



2019-12-19



Director
Environmental Approvals Branch
Manitoba Sustainable Development
1007 Century Street, Winnipeg, MB
R3H 0W4

Please find attached the following Environmental Act Proposal (EAP) package, inclusive of the EAP submission form, supporting report prepared by WSP, and application fee.

We have also included a redacted electronic copy for the of this submission intended for public distribution. This redacted copy removes the intellectual property product of BCI, the RM of Hanover, and WSP, as it relates to the industrial service agreement (ISA), in addition to third party data and drawings which WSP does not have permission for public distribution (just for regulatory submission).

This submission comes about from the long-standing developmental effort of establishing a mutually agreeable ISA between the RM of Hanover and the Bothwell Cheese Inc. (BCI), jointly executed in October of 2017. This ISA forms the basis of the RM's receipt of wastewater from BCI.

This EAP describes the site, the operations, environmental conditions, potential effects of the proposed upgrades, and the measures that have been or will be taken to prevent or mitigate adverse environmental impact. Furthermore, with the advancement of a wastewater pre-treatment, BCI wastewater is expected to improve substantially and become fully compliant with the current ISA limits.

We trust that the information provided is sufficient. Please let me know if you have questions or would like further information.

Sincerely,

Justin Rak-Banville, MSc., MBA, P.Chem., P.Eng., EP
Project Manager
Water and Wastewater Infrastructure

Environment Act Proposal Form



Name of the development: Bothwell Cheese Wastewater Pre-Treatment Upgrade	
Type of development per Classes of Development Regulation (Manitoba Regulation 164/88): Class 2	
Legal name of the applicant: Bothwell Cheese Inc.	
Mailing address of the applicant: 61 Main St. North	
Contact Person: Bryan Thompson	
City: New Bothwell	Province: Manitoba Postal Code: R0A 1C0
Phone Number: (204) 388-4666 Fax:	email: bryan.thompson@bothwellcheese.com
Location of the development: 61 Main St. North, New Bothwell	
Contact Person: Bryan Thompson	
Street Address: 61 Main St. North	
Legal Description: Lot 1 Plan 54242 WLTO in SE 1/4 30-7-5 EPM	
City/Town: New Bothwell	Province: Manitoba Postal Code: R0A 1C0
Phone Number: (204) 388-4666 Fax:	email: bryan.thompson@bothwellcheese.com
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Date: 2019-12-18	Signature of proponent, or corporate principal of corporate proponent:  Printed name: Justin Rak-Banville

PRINT

RESET

A complete **Environment Act Proposal (EAP)** consists of the following components:

- ☒ **Cover letter**
- ☒ **Environment Act Proposal Form**
- ☒ **Reports/plans supporting the EAP** (see Information Bulletin - Environment Act Proposal Report Guidelines for required information and number of copies)
- ☒ **Application fee** (Cheque, payable to Minister of Finance, for the appropriate fee)

Per Environment Act Fees Regulation
(Manitoba Regulation 168/96):

Class 1 Developments	\$1,000
Class 2 Developments	\$7,500
Class 3 Developments:	
Transportation and Transmission Lines ..	\$10,000
Water Developments	\$60,000
Energy and Mining	\$120,000

Submit the complete EAP to:

Director
Environmental Approvals Branch
Manitoba Sustainable Development
1007 Century Street
Winnipeg, Manitoba R3H 0W4

For more information:

Phone: (204) 945-8321

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<http://www.gov.mb.ca/sd/eal>

NEW BOTHWELL CHEESE INCORPORATED

ENVIRONMENT ACT PROPOSAL

BOTHWELL CHEESE INCORPORATED WASTEWATER PRE-TREATMENT UPGRADES

DECEMBER 2019





ENVIRONMENT ACT PROPOSAL

BOTHWELL CHEESE WASTEWATER PRE-TREATMENT UPGRADES

NEW BOTHWELL CHEESE INCORPORATED


ENVIRONMENT ACT PROPOSAL REPORT

PROJECT NO.: 191-00361-00
DATE: DECEMBER 2019

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EXECUTIVE SUMMARY

Bothwell Cheese Incorporated (BCI) facility is located in at 61 Main Street at New Bothwell, Manitoba, approximately 50 km south of Winnipeg. The plant produces cheese and cheese by-products and has been in operation for over 81 years.

The plant's previous Environment Act Proposal (EAP) was completed in March 1984, which led to Environment Act Licence (EAL) No. 1015R, dated March 30, 1984 (revised on October 1, 2002). The original EAP stipulated the discharge limit from the BCI onsite lagoon to an aerated sewage lagoon system of the Community of New Bothwell. At the time, BCI was utilizing its lagoon to treat its wastewater.

Since this initial EAP, the plant has undergone several transitions. In 2011 discussions between BCI and the RM of Hanover (RM) produced a plan outlining the RM's acceptance of BCI's wastewater, culminating with the drafting of an Industrial Services Agreement (ISA). Simultaneously, infrastructure upgrades were also completed within the Community of New Bothwell to facilitate this acceptance. In 2015, when the Community no longer accepted the BCI whey effluent, BCI modified its existing wastewater treatment process with the addition of an ultrafiltration reverse osmosis (UF/RO) system. This UF/RO system allowed [REDACTED]. In 2017, negotiations between BCI and the RM took place to revise the original ISA to reflect current conditions. The revised ISA (dated October 17, 2017) contains new provisions for the monitoring and discharge limits of BCI effluent based on the RM's lagoon design capacities.

Currently, BCI discharges about two-thirds of its total wastewater generated from the facility to the RM lagoon. The remaining one-third of wastewater is directed to the BCI on-site lagoon. The RM currently operates a wastewater treatment lagoon under EAL No. 1524R, and it is expected that the process wastewater generated at the BCI facility will be conveyed to an expanded RM treatment lagoon when the planned expansion and necessary infrastructure upgrades are completed.

To comply with the revised ISA, and in order to meet the revised discharge limit, BCI proposes to upgrade the on-site wastewater pre-treatment process. WSP has prepared this EAP for the provincial licensing of the proposed wastewater pre-treatment upgrades at BCI facility. The proposed upgrade includes the following components:

- An equalization tank;
- A dissolved air floatation (DAF) system including coagulation/flocculation for phosphorus removal;
- A sludge storage tank;
- Management of DAF system sludge; and
- Interconnecting pipe between DAF and the wet well.

The DAF pre-treatment will be operated to reduce the high levels of Total Suspended Solids (TSS) and five-day Biochemical Oxygen Demand (BOD₅) in the generated process wastewater into the RM's lagoon. The alterations are not expected to result in adverse environmental effects (e.g., noise, greenhouse gas emission, and traffic).

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1 INTRODUCTION AND BACKGROUND

1.1 PROJECT OVERVIEW

Bothwell Cheese Incorporated (BCI) is a cheese manufacturing plant that produces cheese and cheese by-products and has been in operation for over 81 years. The plant is located in New Bothwell, Manitoba approximately 50 km south of Winnipeg. **Figure 1** shows the general location of the project site.



Figure 1: Location Map of the Proposed Development

BCI retained WSP Canada Inc. (WSP) for professional consulting engineering services regarding the treatment and discharge of wastewater effluent generated at BCI, as well as to work with Manitoba Sustainable Development (MSD) to deliver the appropriate environmental approvals.

As part of this process, WSP has prepared this Environment Act Proposal (EAP) for the provincial licencing of the proposed upgrades at the BCI facilities.

Wastewater treatment at the facility has varied significantly over the years. Initially, all wastewater and milk by-products generated were discharged directly to ditch. In 1984, the Environment Act License (EAL) No. 1015R ([Appendix A](#)) was implemented as a response to the creation and commissioning of the BCI onsite lagoon. The BCI lagoon is for storage and treatment of wastewater and milk by-products. In 2002, the licence was revised allowing for a ten (10) horsepower (hp) and five (5) hp motor in the BCI lagoon aeration cell. The revised licence also indicated the lagoon holding period to be “*between the 1st day of November of any year and the 15th day of May of the following year.*”

A recent upgrade of the plant includes provisions for a sophisticated pre-treatment system for processing of raw wastewater before its discharge to the RM of Hanover (RM) wastewater treatment lagoon. MSD subsequently deemed, according to section 16 of *The Environment Act* and consistent with MR 164/88 (“Classes of Development Regulation”), that the upgraded facility should be licenced under the statute as a “Class 2 development”.

As such, Bothwell Cheese is seeking an EAL for its upgraded facilities in order to bring the operation of the upgraded facility into compliance with the Act. The project also includes decommissioning of the BCI lagoon. WSP is submitting this proposal on behalf of BCI. Specific aspects of the development as they relate to the licence application are described below.

1.2 BACKGROUND

Historically, BCI utilized their lagoon to treat the wastewater generated by their cheese manufacturing processes. A transition occurred in 2011 when as part of an infrastructure project within New Bothwell, BCI’s process wastewater was tied into the Community of New Bothwell’s wastewater collection system under the 2007 Industrial Service Agreement (ISA) with the RM.

BCI [REDACTED]. Later in 2015 BCI modified its existing wastewater treatment process with the addition of an Ultrafiltration (UF) [REDACTED]. The UF [REDACTED] continued to be sent to the third party.

In April 2016, when the third party no longer accepted the [REDACTED], the Reverse Osmosis (RO) system was commissioned to [REDACTED]. At that time, the BCI lagoon was returned into service to accept the RO polished water permeate thereby reducing the hydraulic loading on the RM’s lagoon. On occasion discharge of this permeate to the municipal wastewater collection system has occurred when the BCI lagoon was unavailable for its receipt, such as if the discharge line to the BCI lagoon is frozen.

Currently, both [REDACTED] are not discharged to the RM wastewater lagoon facility.

In 2017, a newly revised ISA was executed between BCI and the RM that outlined new limits on the facility’s effluent. In 2018, BCI proposed utilizing a Dissolved Air Floatation (DAF) pre-treatment system to reduce the measured wastewater parameters such that it is in compliance with the revised ISA. Note that ISA is not part of this submission as it is considered to be an intellectual property of the RM, BCI, and WSP.

The DAF pre-treatment equipment, currently being piloted, will be commissioned to reduce the high levels of Total Suspended Solids (TSS) and Five-Day Biochemical Oxygen Demand (BOD₅) in the generated process wastewater. Following the successful start-up and commissioning of the proposed DAF pre-treatment system, it is anticipated that the existing BCI lagoon will be decommissioned.

1.2.1 EXISTING AND HISTORICAL LICENCES

Previously an EAL No. 1015R was issued in 1984 for the BCI on-site lagoon.

1.2.2 THE INDUSTRIAL SERVICE AGREEMENT

The growth and expansion at BCI have been far greater than originally anticipated, as both the wastewater strength and volume has exceeded the short and long-term projections originally contemplated in the 2011 EAP submitted by the RM for the its lagoon expansion.

In 2017, negotiations between BCI and the RM took place to revise the 2007 ISA to reflect current conditions. The revised ISA (dated October 17, 2017) contains revised provisions for the monitoring and discharge limits of BCI effluent based on the RM's lagoon design as presented in [Table 1](#).

Table 1: October 2017 ISA conditions for the discharge limits of BCI effluent

Weekly Parameter Limits	Limit	Unit	Monthly Maxima
5-day Biochemical Oxygen Demand			
Total Solvent Extractable Matter			
Animal or vegetable			
Mineral or synthetic			
pH			
Total Phosphorous			
Total Suspended Solids (filtered)			

Of note, when [REDACTED] is not directed to the membrane system. In the past, this whey was directed to the RM sewer, but it has been deemed problematic due to high BOD₅/TSS/pH affecting the RM's lagoon treatment process. With the revised ISA coming in effect, the [REDACTED], [REDACTED].

This [REDACTED] is practised as BCI recognizes the subsequent impacts this creates disposing via to the wastewater collection system, and furthermore, that the 2017 ISA now requires BCI to not release it to the RM.

2 WASTEWATER COLLECTION SYSTEMS

There are two wastewater collection systems on-site. The first collection system directs process wastewater to a sub-surface collection sump outside the north end of the production building. From within the maintenance building, a pump station operating two variable-frequency drive (VFD) pumps transfers flow through a 100 mm diameter low-pressure sewer (LPS) which discharges to the RM's lift station. These pumps are mounted in a duplex configuration to provide redundancy. In the event of mechanical failure, only one pump is required for operation of the system. The maximum flow rate for effluent transfer from the collection sump is [REDACTED].

A second collection system intended for the collection of domestic sources is located towards the south end of the main production building (offices, restrooms, etc.), which discharges to a sub-surface interceptor structure outside the south end of the production building. Although there is no flow meter on this discharge line, there is no indication of a cross-connection with the process wastewater. A pump discharges this interceptor basin via a 75 mm diameter LPS that connects to the RM sewer upstream of the lift station. Note that this second collection system remains outside of the scope of this EAP as it does not meet the definition of industrial wastewater.

2.1 SOURCES OF WASTEWATER AND PRODUCTION

BCI currently generates wastewater from two sources:

- 1 Sanitary wastewater generated by the office and process area washrooms serviced by 75 LPS which discharges upstream of the New Bothwell lift station.
- 2 Process wastewater generated from manufacturing serviced by 100 LPS which discharges into the New Bothwell lift station. Exceptions to this are:
 - a) UF/RO polished permeate water is discharged via a direct line to BCI's lagoon for storage.
 - b) DAF sludge is currently hauled to the City of Winnipeg North End wastewater treatment plant.

The following tables (Table 2) summarizes the daily volume and BOD₅ loadings of the generated wastewater for 2018 and the 20-year design period (2040).

Table 2: Volume and organic loading of generated wastewater for 2018 and 20-year design period (2040)

Wastewater Stream	Approximate Flow (m ³ /day)		Organic Loading (kg-BOD ₅ per day)		Yearly Average Concentration (mg/L)	
	2018	2040	2018	2040	2018	2040
Sanitary Wastewater	4.5	6.75 ¹	2.3	3.4	500	500
Process Wastewater	[REDACTED]					
Truck wash wastewater	Not Determined		Not Determined		Dilute	

¹ Assumes 150 people based on discussions with BCI

As illustrated, 2018 sanitary wastewater generation is approximately 4,500 L/d (BOD₅ loading of 500 mg/L), with a future loading of approximately 6,750 L/d. The average process wastewater production was reported to be [REDACTED]

BCI anticipates that the future 20-year loadings (2040) from the facility will rise to approximately [REDACTED]³ with an organic loading of [REDACTED]

Currently, the UF/RO wastewater is being directed to BCI's lagoon but will be combined with the process wastewater once the expansion to the RM lagoon is completed. UF/RO polished water will add approximately [REDACTED] with an organic loading of [REDACTED].

With respect to the hisotirc wastewater volumes and quality, **Table 3** summarizes the parameters of the generated process waste stream, indicating the average daily concentrations from 2016 to 2018 based on the RM's composite sampler results.

Table 3: Volume and organic loading of currently generated wastewater.

Parameters	Unit	2016	2017	2018
BOD ₅	mg/L	[REDACTED]	[REDACTED]	[REDACTED]
Total Phosphorous	mg/L	[REDACTED]	[REDACTED]	[REDACTED]
Total Kjeldahl Nitrogen (TKN)	mg/L	[REDACTED]	[REDACTED]	[REDACTED]
Total Suspended Solids (TSS)	mg/L	[REDACTED]	[REDACTED]	[REDACTED]
pH	pH units	[REDACTED]	[REDACTED]	[REDACTED]

2.2 CURRENT WASTEWATER MANAGEMENT SYSTEM

Presently, BCI is piloting the DAF system; a dataset representing effluent quality for the current wastewater loading that BCI has been collected since April 2019 to date as presented in **Table 7**.

Evaluation of the DAF system future loading is expected to improve with the advancement of the DAF system commissioning and increased familiarity and comfortability.

Installation and commissioning of the DAF system is expected pending Environmental Approvals. The new treatment system will be located at the maintenance building.

3 PROPOSED DEVELOPMENT

The following section provides information regarding the proposed upgrades at the BCI facility including information regarding the decommissioning of the facility's lagoon.

3.1 PROCESS

BCI has intended to upgrade its facility with installing an industrial wastewater pre-treatment system to secure reductions of effluent concentrations bringing them in compliance with the current ISA.

The proposed upgrade consists of a DAF module, located within the maintenance building at the north end of the facility. The proposed DAF is designed to pre-treat the process wastewater by reducing the high levels of TSS and BOD₅ before it discharges into the RM's lagoon. The proposed system will handle all the process wastewater generated at the plant except UF/RO polished permeate water.

The DAF system effluent will be discharged to an effluent surge tank located in the maintenance building from where it will be pumped via the existing 100 mm low-pressure sewer to the RM's lift station. A Process Flow Diagram (PFD) showing the proposed development is shown in [Figure 2](#).

The proposed upgrades consist of the following key process component:

3.1.1 STATIC PRE-SCREEN

The wastewater will be passed over a pre-screen to remove larger solids and debris. This pre-screen is a wedge wire sidehill screen with 0.5 mm slot openings. Solids removed by the screen will be deposited by gravity into a solids bin. Liquid effluent passing through the pre-screen is collected in a tank and is transferred by a duplex redundant pump system to the Equalization (EQ) Tank. The screen will provide primary filtering of the effluent to intercept larger solids in the raw wastewater conveyed to the new DAF, in order to improve its performance.

3.1.2 WASTEWATER EQUALIZATION

Following pre-screening, the wastewater is accumulated and equalized in an [REDACTED] insulated trailer tank with two pumps (duty/standby). The purpose of an EQ tank is to serve as storage to buffer and attenuate the peak volume of generated wastewater, achieving a constant or nearly constant flowrate and consistent wastewater quality concentrations directed to the DAF treatment system. Under normal operating conditions the target level in this tank will be 50% or [REDACTED]. This level will provide adequate volume for pH equalization of effluent, specifically the caustic and acid cleaning solutions that are used at BCI. This 50% level will also provide sufficient surge capacity to handle periods of peak flow.

The EQ tank is fitted with a recirculation loop. The return flow of this loop is used to agitate the solution and avoid settling of any solids within the tank. This circuit is also fitted with a heat exchanger that provides trim heating to the effluent stream.

3.1.3 DAF PRE-TREATMENT MODULE

The new DAF system provides a two-step treatment process as follows:

CHEMICAL FEEDING SYSTEM:

Raw wastewater is pumped at a constant rate from the EQ tank into the inlet side of the flocculator tube. The pH of the effluent is monitored, and proportional dosing of sulphuric acid or caustic soda is used to neutralize the solution if necessary. The acceptable pH range is determined by the recommended levels for the specific type of flocculant and coagulants used. At the time of drafting, a number of different flocculants and coagulants are being evaluated.

A coagulant (Megafloc 819) is dosed into the pipe flocculator prior to an in-line static mixer that provides the necessary mixing action inside the pipe resulting in the separation of the solids from the water to form “micro flocs” which generally have a positive charge.

A flocculant (Megafloc 4330) is dosed into the pipe prior to a second static mixer by a packaged polymer dosing system. The flocculant is a polymer with an opposite charge that attracts the positively charged micro flocs and agglomerates the micro flocs into larger flocs in order to achieve a size suitable for dissolved air-assisted flotation.

DAF SYSTEM

A pre-packaged FRC branded (Model number: [REDACTED]) DAF system is installed to achieve the required effluent requirements. The use of this technology in industrial pre-treatment plants in dairy-processing facility is well established.

Wastewater is pumped into the DAF unit where the separation of water from sludge is accelerated by aeration, a process where tiny air bubbles promote sludge buoyancy and accumulation at the surface where it can be easily separated and removed. Treated wastewater can then be discharged into the BCI wet well. Both the flocculator and flotation units have a design capacity of [REDACTED] of influent wastewater per hour. FRC provided BCI with the following DAF Design Parameters (Table 4) based on the facility's wastewater-concentration characteristics:

Table 4: DAF Design Parameters

Type of wastewater	Dairy processing
Loading timeframes	[REDACTED]
Wastewater flow rate	[REDACTED]

The DAF system design is based on the following influent parameters (Table 5):

Table 5: Volume and organic loading of currently generated wastewater

Parameters	Unit	
BOD ₅	mg/L	[REDACTED]
TKN	mg/L	[REDACTED]
TSS	mg/L	[REDACTED]
pH	pH units	[REDACTED]
Fat, oil, and grease (FOG)	mg/L	[REDACTED]

According to the manufacturer (FRC), DAF performance is expected to achieve the following effluent-concentration characteristics after the flocculation and flotation treatment process (Table 6):

Table 6: Expected DAF effluent concentration characteristics

Parameters	Unit	
BOD ₅	mg/L	performance has not been estimated
TKN	mg/L	performance has not been estimated
TSS	mg/L	≤350
pH	pH units	6-9
¹ Fat, oil, and grease (FOG)	mg/L	≤100

¹excluding dissolved oil and grease

The DAF system Process and Instrumentation diagram (PID) is included in Appendix B.

DAF SLUDGE STORAGE AND DISPOSAL

The DAF unit will produce both floating sludge and sinking sludge for removal. The floating sludge layer is skimmed off with a top skimmer system and collected in the sludge compartment for discharge. While the floating solids are skimmed off, the clean treated water is leaving the unit through the effluent compartment. The heavy solids which will not float will sink to the bottom of the flotation unit and will be discharged with a bottom outlet valve. The volume of sludge produced by the DAF system is estimated to be about 2% of the total wastewater flow, while literature suggests approximately 1.7% sludge generation

by the DAF system. The solids concentration, reported by laboratory analysis, was found to average about 2-3% by weight ([Appendix C](#)).

Currently, the DAF system's generated sludge at the BCI facility is transported to the City of Winnipeg North End Wastewater Treatment Plant (NEWWTP). BCI is looking for alternatives to divert the plant generated waste stream from being trucked to the NEWWTP to be processed on-site to reduce the associated transportation and tipping fee. [Section 3.2.9](#) presents potential solutions available for sludge management by BCI.

3.1.4 PROCESS WASTEWATER COLLECTION SUMP

An ultrasonic level transmitter will be used to detect the level in the collection sump, and VFD will be used to modulate the pump speed. These controls will provide smooth flow transitions to the downstream equipment while keeping the collection sump drained.

3.1.5 BCI LAGOON DECOMMISSIONING

BCI intends to decommission the existing lagoon at BCI and divert the UF/RO polish water so that it is mixed with DAF effluent and ultimately sent to the RM lagoon. Refer to [Section 5.0](#) for more details.

3.1.6 DAF PILOT PERFORMANCE

Currently, the DAF pre-treatment system is in the stages of being piloted at BCI. The purpose of pilot testing is to investigate the overall viability of a DAF system at BCI. To represent future characterization of the BCI generated wastewater after having the DAF system in operation, the laboratory results of the pilot system effluent are presented in [Table 7](#).

Samples were collected during the piloting of the DAF system, and it is assumed that the average of the results will be reflective of the overall wastewater quality that is expected during full-time operation of the DAF system.

It is important to note that deviations from the average, dramatic increases and decreases in single values, etc., are representative of BCI's effort to pilot different coagulants, and the adjustment of DAF operational parameters (pressure, flow, etc.). BCI continues to work with its system to improve effluent quality.

Table 7: DAF unit effluent quality parameters

Date	Alkalinity, Bicarbonate [mg/L]	Alkalinity, Total [mg/L]	BOD ₅ [mg/L]	Ortho-P Dissolved [mg/L]	Phosphorus [mg/L]	TKN [mg/L]	TSS [mg/L]	pH
1								

¹Observed spike was due to the flocculant feed pump issue at June 6, 2019

As presented, the DAF system piloting has displayed promising results capable of reducing the BOD₅ in the waste stream by up to 80%, and total phosphorus by 76%. Fluctuations in the individual parameters noted are the result of different combinations and concentrations of flocculants and coagulants used. Furthermore, operator ongoing operator training and learning further contribute to these variances. BCI reports that a full-time operator is intended to be hired in November 2019 to operate and maintain the DAF system. As such, in the coming months the wastewater effluent quality is expected to improve on a more consistent basis.

3.1.7 COMMISSIONING AND MAINTENANCE

The FRC commissioning team was involved in the DAF system commissioning period (May 29, 2019- June 1, 2019) in order to train BCI's maintenance staff in the proper operation such as safe use of chemicals, maintenance, monitoring, and troubleshooting of the DAF system. In the event an upset beyond a designated limit occurs, FRC is available to assist with further troubleshooting if required.

A follow-up visit by the FRC after commissioning occurred on July 3rd, 2018 to review overall system performance, to troubleshoot possible issues, to receive feedback on system performance, to review on-site operational practices, and to re-evaluate system performance. Per BCI request, FRC can provide an additional 1-day site visit.

3.2 OPERATION

3.2.1 CHEMICAL USAGE

The following chemicals will be added to the waste stream during the DAF treatment process in order to meet the discharge limit stipulated in the ISA:

- Megafloc 891 (Aluminum chloride hydroxide, 50% strength);
- Sulphuric acid (93%) for pH adjustment;
- Sodium hydroxide (50%) for pH adjustment.

Chemicals, all CFIA-approved, are dosed in order to effectively skim solids and meet the phosphorous compliance level of [REDACTED] and pH adjustment as determined by the current ISA. The associated MSDS sheets are included in [Appendix D](#).

3.2.2 WATER USAGE

Required water to be used for the proposed plant operation including chemical preparation and cleaning will be sourced from the on-site well. The maximum water usage for chemical preparation is [REDACTED]. BCI draws its water from its two groundwater wells, and currently is in the process of expanding its Water Right's licensure to accommodate a larger draw.

3.2.3 WORKFORCE

The DAF system needs one full-time operator, required to be classified as a Class 1 Operator. The operator would be required to exercise valves and perform regular inspections of the DAF system, flocculator tubes, and the EQ tank. The operator would also be responsible for the application of chemicals in the system along with sampling of the effluent and understanding the results of the laboratory analysis in order to operate the system as required. As previously noted, BCI reports they will be hiring this operator in November 2019.

3.2.4 TRAFFIC VOLUMES

During the operation of the project, minor traffic might be affected as a result of transport of DAF system waste from the site depending on the selected sludge management option by BCI. The increase in traffic is expected to be negligible.

3.2.5 HEALTH AND SAFETY

Worker protection in Manitoba is provided through standards, procedures and training legislated under the *Workplace Safety and Health Act*. All practices performed will be carried out following all regulatory requirements.

As described in [Section 3.1.2](#) during the commissioning of the DAF system, BCI staff will be trained in the safe use of chemicals such as acid, base, and coagulant. Training will include the provision of spill protocols and safe handling procedures.

Personal protective equipment (PPE) including goggles and gloves will be required for the operator during working with chemicals. A first aid kit, complete with eye wash station will also be nearby the operator at all times.

3.2.6 ACCIDENTS AND MALFUNCTIONS

To prevent accidents and malfunctions, commissioning and operation activities will be conducted in accordance with the regulatory requirements.

SPILLS

During the DAF system operation, there is a potential for chemical spills and/or leaks due to improper storage and handling procedures. This may result in the accidental release of chemicals.

To prevent chemical spills from occurring, the following procedures will be employed:

- All chemicals will be stored in a safe and secure storage area(s) in accordance with applicable legislation;
- Chemical storage sites will be inspected periodically;
- Service and minor repairs of equipment performed on-site will be performed by trained personnel in appropriate areas;
- Appropriate type and size of spill kits are available on-site;
- On-site operation staff will be trained in how to deal with spills and clean-up procedures.

3.2.7 FUEL, ELECTRICITY AND GAS UTILITIES

The proposed upgrade does not require the onsite storage of gasoline or diesel fuel.

3.2.8 WASTE MANAGEMENT

BCI is seeking alternatives to divert the plant generated sludge stream from being trucked to the City North End Wastewater Treatment Plant (NEWWTTP) such as being processed on site.

A brief list of different sludge management options has been developed and presented based on the following three (3) categories:

- Biological Stabilization;
- Thermal Technologies;
- Sludge Disposal (landfilling).

BIOLOGICAL STABILIZATION

Biological stabilization processes can be used either as a pre-dewatering or a post-dewatering process to reducing pathogenic substances and odours in the wastewater sludge. Mainly, these occur as follows:

1. Anaerobic Digestion

Anaerobic digestion involves the decomposition of organic matter and inorganic matter in the absence of oxygen. During anaerobic digestion, solids are stabilized to reduce pathogens and to reduce offensive odours. Anaerobic digestion also reduces the attraction of infectious vectors during land application. Recently, the conventional anaerobic digestion process has been further advanced to where it reduces the biological solids leaving the digestion process, increases biogas production, and in some cases provides increased pathogen reduction.

2. Aerobic Digestion

Aerobic digestion uses aerobic microbes to decompose organic matter, stabilize waste solids and generate biosolids. However, it requires air input, which causes the process to have high electrical consumption. Conventional aerobic digestion is also only capable of producing Class B biosolids, which limits disposal or reuse options.

3. Composting

Composting is a process in which biodegradable material is decomposed by aerobic microorganisms in a controlled environment. The heat generated in composting pasteurizes the product reducing pathogens and results in sludge stabilization. The heat generated also drives off water vapour, further dewatering the product. Composting that is performed according to regulatory guidelines produces Class A product that is marketable.

THERMAL TECHNOLOGIES

Thermal technologies for sludge management all involve the input of thermal energy to both stabilize wastewater solids and to reduce the volume of material to be hauled away for re-use or disposal.

1. Thermal Drying

Sludge dryers come in several types, all of which operate to decrease water content in wastewater sludge. Solids fed to dryers can be either undigested or digested dewatered sludge. Dryers can produce Class A biosolids which can be beneficially used for land applying.

Even if beneficial use is not the desired option, the drying process greatly reduces the storage, transportation and disposal cost since it significantly lowers the water content and reduces the weight.

2. Wet Air Oxidation Athos/Zimpro

Wet Air Oxidation (WAO) is the oxidation of soluble or suspended components in water using oxygen as the oxidizing agent. When air is used as the source of oxygen, the process is referred to as WAO and is used to reduce the volume of sludge.

3. incineration

Incineration is a high-temperature, dry oxidation process using controlled-air combustion to reduce organic and combustible waste to inorganic, incombustible matter. Due to the high level of moisture in DAF sludge, a significant amount of heat would need to be applied to evaporate off the liquid before incineration could begin. Therefore incineration, solely, cannot be considered as a technically feasible solution. To reduce the moisture content in incinerator feed solid, dewatering is necessary to minimize the required fuel and electricity and consequently incineration operating cost.

SLUDGE DISPOSAL (LANDFILLING)

Landfilling of the stabilized dewatered sludge (with > 20 to 30% solids, by weight) has been considered as a backup disposal method when other preferred alternatives are not available or feasible. However, this option alone cannot be considered as a feasible option for BCI facility due to generated sludge high moisture content. As already presented, sludge solids concentration was found to average about 2-3% by weight. To reduce the water content and associated landfilling costs, sludge dewatering/compacting before landfilling is recommended. Sludge dewatering refers to the reduction of floc-bound and capillary water content of sludges. Sludge dewatering can be achieved by different methods such as a belt filter press, a screw press, and a centrifuge. These technologies produce sludge cakes with different percentages of dry solids.

Further evaluation and consideration of the volume of gross generated sludge, based upon the technologies presented above, is needed to extrapolate the reliability and feasibility of each alternative and is beyond the scope of the submission. Specific sludge volumes are inherent a function of the technology employed, efficacy of the process, and are subject to several kinetic thermodynamic properties which make estimation a speculative process.

3.3 MONITORING

3.3.1 DAF EFFLUENT MONITORING

Effluent discharge from the DAF pre-treatment system will be monitored regularly for comparison with the revised ISA. Sampling will be conducted at the outlet of the DAF system during the routine effluent-quality checks.

Pre-treated wastewater monitoring will rely on BCI on-site equipment, DR 3900 spectrophotometer, for analysis of COD. Further monitoring will be supplemented by a Canadian Association for Laboratory Accreditation Inc. (CALA) accredited laboratory to analyse the following parameters:

- Total Alkalinity;
- Five-day Biochemical Oxygen Demand;
- Orthophosphate-dissolved;
- Total phosphorous;
- Total Kjeldahl Nitrogen;
- Total suspended solids;
- pH.

4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 ODOUR CONSIDERATIONS

It is expected that the DAF system and ancillary pumps and pipes will operate indoors. As well, the EQ tank, located outside of the building, is well sealed, therefore impact on air quality from the project activities during operation is expected to be negligible.

The closest residence to the facility is located approximately 340 m away (to the southeast). There is no record of persistent odour nuisances or complaints from adjoining businesses or regional residences.

4.2 PUBLIC INVOLVEMENT

BCI understands the regulatory requirements for public engagement intended to secure licencing under the Environmental Act. Accordingly, WSP will execute a practical process to advise the neighbouring public about the facility's proposed upgrades, and the opportunity for public expressions of comment or concern. Comments from concerned members of the public will be solicited as part of the MSD review prior to issuing a licence.

5 BCI LAGOON DECOMMISSIONING

The decommissioning of the existing lagoon is expected to be undertaken following successful commissioning and start-up of the DAF pre-treatment system and municipal lagoon expansion. Key aspects associated with decommissioning is dewatering the lagoon and disposing of the sludge remaining in the cells.

The most recent was the sludge survey of all cells carried out in 2012, as a part of BCI lagoon decommissioning plan. The results are shown in [Table 8](#).

Sludge depths were measured in a grid pattern across the open water surface of the lagoon cell. Measurements were obtained by probing the bottom of the lagoon with a measuring pole. Sludge depth was determined at each measurement point and was averaged to obtain the sludge volume per cell. Sludge analysis was not performed at that time.

Table 8: Sludge Volume and Depth Measurements in BCI lagoon (2012)

	Total Sludge Volume (m³)	Average Sludge Depth (mm)
Cell no.1	974	270
Cell no.2	2536	440
Cell no.3	1187	210
Aerated Cell	63	60

As shown in [Table 8](#) the depth of sludge in all four (4) cells varied from 0.06 m to 0.44 m and the total sludge accumulation was estimated to be 4,760 m³.

The year following when the new DAF treatment system is operational, BCI local lagoon will be isolated and discharged to the RM lagoon according to the parameters of the existing Licence. The biosolids will be allowed to dewater over the course of a dry summer period. Once dried, Due to the high moisture content expected of the sludge, some form of dewatering will be required prior to final disposal. When the lagoon is dewatered, a more accurate estimate of sludge volume will be obtained and accordingly will be managed per available options.

The interconnecting pipes in the existing lagoon will also be decommissioned. The existing inflow pipe from UF/RO will also need to be capped and sealed as well as the existing pipe from the BCI lagoon to the RM lagoon.

Once the sludge is removed from the lagoon, the dikes will be leveled, and the site will be regraded for drainage. The site can likely be reseeded with grass.

5.1 THE PROPONENT

For the purposes of development licensing, the proponent is Bothwell Cheese Incorporated (hereafter "BCI"). For further information regarding BCI, please contact the following:

Mr. Eric Wallman
P.O. Box 119, 61 Main Street,
New Bothwell, MB, R0A 1C0

This Environmental Licensing Proposal was prepared by WSP. The local contact is:

Mr. Justin Rak-Banville
1600 Buffalo Place
Winnipeg, MB, R3T 6B8

5.2 PROJECT FUNDING

BCI will provide funding for all undertakings related to the Project.

5.3 LAND OWNERSHIP AND PROPERTY RIGHTS

5.3.1 LAND TITLE

The BCI facility is located at 61 Main Street. The land on the Manitoba Status of Title describes the land as Lot 1 Plan 54242 WLTO in SE ¼ 30-7-5 EPM. The property is owned by Bothwell Cheese under the land title number 2662256/1. The Status of Title is found in [Appendix E](#).

5.3.2 MINERAL RIGHTS

Ownership of the mineral rights is expected to rest with the Crown (Province of Manitoba) and not be impacted as a result of the contemplated activities.

5.3.3 LAND USE DESIGNATION

The land use designation of the property is “Industrial Area” and is zoned “M” Industrial. Land use surrounding the facility is limited to commercial on south, residential on south-east and, recreation and open space on south west.

5.3.4 DESCRIPTION OF EXISTING LAND USE

The project site contains the main production building, maintenance building, facility building, and a four (4) cell earthen lagoon.

5.4 PREVIOUS STUDIES

The following studies and reports were referenced or produced in the preparation of this EAP:

- Preliminary Status Update-Enhanced Phase I/II Environmental Site Assessment at the Bothwell Cheese Lagoons (January 2015), by Dillon.
- New Bothwell Lagoon Investigation (June 2018), by Stantec.
- EAP- New Bothwell Wastewater Treatment Lagoon Expansion (March 2019), by WSP
- Bothwell Cheese -Term Wastewater Treatment Management Plant (May 2019), by WSP

6 CONCLUSION

All activities associated with upgrades at BCI were stipulated in this proposal considering how these activities would interact with different environmental components. All raw material/chemical inputs and waste outputs were considered. It is recommended that BCI establish a wastewater monitoring program to better understand the effluent from the facility once it starts operating. This will allow for BCI to account for the facility's loading to the RM lagoon.

When considering the activities proposed and the mitigation measures to be implemented, the fact that the proposed facility will operate indoor and will not cause new external disturbance. It is the author's opinion that the overall impact of the proposed Facility on the environmental components considered in this assessment will be insignificant.

APPENDIX

A

EXISTING
ENVIRONMENT ACT
LICENCE

Environment Act Licence

Loi sur l'environnement Licence

Manitoba
Conservation
Conservation
Manitoba



Licence No./Licence n° 1015 R

Issue Date/Date de délivrance March 30, 1984

Revised: October 1, 2002

**IN ACCORDANCE WITH THE MANITOBA ENVIRONMENT ACT (C.C.S.M. c. E125)
THIS LICENCE IS ISSUED TO:**

BOTHWELL CHEESE INC.: APPLICANT

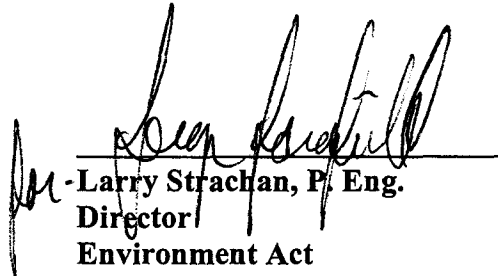
- WHEREAS pursuant to the provisions of The Clean Environment Act, on the 31st day of March, 1972, Toman Engineering Company submitted an application to the Commission, on behalf of the Applicant, to prescribe limits in connection with the operation of an aerated sewage lagoon system located in the SE 1/4 of Section 30, Township 7, Range 5 EPM, in the Rural Municipality of Hanover, Manitoba, for the treatment of liquid waste from a plant for the manufacture of cheese and whey powder, with discharge of effluent via road ditches to the Manning Canal;
- AND WHEREAS the Commission issued Interim Licence No. 206 on the 7th day of September, 1972, prescribing limits in connection with discharges from the said sewage lagoon system for a period of 5 years from the date of issuance;
- AND WHEREAS Interim Licence 206 terminated on the 7th day of September, 1977;
- AND WHEREAS the Applicant filed an application with the department on the 19th day of November, 1979;
- AND WHEREAS in the absence of limits prescribed by a regulation under the said Act, the application was referred to The Clean Environment Commission for the prescribing of limits on the said operation;
- AND WHEREAS after awaiting receipt of an environmental report and after giving notice, the Commission received a representation from a person who was likely to be affected by an order of the Commission prescribing limits, terms and conditions in connection with the said operation;
- AND WHEREAS the Commission held a hearing in New Bothwell on the 9th day of November, 1981, and issued Order No. 936 on the 28th day of January, 1982;

- AND WHEREAS on the 28th day of February, 1983, the Applicant filed a proposal with the department, pursuant to the provisions of the said order, and the provisions of Section 14(1) of the said Act, for the upgrading and continued operation of the said sewage lagoon system;
- AND WHEREAS in the absence of limits, terms and conditions prescribed by a regulation under the said Act, the proposal was referred to the Commission for the prescribing of limits, terms and conditions on the said operation;
- AND WHEREAS after giving notice of the said proposal, and of its intention to consider replacing the said order, the Commission did not receive notice of representation from any person likely to be affected by the said operation;
- AND WHEREAS the Commission considered the proposal on the 19th day March, 1984.

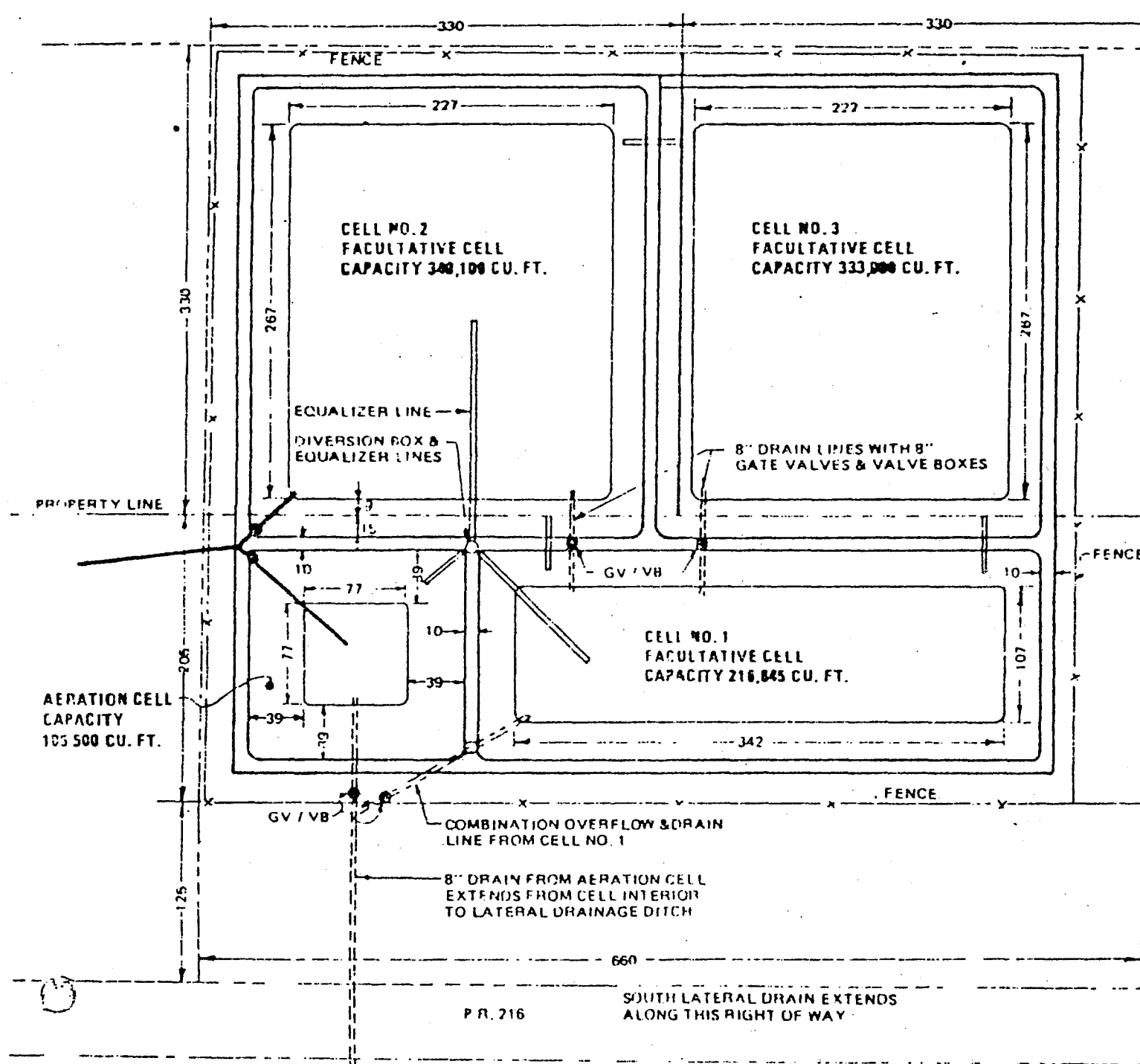
IT IS HEREBY ORDERED THAT:

1. The Applicant shall ensure that the organic loading rate on the said sewage lagoon system, in terms of the five-day biochemical oxygen demand, of the wastewater:
 - a) discharged towards the aeration cell, is not in excess of 260 kilograms per 24-hour period when only a 10HP aerator is functioning in the aeration cell;
 - b) discharged towards the aeration cell is not in excess of 351 kilograms per 24-hour period when both a 10HP and a 5HP aerator are functioning simultaneously in the aeration cell; and
 - c) discharged from the aeration cell towards the lagoon cells #2 and #3 (as shown on the attached diagram labelled Appendix "A") is not in excess of 56 kilograms per hectare per 24-hour period on either said cell, calculated using the liquid surface area of each said cell at the maximum operating depth of 1.5 meters.
2. The Applicant shall not discharge liquid effluent from the wastewater treatment facility:
 - a) where the organic content of the effluent, in terms of the five-day biochemical oxygen demand, is in excess of 30 milligrams per liter;
 - b) where the fecal coliform level of the effluent, as indicated by the MPN index, is in excess of 200 per 100 milliliters of sample; and
 - c) between the 1st day of November of any year and the 15th day of May of the following year.

3. The Applicant shall limit the emission of odours from the said facility to such an extent that odours emanating from the said operation are not detectable at any point of impingement in a residential area at a distance greater than 300 meters from the said facility, when 1 volume of odorous air is diluted with 1 volume of odour-free air.
4. The Applicant shall dispose of sludge and scum removed from the said sewage lagoon system:
 - a) subject to b), at a waste disposal ground designated and registered for that purpose under Manitoba Regulation 150/91; and
 - b) by an alternative method which is satisfactory to the Environmental Stewardship Division.
5. The Applicant shall install and maintain an elapsed time meter on the lift station pump(s) serving the said sewage lagoon system, and post the actual rating of the pump(s), in terms of liters/sec (or igpm), such that daily raw wastewater flow rates can be determined on any day within $\pm 5\%$ error of the true value.
6. Order No. 1015 is hereby rescinded.


-Larry Strachan, P. Eng.
Director
Environment Act

Client File No.: 177.2



EXISTING AERATED LAGOON SYSTEM

APPENDIX

B

DAF SYSTEM P&ID



APPENDIX

C

DAF SLUDGE
ANALYSIS



New Bothwell Cheese
ATTN: TREVOR DUECK (Maintenance)
PO Box 119
New Bothwell MB R0A 1C0

Date Received: 06-JUN-18
Report Date: 18-JUN-18 13:53 (MT)
Version: FINAL REV. 2

Client Phone: 204-770-6554

Certificate of Analysis

Lab Work Order #: L2106561
Project P.O. #: NOT SUBMITTED
Job Reference: CITY OF WINNIPEG SLUDGE
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 11-JUN-18 14:41



Hua Wo
Chemistry Laboratory Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2106561-1 SLUDGE BIN FOR CITY OF WINNIPEG								
Sampled By: CLIENT on 05-JUN-18 @ 14:00								
Matrix: SLUDGE								
Miscellaneous Parameters								
Biochemical Oxygen Demand		22000		12000	mg/L		11-JUN-18	R4086547
Chemical Oxygen Demand		35200		500	mg/L		12-JUN-18	R4080973
Chromium, Hexavalent		<0.010	RRR	0.010	mg/L		07-JUN-18	R4075951
Note: Cr6: Sample filtered due to turbidity. Detection limit adjusted for dilution due to matrix.								
Mercury (Hg)-Total		<0.0010		0.0010	mg/L	07-JUN-18	07-JUN-18	R4075108
Oil and Grease		1110		5.0	mg/L		08-JUN-18	R4075807
Phosphorus (P)-Total		247		1.0	mg/L		07-JUN-18	R4076244
Total Suspended Solids		29600		150	mg/L		06-JUN-18	R4075014
pH		7.81		0.10	pH units		06-JUN-18	R4074532
Total Metals in Water by CRC ICPMS								
Aluminum (Al)-Total		5370		3.0	mg/L	07-JUN-18	07-JUN-18	R4075724
Antimony (Sb)-Total		<0.0050	DLM	0.0050	mg/L	07-JUN-18	07-JUN-18	R4075724
Arsenic (As)-Total		0.0552	DLM	0.0050	mg/L	07-JUN-18	07-JUN-18	R4075724
Barium (Ba)-Total		0.801	DLM	0.0050	mg/L	07-JUN-18	07-JUN-18	R4075724
Beryllium (Be)-Total		<0.0050	DLM	0.0050	mg/L	07-JUN-18	07-JUN-18	R4075724
Bismuth (Bi)-Total		0.109	DLM	0.0025	mg/L	07-JUN-18	07-JUN-18	R4075724
Boron (B)-Total		1.74	DLM	0.50	mg/L	07-JUN-18	07-JUN-18	R4075724
Cadmium (Cd)-Total		0.00055	DLM	0.00025	mg/L	07-JUN-18	07-JUN-18	R4075724
Calcium (Ca)-Total		465	DLM	2.5	mg/L	07-JUN-18	07-JUN-18	R4075724
Cesium (Cs)-Total		0.00068	DLM	0.00050	mg/L	07-JUN-18	07-JUN-18	R4075724
Chromium (Cr)-Total		0.0705	DLM	0.0050	mg/L	07-JUN-18	07-JUN-18	R4075724
Cobalt (Co)-Total		0.0062	DLM	0.0050	mg/L	07-JUN-18	07-JUN-18	R4075724
Copper (Cu)-Total		0.141	DLM	0.025	mg/L	07-JUN-18	07-JUN-18	R4075724
Iron (Fe)-Total		18.4	DLM	0.50	mg/L	07-JUN-18	07-JUN-18	R4075724
Lead (Pb)-Total		0.0091	DLM	0.0025	mg/L	07-JUN-18	07-JUN-18	R4075724
Lithium (Li)-Total		0.061	DLM	0.050	mg/L	07-JUN-18	07-JUN-18	R4075724
Magnesium (Mg)-Total		167	DLM	0.25	mg/L	07-JUN-18	07-JUN-18	R4075724
Manganese (Mn)-Total		0.495	DLM	0.0050	mg/L	07-JUN-18	07-JUN-18	R4075724
Molybdenum (Mo)-Total		0.0235	DLM	0.0025	mg/L	07-JUN-18	07-JUN-18	R4075724
Nickel (Ni)-Total		0.053	DLM	0.025	mg/L	07-JUN-18	07-JUN-18	R4075724
Potassium (K)-Total		30.4	DLM	2.5	mg/L	07-JUN-18	07-JUN-18	R4075724
Phosphorus (P)-Total		351	DLM	2.5	mg/L	07-JUN-18	07-JUN-18	R4075724
Rubidium (Rb)-Total		0.032	DLM	0.010	mg/L	07-JUN-18	07-JUN-18	R4075724
Selenium (Se)-Total		0.0070	DLM	0.0025	mg/L	07-JUN-18	07-JUN-18	R4075724
Silicon (Si)-Total		76.9	DLM	5.0	mg/L	07-JUN-18	07-JUN-18	R4075724
Silver (Ag)-Total		<0.00050	DLM	0.00050	mg/L	07-JUN-18	07-JUN-18	R4075724
Sodium (Na)-Total		873	DLM	2.5	mg/L	07-JUN-18	07-JUN-18	R4075724
Strontium (Sr)-Total		2.94	DLM	0.010	mg/L	07-JUN-18	07-JUN-18	R4075724
Sulfur (S)-Total		351	DLM	25	mg/L	07-JUN-18	07-JUN-18	R4075724
Tellurium (Te)-Total		<0.010	DLM	0.010	mg/L	07-JUN-18	07-JUN-18	R4075724
Thallium (Tl)-Total		<0.00050	DLM	0.00050	mg/L	07-JUN-18	07-JUN-18	R4075724
Thorium (Th)-Total		<0.0050	DLM	0.0050	mg/L	07-JUN-18	07-JUN-18	R4075724
Tin (Sn)-Total		0.0356	DLM	0.0050	mg/L	07-JUN-18	07-JUN-18	R4075724
Titanium (Ti)-Total		0.370	DLM	0.015	mg/L	07-JUN-18	07-JUN-18	R4075724
Tungsten (W)-Total		<0.0050	DLM	0.0050	mg/L	07-JUN-18	07-JUN-18	R4075724
Uranium (U)-Total		0.0102	DLM	0.00050	mg/L	07-JUN-18	07-JUN-18	R4075724
Vanadium (V)-Total		0.615	DLM	0.025	mg/L	07-JUN-18	07-JUN-18	R4075724
Zinc (Zn)-Total		1.00	DLM	0.15	mg/L	07-JUN-18	07-JUN-18	R4075724
Zirconium (Zr)-Total		0.0316	DLM	0.0030	mg/L	07-JUN-18	07-JUN-18	R4075724

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B
Samples are diluted and seeded and then incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.			
COD-WP	Water	Chemical Oxygen Demand	APHA 5220 D
This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colorimetric method.			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc			
ETL-N-TOT-ANY-WP	Water	Total Nitrogen Calculated	Calculated
HG-T-CVAF-WP	Water	Mercury Total	EPA245.7 V2.0
Mercury in filtered and unfiltered waters is oxidized with Bromine monochloride and analyzed by cold-vapour atomic fluorescence spectrometry.			
MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod.)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
N-TOTKJ-WP	Water	Total Kjeldahl Nitrogen	APHA 4500 NorgD (modified)
Aqueous samples are digested in a block digester with sulfuric acid and copper sulfate as a catalyst. Total Kjeldahl Nitrogen is then analyzed using a discrete analyzer with colorimetric detection.			
NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
OG-GRAV-WP	Water	Oil & Grease - Gravimetric	EPA 1664 (modified)
Water samples are acidified and extracted with hexane; the hexane extract is collected in a pre-weighed vial. The solvent is evaporated and Total Oil & Grease is determined from the weight of the residue in the vial.			
P-T-L-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.			
PH-WP	Water	pH	APHA 4500H
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aqueous matrices is determined gravimetrically after drying the residue at 103 105°C.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
---------------	--------	------------------	--------------------

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L2106561

Report Date: 18-JUN-18

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Client: New Bothwell Cheese
PO Box 119
New Bothwell MB R0A 1C0
Contact: TREVOR DUECK (Maintenance)

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-WP		Water						
Batch	R4086547							
WG2793973-2	LCS							
Biochemical Oxygen Demand			110.2		%		85-115	11-JUN-18
WG2793973-1	MB							
Biochemical Oxygen Demand			<2.0		mg/L		2	11-JUN-18
COD-WP		Water						
Batch	R4080973							
WG2794904-2	LCS							
Chemical Oxygen Demand			106.5		%		85-115	12-JUN-18
WG2794904-1	MB							
Chemical Oxygen Demand			<20		mg/L		20	12-JUN-18
CR-CR6-IC-WT		Water						
Batch	R4075951							
WG2791444-2	LCS							
Chromium, Hexavalent			100.6		%		80-120	07-JUN-18
WG2791444-1	MB							
Chromium, Hexavalent			<0.0010		mg/L		0.001	07-JUN-18
HG-T-CVAF-WP		Water						
Batch	R4075108							
WG2791095-2	LCS							
Mercury (Hg)-Total			104.4		%		80-120	07-JUN-18
WG2791095-1	MB							
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	07-JUN-18
MET-T-CCMS-WP		Water						
Batch	R4075724							
WG2790838-2	LCS							
Aluminum (Al)-Total			104.6		%		80-120	07-JUN-18
Antimony (Sb)-Total			108.9		%		80-120	07-JUN-18
Arsenic (As)-Total			102.8		%		80-120	07-JUN-18
Barium (Ba)-Total			101.8		%		80-120	07-JUN-18
Beryllium (Be)-Total			110.9		%		80-120	07-JUN-18
Bismuth (Bi)-Total			104.0		%		80-120	07-JUN-18
Boron (B)-Total			108.4		%		80-120	07-JUN-18
Cadmium (Cd)-Total			104.5		%		80-120	07-JUN-18
Calcium (Ca)-Total			102.3		%		80-120	07-JUN-18
Cesium (Cs)-Total			106.9		%		80-120	07-JUN-18
Chromium (Cr)-Total			100.6		%		80-120	07-JUN-18

Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP		Water						
Batch	R4075724							
WG2790838-2	LCS							
Cobalt (Co)-Total			99.7		%		80-120	07-JUN-18
Copper (Cu)-Total			103.7		%		80-120	07-JUN-18
Iron (Fe)-Total			103.5		%		80-120	07-JUN-18
Lead (Pb)-Total			104.7		%		80-120	07-JUN-18
Lithium (Li)-Total			110.8		%		80-120	07-JUN-18
Magnesium (Mg)-Total			110.9		%		80-120	07-JUN-18
Manganese (Mn)-Total			102.3		%		80-120	07-JUN-18
Molybdenum (Mo)-Total			107.5		%		80-120	07-JUN-18
Nickel (Ni)-Total			100.9		%		80-120	07-JUN-18
Potassium (K)-Total			97.2		%		80-120	07-JUN-18
Phosphorus (P)-Total			103.7		%		80-120	07-JUN-18
Rubidium (Rb)-Total			103.7		%		80-120	07-JUN-18
Selenium (Se)-Total			103.5		%		80-120	07-JUN-18
Silicon (Si)-Total			104.4		%		80-120	07-JUN-18
Silver (Ag)-Total			106.6		%		80-120	07-JUN-18
Sodium (Na)-Total			106.1		%		80-120	07-JUN-18
Strontium (Sr)-Total			104.3		%		80-120	07-JUN-18
Sulfur (S)-Total			105.8		%		80-120	07-JUN-18
Tellurium (Te)-Total			108.4		%		80-120	07-JUN-18
Thallium (Tl)-Total			104.5		%		80-120	07-JUN-18
Thorium (Th)-Total			101.5		%		80-120	07-JUN-18
Tin (Sn)-Total			103.4		%		80-120	07-JUN-18
Titanium (Ti)-Total			99.2		%		80-120	07-JUN-18
Tungsten (W)-Total			102.8		%		80-120	07-JUN-18
Uranium (U)-Total			106.9		%		80-120	07-JUN-18
Vanadium (V)-Total			101.0		%		80-120	07-JUN-18
Zinc (Zn)-Total			101.5		%		80-120	07-JUN-18
Zirconium (Zr)-Total			105.6		%		80-120	07-JUN-18
WG2790838-1	MB							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	07-JUN-18
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	07-JUN-18
Arsenic (As)-Total			<0.00010		mg/L		0.0001	07-JUN-18
Barium (Ba)-Total			<0.00010		mg/L		0.0001	07-JUN-18
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	07-JUN-18

Quality Control Report

Workorder: L2106561

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP		Water						
Batch	R4075724							
WG2790838-1 MB								
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	07-JUN-18
Boron (B)-Total			<0.010		mg/L		0.01	07-JUN-18
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	07-JUN-18
Calcium (Ca)-Total			<0.050		mg/L		0.05	07-JUN-18
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	07-JUN-18
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	07-JUN-18
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	07-JUN-18
Copper (Cu)-Total			<0.00050		mg/L		0.0005	07-JUN-18
Iron (Fe)-Total			<0.010		mg/L		0.01	07-JUN-18
Lead (Pb)-Total			<0.000050		mg/L		0.00005	07-JUN-18
Lithium (Li)-Total			<0.0010		mg/L		0.001	07-JUN-18
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	07-JUN-18
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	07-JUN-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	07-JUN-18
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	07-JUN-18
Potassium (K)-Total			<0.050		mg/L		0.05	07-JUN-18
Phosphorus (P)-Total			<0.050		mg/L		0.05	07-JUN-18
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	07-JUN-18
Selenium (Se)-Total			<0.000050		mg/L		0.00005	07-JUN-18
Silicon (Si)-Total			<0.10		mg/L		0.1	07-JUN-18
Silver (Ag)-Total			<0.000010		mg/L		0.00001	07-JUN-18
Sodium (Na)-Total			<0.050		mg/L		0.05	07-JUN-18
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	07-JUN-18
Sulfur (S)-Total			<0.50		mg/L		0.5	07-JUN-18
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	07-JUN-18
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	07-JUN-18
Thorium (Th)-Total			<0.00010		mg/L		0.0001	07-JUN-18
Tin (Sn)-Total			<0.00010		mg/L		0.0001	07-JUN-18
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	07-JUN-18
Tungsten (W)-Total			<0.00010		mg/L		0.0001	07-JUN-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	07-JUN-18
Vanadium (V)-Total			<0.00050		mg/L		0.0005	07-JUN-18
Zinc (Zn)-Total			<0.0030		mg/L		0.003	07-JUN-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	07-JUN-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-WP	Water							
Batch	R4076094							
WG2789897-6	LCS							
Nitrite (as N)			99.3		%		90-110	06-JUN-18
WG2789897-5	MB							
Nitrite (as N)			<0.010		mg/L		0.01	06-JUN-18
NO3-IC-N-WP	Water							
Batch	R4076094							
WG2789897-6	LCS							
Nitrate (as N)			100.0		%		90-110	06-JUN-18
WG2789897-5	MB							
Nitrate (as N)			<0.020		mg/L		0.02	06-JUN-18
OG-GRAV-WP	Water							
Batch	R4075807							
WG2790252-2	LCS							
Oil and Grease			91.6		%		70-130	08-JUN-18
WG2790252-1	MB							
Oil and Grease			<5.0		mg/L		5	08-JUN-18
P-T-L-COL-WP	Water							
Batch	R4076244							
WG2790406-46	LCS							
Phosphorus (P)-Total			95.0		%		80-120	07-JUN-18
WG2790406-45	MB							
Phosphorus (P)-Total			<0.0010		mg/L		0.001	07-JUN-18
PH-WP	Water							
Batch	R4074532							
WG2790764-7	LCS							
pH			7.40		pH units		7.3-7.5	06-JUN-18
SOLIDS-TOTSUS-WP	Water							
Batch	R4075014							
WG2789646-14	LCS							
Total Suspended Solids			100.4		%		85-115	06-JUN-18
WG2789646-13	MB							
Total Suspended Solids			<2.0		mg/L		2	06-JUN-18

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Quality Control Report

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH	1	05-JUN-18 14:00	06-JUN-18 12:00	0.25	22	hours	EHTR-FM
Aggregate Organics							
Biochemical Oxygen Demand (BOD)	1	05-JUN-18 14:00	11-JUN-18 07:00	48	137	hours	EHT

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2106561 were received on 06-JUN-18 07:45.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Chain of Custody (COC) / Analytical Request Form

Abstract

COC Number: 17-679676

Page of

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW CQC form**.

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JULY 2017 FRQ

APPENDIX

D

MATERIAL SAFETY
DATA SHEET

MEGAFLOC 4330

1 PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: MEGAFLOC 4330
Common Name: MIXTURE
SDS Number: 0601
Revision Date: 2/10/2015
Version: 1
Internal ID: 210C
Product Use: Water Treatment
Supplier Details: U. S. Water Services
12270 43rd St. NE
St. Michael, MN 55376

Contact: Non-emergency #: 866-663-7632
Email: SDS@uswaterservices.com
Web: www.uswaterservices.com

EMERGENCY RESPONSE: (ChemTel)
US & Canada: 800-255-3924
International: +01-813-248-0585

2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS):

Health, Specific target organ toxicity - Single exposure, 3
Health, Serious Eye Damage/Eye Irritation, 2 B
Health, Skin corrosion/irritation, 3
Health, Aspiration hazard, 2

GHS Label elements, including precautionary statements

GHS Signal Word: **WARNING**

GHS Hazard Pictograms:



GHS Hazard Statements:

H335 - May cause respiratory irritation
H320 - Causes eye irritation
H316 - Causes mild skin irritation
H305 - May be harmful if swallowed and enters airways

GHS Precautionary Statements:

P281 - Use personal protective equipment as required.
P302+352 - IF ON SKIN: Wash with soap and water.
P305+351+338 - IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

MEGAFLOC 4330

P304+340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P301+330+331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Hazards not otherwise classified (HNOC) or not covered by GHS

PPE recommendation is advisory only and based on typical use conditions. An industrial hygienist or safety officer familiar with the specific situation of anticipated use must determine actual PPE required when using this product (29 CFR 1910.132)

3 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients:

Cas#	%	Chemical Name
64742-47-8	20-23%	Distillates, petroleum, hydrotreated light
631-61-8	2-10%	Ammonium acetate

4 FIRST AID MEASURES

Inhalation: Remove from contamination. Seek medical attention if difficulties persist.
Skin Contact: Wash off with plenty of soap and water. Remove contaminated garments and wash or destroy. Consult a physician if irritation persists.
Eye Contact: Flush eyes with plenty of running water for at least 15 minutes. Seek medical attention if irritation persists.
Ingestion: This product is not considered toxic based on studies on laboratory animals.

Most important symptoms & effects (acute & delayed):

Indication of need for immediate medical attention: No data available

Special treatment needs: No data available

5 FIRE FIGHTING MEASURES

Flash Point: >93C
Burning Rate: Not applicable
Autoignition Temp: Not applicable
LEL: Not available
UEL: Not available

Extinguishing Media: Water, foam, CO2, Dry Chemical

Suitable: Use extinguishing media appropriate for surrounding fire.

Unsuitable: No information available

Hazardous combustion products: Thermal decomposition may produce oxides of carbon, nitrogen, sulfur, and other potentially hazardous compounds.

Unusual Fire or Explosion Hazards: None known

Special protective equipment/precautions: Wear self-contained breathing apparatus

MEGAFLOC 4330

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective equipment, emergency procedures: Avoid contact with the material. See section 8 of SDS for PPE recommendations

Environmental Precautions: Keep runoff from entering drains or waterways

Spill/Leak procedures: Contain spill or leak. Spilled material is very slippery when wet. Dike area if necessary to prevent spill from spreading or entering sewers and waterways. Recover as much as possible then absorb remainder with inert material. Place into closed container for disposal.

Regulatory Requirements: Dispose of recovered material in accordance with all applicable state and federal regulations.

7 HANDLING AND STORAGE

Handling Precautions: Avoid contact with eyes, skin, or clothing. Do not taste or swallow. Do not inhale vapor or mist. Use with adequate ventilation. To avoid product degradation, and equipment corrosion, do not use iron, copper or aluminum containers or equipment. For industrial use only!

Storage Requirements: Keep away from children. Store in closed containers away from temperature extremes and incompatible materials. Store in a dry, well ventilated area. Keep containers tightly closed, and properly labeled. Store in accordance with all local, state and federal guidelines

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Provide local exhaust ventilation as needed to control misting.

Personal Protective Equipment: HMIS PP, C | Safety Glasses, Gloves, Apron

Respiratory protection: If exposure levels are exceeded a respirator must be used. If needed use a MSHA/NIOSH approved respirator. Seek professional advice prior to respirator selection and use. Follow all requirements of OSHA respirator regulations (29 CFR 1910.134)

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

General Hygiene: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, using the toilet, or applying cosmetics.

PPE recommendation is advisory only and based on typical use conditions. An industrial hygienist or safety officer familiar with the specific situation of anticipated use must determine actual PPE required when using this product (29 CFR 1910.132)

Exposure Limits: Petroleum Distillate Hydrotreated Light
OSHA (TWA)/PEL: 500 ppm (STEL)
ACGIH (TWA/TLV): Not Established

MEGAFLOC 4330

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Opaque, White	Odor:	Petroleum distillate odor
Physical State:	Liquid	Solubility:	Limited by viscosity
Odor Threshold:	Not determined	Percent Volatile:	50-60% (w/w)
Spec Grav./Density:	9.01 lb/gal	Freezing/Melting Pt.:	Not determined
Viscosity:	Not determined	Flash Point:	>93C
Boiling Point:	Not determined	Vapor Density:	Similar to water
Partition Coefficient:	Not determined	Auto-Ignition Temp:	Not determined
Vapor Pressure:	Not determined	UFL/LFL:	Not determined
pH:	7-9		
Evap. Rate:	Not determined		
Decomp Temp:	Not determined		

10 STABILITY AND REACTIVITY

Stability:	Product is stable under normal storage and use conditions.
Conditions to Avoid:	Avoid temperature extremes. Keep container closed when not in use.
Materials to Avoid:	Oxidizing agents may cause exothermic reaction.
Hazardous	carbon dioxide; carbon monoxide; ammonia; oxides of nitrogen; oxides of sulfur
Decomposition:	(includes sulfur di and tri)
Hazardous	Will not occur.
Polymerization:	

11 TOXICOLOGICAL INFORMATION

Acute Toxicity: No data available
Skin Corrosion/Irritation: No data available
Serious eye damage/irritation: No data available
Respiratory or skin sensitization: No data available
Specific target organ toxicity (single exposure): No data available
Specific target organ toxicity (repeated exposure): No data available
Aspiration hazard: No data available
Carcinogenicity: No carcinogenic effects are known for the components of this product
Germ Cell Mutagenicity: No mutagenic effects are known for the components of this product
Teratogenicity: No teratogenic effects are known for the components of this product

12 ECOLOGICAL INFORMATION

Aquatic Toxicity No data available
Elimination (persistence & degradability): No data available
Bioaccumulative potential: No data available
Mobility in soil: No data available
Other adverse effects: No data available

MEGAFLOC 4330

13 DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations.

This material should be fully characterized for toxicity and possible reactivity prior to disposal (40 CFR 261). Use which results in chemical or physical change or contamination may subject it to regulation as a hazardous waste. Along with properly characterizing all waste materials, consult state and local regulations regarding the proper disposal of this material.

Container contents should be completely used and containers should be emptied prior to discard. Container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

14 TRANSPORT INFORMATION

Proper Shipping Name: Non-regulated

DOT Transportation data (49 CFR 172.101)

15 REGULATORY INFORMATION

Component (CAS#) [%] - CODES

Distillates, petroleum, hydrotreated light (64742-47-8) [20-23%] TSCA

RQ(5000LBS), Ammonium acetate (631-61-8) [2-10%] CERCLA, CSWHS, MASS, PA, TSCA

Regulatory CODE Descriptions

RQ = Reportable Quantity

TSCA = Toxic Substances Control Act

CERCLA = Superfund clean up substance

CSWHS = Clean Water Act Hazardous substances

MASS = MA Massachusetts Hazardous Substances List

PA = PA Right-To-Know List of Hazardous Substances

TSCA: All components of this product are listed (or are not required to be listed) in the TSCA inventory

EPA / CERCLA / SARA TITLE III:

Toxic Chemical List (SARA 313): This product does not contain any chemicals subject to routine annual toxic chemical release reporting.

Extremely Hazardous Substance (SARA 302/304): This product does not contain any extremely hazardous substances subject to emergency planning requirements.

SARA 312: Acute

California Proposition 65: This product does not contain any chemicals known to the state of California to cause cancer, birth defects, or any other reproductive harm.

RCRA: No data available

MEGAFLOC 4330

16**OTHER INFORMATION**

HMIS III: Health = 2, Fire = 1, Physical Hazard = 0

HMIS PPE: C - Safety Glasses, Gloves, Apron

HMIS	
HEALTH	2
FLAMMABILITY	1
PHYSICAL HAZARD	0
PERSONAL PROTECTION	C

Author: U.S. Water Services

Revision Notes: Updated to GHS format

Disclaimer:

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s). The above information is not claiming characteristics of the product in term of legal claims of performance / guarantee. This information only describes safety measures and no liability may arise from the use or application of the product described herein. This information is given in good faith and based on our current knowledge of the product.

MEGAFLOC 891**1 PRODUCT AND COMPANY IDENTIFICATION**

Product Identifier: MEGAFLOC 891
Common Name: MIXTURE
SDS Number: 0006
Product Code: WT0002
Revision Date: 8/25/2015
Version: 2
Internal ID: 100C
Product Use: Wastewater treatment coagulant
Supplier Details: U.S. Water Services
12270 43rd St. NE
St. Michael, MN 55376

Contact: Non-emergency contact:
Phone: 866-663-7632
Email: SDS@USWaterServices.com
Web: www.uswaterservices.com

EMERGENCY RESPONSE: (ChemTel)
US & Canada: 800-255-3924
International: +01-813-248-0585

2 HAZARDS IDENTIFICATION**Classification of the Substance or Mixture**

GHS Classification in Accordance with 29 CFR 1910 (OSHA HCS):
Health, Skin corrosion/irritation, 3

GHS Label Elements, Including Precautionary Statements

GHS Signal Word: **WARNING**

GHS Hazard Pictograms:

no GHS pictograms indicated for this product

GHS Hazard Statements:

H316 - Causes mild skin irritation

GHS Precautionary Statements:

P332+313 - If skin irritation occurs: Get medical advice/attention.

Hazards not Otherwise Classified (HNOC) or not Covered by GHS

PPE recommendation is advisory only and based on typical use conditions. An industrial hygienist or safety officer familiar with the specific situation of anticipated use must determine actual PPE required when using this product (29 CFR 1910.132)

3 COMPOSITION/INFORMATION ON INGREDIENTS**Ingredients:**

MEGAFLOC 891

Cas#	%	Chemical Name
12042-91-0	50%	Aluminum chloride hydroxide

4 FIRST AID MEASURES

Inhalation: Vapors or mists are very corrosive to the nose, throat, and mucous membranes. Remove from contamination. If symptoms persist, seek medical attention.

Skin Contact: Prolonged or repeated contact may cause skin irritation. Wash off with soap and plenty of water. Consult a physician if irritation develops.

Eye Contact: Immediately flush eyes with large amounts of water for at least 15 minutes, lifting eyelids occasionally to facilitate irrigation. Get immediate medical attention.

Ingestion: Do not induce vomiting. Drink large quantities of water. Get prompt, qualified medical attention.

Most important symptoms & effects (acute & delayed): No data available

Indication of need for immediate medical attention: No data available

Special treatment needs: No data available

5 FIRE FIGHTING MEASURES**Extinguishing Media:**

Suitable: Use extinguishing media suitable for surrounding fire.

Unsuitable: No information available

Hazardous combustion products: Hazardous decomposition products formed under fire conditions- Carbon oxides, and other hazardous compounds

Unusual Fire or Explosion Hazards: None known

Special protective equipment/precautions: Wear self-contained breathing apparatus

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective equipment, emergency procedures: Avoid contact with the material. See section 8 of SDS for PPE recommendations

Environmental Precautions: Keep runoff from entering drains or waterways

Spill/Leak procedures: Contain spill or leak. Dike area if necessary to prevent spill from spreading or entering sewers and waterways. Recover as much as possible then absorb remainder with inert material. Place into closed container for disposal.

Regulatory Requirements: Dispose of recovered material in accordance with all applicable state and federal regulations.

7 HANDLING AND STORAGE

Handling Precautions: Avoid contact with eyes, skin, or clothing. Do not taste or swallow. Do not inhale vapor or mist. Use with adequate ventilation. For industrial use only!

Storage Requirements: Store in closed containers away from temperature extremes and incompatible materials. Do not store in mild steel, carbon steel, or copper alloys. Rapidly corrodes most materials. Store in properly labeled containers in accordance with all local, state

MEGAFLOC 891

and federal guidelines.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:	Provide local exhaust ventilation as needed to control misting.
Personal Protective Equipment:	HMIS PP, C Safety Glasses, Gloves, Apron
	Respiratory protection: If needed use MSHA/NIOSH approved respirator. Seek professional advice prior to respirator selection and use. Follow all requirements of OSHA respirator regulations (29 CFR 1910.134)
	Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.
	General Hygiene: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, using the toilet, or applying cosmetics.
	PPE recommendation is advisory only and based on typical use conditions. An industrial hygienist or safety officer familiar with the specific situation of anticipated use must determine actual PPE required when using this product (29 CFR 1910.132)
Exposure Limits:	
OSHA (TWA)/PEL):	Not Established
ACGIH (TWA/TLV):	Not Established

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear to amber liquid	Odor:	Little to no odor
Physical State:	Liquid	Solubility:	Completely soluble in water
Odor Threshold:	No data available	Heat Value:	No data available
Particle Size:	No data available	Freezing/Melting Pt.:	No data available
Spec Grav./Density:	11.18 lb/gal	Flash Point:	No data available
Viscosity:	No data available	Vapor Density:	No data available
Boiling Point:	230°F	Auto-Ignition Temp:	No data available
Flammability:	Nonflammable	UFL/LFL:	No data available
Partition Coefficient:	No data available		
Vapor Pressure:	No data available		
pH:	4-5		
Evap. Rate:	No data available		
Decomp Temp:	No data available		

10 STABILITY AND REACTIVITY

Chemical Stability:	Product is stable under normal storage and use conditions.
Conditions to Avoid:	No data available
Materials to Avoid:	Mild steel, carbon steel, and copper alloys. Rapidly corrodes most materials.
Hazardous Decomposition:	None under normal storage conditions.
Hazardous Polymerization:	Will not occur.

MEGAFLOC 891**11 TOXICOLOGICAL INFORMATION**

Acute Toxicity: No data available
Skin Corrosion/Irritation: No data available
Serious eye damage/irritation: No data available
Respiratory or skin sensitization: No data available
Germ cell mutagenicity: No data available
Carcinogenicity: No data available
Reproductive Toxicity: No data available
Specific target organ toxicity (single exposure): No data available
Specific target organ toxicity (repeated exposure): No data available
Aspiration hazard: No data available

12 ECOLOGICAL INFORMATION**Aquatic Toxicity**

Species	48hr LC₅₀	96hr LC₅₀
<i>Ceriodaphnia dubia</i>	>2,000 mg/L	n/a
<i>Daphnia pulex</i>	7,071 mg/L	n/a
Fathead minnow	3,675 mg/L	>1,000 mg/L

Elimination (persistence & degradability): No data available
Bioaccumulative potential: No data available
Mobility in soil: No data available
Other adverse effects: No data available

13 DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations.

This material should be fully characterized for toxicity and possible reactivity prior to disposal (40 CFR 261). Use which results in chemical or physical change or contamination may subject it to regulation as a hazardous waste. Along with properly characterizing all waste materials, consult state and local regulations regarding the proper disposal of this material.

Container contents should be completely used and containers should be emptied prior to discard. Container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

14 TRANSPORT INFORMATION

Proper Shipping Name: Non-regulated

DOT Transportation data (49 CFR 172.101)

See section 15 for information on Reportable Quantity chemicals (RQ)

MEGAFLOC 891**15 REGULATORY INFORMATION****Component (CAS#) [%] - CODES**

Aluminum chloride hydroxide (12042-91-0) [50%] TSCA

Regulatory CODE Descriptions**TSCA = Toxic Substances Control Act**

TSCA: All components of this product are listed (or are not required to be listed) in the TSCA inventory

EPA / CERCLA / SARA TITLE III:

CERCLA List: This product does not contain any CERCLA listed hazardous substances.

Toxic Chemical List (SARA 313): This product does not contain any chemicals subject to routine annual toxic chemical release reporting.

Extremely Hazardous Substance (SARA 302/304): This product does not contain any extremely hazardous substances subject to emergency planning requirements.

SARA 312: No data available

RCRA: No data available

16 OTHER INFORMATION

HMIS III: Health = 1, Fire = 0, Physical Hazard = 0

HMIS PPE: C - Safety Glasses, Gloves, Apron

HMIS	
HEALTH	1
FLAMMABILITY	0
PHYSICAL HAZARD	0
PERSONAL PROTECTION	C

Author: U.S. Water Services

Revision Notes: Updated to GHS format

Disclaimer:

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s). The above information is not claiming characteristics of the product in term of legal claims of performance / guarantee. This information only describes safety measures and no liability may arise from the use or application of the product described herein. This information is given in good faith and based on our current knowledge of the product.

APPENDIX

E

CERTIFICATE OF
TITLE

DATE: 2014/06/10
TIME: 22:50

MANITOBA

TITLE NO: 2662256/1

STATUS OF TITLE

PAGE: 1

STATUS OF TITLE.....	ACCEPTED	PRODUCED FOR..	RONALD S ADE LAW CORPORATION
ORIGINATING OFFICE...	WINNIPEG	ADDRESS.....	102-1015 WILKES AVENUE
REGISTERING OFFICE...	WINNIPEG		WINNIPEG MB R3P 2R8
REGISTRATION DATE....	2013/05/07	LTO BOX NO....	287
COMPLETION DATE.....	2013/06/04	CLIENT FILE...	416853-3
		PRODUCED BY...	SYSTEM for Series: 4490273/1

LEGAL DESCRIPTION:

BOTHWELL CHEESE INC.

IS REGISTERED OWNER SUBJECT TO SUCH ENTRIES RECORDED HEREON
IN THE FOLLOWING DESCRIBED LAND:

LOT 1 PLAN 54242 WLTO
IN SE 1/4 30-7-5 EPM

ACTIVE TITLE NOTE(S):

ENCUMBRANCE - CAVEAT 207692 - AFFECTS PART LOT 1 WITHIN LIMITS OF
RIGHT OF WAY PLAN 9552 AS IT AFFECTS ONLY PART WITHIN LIMITS OF
LOT 9 BLOCK 4 PLAN 9659.
SEPT. 13/05 - O.M.

ACTIVE TITLE CHARGE(S):

207692/1	ACCEPTED	CAVEAT	REG'D: 1967/12/21
FROM/BY:		INTER-CITY GAS TRANS LTD.	
TO:			
CONSIDERATION:		NOTES:	SEE TITLE NOTES -(TSTN)

2584430/1	ACCEPTED	CAVEAT	REG'D: 2001/04/04
DESCRIPTION:		EASEMENT	
FROM/BY:		MTS COMMUNICATIONS INC.	
TO:			
CONSIDERATION:		NOTES:	AFF: PART

2772442/1	ACCEPTED	MORTGAGE	REG'D: 2002/09/27
FROM/BY:		BOTHWELL CHEESE INC.	
TO:		ENSIS GROWTH FUND INC.	
CONSIDERATION:		\$3,000,000.00	NOTES:

CHARGES AFFECTING THIS INSTRUMENT:

3689337/1	ACCEPTED	POSTPONEMENT OF RIGHTS
NOTE 80	STP TO MTGE 3655770	
3936685/1	ACCEPTED	TRANSFER OF MORTGAGE
4351851/1	ACCEPTED	AMENDING AGREEMENT INCLUDING LAND

CERTIFIED TRUE EXTRACT PRODUCED FROM THE LAND TITLES DATA
STORAGE SYSTEM ON 2014/06/10 OF TITLE NUMBER 2662256/1

***** STATUS OF TITLE 2662256/1 CONTINUED ON NEXT PAGE *****

DATE: 2014/06/10
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ORIGINATING OFFICE...	WINNIPEG	ADDRESS.....	102-1015 WILKES AVENUE
REGISTERING OFFICE...	WINNIPEG		WINNIPEG MB R3P 2R8
REGISTRATION DATE....	2013/05/07		
COMPLETION DATE.....	2013/06/04	LTD BOX NO....	287
		CLIENT FILE...	416853-3
		PRODUCED BY...	SYSTEM for Series: 4490273/1

ACTIVE TITLE CHARGE(S):

2772443/1 ACCEPTED MORTGAGE REG'D: 2002/09/27
FROM/BY: BOTHWELL CHEESE INC.
TO: EM CAPITAL INC.
CONSIDERATION: \$500,000.00 NOTES:

CHARGES AFFECTING THIS INSTRUMENT:

3693001/1 ACCEPTED POSTPONEMENT OF RIGHTS
NOTES: MORTGAGE 3655770
3936686/1 ACCEPTED TRANSFER OF MORTGAGE
4351852/1 ACCEPTED AMENDING AGREEMENT INCLUDING LAND

3188887/1 ACCEPTED CAVEAT REG'D: 2005/09/14
DESCRIPTION: DEVELOPMENT AND BUILDING RESTRICTION
FROM/BY: THE RURAL MUNICIPALITY OF HANOVER
TO:
CONSIDERATION: NOTES:

3255738/1 ACCEPTED CAVEAT REG'D: 2006/02/21
DESCRIPTION: EASEMENT
FROM/BY: THE MANITOBA HYDRO-ELECTRIC BOARD
TO:
CONSIDERATION: NOTES: AFF: WTN LTS ROW PL 44754

3255746/1 ACCEPTED CAVEAT REG'D: 2006/02/21
DESCRIPTION: EASEMENT
FROM/BY: CENTRA GAS MANITOBA INC.
TO:
CONSIDERATION: NOTES: AFF: WTN LTS ROW PL 44754

3655770/1 ACCEPTED MORTGAGE REG'D: 2008/08/08
FROM/BY: BOTHWELL CHEESE INC.
TO: FARM CREDIT CANADA
CONSIDERATION: \$5,000,000.00 NOTES:

CHARGES AFFECTING THIS INSTRUMENT:

4351854/1 ACCEPTED AMENDING AGREEMENT INCLUDING LAND

CERTIFIED TRUE EXTRACT PRODUCED FROM THE LAND TITLES DATA
STORAGE SYSTEM ON 2014/06/10 OF TITLE NUMBER 2662256/1

***** STATUS OF TITLE 2662256/1 CONTINUED ON NEXT PAGE *****

DATE: 2014/06/10
TIME: 22:50

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TITLE NO: 2662256/1

PAGE: 3

STATUS OF TITLE.....	ACCEPTED	PRODUCED FOR..	RONALD S ADE LAW CORPORATION
ORIGINATING OFFICE...	WINNIPEG	ADDRESS.....	102-1015 WILKES AVENUE
REGISTERING OFFICE...	WINNIPEG		WINNIPEG MB R3P 2R8
REGISTRATION DATE....	2013/05/07		
COMPLETION DATE.....	2013/06/04	LTO BOX NO....	287
		CLIENT FILE...	416853-3
		PRODUCED BY...	SYSTEM for Series: 4490273/1

ACTIVE TITLE CHARGE(S):

3689337/1	ACCEPTED	POSTPONEMENT OF RIGHTS	REG'D: 2008/10/15
FROM/BY:		ENSIS GROWTH FUND INC. IN MORTGAGE (2772442)	
TO:		FARM CREDIT CANADA IN MORTGAGE (3655770)	
CONSIDERATION:		NOTES:	
3693001/1	ACCEPTED	POSTPONEMENT OF RIGHTS	REG'D: 2008/10/21
FROM/BY:		EM CAPITAL INC. (MORTGAGE 2772443)	
TO:		FARM CREDIT CANADA (MORTGAGE 3655770)	
CONSIDERATION:		NOTES:	
3936685/1	ACCEPTED	TRANSFER OF MORTGAGE	REG'D: 2010/06/04
FROM/BY:		ENSIS GROWTH FUND INC.	
TO:		MUFFY'S MUFFINS LTD.	
CONSIDERATION:		\$1.00	NOTES:
3936686/1	ACCEPTED	TRANSFER OF MORTGAGE	REG'D: 2010/06/04
FROM/BY:		EM CAPITAL INC.	
TO:		MUFFY'S MUFFINS LTD.	
CONSIDERATION:		\$1.00	NOTES:
4351851/1	ACCEPTED	AMENDING AGREEMENT INCLUDING LAND	REG'D: 2013/05/07
DESCRIPTION:		TRUE COPY OF CERTIFICATE OF CHANGE OF NAME ATTACHED	
FROM/BY:		LKG THOMSON HOLDINGS LTD.	
TO:		BOTHWELL CHEESE INC.	
CONSIDERATION:		NOTES:	
4351852/1	ACCEPTED	AMENDING AGREEMENT INCLUDING LAND	REG'D: 2013/05/07
DESCRIPTION:		CERTIFICATE OF CHANGE OF NAME ATTACHED BC0877524	
FROM/BY:		LKG THOMSON HOLDINGS LTD.	
TO:		BOTHWELL CHEESE INC.	
CONSIDERATION:		NOTES:	
4351854/1	ACCEPTED	AMENDING AGREEMENT INCLUDING LAND	REG'D: 2013/05/07
FROM/BY:		FARM CREDIT CANADA	
TO:		BOTHWELL CHEESE INC.	
CONSIDERATION:		NOTES:	

CERTIFIED TRUE EXTRACT PRODUCED FROM THE LAND TITLES DATA
STORAGE SYSTEM ON 2014/06/10 OF TITLE NUMBER 2662256/1

***** STATUS OF TITLE 2662256/1 CONTINUED ON NEXT PAGE *****

DATE: 2014/06/10
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STATUS OF TITLE

TITLE NO: 2662256/1

PAGE: 4

STATUS OF TITLE.....	ACCEPTED	PRODUCED FOR..	RONALD S ADE LAW CORPORATION
ORIGINATING OFFICE...	WINNIPEG	ADDRESS.....	102-1015 WILKES AVENUE
REGISTERING OFFICE...	WINNIPEG		WINNIPEG MB R3P 2R8
REGISTRATION DATE....	2013/05/07		
COMPLETION DATE.....	2013/06/04	LTO BOX NO....	287
		CLIENT FILE...	416853-3
		PRODUCED BY...	SYSTEM for Series: 4490273/1

ACTIVE TITLE CHARGE(S):

4351859/1	ACCEPTED	CAVEAT	REG'D: 2013/05/07
DESCRIPTION:		STAT EASEMENT SEWER LINE-CONDITION OF SUB'D APPROVAL	
FROM/BY:		THE RURAL MUNICIPALITY OF HANOVER	
TO:			
CONSIDERATION:		NOTES:	
4351861/1	ACCEPTED	CAVEAT	REG'D: 2013/05/07
DESCRIPTION:		STATUTORY EASEMENT	
FROM/BY:		THE MANITOBA HYDRO-ELECTRIC BOARD	
TO:			
CONSIDERATION:		NOTES:	AFF: WTN LTS ROW PL 54244
4487735/1	ACCEPTED	PERSONAL PROPERTY SECURITY NOTICE	REG'D: 2014/05/29
DESCRIPTION:		EXPIRES JUNE 1, 2024	
FROM/BY:		CANADIAN WESTERN BANK	
TO:		MARTIN HAK AS AGENT	
CONSIDERATION:		NOTES:	

ADDRESS(ES) FOR SERVICE:

EFFECT	NAME AND ADDRESS	POSTAL CODE
ACTIVE	BOTHWELL CHEESE INC. BOX 119 61 MAIN STREET NORTH NEW BOTHWELL MB	ROA 1C0

ORIGINATING INSTRUMENT(S):

REGISTRATION NUMBER	TYPE	REG. DATE	CONSIDERATION	SWORN VALUE
4351856/1	TREQ	2013/05/07	\$0.00	\$0.00
PRESENTED BY:	SMITH NEUFELD JODOIN-STEINBACH			
FROM:	BOTHWELL CHEESE INC.			
TO:				

FROM TITLE NUMBER(S):

2661745/1	ALL	2630994/1	ALL
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CERTIFIED TRUE EXTRACT PRODUCED FROM THE LAND TITLES DATA
STORAGE SYSTEM ON 2014/06/10 OF TITLE NUMBER 2662256/1

***** STATUS OF TITLE 2662256/1 CONTINUED ON NEXT PAGE *****

DATE: 2014/06/10
TIME: 22:50

MANITOBA
STATUS OF TITLE

TITLE NO: 2662256/1

PAGE: 5

STATUS OF TITLE.....	ACCEPTED	PRODUCED FOR..	RONALD S ADE LAW CORPORATION
ORIGINATING OFFICE...	WINNIPEG	ADDRESS.....	102-1015 WILKES AVENUE
REGISTERING OFFICE...	WINNIPEG		WINNIPEG MB R3P 2R8
REGISTRATION DATE....	2013/05/07		
COMPLETION DATE.....	2013/06/04	LTO BOX NO....	287
		CLIENT FILE...	416853-3
		PRODUCED BY...	SYSTEM for Series: 4490273/1

LAND INDEX:

LOT	BLOCK	SURVEY PLAN
-----	-------	-------------

1		54242
---	--	-------

NOTE:

ACCEPTED THIS 7TH DAY OF MAY, 2013
BY D.WISLOWE FOR THE DISTRICT REGISTRAR OF
THE LAND TITLES DISTRICT OF WINNIPEG.

CERTIFIED TRUE EXTRACT PRODUCED FROM THE LAND TITLES DATA
STORAGE SYSTEM ON 2014/06/10 OF TITLE NUMBER 2662256/1.

***** END OF STATUS OF TITLE 2662256/1 *****

DATE: 2014/06/10
TIME: 22:50

MANITOBA

TITLE NO: 2631041/1

STATUS OF TITLE

PAGE: 1

STATUS OF TITLE.....	ACCEPTED	PRODUCED FOR..	RONALD S ADE LAW CORPORATION
ORIGINATING OFFICE...	WINNIPEG	ADDRESS.....	102-1015 WILKES AVENUE
REGISTERING OFFICE...	WINNIPEG		WINNIPEG MB R3P 2R8
REGISTRATION DATE....	2012/11/07	LTO BOX NO....	287
COMPLETION DATE.....	2012/11/20	CLIENT FILE...	416853-3
		PRODUCED BY...	SYSTEM for Series: 4490273/1

LEGAL DESCRIPTION:

BOTHWELL CHEESE INC.

IS REGISTERED OWNER SUBJECT TO SUCH ENTRIES RECORDED HEREON, IN THE FOLLOWING DESCRIBED LAND:

LOT 5 PLAN 44278 WLTO
IN SE 1/4 OF 30-7-5 EPM.

ACTIVE TITLE CHARGE(S):

2584429/1	ACCEPTED	CAVEAT	REG'D: 2001/04/04
DESCRIPTION:		EASEMENT	
FROM/BY:		MTS COMMUNICATIONS INC.	
TO:			
CONSIDERATION:		NOTES:	

2772442/1	ACCEPTED	MORTGAGE	REG'D: 2002/09/27
FROM/BY:		BOTHWELL CHEESE INC.	
TO:		ENSIS GROWTH FUND INC.	
CONSIDERATION:		\$3,000,000.00	NOTES:

CHARGES AFFECTING THIS INSTRUMENT:

3689337/1	ACCEPTED	POSTPONEMENT OF RIGHTS
NOTES: STP TO MTGE 3655770		
3936685/1	ACCEPTED	TRANSFER OF MORTGAGE
4351851/1	ACCEPTED	AMENDING AGREEMENT INCLUDING LAND

2772443/1	ACCEPTED	MORTGAGE	REG'D: 2002/09/27
FROM/BY:		BOTHWELL CHEESE INC.	
TO:		EM CAPITAL INC.	
CONSIDERATION:		\$500,000.00	NOTES:

CHARGES AFFECTING THIS INSTRUMENT:

3693001/1	ACCEPTED	POSTPONEMENT OF RIGHTS
NOTES: MORTGAGE 3655770		
3936686/1	ACCEPTED	TRANSFER OF MORTGAGE
4351852/1	ACCEPTED	AMENDING AGREEMENT INCLUDING LAND

3655770/1	ACCEPTED	MORTGAGE	REG'D: 2008/08/08
FROM/BY:		BOTHWELL CHEESE INC.	
TO:		FARM CREDIT CANADA	
CONSIDERATION:		\$5,000,000.00	NOTES:

CERTIFIED TRUE EXTRACT PRODUCED FROM THE LAND TITLES DATA
STORAGE SYSTEM ON 2014/06/10 OF TITLE NUMBER 2631041/1

***** STATUS OF TITLE 2631041/1 CONTINUED ON NEXT PAGE *****

DATE: 2014/06/10
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STATUS OF TITLE

TITLE NO: 2631041/1

PAGE: 2

STATUS OF TITLE.....	ACCEPTED	PRODUCED FOR..	RONALD S ADE LAW CORPORATION
ORIGINATING OFFICE...	WINNIPEG	ADDRESS.....	102-1015 WILKES AVENUE
REGISTERING OFFICE...	WINNIPEG		WINNIPEG MB R3P 2R8
REGISTRATION DATE....	2012/11/07	LTO BOX NO....	287
COMPLETION DATE.....	2012/11/20	CLIENT FILE...	416853-3
		PRODUCED BY...	SYSTEM for Series: 4490273/1

ACTIVE TITLE CHARGE(S):

CHARGES AFFECTING THIS INSTRUMENT:

4351854/1 ACCEPTED AMENDING AGREEMENT INCLUDING LAND

3689337/1 ACCEPTED POSTPONEMENT OF RIGHTS REG'D: 2008/10/15
FROM/BY: ENSIS GROWTH FUND INC. IN MORTGAGE (2772442)
TO: FARM CREDIT CANADA IN MORTGAGE (3655770)
CONSIDERATION: NOTES:

3693001/1 ACCEPTED POSTPONEMENT OF RIGHTS REG'D: 2008/10/21
FROM/BY: EM CAPITAL INC. (MORTGAGE 2772443)
TO: FARM CREDIT CANADA (MORTGAGE 3655770)
CONSIDERATION: NOTES:

3936685/1 ACCEPTED TRANSFER OF MORTGAGE REG'D: 2010/06/04
FROM/BY: ENSIS GROWTH FUND INC.
TO: MUFFY'S MUFFINS LTD.
CONSIDERATION: \$1.00 NOTES:

3936686/1 ACCEPTED TRANSFER OF MORTGAGE REG'D: 2010/06/04
FROM/BY: EM CAPITAL INC.
TO: MUFFY'S MUFFINS LTD.
CONSIDERATION: \$1.00 NOTES:

4351851/1 ACCEPTED AMENDING AGREEMENT INCLUDING LAND REG'D: 2013/05/07
DESCRIPTION: TRUE COPY OF CERTIFICATE OF CHANGE OF NAME ATTACHED
FROM/BY: LKG THOMSON HOLDINGS LTD.
TO: BOTHWELL CHEESE INC.
CONSIDERATION: NOTES:

4351852/1 ACCEPTED AMENDING AGREEMENT INCLUDING LAND REG'D: 2013/05/07
DESCRIPTION: CERTIFICATE OF CHANGE OF NAME ATTACHED BC0877524
FROM/BY: LKG THOMSON HOLDINGS LTD.
TO: BOTHWELL CHEESE INC.
CONSIDERATION: NOTES:

CERTIFIED TRUE EXTRACT PRODUCED FROM THE LAND TITLES DATA
STORAGE SYSTEM ON 2014/06/10 OF TITLE NUMBER 2631041/1

***** STATUS OF TITLE 2631041/1 CONTINUED ON NEXT PAGE *****

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REGISTRATION DATE....	2012/11/07		
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		CLIENT FILE...	416853-3
		PRODUCED BY...	SYSTEM for Series: 4490273/1

ACTIVE TITLE CHARGE(S):

4351854/1	ACCEPTED	AMENDING AGREEMENT INCLUDING LAND	REG'D: 2013/05/07
	FROM/BY:	FARM CREDIT CANADA	
	TO:	BOTHWELL CHEESE INC.	
	CONSIDERATION:	NOTES:	
4487735/1	ACCEPTED	PERSONAL PROPERTY SECURITY NOTICE	REG'D: 2014/05/29
	DESCRIPTION:	EXPIRES JUNE 1, 2024	
	FROM/BY:	CANADIAN WESTERN BANK	
	TO:	MARTIN HAK AS AGENT	
	CONSIDERATION:	NOTES:	

ADDRESS(ES) FOR SERVICE:

EFFECT	NAME AND ADDRESS	POSTAL CODE
ACTIVE	BOTHWELL CHEESE INC. BOX 119 NEW BOTHWELL, MB.	ROA 1C0

ORIGINATING INSTRUMENT(S):

REGISTRATION NUMBER	TYPE	REG. DATE	CONSIDERATION	SWORN VALUE
4292912/1	TREQ	2012/11/07	\$0.00	\$0.00
	PRESENTED BY:	RONALD S ADE LAW CORPORATION		
	FROM:	BOTHWELL CHEESE INC.		
	TO:			

FROM TITLE NUMBER(S):

2111710/1 ALL

LAND INDEX:

LOT	BLOCK	SURVEY PLAN
5		44278
	NOTE:	

CERTIFIED TRUE EXTRACT PRODUCED FROM THE LAND TITLES DATA
STORAGE SYSTEM ON 2014/06/10 OF TITLE NUMBER 2631041/1

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TITLE NO: 2631041/1

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ORIGINATING OFFICE...	WINNIPEG	ADDRESS.....	102-1015 WILKES AVENUE
REGISTERING OFFICE...	WINNIPEG		WINNIPEG MB R3P 2R8
REGISTRATION DATE....	2012/11/07	LTO BOX NO....	287
COMPLETION DATE.....	2012/11/20	CLIENT FILE...	416853-3
		PRODUCED BY...	SYSTEM for Series: 4490273/1

ACCEPTED THIS 7TH DAY OF NOVEMBER, 2012
BY G.BILODEAU FOR THE DISTRICT REGISTRAR OF
THE LAND TITLES DISTRICT OF WINNIPEG.

CERTIFIED TRUE EXTRACT PRODUCED FROM THE LAND TITLES DATA
STORAGE SYSTEM ON 2014/06/10 OF TITLE NUMBER 2631041/1.

***** END OF STATUS OF TITLE 2631041/1 *****

APPENDIX

F WASTEWATER TREATMENT FACILITY CLASSIFICATION

Water & Wastewater Facility Operators Certification Program

Application for Wastewater Treatment Facility Classification

also available online at <http://www.manitoba.ca/certification>

Please print clearly or type and follow the instructions on the application form.

NOTE: If using Adobe Reader text can be inserted into form and tab between fields.

This application is pursuant to the Water and Wastewater Facility Operators Regulation issued under The Environment Act.

Name of Facility:

Bothwell Cheese Inc. - Wastewater Pre-Treatment Facility

Name of Facility Owner:

(Municipality/Commission/
Company/Individual/etc)

Bothwell Cheese Inc.

Civic Address of Facility:

61 Main St. North

Mailing Address of Owner:

61 Main St. North

Postal Code:

R0A 1C0

Telephone:

(204) 388-4666

Contact Person:

Bryan Thompson

Position:

Senior Director of Engineering and Maintenance

Cell or Pager:

(204) 388-4666

Fax:

Email:

bryan.thompson@bothwellcheese.com

Is this a REAPPLICATION?

☐ Yes
☒ No

Please complete the following. The information provided will be used to classify the wastewater treatment facility under the Water and Wastewater Facility Operators Regulation. In some cases actual numbers or answers must be supplied, but in most cases it will only be necessary to check the appropriate criteria.

Forward the completed form by email to:
wwopcert@gov.mb.ca

Or mail it to:

Director
Environmental Approvals Branch
Manitoba Sustainable Development
1007 Century Street
Winnipeg MB R3H 0W4

Please direct questions to:

Certification Program Specialist
Email: wwopcert@gov.mb.ca
Phone: (204) 945-7065

Application for Wastewater Treatment Facility Classification

SYSTEM (choose all that apply)			
1.	New or proposed Facility seeking classification		☒
	Proposed start of operations (month / year) 03/01/2020		
	Existing Facility seeking classification (in operation prior to December 31, 2005)		☐
	Facility has been in operation since (approximate month/year)		
2.	The facility WILL employ mechanical treatment processes		☒
	The facility WILL NOT employ mechanical treatment processes		☐

SIZE (refer to Supplemental Information for point designation) (2 point minimum to 20 point maximum)				
1.	Maximum population or part served, peak day	#	[REDACTED]	1-10
2.	Design flow average day Estimated or Actual (Circle volume option & units) ☒ ☐ OR Peak month's flow average day Estimated or Actual ☐ ☐		☒ m ³ /day gal/day m ³ /day gal/day	1-10

VARIATION IN RAW WASTE ¹ (choose all that apply) (0 point minimum to 6 point maximum)			
1.	Variations do not exceed those normally or typically expected	☒	0
2.	Recurring deviations or excessive variations of 100-200% in strength	☐	2
	Recurring deviations or excessive variations of 100-200% in flow	☐	
	Recurring deviations or excessive variations of 100-200% in strength and flow	☐	
3.	Recurring deviations or excessive variations of more than 200% in strength	☐	4
	Recurring deviations or excessive variations of more than 200% in flow	☐	
	Recurring deviations or excessive variations of more than 200% in strength and flow	☐	
4.	Raw wastes subject to toxic waste discharges	☐	6
5.	Septage or truck-hauled waste discharge is accepted at the facility.	☐	0 - 4
	Estimated number of loads per day in peak haul times		

Application for Wastewater Treatment Facility Classification

PRELIMINARY TREATMENT <i>(choose all that apply)</i>			
1.	Facility pumping of main flow	☐	3
2.	Screening or Comminution	☒	3
3.	Grit removal	☐	3
4.	Equalization	☐	1

PRIMARY TREATMENT <i>(choose all that apply)</i>			
1.	Clarifiers	☐	5
2.	Anaerobic treatment with biogas flare	☐	10
3.	Anaerobic treatment with biogas utilization facility	☐	15

SECONDARY TREATMENT <i>(choose all that apply)</i>			
1.	Fixed-film reactor	☐	10
2.	Activated sludge	☐	15
3.	Stabilization ponds without aeration(i.e. sewage lagoon)	☐	5
4.	Stabilization ponds with aeration	☐	8

TERTIARY TREATMENT <i>(choose all that apply)</i>			
1.	Polishing ponds for advanced waste treatment	☐	2
2.	Chemical / physical advanced waste treatment without secondary treatment	☐	15
3.	Chemical / physical advanced waste treatment following secondary treatment	☐	10
4.	Biological or chemical / biological advanced waste treatment	☐	12
5.	Nitrification by designed extended aeration only	☐	5
6.	Ion exchange for advanced waste treatment	☐	10
7.	Reverse osmosis, electrodialysis and other membrane filtration techniques	☐	10
8.	Advanced waste treatment chemical recovery, carbon regeneration	☐	4

Application for Wastewater Treatment Facility Classification

9.	Media filtration	☐	5
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ADDITIONAL TREATMENT PROCESSES *(choose all that apply)*

1.	Chemical addition: <i>(Please list chemicals used, 2 pts per chemical to max. of 6)</i> Chemicals H ₂ SO ₄ , NaOH, Coagulant, Flocculant	☒	0 - 6
2.	Dissolved air floatation (other than for sludge thickening)	☒	8
3.	Intermittent sand filter	☐	2
4.	Recirculating intermittent sand filter	☐	3
5.	Microscreens	☐	5
6.	Generation of oxygen	☐	5

SOLIDS HANDLING *(choose all that apply)*

1.	Storage (other than for stabilization)	☐	2
2.	Stabilization by storage (including any storage afterwards)	☐	4
3.	Gravity thickening	☐	2
4.	Mechanical dewatering	☐	8
5.	Anaerobic digestion of solids	☐	10
6.	Utilization of digester gas for heating or cogeneration	☐	5
7.	Aerobic digestion of solids	☐	6
8.	Air-drying of sludge	☐	2
9.	Solids reduction (including incineration and wet oxidation)	☐	12
10.	Disposal in landfill	☐	2
11.	Solids composting	☐	10
12.	Land application of biosolids by contractor	☒	2
13.	Land application of biosolids by facility personnel	☐	10

Application for Wastewater Treatment Facility Classification

DISINFECTION (choose all that apply) (0 point minimum to 10 point maximum)			
1.	Chlorination	☐	5
	Ultraviolet irradiation	☐	
2.	Ozonization	☐	10

EFFLUENT DISCHARGE (choose all that apply) (0 point minimum to 10 point maximum)			
1.	Discharge to pumped to the RM of Hanover - Community of New Bothwell - Wastewater Treatment Lagoon	☒	0
2.	Mechanical post-aeration	☐	2
3.	Direct recycling and reuse	☐	6
4.	Land treatment and surface or subsurface disposal	☐	4

INSTRUMENTATION (choose one) (0 point minimum to 6 point maximum)			
1.	SCADA or similar instrumentation systems are used to provide:		
	• Data with no process operation	☐	0
	• Data with limited process operation	☒	2
	• Data with moderate process operation	☐	4
	• Data with extensive or total process operation	☐	6

LABORATORY CONTROL² (choose all that apply) (0 point minimum to 15 point maximum)			
1.	Bacteriological / Biological (0 point minimum to 5 point maximum)		
	• Lab work done outside the facility	☐	0
	• Membrane filter procedures	☐	3
	• Use of fermentation tubes or any dilution method of fecal coliform determination	☐	5
2.	Chemical / Physical (0 point minimum to 10 point maximum)		
	• Lab work done outside the facility	☒	0

Application for Wastewater Treatment Facility Classification

	Push button or visual methods for simple tests such as pH or settleable solids (List tests) pH, TSS, Hach DR 3900 Spectorphotometer	☒	3
	Additional procedures such as DO, COD, BOD, gas analysis, titration, solids content or volatile content (List tests)	☐	5
	More advanced determinations such as specific constituents, nutrients, total oils or phenols (List tests)	☐	7
	Highly sophisticated instrumentation such as atomic absorption or gas chromatograph (List tests)	☐	10

APPLICANT VERIFICATION	
I HEREBY DECLARE THAT ALL INFORMATION IN THIS APPLICATION IS TRUE.	
Name of Applicant ³ : (Print) Justin Rak-Banville	
Title: Project Manager, Water and Wastewater Infrastructure	
Telephone: (204) 477-6650	Fax:
Email: justin.rak.banville@wsp.com	
Signature of Authorized Representative: 	Date: 12/18/2019

¹The key concepts are frequency or intensity of deviation, or excessive variation from normal or typical fluctuations. The deviations in strength, toxicity, ratio of infiltration to inflow, or shock loads.

² The key concept is to credit laboratory analyses done on-site by facility personnel under the direction of an operator-in-charge with points from 0-15.

³ Applicant must be an authorized representative of the owner/operating authority (i.e. manager, P. Eng., or overall responsible operator).

Wastewater Treatment Form Supplemental Information

This is supplemental information for completing the Application for Wastewater Treatment Facility Classification Form only.

For exact definitions and text refer to Manitoba Regulation 77/2003, Water and Wastewater Facility Operators Regulation under The Environment Act (C.C.S.M. c E125).

A copy of the regulation is available by following the link for Manitoba Regulations at:
<http://www.gov.mb.ca/conservation/envapprovals/publs/index.html>

Facilities are classified as follows:

Small system class

A wastewater treatment facility that otherwise meets the criteria of a class 1 wastewater treatment facility shall be classified in the small system class if

- a) it treats wastewater from a population of no more than 500; and
- b) no mechanical treatment processes are employed at the facility.

Classes 1 to 4

Wastewater treatment facilities shall be classified in classes 1 to 4 in accordance with the following table, on the basis of the number of classification points assessed under the classification point system set out in the Water and Wastewater Facility Operators Regulation.

<u>Range of Classification Points</u>	<u>Classification</u>
0 to 30	Class 1
31 to 55	Class 2
56 to 75	Class 3
76 or more	Class 4

Size

Points for size: (2 point minimum to 20 point maximum)

Maximum population or part served, peak day (1 point minimum to 10 point maximum). Points are assigned at 1 point per 10,000 population or part.

Design flow average day or peak month's flow average day, whichever is larger (1 point minimum to 10 point maximum). Points are assigned at 1 point per 4.5 megalitres per day or part.

Authorized Representative

Signatures for the Applicant Verification section must be an individual recognized by the Owner of the facility as able to sign official documentation (i.e. P.Eng., Manager, CAO, etc).