



**FEDERATED CO-OP LIMITED
BULK FERTILIZER STORAGE FACILITY
BRANDON SITE**

Submitted to:
Federated Cooperatives Limited (FCL)
Saskatoon, Saskatchewan

Submitted by:
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WX17731

EXECUTIVE SUMMARY

The report summarizes the environmental assessment for the Federated Co-op Limited Bulk Fertilizer Storage Facility Brandon Site Project (the Project). The environmental assessment report provides a description of the environmental assessment process, provides a description of the proposed project, characterization of the existing environment including biophysical and socioeconomic environments; description of the potential effects and mitigation, significance of residual effects and an analysis of cumulative effects.

Environmental Assessment

The proposed Federated Co-op Limited Bulk Fertilizer Storage Facility Brandon Site Project requires a license for a Class 1 development under *The Environment Act* (Manitoba). The environmental assessment was completed in accordance with Manitoba's environmental assessment legislation.

Project Area and Description

This section includes a summary of the project area and a description of the proposed project. Construction phases are also discussed and include pre-construction, construction, and operation of the facility. A schematic drawing of the proposed facility is also included in this section.

Regulatory Environment

The construction of the proposed Project is subject to all applicable provincial and federal legislation. In addition, the City of Brandon has their own by-laws that govern land use planning and approvals, zoning and approvals for lands within the city limits.

Environmental Assessment Methods

The scope of the proposed Project includes pre-construction, construction, and operation. The lifespan of the facility is 25 years at which time decommissioning may occur. The scope of the environmental assessment includes the identification of the spatial and temporal boundaries for the proposed project. The spatial boundaries consist of the project assessment area (project footprint), local assessment area (2.0 km around the project footprint), and the regional assessment area (10 km around the project footprint). The temporal boundary of 25 years was considered for the environmental assessment based on the life span of the project. Interactions between environmental components and project activity phases are identified and methods used to assess project effects, cumulative effects and determination of significance is outlined.

Environmental Description

The proposed Project is located in the Prairies Ecozone, Aspen Parkland Ecoregion and Stockton Ecodistrict. The area is dominantly agricultural with some industrial and residential areas. There

are also small areas of trees in the project area. Two species of conservation concern protected provincially and federally identified in the local assessment area include the following: one record for Loggerhead Shrike (*Lanius Ludovicianus*), and one record for Chestnut-collared Longspur (*Calcarius ornatus*).

Assessment of Project Effects

The environmental effects of the proposed Project on environmental components were identified using existing literature and previous environmental assessments, and professional judgements. The significance of any residual environmental effects was evaluated using factors adapted from the Canadian Environmental Assessment Agency. Residual effects, those effects that occur after mitigation, were also identified. The assessment found no significant effects to any of the environmental components.

Accidents and Malfunctions

Potential accidents and malfunctions that could occur during any phase of the project and that may potentially result in significant adverse environmental effects were identified and include risks of vehicle accidents due to increased construction traffic, machinery and equipment; and the release of hazardous substances (i.e. fuels). Mitigation measures to minimize or eliminate the potential environmental effects from accidents and malfunctions for the proposed project are also discussed.

Effects of the Environment on the Project

Potential effects of the environment that can affect the proposed Project include damage from grass fires. Climate change will increase the risk over time of extreme weather events and grass fires.

Assessment of Cumulative Effects

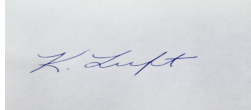
Cumulative effects are the environmental effects that are likely to result from a project in combination with the environmental effects of other past, existing and future projects or activities (Canadian Environmental Assessment Agency, 2014). The following five-step environmental assessment process for cumulative environmental effects was considered for the proposed project: Scoping, Analysis of effects, Identification of mitigation, Evaluation of significance, and Follow-up. The cumulative effects assessment for the Project considers the residual effects of the environmental components and interactions with other past, existing and future project actions.

Monitoring and Follow-up Activities

Federated Co-op Limited will ensure that it adheres to all applicable federal, provincial and municipal acts and regulations and will follow industry standards and best management practices as well as mitigation measures provided in this report.

SIGNATURE PAGE

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1.0 INTRODUCTION

Federated Cooperatives Limited (FCL) is proposing to construct a new bulk granular fertilizer storage facility in Brandon Manitoba called the Brandon Bulk Fertilizer Facility Project (The Project) (Figure 1). The proposed Project is a Class I development and requires a license under the *Environment Act* (Manitoba).

To satisfy this requirement, this environmental assessment identifies: the scope of the project and assessment, description of the existing environment (including biophysical, socioeconomic and land use); potential environmental effects associated with the Project; mitigation for potential effects, effects of accidents and malfunctions, evaluation of residual environmental effects and analysis of cumulative effects.

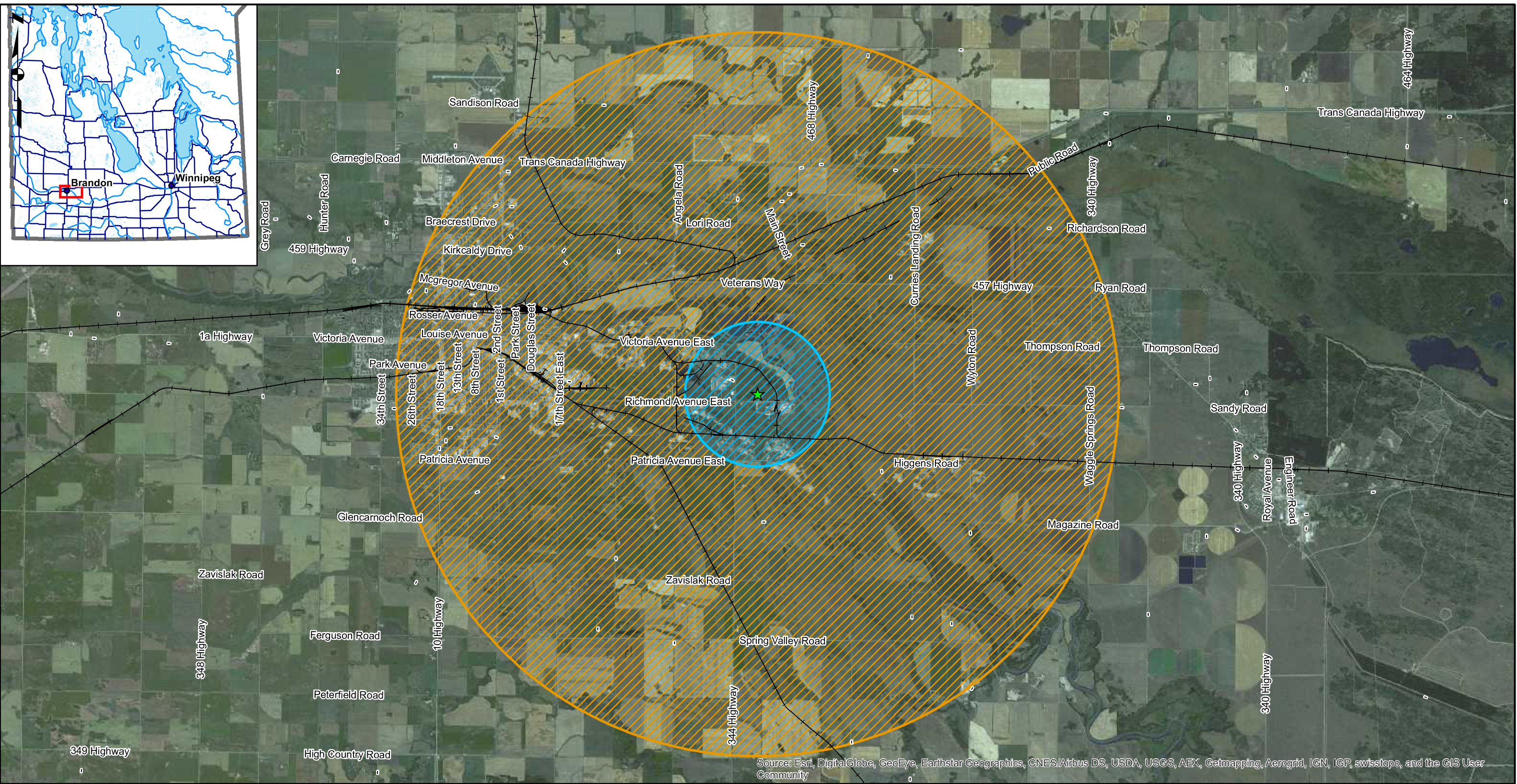
2.0 PROJECT AREA AND DESCRIPTION

2.1 Overview

The Project includes the construction of a bulk granular fertilizer storage facility in Brandon, Manitoba (Section SW ¼ Sec and SE ¼ Sec 15-10-18 WPM) near the eastern boundary of the City of Brandon and the R.M. of Cornwallis (Figure 2). The proposed facility will have a 27,500 tonne storage capacity and will be concrete (16 feet in height) with a fabric top. It will include a loading office with washroom facilities; a terminal manager's office; and a meeting room/lunch room with sink and washroom facilities. The offices, washrooms and lunch areas will be air conditioned and the facility will also be equipped with a mechanical room and space for Information Technology (IT) infrastructure (Appendix A – Project Site Plan).

The facility will include an inload conveyor with a capacity to transfer 800 tonnes per hour of granular fertilizer from both truck and rail to the facility. It will also include a continuous flow blender, with the capacity to blend between 300 to 400 tonnes of fertilizer per hour, with six macronutrients bins and two to three bins for micronutrients capable of blending five products. The expected usage of macronutrients are as follows:

Product	Brandon Facility	Volume (tonnage)
Urea	32%	8,800
MAP	32%	8,800
Suphur	23%	6,325
Potash	9%	2,475
Specialty 1 (Ex: ESN)	2%	550
Specialty 2 (Ex: Super U)	2%	550
Total	100%	27,500



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

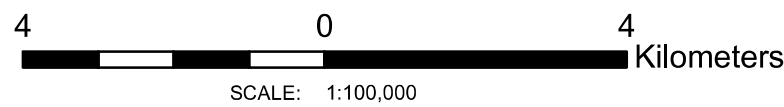
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- ★ Site Location
- +— Railroad
- ▨ Local Assessment Area
- ▨ Regional Assessment Area

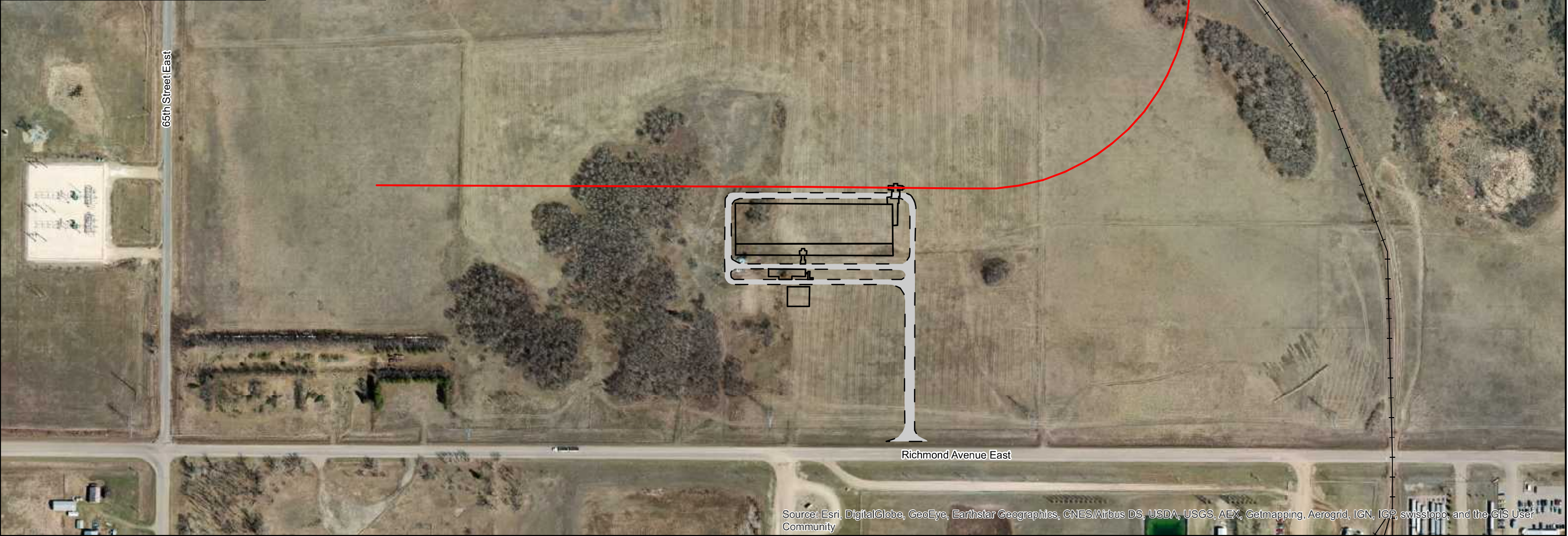
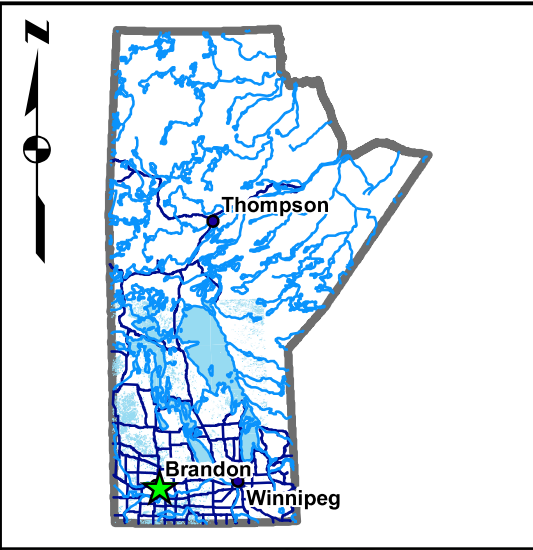
REFERENCE

CANVEC © NATURAL RESOURCES CANADA, 2012

NOTES



Project			
Brandon FCL Bulk Fertilizer Storage Plant			
Title			
Figure 1: Project Location			
	DWN BY: JMG	REV. NO.: -	SCALE: AS SHOWN
	CHKD BY: KL	PROJECT NO.: WX17731	DATE: OCT 2015
PROJECTION: UTM Zone 14 U	DATUM: NAD83		



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

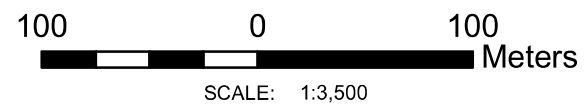
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- Proposed Track
- +— Railroad
- Plant Footprint
- ▭ Proposed Roads

REFERENCE

CANVEC © NATURAL RESOURCES CANADA, 2012

NOTES



Project			
Brandon FCL Bulk Fertilizer Storage Plant			
Title			
Figure 2: Project Assessment Area			
	DWN BY:	REV. NO.:	SCALE:
	JJMG	-	AS SHOWN
	CHKD BY:	PROJECT NO.:	DATE:
	KL	WX17731	OCT 2015
PROJECTION:	UTM Zone 14 U		
DATUM:	NAD83		

In addition the facility will include an elevated, dry method truck cleanout station fitted with fall protection.

The site will also accommodate a rail track for 50 cars, 25 incoming full and 25 outgoing empty, with incoming and outgoing switches, estimated to be 3,500 feet (~1 km) of spur line.

2.2 Project Phases and Activities

2.2.1 Pre-construction Activities

Pre-Construction activities include:

- Ensuring that all necessary permits required to start work activities are obtained
- Surveying and flagging of the proposed

2.2.2 Construction

Construction activities include:

The propose fertilizer storage facility will be installed to meet industry standards and construction activities will be monitored on-site. Construction activities include the following:

- Topsoil and vegetation removal – trees and shrub and other ground vegetation will be stripped from the site. Topsoil that is stripped will be stockpiled on site.
- Construction of fertilizer storage facility

2.2.3 Site Restoration and Clean-up

After construction of the fertilizer bulk storage facility is complete, topsoil that has been stockpiled on site will be re-spread and levelled on disturbed areas where possible. Any additional soil not re-spread will be hauled from the site to a licensed disposal facility. Areas that have been used for temporary storage of construction equipment (i.e temporary work areas) will be re-seeded using an approved seed mix.

2.2.4 Operations

Once the bulk fertilizer storage facility and rail spur have been constructed, maintenance checks will be conducted on a regular basis to ensure all components of the facility are in proper working order. Detailed emergency and spill response plans will be prepared and kept on site in to ensure the health and safety of the employees. Employees working at the facility will also be trained in health and safety procedures and will receive the appropriate training to handle the fertilizers products being stored.

3.0 PROJECT SCHEDULE

Construction of the proposed Project will take place in spring of 2016 for an anticipated duration of 8-10 months.

4.0 REGULATORY ENVIRONMENT

As indicated above, The Project is a Class I development and requires a licence under *The Environment Act* (Manitoba). It is our understanding that the Project does not trigger an environmental assessment under the *Canadian Environmental Assessment Act* (2012). This report will be provided as a component of the Environmental Act Proposal Form submitted to the Province for regulatory review of the project.

The construction of the proposed Project is subject to all applicable provincial and federal legislation. In addition, the City of Brandon has their own by-laws that govern land use planning and approvals, zoning and approvals for lands within the city limits.

4.1 Provincial Legislation

The proposed Project is subject to all applicable provincial legislation including the following acts and regulations:

- *The Pesticides and Fertilizers Control Act*
- *The Contaminated Remediation Sites Act*
- *The Dangerous Goods and Handling and Transportation Act*
 - Dangerous Goods Handling and Transportation Regulation
 - Environmental Accident Reporting Regulation
- *The Drinking Water Safety Act*
 - Drinking Water Quality Standards Regulation
 - Drinking Water Safety Regulation
- *The Endangered Species and Ecosystems Act*
 - Threatened, Endangered and Extirpated Species Regulation
- *The Environmental Act* (Manitoba)
 - Classes of Development Regulation
 - Licensing Procedures Regulation
 - Litter Regulation
 - Waste Disposal Grounds Regulation
- *The Highways and Transportation Act*
- *The Provincial Railways Act*
 - *Exemption of Certain Railway Line Alterations Regulation*
- *The Planning Act*
 - Provincial Planning Regulation
- *The Wildlife Act*
- *The Workplace Safety and Health Act*

- Workplace Safety and Health Regulation

4.2 Federal Legislation

The proposed Project is subject to the applicable federal acts and regulations:

- *The Canada Environmental Protection Act*
- *The Migratory Birds Convention Act*
- *The Species at Risk Act*

4.3 Brandon and Area Planning District Development Plan

The Brandon and Area Planning District (BAPD) represents the City of Brandon, as well as the Rural Municipalities of Cornwallis and Elton. The purpose of the BAPD is to provide an increased level of co-ordination and co-operation among the participating municipalities, primarily with regard to land use and land development issues (Brandon and Area Planning District, 2015).

The BAPD Development Plan provides a description of documents, by-laws, and references that are used to implement the Development Plan policies including the City of Brandon Zoning By-law. According to By-Law No. 6642, City of Brandon “Zoning By-Law”, the area of the proposed Project is classified as a Development Reserve Zone. The objectives of these areas are to ensure there is an abundance of land within the City boundaries to address any fluctuation in the supply and demand trends for various land uses and to protect these lands from fragmentation until a more intensive land use is identified for these areas. The City of Brandon will designate lands as Development Reserve and will protect these areas until they are required for intensive urban development. When these land are identified for development, they will be re-designated for the proposed use through an amendment in accordance with the provisions of *The Planning Act*.

As per the BAPD Development Plan reference mapping (secondary plan areas and urban land use) the proposed Project area is designated for future industrial use.

5.0 ENVIRONMENTAL ASSESSMENT METHODS

The environmental assessment was completed with the objective of building a project considerate of local issues and concerns and providing sufficient information in order to satisfy the requirements of *The Environment Act* (Manitoba) and the Environment Act Proposal Report Guidelines Information bulletin (Manitoba Conservation and Water Stewardship, 2014).

Methods used to establish baseline environmental conditions within the Project area consisted of the following:

- Desk-top review and examination of topographic maps, drainage maps, and published information for the area was used to gather information on land use, watercourses and waterbodies, roadways, farmyards, infrastructure, topography and location of protected areas.

- Site Reconnaissance visit of the Project study area on August 18, 2015 to document vegetated areas; cultivated areas, potential wildlife habitat, roads and other human made structures or land use practices.
- Review of applicable city, provincial and federal environmental regulations, guidelines and/or policies.
- Provincial and Federal Databases and registries were reviewed to determine the potential for the presence of any species listed as endangered, threatened or of special concern within the Project area. These included:
 - Manitoba Conservation Data Centre (MCDC);
 - Committee on the Status of Endangered Wildlife (COSEWIC);
 - Manitoba Endangered Species and Ecosystems Act (MESEA);and
 - Species at Risk Act (SARA)
- A request was submitted to the Manitoba Conservation Data Centre for information on the presence of any rare or endangered species in the Project area.
- A request was submitted to the Manitoba Historic Resources Branch for information on the presence of any heritage resources in the Project area.

Methods and analysis used to identify and determine potential environmental effects within the Project area consisted of the following:

- Professional judgement, knowledge of the Project area, previous experience with similar projects, knowledge of applicable environmental regulations, guidelines and/or policies.
- If required, mitigation measures were identified to comply with legislation and to eliminate, control or minimize potential adverse effects. Where necessary, follow-up requirements were defined to ensure that mitigation measures are implemented and effectiveness can be assessed.
- Criteria set out in Canadian Environmental Assessment Act (CEAA) guidelines were used to determine potential environmental effects as well as the presence of residual effects once mitigation measures have been considered. They were also used to determine if any remaining residual effects will have an environmental consequence, potential cumulative effects, and the need for any follow-up monitoring activities. Further information on the criteria used to assess potential environmental effects is provided in Section 5.3.

5.1 Spatial and Temporal Boundaries

5.1.1 Spatial Boundaries

The spatial boundaries for the environmental assessment of the proposed Project consist of project, local and regional assessment areas as described below.

Project Assessment Area: Footprint of the proposed Project including the additional rail siding to accommodate 50 cars. The approximate area of these components is (Figure 2).

Local Assessment Area: The local assessment area is a 2 km area surrounding the proposed Project Footprint (PF) (Figure 1). This area was selected to allow for any upcoming work such as geotechnical investigations. Significance of project effects will be determined within the local assessment area.

Regional Assessment Area: The regional assessment area includes a 10 km area surrounding the proposed PF (Figure 1). This area was selected to allow for any potential socio-economic effects and migration of any potential species of concern. The assessment of cumulative environmental effects is considered in the regional assessment area.

5.1.2 Temporal Boundaries

The temporal boundaries that were identified for the identification and evaluation of potential project effects include the following:

Construction phase: The construction phase will include all activities that are associated with the building of the facility and railway spur including transport and storage of equipment and materials to the site. The construction phase is anticipated to take approximately 8-10 months, starting in spring of 2016.

Operations phase: The lifespan of the facility is anticipated to be approximately 25 years.

5.2 Mitigation of Project Environmental Effects

A description of mitigation measures that will avoid, reduce or eliminate the potential environmental effects is discussed in Section 7.0 Potential Environmental Effects and Mitigation.

5.3 Identification and Assessment of Residual Effects

Residual effects are the anticipated effects that remain after mitigation measures have been applied. The Canadian Environmental Assessment Agency provides guidance material for significance criteria. Residual effects for the Project were assessed for significance using the following criteria:

Ecological Value – includes the rarity and uniqueness, fragility, importance within ecosystem, and the importance to scientific studies which can be low (no protected species or habitat, important features, scientific values), moderate (species of concern, important features, resilient ecosystems, scientific value), or high (threatened or endangered species, significant features, fragile ecosystems, scientific value).

Societal Value – the societal value of the affected environment components that includes the nature and degree of protection provided. Rankings include low (no formal designation), moderate (protected locally, regionally or provincially but not by legislation), and high (designated or protected provincially, nationally or internationally by legislation).

Direction – the direction of the effect may be positive, neutral, or negative with respect to beneficial or adverse effects from the project on the existing environment.

Magnitude – a measure of the degree of intensity of change that can occur as the Project proceeds, which can be low (above background conditions, but within established criteria or scientific threshold and the range of natural variability), medium (substantially above background conditions, but within established criteria or scientific threshold and the range of natural variability), or high (predicted to exceed established criteria or scientific threshold and will likely cause detectable change beyond the range of natural variability).

Geographic extent – refers to the area potentially affected by the effect, whether it is on-site, or some area beyond the bulk fertilizer storage facility property.

Duration – refers to the length of time that the environmental effect occurs and whether the effect is reversible once the disturbance has been completed (i.e., reclamation of disturbed areas). Duration can be short-term (less than one year); medium-term (throughout operation); or long-term (continues beyond site closure and reclamation).

Frequency – refers to the frequency at which the effect occurs over the specified duration and is described as: infrequent (occurs once over the duration of the disturbance); frequent (occurs periodically over the duration of disturbance); or continuous (occurs continuously over the duration of disturbance).

Likelihood – refers to the probability of occurrence (i.e., the risk of an event occurring) and is described as very unlikely, unlikely, likely and very likely.

The activities associated with the proposed Project were first assessed according to the above criteria, and then evaluated together to predict the overall environmental consequence. Environmental consequence was determined as:

Minimal – effects with a low magnitude, short- to medium duration, infrequent to continuous occurrence, and restricted to the bulk fertilizer storage facility in geographic extent. The potential

effect may result in a slight decline in the resource in the Project area during the construction phase of the Project, but the resource should return to pre-construction levels.

Low – effects with a low magnitude, short- to long-term duration, infrequent to continuous occurrence, and restricted to the proposed Project area in geographic extent. The potential effect may result in a slight decline in the resource in the Project area during the life of the Project. Research, monitoring and/or recovery initiatives would not normally be required.

Moderate – effects with a medium magnitude, short-to long-term duration, frequent to continuous occurrence, and extend off-site to adjacent areas. Potential effect could result in a decline in resource to lower-than-baseline but stable levels in the region after Project closure and into the foreseeable future. Regional management actions such as research, monitoring, and/or recovery initiatives may be required.

High – refers to major effects that are long-term in duration, continuous in occurrence, and extend off-site to adjacent areas. Potential effect could threaten sustainability of the resources and should be considered a management concern. Research, monitoring, and/or recovery initiatives should be considered.

The effect is considered to be significant if the environmental consequence is determined to be moderate or high, and is considered to be not significant if the environmental consequence is determined to be minimal or low.

5.4 Assessment of Cumulative Environmental Effects

Cumulative effects are the residual environmental effects that are likely to result from a project in combination with the environmental effects of other past, existing and future projects or activities (Canadian Environmental Assessment Agency, 2014). The Canadian Environmental Assessment Agency Operational Statement (2012) provides guidance on how cumulative environmental effects should be considered under the Canadian Environmental Assessment Act 2012. Additionally, the Agency's Practitioner's Guide (1999) outlines a five-step environmental assessment process for cumulative environmental effects that was included for the proposed project: Scoping, Analysis of Effects, Identification of Mitigation, Evaluation of Significance, and Analysis of Cumulative Effects, Identification of Cumulative Mitigation Measures and Evaluation of the Significance of Cumulative Effects (Section 11.0).

6.0 ENVIRONMENTAL DESCRIPTION

This chapter of the environmental assessment report provides a description of the existing environmental setting for the proposed Project, including the biophysical and socio-economic components of the environment.

6.1 Biophysical Environment

6.1.1 Ecological Classification

The proposed Project is located in the Prairies Ecozone, Aspen Parkland Ecoregion and Stockton Ecodistrict (Smith et al, 1998).

The Stockton Ecodistrict runs along the south portion of the Assiniboine River, including the river valley. It lies within a subdivision of the Grassland Transition Ecoclimatic Region situated between the most humid subdivision to the east and northeast and the driest subdivision to the southwest. The climate is characterized by short, warm summers and long, cold winters. The mean annual temp is 2.4 C, the average growing season is 181 days and growing degree-days number about 1670 (Smith et al, 1998). The mean annual precipitation is about 490 mm of which approximately one-quarter falls as snow.

The mean elevation of the Stockton Ecodistrict is about 366 masl. It is a level to hummocky proglacial lacustrine plain occupying a long and narrow area between the Pembina Hills and Tiger Hills on the south and the Assiniboine River Valley on the north. Adjacent to the Assiniboine River a narrow band of hummocky duned sands occurs with short slopes, less than 50 m in length, and with gradients between 6 and 15 percent. The Assiniboine River Valley has a local relief of 30 to 60 m with steep valley walls and strongly meandering river. The western portion of the ecodistrict is within the Hamiota drainage division and the eastern portion is in the Brandon drainage division of the Assiniboine watershed.

Generally, soils in the ecodistrict are predominantly well drained Black Chernozemic soils developed on strong calcareous, fine loamy sediments while the sandy, duned area is very droughty Humic Regosols.

Vegetation varies throughout the ecodistrict with vegetation in the Assiniboine River Valley varying considerably. The duned area is rapidly and well drained and therefore is generally grassland with hazel, common and horizontal juniper, white spruce, scrub trembling aspen and sometime scrub burn oak. Heavier forest cover with less grass is found on north facing slopes. Willow, alder and dogwood with grass and sedge groundcover appear on the poorly drained sites. In the valley itself, alluvial floodplains have natural vegetation of deciduous forest with white elm, green ash, Manitoba maple, balsam poplar and understory of alder, dogwood and high bush cranberry. Higher terraces are mostly cultivated but in the past supported deciduous forest. Natural vegetation in the rest of the ecodistrict has mostly been replaced by cultivated fields, but once included aspen and balsam poplar groves with areas of mixed-grass prairie vegetation interspersed.

Groundwater of variable quality forming deep stratified silts and sands is the main source of water in the ecodistrict with quality decreasing towards the base of the Pembina Hills and Tiger Hills to the south.

The majority of the Stockton Ecodistrict is cultivated for production of spring wheat and other cereal grains, oil seeds and some hay while saline and Solonetzic soil areas are for pasture and hay production.

6.1.2 Air Quality

Air quality and greenhouse gas (GHG) emissions within the Project area are affected by industrial, transportation, agricultural, urban and rural activities.

The Province of Manitoba operates an air quality monitoring station in the City of Brandon. Air quality parameters measured at the monitoring station located at 1430 Victoria Avenue East in the city of Brandon are provided in table 6-1. Air quality parameters that are monitored include: particulate matter ≤ 10 microns (PM10t); particulate matter ≤ 2.5 microns (PM2.5s), nitric oxide (NO); nitrogen dioxide (NO₂); nitrogen oxides (NO_x); ground level ozone (O₃); and ammonia (NH₃).

Table 6-1: Air Quality Parameters for Brandon Station (Victoria Ave.) on Aug 11th 2015

	PM10t	PM2.5s	NO _x	O ₃	NO ₂	NH ₃	NO
	µg/m ³	µg/m ³	ppb	ppb	ppb	ppb	ppb
Measurements	41.6	7.5	8.6	-	4.6	-22	3.9

Source: Manitoba Conservation and Water Stewardship 2015

Manitoba Ambient Air Quality Criteria (July 2005) provide the maximum tolerable, maximum acceptable and maximum desirable concentrations of air pollutants required to protect and preserve air quality for human health (Government of Manitoba 2015). Comparison of the air quality parameters in Table 6-1 to the Manitoba Ambient Air Quality Criteria identified all measurable parameters were below the maximum acceptable concentrations.

6.1.3 Noise

Existing noise levels in the Project area and areas immediately surrounding the Project area are expected to be typical of an urban center with areas zoned heavy industrial immediately adjacent to the PF as well as agricultural area including the presence of commercial, industrial and recreational activities. Sources of noise identified for the Project area include:

- Rail traffic;
- Heavy vehicle traffic associated with the TransCanada Highway
- Industrial traffic and facility operations associated primarily with Maple Leaf Plant and CF Industries (Viterra)
- Agricultural equipment use and practices surrounding the Project Area

- Human activities in urban and surrounding rural areas
- Commercial, industrial and recreational activities in the RM of Cornwallis

6.1.4 Climate

The climate in the proposed Project area is characterized by long, cold winters and short, warm summers (Smith et al. 1998). Table 6-2 shows selected climate data for the City of Brandon (Government of Canada, 2015) which is relevant climate data for the proposed Project area.

Table 6-2: Selected Climate Data					
Parameters	Year	June – Aug.	Sept – May.	July	Jan.
Brandon A¹					
Temperature °C	2.2	17.4	-2.8	18.5	-16.6
Precipitation mm (equiv.)	474.2	220	254	73.4	17.8
Rain/Snow (mm/cm)	374.9/117.8	220/0.0	155/117.8	73.4/0.0	0.3/22.8
Brandon CDA²					
Temperature °C	2.7	18	-2.4	19.2	-16.5
Precipitation mm (equiv.)	461.7	213.3	248.5	68.2	17.9
Rain/Snow (mm/cm)	360.8/100.8	213.3/0.0	147.7/100.8	68.2/0.0	0.1/17.6

¹ Source: Government of Canada, 2015: Climate Normals from 1981-2010.

² Source: Government of Canada, 2015: Climate Normals from 1981-2010.

6.1.5 Geology and Physiography

The Brandon area is almost entirely underlain by bedrock formations of the Mesozoic era placing them in the Cretaceous period of geological time. The Riding Mountain Formation is found in the local study area and is predominantly made of shales but also includes limestone, bentonite and some sand and silt are present (Michalyna et al, 1976).

The surficial geology of the local assessment area is characterized as being predominantly distal glaciofluvial sediments comprised of fine sand, minor gravel, thin silt and clay interbeds 1-75 m thick and subaqueous outwash fans, as well as alluvial sediments comprised of sand and gravel, silt, clay organic detritus 1-20 m thick (Manitoba Mineral Resources, 2013).

The landscape in the Brandon area consists mainly of lacustrine plains with nearly level to undulating topography. Relief throughout the surrounding area is generally less than 3 m with slopes less than 5%. Hummocky and ridged surface forms in the Brandon Hills and along the valley of the Assiniboine River tend to have steeper slopes (Manitoba Land Resources Unit, 1996). The U-shaped valley of the Assiniboine River has a depth up to 61 m in some locations (Michalyna et al, 1976). During the site reconnaissance conducted on August 18, 2015, the terrain consisted of sandy soils with some sandy ridges as well as some gentle rolling hills.

6.1.6 Soils

Dominant soils found in the local study area are Black Chernozems in well drained sites and imperfectly drained Black Chernozems in areas of lower slopes. Poorly drained Humic Gleysol soils are characteristic of poorly drained areas with high seasonal water tables (Manitoba Land Resources Unit, 1996).

The predominant soil association in the upland area of the local study area is the Marringhurst which occurs on level to gently undulating topography and are the dominant soils outside of the Assiniboine River valley. With the exception of remnant stream channels where drainage is poor, the areas of the Marringhurst association are well to rapidly drained. The Marringhurst association consists of coarse textured soils developed on coarse sandy and gravelly outwash deposits with a coarse sandy loam texture. With depth, the texture becomes coarser (Manitoba Land Resources Unit, 1996).

In addition to the Marringhurst association, the Assiniboine Association can be found in a small portion of the study area which includes the Assiniboine River and the Brandon Sewage Lagoons. The Assiniboine soils are classified as Regosolic and the complex has a wide range of textures ranging from loamy sand to clay (Manitoba Land Resources Unit, 1996).

For the general Project area, the Canada Land Inventory (1974) classifies the majority of the area as having very severe limitations (Class 5) that restrict their capability in producing perennial forage crops due to soil moisture limitations, but improvement practices are feasible.

6.1.7 Surface Water and Water Quality

The Project area is located in the Assiniboine River drainage basin and is within one kilometer of the Assiniboine River. The main stem of the Assiniboine River spans across the Central Assiniboine and Lower Souris River Watershed for about 120 km with variable flow from year to year, highest flow being in spring as a result of snow melt (Government of Manitoba, 2015). The river has a large drainage basin of 163,000 km² covering portions of southeast Saskatchewan, northwest Dakota and southwest Manitoba.

Three long term water quality monitoring stations (1956-2013) are located on the Assiniboine River. The Water Quality Index (WQI) categories are generally described as “fair” and “good” as total phosphorous concentrations, as well as nitrogen, showed an increase at most of the locations between 1970 and 2012.

Controlled releases from the Lake of the Prairies via the Shellmouth Dam and the Qu’Appelle River are the main contributors of water to the Assiniboine River.

A number of irrigation ditches and agricultural drains to carry surface drainage away from upstream farmlands are found within the Regional Assessment Area.

6.1.8 Groundwater

East of the project study area is the Assiniboine Delta Aquifer, a thick unconfined deltaic sand and gravel water producing unit that averages 60 feet in thickness varying from only a few feet along the extremities of the delta to over 100 feet in the central portion of the system (Render 1987). The structure resulted from a large glacial river depositing sediments into a large bay in Lake Agassiz. The aquifer is recharged from local rainfall and snowmelt and groundwater and yields approximately 5000 acre feet of water annually for irrigation purposes.

The aquifers groundwater quality is generally described as excellent to good. Naturally occurring concentrations of arsenic and barium have been found above the drinking water quality standard in some wells and hardness, iron and magnesium are common problems of an aesthetic nature (The Central Assiniboine and Lower Souris River Integrated Watershed Management Plan, 2015).

The Assiniboine Delta Aquifer Management Plan, completed in 2005, outlines protocol for water quality monitoring, addresses irrigation accountability and co-management issues, and promotes education and awareness.

Vulnerable groundwater areas are those with high potential for contamination of groundwater from sources at or near ground surface regardless of how local or extensive an aquifer may be (Government of Manitoba, 2015a). The thickness and properties of the material overlying the aquifer and properties of the contaminant play a factor in the degree to which aquifers are vulnerable to contamination from the surface. Portions of the Assiniboine Delta are considered as having high potential for contamination of groundwater due to their unconfined nature (lack of overlying low permeability soils) However, buried sand and gravels aquifers such as those near Brandon would be considered as having low potential for contamination because of their relatively confined nature (i.e., adequate thickness of overlying low permeability soils).

6.1.9 Vegetation and Wetlands

Smith et. al (1998) notes that vegetation in the Stockton Ecodistrict varies with soil texture, drainage, aspect and slope. Duned areas, which are rapidly and well drained, contain grassland with hazel, common and horizontal juniper, white spruce, scrub trembling aspen and sometimes scrub bur oak. Heavier forest cover with less grass and no juniper tend to be found on north facing slopes. Trembling aspen, balsam poplar and dense alder and dogwood populate imperfectly drained site, while vegetation cover on poorly drained sites consists of willow, alder and dogwood with grass and sedge groundcover.

Alluvial floodplains of the Assiniboine River Valley have natural vegetation of deciduous forest including white elms, green ash, Mountain maple, and balsam poplar with and understory of alder, dogwood and high bush cranberry. Areas of higher elevation are currently mostly cultivated, but once supported deciduous forest. Where the land has not been replaced by cultivated fields, open stands of trembling aspen and shrubs occur on most sites with bur oak and grassland communities increasingly occupying driers sites.

The local study area is located within the Aspen-Oak forest of the Boreal Forest Region (Rowe 1972). The majority of the vegetation in the local study area has been altered for industrial practices or agriculture purposes. At the time of the site visit on 18 August 2015, the majority of the land in the project assessment area consisted of pasture with some treed areas consisting of trembling aspen, balsam poplar, and box elder (Photograph 1). Weed species found in the project assessment area include Leafy Spurge, Canada Thistle and Baby's Breath. No wetlands were observed.



Photograph 1: Proposed Project Assessment Area

6.1.10 Fish

The Assiniboine River, located within one kilometer to the east and north of the project assessment area, provides habitat to wide variety of fish species including lake sturgeon, walleye, yellow perch, northern pike, mooneye, burbot, channel catfish, brown bullhead, rock bass, white sucker and common carp (Government of Manitoba, 2015). Tributaries include white suckers, fathead minnows, darters, sticklebacks, shiners, yellow perch, walleye and northern pike.

6.1.11 Wildlife

A significant portion of the local study area has been disturbed through agricultural and industrial land use resulting in loss of grassland and wetland habitat. This has affected the distribution of species and populations. In the Aspen Parkland Ecoregion, Elk are now confined to the Spruce Woods area and pronghorn are rarely seen. White-tailed deer, however, are widespread, particularly in areas which provide both grazing and cover habitat. Other mammals common to the ecoregion include coyote, red fox, cottontail rabbit, hare, striped skunk, redback vole, ground squirrel and deer mice (Smith et al. 1998).

A variety of bird species are found throughout the ecoregion including raptors such as Ferruginous hawk and red-tailed hawk. Due to the flat topography and lack of wetlands, waterfowl capability in the project area is limited, but does better along the river valley.

No amphibian and reptile species occurrences were present in the project assessment area according to Manitoba Herp. Atlas 2015, Preston 1982. One occurrence, wood frog, was found in the local assessment area. In the Regional Assessment Area, in addition to wood frog, species records included smooth green snake, plains garter snake and once one occurrence of northern leopard frog. The northern leopard frog is listed by the *Species at Risk Act* as “Special Concern” in western Canada, but is considered abundant across the Manitoba part of its range.

During Amec Foster Wheeler’s site visit 18 August 2015, gopher and squirrel burrows were observed, and one red-tailed hawk was identified.

6.1.12 Species at Risk

The term “species of conservation concern” includes species that are rare, disjunct, or at risk throughout their range in Manitoba and in need of further research (Manitoba Conservation Data Centre, 2015). These species are listed as very rare to uncommon by the Manitoba Conservation Data Centre (MBCDC). Species that are listed under *The Endangered Species and Ecosystems Act – Manitoba* (ESEA), the federal *Species at Risk Act* (SARA) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) are also encompassed under the term “species of conservation concern”.

The MBCDC maintains a list of flora and fauna species of conservation concern in the province. Appendix B lists occurrences of flora and fauna species in the Aspen Parkland Ecoregion which encompasses the Project Site. Potential species of concern that could occur in the region include, two animal assemblages, 10 invertebrate animals, 50 vertebrate animals and 135 vascular plants.

Manitoba’s Conservation Data Centre (CDC) was contacted in August 2015 to screen the project area for species of conservation concern within the local assessment area. The CDC found the following records for species of conservation concern within the local assessment area:

- one record for Loggerhead Shrike (*Lanius Ludovicianus*),
- one record for Chestnut-collared Longspur (*Calcarius ornatus*), and

Table 6-3 provides information on the species of conservation concern found within the local assessment area and their status rankings.

Table 6-3: Species of Conservation Concern in the Local Assessment Area

Scientific Name	Common Name	COSEWIC	SARA	ESEA	MBCDC
<i>Lanius ludovicianus</i>	Loggerhead Shrike	Threatened	Threatened	Endangered	S1
<i>Calcarius ornatus</i>	Chestnut-collared Longspur	Threatened	Threatened	Endangered	S2

Note: Provincial (S) rank range from (MBCDC).

- 1 Very rare throughout its range or in the province (5 or fewer occurrences, or very few remaining individuals). May be especially vulnerable to extirpation.
- 2 Rare throughout its range or in the province (6 to 20 occurrences) May be vulnerable to extirpation

In addition, one record for Sharp-tailed Grouse (*Tympanuchus phasianellus*), lek site is also found in the local assessment area as indicated by the Manitoba Conservation Data Centre.

A field visit was conducted for the proposed Project on August 18th, 2015. Information collected during this visit included existing land use information (i.e. agricultural land, shelterbelts, wetlands); observances of wildlife including mammals and birds, and identification of plant species. No wildlife or plant species of conservation concern were identified during the visit.

6.2 Socio-Economic Environment

The proposed Project is located within the City of Brandon, near the eastern boundary of the City and the R.M. of Cornwallis (Figure 1).

6.2.1 First Nations

According to the 2011 census, the City of Aboriginal population, including First Nations, Metis, and Inuit is 5,160 which is approximately 11% of the population of Brandon (Statistics Canada, 2011).

Lands belonging to the Sioux Valley Dakota Nation, Swan Lake First Nation Canupawakpa and Dakota First Nation were identified within a 100 km of the proposed Project area.

The Sioux Valley Dakota Nation Reserve is over 46 km west of the proposed Project area and covers an area of 4,136 ha. The total registered population of the reserve is 2,557 (1,392 on-reserve) and is governed by Chief Vincent Tacan and council (AANDC 2015).

The Swan Lake First Nation Reserve 7A is located approximately 38 km southeast of the proposed Project area and covers an area of 2,636 ha. Swan Lake First Nation has four reserves within Manitoba and has a total registered population of 1,387 (582 on-reserve). It is governed by Chief Francine Meeches and council (ADDNDC 2015).

The Canupawakpa Dakota First Nation is located approximately 82 km southwest of the proposed Project area and covers an area of 1,024 ha. The total registered population of the reserve is 680 (296 on-reserve) and is governed by Chief Delbert Cruise and council (ADDNDC 2015).

6.2.2 Population, Employment and Economy

The City of Brandon has a population of approximately 46,000 people making it the second largest city in Manitoba (Statistics Canada, 2011).

The labor force in the city of Brandon is drawn from approximately 67 municipalities with 25% of the labour force living rurally outside of the city's boundaries. The labour force totals over 32,200 and continues to grow with 59% of residents having graduated from post-secondary education institutions.

Approximately 200 businesses exist in the city of Brandon with about 350 serving the agricultural market place. Both the Agriculture Canada Research Station and Agri-Environment Centre are located in Brandon emphasizing its agricultural presence.

The main contributors to Brandon's economy include Agri-Food processing, metal fabrication, industrial chemical production, farm fertilizer production, trucking and rail transportation, the Regional Health Care Centre, event hosting, regional retail and service, Canadian Forces Base Shilo, Bakken Formation oil field services centre, regional centre for recreation entertainment, higher education (university and colleges) and federal and provincial government service centers.

Brandon's largest manufacturing company employer is Maple Leaf Consumer Foods and the city's largest public sector employer is Prairie Mountain Health followed by Canadian Forces Base Shilo (Brandon Community Profile, 2015).

6.2.3 Land Use

The proposed project area is located in an area overseen by the Brandon and Area Planning District (BAPD) and in general under Zoning Bylaw 6642 adopted in 2001 and the BAPD Development Plan. Although the project assessment area is classified as Development Reserve Zone, as described in Section 4.3, the adjacent properties are classified as Industrial Heavy Zone.

The local assessment area is mainly comprised of industrial sites, roads, railways, and farmsteads. Directly west of the project assessment area is Brandon's largest manufacturing company, Maple Leaf Consumer Foods. To the south of the project assessment area is CF Industries (Viterra), a distribution facility for anhydrous ammonia, and to the south east is Canexus, a sodium chlorate plant.

Two residential dwellings are within the local assessment area. One property is located north east of the project assessment area off 65 St E., and the second is located southeast of the project assessment area at the junction of 65 St E and Richmond Road.

The Assiniboine River, within one kilometer to the east and north of the project assessment area, accommodates recreational activities such as boating, canoeing, water skiing, fishing, swimming and is the drinking water source for the City of Brandon. North of the project assessment area, across the Assiniboine River, is the City of Brandon's waste water treatment lagoons.

There are no protected lands in the local or regional assessment area. The nearest provincial park is Spruce woods Provincial Park located approximately 55 km to the southeast.

6.2.4 Infrastructure and Services

The Assiniboine River, which runs through the city of Brandon, is the sole source of potable water during normal operations with the city's water treatment plant providing a capacity of 40 million litres per day. In addition, the city's water reclamation facility has treated effluent to use as industrial process water in the range of 20-25 ML per day.

The city of Brandon Landfill located at NE ¼ Sec. 17-10 WPM serves the City of Brandon.

Brandon is located at the cross-section of two major highways, the Trans-Canada (#1) running east-west and Highway #10 running north-south. In addition, it lies at the cross roads of two Class 1 rail roads, CP Rail and CN Rail. The city has a commercial airport and is located approximately 220 km west of Winnipeg's James Richardson International Airport. Brandon's location and multiple modes of transportation networks allows for numerous logistical efficiencies.

The Brandon Police Service has over 100 sworn and civilian staff while the RCMP serves rural areas surrounding the city. Fire, rescue and emergency medical response is provided by Brandon Fire and Emergency Services.

Health care in the City of Brandon is provided by the Prairie Mountain Health Authority. Brandon General Health Centre has over 300 beds with surgical suites, maternity unit, emergency department and diagnostic service. The Western Manitoba Cancer Centre provides radiation, chemotherapy and outpatient care (Brandon Community Profile, 2015).

6.2.5 Heritage Resources

A request was made to the Manitoba Historic Resources Branch (MHRB) with respect to the location of heritage resources on the subject property on September 2, 2015. MHRB provided a list of the known archeological sites, designated heritage sites and plaques located in the area of interest. Review of the MHRB information showed that there are no known archaeological sites, designated heritage sites or plaques located within or immediately adjacent to the Project Assessment Area.

The MHRB data indicated that there are 3 archaeological sites located within the Local Assessment Area. The approximate locations of the three archaeological sites are as follows; 800 m west of the proposed site, and 1.0 km and 1.2 km north east of the site.

7.0 POTENTIAL ENVIRONMENTAL EFFECTS AND MITIGATION

A review of the potential interaction that the construction and operations of the proposed Project would have on the environment is outlined in Table 7-1. Mitigation to minimize, reduce or eliminate potential environmental effects is also provided. Residual effects, which are those effects that remain after mitigation is applied are determined. An evaluation of the residual effects and determination of significance is discussed in more detail in Section 10.0.

Table 7-1: Potential Environmental Effects and Mitigation			
Environmental Component	Potential Environmental Effects	Proposed Mitigation	Residual Effects
Air Quality	Potential increase in fugitive dust levels in the project and local assessment area from increased vehicle and construction equipment during construction activities and increased transport vehicles during operations <small>*Note that the proposed site is adjacent to industrial areas with paved access roads limiting dust generation</small>	<ul style="list-style-type: none"> • Undertake construction during winter months to the extent possible • Apply dust control measures such as water or approved dust suppressants • Curtail construction work during high wind conditions • Cover truckloads of construction materials (such as rock and gravel) with tarpaulins • Restrict the speed of work vehicles and equipment as required • Enforce posted construction speed limits 	None
	Potential increase in emissions of volatile compounds (VOCs) as a result of increased vehicular traffic and heavy equipment activities during construction and operation	<ul style="list-style-type: none"> • Limit unnecessary idling of equipment and vehicles • Encourage use of low sulphur-containing fuels • Routine maintenance of construction equipment and vehicles • Enforce posted speed limits 	None
	Potential for Increased VOC emissions as a result of fertilizer storage facility fire	<ul style="list-style-type: none"> • Ensure proper storage of fertilizer Products as per any Government of Canada and provincial codes and regulations • Ensure local fire departments are advised of chemicals stored on site • Emergency spill response plan to be prepared and kept up to date 	None
	Potential for release of fertilizer dust during transport	<ul style="list-style-type: none"> • Ensure all bulk loads of fertilizer products are securely covered during transport 	None
Groundwater	Potential impairment to groundwater quality in the project and local assessment area resulting from leachate from the bulk storage of fertilizer products	<ul style="list-style-type: none"> • All fertilizer products will be stored within the on-site structures constructed with concrete floor slabs • Loading and unloading of fertilizer products will take place within storage structures with minimum moving of products outside of storage structures • Fertilizer products moved outside of the storage structures will occur on concrete pads • Any fertilizer spills outside of storage structures will be cleaned and recovered immediately • Areas where fertilizers are stored, loaded, blended or transferred will be surfaced, 	None

Table 7-1: Potential Environmental Effects and Mitigation			
Environmental Component	Potential Environmental Effects	Proposed Mitigation	Residual Effects
		graded, diked and/or curbed or handled in a manner so that all product spillage and contaminated run-off water from the area is contained within the development.	
Vegetation	Permanent loss of trees and shrubs in the project assessment area due to clearing activities during construction	<ul style="list-style-type: none"> • None 	Yes
Wildlife and Wildlife Habitat	Temporary disruption to local wildlife species as a result of noise from construction activities	<ul style="list-style-type: none"> • None 	None
Agriculture	Permanent loss of agricultural land in the project assessment area	<ul style="list-style-type: none"> • None 	Yes
Noise	Increased noise and vibration during construction in the local assessment area	<ul style="list-style-type: none"> • Limit noisy construction activities to normal working hours • Construction equipment and machinery to be effectively sound-reduced • Notify landowners of construction schedules 	No

8.0 ACCIDENTS AND MALFUNCTIONS

The following are project-related accidents and malfunctions that could occur during the construction and operations phase of the Project and that may potentially result in adverse environmental effect:

- Automobile and equipment collisions due to increased traffic, machinery and equipment during construction and operations
- Release of hazardous substances (i.e. fuel and oil) during construction and operations.

Vehicle Accidents

There is the potential for automobile accidents related to the increase in vehicle and equipment traffic during construction activities which can result in serious injury or death people, and wildlife. Mitigation recommended to minimize potential effects include:

- provision of warning signs, speed control and flag persons if required to that construction activities are occurring in the areas;
- adherence to all provincial highway, safety regulations and codes

- notifying local residents of project initiation and construction schedules.

Hazardous Substances

The operation and maintenance of equipment during the construction phase of the Project has the potential to release hazardous materials (e.g. oil, gasoline, diesel, propane, lubricants, etc.) to the environment in the event of an accident or malfunction. Spills will generally be small in size and localized.

To mitigate potential environmental effects from the accidental release of hazardous substances, the following measures should be adhered to:

- Crews will be properly trained in spill prevention and cleanup and be familiar with the location of spill kits and trays for re-fueling.
- All applicable provincial regulations and guidelines for fuel storage and handling will be followed
- Fuels and hazardous substances will be located a minimum of 100m from drainage ditches
- Containment for hazardous substances will be provided to minimize compounds from being released on the ground
- Preparation and adherence to an emergency response plan
- Report spills immediately to Manitoba Conservation and Water Stewardship and clean up spills immediately.
- Regular inspection of work sites

8.1 Likelihood of Accidents and Malfunctions

Federated Co-op Limited will ensure that it constructs and operates the bulk fertilizer storage plant and railway spur with consideration of the health and safety of its employees and protection of the environment to minimize potential environmental effects. Through proper project planning and adherence to the mitigation measures identified in the section above it is unlikely that an accident and malfunction identified in Section 8.0 will occur. As a result no residual effects for accidents and malfunctions were identified.

9.0 EFFECTS OF THE ENVIRONMENT ON THE PROJECT

Potential effects of the environment on the project were considered in this assessment and include effects from grass fires.

There is the potential for grass fires to occur in the road right-of-way ditches during seasonally dry weather. Causes of grass fires include natural causes such as lightning and human involvement including: machinery sparks, smoking, and controlled agricultural burns.

Potential effects of grassfires during construction include a delay in construction activities. During operations, grass fires are a direct threat to the storage facility and materials and there is the potential for a facility fire or explosion.

The probability of a significant adverse environmental effect from grass fires is not anticipated to have any effect on the proposed Project. Mitigation recommended to minimize potential effects from grass fires on the fertilizer storage facility include preparation and updating of an emergency response plan that includes grass fires. If required, proper fire suppression systems should be available on site. Employees shall be aware of the site emergency procedures and properly trained to deal with site emergencies. Adherence to these mitigation measures will minimize potential effects from the environment on the project and therefore no residual effects are anticipated

10.0 RESIDUAL EFFECTS

Residual effects are a resultant change in the environment after the application of mitigation measures. The significance of the residual environmental effects for the proposed Project was evaluated using factors and criteria adapted from the Canadian Environmental Assessment Agency (1994, 2000) and the Canadian Standards Association draft environmental assessment standard (1999) and are outlined in Section 5.3 of this report. Significance of residual effects was also determined.

Residual effects identified for the Project include the loss of agricultural land and minimal loss of trees in the project footprint and were determined to be low in ecological value; low in societal value, low in magnitude, small in geographical extent, occurs once, moderate-term in duration and reversible. Follow-up includes inspections to ensure that mitigation is implemented, effective and identifies any unforeseen effects.

11.0 CUMULATIVE ENVIRONMENTAL EFFECTS

Cumulative effects are the environmental effects that are likely to result from a project in combination with the environmental effects of other past, existing and future projects or activities (Canadian Environmental Assessment Agency, 2014). The Canadian Environmental Assessment Agency Operational Statement (2012) provides guidance on how cumulative environmental effects should be considered under the Canadian Environmental Assessment Act 2012. The Agency's Practitioner's Guide (1999) outlines a five-step environmental assessment process for cumulative environmental effects that includes: Scoping, Analysis of effects, Identification of Mitigation, Evaluation of Significance, and Follow-up. The cumulative effects assessment for the Project considers the residual effects of the project VECs and interactions with other past, existing and future project actions.

11.1 Scoping

Potential environmental effects as a result of the proposed Project were identified (Section 7.0). After a description of mitigation, residual effects were identified for two of the environmental components: loss of agricultural land and loss of trees. The following cumulative effects assessment will consider the potential residual effects for agricultural land and trees in conjunction with other past, existing and future project activities and actions.

11.1.1 Spatial and Temporal Boundaries

Spatial boundaries are generally greater and temporal boundaries are often longer for a cumulative effects assessment since the effects of other projects and activities may occur over a wider area and extend before and after the project boundaries. The spatial boundary identified for the cumulative effects assessment area includes the regional assessment area identified for the Project which is a 10 km radius around the project footprint (Section 5.1). The lifespan of the proposed project has been identified as 25 years and therefore is the temporal boundary that will be used for the duration of residual effects and any required follow-up monitoring.

11.1.2 Other Projects/Actions

Existing and future projects/activities that occur in the regional assessment area that have the potential to interact cumulatively with the two following VECs: agricultural land and bird species of conservation concern include the following:

Existing Projects/Activities

- Maple Leaf Consumer Foods
- CF Viterra
- Canexus Chemicals Canada Limited Partnership
- Landfills
- Industrial Use
- Agricultural land use
- Water treatment/lagoon
- Transmission Projects

Future Projects/Activities:

- Infrastructure
- Residential development
- Industrial development
- Water Treatment/lagoons
- Agricultural Land Use

Potential Effects: The potential environmental effects on agricultural land and loss of trees due to the proposed Project and other projects and activities in the regional assessment area for the reasonably foreseeable future are shown as interactions in Table 11-1.

Table 11-1: Potential Cumulative Effects Identification		
Projects and Activities	Environmental Component	
	Agricultural Land	Trees
Proposed Project		
Project construction	X	X
Project operation	X	X
Existing Projects and Activities		
Maple Leaf Consumer Foods	X	X
CF Viterra	X	X
Canexus Chemicals Canada Limited Partnership	X	X
Landfills	X	X
Industrial Use	X	X
Agricultural land use		X
Water Treatment/Lagoon	X	
Transmission Projects	X	X
Infrastructure Project	X	X
Future Projects and Activities		
Infrastructure Projects	X	X
Residential development	X	X
Industrial development	X	X
Water Treatment/Lagoon	X	
Agricultural land use		X

11.1.3 Analysis of Effects

The potential cumulative effects of the proposed Project in combination with the effects of other projects and activities in the regional assessment area are summarized below:

Agricultural Land: The effects of construction and operation of the Project may act cumulatively with the effects of the existing Maple Leaf Consumer Foods, CF Viterra, Canexus Chemicals Canada Limited Partnership, landfills, industrial use, water treatment/lagoons, transmission projects, infrastructure projects and future projects and activities such as infrastructure, residential and industrial development, and water treatment/lagoons where agricultural land may be taken out of production. Future tree clearing may result in a beneficial effect on agricultural land production.

Trees: The effects of construction activities (clearing) of the proposed Project may act cumulatively with Maple Leaf Consumer Foods, CF Viterra, Canexus Chemicals Canada Limited Partnership, landfills, industrial use, agricultural land use, transmission projects, infrastructure projects and future infrastructure, residential and industrial development, and agricultural land uses.

The potential cumulative effects of the proposed Project in combination with the effects of other projects and activities in the assessment area are evaluated below in Table 11-2. The rating of evaluation criteria are similar to those listed in Section 5.3 of this report.

Table 11-2: Summary of Cumulative Residual Environmental Effects								
Potential Cumulative Effect Category	Cumulative Residual Environmental Effects Characteristics							Significance
	Ecological Value	Societal Value	Magnitude	Geographic Extent	Frequency	Duration	Reversibility	
Agricultural land	Low	Low	Low	Small	Continuous	Long	R	No
Trees	Low	Low	Low	Small	Continuous	Long	R	No

11.1.4 Summary of Project Cumulative Environmental Effects

11.1.4.1 Agricultural Land

The total cumulative effect to agricultural land use consists of the permanent loss of agriculture land as a result of the project in conjunction with other existing and future projects identified in Table 11.2 above. The overall magnitude of the loss of agricultural land is considered to be relative small in comparison to the amount of predominantly agricultural land found in the regional assessment area (Figure 1). Where there is the additive effect of permanent agricultural land loss considering the existing and future projects identified above, the additive effect as a result of the Project is considered relatively small. The cumulative residual effects were characterized as being low for ecological and societal value, low in magnitude, small in geographic extent, continuous in frequency, long duration, and reversible. It is anticipated that the cumulative effects of the loss of agricultural land in the project footprint will not result in adverse environmental effects to agricultural land in the regional assessment area and therefore cumulative effects are rated as not significant.

11.1.4.2 Shelterbelts/Trees

The total cumulative effect to trees consists of the permanent removal of a minimal number of trees where the railway spur will be located in combination with the effects of other projects and activities in the assessment area outlined in Table 11-2. The cumulative residual effects were characterized as being low for ecological and societal value, low in magnitude, small in geographic extent, continuous in frequency, long duration, and reversible. The overall loss of trees will not likely result in adverse environmental effects to the total amount of trees found in the regional assessment area and as a result cumulative effects are considered not significant.

11.1.4.3 Identification of Mitigation

No additional mitigation measures are required for any potential cumulative environmental effects.

11.1.4.4 Evaluation of Significance

No significant cumulative environmental effects were identified for the proposed Project in combination with the environmental effects of other projects and activities in the assessment area currently or for the reasonably foreseeable future.

11.1.4.5 Follow-up

No additional follow-up is required for any potential cumulative environmental effects.

12.0 MONITORING AND FOLLOW-UP ACTIVITIES

Federated Co-op Limited will ensure that it adheres to all applicable federal, provincial and municipal acts and regulations and will follow industry standards and best management practices as well as mitigation measures outlined in Section 7.0.

13.0 SUMMARY AND CONCLUSION

Federated Cooperatives Limited is proposing to construct a bulk granular fertilizer storage facility in Brandon, Manitoba (Section SW ¼ Sec and SE ¼ Sec 15-10-18 WPM) near the eastern boundary of the City of Brandon and the R.M. of Cornwallis.

The proposed Project requires a licence for a Class I development under *The Environment Act* (Manitoba). The environmental assessment was carried out based on information provided by Federated Co-op, reference materials obtained from Manitoba Conservation and Water Stewardship, literature and internet searches, and personal reference collections.

Environmental effects of the Project were identified and assessed, mitigation measures were identified and residual environmental effects were evaluated. The assessment considered biophysical and socio-economic effects, effects of accidents and malfunctions associated with the Project, effects of the environment on the Project, and cumulative environmental effects.

13.1 Conclusion

Based on the information contained in the environmental assessment report and the implementation of mitigation measures the proposed Project will not result in any significant adverse environmental effects.

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Appendix A
Project Site Plan

Appendix B

Species of Concern for the Aspen Parkland Region

Species of Conservation Concern in the Aspen Parkland Ecoregion

Animal Assemblage			
Gull Colony		GNR	SNR
Snake Hibernaculum		GNR	SNR
Invertebrate Animal			
Copablepharon grande	Pale Yellow Dune Moth	G4G5	S1
Copablepharon longipenne	Dusky Dune Moth	G4	S1
Erynnis martialis	Mottled Dusky Wing	G3	S2
Hesperia dacotae	Dakota Skipper	G2	S2
Hesperia ottoe	Ottoe Skipper	G3G4	S1
Hypochlora alba	Sage Grasshopper	G5	SNR
Quadrule quadrule	Mapleleaf Mussel	G5	S2
Schinia avemensis	Golden-edged Gem	G1G3	S1
Schinia bimatrix	White Flower Moth	G2G4	S1
Strophitus undulatus	Creepers	G5	SNR
Vascular Plant			
Achnatherum hymenoides	Indian Rice Grass	G5	S2
Agalinis aspera	Rough Purple False-foxglove	G5	S1S2
Alisma gramineum	Narrow-leaved Water-plantain	G5	S1
Ambrosia acanthicarpa	Sandbur	G5	S1S2
Andropogon hallii	Sand Bluestem	G4	S2S3
Aristida purpurea var. longiseta	Red Three-awn	G5T5?	S1
Arnica fulgens	Shining Arnica	G5	S2
Artemisia cana	Silver Sagebrush	G5	S2
Asarum canadense	Wild Ginger	G5	S3S4
Asclepias lanuginosa	Hairy Milkweed	G4?	S2
Asclepias verticillata	Whorled Milkweed	G5	S3
Asclepias viridiflora	Green Milkweed	G5	S3
Astragalus gilviflorus	Cushion Milkvetch	G5	S1
Astragalus pectinatus	Narrow-leaved Milkvetch	G5	S2S3
Atriplex argentea	Saltbrush	G5	S2
Bidens amplissima	Beggar-ticks	G3	SNA
Boltonia asteroides var. recognita	White Boltonia	G5T3T5	S2S3
Botrychium campestre	Prairie Moonwort	G3G4	S1
Botrychium multifidum	Leathery Grape-fern	G5	S3
Bouteloua curtipendula	Side-oats Grama	G5	S2S3
Bromus porteri	Porter's Chess	G5	S3?
Bromus pubescens	Canada Brome Grass	G5	SNA
Buchloe dactyloides	Buffalograss	G4G5	S1
Calamagrostis montanensis	Plains Reed Grass	G5	S3
Callitriche heterophylla	Larger Water-starwort	G5	S2
Carex bicknellii	Bicknell's Sedge	G5	SH
Carex cristatella	Crested Sedge	G5	S2
Carex cryptolepis	Northeastern Sedge	G4	S1
Carex emoryi	Emory's Sedge	G5	S2?
Carex gravida	Heavy Sedge	G5	S1

<i>Carex hallii</i>	Hall's Sedge	G4?Q	S3
<i>Carex hystericina</i>	Porcupine Sedge	G5	S3?
<i>Carex parryana</i>	Parry's Sedge	G4	S3?
<i>Carex pedunculata</i>	Stalked Sedge	G5	S3?
<i>Carex prairea</i>	Prairie Sedge	G5	S4?
<i>Carex sterilis</i>	Dioecious Sedge	G4	S2
<i>Carex supina</i> var. <i>spaniocarpa</i>	Weak Sedge	G5T3T5	S2?
<i>Carex tetanica</i>	Rigid Sedge	G4G5	S2
<i>Carex torreyi</i>	Torrey's Sedge	G4	S4
<i>Carex tribuloides</i>	Prickly Sedge	G5	SNA
<i>Carex xerantica</i>	White-scaled Sedge	G5	S3?
<i>Celtis occidentalis</i>	Hackberry	G5	S1
<i>Chamaesyce geyeri</i>	Prostrate Spurge	G5	S1
<i>Chenopodium subglabrum</i>	Smooth Goosefoot	G3G4	S1
<i>Circaea lutetiana</i> ssp. <i>canadensis</i>	Large Enchanter's-nightshade	G5T5	S2
<i>Clematis ligusticifolia</i>	Western Virgin's-bower	G5	S1
<i>Clematis virginiana</i>	Virgin's-bower	G5	S2
<i>Coreopsis tinctoria</i>	Common Tickseed	G5	SH
<i>Corispermum americanum</i> var. <i>americanum</i>	American Bugseed	G5?T5?	S2S3
<i>Corispermum hookeri</i> var. <i>hookeri</i>	Hooker's Bugseed	G4G5T4T5	S1
<i>Corispermum pallasii</i>	Pallas' Bugseed	G4?	SU
<i>Corispermum villosum</i>	Hairy Bugseed	G4?	S1S2
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	G5	S3
<i>Coryphantha vivipara</i>	Pincushion Cactus	G5	S2
<i>Cryptotaenia canadensis</i>	Honewort	G5	S2
<i>Cycloloma atriplicifolium</i>	Winged Pigseed	G5	S2
<i>Cymopterus acaulis</i>	Plains Cymopterus	G5	S2S3
<i>Cyperus houghtonii</i>	Houghton's Umbrella-sedge	G4?	S2
<i>Cyperus schweinitzii</i>	Schweinitz's Flatsedge	G5	S2
<i>Cypripedium candidum</i>	Small White Lady's-slipper	G4	S2
<i>Dalea villosa</i> var. <i>villosa</i>	Silky Prairie-clover	G5T5	S2S3
<i>Desmodium canadense</i>	Beggar's-lice	G5	S2
<i>Dichanthelium linearifolium</i>	White-haired Panic-grass	GNR	S2
<i>Drosera anglica</i>	Oblong-leaved Sundew	G5	S3
<i>Eleocharis engelmannii</i>	Engelmann's Spike-rush	G4G5	S1
<i>Elymus hystrix</i>	Bottle-brush Grass	G5	S2
<i>Eragrostis hypnoides</i>	Creeping Teal Love Grass	G5	S4
<i>Erigeron caespitosus</i>	Tufted Fleabane	G5	S2
<i>Eriogonum flavum</i>	Yellow Eriogonum	G5	S3
<i>Festuca hallii</i>	Plains Rough Fescue	G4	S3
<i>Festuca subverticillata</i>	Nodding Fescue	G5	S1
<i>Galium aparine</i>	Cleavers	G5	SU
<i>Hackelia floribunda</i>	Large Flowered Stickseed	G5	SU
<i>Helianthus nuttallii</i> ssp. <i>rydbergii</i>	Tuberous-rooted Sunflower	G5T5	S2
<i>Heliotropium curassavicum</i>	Seaside Heliotrope	G5	SH
<i>Hypoxis hirsuta</i>	Yellow Stargrass	G5	S4
<i>Juncus interior</i>	Inland Rush	G4	S1

<i>Krascheninnikovia lanata</i>	Winterfat	G5	S2
<i>Leersia oryzoides</i>	Rice Cutgrass	G5	S3?
<i>Lemna turionifera</i>	Duckweed	G5	SU
<i>Leucophysalis grandiflora</i>	Large White-flowered Ground-cherry	G4?	S3
<i>Linum sulcatum</i>	Grooved Yellow Flax	G5	S3
<i>Lomatium foeniculaceum</i>	Hairy-fruited Parsley	G5	S3
<i>Lomatium macrocarpum</i>	Long-fruited Parsley	G5	S3
<i>Lomatium orientale</i>	White-flowered Parsley	G5	S1
<i>Lomatogonium rotatum</i>	Marsh Felwort	G5	S2S3
<i>Lotus unifoliolatus</i>	prarie trefoil	G5	S2S3
<i>Malaxis monophyllos</i>	White Adder's-mouth	G5	S2?
<i>Malaxis paludosa</i>	Bog Adder's-mouth	G4	S1
<i>Mentzelia decapetala</i>	Gumbo-lily	G5	SH
<i>Mertensia lanceolata</i>	Tall Lungwort	G5	S2
<i>Mimulus glabratus</i>	Smooth Monkeyflower	G5	S1
<i>Mimulus glabratus</i> var. <i>jamesii</i>	Smooth Monkeyflower	G5T5	S1
<i>Musineon divaricatum</i>	Leafy Musineon	G5	S2
<i>Myosurus minimus</i> ssp. <i>minimus</i>	Least Mousetail	G5T5	S1
<i>Nassella viridula</i>	Green Needle Grass	G5	S3
<i>Orobanche ludoviciana</i>	Louisiana Broom-rape	G5	S2
<i>Osmorhiza claytonii</i>	Wooly or Hairy Sweet Cicely	G5	S2
<i>Ostrya virginiana</i>	Hop-hornbeam	G5	S2
<i>Oxytropis sericea</i>	Early Yellow Locoweed	G5	S1
<i>Parietaria pensylvanica</i>	American Pellitory	G5	S4
<i>Penstemon nitidus</i>	Smooth Blue Beard-tongue	G5	S2
<i>Penstemon procerus</i>	Slender Beard-tongue	G5	S1?
<i>Phlox hoodii</i>	Moss Pink	G5	S3
<i>Phryma leptostachya</i>	Lopseed	G5	S3
<i>Piptatherum micranthum</i>	Little-seed Rice Grass	G5	S2
<i>Plagiobothrys scouleri</i> var. <i>scouleri</i>	Scouler's Allocarya	G5TNR	S1
<i>Plantago elongata</i> ssp. <i>elongata</i>	Linear Leaved-plantain	G4T4	S2
<i>Platanthera orbiculata</i>	Round-leaved Bog Orchid	G5	S3
<i>Poa arida</i>	Plains Blue Grass	G5	S4
<i>Poa cusickii</i>	Mutton-grass	G5	S2?
<i>Poa fendleriana</i>	Mutton Grass	G5	S2
<i>Polanisia dodecandra</i> ssp. <i>dodecandra</i>	Clammyweed	G5T5?	S1
<i>Polanisia dodecandra</i> ssp. <i>trachysperma</i>	Clammyweed	G5T5?	S1
<i>Polygala verticillata</i>	Whorled Milkwort	G5	S2
<i>Polygala verticillata</i> var. <i>isocycla</i>	Whorled Milkwort	G5T5	S2
<i>Potamogeton amplifolius</i>	Large-leaved Pondweed	G5	S2?
<i>Potamogeton illinoensis</i>	Illinois Pondweed	G5	S2
<i>Potentilla gracilis</i> var. <i>flabelliformis</i>	Graceful Cinquefoil	G5?	S1
<i>Potentilla plattensis</i>	Low Cinquefoil	G4	S2
<i>Ranunculus cymbalaria</i> var. <i>saximontanus</i>	Seaside Crowfoot	G5T5	S1S2
<i>Rhynchospora alba</i>	White Beakrush	G5	S3?
<i>Rhynchospora capillacea</i>	Horned Beakrush	G4	S2
<i>Sanguinaria canadensis</i>	Blood-root	G5	S2

<i>Schedonnardus paniculatus</i>	Tumble-grass	G5	S2
<i>Selaginella densa</i>	Prairie Spike-moss	G5	S3
<i>Shinnersoseris rostrata</i>	Annual Skeletonweed	G5?	S1S2
<i>Sisyrinchium campestre</i>	White-eyed Grass	G5	SU
<i>Sisyrinchium mucronatum</i>	Michaux's Blue-eyed Grass	G5	S1?
<i>Sporobolus neglectus</i>	Annual Dropseed	G5	S3?
<i>Thermopsis rhombifolia</i>	Golden Bean	G5	S2
<i>Townsendia exscapa</i>	Silky Townsend-daisy	G5	S2
<i>Tradescantia occidentalis</i>	Western Spiderwort	G5	S1
<i>Uvularia sessilifolia</i>	Small Bellwort	G5	S2
<i>Verbena bracteata</i>	Bracted Vervain	G5	S3
Vertebrate Animal			
<i>Accipiter cooperii</i>	Cooper's Hawk	G5	S4S5B
<i>Aechmophorus occidentalis</i>	Western Grebe	G5	S4B
<i>Ammodramus bairdii</i>	Baird's Sparrow	G4	S1B
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	G5	S2B
<i>Anthus spragueii</i>	Sprague's Pipit	G4	S2B
<i>Ardea herodias</i>	Great Blue Heron	G5	S4S5B
<i>Asio flammeus</i>	Short-eared Owl	G5	S2S3B
<i>Athene cunicularia</i>	Burrowing Owl	G4	S1B
<i>Bubulcus ibis</i>	Cattle Egret	G5	S1S2B
<i>Bufo cognatus</i>	Great Plains Toad	G5	S2
<i>Buteo regalis</i>	Ferruginous Hawk	G4	S1S2B
<i>Calamospiza melanocorys</i>	Lark Bunting	G5	S1B
<i>Calcarius ornatus</i>	Chestnut-collared Longspur	G5	S1S2B
<i>Chaetura pelagica</i>	Chimney Swift	G5	S2B
<i>Charadrius melodus</i>	Piping Plover	G3	S1B
<i>Chelydra serpentina serpentina</i>	Common Snapping Turtle	G5T5	S3
<i>Chlidonias niger</i>	Black Tern	G4	S4B
<i>Chordeiles minor</i>	Common Nighthawk	G5	S3B
<i>Contopus cooperi</i>	Olive-sided Flycatcher	G4	S3S4B
<i>Coturnicops noveboracensis</i>	Yellow Rail	G4	S3S4B
<i>Cygnus buccinator</i>	Trumpeter Swan	G4	S1S2B
<i>Dolichonyx oryzivorus</i>	Bobolink	G5	S4B
<i>Empidonax traillii</i>	Willow Flycatcher	G5	S2S3B
<i>Eremophila alpestris</i>	Horned Lark	G5	S3B
<i>Eumeces septentrionalis</i>	Northern Prairie Skink	G5	S1
<i>Falco peregrinus anatum</i>	Peregrine Falcon		S1B
<i>Heterodon nasicus</i>	Western Hognose Snake	G5	S1S2
<i>Hirundo rustica</i>	Barn Swallow	G5	S4B
<i>Ichthyomyzon castaneus</i>	Chestnut Lamprey	G4	S3S4
<i>Lanius ludovicianus excubitorides</i>	Loggerhead Shrike	G4T4	S2B
<i>Liochlorophis vernalis</i>	Smooth Green Snake	G5	S3S4
<i>Lithobates pipiens</i>	Northern Leopard Frog	G5	S4
<i>Macrhybopsis storeriana</i>	Silver Chub	G5	S3
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	G5	S2B
<i>Mustela frenata</i>	Long-tailed Weasel	G5	S3

Notropis dorsalis	Bigmouth Shiner	G5	S3
Numenius borealis	Eskimo Curlew	GH	SNA
Nycticorax nycticorax	Black-crowned Night-heron	G5	S3S4B
Odocoileus hemionus	Mule or Black-tailed Deer	G5	S3
Phalacrocorax auritus	Double-crested Cormorant	G5	S5B
Podiceps auritus	Horned Grebe	G5	S3B
Podiceps nigricollis	Eared Grebe	G5	S4S5B
Sayornis saya	Say's Phoebe	G5	S2S3B
Spea bombifrons	Plains Spadefoot Toad	G5	S2S3
Sterna forsteri	Forster's Tern	G5	S4B
Storeria occipitomaculata	Northern Redbelly Snake	G5	S3S4
Strix varia	Barred Owl	G5	S4B
Thamnophis radix haydenii	Western Plains Garter Snake	G5T5	S4
Vermivora chrysoptera	Golden-winged Warbler	G4	S3B
Wilsonia canadensis	Canada Warbler	G5	S4B

Source: Manitoba Conservation Data Centre. Website Accessed Oct. 2015 <http://www.gov.mb.ca/conservation/cdc/ecoreg/aspn.html>

Conservation Data Centre Rankings Definitions

Rank	Definition
1	Very rare throughout its range or in the province (5 or fewer occurrences, or very few remaining individuals). May be especially vulnerable to extirpation.
2	Rare throughout its range or in the province (6 to 20 occurrences). May be vulnerable to extirpation.
3	Uncommon throughout its range or in the province (21 to 100 occurrences).
4	Widespread, abundant, and apparently secure throughout its range or in the province, with many occurrences, but the element is of long-term concern (> 100 occurrences).
5	Demonstrably widespread, abundant, and secure throughout its range or in the province, and essentially impossible to eradicate under present conditions.
U	Possibly in peril, but status uncertain; more information needed.
H	Historically known; may be rediscovered.
X	Believed to be extinct; historical records only, continue search.
SNR	A species not ranked. A rank has not yet assigned or the species has not been evaluated.
SNA	A conservation status rank is not applicable to the element
G	Global
S	Sub-National

Species Listed by the Manitoba Endangered Species Act (MBESA), the Species at Risk Act (SARA) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)

Scientific Name	Common Name	MBESA	SARA	COSEWIC
Vascular Plants				
<i>Agalinis aspera</i>	Rough Agalinis	Endangered	Endangered	Endangered
<i>Agalinis gattingeri</i>	Gattinger's Agalinis	Endangered	Endangered	Endangered
<i>Buchloë dactyloides</i>	Buffalo Grass	Threatened	Threatened	Threatened
<i>Celtis occidentalis</i>	Hackberry	Threatened	-	-
<i>Chenopodium subglabrum</i>	Smooth Goosefoot	Endangered	Threatened	Threatened
<i>Cypripedium candidum</i>	Small White Lady's-slipper	Endangered	Endangered	Endangered
<i>Dalea villosa</i>	Hairy Prairie-clover	Threatened	Threatened	Threatened
<i>Platanthera praeclara</i>	Western Prairie Fringed Orchid	Endangered	Endangered	Endangered
<i>Solidago riddellii</i>	Riddell's Goldenrod	Threatened	Special Concern	Special Concern
<i>Spiranthes magnicamporum</i>	Great Plains Ladies'-tresses	Endangered	Endangered	-
<i>Symphotrichum sericeum</i>	Western Silvery Aster	Threatened	Threatened	Threatened
<i>Tradescantia occidentalis</i>	Western Spiderwort	Threatened	Threatened	Threatened
<i>Veronia fasciculata</i>	Western Ironweed	Endangered	-	-
<i>Veronicastrum virginicum</i>	Culver's-root	Threatened	-	-
Invertebrates				
<i>Hesperia dactotae</i>	Dakota Skipper	Threatened	Threatened	Threatened
<i>Quadrula quadrula</i>	Mapleleaf Mussel	Endangered	Threatened	-
Vertebrate Animal				
<i>Ammodramus bairdii</i>	Baird's Sparrow	Endangered	-	-
<i>Anthus spragueii</i>	Sprague's Pipit	Threatened	Threatened	Threatened
<i>Athene cucularia</i>	Burrowing Owl	Endangered	Endangered	Endangered
<i>Calcarius ornatus</i>	Chestnut-collared Longspur	Endangered	Threatened	-
<i>Caprimulgus vociferous</i>	Whip-poor-will	Threatened	-	-
<i>Chaetura pelagic</i>	Chimney Swift	Threatened	Threatened	-
<i>Chordeiles minor</i>	Piping Plover	Endangered	Endangered	-
<i>Chelydra serpentina serpentina</i>	Common Snapping Turtle	-	Special Concern	-
<i>Charadrius melodus</i>	Common Nighthawk	Threatened	Threatened	-
<i>Coturnicops noveboracensis</i>	Yellow Rail	-	Special Concern	Special Concern
<i>Falco peregrines anatum</i>	Peregrine Falcon	Endangered	Special Concern	Threatened
<i>Ixobrychus exilis</i>	Least Bittern	Endangered	Threatened	Threatened
<i>Lanius ludovicianus excubitorides</i>	Loggerhead Shrike	-	Threatened	Threatened
<i>Lanius ludovicianus migrans</i>	Loggerhead Shrike	Endangered	Endangered	Endangered
<i>Macrhybopsis storeriana</i>	Silver Chub	-	Special Concern	Special Concern
<i>Melanerpes erythrorhynchus</i>	Red-headed Woodpecker	Threatened	Threatened	Threatened
<i>Numenius borealis</i>	Eskimo Curlew	Endangered	Endangered	Endangered
<i>Podiceps auritus</i>	Horned Grebe	Endangered	-	-
<i>Vermivora chrysoptera</i>	Golden-winged Warbler	Threatened	-	-

Sources:

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