



Appendix A

Environment Act Proposal Report Guidelines

These guidelines apply to all Environment Act Proposals (EAPs) under The Environment Act. They prescribe what is required in report(s) supporting the EAP, and the quantity and types of copies required.

Separate, supplementary guidelines exist for certain types of developments, indicating additional information required. These guidelines are available on the Environmental Approvals Branch (EAB) webpage (<http://www.gov.mb.ca/sd/eal>) or by contacting the EAB.

DEVELOPMENT ENVIRONMENTAL ASSESSMENT (EA) REPORT

This information is based on the Licensing Procedures Regulation (Manitoba Regulation 163/88). Note that where Imperial measurements are used, metric equivalents must be listed as well.

The EA Report typically contains the following:

- Executive summary
- Introduction and background
- Description of proposed development, including construction, operation, maintenance, and decommissioning if applicable
- Description of existing environment in the project area
- Description of environmental effects of the proposed development
- Description of the human health effects of the proposed development
- Mitigation measures to protect the environment and human health, and residual environmental effects
- Follow-up plans, including monitoring and reporting
- Conclusions

Definitions

“environment” means

- (a) air, land and water, or
- (b) plant and animal life, including humans

“environmental health” means those aspects of human health that are or can be affected by pollutants or changes in the environment

“pollutant” means any solid, liquid, gas, smoke, waste, odour, heat, sound, vibration, radiation, or a combination of any of them that is foreign to or in excess of the natural constituents of the environment, and

- (a) affects the natural, physical, chemical, or biological quality of the environment, or
- (b) is or is likely to be injurious to the health or safety of persons, or injurious or damaging to property or plant or animal life, or
- (c) interferes with or is likely to interfere with the comfort, well being, livelihood or enjoyment of life by a person.

Introduction and Background

- Need or rationale for the development, purpose, and alternatives; may include one or more of the following depending on the development:

- products or services to be provided and process technologies to be used;
- quantitative information on the volumes or amounts of products or services as applicable;
- current population trends, if a specified population is to be served by the development; and
- reference to previous studies and activities relating to feasibility, exploration, or project siting and prior authorization received from other government agencies.

Description of Proposed Development

- Certificate of Title showing the owner(s) and legal description of the land upon which the development will be constructed; or, in the case of highways, rail lines, electrical transmission lines, or pipelines, a map or maps at a scale no less than 1:50,000 showing the location of the proposed development.
- Owner of land upon which the development is intended to be constructed, and of mineral rights beneath the land, if different from surface owner.
- Existing land use on the site and on land adjoining it, as well as changes that will be made in such land use for the purposes of the development.
- Land use designation for the site and adjoining land as identified in a development plan adopted under The Planning Act or The City of Winnipeg Act, and the zoning designation as identified in a zoning by-law, if applicable.
- Description of proposed development and schedule for stages of the development, including proposed dates for planning, design, construction, commissioning, operation, and decommissioning and/or termination of operation (if known), identifying major components and activities of the development as applicable (e.g. access road, airstrip, processing facility, waste disposal area, etc.).
- Funding, including the name and address of any government agency or program (federal, provincial or otherwise) from which a grant or loan of capital funds have been requested (where applicable).
- Other federal, provincial or municipal approvals, licences, permits, authorizations, etc. known to be required for the proposed development, and the status of the project's application or approval. (Information on federal approval requirements may be obtained from the Canadian Environmental Assessment Agency at <http://www.ceaa-acee.gc.ca/default.asp?lang=En&n=D75FB358-1>.)
- Results of any public consultations undertaken or to be undertaken in conjunction with project planning.

Description of Existing Environment in the Project Area

- The biophysical environment as related to the development, including topographic and base maps and aerial photographs as necessary, as follows:
 - description of the local area and regional setting including important terrain features such as hills, valleys, lakes, rivers, shorelines, etc;
 - description of the prevailing climate and meteorological conditions, and identification of any nearby climate monitoring stations;
 - identification and description of local and regional surface waterbodies (lakes, rivers, wetlands, etc.) and description of the regional groundwater conditions including aquifers, recharge areas, quality, wells, etc.;
 - description of the aquatic environment including fish resources, fish habitat, benthic invertebrates, aquatic macrophytes, etc. for each waterbody that could be affected by the proposed development;
 - description of the terrestrial environment including vegetation, wildlife (mammals, birds, amphibians, reptiles, etc.), wildlife habitat, etc. that could be affected by the proposed development;
 - identification and description of any rare, threatened or endangered species or any important or sensitive species and/or habitats, particularly if federally and/or provincially protected; and

- identification and description of the existing land and resource uses in the region including agriculture, forestry, mining, hydroelectric, oil and gas, recreation, tourism, etc.
- The socioeconomic environment as related to the development, including topographic and base maps and aerial photographs as necessary, as follows:
 - identification of any existing public safety and human health risks in the development area;
 - identification and description of protected areas (e.g. national and provincial parks);
 - heritage resources (e.g. archaeological and historic sites), etc; and
 - identification of Indigenous communities in the vicinity of the proposed development.

Existing environmental information may come from sources such as site visits, previous studies, environmental databases, baseline data, ecological land classification, and traditional ecological knowledge.

Description of Environmental and Human Health Effects of the Proposed Development

- Potential impacts of the development on the environment, including, but not necessarily limited to:
 - impact on biophysical environment, including wildlife, fisheries, surface water, groundwater, and forestry resources;
 - type, quantity and concentration of pollutants (emissions, effluents and solid wastes) to be released, and the technologies proposed to contain or treat the waste streams;
 - information on the storage, transportation and disposal of any hazardous wastes that may be produced;
 - identification of any storage of gasoline or associated products (e.g. diesel fuel, used oil, heating oil, aviation gas, solvents, isopropanol, methanol, acetone, etc.);
 - impact on heritage resources;
 - socio-economic implications resulting from environmental impact; and
 - climate change implications including a greenhouse gas inventory calculated according to guidelines developed by Environment Canada (<http://www.ghgreporting.gc.ca/GHGInfo/Pages/page15.aspx>) and the United Nations (<http://www.ipcc-nggip.iges.or.jp/public/index.html>.)
- Potential impacts of the development on human health and safety, including, but not necessarily limited to:
 - potential impact on human health and safety resulting from any release of pollutants, including a human health risk assessment.
- Potential impacts of the development on Indigenous communities, including, but not necessarily limited to:
 - direct impacts on communities in the project area;
 - resource use, including hunting, fishing, trapping, gathering, etc.;
 - cultural or traditional activities in the project area.

Mitigation Measures and Residual Environmental Effects

- Proposed environmental management and risk mitigation practices to be employed to prevent or mitigate adverse implications from the impacts identified above, having regard to, where applicable:
 - mitigation incorporated at the planning and design stages;
 - containment, handling, monitoring, storage, treatment, and final disposal of pollutants;
 - conservation and protection of natural or heritage resources;
 - environmental restoration and rehabilitation of the site upon decommissioning; and
 - protection of environment and human health.
- Residual environmental effects remaining after the application of mitigation measures, to the extent possible expressed in quantitative terms relative to baseline conditions.
- Description of control technology as compared to best available control technology.

Follow-up Plans, including Monitoring and Reporting

- Proposed follow-up activities that will be required at any stage of development (e.g. monitoring, inspection, surveillance, audit, etc.)
-

COPIES:

For EAP reports, submit the following:

- 2 hard (paper) copies; and
- 1 electronic copy (CD)

Additional hard copies may be required for proposals in locations where internet access is limited.

NOTE: The Environment Act requires that subject to the Confidential Information clause, Section 47, a proposal shall be filed in the public registry. **Proprietary information, if applicable, should be clearly noted. Separate hard and electronic reports excluding proprietary information should be submitted for the public registry.**

The EAB publishes all EAPs on its webpage for public access. For this reason, please use the following guidelines for creating electronic copies:

- Documents must be in Portable Document Format (PDF) or a file type that can be easily

converted to PDF (e.g. Microsoft Word or other word processing documents).

- Files should be smaller than 5 MB. Larger files may be broken into logical sections if necessary. Avoid numerous small files.
 - The content and order of the electronic copy must be identical to the hard copy. Include tables, pictures, figures, drawings, etc. in the same locations throughout the document as they would be in the hard copy. If the Table of Contents lists them as separate documents, include them as separate electronic files.
 - File names must be in lower case letters with no spaces. Numbers and underscores (_) are acceptable (e.g. "eap_sec1.pdf").
 - If GIS data were used to create any maps or drawings included in the submission, include digital data files compatible with ESRI software (e.g. Shapefile, Coverage or DXF format) along with base metadata (author/date/datum/projection/accuracy).
-

For further information, please contact:

Environmental Approvals Branch
Manitoba Sustainable Development
1007 Century Street
Winnipeg, MB R3H 0W4
Phone: (204) 945-8321
<http://www.gov.mb.ca/sd/eal>



Appendix B

Environmental Assessment and Mitigation Measures

6. Environmental Assessment and Mitigation Measures

This section identifies the potential Project effects on the biophysical and socioeconomic environmental components, describes mitigation measures included in the design of the Project to avoid or minimize potential Project effects and determines the residual adverse impacts remaining after the application of mitigation measures.

The scope of this environmental assessment regarding spatial and temporal boundaries and the environmental components to be assessed has been described in **Section 3**.

6.1 Effects Assessment Methods

Table 6-1 identifies the biophysical and socioeconomic components that may be potentially affected by the Project due to the potential for interactions with the Project activities and components. Potential interactions were identified based on:

- Professional judgement;
- An understanding of Project components, construction methods, operation processes and the assumption that standard environmentally responsible construction techniques and operating procedures will be applied during Project construction, operation and decommissioning/closure.

Table 6-1: Environmental Component Potential Interactions with the Project

ACTIVITY	BIOPHYSICAL COMPONENTS										SOCIO-ECONOMIC COMPONENTS				
	Physical			Atmospheric		Terrestrial			Aquatic		Land and Resource Use	Human Health	Indigenous and Treaty Rights**	Heritage Resources	Aesthetics
	Geology/ Topography	Soil	Groundwater	Air Quality (dust, noise)	Climate / Greenhouse Gases	Vegetation	Wildlife	Species of Conservation Concern	Surface Water Quality	Fish and Fish Habitat*					
CONSTRUCTION															
Mobilizing construction equipment, materials and crew to and from Project Site		X		X	X	X	X	X	X		X	X		X	X
Vegetation clearing, grubbing and leveling as needed, for well clusters, temporary access trails and slurry line / water return line trails	X	X		X	X	X	X	X	X		X	X		X	X
Stockpiling cleared woody debris/organics/soil	X	X		X	X	X	X	X	X		X	X		X	X
Disposing of large woody debris (trees)		X		X	X	X	X	X			X	X		X	X
Drilling extraction wells	X	X	X	X	X	X	X	X	X		X	X		X	X
Establishment/laydown of slurry and return water line and associated pumping stations		X		X	X	X	X	X	X		X	X		X	X
Disposing and recycling of miscellaneous construction wastes (e.g. lubricant containers; parts packaging)		X		X	X		X	X			X				X
OPERATION and MAINTENANCE															
Mobilizing drill rigs and crew to and from Project site		X		X	X		X	X				X			X
Operation of air compressors, pumping stations and other equipment.	X	X	X	X	X		X	X			X	X			X
Disposing and recycling of miscellaneous operation and maintenance wastes (e.g. lubricant containers; parts packaging)		X		X	X		X	X				X			X
DECOMMISSIONING/CLOSURE															
Mobilizing decommissioning/closure equipment, materials and crew to and from Project site		X		X	X		X	X				X			X
Dismantling slurry lines, water return lines and associated pumping stations		X		X	X		X	X				X			X
Progressive annual closure of extraction wells (well sealing)	X	X	X	X	X		X	X				X			X
Spreading organics/soil and revegetating previously disturbed areas	X	X		X	X	X	X	X				X			X
Disposing and recycling of miscellaneous construction wastes (e.g. lubricant containers; parts packaging)		X		X	X		X	X				X			X

* There is a low probability of fish habitat existing within the waterbodies (i.e. quarry ponds) occurring within the Project Site. Project activities will avoid waterbodies and will apply appropriate erosion and sedimentation mitigation practices. Therefore, Project related activities are not anticipated to interact with surface waterbodies.

** Project activities are not anticipated to adversely impact Indigenous and Treaty Rights (Section 6.6.5).

The framework for determining environmental impacts of the Project on environmental components includes the following:

- Determine potential adverse effects of the Project on environmental components;
- Apply mitigation measures to avoid or minimize potential adverse effects;
- Determine the residual environmental impacts, which are those adverse environmental effects that remain after the application of mitigation measures; and
- Evaluate the residual environmental impacts based on defined effects evaluation criteria.

The criteria used to evaluate residual environmental impacts are defined in **Table 6-2**, noting that the defined criteria is used as a general guide and may be modified to more appropriately evaluate impacts to specific environmental components.

Table 6-2: Environmental Effects Assessment Criteria

CRITERIA TERM	DEFINITION			
Magnitude of Effect:	<p>Refers to the estimated percentage of population or resource that may be affected by activities associated with the construction, operation and decommissioning/closure of the Project. Where possible and practical, the population or resource base has been defined in quantitative or ordinal terms (e.g., hectares of soil types, units of habitat). Magnitude of effect has been classified as less than (<) 1%, 1% to 10%, or greater than (>) 10% of the population or resource base.</p> <p>Where the magnitude of an effect was determined as virtually immeasurable or represented a potential change that was within the natural variation of population or resource levels, the effect was considered Negligible. An exception to this is regarding human health effects where, for example adverse health issues due to the Project and affecting 1% of the population would still be considered major</p>			
	Negligible (immeasurable)	Minor (<1%)	Moderate (1 to 10%)	Major (>10%)
Direction of Effect:	<p>Refers to whether an effect on a population or a resource is considered to have a positive, adverse or neutral effect</p>			
	Positive	Adverse	Neutral	
Duration of Effect:	<p>Refers to the time it takes a population or resource to recover from the effect. If quantitative information was lacking, duration was identified as short term (<1 year), Moderate term (1 to 10 years) and long term (>10 years)</p>			
	Short term (<1 year)	Moderate (1 to 10 years)	Long term (>10 years)	
Frequency:	<p>Refers to the number of times an activity occurs over the Project phase and is identified as once, rare, intermittent or continuous</p>			
	Once	Rare	Intermittent	Continuous
Scope of Effect:	<p>Refers to the spatial area potentially affected by the effect and categorized as Project Site, Local Project Area or Regional Project Area as defined in Section 3.2. Where possible, quantitative estimates of the resource affected are provided</p>			
	Project Site	Local Project Area	Regional Project Area	
Reversibility:	<p>Refers to if an adverse effect is likely to be reversed after completion of the activity or Project decommissioning/closure</p>			
	Reversible		Irreversible	

The significance of residual environmental impacts is commented on where applicable regulatory criteria exist such as a regulatory threshold (e.g. air quality guidelines are exceeded due to Project activities). In the absence of such regulatory thresholds, an overall characterization of the impact is provided, taking into consideration the assessment criteria as described above in **Table 6-2**.

Environmental effects that may be caused due to accidents and malfunctions are discussed separately in **Section 6.9**.

6.2 Physical Environment

6.2.1 Geology/Topography

Magnitude of Effect: Minor (Topography and Geology)

Direction of Effect: Adverse

Duration of Effect: Long term

Frequency: Intermittent

Scope of Effect: Project Site

Reversibility: Reversible (Topography); Irreversible (Geology)

The geology and topography of the Project Site will be affected by Project activities including:

- Clearing and levelling as needed at the sand extraction well locations;
- Clearing for temporary laydown areas in well cluster areas;
- Development of temporary access trails for drilling equipment access and temporary trails for slurry line and return water line and associated pumping stations; and
- Drilling of sand extraction wells.

Extraction of the silica sand resource will result in a permanent change to the underground geology in the form of horizontal arrays of rooms and pillars in the sandstone geological layer (between 52 m to 76 m), in the Winnipeg Formation aquifer within the Project Site.

Results of a geotechnical assessment based on preliminary exploratory drilling associated with this Project from 2017 to 2021 indicated that the overlying carbonate (limestone) geological layer needs to be at least 15 m thick to minimize the possibility of surface subsidence during sand extraction activities (Stantec, 2019; 2020; 2021). Additionally, the preliminary analysis indicated that:

- The diameter of extraction voids (areas where sand is extracted at each drill hole site) should not extend beyond 60 m in any circumstance, and should be reduced to 50 m as the overlying limestone layer thins to 15 m.
- The distance from the edge of one extraction void to the edge of the next extraction void should not be less than 60 m in direction.

Based on these cone diameters and distances between sand extraction centres, each extraction void would contain approximately 25,000 tonnes of sand resource, and a total estimated sand recovery of 1.06% targeted over the 24 year life of the Project compared to the total volume of sand identified as a resource in the Winnipeg Sandstone Formation (Stantec, 2020; 2021).

The following measures will be implemented to avoid or minimize Project adverse effects on geology and topography, including potential for underground and surface subsidence due to the sand and groundwater extraction activities:

- Where applicable, existing roads and trails and other previously disturbed areas will be utilized to minimize disturbance to the natural topography.
- The locations of annual extraction wells will be determined in consideration of the results of preliminary geotechnical modeling used to predict thresholds of extraction amounts to mitigate adverse effects related to the potential for underground and surface subsidence (Stantec, 2021).
- Additional testing will be conducted to further assess and confirm the limestone and overburden thickness and structure as the Project progresses geographically.
- Progressive annual decommissioning of extraction wells will be done using a concrete cap, bentonite and permeable backfill in accordance with applicable guidance documents such as 'Constructing and Sealing Wells in Manitoba' (Province of Manitoba, 2018).
- Levelling and grading will occur during progressive annual decommissioning of extraction wells to return the landscape to elevations typical to the surrounding area.

While measurable disturbances will be imposed on natural geologic and topographic features, disturbances will be limited to the Project Site. With the application of the above described mitigation measures, impacts on topography have been assessed as being minor because disturbed land will be leveled, graded and progressively rehabilitated. Impacts to geology are assessed as being minor due to the abundance of remaining silica sand resource with approximately 1.06% removed throughout the 24-year life of the project in the target regional aquifer geological layer within the Project Site. The extracted silica sand will not be replaced; therefore, impacts to the geology will be irreversible/permanent.

6.2.2 Soils

Magnitude of Effect: Minor

Direction of Effect: Adverse

Duration of Effect: Long term

Frequency: Intermittent

Scope of Effect: Project Site

Reversibility: Reversible

Construction / operation activities including clearing, levelling, and construction of temporary access trails, well clusters and slurry line and water return line routes, and the progressive annual decommissioning of extraction wells and disturbed areas have the potential to cause soil erosion. Soil erosion can potentially increase during high wind and precipitation events, which are expected to be most frequent during the extraction activities when soils are exposed and not frozen/snow covered (i.e. April through November). Soil erosion may affect other environmental components, such as air quality (e.g. dust from soil disturbance), water quality and vegetation.

To mitigate the effects of soil erosion, the following measures will be incorporated:

- An Erosion and Sediment Control Plan will be implemented for all phases of the Project.
- During the progressive annual decommissioning activities, after Project components have been removed, the landscape will be leveled and graded, and disturbed areas will be revegetated as quickly as feasible to stabilize the soil and minimize soil erosion.

With the application of the above mitigation measures, the potential for soil erosion and associated adverse impacts to the surrounding environment are anticipated to be minor and restricted to the Project Site.

6.2.3 Groundwater

Magnitude of Effect: Minor

Direction of Effect: Adverse (quantity); Positive to Adverse (quality)

Duration of Effect: Long term

Frequency: Intermittent (i.e. seasonal)

Scope of Effect: Project Region

Reversibility: Reversible (aquifer will recharge over time)

The potential risks to groundwater are assessed to be minor, seasonal in duration and reversible. Water levels in the Winnipeg Sandstone and Red River Carbonate aquifers are expected to recover 80% in first two days with remaining 20% recovering over a period of 20 to 80 days following the end of extraction activities in the fall of each year.

As indicated in **Section 2.2.1**, the slurry loop system for transporting sand to the facility is designed to not require any additional water which allows for the majority of the water that comes from the extraction well to be returned to the aquifer within a short period of time. Therefore, very little extraction of groundwater from the aquifer is required.

A comprehensive hydrogeological and geochemical assessment was undertaken involving field investigation, data analysis, numerical groundwater modelling and geochemical modelling, with the results described in an extensive, peer-reviewed hydrogeology and geochemistry assessment report (**Appendix A**). Overall, drawdown effects associated with sand extraction were simulated to be localized, with limited to no effects beyond 1,500 m (4,921 ft) from the active extraction wells when the majority of groundwater is reinjected. During a pumping test, little to no decline (0.02 m to 0.77 m) in water levels was observed in the existing domestic wells near the Project site in the Winnipeg Sandstone or Red River Carbonate aquifers and no negative impacts were reported by well owners. Water levels in the observation well network declined by up to 8.5 m (Winnipeg Sandstone) and 1.5 m (Red River Carbonate) at a distance of 89.3 m from the pumping well. Drawdown effects are largely restricted to the Project Site boundary, but minor effects are anticipated to extend beyond it during and immediately following operation of extraction wells close to the boundary.

A draft version of the hydrogeology and geochemistry assessment report (final version in **Appendix A**) underwent peer review by two separate hydrogeologists with extensive knowledge of the subject matter and the regional aquifer. The peer review comments and responses to those comments are provided in **Appendix B**. The hydrogeology and geochemistry assessment report was finalized (**Appendix A**) in consideration of peer review input and additional information was incorporated to improve the assessment. The following two expert hydrologists conducted a peer review (**Appendix B**) of the draft version of the hydrogeology and geochemistry report:

Jeff Bell, B.Sc. (G.E.), P.Eng. Hydrogeological Engineer, Friesen Drillers Ltd.

Jeff Bell is president of the Manitoba Water Well Association and is the head hydrogeological engineer for Friesen Drillers Ltd., a company that specializes in water well drilling and is based in Steinbach, Manitoba. He has over 20 years' experience in groundwater development and hydrogeological studies. He has extensive experience in the design and supervision of water wells using a direct rotary, air, and reverse rotary drilling equipment and has designed numerous large capacity municipal, industrial and domestic water supply wells using innovative methods and techniques. He also has extensive experience in well rehabilitation and development techniques.

Mr. Bell has undertaken numerous large-scale municipal and industrial groundwater supply projects and resource evaluations. He has completed large scale numerical groundwater models for projects including the Red River Floodway and the City of Winnipeg Sandilands water supply project. He has also undertaken

regional groundwater mapping investigations, geochemical studies, and environmental hydrogeology studies. Mr. Bell has also undertaken several major environmental studies relating to possible groundwater supply impacts from municipal and industrial groundwater developments. Most recently, Mr. Bell was a lead hydrogeological engineer for the hydrogeological investigation of a proposed new municipal groundwater supply for the communities of Oakbank and Dugald in the R.M. of Springfield (Friesen Drillers, 2019).

Dr. Grant Ferguson, B.Sc., Ph.D., P.Geo., Eng.L. University of Saskatchewan, Professor Civil, Geological and Environmental

Grant Ferguson holds a B.Sc. in Honours Geology from the University of Waterloo and a PhD in Civil Engineering from the University of Manitoba. He is a Centennial Enhancement Chair and Professor in the Department of Civil, Environmental and Geological Engineering and School of Environment and Sustainability at the University of Saskatchewan and an Adjunct Professor in the Department of Hydrology and Atmospheric Sciences at the University of Arizona.

His research focuses on hydrogeology and hydrogeochemistry of regional groundwaters systems and the interplay between energy and water resources. He was the 2019 recipient of the Global Institute for Water Security's Research Excellence Award. Dr. Ferguson served as president of the International Association of Hydrogeologists – Canadian National Chapter (IAH CNC) from 2009 to 2015 and was one of the founders of the IAH's Early Career Hydrogeologists Network

Based on a comprehensive geochemical assessment that included geochemical modelling, the overall quality of groundwater within the maximum footprint of the Project will be largely preserved. The activities associated with Project operations and post-closure phases of the Project were determined to have a temporary and minor impact on groundwater quality. For some constituents, the impact was simulated to be positive due to reduction of concentrations of iron and manganese when oxygen (air) is introduced into the aquifer or is allowed to mix with water containing lower concentrations of those elements.

The following measures are expected to mitigate groundwater withdrawal effects and potential for groundwater contamination:

- Process water will be recycled in a loop system for reuse, which reduces the quantity of water required from groundwater;
- When each well is drilled, casing will be installed and grouted in place to isolate the Red River Carbonate and Winnipeg Sandstone aquifers from one another and thereby prevent vertical mixing of waters;
- Extraction wells will be progressively (sequentially) established and sealed (decommissioned) during the ongoing sand and groundwater extraction activities in accordance with applicable guidance documents such as 'Constructing and Sealing Wells in Manitoba' (Province of Manitoba, 2018) and Environment Act Licence requirements;
- Geochemical modelling (**Appendix A**) has indicated that reinjection of groundwater (which will be UV-treated) back to the sandstone aquifer will not adversely affect groundwater quality in either the Winnipeg Sandstone or Red River Carbonate aquifers. A Waste Characterization and Management Plan, Water Management Plan, Groundwater Monitoring and Impact Mitigation Plan and Progressive Well Abandonment Plan (**Section 8**) will be developed and implemented to protect groundwater quality and guide responses to any potential impacts to groundwater quantity and quality. Measures will be developed to avoid and/or mitigate any well interference issues as required by *The Water Rights Act* of Manitoba.

With the application of the above mitigation measures and utilization of groundwater at sustainable rates as determined by ongoing hydrogeological testing and monitoring, impacts to groundwater are anticipated to be minor, seasonal in duration and reversible. Considering there will not be a continuous and unsustainable drawdown on the regional groundwater aquifer for Project processes and that the majority of the water that comes from the extraction well will be returned to the aquifer within a short period of time, effects on groundwater quantity in the regional aquifer can be managed by adhering to a Water Management Plan and by implementing a Groundwater Monitoring and Impact Mitigation Plan. The aquifer will also continue to be recharged through natural groundwater recharge processes (i.e. rain and snow melt) and lateral groundwater flow. Effects on groundwater quality will be minor and, in some cases, positive. Risks to groundwater quality will be mitigated through application of a Waste Characterization and Management Plan, Progressive Well Abandonment Plan and a Groundwater Monitoring and Impact Mitigation Plan.

6.3 Atmospheric Environment

6.3.1 Air Quality

Magnitude of Effect: Minor to Negligible

Direction of Effect: Adverse

Duration of Effect: Long term

Frequency: Intermittent

Scope of Effect: Project Regional Area

Reversibility: Reversible

Project activities are expected to affect air quality due to dust generated by movement of drilling rigs and other mobile equipment, and due to exhaust emissions including nitrogen dioxide (NO₂), carbon monoxide (CO) and sulfur dioxide (SO₂). The exhaust emissions and dust generated from mobile equipment can have adverse effects on human health, wildlife and vegetation.

The number of vehicles and equipment used for Project activities listed in **Section 2.8** would not all be operating simultaneously. Therefore, adverse effects on air quality beyond Manitoba's air quality guidelines at nearest residences⁶ from vehicles and mobile equipment use are not anticipated.

As indicated in **Section 1.1**, at no time will dry silica sand be left exposed at the Project Site. Sand will be wet and will either be contained within the extraction well lines or the slurry lines, or material that is too large ('overs'), such as concretions (calcified sand), will be stored in appropriate containment prior to removal from site or use in well sealing activities. Therefore, the risk of silica sand dust dispersal is eliminated.

Measures that will be applied to minimize potential Project effects to air quality include the following:

- Idling of motorized equipment will be minimized to the extent feasible;
- Water will be applied on gravel roads to control dust, as required; and
- Equipment and vehicles will be properly maintained.

With the application of the above measures, impacts on air quality are expected minor to negligible, and sufficiently mitigated.

⁶ Nearest residence is approximal 133 m west of proposed well cluster areas.

Impact assessment information for greenhouse gas (GHG) emissions is provided in **Section 6.3.2**.

6.3.2 Climate/Greenhouse Gases

- Magnitude of Effect:** Negligible
- Direction of Effect:** Adverse
- Duration of Effect:** Long term
- Frequency:** Intermittent
- Scope of Effect:** Beyond the Project Regional Area
- Reversibility:** Irreversible

To estimate the annual emissions of greenhouse gases (GHG), emissions of carbon dioxide (CO₂), methane (CH₄) and Nitrous Oxide (N₂O) were estimated from onsite activities associated with the Project operation. Estimated GHG emissions associated with Project equipment are summarized in **Table 6-3**.

Table 6-3: Greenhouse Gas Annual Emissions (CO₂e)

Emission Sources	Total Utilization (hours/year)	CO₂e GHG Emission (kg CO₂e/year)
DIRECT EMISSIONS		
EXTRACTION		
10 x Extraction Rigs @ 200,000 each - Off-Road	60,000	2,445,719
Compressor trailer for extraction / OFD1550 Tier 4 Final Oil Free Rotary Screw Air Compressor	12,000	934,060
Excavator per pad	6,000	318,505
Light Plant x 8	24,000	385,998
Flat Deck Truck (2015 F650 XLT Super Duty w/ 17' bed)	6,000	303,487
Zoom Boom / Manitou MT 5519 Telescopic Handler	6,000	239,291
DRILLING		
TH60 for drilling Earth Drilling	6,000	489,898
DR24 for Drilling Earth Drilling	6,000	491,784
2022 Ford F750 Water Truck Heavy Duty	6,000	212,886
Grouting System	700	11,295
SEALING		
DR24 for Abandonment	3,000	250,513
Picker Truck On-Road	1,000	72,915
SUPPORT		
Welding Truck F350 Light Duty	750	46,332
Mechanical Service Truck F350 Light Duty	750	46,332
SLURRY HANDLING		
CAT C18 Diesel Generator Set	6,000	394,712
HDPE Tube Welding Machine	1,000	68,475
Vac Truck	1,000	72,777
INDIRECT EMISSIONS		
POWER CONSUMPTION		
Pump Station	8,784	12,432
Total (kg CO₂e/year)		6,797,411

The following measures to minimize the production of GHG emissions will be applied:

- Emissions will be minimized by regularly maintaining equipment and vehicles and minimizing idling of vehicles
- Vehicles and equipment will meet required emission standards.

Overall, the Project is estimated to generate 0.006797411 tonnes (Mt) of CO₂e annually with the application of the above mitigation measures, which is 0.0296% of the reported Manitoba emissions in 2019 which were 23 Mt CO₂e (ECCC, 2021), about 0.000931% of the reported 730 Mt CO₂e from Canada in 2019 (ECCC, 2021). Therefore, the impact of the Project on Greenhouse Gas contributions to the atmosphere is assessed as negligible.

6.3.3 Noise

Magnitude of Effect: Minor to Moderate

Direction of Effect: Adverse

Duration of Effect: Short-term

Frequency: Intermittent

Scope of Effect: Variable due to changing annual locations of Project activities within the Project Site

Reversibility: Reversible

Noise generated by Project activities (e.g. extraction well drilling; operation of vehicles and machinery such as pumping stations) has the potential to adversely affect wildlife (**Section 6.5.2**) and could result in nuisance noise to people living within the Local Project Area. Project components expected to generate noise that may contribute to noise levels at the nearest points of reception (e.g. nearest residence, i.e. 133 m from a well cluster area) are listed in **Section 2.8**. Example noise sources associated with Project activities include mobilization of extraction well drilling equipment, drilling of wells and operation of pump stations.

The following measures will be implemented to reduce noise generated from Project activities:

- Vegetation clearing will be minimized to the extent feasible.
- Project activities will setback a minimum of 100 m from nearest residences.
- Mobile equipment and vehicles will be kept well maintained and will be fitted with mufflers, and other noise mitigation equipment as required.
- Unnecessary idling and revving of engines will be avoided.
- Additional noise mitigation measures will be applied (e.g. portable noise barriers) as required.

In consideration of the above measures to minimize noise levels due to Project activities, it is anticipated that potential noise levels at the nearest residences will be adequately attenuated. Noise disturbances to wildlife are expected to be moderate in the vicinity of Project activities but are not expected to measurably affect wildlife populations within the Interlake Plain Ecoregion within which the Project is located.

6.4 Aquatic Environment

6.4.1 Surface Water

Magnitude of Effect: Negligible

Direction of Effect: Adverse

Duration of Effect: Short term

Frequency: Intermediate

Scope of Effect: Local Project Area

Reversibility: Reversible

Project operations do not involve the use of, or discharge of, any surface water of any kind. Residual effects from temporary extraction-related activities including clearing, levelling, compacting, and establishment of well clusters, extraction wells, temporary access trails and slurry and water return line trails has the potential to increase surface water runoff within the Project Site and Local Project Area and potentially affect surface water quality and quantity. Removal of existing vegetation can potentially pose a risk to surface water quality as more sediment will be exposed to surface water drainage, potentially resulting in sediment laden runoff water. However, considering the Project Site does not have natural waterbodies potentially affected by vegetation removal, adverse effects to surface water from vegetation removal are not anticipated.

Due to the absence of natural waterbodies such as wetlands in the Project Site and immediately adjacent Local Project Area that may be potentially affected due to a temporary drawdown effect⁷ from sand extraction activities, Project operations are not expected to affect surface water quantity.

The following mitigation measures will be implemented to avoid or minimize potential effects on surface water quality:

- Drainage ditching will be constructed along Project access trails and at disturbed areas, as required, to assist in directing runoff flow from rain and snow and maintaining natural drainage pathways through low areas.
- As per **Section 2.3.1**, portable toilets will be located at active well cluster sites which will be regularly pumped out by a licensed local contractor for proper disposal as a means to prevent potential contamination of local waterbodies with potentially harmful substances.
- As per **Section 6.2.2**, an Erosion and Sediment Control Plan will be implemented for all phases of the Project.

With the application of the above described mitigation measures, the impacts on surface water are assessed as negligible.

6.4.2 Fish and Fish Habitat

Project related impacts on fish and fish habitats are not anticipated due to the lack of potential fish habitat within the Project Site (**Section 4.3.2**), no expected impacts on surface water quantity (**Section 6.4.1**) and application of an Erosion and Sediment Control Plan as indicated in **Section 6.2.2**.

6.5 Terrestrial Environment

6.5.1 Vegetation

Magnitude of Effect: Minor (Project Site) to Negligible (Local Project Area)

Direction of Effect: Adverse

Duration of Effect: Long term

Frequency: Intermittent

Scope of Effect: Project Site (vegetation clearing) to Local Project Area (dust deposition)

Reversibility: Reversible

⁷ Drawdown effect is the lowering of the water table related to the zone of influence that groundwater extraction activities would have in the vicinity of extraction sites (refer to **Appendix A** for a description of the predicted drawdown effect distance for Project operations).

The total amount of naturally vegetated area requiring clearing for annual Project operations will vary considering the variable amounts of natural vegetation present within each annual block of Project development lands within the Project Site (which consists of 31% agriculture lands and 13% 'developed land; **Section 4.4.1**). There will be no permanent components associated with the extraction Project. Therefore, progressive annual rehabilitation/revegetation of Project activity sites will minimize the long-term effects on vegetation within the Project Site. Direct impacts on vegetation through annual clearing activities will be restricted to the Project Site in consideration of setback distances as described in **Section 1.4**.

The footprint area of each well cluster will be minor (i.e. 0.20 ha to 0.28 ha), with only seven well clusters active any one time and other well clusters being progressively rehabilitated and revegetated. The pathway required to accommodate the parallel slurry and water return line will be very narrow (2 m wide), with temporary access trails limited to approximately four m in width and up to approximately eight m in width at turning points to accommodate required drill rig turning areas. Routing of these lines and the temporary access trails will be located within previously disturbed/cleared areas to the extent feasible. Therefore, these annual pathway routes will not represent a substantial annual footprint area where natural vegetation will need to be cleared. The number and locations of pumping stations required along the slurry line routes will also vary annually with increasing distance from the Processing Facility. The footprint area of the pumping stations will also be minor; approximately 63 m² each.

Project activities and temporary components will be located on previously disturbed land to the extent feasible within a Project Site that consists of approximately 56% natural vegetation cover. Therefore, the amount of naturally vegetated area requiring clearing each year is expected to be minor.

The types of naturally vegetated land cover that will be cleared (i.e., forest, meadow and willow/alder) are common within the Regional Project Area (**Section 4.4.1**).

Considering progressive closure, rehabilitation and revegetation of extraction activity areas will be done each year, it is expected that most natural vegetation will be very well established after approximately four years, with reestablishment of trees and shrubs expecting to be evident within five to 10 years following closure.

The following mitigation measures will be implemented to avoid or minimize potential effects of clearing on vegetation:

- Areas to be cleared of vegetation will be minimized to the extent feasible and will be clearly marked to avoid clearing more than required.
- Usable trees/wood will be cut and stacked at the Project Site for local use as firewood for no longer than one year or disposed of in accordance with applicable regulations.
- Disturbed areas will be allowed to revegetate naturally and will be augmented using an approved native seed mixture and native plantings if required.
- A Revegetation Monitoring Program (**Section 8.7**) will be implemented annually after the first year of Project operations to determine the success of the revegetation program and determine if follow-up reseeding or replanting is required. The monitoring program will include monitoring during the growing season until the seedlings appear to be established.
- Mitigation measures to control dust (**Section 6.3.1**) will be applied.

Clearing impacts on vegetation are limited to the Project Site and are assessed as minor due to:

- The limited amount of clearing required for annual Project operations; and
- The progressive annual site reclamation and revegetation procedures that will occur to return the landscape to pre-construction conditions to the extent feasible.

Vegetation within the Project Site and Local Project Area can also be harmed due to dust deposition on the surface of plants, which may prevent adequate photosynthesis and other life functions of vegetation (Farmer, 1993). Dust will be generated during Project activities as follows:

- Due to vegetation clearing and ground levelling activities, as needed;
- During use of existing gravel roads and temporary access trails which will contribute to dust emissions, to mobilize employees and equipment to the Project Site; and
- During the progressive annual closure/reclamation activities, dust deposition will be generated from cleanup and removal of Project components.

Effects of dust deposition are assessed to be minor due to the application of the mitigation measures listed in the air quality **Section 6.3.1** to control dust.

With the application of the above mitigation measures, overall Project impacts to vegetation are assessed as minor within the Project Site and negligible within the Local Project Area.

6.5.2 Wildlife

Magnitude of Effect: Negligible

Direction of Effect: Adverse

Duration of Effect: Long term

Frequency: Intermittent

Scope of Effect: Regional Project Area

Reversibility: Reversible

Project activities that disrupt the natural environment (e.g. vegetation clearing, noise) are the primary contributors to potential effects on wildlife. Wildlife management focuses on regional wildlife populations because wildlife populations (e.g. deer) are typically not measurably affected if only an individual or small number of individuals are affected within a relatively small spatial area (e.g. the home range of a deer). Therefore, the spatial scope of the assessment of the Project impacts on wildlife has been conducted in consideration of the Regional Project Area. The availability of nearby alternative habitat for wildlife is also taken into consideration when assessing the potential effects of a development on wildlife.

The limited average annual amount of natural vegetation clearing within the Project Site that is required for Project activities (**Section 6.5.1**) is unlikely to substantially affect wildlife populations within the Regional Project Area because:

- The Project Site currently provides sub-optimal wildlife habitat (generally) due to existing disturbances and resulting fragmented habitat from existing development (e.g. agriculture fields; existing roads; quarries; residential lots; **Section 4.6.4**);
- The types of landcover used by wildlife that will be cleared during Project activities are common in the Regional Project Area (**Section 4.4.1**);
- The amount of naturally vegetated area that will need to be cleared for the Project during each year of operation is minor considering approximately 44% of the Project site is previously disturbed landcover due to human development such as agriculture, roads and aggregate quarries.

Noise generated during Project activities is expected to influence wildlife behaviour (e.g. area avoidance) to varying degrees within the Project Site and Local Project Area depending on the type of wildlife (U.S. National Parks Service, 2018). Noise generated within the Project Site is not expected to be of a magnitude that would substantially affect wildlife populations within the Regional Project Area because:

- Project-generated noise is not expected to be substantial beyond the Project Site and adjacent Local Project Area (**Section 6.3.3**); and
- Wildlife species present in the vicinity of the Project are anticipated to be accustomed (habituated) to some level of noise (U.S. National Parks Service, 2018) due to the presence of existing developments (e.g. agriculture activities, residential areas, roads and aggregate quarries).

Additional potential effects of the Project on wildlife include the following:

- Light pollution emanating from the well cluster/work areas within the Project Site can also disturb wildlife and alter natural wildlife behaviour for wildlife that may be present within the zone of influence of site lighting (e.g. Dominoni, 2017).
- The minor increase in vehicle traffic in the Regional Project Area as a result of Project activities (**Section 6.7**) is anticipated to result in a minor increase the risk of vehicle collisions with wildlife.

The following measures will be applied to minimize potential adverse effects to wildlife resulting from Project activities:

- Areas to be cleared of vegetation will be minimized to the extent feasible and will be clearly marked to avoid clearing more than required.
- Vegetation clearing will take place outside of the spring and summer months to the maximum extent feasible to avoid disturbance to breeding birds and other spring breeding wildlife species.
- Vegetation clearing will not take place during the breeding bird season for this ['Zone B4'](#) area (April 14 – August 24; Government of Canada, 2018).
- Areas disturbed during annual Project activities will be allowed to revegetate naturally after each Project operation year and will be augmented using an approved native seed mixture and native plantings if required.
- Noise mitigation as proposed in **Section 6.3.3** will be applied.
- Measures to control dust generation will be applied as described in **Section 6.3.1**.
- Fully shielded directional lighting fixtures will be used to focus light specifically to work areas to minimize the dispersal of light to the surrounding Project Site.
- Workers using the temporary access trails to access the Project Site (e.g. well cluster sites) will be required to limit vehicle speed to a maximum of 30 km/hr.
- Employees and contractors will be required not to feed or harass wildlife.

With the application of the above mitigation measures, Project impacts to the Regional Project Area wildlife populations are assessed as negligible. The Project is also not anticipated to have a measurable effect on wildlife populations within the Interlake Plain Ecoregion.

6.5.3 Species of Conservation Concern

Magnitude of Effect: Minor to Negligible

Direction of Effect: Adverse

Duration of Effect: Long term

Frequency: Intermittent

Scope of Effect: Regional Project Area

Reversibility: Reversible

Species of conservation concern that potentially occur in the Regional Project Area (**Section 4.4.3; Appendix E**) are not expected to experience a substantial decrease in regional populations as a result of Project activities due to:

- The limited amount of cleared vegetation/habitat that will be required for the Project (**Section 6.5.1**);
- Prevalence of similar cover types within the Regional Project Area, and the application of measures indicated in **Sections 6.5.1** and **6.5.2** to mitigate adverse effects of the Project on vegetation and wildlife in general.

Therefore, the Project impacts to regional populations of species of conservation concerns are assessed as minor to negligible, depending on the species of conservation concern and their habitat preferences.

6.6 Socioeconomic Environment

6.6.1 Labour Force and Employment

Magnitude of Effect: Minor

Direction of Effect: Positive

Duration of Effect: Long term

Frequency: Intermittent

Scope of Effect: Regional Project Area

Reversibility: Reversible

According to the labour force and education/training statistics provided in **Section 4.6.2**, there will be potentially employable people in the Local and Regional Project Areas having the skills, training and experience required for Project employment positions. There may also be other supply and services contracts associated with the operation of the Project that will provide additional long-term economic opportunities.

As indicated in **Section 2.5**, approximately 35 to 45 people will be employed for Project activities such as annual site clearing, extraction well drilling, extraction activities and relocation and assembly of temporary Project components. The need for local suppliers and other business to support Project activities is likely to provide an additional 100 to 120 indirect employment opportunities. Employment opportunities associated with the Project will be advertised as needed within the Regional Project Area and will be a positive, long-term and continuous benefit for the Regional Project Area.

6.6.2 Infrastructure and Services

6.6.2.1 Emergency Services

Magnitude of Effect: Minor

Direction of Effect: Neutral/Adverse

Duration of Effect: Long term

Frequency: Intermittent

Scope of Effect: Regional Project Area

Reversibility: Reversible

Emergency services (i.e., fire, policing and ambulance) in the Regional Project Area have the potential to be utilized more often potentially resulting in limitations to the current availability and response times for these regional services. To mitigate potential adverse effects of the Project on Regional Project Area emergency services, CanWhite will incorporate the following measures:

- An Emergency Response Plan will be available on-site during all Project phases that will clearly outline appropriate emergency response protocols.
- CanWhite will notify the RM of Springfield emergency services when annual Project activities will begin.
- Measures to avoid accidents and malfunctions as described in **Section 6.9** will be applied.

With the application of the above measures, the Project impacts on regional emergency services are anticipated to be minor.

6.6.2.2 Community Services

Magnitude of Effect: Minor (benefit)

Direction of Effect: Neutral to Positive

Duration of Effect: Long term

Frequency: Intermittent

Scope of Effect: Local and Regional Project Area

Reversibility: Reversible

Although Project activities (well drilling) will occur year-round, there will be no permanent structures associated with Project activities. Therefore, the need for community services will be limited, but may include sourcing of some supplies and services locally where available such as machine maintenance services; fuel, oil and grease supply; small tools and equipment supply; garbage removal; health and safety supplies as well as drilling materials such as cement. CanWhite may initiate agreements for local / regional community services that would be beneficial for both the RM of Springfield and the Project.

Solid waste generated at the temporary annual work areas will be transported by a licensed local contractor to be disposed at a local licenced landfill to an amount that would be sustainable for the local landfill. Otherwise, solid waste will be transported 63 km to the Brady Road Landfill managed by the City of Winnipeg.

Benefits to the Local and Regional Project Area from the opportunities for local business to supply required goods and services are anticipated to result in an overall minor positive impact to community services.

6.6.3 Land and Resource Use

Magnitude of Effect: Minor

Direction of Effect: Adverse

Duration of Effect: Short term

Frequency: Intermittent

Scope of Effect: Project Site

Reversibility: Reversible

Project activities will occur on CanWhite mining claims sequentially from 2021 to 2025 which will result in temporary use of a very limited portion of the Project Site land each year of the Project. Land use for Project activities will occur in accordance with municipal and provincial approvals and legislative requirements.

Use of the land for other purposes will not be available in the locations of annual Project activities. However, due to the progressive annual reclamation of extraction sites and other Project-related disturbed areas, parcels of land used for Project activities during any given year of Project operation will be available for other uses the following year or once the activities are complete. Sand Extraction activities occur over

weeks in one area rather than months, with individual wells over days. Therefore, the Project is anticipated to result in an overall minor temporary adverse impact to land use within the Project Site.

6.6.4 Human Health

Magnitude of Effect: Negligible

Direction of Effect: Adverse

Duration of Effect: Long Term

Frequency: Intermittent

Scope of Effect: Local and Regional Project Areas

Reversibility: Reversible

Project activities have the potential to adversely affect human health through:

- Increased traffic due to employees and contractors accessing the Project Site;
 - Emissions from vehicles affecting air quality; and
 - Higher potential for traffic accidents;
- Dust and noise generated by Project activities.

Mitigation measures that will avoid or minimize potential adverse effects on human health are the following:

- Measures to avoid or minimize adverse effects on air quality (**Section 6.3.1**) and effects on climate (**Section 6.3.2**) will be applied.
- Measures to control noise will be applied (**Section 6.3.3**).
- All CanWhite employees will abide by the standards, procedures and training required under *The Workplace Safety and Health Act* as well as CanWhite's internal Health and Safety Program and Emergency Response Plan.
- Employee Orientation and Safety training will be mandated for all new hires in addition to required yearly safety reviews for existing staff.
- Applicable personal protective equipment (PPE) will be provided to employees. Where required, visitor orientation and PPE will be provided when visitors enter employee only areas.

Through the implementation of the measures referenced above, impacts to human health are assessed as negligible.

6.6.5 Indigenous and Treaty Rights

The Project is not expected to adversely impact the exercise of Indigenous or Treaty rights because:

- The Project Site consists of private land covered under private surface rights that do not have public access unless by permission;
- No fish or fish habitat will be affected by the Project (**Section 6.4.2**);
- The residual environmental impact of the Project on vegetation beyond the Project Site is assessed to be negligible (**Section 6.5.1**); and
- The residual environmental impact of the Project on regional wildlife populations is assessed to be negligible (**Section 6.5.2**).

6.6.6 Heritage Resources

Magnitude of Effect: Minor

Direction of Effect: Adverse

Duration of Effect: Long Term

Frequency: Intermittent
Scope of Effect: Project Site
Reversibility: Irreversible

Activities related to Project construction and operations that disturb the land may have the potential to disturb or destroy heritage resources (e.g. unknown archaeological sites). Project activities that disturb the land include clearing for temporary access trails, clearing and leveling (as required) to prepare the well pad sites for establishment of extraction wells and drilling of extraction wells.

As indicated in **Section 4.6.5**, the results of an on-site archaeological investigation found the Project Site to have substantial previous disturbances and concluded that there were no heritage concerns regarding development of the Project at the Project Site (**Appendix G**).

If heritage resources are discovered within the Project Site, work will be stopped, Historic Resources Branch will be advised, and the discovered historic resources will be recorded by an archaeologist and adequately protected as required. The heritage resources protection practices outlined in the Heritage Resources Protection Plan for the Facility Project will also be used for this Project (AECOM 2020).

With the application of the above described mitigation measure and given the opinion of a qualified archaeologist indicating no heritage concerns regarding development of the Project at the Project Site, the impacts on heritage resources are assessed as minor.

6.7 Traffic

Magnitude of Effect: Minor
Direction of Effect: Adverse
Duration of Effect: Long Term
Frequency: Intermittent
Scope of Effect: Regional Project Area
Reversibility: Reversible

The increase in Regional Project Area traffic will be not substantial for the following reasons:

- The sand will be transported to the sand Processing Facility by slurry line rather than by haul truck which will limit traffic associated with the Project staff and contractors during the Project construction and operation.
- Project staff will be limited to approximately 35 to 45 personnel during the construction and operation phases of the Project (**Section 2.5**) with staff arrivals and departures being staggered daily to accommodate the 24 hours, seven days/week (24/7) operation schedule. Additional minor traffic will be related to weekly supply/parts deliveries and contractors for services such as waste disposal.
- To access the different well cluster locations which will vary within and between Project operation years (from April through November each year of the Project), traffic will travel within the Project Site along the PR 302 (Ostenfield Road) for up to 5 km or along municipal road 42E (Queens Valley Road) for up to 1.8 km, south from PTH 15.
- The distance and frequency that traffic will travel on local roads will be variable depending on the locations of the well cluster sites within and between Project operation years.

Therefore, the overall annual increased use of regional roads will be minor.

6.8 Aesthetics

Magnitude of Effect: Minor
Direction of Effect: Adverse
Duration of Effect: Long Term
Frequency: Continuous
Scope of Effect: Project Site
Reversibility: Reversible

The impact of the Project on the aesthetics of the Local Project Area is anticipated to be minor for the following reasons:

- Land disturbances and Project components will be temporary within a very limited area in the Project Site during each year of operation;
- Most of the Project Site will remain undisturbed, and vegetation clearing to accommodate the Project footprint will be minimized to the extent feasible (refer to mitigation described in **Section 6.5.1** 'Vegetation').
- Most of the land that will be used for the footprint of Project operations is previously disturbed (e.g. agriculture; gravel quarry).
- Annual well cluster sites and wells will be progressively closed / sealed each year, and disturbed areas will be rehabilitated throughout each year of Project operation.
- Setback distances where no activity will occur (e.g. from residences) will be maintained as described in **Section 1.4**.

6.9 Accidents and Malfunctions

To minimize the probability of accidents and malfunctions, the proposed Project activities will be conducted in accordance with applicable regulatory requirements. The following sections provide additional details on precautionary measures that will be implemented by CanWhite to further minimize the potential for accidents and malfunctions to occur.

6.9.1 Worker Health and Safety

Worker protection in Manitoba is regulated through standards, procedures and training under the *Workplace Safety and Health Regulation, M.R. 219/2015*. Safety equipment and personal protective equipment will be supplied to employees. Employees and contractors will be subject to site specific environmental health and safety orientation for all phases of the Project.

6.9.2 Spills and Leaks

Environmental effects may occur due to fuel and chemical spills from diesel fuel, lubricants, oils and hydraulic fluids. An accidental release of hazardous materials and/or equipment fluids could occur from improper storage and handling procedures. An accidental release of slurry or return water may also occur if a break or crack occurs in the slurry and/or water return line. Accidental releases, depending on the type and quantity of substances released, have the potential to affect air, surface water, groundwater and soils, with consequential effects on vegetation, aquatic resources and possibly human health and safety.

The following standard procedures will be implemented to prevent spills from occurring during Project activities:

- Diesel tanks used on-site will be self-contained aboveground storage tank(s);
- When servicing requires drainage or pumping of lubricating oils or other fuels from equipment, a groundsheet of suitable material and size and drip tray where applicable will be spread on the ground to catch all fluid in the event of a leak or spill. An adequate supply of suitable absorbent material and any other supplies and equipment necessary to immediately clean up spills will also be available;
- Storage and disposal of liquid wastes and filters from equipment maintenance, and residual material from spill clean-up will be contained in an environmentally safe manner and in accordance with existing regulations;
- Waste oils, fuels, and other hazardous wastes will be handled in a safe manner. Staff will be required to transport, store and handle all such substances as recommended by the suppliers and/or manufacturers and in compliance with applicable federal, provincial and municipal regulations. Manitoba Conservation and Climate will be notified immediately if a reportable spill occurs;
- Fuels, oils or other hazardous materials will be stored in designated areas;
- Storage sites will be inspected regularly for compliance;
- Personnel on-site will be trained in how to deal with spills, including knowledge of how to properly deploy site spill kit materials which will be available on-site;
- Spill kits will be stationed and readily available for easy access;
- Service and repairs of equipment will be performed at the Processing Facility whenever possible, and all service and repairs will be done by trained personnel;
- Vehicles and Equipment will have pre-shift inspections and walk arounds to check for fluid leaks, primarily from the fuel system and/or hydraulics. Any detected leak will result in the unit being pulled from service until repaired. All service and repairs will be logged and tracked in the units operating and maintenance logs. A manufacturer defined maintenance and preventative care will be practiced by CanWhite and its employees;
- Slurry and water return line will be inspected on a daily basis, and after extreme weather events, to check for leaks and/or breaks in the line. If leaks or breaks in the line are detected, appropriate spill containment and clean-up measures will be applied as soon as feasible and the line will be repaired or replaced; and
- Fuel and chemical handlers will be trained and qualified, and appropriate emergency response measures will be in place and readily available.

Taking into account application of the above mitigation measures as necessary, and assuming the implementation of safe work practices, the risk of spills and leaks is considered to be appropriately mitigated.

6.9.3 Fires and Explosions

The presence of mechanical equipment, fuels and other hazardous materials creates a potential for fires and explosions. Such incidents can harm on-site personnel, cause equipment damage and lead to a release of contaminants, resulting in consequent effects to other environmental components (air, surface water, groundwater, plants, wildlife, aquatic resources and aesthetics).

Necessary precautions will be taken to prevent fire hazards at the Project Site; including but not limited to:

- Removal of flammable waste on a regular basis and disposal at a licenced disposal facility;
- Workers will be provided with appropriate fire prevention training;

- Appropriate fire extinguishers will be available on the Project Site. Such equipment will comply with and be maintained to the manufacturers' standards and employees will be appropriately trained in their use;
- Storage, transportation and use of hazardous materials, including flammable waste, will comply with regulatory requirements;
- On-site fire prevention/response equipment will be checked on a routine basis and in accordance with local fire safety regulations to maintain proper working order;
- Greasy or oily rags or materials subject to spontaneous combustion will be deposited and stored in appropriate receptacles. This material will be removed from the Project Site on a regular basis and be disposed of at licenced waste disposal facility;
- Emergency communication devices will be available and easily accessible to personnel to communicate and emergency as not all sites will have cellular signal; and
- Smoking will be restricted to designated areas.

With the measures outlined above, and assuming implementation of safe work practices, the risk of fires and explosions is assessed to be appropriately mitigated.

6.9.4 Transportation Accidents

An increase in traffic due to employee and contractor traffic to and from the Project Site has the potential to increase the likelihood for transportation accidents. Transportation accidents can consequently result in the release of pollutants to the environment such as fuel and oils, or materials that the vehicles colliding are transporting (e.g. construction wastes). Such accidental releases to the environment could potentially result in secondary effects on other environmental components (e.g., groundwater contamination through seepage, decline in surface water quality through runoff) or tertiary effects on vegetation (e.g., decline of growth potential due to soil contamination), wildlife, aquatic resources and human health.

The following measures will be employed to reduce the risk of transportation accidents:

- The sand will be transported from the extraction wells to the sand Processing Facility directly by slurry line rather than using transport trucks.
- Personnel retained to drive and operate vehicles and equipment such as drill rigs will have a valid appropriate-Class Manitoba Driver's License with a copy provided to CanWhite.
- Speed limits on municipal road and provincial roads/highways will continue to be implemented. Signage and speed limits on the PR 302 and PTH 15 are regulated by the Province of Manitoba.

The above noted measures are assessed to appropriately mitigate the potential risk of transportation accidents during all phases of the Project.

6.10 Summary of Environmental Effects and Mitigation Measures

Table 6-4 summarizes potential environmental effects of the proposed Project and the design features, standard operating procedures and other mitigation measures that will be implemented.

Table 6-5 summarizes potential accidents and malfunctions and measures to reduce the risk of such occurrences.

With the application of proposed mitigation measures, adverse environmental impacts of the Project are expected to be sufficiently mitigated.

Table 6-4: Summary of Environmental Assessment and Mitigation Measures

Environmental and Social Component	Project Phase	Sources of Potential Effects	Summary of Measures *	Residual Adverse Impact
PHYSICAL ENVIRONMENT				
Geology / Topography	Construction/Operation	Clearing, levelling (as needed), and construction of temporary components including access trails, well clusters, extraction well drilling, slurry and return water line/routing trails and associated pumping stations.	<p>Where applicable, existing roads and trails and other previously disturbed areas will be utilized to minimize disturbance to the natural topography.</p> <p>The locations of annual extraction wells will be determined in consideration of the results of preliminary geotechnical modeling used to predict thresholds of extraction amounts to mitigate adverse effects related to the potential for underground and surface subsidence (Stantec, 2021).</p> <p>Additional testing will be conducted to further assess and confirm the limestone and overburden thickness and structure as the Project progresses geographically.</p>	Minor (Topography and Geology)
	Decommissioning	Progressive annual removal of Project components; progressive annual closure of extraction wells and rehabilitation of disturbed areas.	<p>Progressive annual decommissioning of extraction wells will be done using a concrete cap, bentonite and permeable backfill in accordance with applicable guidance documents such as 'Constructing and Sealing Wells in Manitoba' (Province of Manitoba, 2018).</p> <p>Levelling and grading will occur during progressive annual decommissioning of extraction wells to return the landscape to elevations typical to the surrounding area.</p>	
Soil Erosion	Construction	Clearing, levelling (as needed), and construction of temporary components including access trails, well clusters, extraction well drilling, slurry and return water line/routing trails and associated pumping stations.	An Erosion and Sediment Control Plan will be implemented for all phases of the Project.	Minor
	Decommissioning	Progressive annual removal of Project components; progressive	During the progressive annual decommissioning activities, after Project components have been removed, the landscape will be	

Environmental and Social Component	Project Phase	Sources of Potential Effects	Summary of Measures *	Residual Adverse Impact
		annual closure of extraction wells and rehabilitation of disturbed areas.	leveled and graded, and disturbed areas will be revegetated as quickly as feasible to stabilize the soil and minimize soil erosion.	
Groundwater	Construction/Operation and Decommissioning	Withdrawing quantities of groundwater water that exceed capacity of the source aquifer may potentially affect the regional groundwater aquifer and potentially affect regional aquifer quantity and quality.	Process water will be recycled in a loop system for reuse, which reduces the quantity of water required from groundwater.	Minor
			When each well is drilled, casing will be installed and grouted in place to isolate between the various formation layers to prevent vertical mixing of the different aquifers present.	
			The water contained within the extraction lines will be returned between the grouted in place casing that goes to the sandstone and the production piping so that it does not contact the shale layers between aquifers and has no other place to go except the sandstone aquifer.	
			Extraction wells will be progressively (sequentially) established and sealed (decommissioned) during the ongoing sand and groundwater extraction activities in accordance with applicable guidance documents such as 'Constructing and Sealing Wells in Manitoba' (Province of Manitoba, 2018) and Environment Act Licence requirements.	
			A Waste Characterization and Management Plan, Groundwater Monitoring and Impact Mitigation Plan, Progressive Well Abandonment Plan, and Water Management Plan will be developed and implemented to protect groundwater quality and guide responses to any potential impacts. Measures will be developed to avoid and/or mitigate any well interference issues as required by <i>The Water Rights Act</i> of Manitoba.	
ATMOSPHERIC ENVIRONMENT				
Air Quality	Construction/Operation and Decommissioning	Generation of greenhouse gases from Project equipment. Dust generation from construction traffic along the main roads and temporary trails, and	Idling of motorized equipment will be minimized to the extent feasible.	Minor to Negligible
			Water will be applied on gravel roads to control dust, as required.	
			Equipment and vehicles will be properly maintained.	

Environmental and Social Component	Project Phase	Sources of Potential Effects	Summary of Measures *	Residual Adverse Impact
		during other Project activities.		
Climate / Greenhouse Gases	Construction/Operation, and Decommissioning	Generation of greenhouse gases from Project equipment.	Emissions will be minimized by regularly maintaining equipment and vehicles and minimizing idling of vehicles.	Negligible
			Vehicles and equipment will meet required emission standards.	
Noise	Construction/Operation and Decommissioning	Noise from Project construction/operations activities such as extraction well drilling; operation of vehicles and machinery such as pumping stations and noise from decommissioning activities.	Vegetation clearing will be minimized to the extent feasible.	Minor to Moderate
			Project activities will setback a minimum of 100 m from nearest residences.	
			Mobile equipment and vehicles will be kept well maintained and will be fitted with mufflers, and other noise mitigation equipment as required.	
			Unnecessary idling and revving of engines will be avoided.	
			Additional noise mitigation measures will be applied (e.g. portable noise barriers) as required.	
AQUATIC ENVIRONMENT				
Surface Water	Construction/ Operation, and Decommissioning	Clearing, leveling (as needed), compacting; ditching for water drainage as required; stockpiling overs; progressive annual closure of extraction wells and rehabilitation of disturbed areas.	Drainage ditching will be constructed along Project access trails and at disturbed areas, as required, to assist in directing runoff flow from rain and snow and maintaining natural drainage pathways through low areas.	Negligible
			Portable toilets will be located at active well cluster sites which will be regularly pumped out by a licensed local contractor for proper disposal as a means to prevent potential contamination of local waterbodies with potentially harmful substances.	
			An Erosion and Sediment Control Plan will be implemented for all phases of the Project.	
Fish and Fish Habitat	Construction/Operation and Decommissioning	Not applicable.	Project related impacts on fish and fish habitats are not anticipated due to the lack of potential fish habitat within the Project Site, no expected impacts on surface water quantity and application of an Erosion and Sediment Control Plan.	None
TERRESTRIAL ENVIRONMENT				
Vegetation	Construction/Operation and Decommissioning	Clearing, leveling, compacting, ditching for water drainage as	Areas to be cleared of vegetation will be minimized to the extent feasible and will be clearly marked to avoid clearing more than required.	Minor (Project Site) to

Environmental and Social Component	Project Phase	Sources of Potential Effects	Summary of Measures *	Residual Adverse Impact
		required; operation of machinery and activities that produce dust; progressive annual closure of extraction wells and rehabilitation of disturbed areas.	<p>Usable trees/wood will be cut and stacked at the Project Site for local use as firewood for no longer than one year or disposed of in accordance with applicable regulations.</p> <p>Disturbed areas will be allowed to revegetate naturally and will be augmented using an approved native seed mixture and native plantings if required.</p> <p>A Revegetation Monitoring Program will be implemented annually after the first year of Project operations to determine the success of the revegetation program and determine if follow-up reseeding or replanting is required. The monitoring program will include monitoring during the growing season until the seedlings appear to be established.</p> <p>Mitigation measures to control dust (see Air Quality component in this table) will be applied.</p>	Negligible (Local Project Area)
Wildlife	Construction/ Operation, and Decommissioning	Vegetation clearing; human presence and noise related to Project construction/operation and decommissioning activities such as operation of machinery and well drilling; increased human presence at the Project Site and increased traffic at the Project Site and adjacent Local Project Area.	<p>Areas to be cleared of vegetation will be minimized to the extent feasible and will be clearly marked to avoid clearing more than required.</p> <p>Vegetation clearing will take place outside of the spring and summer months to the maximum extent feasible to avoid disturbance to breeding birds and other spring breeding wildlife species.</p> <p>Vegetation clearing will not take place during the breeding bird season for this 'Zone B4' area: April 14 – August 24 (Government of Canada, 2018).</p> <p>Areas disturbed during annual Project activities will be allowed to revegetate naturally after each Project operation year and will be augmented using an approved native seed mixture and native plantings if required.</p> <p>Mitigation measures to control noise (see Noise component in this table) and dust (see Air Quality component in this table) will be applied.</p> <p>Fully shielded directional lighting fixtures will be used to focus light specifically to work areas to minimize the dispersal of light to the surrounding Project Site.</p>	Negligible

Environmental and Social Component	Project Phase	Sources of Potential Effects	Summary of Measures *	Residual Adverse Impact
			Workers using the temporary access trails to access the Project Site (e.g. well cluster sites) will be required to limit vehicle speed to a maximum of 30 km/hr. Employees and contractors will be required not to feed or harass wildlife.	
Species of Conservation Concern	Construction/Operation, and Decommissioning	As above for the Vegetation and Wildlife components.	Mitigation measures as listed for the Vegetation and Wildlife components above will be applied.	Minor to Negligible
SOCIOECONOMIC ENVIRONMENT				
Labour Force and Employment	Construction/Operation and Decommissioning	Employment and contract services required for Project construction/ operation and decommissioning phases.	Employment opportunities associated with the Project will be advertised as needed within the Regional Project Area.	None (adverse) to Minor (benefit)
Emergency Services	Construction/ Operation, and Decommissioning	Accidents, malfunctions and extreme natural events such as storms.	An Emergency Response Plan will be available on-site during Project construction and operation that will clearly outline appropriate emergency response protocol. CanWhite will notify the RM of Springfield emergency services when Project construction/operation will begin. Measures to avoid accidents and malfunctions as described in Table 6-5 will be applied.	Minor
Community Services	Construction/ Operation, and Decommissioning	Requirement for use of Local and Regional Project Area supplies and services (e.g. contractor services; waste removal)	Solid waste will be transported by a licensed local contractor to be disposed at a local licenced landfill to an amount that would be sustainable for the local landfill. Otherwise, solid waste will be transported 63 km to the Brady Road Landfill managed by the City of Winnipeg. CanWhite may initiate agreements for local / regional community services that would be beneficial for both the RM of Springfield and the Project.	None (adverse) to Minor (benefit)
Land and Resource Use	Construction/ Operation, and Decommissioning	Use of the Project Site for Project activities which will result in temporary use of a very limited portion land each	Land use for Project activities will occur in accordance with municipal and provincial approvals and legislative requirements. Due to the progressive annual reclamation of extraction sites and other Project-related disturbed areas, parcels of land used for Project activities during any given year of Project operation	Minor

Environmental and Social Component	Project Phase	Sources of Potential Effects	Summary of Measures *	Residual Adverse Impact
		year of Project operations.	will be available for other uses the following year or once the activities are complete.	
Human Health	Construction/Operation, and Decommissioning	Increased traffic due to employees and contractors accessing the Project Site; dust and noise generated by Project activities.	<p>Mitigation measures that will avoid or minimize potential adverse effects on human health are those that will be implemented to control noise (See Noise component in this table), avoid or minimize effects on air quality (see Air Quality component in this table) and avoid or minimize effects on climate (see Climate/Greenhouse Gasses component in this table).</p> <p>All CanWhite employees will abide by the standards, procedures and training required under <i>The Workplace Safety and Health Act</i> as well as CanWhite's internal Health and Safety Program and Emergency Response Plan.</p> <p>Employee Orientation and Safety training will be mandated for all new hires in addition to required yearly safety reviews for existing staff.</p> <p>Applicable personal protective equipment (PPE) will be provided to employees. Where required, visitor orientation and PPE will be provided when visitors enter employee only areas.</p>	Negligible
Effects on Indigenous and Treaty Rights	Construction, Operation, and Decommissioning	Potential effects as above Land and Resource Use and Human Health components.	<p>The Project is not expected to adversely impact the exercise of Indigenous or Treaty rights because:</p> <ul style="list-style-type: none"> • The Project Site consists of private land covered under private surface rights that do not have public access unless by permission • No fish or fish habitat will be affected by the Project (See Fish and Fish Habitat section of this table); • The residual environmental impact of the Project on vegetation beyond the Project Site is assessed to be negligible (See Vegetation section of this table); and • The residual environmental impact of the Project on regional wildlife populations is assessed to be negligible (See Wildlife section of this table). 	None anticipated ⁸

⁸ Note: there are no First Nation reserve lands within the Local or Regional Project Area.

Environmental and Social Component	Project Phase	Sources of Potential Effects	Summary of Measures *	Residual Adverse Impact
Heritage Resources	Construction and Decommissioning	Clearing, leveling, compacting, ditching for water drainage as required; removal of Project infrastructure and rehabilitation of disturbed areas	If heritage resources are discovered within the Project Site, work will be stopped, HRB will be advised, and the discovered historic resources will be recorded by an archaeologist and adequately protected as required.	Minor
			The heritage resources protection practices outlined in the Heritage Resources Protection Plan for the Facility Project will also be used for this Project (AECOM 2020).	

*Additional mitigation measures are proposed in the Closure Plan (Section 7) and submitted to Manitoba Conservation and Climate as a requirement under the project licencing process. Section 7 outlines detailed mitigation and monitoring requirements for reclamation of the Project Site.

Table 6-5: Summary of Potential Accidents and Malfunctions and Measures to Mitigate Risk of Occurrence

Risks Associated with Accidents and Malfunctions	Project Phase	Possible Consequences	Measures to Reduce Risk of Occurrence	Conclusion
<p>Worker Health and Safety</p>	<p>Construction/ Operation and Decommissioning</p>	<p>Risk of workplace accidents affecting worker health.</p>	<p>Worker protection in Manitoba is regulated through standards, procedures, and training under the Workplace Safety and Health Regulation, M.R. 217/2006.</p>	<p>Risk is assessed to be appropriately mitigated</p>
			<p>Safety equipment and personal protective equipment will be supplied to employees.</p>	
			<p>Employees and contractors will be subject to site specific environmental health and safety orientation for all phases of the Project.</p>	
<p>Spills and Leaks</p>	<p>Construction/ Operation and Decommissioning</p>	<p>Spills and leaks from diesel fuel, lubricants, oils, hydraulic fluids, and other hazardous materials can have adverse effects to air quality, water quality, groundwater quality, wildlife, plants and human health and safety.</p>	<p>Diesel tanks used on-site will be self-contained aboveground storage tank(s).</p>	<p>Risk is assessed to be appropriately mitigated</p>
			<p>When servicing requires drainage or pumping of lubricating oils or other fuels from equipment, a groundsheet of suitable material and size will be spread on the ground to catch all fluid in the event of a leak or spill. An adequate supply of suitable absorbent material and any other supplies and equipment necessary to immediately clean up spills will also be available.</p>	
			<p>Storage and disposal of liquid wastes and filters from equipment maintenance, and residual material from spill clean-up will be contained in an environmentally safe manner and in accordance with existing regulations.</p>	
			<p>Waste oils, fuels, and other hazardous wastes will be handled in a safe manner. Staff will be required to transport, store, and handle all such substances as recommended by the suppliers and/or manufacturers and in compliance with applicable federal, provincial, and municipal regulations. Manitoba Conservation and Climate will be notified immediately if a reportable spill occurs.</p>	
			<p>Fuels, oils, or other hazardous materials will be stored only in designated areas.</p>	
			<p>Storage sites will be inspected regularly for compliance.</p>	
			<p>Personnel on-site will be trained in how to deal with spills, including knowledge of how to properly deploy site spill kit materials which will be available on-site.</p>	
			<p>Spill kits will be stationed and readily available for easy access.</p>	
			<p>Service and repairs of equipment will only be performed by trained personnel.</p>	

Risks Associated with Accidents and Malfunctions	Project Phase	Possible Consequences	Measures to Reduce Risk of Occurrence	Conclusion
			<p>Vehicles and Equipment will have pre shift inspections and walk arounds to ensure no fluid leaks, primarily from the fuel system and/or hydraulics. Any detected leak will result in the unit being pulled from service until repaired. All service and repairs will be logged and tracked in the units operating and maintenance logs. A manufacturer defined maintenance and preventative care will be practiced by CanWhite and its employees.</p> <p>Slurry and water return line will be inspected on a regular basis, and after extreme weather events, to check for leaks and/or breaks in the line. If leaks or breaks in the line are detected, appropriate spill containment and clean-up measures will be applied as soon as feasible and piping will be repaired or replaced.</p> <p>Fuel and chemical handlers will be trained and qualified, and appropriate emergency response measures will be in place and readily available.</p>	
Fires and Explosions	Construction/ Operation and Closure	Accidental fires and explosions from mechanical equipment, fuels, and other hazardous materials may result in loss of equipment and infrastructure, worker health and safety risk, and deterioration or loss of natural habitat.	<p>Removal of flammable waste on a regular basis and disposal at a licenced disposal facility.</p> <p>Workers will be provided with appropriate fire prevention training.</p> <p>Appropriate fire extinguishers will be available on the Project Site. Such equipment will comply with and be maintained to the manufacturers' standards, and employees will be appropriately trained in their use.</p> <p>Storage, transportation and use of hazardous materials, including flammable waste, will comply with regulatory requirements.</p> <p>On-site fire prevention/response equipment will be checked on a routine basis and in accordance with local fire safety regulations to maintain proper working order.</p> <p>Greasy or oily rags or materials subject to spontaneous combustion will be deposited and stored in appropriate receptacles. This material will be removed from the Project Site on a regular basis and be disposed of at licenced waste disposal facility.</p> <p>Emergency communication devices will be available and easily accessible to personnel to communicate and emergency as not all sites will have cellular signal.</p> <p>Smoking will be restricted to designated areas.</p>	Risk is assessed to be appropriately mitigated
Transportation Accidents		Vehicular collisions (human health and	The sand slurry will be transported from the extraction wells to the sand Processing Facility directly by slurry line rather than using transport trucks.	Risk is assessed to be

Risks Associated with Accidents and Malfunctions	Project Phase	Possible Consequences	Measures to Reduce Risk of Occurrence	Conclusion
	Construction/ Operation and Decommissioning	safety, traffic disruption, road closure, release of contaminants) and wildlife collisions (loss of wildlife, human health and safety, road closures).	<p>Personnel retained to drive and operate vehicles and construction equipment will have a valid appropriate-Class Manitoba Driver's License with a copy provided to CanWhite.</p> <p>Speed limits on access roads, local road and Provincial Highways will continue to be implemented. Signage and speed limits on the PR 302 and PTH 15 are regulated by the Province of Manitoba.</p>	appropriately mitigated