peter C. Dunlop	4-Oct-1993	5-Oct-2093	4-Dec-2030	16.0
ROY	MB12333	William Kuran	7-Apr-2017	12-Apr-2017	11-Jun-2019	256.0
Morris 27	MB13673	Havilah Mining Canada	3-Jan-2019	---	---	192.0
Morris 8	MB13654	Havilah Mining Canada	27-Dec-2018	---	---	256.0
Morris 4	MB13650	Havilah Mining Canada	16-Dec-2018	---	---	256.0
BARB 7	MB10435	Madeira Resources Ltd.	27-Jul-2011	4-Aug-2011	3-Oct-2019	224.0
Morris 17	MB13665	Havilah Mining Canada	28-Dec-2018	---	---	128.0
Morris 20	MB13667	Havilah Mining Canada	30-Dec-2018	---	---	256.0
Morris 19	MB13666	Havilah Mining Canada	30-Dec-2018	---	---	220.0
Morris 14	MB13662	Havilah Mining Canada	29-Dec-2018	---	---	256.0
Morris 12	MB13660	Havilah Mining Canada	28-Dec-2018	---	---	256.0
Morris 5	MB13651	Havilah Mining Canada	15-Dec-2018	---	---	256.0
BARB 8	MB11234	Madeira Resources Ltd.	25-Oct-2014	27-Oct-2014	26-Dec-2019	240.0
Morris 3	MB13649	Havilah Mining Canada	14-Dec-2018	---	---	184.0
GEE 6	MB9740	Golden Eye Exploration Inc.	24-Sep-2010	28-Sep-2010	27-Nov-2019	180.0
Morris 26	MB13672	Havilah Mining Canada	7-Jan-2019	---	---	256.0
BARB 17	MB10494	Madeira Resources Ltd.	3-Oct-2011	27-Oct-2011	26-Dec-2019	256.0
Morris 18	MB13659	Havilah Mining Canada	12-Jan-2019	---	---	56.0
LOTUS 2	W53446	Peter C. Dunlop	4-Oct-1993	5-Oct-2093	4-Dec-2025	48.0
GEE 7	MB9741	Golden Eye Exploration Inc.	26-Sep-2010	28-Sep-2010	27-Nov-2019	256.0

Source: Manitoba Mineral Resources. 2019: Mining Claims, Manitoba; in Map Gallery – Geoscientific Maps, Manitoba Mineral Resources, URL <https://web33.gov.mb.ca/mapgallery/mgm-md.html> (downloaded January 1, 2019).

Regional Casual Quarry Permits

Permit Number	Permit Holder	Status	Issue Date	Expiry Date
CP-2011-820	Dan's Excavating Ltd.	Concluded	14-Sep-2011	30-Nov-2011
CP-2011-052	Ray-Ann Transport Ltd.	Concluded	3-Mar-2011	30-Nov-2011
CP-2010-384	John Prymak Trucking	Concluded	31-May-2010	30-Nov-2010
CP-2014-1005597	Manigotago Bay Inc.	Withdrawn	---	30-Nov-2014
CP-2018-1013142	Gord's Hauling	Issued	8-May-2018	30-Nov-2018
CP-2010-0067	Glacier North Limited	Concluded	4-Mar-2010	30-Nov-2010
CP-2018-1013364	Hapel, Karsten	Issued	18-May-2018	30-Nov-2018
CP-2014-1004265	East Side Road Authority	Concluded	14-Jan-2014	31-Dec-2014
CP-2012-1001378	East Side Road Authority	Withdrawn	---	30-Nov-2012
CP-2011-661	Pelican Harbour Resorts Ltd.	Outstanding	7-Jul-2011	30-Nov-2011
CP-2018-1013285	John Prymak Trucking	Issued	22-May-2018	30-Nov-2018
CP-2018-1013362	Macauley, Colin	Issued	18-May-2018	30-Nov-2018
CP-2010-850	Strilkiwski Contracting Ltd.	Concluded	25-Nov-2010	31-Dec-2010
CP-2014-1004261	East Side Road Authority	Concluded	14-Jan-2014	31-Dec-2014
CP-2018-1012316	Manitoba Infrastructure - Remote Road Operations	Concluded	28-Feb-2018	30-Nov-2018
CP-2011-285	Manitoba Infrastructure & Transportation (Steinbach)	Concluded	21-Apr-2011	30-Nov-2011
CP-2014-1004263	East Side Road Authority	Concluded	14-Jan-2014	31-Dec-2014
CP-2019-1013757	Manitoba Infrastructure - Remote Road Operations	Pending	---	30-Nov-2019
CP-2009-155	Manitoba Infrastructure & Transportation (Steinbach)	Concluded	19-Mar-2009	30-Nov-2009
CP-2015-1007911	Glacier North Limited	Concluded	1-Oct-2015	31-Dec-2015
CP-2018-1012146	Lawrence Hadiken	Issued	25-Apr-2018	30-Nov-2018
CP-2018-1013430	Ray-Ann Transport Ltd.	Issued	18-Jun-2018	30-Nov-2018
CP-2018-1013389	Hawker's Hauling Ltd.	Issued	22-May-2018	30-Nov-2018
CP-2018-1013136	Manigotago Bay Inc.	Issued	8-May-2018	30-Nov-2018
CP-2010-0080	Glacier North Limited	Concluded	4-Mar-2010	30-Nov-2010
CP-2010-0071	Glacier North Limited	Concluded	4-Mar-2010	30-Nov-2010
CP-2010-642	Hawker's Hauling Ltd.	Concluded	5-Jul-2010	31-Dec-2010
CP-2009-154	Manitoba Infrastructure & Transportation (Steinbach)	Concluded	19-Mar-2009	30-Nov-2009
CP-2018-1012434	Hawker's Hauling Ltd.	Issued	12-Apr-2018	30-Nov-2018
CP-2018-1012541	Strilkiwski Contracting Ltd.	Concluded	11-May-2018	30-Nov-2018
CP-2012-1000852	Glacier North Limited	Withdrawn	---	30-Nov-2012
CP-2011-774	Seymourville Development Corporation	Outstanding	9-Aug-2011	30-Nov-2011
CP-2009-9004	Ray-Ann Transport Ltd.	Unauthorized	---	---
CP-2009-616	Pelican Harbour Resorts Ltd.	Concluded	2-Jul-2009	30-Nov-2009
CP-2017-1011552	Ivon Saber	Unauthorized	---	30-Nov-2017
CP-2009-152	Manitoba Infrastructure & Transportation (Steinbach)	Concluded	18-Mar-2009	30-Nov-2009
CP-2019-1013686	Manitoba Infrastructure - Remote Road Operations	Pending	---	30-Nov-2019
CP-2019-1013685	Manitoba Infrastructure - Remote Road Operations	Pending	---	30-Nov-2019
CP-2012-1000847	Glacier North Limited	Concluded	6-Mar-2012	30-Nov-2012
CP-2010-116	Manitoba Infrastructure & Transportation (Steinbach)	Concluded	10-Mar-2010	30-Nov-2010
CP-2010-117	Manitoba Infrastructure & Transportation (Steinbach)	Concluded	10-Mar-2010	30-Nov-2010
CP-2019-1013874	Infrastructure-Region 1 (Steinbach)	Pending	---	30-Nov-2019
CP-2009-626	Ivon Saber	Concluded	7-Jul-2009	30-Nov-2009
CP-2011-246	John Prymak Trucking	Concluded	5-Apr-2011	30-Nov-2011
CP-2010-262	Glacier North Limited	Concluded	28-Feb-2010	30-Nov-2010
CP-2018-1012433	Hawker's Hauling Ltd.	Issued	12-Apr-2018	30-Nov-2018
CP-2011-284	Manitoba Infrastructure & Transportation (Steinbach)	Concluded	26-Apr-2011	30-Nov-2011

Permit Number	Permit Holder	Status	Issue Date	Expiry Date
CP-2015-1007910	Glacier North Limited	Concluded	1-Oct-2015	31-Dec-2015
CP-2010-672	Ray-Ann Transport Ltd.	Concluded	13-Jul-2010	30-Nov-2010
CP-2018-1012377	Ray-Ann Transport Ltd.	Issued	3-Apr-2018	30-Nov-2018
CP-2018-1012430	Hawker's Hauling Ltd.	Issued	12-Apr-2018	30-Nov-2018
CP-2010-0077	Glacier North Limited	Concluded	4-Mar-2010	30-Nov-2010
CP-2010-849	Strilkiwski Contracting Ltd.	Concluded	25-Nov-2010	31-Dec-2010
CP-2010-113	Manitoba Infrastructure & Transportation (Steinbach)	Concluded	10-Mar-2010	30-Nov-2010
CP-2018-1013661	Manitoba Infrastructure - Remote Road Operations	Unauthorized	---	30-Nov-2018
CP-2018-1013663	Manitoba Infrastructure - Remote Road Operations	Unauthorized	---	30-Nov-2018
CP-2018-1013662	Manitoba Infrastructure - Remote Road Operations	Unauthorized	---	30-Nov-2018
CP-2011-159	Strilkiwski Contracting Ltd.	Concluded	23-Mar-2011	30-Nov-2011
CP-2011-798	Lawrence Hadiken	Concluded	9-Aug-2011	30-Nov-2011
CP-2010-0068	Glacier North Limited	Concluded	4-Mar-2010	30-Nov-2010
CP-2012-1002216	Community of Loon Straits	Issued	12-Oct-2012	30-Nov-2012
CP-2009-625	Ivon Saber	Concluded	7-Jul-2009	30-Nov-2009
CP-2010-505	Pelican Harbour Resorts Ltd.	Concluded	21-Jun-2010	30-Nov-2010
CP-2018-1012671	Dan's Excavating Ltd.	Issued	13-Apr-2018	30-Nov-2018
CP-2010-0072	Glacier North Limited	Concluded	25-Feb-2010	30-Nov-2010
CP-2019-1013881	Infrastructure-Region 1 (Steinbach)	Pending	---	30-Nov-2019
CP-2016-1010054	Hollow Water First Nation	Withdrawn	---	30-Nov-2016
CP-2009-605	Hawker's Hauling Ltd.	Concluded	3-Jul-2009	30-Nov-2009
CP-2010-612	Manitoba Infrastructure & Transportation (Steinbach)	Concluded	30-Jun-2010	30-Nov-2010
CP-2010-643	Hawker's Hauling Ltd.	Concluded	5-Jul-2010	31-Dec-2010
CP-2019-1013873	Infrastructure-Region 1 (Steinbach)	Pending	---	30-Nov-2019
CP-2019-1013759	Manitoba Infrastructure - Remote Road Operations	Pending	---	30-Nov-2019
CP-2010-599	Ivon Saber	Concluded	25-Jun-2010	30-Nov-2010
CP-2012-1002156	Leo Boulanger	Concluded	---	30-Nov-2012
CP-2010-260	Glacier North Limited	Concluded	28-Apr-2010	30-Nov-2010
CP-2019-1013687	Manitoba Infrastructure - Remote Road Operations	Issued	17-Jan-2019	30-Nov-2019
CP-2016-1008341	East Side Road Authority	Withdrawn	---	30-Nov-2016
CP-2013-1003728	Ivon Saber	Unauthorized	---	30-Nov-2013
CP-2019-1013758	Manitoba Infrastructure - Remote Road Operations	Pending	---	30-Nov-2019
CP-2010-851	Strilkiwski Contracting Ltd.	Concluded	25-Nov-2010	31-Dec-2010
CP-2016-1010023	Manitoba Hydro (Property)	Withdrawn	---	30-Nov-2016
CP-2018-1012315	Manitoba Infrastructure - Remote Road Operations	Concluded	8-Mar-2018	30-Nov-2018
CP-2009-604	Hawker's Hauling Ltd.	Concluded	3-Jul-2009	30-Nov-2009
CP-2017-1011062	Strilkiwski Contracting Ltd.	Concluded	22-Feb-2017	30-Nov-2017

Source: Manitoba Mineral Resources. 2019: Casual Quarry Leases, Manitoba; in Map Gallery – Geoscientific Maps, Manitoba Mineral Resources, URL <https://web33.gov.mb.ca/mapgallery/mgm-md.html> (downloaded January 1, 2019).

Regional Quarry Leases

Quarry Lease Number	Lease Holder	Status	Issue Date	Expiry Date
QL-2925	Claim Post Resources Inc. (now Canadian Premium Sand Inc.)	Pending	---	---
QL-1276	Claim Post Resources Inc.	Issued	16-Jul-1996	15-Aug-2019
QL-1682	Claim Post Resources Inc.	Issued	20-Jun-2003	20-Jul-2019
QL-1678	Claim Post Resources Inc.	Issued	20-Jun-2003	20-Jul-2019
QL-1691	Claim Post Resources Inc.	Issued	24-Sep-2003	24-Oct-2019
QL-2967	Claim Post Resources Inc.	Pending	---	---
QL-2964	Claim Post Resources Inc.	Pending	---	---
QL-2469	Larry Barker	Issued	16-May-2011	15-Jun-2017
QL-1694	Claim Post Resources Inc.	Issued	24-Sep-2003	24-Oct-2019
QL-1681	Claim Post Resources Inc.	Issued	20-Jun-2003	20-Jul-2019
QL-2935	Claim Post Resources Inc.	Issued	16-Jun-2016	16-Jul-2019
QL-2930	Claim Post Resources Inc.	Pending	---	---
QL-2936	Claim Post Resources Inc.	Issued	16-Jun-2016	16-Jul-2019
QL-580	Aarticulate Enterprises	Issued	19-Jun-1992	19-Jul-2019
QL-1275	Claim Post Resources Inc.	Issued	16-Jul-1996	15-Aug-2019
QL-1680	Claim Post Resources Inc.	Issued	20-Jun-2003	20-Jul-2019
QL-2953	Claim Post Resources Inc.	Pending	---	---
QL-1785	Claim Post Resources Inc.	Issued	25-May-2005	24-Jun-2019
QL-1692	Claim Post Resources Inc.	Issued	24-Sep-2003	24-Oct-2019
QL-2929	Claim Post Resources Inc.	Pending	---	---
QL-2962	Claim Post Resources Inc.	Pending	---	---
QL-1642	Claim Post Resources Inc.	Issued	26-Jun-2002	26-Jul-2019
QL-2969	Claim Post Resources Inc.	Pending	---	---
QL-2974	Claim Post Resources Inc.	Pending	---	---
QL-579	Aarticulate Enterprises	Issued	19-Jun-1992	19-Jul-2019
QL-2736	Glacier North Limited	Issued	21-Jun-2013	21-Jul-2019
QL-1896	Claim Post Resources Inc.	Issued	16-Apr-2007	16-May-2019
QL-1759	Claim Post Resources Inc.	Issued	10-Dec-2004	9-Jan-2020
QL-2931	Claim Post Resources Inc.	Pending	---	---
QL-1679	Claim Post Resources Inc.	Issued	20-Jun-2003	20-Jul-2019
QL-2957	Claim Post Resources Inc.	Pending	---	---
QL-1895	Claim Post Resources Inc.	Issued	21-Mar-2007	20-Apr-2019
QL-2926	Claim Post Resources Inc.	Pending	---	---
QL-2932	Claim Post Resources Inc.	Pending	---	---
QL-2973	Claim Post Resources Inc.	Pending	---	---
QL-2960	Claim Post Resources Inc.	Pending	---	---
QL-2961	Claim Post Resources Inc.	Pending	---	---
QL-2965	Claim Post Resources Inc.	Pending	---	---
QL-1308	Claim Post Resources Inc.	Issued	3-Mar-1997	2-Apr-2019
QL-1693	Claim Post Resources Inc.	Issued	24-Sep-2003	24-Oct-2019
QL-2968	Claim Post Resources Inc.	Pending	---	---
QL-2959	Claim Post Resources Inc.	Pending	---	---
QL-2963	Claim Post Resources Inc.	Pending	---	---
QL-2685	Ray-Ann Transport Ltd.	Issued	14-Nov-2012	14-Dec-2018
QL-2251	Claim Post Resources Inc.	Issued	16-Oct-2009	16-Oct-2019
QL-2927	Claim Post Resources Inc.	Pending	---	---
QL-2928	Claim Post Resources Inc.	Pending	---	---

Source: Manitoba Mineral Resources. 2019: Quarry Leases and Surface Quarry Leases, Manitoba; in Map Gallery – Geoscientific Maps, Manitoba Mineral Resources, URL <https://web33.gov.mb.ca/mapgallery/mgm-md.html> (downloaded January 1, 2019).

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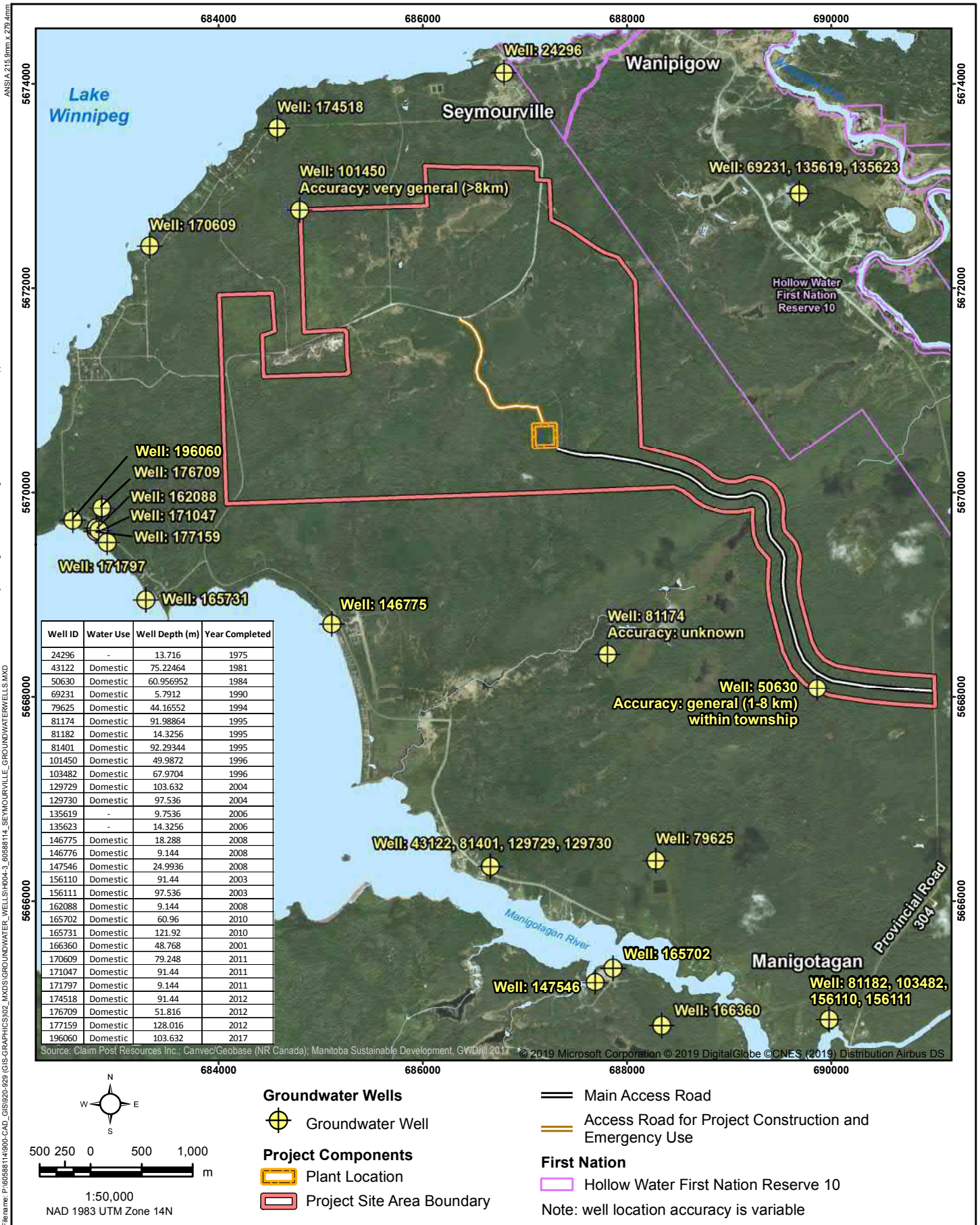
Appendix C

Updated Groundwater Wells Figure 4-3 from EAP



Well ID	Water Use	Well Depth (m)	Year Completed
24296	-	13.716	1975
43122	Domestic	75.22464	1981
50630	Domestic	60.956952	1984
69231	Domestic	5.7912	1990
79625	Domestic	44.16552	1994
81174	Domestic	91.98864	1995
81182	Domestic	14.3256	1995
81401	Domestic	92.29344	1995
101450	Domestic	49.9872	1996
103482	Domestic	67.9704	1996
129729	Domestic	103.632	2004
129730	Domestic	97.536	2004
135619	-	9.7536	2006
135623	-	14.3256	2006
146775	Domestic	18.288	2008
146776	Domestic	9.144	2008
147546	Domestic	24.9936	2008
156110	Domestic	91.44	2003
156111	Domestic	97.536	2003
162088	Domestic	9.144	2008
165702	Domestic	60.96	2010
165731	Domestic	121.92	2010
166360	Domestic	48.768	2001
170609	Domestic	79.248	2011
171047	Domestic	91.44	2011
171797	Domestic	9.144	2011
174518	Domestic	91.44	2012
176709	Domestic	51.816	2012
177159	Domestic	128.016	2012
196060	Domestic	103.632	2017

N
W
E
S

500 250 0 500 1,000 m

1:50,000
NAD 1983 UTM Zone 14N

Groundwater Wells
- Groundwater Well

Project Components
- Plant Location
- Project Site Area Boundary

- Main Access Road
- Access Road for Project Construction and Emergency Use

First Nation
- Hollow Water First Nation Reserve 10

Note: well location accuracy is variable

ANSI A 215.9mm x 279.4mm
Approved:
Checked:
Project Management Initials: Designer:
Last Plotted: Mon Feb 04, 2019
Last saved by: PAIGE.CROSSMAN (2019-02-04)
Filename: P:\60588114\900-CAD_GIS\920-929 (GIS-GRAPHICS)\02_MXDS\GROUNDWATER_WELLS\H004-3_60588114_SEYMOURVILLE_GROUNDWATERWELLS.MXD

WANIPIGOW SAND EXTRACTION PROJECT
GROUNDWATER WELLS
CANADIAN PREMIUM SAND INC.

AECOM

Figure: 4-3

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Appendix D

VC Screening for Cumulative Effects

VC	Cumulative Effects Analysis Screening Summary Screening Criteria[a] Considered: • If the VC is affected by residual effects of the Project • Likely to be adversely affected by other past, present or future physical activities within the spatial and temporal boundaries defined in Section 3.2 and 3.3?[b] • Potential for significant adverse cumulative effects to the VC after application of mitigation measures? • High level of concern expressed through the Engagement Program? • Need for additional monitoring program or follow-up?	VC Carried Forward for Further Cumulative Effects Analysis?[c]
Groundwater	Potential residual effects of the Project on groundwater quantity combined with known current use of the groundwater resource as indicated by provincial groundwater well records, particularly use by local cottage owners in the Local Project Area, has indicated that hydrogeotechnical testing of the groundwater resource is required to confirm the sustainability of the use of groundwater for Project processes during Project operation. Groundwater quantity and quality has been a topic raised during the Engagement Program and will require additional information from hydrogeotechnical testing of the groundwater resource during February and March 2019 to confirm if the resource can be sustainably used for Project process and if water seepage into the annually active quarry will potentially affect groundwater quality and shallow groundwater levels in the Local and Regional Project Areas. Although CPS will use alternative licenced water sources for process water if use of the groundwater resource proves not sustainable, groundwater seepage into the annually active quarry may potentially result in water drawdown of the shallow groundwater table which may result in adverse effects to some Local and Regional Project Area wetlands by potentially lowering or dewatering water levels in some wetlands.	**Yes**
Surface Water Quality	The Project will result in minor residual effects to surface water due to the creation of ditches, and culverts as needed, to direct water runoff at the Project Site and equalize water flow on either side of the proposed access roads. Surface run-off water that would otherwise seep into the ground or run-off into low-lying areas will be re-directed at the Project Site. During all Project phases, erosion and sediment control measures will be applied to minimize potential residual effects to surface water quality from the Project, which are not expected to combine with effects to surface water from other past, present or future physical activities. During excavation activities, any overburden strata with pyritic minerals that have the potential to result in acid drainage will be isolated and managed under the direction of a geochemist. This may include placement of materials in a clay-lined pit, and capped with limestone to mitigate the potential for groundwater contamination. Directing water runoff at the Project Site in the vicinity of the active quarry into the active quarry pit for pumping into the sand wash processing facility will mitigate the potential for runoff water flow beyond the Project Site area. Therefore no additional mitigation or monitoring programs are required for surface water and the potential for significant adverse cumulative effects is considered to be mitigated.	**No**
Fish and Fish Habitat	Considering the environmental assessment within the EAP for this Project has determined that there will be no residual environment effects of the Project on fish and fish habitat (refer to Sections 4.2.2 and 6.3.2 of the EAP), fish and fish habitat have been screened out of this cumulative impact assessment.	**No**
Vegetation	The maximum extent of vegetation clearing that will occur over the life of the Project will be 353 ha which represents 0.00002% of the Lac Seul Ecoregion area, and will affect vegetation communities that are common to this ecoregion. Past, present and future physical activities that have affected or will affect vegetative communities in the ecoregion are limited due to the rural nature of the region and are largely limited to roadways, small local communities and cottage developments with a total Regional Project Area population of less than 1000 people (Section 4.6.1 'Demographic Profile' of the EAP). These physical activities combined have not resulted in significant cumulative vegetation community losses within the Lac Seul Ecoregion. CPS has committed to annual progressive rehabilitation and	**Yes**

VC	Cumulative Effects Analysis Screening Summary Screening Criteria[a] Considered: • If the VC is affected by residual effects of the Project • Likely to be adversely affected by other past, present or future physical activities within the spatial and temporal boundaries defined in Section 3.2 and 3.3?[b] • Potential for significant adverse cumulative effects to the VC after application of mitigation measures? • High level of concern expressed through the Engagement Program? • Need for additional monitoring program or follow-up?	VC Carried Forward for Further Cumulative Effects Analysis?[c]
	revegetation of each annual quarry cell and has committed to implementing a revegetation monitoring program. Monitoring of revegetation of quarry sites, and revegetation of the Project footprint area at the end of the life of the Project in accordance with a Closure Plan, will be important to mitigate adverse effects to Species at Risk, migratory birds and Indigenous people. Feedback from the Engagement Program has also emphasized the importance of restoration and successful revegetation of the land.	
Wildlife (including migratory birds)	Mitigation measures proposed for this Project to minimize adverse effects to vegetative communities, and contribution to cumulative effects of regional vegetation impacts, are expected to sufficiently mitigate adverse effects to migratory birds. Regarding other wildlife in the Project Regional Area and Lac Seul Upland Ecoregion, the regional moose population is low and is currently being managed by Manitoba Sustainable Development through a hunting restriction within the Game Hunting Area that overlaps with the Project Site Area and Regional Project Area. The low regional moose population is an on-going concern for local and regional communities. Mitigation measures proposed for this Project to mitigate adverse effects to wildlife (Section 6.4.2 of the EAP), in conjunction with the continued Manitoba Sustainable Development hunting restriction for Game Hunting Area #26, is considered sufficient to mitigate the potential for significant adverse effects to moose. However, continuation of the on-going regional moose population monitoring by Manitoba Sustainable Development is recommended.	**Yes - Moose**
Species of Conservation Concern	Seven Species at Risk (as defined within the EAP) have been identified as having a low to moderate or high probability of occurrence within the Project Site Area (Section 4.3.3 'Species of Conservation Concern' in the EAP). Habitat for species of conservation concern, including Species at Risk listed under the *Species at Risk Act*, is not limited in the Project Regional Area or Lac Seul Upland Ecoregion. Potential Project impacts to Species at Risk were not identified as a key concern expressed by local communities during the Engagement Program or during on-going Project-related meetings with provincial regulators. Mitigation measures proposed for this Project to minimize adverse effects to vegetative communities are expected to sufficiently mitigate adverse cumulative effects to species of conservation concern.	**No**
Air Quality	The potential for dispersion of particulate matter (dust) and potential for adverse effects, including cumulative effects, to people has been a topic consistently raised during the Engagement Program. The results of air quality modeling provided in Appendix E of the EAP has suggested that particular matter generated from Project activities may exceed Manitoba Ambient Air Quality Criteria within 500 m of the Project Site Area boundary under worst-case-scenario conditions (i.e. hot, dry weather). Therefore, CPS will implement an air quality monitoring program and apply follow-up measures to mitigate adverse levels of dust as required.	**Yes – Dust and Greenhouse Gases**
Noise	The potential for noise at nearby receptors and potential for adverse effects, including cumulative effects, to people has been a topic consistently raised during the Engagement Program. However, the results of a noise impact assessment (Appendix F of the EAP) have predicted that the daytime and nighttime 1-hour, and day-night equivalent sound levels will meet the Manitoba Guidelines for Sound Pollution at nearest points of reception. CPS will engage with the local community to determine feasible solutions to adaptively manage noise levels resulting from Project	**No**

VC	Cumulative Effects Analysis Screening Summary Screening Criteria[a] Considered: • If the VC is affected by residual effects of the Project • Likely to be adversely affected by other past, present or future physical activities within the spatial and temporal boundaries defined in Section 3.2 and 3.3?[b] • Potential for significant adverse cumulative effects to the VC after application of mitigation measures? • High level of concern expressed through the Engagement Program? • Need for additional monitoring program or follow-up?	VC Carried Forward for Further Cumulative Effects Analysis?[c]
	activities should complaints be brought to the attention of CPS.	
Climate/Greenhouse Gases	The federal government's plan to combat climate change includes a Pan-Canadian Framework to meet established emissions reduction targets while growing the economy and building resilience to a changing climate. It is expected that the potential for cumulative impacts of GHGs generated by a proposed Project would warrant adequate assessment, and review by the current federal government.	**No**
Land and Resource Use	Results of a previous Traditional Ecological Knowledge (TEK / Indigenous Knowledge) regional study has indicated that land and resource use by the local Indigenous community, including Métis people, is more frequent in regional areas outside of the Local Project Area (Appendix G2 of the EAP). Therefore, the proposed Project is not likely to significantly contribute to cumulative adverse environmental effects that may potentially affect Indigenous land and resource use. Mitigation measures listed within the EAP for the protection of the physical environment (Section 6.2), the aquatic environment (Section 6.3), the terrestrial environment (Section 6.4), and the atmospheric environment (Section 6.4), combined with monitoring and follow-up (Section 8), are expected to sufficiently mitigate potential adverse cumulative effects on land and resource use.	**No**
Human Health and Well-being	Potential adverse cumulative effects to human health and well-being are linked to cumulative adverse effects associated with air quality, noise, increased truck traffic, potential effects to groundwater, reduced access to land and resource use and disruption to natural areas which is contrary to the Indigenous traditional teachings and respect for the land. Mitigation measures listed within the EAP for the protection of the physical environment (Section 6.2), the aquatic environment (Section 6.3), the terrestrial environment (Section 6.4), and the atmospheric environment (Section 6.4), combined with monitoring and follow-up (Section 8), are expected to sufficiently mitigate potential adverse cumulative effects on human health and well-being.	**No**
Effects on Indigenous and Treaty Right	Collective local support has been expressed for the Project, during its exploration phase, in the form of Memorandums of Understanding between CPS and the Incorporated Community of Seymourville, and CPS and Hollow Water First Nation. Additionally, letters of support have been issued for the Project by the local communities of Seymourville, Manigotagan, Aghaming and Hollow Water First Nation (Appendix L of the EAP). CPS has also entered into an Economic Participation Agreement with Hollow Water First Nation, on November 22, 2018, that provides for various economic and social benefits and opportunities, including employment, contracting and training initiatives (Appendix M of the EAP). With respect to the Economic Participation Agreement with CPS, Hollow Water First Nation has acknowledged in a letter dated December 6, 2018 to Manitoba Sustainable Development that the Project operation activities will be taking place within Hollow Water First Nation's Home Block lands (Appendix M of the EAP). Additionally, CPS and the governments of Seymourville and Manigotagan have agreed in principal on the essential terms of separate Participation Agreements, and are currently finalizing documentation for these agreements. The	**No**

VC	Cumulative Effects Analysis Screening Summary Screening Criteria[a] Considered: • If the VC is affected by residual effects of the Project • Likely to be adversely affected by other past, present or future physical activities within the spatial and temporal boundaries defined in Section 3.2 and 3.3?[b] • Potential for significant adverse cumulative effects to the VC after application of mitigation measures? • High level of concern expressed through the Engagement Program? • Need for additional monitoring program or follow-up?	VC Carried Forward for Further Cumulative Effects Analysis?[c]
	Project Site is not within a Traditional Territory of any other Regional Project Area First Nation including the Little Black River, Sagkeeng and Bloodvein First Nations. Therefore, no adverse cumulative effects on Indigenous and Treaty Rights are anticipated.	
Heritage Resources	Results of a Heritage Resource Impact Assessment (HRIA) conducted within the Project Site Area from November 1 to 8, 2018, indicated that no archaeological artifacts or features were identified (Appendix I of the EAP). Therefore, the potential for the Project to contribute to cumulative adverse effects to heritage resources is considered to be minor. Measures that will be applied to mitigate potential adverse effects to heritage resources, including those that may result from the discovery of unknown heritage resources, are outlined in Section 6.6.7 of the EAP.	**No**

[a] Refer to VC scoping criteria in Section 3.
[b] Refer to Section 3.4 for lists of past, present and future physical activities and potential effects to VCs.
[c] Refer to Section 4 for the analyses of cumulative effects on VCs that have been carried forward for cumulative effects analyses.

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Table 1, Attachment D

Traffic Memorandum

AECOM Canada Ltd.
99 Commerce Drive
Winnipeg, MB R3P 0Y7
Canada

T: 204 477 5381
F: 204 284 2040
www.aecom.com

To: Marlene Gifford

Date: March 12, 2019
Project #: 60588114
From: James McCutchon

cc: Cliff Samoiloff
Kevin Rae
Bob Archibald

Memorandum

Subject: **Response to Traffic Concerns from the Technical Advisory Committee (TAC) and Public Review of the Environment Act Proposal for the Canadian Premium Sand Inc. (CPS) Project - FINAL**

1. Purpose

To provide responses to comments received regarding traffic concerns associated with the proposed CPS Wanipigow Sand Extraction Project.

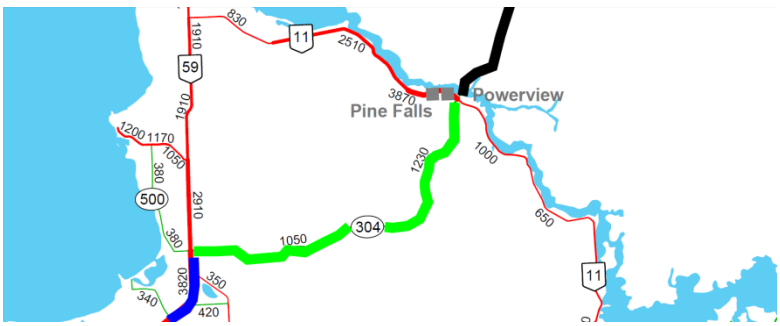
2. Increased Traffic on Roads and Highways

In the local area near the proposed Project Site, it is anticipated that site generated traffic due to the Project operations is estimated to be comprised of 35 light vehicles (FHWA Class 6 [3 axle single unit and below]) during the peak hour entering and exiting the proposed Project main access road off of Hollow Water Road. Traffic will access the Project Site from PR 304 from the northeast and southwest.

Sand product hauling operations will utilize FHWA Class 13 (7 or 8 axles, multi-trailers) and will haul south and west on PR 304 to PTH 59 and then south to Winnipeg.The haul truck route will be as follows: the trucks will proceed south on PR-304 for 105 km to intersect PTH-59 then south on PTH-59 for 70 km to PTH-101 at Winnipeg then east on PTH-101 for 6.5 km to Gunn Road then 0.75 km west to Redonda Street then 1 km north on Redonda Street to the proposed transload facility at 999 Redonda Street.

It is anticipated that the Project Site generated sand haul truck traffic will be between 6 to 8 trucks per hour (3 to 4 in each direction). This translates to seeing one sand truck approximately every 8 minutes along the route.

Changes to traffic volumes along the proposed sand haul route are shown in Tables 1 and 2. Using data from the Manitoba Highway Traffic Information System (MHTIS), the tables provide the annual average daily traffic (AADT), and peak hour traffic volumes (assuming 15% of the AADT) from:



- 2009 - when both SanGold (mining operation) and Tembec (forestry operations) were operating;
- 2017 - following closure of Tembec and downturn in production at SanGold;

- Projected AADT volumes for 2019 and;
- Estimated traffic volumes during CPS operations in 2020.

Traffic count locations shown in Tables 1 and 2 are colour-coded in reference to the sand haul route segments shown above in the 2017 average annual daily traffic (AADT) route map. The % increase is based on the proposed site generated traffic over the estimated background traffic in the year 2020.

Table 1 – Annual Average Daily Traffic (AADT)

Traffic Count Location	Year 2009	Year 2017	Year 2019 (1% annual growth)	Year 2020 (under CPS full operation)	% Increase due to Project Generated Traffic
PTH 59 (Scanterbury) -S of PR 304	3460	3820	3897	4128	5%
PR 304 – S of PTH 11	1230	1230	1255	1459	15%
PR 304 – N of PTH 11	820	790	806	1041	28%

Table 2 – Peak Hour Traffic (based on 15% of AADT)

Count Location	Year 2009	Year 2017	Year 2019 (1% annual growth)	Year 2020 (under CPS full operation)	% Increase due to Project Generated Traffic
PTH 59 (Scanterbury) - S of PR 304	519	573	585	599	2%
PR 304 – S of PTH 11	185	185	189	199	5%
PR 304 – N of PTH 11	123	119	121	142	16%

3. Are the Existing Road/Highway Conditions Good Enough for Increased Truck Traffic?

Functional studies for PR 304 were completed by Manitoba Infrastructure in 2004, 2008 and 2011 (https://www.gov.mb.ca/mit/hpd/resources.html). It was noted that the section of PR 304 east of Stead to PTH 11 was classified as a secondary arterial and subject to spring weight restrictions. However, condition assessments for highway infrastructure are undertaken by Manitoba Infrastructure and they would have the latest information regarding the level of service of the road network. Notwithstanding, CPS is in ongoing discussions with Manitoba Infrastructure to determine possibilities for upgrading provincial infrastructure to accommodate the proposed Project traffic and maintain public safety.

4. Who is responsible for the Maintenance on the Roads?

Manitoba Infrastructure Region 1(eastern Manitoba) is responsible for highway maintenance including snow clearing, right-of-way clearing, line painting, regulatory, warning, wayfinding and information signage and pavement repairs.

5. Who is responsible for Road Safety?

Manitoba Infrastructure Region 1 is responsible for road safety issues along the proposed sand transportation route to Winnipeg. CPS has proposed that they will be available to work with Manitoba Infrastructure to contribute to the upgrading of the roads in the vicinity of the new Project main access road by providing a paved surface on Hollow Water Road and PR 304 from the Project access road turn off to Manigotagan. CPS is in on-going discussions with Manitoba Hydro and Manitoba Infrastructure to confirm the need and scheduling for road upgrades for the portion of the proposed truck route that will be crossing the Pine Falls Generating Station, in addition to other improvements.

6. Why was the Traffic Impact on the area within the Perimeter Highway and around Winnipeg not considered?

Environmental assessment information included within Environment Act Proposals for proposed Projects in Manitoba are typically not scoped to include all public highway and road routes proposed to be used, and that may potentially be used, by project-related traffic to transport resource products (e.g., forestry operations; mineral mining developments).

Statement of Qualifications and Limitations

The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("AECOM") for the benefit of the Client ("Client") in accordance with the agreement between AECOM and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations");
- represents AECOM's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to AECOM which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

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AECOM: 2015-04-13