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Canadian Premium Sand Inc.

Wanipigow Sand Extraction Project

Environment Act Proposal

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

Date: December 18, 2018
Project #: 60588114

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

December 18, 2018

Project #
60588114

Dear Mr. Archibald:

Regarding: Wanipigow Sand Extraction Project Environment Act Proposal

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.
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MG:rz
Encl:

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AECOM: 2015-04-13

Quality Information

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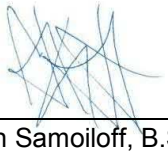

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Executive Summary

Canadian Premium Sand Inc. ('CPS') is a Canadian-based publically held company proposing to develop a high-grade silica sand extraction project substantially within the geographic boundaries of the Incorporated Community of Seymourville located on the east side of Lake Winnipeg approximately 160 km northeast of the City of Winnipeg. This sand extraction project, i.e., the Wanipigow Sand Extraction Project (the 'Project') is being developed for the purpose of supplying high-quality silica sand for use in a variety markets such as oil and gas operations and the glass production industry. The Project will have an estimated annual production rate of approximately 1 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.

The Project will consist of: high-grade silica sand quarries that will be sequentially opened, closed and progressively rehabilitated each year; a sand wash and dry facility; two access roads; and a powerline on provincial Crown Land west of Hollow Water First Nation within the core area of its Traditional Territory, referred to as Hollow Water First Nation's Home Block. The average annual size of an open quarry cell will be 5 ha. Access roads will include a new 6 km-long paved all-season main access road that will intersect with the southern portion of the Hollow Water Main Road and improvements to an existing 1.5 km-long gravel road to be used for construction and emergency use. A powerline is planned to parallel the Project main access road to provide the primary power source for Project operations, with diesel generators used during the construction phase and for back-up power during the operation phase in the event of a main power loss. Functioning of the sand wash plant will require 1,817 m^3/hour (8,000 US gpm) of water. The process water will be recycled in a closed-loop system within the wash plant, with the addition of 'make-up' water required at a maximum rate of 45 m^3/hour (200 US gpm) to account for water loss primarily due to evaporation. Water for the processing of sand will be sustainably sourced from a combination of groundwater, water from seepage within the annual open quarry pit, and supplemental water (as required) that will be trucked to the Project site from a licenced source. Hydrogeological testing to confirm the sustainability of the local groundwater supply will be initiated in January, 2019.

Pending regulatory approval of the proposed Project, site clearing and infrastructure construction is anticipated to begin during February/March 2019. Project operations will occur 24 hours per day, 7 days per week throughout each year of operation except during extreme weather events. These Project operations include quarrying, sand washing and drying, and transportation of the sand product to Winnipeg for distribution. Transportation of the first loads of sand by truck to Winnipeg is expected by Q4 2019, with an estimated sand product transportation frequency of 3 to 4 trucks/hour leaving the sand wash and dry facility. During peak production, the Project will require 75 employees for Project operations with up to 50 truck drivers required to transport sand to Winnipeg for distribution. The anticipated life of the Project is 54 years.

The Project will be located on provincial Crown Land within an area encompassed by the 42 existing Claim Post (now 'CPS') quarry leases. The total disturbed Project footprint area in any given year of the Project life is estimated to be 83 ha, with on-going annual progressive rehabilitation of quarry cells occurring in accordance with a regulator-approved Closure Plan. The existing land cover at the proposed Project site is primarily mixed-wood boreal forest with some human disturbance in the form of existing roads, trails, exploratory drilling activities and previous small quarry and tree cutting operations. No Project components or activities occur in or immediately adjacent to fish-bearing waterbodies and no Project effects to fish-bearing waterbodies, including Lake Winnipeg, are anticipated. The natural land cover that will be cleared for the Project is common to the regional area, and the extent of clearing will be limited with progressive rehabilitation and revegetation of disturbed areas conducted in accordance with a

Closure Plan. Therefore, long-term adverse effects to vegetation and regional wildlife populations, including species at risk populations, are not anticipated. A Traditional Ecological Knowledge (TEK) study and walk through the Project area with a respected local elder knowledgeable of traditional medicinal plants also indicated that the natural resources in the Project area were common to the regional area. A Heritage Resource Impact Assessment Study conducted throughout the Project site during November 2018, prior to significant snowfall, indicated that no archaeological resources were identified. A cemetery on the west side of the main access road to Seymourville that occurs in the vicinity of one of the northern-most quarry lease areas will be protected by a 100 m 'no activity' buffer area.

Other studies completed to assess the potential environmental impacts of the Project included air quality, noise and traffic studies. To mitigate project effects on air quality, the silica sand dry plant, including all conveyors and transfer points, will be enclosed and under negative pressure to allow fines to be collected in a bag house fabric filter dust collection system to minimize dust projection. Sand truck transport loads will be completely contained with a waterproof sealed load cover which will mitigate dispersion of fugitive sand dust during transport. Project-related emissions will be minimized by regularly maintaining equipment and vehicles and minimizing idling of vehicles. Power use for the long-term operation of the Project will be obtained from hydroelectric power via a planned powerline which will minimize the need for power from diesel generators. Noise generated from Project quarrying and sand processing activities is expected to be adequately attenuated from the nearest human receptors by the surrounding densely forested area, combined with the completely enclosed wash and dry facility, depth of the active quarry site, and berms of overburden at quarries as needed. Noise disturbances to wildlife are expected to be moderate in the vicinity of Project construction and operation activities, but are not expected to measurably affect wildlife populations within the Lac Seul Upland Ecoregion within which the Project is located. Results of a traffic assessment study has indicated that the current level of service will be maintained during full Project operations for intersections of the Project main access road at the Hollow Water Road, and for the Hollow Water Road at Provincial Road 304.

Monitoring and follow-up studies proposed for this Project include development of a Closure Plan, revegetation monitoring program, air quality monitoring (dust and noise), and on-going groundwater monitoring throughout the life of the Project.

In summary, and with the application of the proposed mitigation measures and monitoring plans outlined in this report and the Closure Plan, adverse residual environmental impacts resulting from the Project are expected to be sufficiently mitigated. The success of the Project is anticipated to be a substantial benefit to the Local and Regional Project Area communities in terms of training, employment, and potential business opportunities related to the services that will be required for the Project. Letters of support have been issued for the Project by the local potentially impacted communities, including the Incorporated Communities of Seymourville ('Seymourville'), the Community of Manigotagan ('Manigotagan'), the Northern Affairs Settlement of Aghaming ('Aghaming') and Hollow Water First Nation. CPS 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. Additionally, 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. CPS will also be paving local unpaved road segments used by sand transport trucks, providing support for affordable employee housing in the local community, and upgrading the Seymourville water and wastewater treatment facilities to accommodate Project water and wastewater treatment requirements, as needed. These actions by CPS will further contribute to the socioeconomic benefits of the proposed Project.

List of Abbreviations

CFWR	Community Futures Winnipeg River.
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	'Carbon Dioxide equivalent' – amount of CO_2 that would have equivalent global warming impact as the effect of different greenhouse gases
COSEWIC	Committee on the Status of Endangered Wildlife in Canada.
CPS	Canadian Premium Sand Inc.
EAP	Environment Act Proposal
EC	Environmental Component
ELC	Ecological Land Classification
FML	Forest Management Licence
GHA	Game Hunting Area
GHG	Greenhouse Gas(es)
ha	Hectares.
hp	Horsepower.
HDPE	High density polyethylene.
HRIA	Heritage Resources Impact Assessment.
km	Kilometre
kW	Kilowatt
L	Litre
m	Metre
m^3	Cubic metres
MAAQC	Manitoba Ambient Air Quality Criteria
MBESEA	*The Endangered Species and Ecosystems Act of Manitoba*
MOU	Memorandum of Understanding
N_2O	Nitrous Oxide
NO_2	Nitrogen Dioxide
PM	Particulate matter
Ppb	Parts per billion
PR	Provincial Road
PTH	Provincial Trunk Highway
RCMP	Royal Canadian Mounted Police
R.M.	Rural Municipality
RV	Recreational vehicle
SARA	*Species at Risk Act*

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1. General Project Information

1.1 Project Overview

Canadian Premium Sand Inc. ('CPS') is proposing to develop a silica sand extraction project substantially within the geographic boundaries of the Incorporated Community of Seymourville located on the east side of Lake Winnipeg approximately 160 km northeast of the City of Winnipeg. This proposed sand extraction project*, i.e.,* the Wanipigow Sand Extraction Project (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 which further substantiates the need for this Project. The Project will have an estimated annual production rate of approximately 1 million tonnes of silica sand at full operation 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.

The anticipated life of the Project will be 54 years which will provide substantial long-term economic and employment benefit to the local communities which include, but are not limited to, Seymourville, Manigotagan and Hollow Water First Nation. Early and proactive communications CPS has initiated with the potentially impacted local communities regarding this Project have resulted in letters of support issued for the Project by the Incorporated Communities of Seymourville ('Seymourville'), the Community of Manigotagan ('Manigotagan'), the Northern Affairs Settlement of Aghaming ('Aghaming') and Hollow Water First Nation. Additionally, CPS has an Economic Participation Agreement with Hollow Water First Nation, and the governments of Seymourville and Manigotagan have agreed in principal on the essential terms of separate Participation Agreements, and are currently finalizing the documentation for these agreements.

Key components of the Project will include:

- An active open pit sand quarry each year of operation, including progressive annual site reclamation of closed quarries;
- Silica sand production process, 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 the Project Description (Section 2).

1.2 Proponent Contact Information

Table 1-1: Proponent Contact Information

Name of Proponent	Canadian Premium Sand Inc.
Address of Proponent	400, 522 11th Ave. S.W. Calgary, AB T2R 3P2
Principal Contact Person for the EAP	**Robert Archibald** Chief Operating Officer Ph: (630) 608-3678 Email: bob.archibald@cpsmail.com

1.3 Company Profile

Canadian Premium Sand Inc. (formerly Claim Post Resources Inc.) is a Canadian-based publically held company trading on the TSX Venture Exchange under the symbol of CPS. CPS is focused on becoming a leading provider of premium white silica sand for use in a variety of markets requiring high-grade silica sand such as oil and gas operations and the glass production industry.

- Corporation ID: 6699890
- Business Number: 823715875 RC0001
- Incorporation Date: September 21, 2005

1.4 Exploration History

The Seymourville silica sand deposit was discovered in 1977 and was drilled by Manitoba government Geologists in 1981 and 1989. Based on the drill campaigns, government Geologists estimated a resource of 45 million tonnes of high-grade silica sand as outlined in *Manitoba Open File Report OF96-4* (Ash Associates 1996). The deposit is hosted within a 25 m high hill composed mainly of Lake Winnipeg Formation, which is the on-shore extension of the Historical Black Island silica sand deposit. In 1980, the deposit was evaluated to a feasibility study level by the Manitoba government at a throughput rate of 500 tonnes per day (tpd) for the production of 99.6% pure silica sand for use in the plate glass industry.

A history of exploration within the quarry lease areas currently issued to Claim Post Resources Inc. (now Canadian Premium Sand Inc.) is summarized in **Table 1-2**.

Table 1-2: Historical Exploration of the Seymourville Area Quarry Leases

Year	Company	Exploration
1977	Manitoba Energy and Mines	Seymourville silica sand deposit first discovered.
1981	Manitoba Energy and Mines	Twelve (12) exploratory drill holes in a north-south orientation through the former 'Char-Crete' quarry lease areas. A 2 m silica sand intersection was reported in the Gossan quarry lease areas. Exploratory results yielded up to 96% SiO_2.
1981	Manitoba Energy and Mines	Metallurgical test work showed 80% recovery of well-rounded silica sand with sand sizes ranging between twenty (20) mesh and hundred (100) mesh. The silica purity of the processed sand was 98.2% and upgraded to 99.8% after an acid wash.
1989	Manitoba Energy and Mines	Drilled several holes with 18 m silica sand intersections.
2001	Gossan Resources	Nine (9) quarry leases were acquired.
2002	Claymore Resources	Drilled two (2) test holes on the Gossan quarry leases.
2004	Gossan Resources	Eleven (11) holes RC drill program. Holes drilled at 100 m spacing along the Ferry Landing Road.
2005	Gossan Resources	Gossan acquired Claymore quarry leases.

Year	Company	Exploration
2006	Gossan Resources	Twenty two (22) holes auger drill program totalling 370.15 m.
2007	Gossan Resources	Two (2) trenches were dug by backhoe to a depth of 3 m each.
2008	Gossan Resources	Twenty six (26) drill hole program using a sonic drill.
2009-2010	Gossan Resources	Tests on drill samples to evaluate the proppant qualities of the sand deposit.
2014	Claim Post	Preliminary exploration drilling.

After: P&E Mining Consultants Inc. 2014

1.5 Project Planning Process

CPS is completing on-going exploratory drilling activities in 2018 to further define the site-specific locations, quantities and quality of the silica sand deposits within the CPS quarry lease areas. These later-stage drilling activities were recommended in a preliminary economic analysis of the target silica sand deposits conducted in 2014 and are required to determine the priority sequence of proposed sand quarry locations and to determine the most feasible locations for Project infrastructure required for Project operations. These sand extraction planning activities will also include the establishment and monitoring of hydrogeological wells in January 2019 to confirm characteristics of the local groundwater aquifer and plan for sustainable water use for Project operations.

CPS is planning to initiate clearing and construction activities during February/March 2019, and begin Project operations in November 2019 pending the issuance of regulatory permits and approvals required for Project construction and operation. Planned Project phases, activities and scheduling are provided in the Project Description (Section 2).

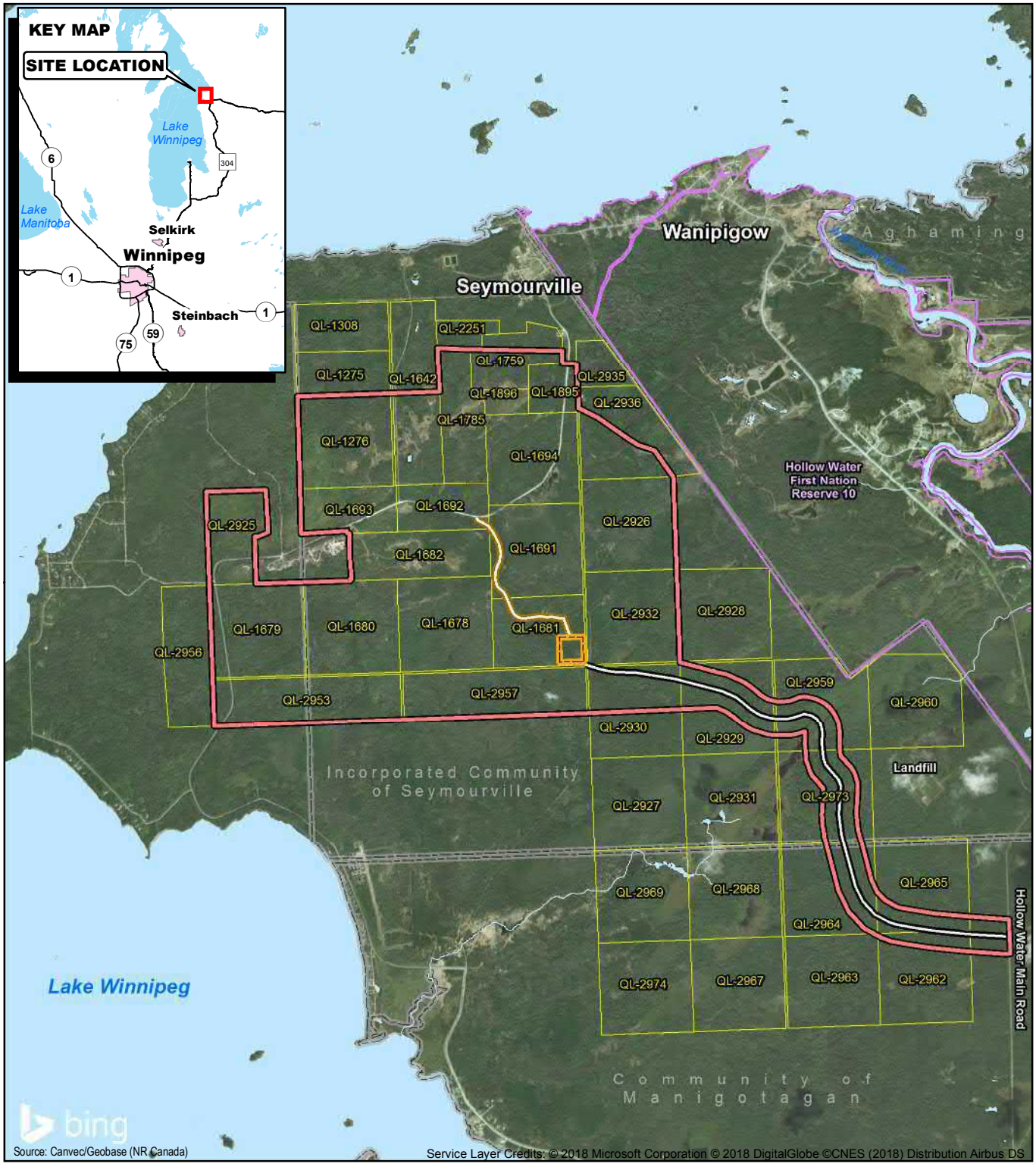
Project phases include the following:

- Planning and exploration phase
    - Current phase of the proposed Project
- Construction phase
    - Includes clearing for:
        - Laydown area (approximately 4 ha);
        - Sand wash and dry facility;
        - Initial quarry cell (first year);
        - Ancillary facilities; and
        - Two access roads (construction / emergency use access road and main access road).
    - Construction of:
        - Access roads;
        - Sand wash and dry facility; and
        - Ancillary facilities.
- Operation phase
    - Includes sand quarrying, operation of the wash and dry facility and transportation of silica sand product to Winnipeg for distribution.

Project operation activities will occur 24 hours per day, 7 days per week for the life of the Project, except during extreme weather events.

1.6 Project Location and Land Tenure

The Project will be located substantially within the boundary of the Incorporated Community of Seymourville on provincial Crown Land as illustrated in **Figure 1-1**. Project components will be located on proponent quarry lease areas with the exception of an approximately 300 m length of proposed main access road and adjacent powerline right-of-ways that will be required on provincial Crown Land outside of the quarry lease boundaries and intersecting with the Hollow Water main road. The total land area within the outer boundary of the 42 proponent quarry lease areas is 2,289 ha.



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

AECOM

Figure: 1-1

1.7 Regulatory Framework

1.7.1 Quarry Leases

Exploratory drilling activities, including clearing for temporary access trails, 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.

1.7.2 Other Approvals

All components of the Project will be assessed and permitted as one 'Class 2 development' under *The Environment Act* (C.C.S.M. c. E125). The Class 2 development designation is primarily triggered by the development of the new two-lane all-season access roads for the Project which are considered Class 2 developments under the Classes of Development Regulation. Therefore, the Environmental Approvals Branch of Manitoba Sustainable Development will review the entire project conservatively under the higher Class 2 development category. Once an Environment Act Licence has been issued for the Project, CPS will proceed with approval applications required for other specific Project-related activities.

General work permit(s) for clearing of trees and land use (laydown areas, construction of access roads and facilities construction) will be sought in accordance with *The Crown Lands Act* (C.C.S.M. c C340) and applicable regulations. Burning permits to dispose of woody debris will be sought, as required, in accordance with Section 19(1) of *The Wildfires Act* (C.C.S.M. c W128).

CPS will apply for water rights license(s) for use of groundwater needed to support the sand wash plant and associated facilities. A hydrogeological study and pump tests for groundwater conditions at the Project Site will be completed in Q1 2019 to determine the feasibility and sustainability of groundwater use for Project operations.

CPS is currently in discussions with Manitoba Hydro to coordinate development of the powerline, including powerline capacity, required for the Project. CPS will also coordinate with Manitoba Infrastructure regarding approvals for the development of Project access road intersections and any required improvements needed to local roads that will be required for truck transport of the sand.

No federal permits or approvals are expected to be required for the Project, noting that revisions to current federal environment-related legislation are anticipated in 2019 (e.g., *Canadian Environmental Assessment Act, 2012*).

1.8 Project Funding

Development of the Project will be funded entirely by CPS and will be owned and operated by CPS.

2. Project Description

CPS is proposing to develop annual high-grade silica sand quarries which will be sequentially closed and rehabilitated each year, a sand wash and dry facility, two access roads and a powerline on provincial

Crown Land west of Hollow Water First Nation within the core area of their Traditional Territory, referred to as Hollow Water First Nation's Home Block.

The Project will have a lifespan of 54 years with an estimated production of approximately 1 million tonnes/year of silica sand product. The overall production process is illustrated in **Figure 2-1**.

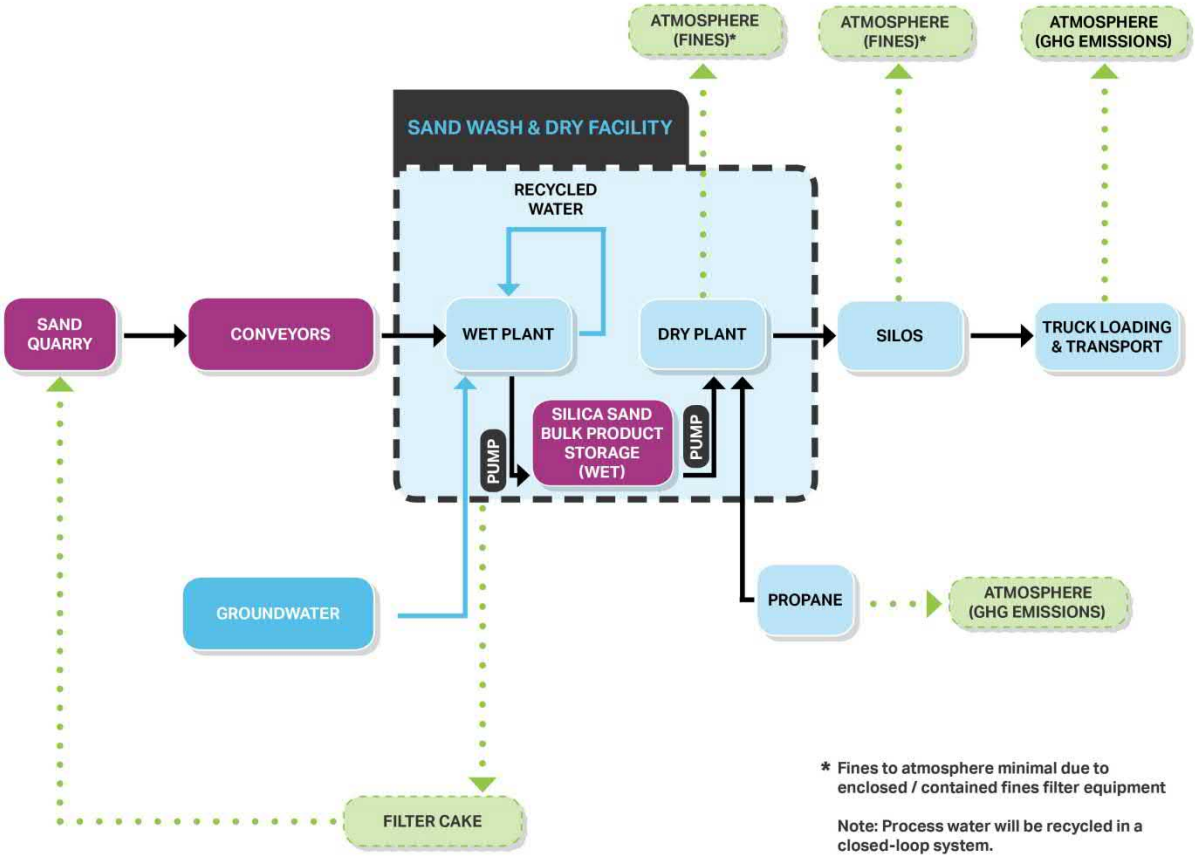


Figure 2-1: Silica Sand Process Flow Diagram

Sections 2.2 to 2.7 provide additional information for each of the Project components.

2.1 Components and Activities

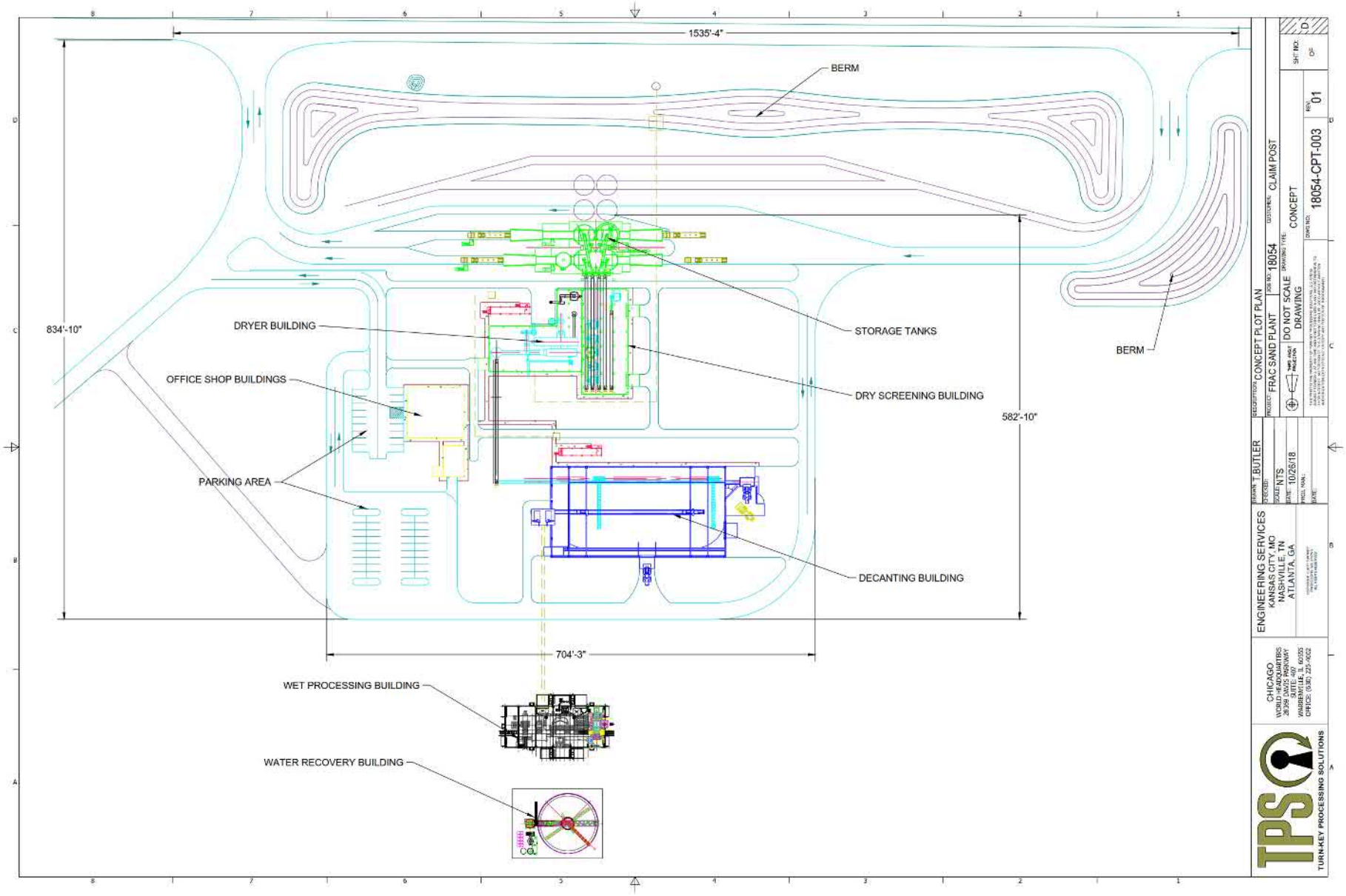
The proposed Project will consist of the following key activities and components:

- Quarrying, including annual progressive (rolling) quarry rehabilitation;
- Silica sand production process, including a fully enclosed sand wash and dry facility;
- Ancillary facilities adjacent to the wash and dry facility, including office, storage and maintenance buildings;
- 6 km long paved main access road;
- 6 km long powerline adjacent to the main access road;
- Improvements to an existing 1.5 km-long road for construction and emergency use; and
- Truck transportation of silica sand product to Winnipeg for distribution.

A portable concrete batch plant will be located on-site during the Project construction phase. The sections below describe the above-listed Project components in more detail. A conceptual image of the sand wash and dry facility is shown in **Figure 2-2**. The site layout for the sand wash and dry facility and ancillary infrastructure is provided in **Figure 2-3**.

Figure 2-2: Conceptual Image of Sand Wash and Dry Facility

Figure 2-3: Layout of the Wash and Dry Facility and Ancillary Infrastructure



2.2 Quarrying

The Project will be developed as an open pit quarry operation with progressive annual rehabilitation of used quarries. CPS anticipates sequentially extracting silica sand from annual quarries that average 5 ha in size and 10 m to 30 m deep. Annual reclamation of each quarry cell will occur as mining is completed in each cell. Therefore, during any given year of operation, there will be only one active quarry cell averaging 5 ha. Additional details regarding quarrying methods and required equipment are provided in Sections 2.2.1 to 2.2.2.

2.2.1 Quarry Method

The following activities are proposed during sand extraction quarrying:

- Sand quarrying will take place 24 hours per day, 7 days per week year-round expect during extreme weather events;
- Topsoil and overburden stripping and stockpiling will take place outside of the breeding bird season;
- Extracted sand will feed the wet processing plant; and
- Quarry backfilling and progressive reclamation (utilizing stockpiled overburden) will occur concurrently with the advancement of quarrying.

No drilling, blasting or crushing activities are anticipated to be required for quarry development. Occasional ‘lumps’ of sand may be encountered which will require breaking in the quarry by use of a horizontal shaft breaker. The sand that is extracted from the active quarry has inherent moisture content (i.e. is not ‘dry’). Therefore, dust related to the sand being extracted from the quarry will be minor to negligible with the possible exception of ‘worst-case scenario’ days of extended long, dry, hot weather during non-winter months coupled with high winds.

Tracked push dozers will strip and clear the overburden off the quarry cell. Front-end loaders will excavate the sand which will then be fed to a hopper and breaker system for conveying to the wet plant.

Each quarry cell will be further divided into smaller cells (extraction cells) which will progress from stripping to extraction to backfilling and then reclamation. The sequential steps are illustrated below in **Figure 2-4**.

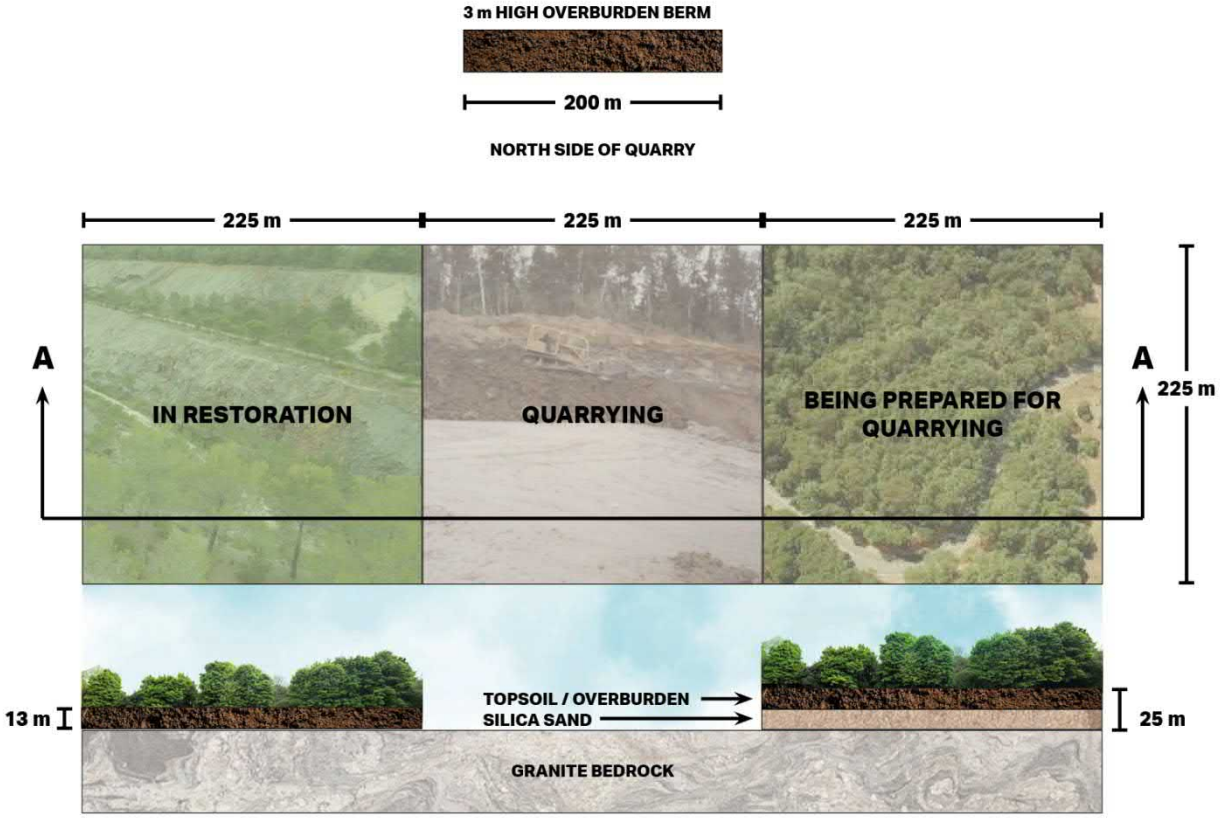


Figure 2-4: Quarry Sequence

The following outlines the quarry extraction cell sequence:

- Extraction Cell 1 Development:
  - The overburden material will be stripped with a dozer and stockpiled adjacent to the active cell to mitigate noise levels as required.
- Extraction Cell 2 Quarrying:
  - A front-end loader will feed the hopper / breaker for conveying the sand to the wet and dry facility.
- Extraction Cell 3 Restoring:
  - Once quarrying in Cell 2 is complete, the overburden material stockpiled adjacent to the cell will be redistributed throughout the cell for restoration.

This entire sequence is repeated each year and reclamation will occur concurrently with the quarrying, utilizing the overburden that was stockpiled during quarry cell development. Once a quarry cell is ready for reclamation, CPS will revegetate with a native seed mixture and tree saplings appropriate for the area which will be used for reclaiming the quarry cell and the subsequent quarry cells each year for the life of the Project.

2.2.2 Quarry Equipment

Equipment required during quarrying will include the following:

- Two D11 track dozers;
- Two 3 m^3 front-end loaders; and
- Two articulated dump trucks.

The dozers will primarily push overburden material during quarry stripping and restoration. Dump trucks will distribute overburden during restoration. A front-end loader will feed the hopper/breaker during quarrying for conveyance to the sand wash and dry facility. The dump trucks will remove oversized material and transport it to the backfill area.

There will also be 4x4 pickup trucks at the quarry along with a grader and a variety of utility vehicles.

2.3 Silica Sand Production Process

The silica sand processing involves a fully contained sand wash and dry facility and bulk storage silos. The sand wash and dry facility equipment consists of pumps, conveyors, screens, cyclones, belt filters, dryer and mixers. A list of the sand wash and dry facility equipment and diagrams of the process flow are provided in **Appendix A**.

2.3.1 Sand Conveyance to Processing Facility

As indicated in Section 2.2.2, front-end loaders within the active quarry cell will feed sand to the hopper / breaker during quarrying for covered conveyance to the and wash and dry facility.

2.3.2 Wet Plant Processing

The wet plant process is based on rougher hydro-separation method of classification of the silica sand and will be in operation 24 hours per day, 7 days per week.

Water used in the wet plant processing will be recycled in a closed-loops system within the plant for process reuse. No water will be discharged from the sand processing.

The sand from the active quarry cell is conveyed into the first stage hydro-separator, which is then pumped to attrition scrubbers which are used to polish the surface and remove scale deposition. From the scrubbers, the polished slurry is then pumped to a second hydro-separator. The feed density to each hydro-separator is controlled by a dewatering hydrocyclone. The cleaned silica sand (approximate 5% moisture) is transferred to the dry plant. Waste fines in the slurry are pumped to the thickener tank where a polymer will be added to facilitate fines settling. Additional information regarding the nature and purpose of the water soluble polymer in the sand washing process is provided in **Appendix B**.

Solids from the thickener tank are transferred to a filter press for further dewatering. The ‘filter cake’ (by-product generated in the filter press) will be hauled back to the quarry and used for site reclamation. The clarified water is pumped back to the wet plant for continued use in the closed-loop processing system.

2.3.3 Dry Plant Processing

From the bulk product storage building, sand will be loaded into a hopper which will feed the propane fired rotary dryer via a conveyor. From the dryer, the sand will then be conveyed to the product sizing

screens which will separate the sand based on particle size. Impurities will be captured via a magnetic separator. The screened sand will then be conveyed to storage silos prior to being loaded into trucks. The dry plant, including all conveyors (1,524 m total length) and transfer points, will be enclosed and under negative pressure to allow fines to be collected in a bag house fabric filter dust collection system. The dry plant will be operated year-round.

2.3.4 Bulk Product Storage

Four storage silos (capacity: 2,000 tonnes each) for dry silica sand (moisture content approximately 0.5 %) will be located adjacent to the dry plant and connected to the central dust collection system. Particle size range of the dry silica sand product will be 20 – 140 mesh[1].There will be a covered conveyor from the dry plant to transport the silica sand to the silos.

2.3.5 Reagents

Waste fines in the slurry are pumped to the thickener tank where a water-soluble polymer will be added to facilitate fines settling. Additional information regarding the nature and purpose of the water-soluble polymer in the sand washing process is provided in **Appendix B**.

2.4 Trucking

Silica sand will be loaded from the storage silos into trucks within an enclosed silo loading area. Sand will drop by gravity from storage silos into the trucks via an enclosed trunk that is located within an enclosed negative-pressure loading area which is connected to a dust collection system. Sand truck transport loads will be completely contained with a waterproof sealed load cover. No exposure of sand to the ambient atmosphere will occur as all sand transfer points will be fully enclosed.

The final product (silica sand) will be trucked from the Project site approximately 200 km south to Winnipeg, Manitoba via Provincial Road (PR) 304, Provincial Trunk Highway (PTH) 59 and Gunn Road to trans-load facility at 999 Redonda Street. Trucks with 40 tonne capacity will transport sand 24 hours a day, 7 days a week. Therefore, 3 to 4 trucks per hour will be loading sand at the facility.

2.5 Process Waste

2.5.1 Wastewater

There will be no discharge of wastewater during processing as all process water will be recycled back into the wet plant and not discharged to the environment. Wastewater from washroom and shower facilities along with the cafeteria will be directed to a septic holding tank. The septic holding tank will be pumped out by a licensed local contractor on an as-needed basis and will be disposed at a licenced local wastewater treatment facility.

2.5.2 Solid Waste

Domestic and commercial waste will be removed from the Project site by a licensed local contractor and disposed of at a licensed landfill. Recyclable materials will be collected in designated recycling containers and transported to a recycling facility.

[1] *0.105 mm to 0.841 mm size range (Ref: https://www.kmizeolite.com/mesh-chart/)*

2.6 Ancillary Facilities

2.6.1 Maintenance Shop

The maintenance shop will be sized to accommodate both quarry and process-related mobile equipment. It will also include a fabrication shop, truck shop and warehouse.

2.6.2 Operations and Administration Building

The operations and administration building will be a two-storey office building that will include space for administration, engineering, geology, general services, environmental services, health and safety, human resources, training and other support personnel.

2.6.3 Fuel Depot

The fuel depot (diesel) will be located within a required regulated distance from the nearest inhabited building and will house one 18,927 L (5,000 U.S. liquid gallon) fuel tanks with secondary containment as per applicable guidelines and regulations.

2.6.4 Propane Tank Storage

The propane tank storage will include one 10,000 L horizontal propane tank with proper containment as per applicable guidelines and regulations.

2.6.5 Other Ancillary Facilities

Within the wash and dry facility there will also be a change room, a cafeteria, a quality control lab, and offices.

2.7 Access Roads

One new paved access road and one existing gravel access road will be required for the Project:

- A 6 km main access road (paved) to access the Project site that will intersect with the existing Hollow Water Main Road; and
- Improvements to an existing 1.5 km road, which will be a gravel road, for construction phase access to the Project site and for emergency use during Project operation.

Both access roads will be gated to control Project Site access.

Although water crossing structures will not be required for the Project access, culverts will be installed as required along the main access road and the construction and emergency use access road to equalize surface water flow in low wet/bog areas.

In addition to the two new access roads to the Project Site, CPS will be upgrading the section of Hollow Water Main Road required for truck transport of the silica sand product to Winnipeg for distribution to national and international markets. CPS will determine Hollow Water Main Road improvements required in discussion with Manitoba Infrastructure.

2.8 Employees

There will be no worker camp on-site. Employees required for Project construction and operation will be housed in their current homes, or additional housing may be provided by CPS in local communities while CPS is supporting the development of permanent affordable housing for Project employees in the local area. If transportation of local employees to the Project site is deemed to be necessary, bus service will be provided to transport local community workers to and from the Project Site, during all Project phases, as required. Information regarding the estimated number of employees and positions required for Project construction and operation phases are provided in Sections 2.8.1 and 2.8.2.

2.8.1 Construction

During the Project construction phase, approximately 30 people will be employed for Project site clearing and construction of the sand wash and dry facility and associated infrastructure including access roads and powerline. CPS anticipates that a number of the employees trained and retained for construction activities will then be employed for operation activities (Section 2.8.2).

2.8.2 Operation

During the operation phase, there will be approximately 75 people employed for quarry and sand wash and dry facility operations which will require the following key occupations:

Quarrying:

- Quarry superintendent;
- Foremen;
- Heavy equipment operators;
- Mechanics;
- Geologists; and
- Engineers.

Processing:

- Manager, Foremen, Clerk, Shift Supervisors and Operational Leads;
- Process Operators;
- Electrical and Instrumentation Technicians;
- Millwrights;
- Environment, Safety and Health Professionals;
- Maintenance; and
- Quality control technicians.

Transporting the silica sand product to Winnipeg for distribution will require up to 50 truck drivers.

2.9 Water Use

Water for the processing of silica sand will be sustainably sourced from a combination of groundwater, water from seepage within the annual open quarry pit, and supplemental water (as required) that will be trucked to the Project site from a licenced source. Hydrogeological testing will be undertaken by AECOM in Q1 2019 to confirm sufficient and sustainable groundwater volumes for plant processes while preserving the integrity of the aquifer. If required, two 3 m tall x 30.5 m diameter water storage tanks will be installed on-site to provide supplementary water for plant processes. Functioning of the wet plant will require 1,817 m3/hour (8,000 US gpm) of water. The process water will be recycled within the wet plant, with the addition of ‘make-up’ water required at a maximum rate of 45 m^3/hour (200 US gpm) to account for water loss primarily due to evaporation.

2.10 Power Use

Power to the wash and dry facility will be supplied via a powerline which is currently proposed to run along the main access road right-of-way. Operation of the sand wash plant will require 5,966 kW (8,000 hp) of power, with 1,119 kW (1,500 hp) of that power needed to operate pumps. There will be two diesel generators at the Project site during construction that will also be used as back-up power during the operation phase in the event of a main power loss.

2.11 Equipment Use

Table 2-1 presents the heavy equipment use expected during Project.

Table 2-1. Project Heavy Equipment Use

Equipment	Units*
Construction Phase	
Track dozers	2
Feller bunchers	4
Concrete batch plant	1
Grader	2
4 x 4 pick-up trucks	8
Cranes	4
Man-lift	2
Operation Phase	
Silica Sand Transportation Trucks	30
Track dozers	2
Articulated dump trucks	2
Grader	1
4 x 4 pick-up trucks	4
Front-end loaders	2
Decommissioning/Closure Phase	
Track dozers	2
Articulated dump trucks	2
Cranes	4
Grader	2
4 x 4 pick-up trucks	8

* Not all operating simultaneously during any given phase.

2.12 Traffic

The maximum daily estimated traffic volumes expected during Project operation is described, and have been assessed, in terms of traffic turning at community intersections (Section 6.7). An estimated 78 vehicles per hour will be entering and exiting the intersection of the Project main access roads with the Hollow Water Main Road. An estimated 96 vehicles per hour will be entering and exiting the intersection of Hollow Water Main Road with PR 304. Traffic during the Project construction and closure phases will be considerably less due to the lack of silica sand transport truck traffic during these Project phases. During the operation phase, 3 to 4 trucks per hour will be loading sand at the facility for transportation to Winnipeg for distribution.

2.13 Project Schedule

The proposed Project schedule is provided in **Table 2-2**.

Table 2-2. Proposed Scheduling

Project Phases and Activity	Proposed Schedule (subject to the results of Regulatory review)
Construction	
Site preparation (clearing vegetation, grubbing, grading, leveling)	February-March, 2019
Improvements to existing 1.5 km access road for construction and emergency use	Q2, 2019
Construction of main access road and powerline	Q2 – Q3, 2019
Construction of the wash and dry facility and associated infrastructure	March - October, 2019
Operation	
Testing and commissioning the wash and dry facility	November - December 2019
Quarrying	Initial production year: Q3 – Q4, 2019 Each production year thereafter: (year-round; 24 hours/day, 7 days/week)
Wet sand processing	Initial production year: November, 2019 Each production year thereafter: (year-round; 24 hours/day, 7 days/week)
Transporting silica sand product to Winnipeg	Initial production year: November 2019 Each production year thereafter: (year-round; 24 hours/day, 7 days/week)
Reclamation and Closure	- Annual sequential (progressive) reclamation of quarry cells - Project Site reclamation (closure) at end of Project Life (54 years): **2073**

In addition to the proposed Project schedule in **Table 2-2**, CPS will be providing on-going worker training beginning Q1 2019.

3. Scope of the Assessment

To assess the potential environmental impact of the proposed Project, spatial and temporal boundaries were defined as follows:

3.1 Temporal Boundaries

The temporal boundaries of the assessment are divided as follows:

- **Construction Phase**: Includes clearing for, and construction of, infrastructure required for Project operations including the sand wash and dry facility and site access roads.
  - Q1 2019 – Q4 2019
- **Operation Phase** – Includes sequential sand quarrying, sand washing and drying (processing) and sand hauling to the distribution facility in Winnipeg.
  - Q4 2019 - 2073
- **Decommissioning Phases:**
  - **Sequential Sand Quarry Decommissioning (Progressive Rehabilitation):** Each sand quarry cell (average annual size of 5 ha) will remain open during the Operation Phase for approximately 12 months and will overlap with the opening of the next adjacent quarry cell area. The new quarry cell area will remain open for a similar time period after which each quarry cell will be back-filled with stockpiled substrate. Stockpiled soil will be spread to initiate revegetation efforts.
  - **Project Decommissioning and Closure:** After the expected life of the Project (54 years), the wash and dry facility and associated infrastructure will be removed and previously disturbed areas leveled and rehabilitated as described above for sand quarry decommissioning. After the life of the Project, future use of access roads and powerline to the Project Site will be discussed with the local communities and Manitoba Hydro to determine if the communities would like to repurpose and assume long-term maintenance of these components. Should the local communities not require the Project access roads and/or powerline, they will be decommissioned and disturbed areas will be rehabilitated as per other disturbed areas associated with Project components.

3.2 Spatial Boundaries

Spatial boundaries used for the assessment are described below. However, where specifically noted, the boundaries may be adjusted to suit the Environmental Component (EC) or Social Component (SC) affected.

- **Project Site** – includes the Project Footprint, which is the area that will encompass the land on which project components are located and immediate surrounding area that will be directly affected by the Project.
- **Local Project Area** – is comprised of an area 2 km beyond the Project Site, which is intended to take into account the majority of direct and indirect effects of the Project on ECs (such as wildlife habitat loss related to vegetation clearing and noise). The Local Project Area extends to include the southern extent of the Hollow Water Main Road used by Project trucks and highway segments used by Project trucks to account for emissions and traffic effects. The Local Project

Area extent for project effects on SCs includes the local communities of Seymourville, Hollow Water First Nation and Manigotagan.

- **Regional Project Area** – is comprised of an area up to 10 km beyond the Project Site, which is intended to take into account the maximum spatial extent of potential effect of the Project, with the exception of highway traffic related to Project trucks transporting silica sand to Winnipeg for distribution.

The Project Site area boundary is illustrated in **Figure 1-1**.

3.3 Biophysical and Socioeconomic Components

In accordance with the Manitoba Sustainable Development 'Information Bulletin – Environment Act Proposal Report Guidelines' (Manitoba Sustainable Development 2018a), the scope of the environmental assessment has included potential Project effects on the:

- Biophysical environment
  - Including wildlife, fisheries, surface water, groundwater and forestry resources.
- Socioeconomic environment
  - Including human health and safety.
  - Potential impacts on Indigenous communities such as resource use and cultural or traditional activities.

Environmental assessment methods, including a specific list of the environmental components included within this assessment due to the potential for interactions with the Project, are described in Section 6.1.