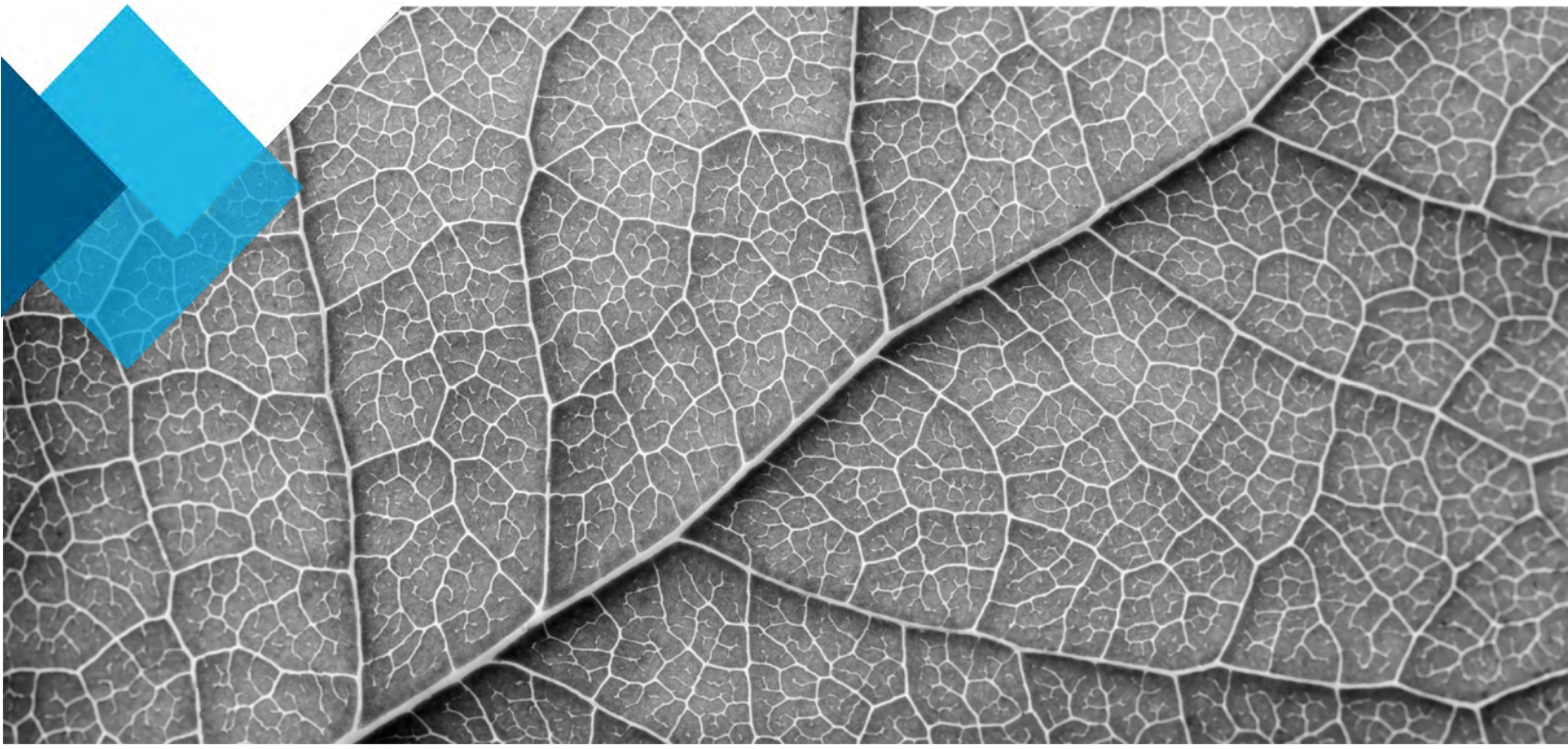
SNC·LAVALIN

Environment Act Proposal

Merit Pea Canola Protein Processing Plant

Merit Functional Foods Corporation



Environment & Geoscience

10 February 2020

Internal Ref: 667646

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Executive Summary

Introduction

SNC-Lavalin Inc. (SNC-Lavalin) was retained by Merit Functional Foods Corporation (Merit Foods) to prepare this Environment Act Proposal (EAP) for their proposed Merit Pea Canola Protein Processing Plant. Merit Foods plans to develop a 20,000 t/y pea and canola processing facility (Phase 1) and expand to a 50,000 t/y facility (Phase 2). The facility will process protein from yellow field peas and canola for use as an ingredient in other food products. Merit Foods is including both Phases 1 and 2 of the project in this proposal.

Project Description

The proposed facility is located on approximately 3.43 ha of previously cultivated land in the BrookPort Business Park in the RM of Rosser. The legal land description is: SE 34-11-2 EPM, Lots 6, 7 and 8, Plan 64621, WLTO. The project will include the processing facility and headquarters and will include two buildings: the main facility and a scale shed. The main building consists of two-stories and will include four distinct areas: office and support, warehouse, maintenance, and process area. The complex will also include grain bins and conveying apparatus for raw materials and by-products, canola oil storage tanks, an oil interceptor, an equalization treatment tank for sewage effluent, a hydrochloric acid (HCl) storage tank, and transmission and distribution equipment for hydroelectricity.

Yellow field peas and canola will be brought to the facility in B-trains. The peas will be cleaned, destoned and dehulled. The hulls will be ground to coarse powder, whereas the peas will be ground into fine pea flour. The ground hulls will be sold as a co-product and the ground pea flour will be further processed using the wet process. The canola will be screened, aspirated, and pressed to produce product canola oil and canola cake. The oil will be decanted and conveyed to storage bins for sale as crude canola oil. The canola cake will be ground into canola meal and furthered processed using the wet process.

The wet process will produce a starch slurry of 65% water / 35% starch or a spent canola meal at 65% water / 35% solids. The slurry will be fed into a dispersion dryer that will use two spray dryers to dry the slurry to 90% solids / 10% water and produce dry powder. There will be minimal process waste, as almost 99% of the product stream will be sold as protein powders or as co-products. The dockage is expected to be provided to a feed mill for feeding of large animals rather than landfilled.

Project Emissions

The facility will require approximately 350,000 L/day and 800,000 L/day of water for Phases 1 and 2, respectively, and will discharge similar amounts of wastewater. The water will be obtained from the Cartier Regional Water Co-op. The wastewater will undergo a pre-treatment process to ensure pH requirements are met prior to being discharged to the RM of Rosser for eventual treatment at the North End plant. An oil interceptor will also be installed to ensure canola oil is removed from the wastewater.

There will be minimal process waste, as almost 99% of the product stream will be sold as protein powders or as co-products such as pea fiber / starch or canola meal / oil. There will be approximately 1.5% dockage of peas and canola, which is expected to be provided to a feed mill for feeding of large animals rather than landfilled.

An air quality analysis was completed to model the expected air contaminant and water vapour emissions for both Phases 1 and 2. Suspended particulate matter (PM, as PM_{10} and $PM_{2.5}$) and plume visibility (including potential surface fogging and icing) were the focus of the study. In all cases, there are no exceedances of the applicable government ambient air quality objectives (AQOs) at any sensitive receptor (nearby residences and public facilities such as care homes, recreational centers and hospitals), for any air contaminant assessed.

Exceedances of the AQOs are predicted, but only at or very near the facility fenceline. The project $PM_{2.5}$ emissions were conservatively estimated by assuming that all emitted particulate would be the smallest size category ($PM_{2.5}$) and that the emission controls (cyclones and baghouses) would release particulate at their maximum level of 5 mg/m^3 at all hours of the day during a five-year simulation period. The performance of the emissions controls is expected to be better. Monitoring of PM will be conducted during operation to validate the model, and mitigation measures will be implemented to reduce PM emissions if required. Due to the phased nature of the project, monitoring during Phase 1 of the project can support any necessary changes to Phase 2.

The NO_2 predictions assume 100% conversion of NO to NO_2 upon release, which is expected to be a gross over-estimate. While an exceedance of the 1-hour objective was modelled for Phase 2, no exceedances of the NO_2 AQOs are expected, for either phase of operations. The ambient CO predictions are much lower than the AQOs.

Water vapour emissions from three facility dryers were simulated to cause visible fog plumes and infrequent surface icing during cold conditions. The vapour plumes heights tend to be limited in extent (<100 m high and <1 km in length). Rare surface fogging and icing was infrequently predicted during cold temperatures with clear skies near the facility, associated with moderate to high wind speeds and building downwash.

Due to the facility's proximity to the Winnipeg International Airport (YWG), flight path data was obtained to evaluate potential water vapour plume effects on air traffic. The great majority of time the visible plumes for both Phase 1 and Phase 2 emissions are predicted to be under 70 m in height and 500 m in length. Even the extreme plume heights and lengths infrequently predicted by the model, which may not occur in reality, do not intersect the flight paths in any cases. However, surface fogging and icing will be monitored during operation, and mitigation measures will be implemented as required.

Environmental Effects and Mitigation Measures

A summary of the potential environmental effects and mitigation and environmental design measures to minimize or eliminate effects, as well as identification of residual effects, is included as **Table I**. All residual effects were assessed for significance. The assessment indicates the project is anticipated to have no significant residual effects. A commitments register was developed that summarizes the commitments by Merit Foods to execute the project in accordance with the proposed mitigation measures.

Environmental Monitoring

An environmental monitoring plan will be developed to validate the air emissions model. Monitoring will include stack sampling, monitoring of particulate matter at the fenceline, visual monitoring of fog plumes, and monitoring of surface ice on Brookside Blvd. Due to the phased nature of the project, monitoring during Phase 1 of the project can support any necessary changes to Phase 2.

Table I Potential project effects, mitigation measures, and residual effects

Phase: Construction	Phase: Operation	Phase: Decommissioning	Project Activity / Component	Potential Environmental Effects	Environmental Design and Mitigation Measures	Residual Effects
X			Vegetation clearing, topsoil stripping, and earthworks	› Grading of the site may affect local runoff. › Potential sedimentation and contaminants in site runoff. › The disturbance to approximately 3.43 ha of land, which may include the following effects to soils: grading and removal of topsoil; soil compaction / mixing from heavy equipment traffic; and soil loss from erosion due to wind and precipitation / runoff during construction. › Spread of weedy and / or invasive plant species, › Clearing of the site has the potential to affect wildlife and wildlife habitat and vegetation, including rare species. › Potential destruction / damage to migratory bird nests during construction. › Unknown heritage resources could be affected during construction.	› During construction, BMPs will continue to be implemented to prevent contaminants in site runoff. During dewatering, any water discharged to the drainage ditch was pumped through filter fabric. Washout bins are being used during construction for concrete trucks and pumps to ensure wash out water does not contaminate the surrounding land / water, and wash water will be disposed at an approved location. › The site is graded with a site runoff / ditch system that complies with RM of Rosser By-law No. 2-17. › The project was sited on previously cultivated land to minimize effects to the biophysical environment. › Continue to implement BMPs for construction during preparation, stripping, storage, backfill and reclamation of soils including: topsoil management, limiting disturbed areas, limiting construction during extensive precipitation, erosion and sediment control and re-vegetation of disturbed areas as soon as practical. › Implement BMPs to minimize the spread of weedy and / or invasive species, which may include requiring equipment to arrive at site clean and clear of soil, and management of weeds on-site. › Implement BMPs to manage wildlife as required which may include: speed limits, management of attractants, fencing, documentation of wildlife sightings, etc. › Construction activity commenced in September 2019, outside of the general nesting season for migratory birds. If bird nesting becomes problematic during ongoing construction and / or operation, Merit Foods will implement BMPs to minimize effects to birds which may include: installation of bird deterrent equipment, setbacks around active nests, and removal of inactive nests outside of bird season. Any bird deterrent and management measures would be conducted in accordance with the *Migratory Birds Convention Act, 1994*. › In the event that archaeological, historical or paleontological resources are discovered during construction, work that could affect the potential resource will cease until a heritage resource management strategy is developed.	› Affects to local runoff from site grading. › Removal and / or compaction of topsoil and grading of up to 3.43 ha of land.
X	X	X	Construction, operation, and decommissioning of the processing plant	› Injury to wildlife and birds accessing the site during operation. › The project will contribute to increased traffic along Brookside Blvd. and Farmer Rd.	› Implement BMPs to manage wildlife as required which may include: speed limits, management of attractants, fencing, documentation of wildlife sightings, etc. › Implement BMPs to minimize effects to birds which may include: installation of bird deterrent equipment, setbacks around active nests, and removal of inactive nests outside of bird season. › Ongoing engagement with stakeholders will continue to identify their project concerns and allow Merit Foods to resolve concerns effectively. › Scheduling of two to three shifts per day and including overlapping shifts several days per week such that traffic is not all concentrated at peak traffic times.	› Increased traffic.
X	X	X	Use of water and power resources	› Use and production of approximately 350,000 L/day of water / wastewater for Phase 1 and approximately 800,000 L/day water / wastewater for Phase 2.	› Water recycle is included in the process design to reduce water usage and effluent discharge › The Cartier Regional Water Co-op has capacity to supply water to the project, and the RM of Rosser and North End Plant have the capacity to receive the wastewater. Merit Foods has an agreement in place with the RM of Rosser to discharge water to their wastewater distribution system › During operation no wastewater will be discharged to the environment.	› Use of water and production of wastewater.
X	X	X	Air emissions (noise, particulate matter, GHG)	› Dust, vehicle exhaust, and noise from heavy equipment and earthworks during construction. › Emissions of particulate matter ($PM_{2.5}$, PM_{10}), CO, and NO_2 from boilers, dryers, heaters, and other processing equipment during operation, and potential exceedances of $PM_{2.5}$, PM_{10}, and NO_2.	› The facility is located in an industrial park >1 km away from any sensitive receptors (e.g. residences, schools, etc.). › Continue to implement best management practices (BMPs) during construction and operation to minimize air and noise emissions, which may include: the use of dust suppression (e.g. spraying roads with water); limiting speeds on unpaved roads; keeping vehicles / equipment properly maintained; keeping idling to a minimum; controlling fugitive dust emissions from stockpiled and exposed soils; and re-vegetation of disturbed areas as soon as practical where required.	› Emissions of particulate matter during operation. › Surface fogging / icing during operation.

Phase: Construction	Phase: Operation	Phase: Decommissioning	Project Activity / Component	Potential Environmental Effects	Environmental Design and Mitigation Measures	Residual Effects
				› Fugitive emissions of dust during operation (i.e. unloading / loading). › Vehicle exhaust emissions during operation. › Water vapour emissions, which have the potential to cause surface fogging and icing. › Emissions of greenhouse gases. › Noise emissions during operation from vehicles, heavy equipment, unloading / loading or raw materials and products, and other general equipment use.	› Continue to implement best management practices (BMPs) during construction and operation to protect workers and the public from noise emissions which may include: worker use of hearing protection as required; informing nearby residents of any significant noise-causing activities; and conducting high noise construction activities during daytime hours as much as possible. › Activities will comply with the RM of Rosser Nuisance Noise By Law No. 7-14 › Air dispersion modelling was conducted to predict potential emissions, with a focus on emissions of particulate matter and plume visibility. The modelling was conducted based on conservative assumptions. › The facility has been designed with numerous emission controls. With the exception of the boilers, baghouses will be used on all sources. The dryers will additionally use a cyclone paired with a baghouse (termed cyclofilter) to minimize PM emissions. The cyclones are effective at removing larger particulate from the exhaust stream. The baghouses that follow the cyclones will be effective at removing much of the remaining PM. All dryers are characterized with a maximum PM concentration in the exhaust of 5 mg/m^3 based on expectations provided by the equipment manufacturers. The baghouses in the milling room are also characterized with a 5 mg/m^3 limit. The boilers, including the dryer burners have low NOx burners and do not require further exhaust treatment as PM emissions are very low. Both the NOx and the CO emission rates for the boilers and dryer burners were calculated using the US EPA (2006). The PM controls are considered to be best practice treatment for sources of this nature and the actual performance of the cyclofilters is expected to be better than 5 mg/m^3. › The loadout area will be a covered structure open on either end for trucks to enter and exit. Raw peas and canola will be unloaded within a closed garage. The loading of by-products will also take place in a closed garage, where material will flow through a red wing nozzle to minimize dust. For these reasons, the loadout area is not expected to be a significant source of dust. Fugitive dust emissions from the movement of trucks throughout the property are also not expected to be significant, as a recycled asphalt material is planned to be used for the traffic areas. › The majority if the processing equipment will be contained within a building which will minimize noise emissions from the process plant. › Consult with the City of Winnipeg, who has jurisdiction over Brookside Blvd., to identify and implement any mitigation measures required with respect to surface icing (e.g. warning signage). › A monitoring program will be developed to validate the model and will include: stack sampling, monitoring of PM concentrations at the facility fenceline, visual monitoring of fog plumes, and monitoring of surface icing. Based on the results of the monitoring program, further mitigation measures will be implemented if required. › Ongoing engagement with stakeholders will continue to identify their project concerns and allow Merit Foods to resolve concerns effectively.	
X	X	X	Unplanned events / upset conditions	› An unplanned release / spill during construction or operation has the potential to affect soils, near surface groundwater, surface water, biological resources, and human health. › An unplanned fire / explosion / vehicular accident has the potential to harm workers, cause equipment damage, and lead to a release / spill. › Severe weather, including high winds, heavy precipitation and storm events, has the potential to affect the project during construction and operation. It may affect material placement / compaction, grading, re-vegetation, result in erosion and / or dust, and / or damage site infrastructure. › There is potential for health and safety accidents during construction or operation.	› Develop an Emergency Response Plan to respond to all emergencies on site, including spill prevention and response. Workers will be trained in the plan and there will be adequately-sized onsite spill kits to manage any spills that may occur. Any reportable spills of a hazardous substance will be cleaned up and reported to the Manitoba Conservation and Climate (MCC) Environmental Emergency line at 204-944-4888. › There will be a materials storage, handling, and waste management plan during operation to ensure fuels, oils, and hazardous materials are stored, handled, and disposed of in a safe manner that is compliant with applicable legislation. › Health and safety measures will be developed in accordance with applicable legislation and industry standards, including , including The Workplace Safety and Health Act and the Workplace Safety and Health Regulation (Section 2.8). › The facility will be designed in accordance with applicable codes and regulations.	› n/a

Abbreviations and Acronyms

Term	Definition
AQO	air quality objective
BMP	best management practice
Burcon	Burcon NutraScience Corporation
CCME	Canadian Council of Ministers of the Environment
CO	carbon monoxide
ECCC	Environment and Climate Change Canada
EAL	Environment Act Licence
EAP	Environment Act Proposal
GHG	greenhouse gas
HCl	hydrochloric acid
HRB	Historic Resources Branch
IPCC	International Panel on Climate Change
Merit Foods	Merit Functional Foods Corporation
MBCDC	Manitoba Conservation Data Centre
MCC	Manitoba Conservation and Climate
NaCl	sodium chloride
NaOH	sodium hydroxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NPRI	National Pollutant Release Inventory
PDCAAS	protein digestibility-corrected amino acid score
PM	particulate matter
$PM_{2.5}$	particulate matter of aerodynamic diameter 2.5 µm or less
PM_{10}	particulate matter of aerodynamic diameter 10 µm or less
RM	Rural Municipality
SNC-Lavalin	SNC-Lavalin Inc.
UTM	Universe Transverse Mercator coordinate system

Units of Measure

Term	Definition
%	percent
°C	degrees Celsius
cm	centimetre
F	Fahrenheit
ft^2	square feet
ha	hectare
km	kilometre
km/h	kilometre per hour
kt	kilotonne
m	metre
m^2	square metre
m^3	cubic metre
masl	metres above sea level
mg/m^3	milligrams per cubic metre
mm	millimetre
t/y	tonne per year
$\mu g/m^3$	micrograms per cubic metre

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Appendices

1 Introduction

SNC-Lavalin Inc. (SNC-Lavalin) was retained by Merit Functional Foods Corporation (Merit Foods) to prepare this Environment Act Proposal (EAP) for their proposed Merit Pea Canola Protein Processing Plant. Merit Foods plans to develop a 20,000 t/y pea and canola processing facility (Phase 1) and expand to a 50,000 t/y facility (Phase 2). The proposed facility is located just northwest of the City of Winnipeg, Manitoba, in the RM of Rosser (**Figure 1.1** and **1.2**). The facility will process protein from yellow field peas and canola for use as an ingredient in other food products.

There is potential for the facility to expand 80,000 t/y (Phase 3), depending on economic conditions. Merit Foods is including both Phases 1 and 2 of the project in this proposal, and would submit a Notice of Alteration prior to the Phase 3 expansion.

1.1 Proponent

Merit Functional Foods Corporation (Merit Foods) is the preeminent plant-based protein company formed by both Burcon NutraScience Corporation (Burcon), a leader in plant-based food technologies, and hemp food industry veterans and pioneers, Shaun Crew (Founder, Hemp Oil Canada), Barry Tomiski (Past COO, Manitoba Harvest) and Ryan Bracken (Past VP Innovation, Manitoba Harvest). Merit Foods is in the process of designing and building a 94,000 square foot state of the art, plant-based protein extraction facility, based on Burcon's patented technologies. When commissioned in late-2020, the facility will have the ability to produce the world's highest quality plant-based proteins (solubility, purity, taste), with an initial focus on pea and canola proteins.

Project Name: Merit Pea Canola Protein Processing Plant

Proponent Contact: Ryan Bracken, P.Eng., Co-CEO
Merit Functional Foods Corporation
1601C Silver Avenue
Winnipeg, MB R3J 4A1
Phone: 204.998.8884
Email: rbracken@meritfoods.com

LEGEND

- SITE LOCATION
- RAILWAY
- HIGHWAY

NOTES

1. COORDINATE SYSTEM: NAD 1983 UTM ZONE 14N.
2. SERVICE LAYER CREDITS: © 2020 MICROSOFT CORPORATION © 2020 HEREIN© 2020 MICROSOFT CORPORATION EARTHSTAR GEOGRAPHICS SIO.

DISCLAIMER

REFERENCE DRAWINGS

DWG No.	DESCRIPTION

REVISIONS

REV	DATE	DESCRIPTION	DES	DRN	CHK	APP
00	2020 02 07	ISSUED FOR INFORMATION	LM	KVG	LM	JP

0 500 1,000 2,000 3,000 4,000 METRES

SCALE: 1:100,000

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CLIENT	PROJECT LOCATION
MERIT FUNCTIONAL FOODS	RM OF ROSSER

TITLE

LOCATION PLAN

DATE	DWG No.	FIG No.	REV
2019 08 13	667646-0000-4GDD-0001	1.1	00

SIZE 11x17

Path: \\SLI16531\Projects QMS\Merit Functional Foods\667646_EA Proposal Merit Pea Canola Protein Proc. Plant\40_Execution\45_GIS_Dwgs\4.5.1 GIS\667646-0000-4GDD-0001 Location Plan.mxd

LEGEND

- SITE
- BROOKPORT BUSINESS PARK
- PROPOSED ROAD

NOTES

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2. CADASTRAL BOUNDARIES ARE FOR INFORMATIONAL PURPOSES ONLY AND SHOULD NOT BE CONSIDERED SUITABLE FOR LEGAL, ENGINEERING, OR SURVEYING PURPOSES.
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REFERENCE DRAWINGS

DWG No.	DESCRIPTION

REVISIONS

00	2020 02 07	ISSUED FOR INFORMATION	LM	KVG	LM	JP
REV	**DATE**	**DESCRIPTION**	**DES**	**DRN**	**CHK**	**APP**

0 50 100 200 300 METRES

SCALE: 1:5,000

SNC·LAVALIN

CLIENT	PROJECT LOCATION
MERIT FUNCTIONAL FOODS	RM OF ROSSER

TITLE

SITE PLAN

DATE	2019 08 14	DWG No.	667464-0000-4GDD-0002	FIG No. 1.2	REV	00

SIZE 11x17

Path: \\SLI16531\Projects QMS\Merit Functional Foods\667646_EA Proposal Merit Pea Canola Protein Proc. Plant\40_Execution\45_GIS_Dwgs\4.5.1 GIS\667646-0000-4GDD-0002 Site Plan.mxd

1.2 Statement of Need

High quality plant proteins are in significant shortage. This project will meet the North American need for high quality plant proteins, currently being sourced from international markets such as the European Union and / or China. Canada is the largest supplier of peas and canola in the world, the two key raw materials used in Merit Foods' extraction process. These raw materials are currently exported to both the European Union and China, further processed and shipped back to North America for use in various Consumer Packaged Goods (CPG) products.

Merit Foods has been established as a new entrant in the plant protein ingredient industry and holds the worldwide, exclusive rights to commercialize Burcon Nutrasciences's valuable and timely pea and canola protein technologies. Over the past 18 years, Burcon has spent over $60M in the development of proprietary plant-based protein ingredients and protein blends that provide excellent nutrition (comparable to dairy) combined with exceptional taste and solubility profiles. With Merit Foods' plant-based proteins, formulators can develop dairy-free, soy-free and gluten-free clean label products while simultaneously providing an excellent nutrient profile. Merit Foods will stand-out in the plant protein ingredient space, as it will have the highest purity, most neutral tasting, low texture, and highest solubility plant proteins available. Furthermore, Merit Foods will be the only plant-based protein provider with a protein digestibility corrected amino acid score (PDCAAS) score of 1.0 offering, making the pea / canola blend a highly desired product by most if not all large-scale Consumer Packaged Goods (CPG) brands. Primarily focused on the beverage industry, Merit Foods will also service the meat analogue and ready to mix (RTM) market, amongst many other product channels.

1.3 Regulatory Framework

The following sections describe the various federal, provincial, and municipal approvals, permits, and licences required for development of the proposed project.

1.3.1 Federal

1.3.1.1 NavCanada Land Use

Merit Foods submitted a Land Use Proposal to NavCanada as the facility includes an 85' structure near the Winnipeg James Armstrong Richardson International Airport. The majority of the building will have a roof height of 14.3 m (250.3 masl), however, a small portion of the building enclosing higher-height equipment will have a height of 26.2 m (262.2 masl). The proposal was approved by NavCanada (2019; Appendix A).

1.3.2 Provincial

1.3.2.1 Environment Act Licence

A food processing plant is considered a Class 2 development under Manitoba's *Environment Act* and will require a Class 2 Environment Act Licence (EAL). This EAP has been prepared in accordance with the Information Bulletin – Environment Act Proposal Guidelines (MCC 2018). Merit Foods received approval to commence construction prior to licensing, however, will require a licence prior to operation (MCC 2019a; Appendix A).

1.3.3 Municipal

Merit Foods received the following approvals from the RM of Rosser (Appendix A):

- Approval to obtain water and discharge wastewater (RM of Rosser 2019a); and.
- Approval to strip soils in accordance with the RM of Rosser Soil Stripping Bylaw No. 15-71 (RM of Rosser 1971 and 2019b).

1.4 Community Engagement

Merit Foods has engaged with various stakeholders, both private and public, regarding the proposed development, including:

- **City of Winnipeg:** Merit Foods engaged the City of Winnipeg Water and Waste Department to discuss water and wastewater requirements. The City indicated the South End Sewage Treatment Plant did not have capacity for the project and wastewater would need to be routed to the North End Sewage Treatment Plant;
- **RM of Rosser:** Merit Foods engaged the RM of Rosser to review the project and its water, wastewater, and infrastructure needs. The RM has provided Merit Foods with approval to discharge wastewater for Phases 1 & 2, as well as approval to strip topsoil;
- **South Interlake Planning District:** Merit Foods provided the South Interlake Planning District, a partnership between the RM's of Rockwood and Rosser, with a Letter of Intent describing the project and continues to work with the planning district to ensure compliance with the district's Development Plans;
- **CentrePort Canada:** CentrePort Canada is very supportive of the project;
- **Manitoba Agriculture:** Merit Foods has informed Manitoba Agriculture of the project, including the Minister, who is supportive of the project;
- **Manitoba Economic Development and Training:** Merit Foods has informed Manitoba Economic Development and Training of the project, including the Minister, who is supportive of the project;
- **NAV CANADA / Winnipeg Airport Authority:** Merit Foods has received approval from NAV CANADA to construct the facility, which lies in an air traffic corridor;
- **YES! Winnipeg:** YES! Winnipeg is Economic Development Winnipeg's business development team, promoting the city as an ideal location for investment, hence, has been very supportive of the project and its economic benefits;
- **Crystal Properties (Brookside Business Park Developer):** Crystal Properties has developed the majority of CentrePort Canada to date, including properties just south of the proposed project. Crystal Properties has reviewed the project plans and is supportive of the project; and
- **Manitoba Hydro:** Merit Foods has engaged with Manitoba Hydro regarding power and natural gas services, who is supportive of the project.

Overall, feedback on the project has been positive. Merit Foods will continue to engage affected stakeholders throughout the life of the project.

1.5 Report Organization

The Environment Act Proposal is organized into the following sections and attachments:

- **Executive Summary** provides a summary of the report with a focus on the outcomes of the effects assessment.
- **Section 1.0 Introduction** introduces the project and proponent, and describes the statement of need, regulatory framework, community engagement, and report organization.
- **Section 2.0 Project Description** provides a conceptual project description through construction, operation, and decommissioning. It describes the project schedule, components, and activities as well as supporting utilities and services.
- **Section 3.0 Description of the Environment** describes the atmospheric environment, physical environment, biological environment, and human environment in the vicinity of the proposed project.
- **Section 4.0 Effects Assessment Approach** identifies the valued components and outlines the approach for the assessment of effects, residual effects, and significance of effects.
- **Section 5.0 Potential Effects and Mitigation Measures** provides an assessment of effects, proposed mitigation measures, commitments, residual effects, significance, and cumulative effects.
- **Section 6.0 Environmental Monitoring** describes the proposed environmental management and monitoring measures during construction and operation.
- Appendix A presents the project approvals received to date.
- Appendix B presents the land title.
- Appendix C presents conceptual drawing of the proposed project.
- Appendix D presents a process flow overview for the proposed project.
- Appendix E presents the Air Quality Assessment.
- Appendix F presents a list of species occurring in the Lake Manitoba Plain Ecoregion.
- Appendix G presents the results of the Conservation Data and Heritage searches.

2 Description of Proposed Development

This project description is based on preliminary design and is subject to change. All dimensions are approximate.

2.1 Project Location

The proposed facility is located on approximately 3.43 ha of land in the BrookPort Business Park at 400 Goldenrod Drive in the RM of Rosser and just northwest of the City of Winnipeg, Manitoba (**Figures 1.1** and **1.2**). The legal land description is: SE 34-11-2 EPM, Lots 6, 7 and 8, Plan 64621, WLTO. The facility is centered at approximately UTM Zone 14U 626875 m E / 5536300 m N.

2.2 Ownership of Land and Mineral Rights

Merit Foods has included the land title as Appendix B. There are no known existing mineral, quarry, or oil and gas rights for the property.

2.3 Land Use

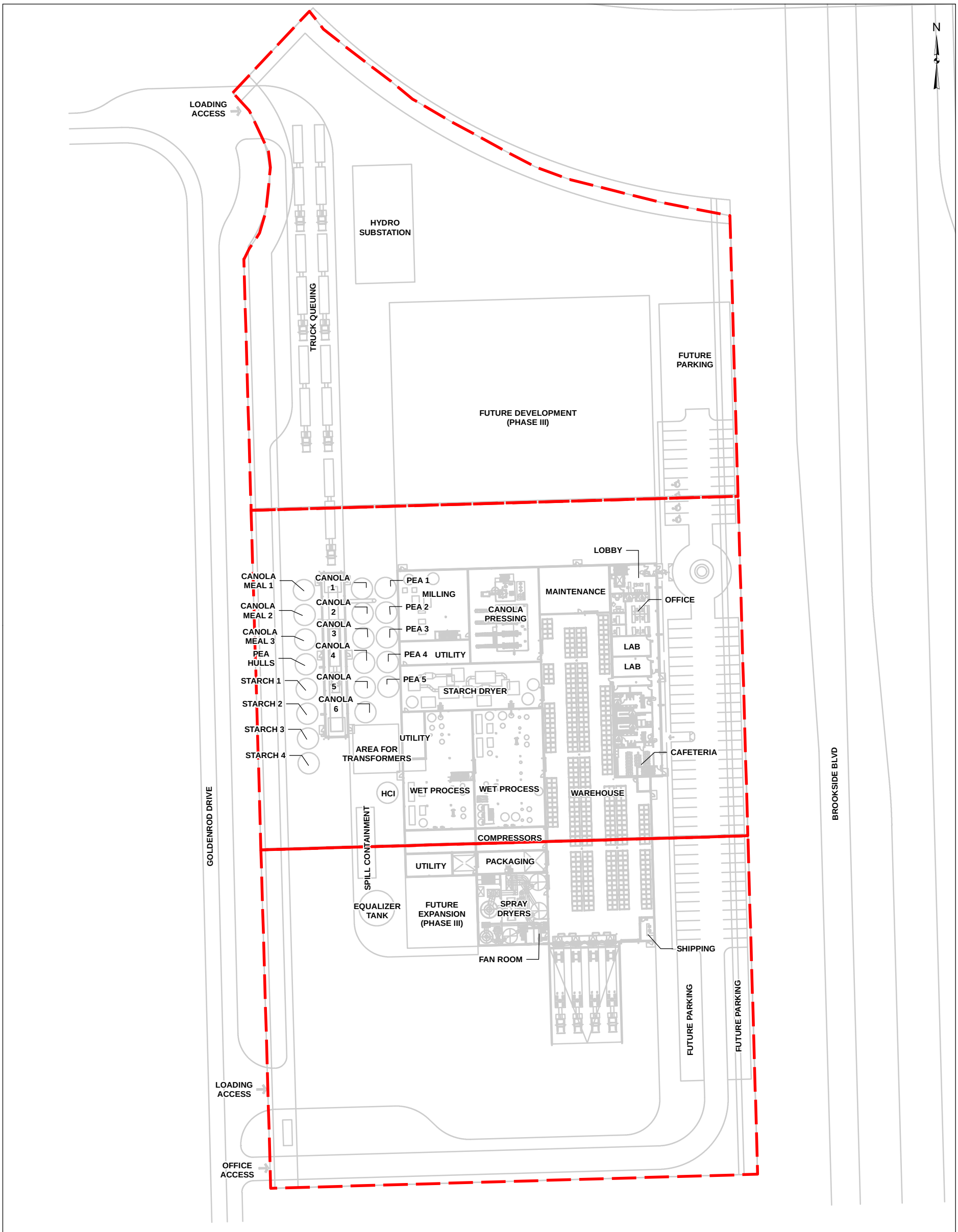
The land was cultivated prior to development of the BrookPort Business Park. The business park surrounds the proposed facility to the north, west, and south, and Brookside Blvd. borders the site to the east. The land is zoned Industrial General Zone (I2) according to Zoning Bylaw 48/2016 (Government of Manitoba 2019b). The site is located approximately four kilometres north of the Winnipeg James Armstrong Richardson International Airport, and directly below one of its flight paths (Runway 18L-36R).

2.4 Assessment of Alternatives

Alternative options, such as utilizing existing assets (buildings / equipment), were assessed for use in this project, however were not readily available. Other alternatives for this project include the establishment of facilities in alternative locations such as the Midwest USA. Manitoba (specifically CentrePort Canada) was chosen by Merit Foods for many reasons including the proximity and availability of dependable, sustainable and low-cost electricity, as well as a provincial government open for new business establishment. If such an environment were not available, Merit Foods would otherwise look to set-up closer to future customers in the USA. Merit Foods is hopeful that the initial build-out will prove that value-adding Western Canadian pulses and oilseeds are both economically and environmentally sustainable for the long-term, making Manitoba a global base for plant-based ingredient manufacturing.

2.5 Project Description

Merit Foods plans to develop a 20,000 t/y pea and canola processing facility (Phase 1) and expand to a 50,000 t/y facility (Phase 2). The project will include the processing facility and headquarters and will include two buildings: the main facility and a scale shed. A preliminary site layout is presented in **Figure 2.1**. A preliminary drawing of the proposed facility is included in Appendix C and a process flow overview is included in Appendix D.



MAIN FLOOR PLAN

LEGEND

SITE

NOTES

1. COORDINATE SYSTEM: NAD 1983 UTM ZONE 14N.
2. CADASTRAL BOUNDARIES ARE FOR INFORMATIONAL PURPOSES ONLY AND SHOULD NOT BE CONSIDERED SUITABLE FOR LEGAL, ENGINEERING, OR SURVEYING PURPOSES.

0 5 10 20 30 40 Metres

SCALE: 1:1,000

SNC·LAVALIN

CLIENT

MERIT FUNCTIONAL FOODS

PROJECT LOCATION

RM OF ROSSER

TITLE

SITE PLAN

REFERENCE DRAWINGS		REVISIONS						
BURCON A3	CAD FLOOR PLAN	00	2020 02 07	ISSED FOR INFORMATION	LM	KG	LM	JP
DWG. No.	**DESCRIPTION**	**REV**	**DATE**	**DESCRIPTION**	**DES**	**DRN**	**CHK**	**APP**

DATE 2019 09 20	**DWG No.** 667464-0000-4GDD-0003	**FIG No.** 2.1	**REV** 00
SIZE 11x17	Path: \\SLI1653\Projects QMS\Merit Functional Foods\667646_EA Proposal Merit Pea Canola Protein Proc. Plant\40_Execution\45_GIS_Dwgs\4.5.1 GIS\667646-0000-4GDD-0003 Site Plan Detailed.mxd		

During Phase 1, a single production line will be used to produce pea or canola protein. During Phase 2, a second manufacturing line will be installed, with the goal of having one production line for pea protein and the other line for canola protein. There is potential for the facility to expand 100,000 t/y (Phase 3), depending on economic conditions. Merit Foods is including both Phases 1 and 2 of the project in this proposal, and would submit a Notice of Alteration prior to the Phase 3 expansion.

2.5.1 Infrastructure

The proposed facility includes two buildings: the main facility and a scale shed.

The main building will accommodate all of Phase 1 and most of Phase 2 (i.e. expected to require a 4,000 ft^2 addition for Phase 2). It include four distinct areas:

- **Office and support:** Includes the staff entrance, locker rooms, lunchroom, and quality assurance and innovation laboratories on the main floor and offices on the second floor;
- **Warehouse:** Includes raw material and finished goods storage in pallet racking, a loading dock with four dock levelers, an at-grade drive-in door for deliveries, a forklift charging area, and a shipping office;
- **Maintenance:** Area for equipment maintenance functions; and
- **Process**: Includes a milling room, a wet-process room, a starch drying room, and spray drying room. The wet process area is a two-storey. The spray drying room will be several levels, but the raised 'floors' will be for equipment service access only, and will not be occupied space.

The 'scale building' is a separate outbuilding that will be unheated and will serve mainly to protect the loading, load-out, and weighing operations from inclement weather. The scale building will be used for:

- Off-loading of raw materials (peas and canola) from B-trains into a hopper, which will move the grain to storage bins;
- Load-out of by-products from by-product storage bins to B-trains. The by-products incude pea hulls and starch; and
- A scale to weigh both incoming and outgoing trucks.

The complex will also include:

- Grain bins and conveying apparatus for raw materials (**Table 2.1**);
- Grain bins and conveying apparatus for by-products (**Table 2.1**);
- Two 150,000 L canola oil storage tanks;
- An oil interceptor to prevent canola oil from going into the wastewater;
- A 200,000 L equalization treatment tank for process water effluent;
- A 25,000 L hydrochloric acid (HCl) storage tank with containment; and
- Transmission and distribution equipment for hydroelectricity.

The HCl tank will be constructed with applicable containment / safety measures in accordance with the applicable codes, Manitoba Fire Code, and Workplace Safety and Health Regulation. The HCl tank and grain bins will be surrounded by a perimeter fence.

The facility will include approaches, access drives, parking, and outsides storage areas. The parking will be asphalt paved and the other truck maneuvering areas will use a permeable recycled asphalt surface.

The recessed loading dock and the outside storage areas (grain bins, tanks) will have reinforced concrete paving.

Table 2.1 Grain bins

Product	Units	Raw Peas	Pea Starch	Pea Hulls	Raw Canola Seed	Spent Canola Meal	Salt (Food Grade)
Phase 1	no. of bins	4	4	1	2	1	1
Phase 2	no. of bins	1			4	2	
Bushel Weight	lb / bushel	60	50	30	50	40	
Bushel Weight	metric tonnes / bushel	0.0272	0.0227	0.0136	0.0227	0.0181	

2.5.2 Process Description

Yellow field peas and canola will be brought to the facility in B-trains and delivered to a “receiving pit.” The process flow overview for the project is shown in Appendix D.

The peas will be delivered into the pea milling room where they will be cleaned and destoned using the cleaner and destoner, respectively. The cleaned and destoned peas will then be dehulled to separate the hulls from the kernel. The hulls and the dehulled peas will be ground on separate hammermills in the room. The hulls will be ground to coarse powder, whereas the peas will be ground into fine pea flour. The ground hulls will be conveyed to the hull bin for sale as a co-product and the ground pea flour will be conveyed to the pea flour bin in preparation for the next stage of processing, i.e., the wet process.

The canola will be delivered into the canola pressing room where they will be screened and aspirated. The canola will then be pressed to produce product canola oil and canola cake. The oil will be decanted and conveyed to storage bins for sale as crude canola oil. The canola cake will be ground into canola meal, conveyed to the canola meal bin in preparation for the next stage of process, i.e. the wet process. Dust is not expected to be generated in the canola pressing process.

The wet process (for both pea flour and canola meal) will take place in the designated wet process room. All the processes in this area are performed in an aqueous medium; hence, the wet process is not expected to generate any dust. In all cases the products will have a maximum of 35% solids and a minimum of 65% water. To aid in the protein purification process, HCl is used for pH adjustment of the pea protein, while sodium chloride (NaCl) is used in the canola protein.

The by-product from the wet process, which will consist of either a starch slurry at 65% water / 35% starch or a spent canola meal at 65% water and 35% solids, will be fed into a dispersion dryer that will be installed in the starch dryer room. The dryer will dry the slurry to 90% solids and 10% water and produce dry powder. The powder from the dryer will be pneumatically conveyed to a cyclone where over 95% of the powder would be discharged through an airlock and the remaining 5% will be exhausted with air to a baghouse. In the baghouse, the powder will be separated from the air by filter bags. The powder will be discharged through an airlock and the cleaned air will be exhausted to the atmosphere. Powder from the material discharge points of the cyclone and the baghouse will be pneumatically conveyed to storage bins outside the room. The expected inlet air temperature for the starch dryer is approximately 204°C (400 F) and the outlet temperature will be approximately 79°C (175 F).

There are two spray dryers installed in the spray dryer room, both processing a specific protein powder depending on the product made in the wet area. The feed to the dryers are pumped as 15-20% solids solutions from the wet process area into the main drying chamber. Hot air at 193°C (380 F) is introduced with the atomized protein solution. It is expected that by the time the atomized protein solution has dropped to the bottom of the chamber, its solids content will be 95% and its water content will be 5%. The expected air temperature in the bottom part of the dryer is expected to drop to 79°C (175 F). Since the material in the upper section of the dryer where the expected temperature is 193°C will be in a slurry form, the dried powder at the bottom part of the dryer is not expected to be exposed to temperature in excess of the expected outlet temperature (79°C). The air / powder mix then goes to the cyclone(s) where most of the powder is discharged through an airlock. The air and a small amount of remaining powder will move into the baghouse where the powder will be separated from the air through filter bags. The powder from the baghouse drops though an airlock and is sent though a common pneumatic line with the powder from the cyclone to a powder hopper in the adjacent powder packaging room. A dust filter is included with the pneumatic line to remove any residual powder from the air.

2.5.3 Raw Materials and Products

Quantities of raw materials and products for Phases 1 and 2 of the project are presented in **Table 2.2**. The pea products are approximately 65% of the weight of the raw peas and the canola products are approximately 48% of the weight of the raw canola.

Table 2.2 Raw materials and products for Phases 1 and 2

	Phase 1 (tonnes)	Phase 2 (tonnes)
Raw Materials		
Peas	17,000	20,000
Canola	1,400	33,000
Products		
Pea Starch / Pea Fiber (by-products)	11,050	13,000
Canola Meal	672	15,840

2.6 Utilities and Services

The BrookPort Business Park lots are fully serviced and include paved roads, water and wastewater servicing, and hydroelectricity, telephone, and internet at the lot lines.

2.6.1 Water

Water requirements will be approximately 350,000 L/day of water for Phase 1 and approximately 800,000 L/day for Phase 2. The water will be obtained from the Cartier Regional Water Co-op. Water recycle is included in the process design to reduce water usage and effluent discharge, however, there may be opportunities for further reduction of these flows after operation commences.

2.6.2 Power

The facility will require approximately 5,359 kVA power during Phase 1 and approximately 8,274 kVA power during Phase 2, which includes a 5% contingency. Electricity will be obtained from Manitoba Hydro via a 66 kV power line.

2.6.3 Natural Gas

The facility will require approximately 8,890,000 m^3/y natural gas during Phase 1 and approximately 15,830,000 m^3/y natural gas during Phase 2. Natural gas will be obtained from Manitoba Hydro.

2.6.4 Traffic

2.6.4.1 Traffic Impact Study for the BrookPort Business Park

A Traffic Impact Study was conducted by WSP Canada Group Limited (WSP 2018) to investigate the potential transportation impacts on the streets adjacent to the BrookPort Business Park. The business park includes 26 lots on approximately 70.7 acres of land on the northwest quadrant of the intersection between Farmer Rd. and Brookside Blvd (**Figure 1.2**). No pedestrian, cycling, or transit facilities currently exist near the proposed facility. The study investigated potential traffic impacts on the adjacent street network and access to the development and included the following intersections: (i) Brookside Blvd. and Farmer Rd.; and (ii) Farmer Road the proposed development access road (at Mountainvew Rd.). The following key roads / intersections were included in the study:

- **Brookside Blvd**. - a paved, four-lane divided rural roadway with a speed limit of 90 km/h at Farmer Rd. It has paved shoulders and left-turn storage lanes (WSP 2018). It is within the City of Winnipeg's jurisdiction.
- **Farmer Rd**.- a gravel, two-lane undivided rural roadway with a with a speed limit of 90 km/h. The BrookPort Business Park is accessed via Farmer Road, along with the industrial park to the south, Little Mountain Park, and Little Mountain Sportsplex. It is within the RM of Rosser's jurisdiction.
- **Brookside Blvd. / Famer Rd. Intersection** - an unsignalized intersection with stop-control on Farmer Rd. Brookside Blvd. includes northbound left-turn and southbound right-turn storage / decelerations lanes at the intersection with Farmer Rd. It is within the City of Winnipeg's jurisdiction.
- **Famer Rd. / Mountainview Rd. / Access Rd. Intersection** – an unsignalized intersection with stop control on Mountainview Rd. It is within the RM of Rosser's jurisdiction.

WSP (2018) presented traffic volume data for the Brookside Blvd. and Farmer Rd. (**Table 2.3**) and Farmer Rd and Mountainview Rd. (**Table 2.4**). According to the study, trucks make up approximately 2% to 15% of the through traffic on Brookside Blvd. and 15% of traffic turning to / from Farmer Rd.

Table 2.3 Road volumes, Brookside Blvd. and Farmer Rd. collected from 07:00 to 20:45 on 7 November 2017 (WSP 2018)

	Total Traffic Count
Southbound	9,600
Westbound	358
Northbound	10,618
Eastbound	285

Table 2.4 Road volumes, Farmer Rd. and Mountainview Rd. collected from 07:00 to 16:45 on 7 November 2017 (WSP 2018)

	Total Traffic Count
Westbound	159
Northbound	63
Eastbound	60

The study projected the development traffic volumes and conducted a traffic analysis to assess the post-development levels of service and recommend improvements (WSP 2018). The study concluded that improvements would be required at the Brookside Blvd. / Farmer Rd. intersection, including signalization and intersection improvements. It is Merit's understanding that the developer of the business park will be funding traffic lights at the Brookside Blvd. / Farmer Rd. intersection.

2.6.4.2 Truck Traffic

Expected truck traffic for Phases 1 and 2 of the proposed project are presented in **Table 2.5**. The total truck traffic through the shipping / receiving area is estimated to be 19.3 loads / week for Phase 1 and 50.8 loads / week for Phase 2. The site will be accessed from Goldenrod Drive. The total truck traffic represents a small fraction of the existing traffic utilizing the current Farmer Rd. / Mountainview Rd. and Brookside Blvd. / Farmer Rd. intersections.

Table 2.5 Estimated truck traffic through shipping / receiving area for Phases 1 and 2

	Phase 1	Phase 2
Raw Materials		
Peas	386 x 44 MT B-Train Trailer Loads (7.5 loads/week)	454 x 44MT B-Train Trailer Loads (8.7 loads / week)
Canola	32 x 44MT B-Train Trailer Loads (0.6 loads/week)	750 x 44MT B-Train Trailer Loads (14.4 loads / week)
Products		
Pea Starch / Pea Fiber (by-products)	553 x 20MT Tandem Axle Trailers (10.6 loads/week)	650 x 20MT Tandem Axle Trailers (12.5 loads / week)
Canola Meal	33.6 x 20MT Tandem Axle Trailers (0.6 loads/week)	792 x 20MT Tandem Axle Trailers (15.2 loads / week)

2.7 Emissions and Wastes

2.7.1 Wastewater

The wastewater flow will be approximately 350,000 L/day for Phase 1 and approximately 800,000 L/day for Phase 2; however due to evaporation of water (100,000 L per day during Phase 1), the wastewater flows may be less. Merit Foods has approval to discharge the wastewater to the RM of Rosser for eventual treatment at the North End plant (RM of Rosser 2019a; Appendix A).

The wastewater will undergo a pre-treatment process to ensure pH requirements are met prior to discharge. The wastewater will enter the equalization tank where it equalize for a period allowing the high and low pH streams time to mix and reach a more neutral pH. The tank level will be monitored and controlled to allow for this. The wastewater will then flow from the equalization tank to the pH control building by gravity and

the flow will be controlled by a flow control valve. On this line there will be a pH probe in the pH control building that will monitor the pH and also feed a signal to the chemical delivery system. If the pH is not within a specified range the pH probe will signal the appropriate chemical (acid of 33% HCl or base of 50% sodium hydroxide [NaOH]) to start adding until the pH is in range where the probe will then signal the chemical to stop. The volume of wastewater flowing through the system will also be quantified by a totalizer which is typically a provision of the city. There is an inline mixer to mix the acid or base prior to the pH meter so that the correct pH is monitored.

There will also be a provision to monitor this wastewater stream after the pH adjustment prior to leaving the pH control building on its way to the municipal collection system. Options are being considered for both real time monitoring and allowance for a composite sampler to both monitor and collect samples for third party conformation. There is space in the pH control building that can be used by a third party for an additional composite sampler.

An oil interceptor will also be installed to ensure canola oil is removed from the wastewater.

2.7.2 Site Runoff

The site is graded with a site runoff / ditch system that complies with RM of Rosser By-law No. 2-17 for the protection of the surface water drainage system for CentrePort Canada lands.

2.7.3 Solid Waste

2.7.3.1 Process Waste

There will be minimal process waste, as almost 99% of the product stream will be sold as protein powders or as co-products such as pea fiber / starch or canola meal / oil. There will be approximately 1.5% dockage of peas and canola, which will amount to 2,040 kg/day pea dockage and 5,700 kg/day canola dockage during Phase 2. The dockage is expected to be provided to a feed mill for feeding of large animals rather than landfilled.

2.7.3.2 Other Solid Waste

The facility will generate solid waste which will be separated into hazardous waste, recyclable waste and domestic waste. A waste management plan will be created outlining management procedures for waste generated during construction and operation.

Hazardous waste may include waste oil, oil filters, lubricants, solvents, and batteries. Hazardous materials will be managed in accordance with the applicable legislation. It will be stored and labelled in appropriate containers and removed from site using a qualified third party and disposed of in licenced facilities.

Recyclable waste may include metal, plastic, cardboard and paper. Recyclable wastes will be stored in a metal dumpster and recycled through a qualified third party.

Solid wastes (domestic waste) will be stored in a metal dumpster and sent to the municipal landfill using a qualified third party.

2.7.4 Air Emissions

An air quality analysis was completed to model the expected air contaminant and water vapour emissions for both Phases 1 and 2. A summary of the assessment is presented here and the full assessment is included as Appendix E. Suspended particulate matter (PM, as PM_{10} and $PM_{2.5}$) and plume visibility (including potential surface fogging and icing) were the focus of the study.

Dispersion modelling was completed using the expected maximum PM emission rates for the various sources. Emission estimates for NO_x and CO were also completed and modelled. The maximum predicted ground-level ambient concentrations at various time averaging periods are shown in **Table 2.6**, compared to the applicable government ambient air quality objectives (AQOs). These predictions are at the maximum predicted locations, which are at the facility fenceline in each case. Exceedances of the AQOs are shown in bold. The model also considered sensitive receptors, which include the nearest residences and public facilities such as care homes, recreational centres and hospitals. In all cases, there are no exceedances of the AQOs at any sensitive receptor, for any air contaminant assessed.

Exceedances of the AQOs are predicted, but only at or very near the facility fenceline. These relatively high model predictions are associated with building downwash, which may infrequently fold the plume over towards the ground during moderate to high winds. However, the project $PM_{2.5}$ emissions were conservatively estimated by assuming that all emitted particulate would be the smallest size category ($PM_{2.5}$) and that the emission controls (cyclones and baghouses) would release particulate at their maximum level of 5 mg/m^3 at all hours of the day during a five-year simulation period. The performance of the emissions controls is expected to be better. Monitoring of PM will be conducted during operation to validate the model, and mitigation measures will be implemented to reduce PM emissions if required. The NO_2 predictions assume 100% conversion of NO to NO_2 upon release, which is expected to be a gross over-estimate. While an exceedance of the 1-hour objective is shown in **Table 2.6** (for Phase 2 only), no exceedances of the NO_2 AQOs are expected, for either phase of operations. The ambient CO predictions are much lower than the AQOs.

Additional dispersion modelling was conducted for the water vapour that will be released from the facility dryers. The water vapour has the potential for forming visible plumes in the air, as well as surface fogging or icing.

The Phase 1 water vapour emissions, from three facility dryers, were simulated to cause visible plumes longer than 500 m in length up to 81 hours over the five-year simulation period. In rare conditions, the visible plume was simulated up to 2,250 m in length from the facility (one hour over the five-year model period). The plume heights tend to be low, with infrequent heights of up to 160 m. Surface fogging and icing was infrequently predicted during cold temperatures with clear skies near the facility, associated with moderate to high wind speeds and building downwash. Up to 12 hours of surface fogging and 110 hours of surface icing were predicted at the facility boundary. The potential area of surface icing extends just beyond Brookside Blvd. adjacent to the facility.

The Phase 2 water vapour emissions from six facility dryers were simulated to cause visible plumes longer than 500 m in length up to 411 hours during the five-year simulation period. In this case the visible plume was simulated to extend up to 3,960 m once during the five years, under similar weather conditions noted for the simulated extreme plume lengths for Phase 1. Up to 43 hours of surface fogging and 447 hours of surface icing were predicted, close to the facility but extending further than the Phase 1 predictions.

The potential surface fogging and icing is associated with building downwash which is influenced by the current plan of short stacks on the dryers (5 feet high). Use of higher stacks would reduce the likelihood of surface fogging and icing and should be considered, particularly for the Phase 2 expansion. During Phase 1, monitoring of the Brookside Blvd. for fogging or icing during cold ambient conditions (early morning hours, early evening hours) will be conducted, and mitigation measures to reduce surface fogging and icing will be implemented if required. Additional monitoring will be conducted during Phase 2 as required/

Due to the facility's proximity to the Winnipeg International Airport (YWG), flight path data was obtained to evaluate potential water vapour plume effects on air traffic. The great majority of time the visible plumes for both Phase 1 and Phase 2 emissions are predicted to be under 70 m in height and 500 m in length. Even the extreme plume heights and lengths infrequently predicted by the model, which may not occur in reality, do not intersect the flight paths in any cases. However, monitoring should be conducted during operation.

Table 2.6 Summary of air quality modelling results at the location of maximum model prediction, Phases 1 and 2; exceedances are bolded

Air contaminant and averaging period	Maximum ground-level model prediction (µg/m^3) Phase 1		Maximum ground-level model prediction (µg/m^3) Phase 2		AQO
	Project contributions	Project + background	Project contributions	Project + background	
$PM_{2.5}$ 24-hour	26.6	**44.6**	**30.2**	**48.2**	28
$PM_{2.5}$ annual	6.3	**12.3**	7.8	**13.8**	10.0
PM_{10} 24-hour	29.7	**71.4**	34.2	**75.9**	50
NO_2 1-hour	319.4	373.0	**458.2**	**511.8**	400
NO_2 24-hour	86.2	125.0	115.7	154.5	200
NO_2 annual	10.3	24.6	13.9	28.2	40
CO 1-hour	812.3	813.2	1023.6	1024.5	34,500
CO 8-hour	326.0	326.8	409.7	410.5	15,000

2.7.5 Greenhouse Gas Emissions

Greenhouse gas (GHG) emissions were calculated based on the proposed annual natural gas consumption rate, using the most recent Environment and Climate Change Canada (ECCC 2019e) National Inventory Report fuel-based GHG emission factors for natural gas for the province of Manitoba. The equivalent CO_2 totals use the International Panel on Climate Change Fourth Assessment Report (2007) global warming potentials (**Table 2.7**).

Table 2.7 Calculated GHG emissions per year (tonnes)

	CO_2	CH_4	N_2O	Total CO_2e
Phase 1	16,767	0.33	0.31	16,767
Phase 2	29,855	0.59	0.55	29,855

2.8 Health, Safety, Security and Environment

Merit Foods will develop a comprehensive health, safety, security and environment (HSSE) program that will include health and safety, employee and contractor training, emergency response, and environmental management / protection. The HSSE program will be developed in accordance with applicable legislation and industry standards, including *The Workplace Safety and Health Act* and the Workplace Safety and Health Regulation.

An Emergency Response Plan will be developed to outline emergency response procedures in the event of incidents outside normal operations that may impact the environment including: environmental releases, medical emergencies, fires, natural incidents (e.g. extreme weather events), and utility / service outages. It will provide a breakdown of the roles and responsibilities of the various employees. The facility will have a private fire hydrant.

The facility will be classified as a Medium Hazard Industrial Building (Use Group F2) and will be fully sprinklered with a wet-pipe sprinkler system. Merit Foods retained Jensen Hughs to conduct a dust hazard analysis, hazardous area classification, and an occupancy group assessment to support compliance with the Manitoba Building Code and Manitoba Fire Code.

2.9 Workforce

Phase 1 of the facility will create 80 to 100 jobs during construction and 80 to 85 jobs during operation. Phase 2 will require 140 jobs during operation.

2.10 Schedule

Merit Foods commenced construction in September 2019, and plans to commence operations in summer 2020, pending regulatory approval. A preliminary schedule for Phase 1 is presented in **Table 2.8**, however, is subject to change. The lifespan of the facility is dependent on its continuing economic and technologic viability. The schedule for Phase 2 will be determined based on consumer demand.

The facility will operate 350 days per year, 24 hours per day and seven days per week, with an anticipated two-week shutdown each year. There are expected to be two to three shifts per day, with overlapping shifts several days per week.

Table 2.8 Preliminary project schedule

Task	Date
Site Clearing / Commencement of Construction	September 2019
Submission of Environment Act Proposal	February 2020
Installation of Processing Equipment	April 2020
Commissioning	September to November 2020
Operation	December 2020

2.11 Conceptual Decommissioning and Reclamation

The objectives of decommissioning and reclamation will be to restore the area to a state similar to the surrounding lands that will be both safe and environmentally stable. At the time of facility closure, the following decommissioning activities may be undertaken:

- All buildings no longer required will be demolished;
- All salvageable material (i.e. metals, equipment, and electronics) will be sorted and reused, sold, or recycled. The remaining materials will be removed from site and disposed in an approved facility;
- All hazardous materials will be identified for recycling or disposal;
- Concrete pads and building foundations no longer required will be demolished;
- Site roads no longer required will be decommissioned and reclaimed;
- On-site utilities will be removed;
- Pipelines will be drained and either dismantled (above ground pipelines) or abandoned in place (underground);
- Areas where contaminated soils may be present will be assessed and remediated as required;
- Surface drainage conditions will be restored similar to pre-existing conditions;
- All disturbed areas will be reclaimed. Reclamation will generally consist of re-contouring the site, replacing topsoil, and re-vegetating to restore the land surface to as near as possible to the original conditions; and
- Salvaged topsoil will be used to re-contour the landscape, where applicable. Plant species selected to provide a vegetative cover on each cap will be compatible with the surrounding vegetation to ensure that the established vegetation will provide a self-sustaining cover.

Progressive reclamation methods will be utilized wherever possible; the timelines for progressive reclamation will be assessed in the future. The site may also be evaluated for alternative industrial uses. The timeline for the implementation of a detailed decommissioning plan will be determined in the future. The expected life span is based on its continued economic and technologic viability.