Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

NRCB USE ONLY	Application number	Legal land description
☐ Approval ☐ Registration ☒ Authorization ☐ Amendment	RA24036	SW 12-44-23 W4M

APPLICATION DISCLOSURE

This information is collected under the authority of the *Agricultural Operation Practices Act* (AOPA), and is subject to the provisions of the *Freedom of Information and Protection of Privacy Act*. This information is public unless the NRCB grants a written request that certain sections remain private.

Any construction prior to obtaining an NRCB permit is an offence and is subject to enforcement action, including prosecution.

I, the applicant, or applicant's agent, have read and understand the statements above, and I acknowledge that the information provided in this application is true to the best of my knowledge.

August 14 2024
Date of signing

[redacted]
Signature

Garry Olson Farms Ltd
Corporate name (if applicable)

Scott Olson
Print name

GENERAL INFORMATION REQUIREMENTS

Proposed facilities: list all proposed confined feeding operation facilities and their dimensions. Indicate whether any of the proposed facilities are additions to existing facilities. (attach additional pages if needed)

Proposed facilities	Dimensions (m) (length, width, and depth)
Turkey Barn 60 feet x 300 feet x 12 feet high	91.4 m x 18.3 m

Existing facilities: list **ALL** existing confined feeding operation facilities and their dimensions

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
Barn East barn	60 x 300 18.3 x 91.4 m	
2 barns 3 south barns (converted to storage)	198 x 56 60.4 m x 17 m each	
1 barn North barn	250 x 40 76.2 m x 12.2 m	

NRCB USE ONLY

Existing facilities confirmed.

Last updated September 11, 2023

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

If a new facility is replacing an old facility, please explain what will happen to the old facility and when. ☐ N/A

The new barn will replace 2 of my older barns. The barns being replaced will be used for storage

AO note: the new barn will replace the 3 south barns. The old barns will all be used for storage.

Construction completion date for proposed facilities Jan 1 2025

Additional information

Livestock numbers: Complete only if livestock numbers are different from what was identified in the Part 1 application. Note: if livestock numbers increase in your Part 2 application, a new Part 1 application must be submitted which may result in a loss of priority for minimum distance separation (MDS).

Livestock category and type (Available in the Schedule 2 of the Part 2 Matters Regulation)	**Permitted number**	**Proposed increase or decrease in number (if applicable)**	**Total**
Same as part 1			
Turkey toms/breeders	10,000	0	10,000
No proposed increase in livestock			

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

DECLARATION AND ACKNOWLEDGMENT OF APPLICANT CONCERNING *WATER ACT* LICENCE
issued by Alberta Environment and Protected Areas (EPA) for a confined feeding operation (CFO)
Date and sign one of the following four options

OPTION 1: Applying through the NRCB for both the AOPA permit and the *Water Act* licence

I **DO** want my water licence application coupled to my AOPA permit application.

Signed this ____day of _____, 20____. _____
Signature of Applicant or Agent

OPTION 2: Processing the AOPA permit and *Water Act* licence separately

1. I (we) acknowledge that the CFO will need a new water licence from EPA under the *Water Act* for the development or activity proposed in this AOPA application.
2. I (we) request that the NRCB process the AOPA application **independently of** EPA's processing of the CFO's application for a water licence.
3. In making this request, I (we) recognize that, if this AOPA application is granted by the NRCB, the NRCB's decision will not be considered by EPA as improving or enhancing the CFO's eligibility for a water licence under the *Water Act*.
4. I (we) acknowledge that any construction or actions to populate the CFO with livestock pursuant to an AOPA permit in the absence of a *Water Act* licence will **not** be relevant to EPA's consideration of whether to grant the *Water Act* licence application.
5. I (we) acknowledge that any such construction or livestock populating will be at the CFO's sole risk if the *Water Act* licence application is denied or if the operation of the CFO is otherwise deemed to be in violation of the *Water Act*. This risk includes being required to depopulate the CFO and/or to cease further construction, or to remove "works" or "undertakings" (as defined in the *Water Act*).
6. **AS RELEVANT:** I (we) acknowledge that the CFO is located in the South Saskatchewan River Basin and that, pursuant to the *Bow, Oldman and South Saskatchewan River Basin Water Allocation Order* [Alta. Reg. 171/2007], this basin is currently closed to new surface water allocations.
7. **Provide:** Water licence application number(s) _____

Signed this ____ day of _____, 20____. _____
Signature of Applicant or Agent

OPTION 3: Additional water licence not required

1. I (we) declare that the CFO will not need a new licence from EPA under the *Water Act* for the development or activity proposed in this AOPA application.
2. **Provide**: Water license number(s) or water conveyance agreement details _____

Signed this 16 day of August, 2024. [redacted]
Signature of Applicant or Agent


2:59 PM Tue Aug 20
95%
earth.google.com
Reviews: Bo...
Pitt Boss | Fi...
Google Earth
Jøtul GF 500...
Gabe Leonar...
Order Starlink
Support - St...
Smoked Tur...
File
View
Add
Tools
Help
Search Google Earth
Water wells
North barn
East barn
Proposed new barn
Three south barns to be converted to storage
Layers
3D
Google
100%
Data attribution
9/12/2023
100 m
Camera: 2,679 m
52°46'29"N 113°12'59"W 777 m

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

GENERAL ENVIRONMENTAL INFORMATION

(complete this section for the worst case of the existing facility which is the closest to water bodies or water wells and for each of the proposed facilities)

Facility description / name *(as indicated on site plan)*

Existing: North barn **Proposed 1:** New poultry barn

Proposed 2: _____ **Proposed 3:** _____

Facility and environmental risk information		Facilities				NRCB USE ONLY	
		Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
Flood plain information	What is the elevation of the floor of the lowest manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	☒ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☐ >1 m ☐ ≤ 1 m	☐ > 1 m ☐ ≤ 1 m	☒ YES ☐ NO ☐ YES with exemption	>1 m confirmed
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?	None	None			☒ YES ☐ NO ☐ YES with exemption	None
	How many water wells are within 100 m of the manure storage facility or manure collection area?	2	None			☒ YES ☐ NO ☐ YES with exemption	Closest well ~105 m NW of proposed barn
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	350 m	280 M			☒ YES ☐ NO ☐ YES with exemption	Slough ~250 m south of proposed barn
Groundwater information	What is the depth to the water table?	> 3 m	12 feet			☒ YES ☐ NO ☐ YES with exemption	> 3 m confirmed
	What is the depth to the groundwater resource/aquifer you draw water from?	64.9 m	220 feet			☒ YES ☐ NO ☐ YES with exemption	64.9 m using WWID 278474

Additional information (attach supporting information, e.g. borehole logs, records, etc. you consider relevant to your application)

AO note: text in blue entered by AO

Part 2 — Technical Requirements

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

NRCB USE ONLY

WATER WELL AND SURFACE WATER INFORMATION

Well IDs: 278474 278489

Surface water related concerns from directly affected parties or referral agencies: ☐ YES ☒ NO

Groundwater related concerns from directly affected parties or referral agencies: ☐ YES ☒ NO

Water wells ☒ N/A

If applicable, exemption for 100 m distance requirements applied: ☐ YES ☐ NO Condition required: ☐ YES ☐ NO

Surface water ☒ N/A

If applicable, exemption for 30 m distance requirements applied: ☐ YES ☐ NO Condition required: ☐ YES ☐ NO

Water Well Exemption Screening Tool ☒ N/A

Water Well ID	Preliminary Screening Score	Secondary Screening Score	Facility

Groundwater or surface water related comments:

Part 2 — Technical Requirements

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

NRCB USE ONLY

ENVIRONMENTAL RISK SCREENING INFORMATION

ERST for **proposed** facilities

Facility	Groundwater score	Surface water score	File number
New barn	low	low	RA24036

ERST for **existing** facilities

Facility	Groundwater score	Surface water score	File number
North barn	low	low	RA24036

ERST related comments:

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

DISTANCE OF ANY MANURE STORAGE FACILITY (EXISTING OR PROPOSED) TO NEIGHBOURING RESIDENCES

			NRCB USE ONLY				
Neighbour name(s)	**Legal land description**	**Distance (m)**	**Zoning (LUB) category**	**MDS category (1-4)**	**Distance (m)**	**Waiver attached (if required)**	**Meets regulations**
Brad Myers	NW-12-44-23 W4	584	Agriculture	1	645 m	N/A	Yes
Don and Marg Buskas	NE-02-44-23 W4		Ag	1	675 m		Yes
Jesse Graff	NE-01-44-23 W4		Rural residential	2	871 m		Yes

LAND BASE FOR MANURE AND COMPOST APPLICATION (complete only if an increase in livestock or manure production will occur)

				NRCB USE ONLY	
Name of land owner(s)*	**Legal land description**	**Usable area** (ha)**	**Soil zone *****	**Usable area (ha)**	**Agreement attached (if required)**
				N/A for authorization applications	
	N/A				
			Total		

* If you are **not** the registered landowner, you must attach copies of land use agreements signed by all landowners.

** Available manure spreading area (excluding setback areas from residences, common bodies of water, water wells, etc. as identified in Agdex 096-5 Manure Spreading Regulations)

*** Brown, dark brown, black, grey wooded, or irrigated

Additional information (attach any additional information as required)

AO note: text in blue added by AO.

Part 2 — Technical Requirements

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

NRCB USE ONLY

MINIMUM DISTANCE SEPARATION

Methods used to determine distance (if applicable): Aerial photography

Margin of error (if applicable): +/- 3 m

Requirements (m): Category 1: 372 Category 2: 496 Category 3: 620 Category 4: 992

Technology factor: ☐ YES ☒ NO

Expansion factor: ☐ YES ☒ NO

MDS related concerns from directly affected parties or referral agencies: ☐ YES ☒ NO

LAND BASE FOR MANURE AND COMPOST APPLICATION

Land base required: _____

Land base listed: _____

Area not suitable: _____

Available area _____

N/A for authorization applications

Requirement met: ☐ YES ☐ NO

Land spreading agreements required: ☐ YES ☐ NO

Manure management plan: ☐ YES ☐ NO If yes, plan is attached: ☐

PLANS

Submitted and attached construction plans: ☐ YES ☒ NO

Submitted aerial photos: ☒ YES ☐ NO

Submitted photos: ☐ YES ☒ NO

GRANDFATHERING

Already completed: ☐ YES ☒ NO ☐ N/A

If already completed, see _____

See DS RA24036 for grandfathering determination

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area and/or manure storage facility(ies)

SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - Naturally occurring protective layer

*(complete a copy of this section for **EACH** barn, feedlot, and storage facility for solid manure, composting materials, or compost with a naturally occurring protective layer for the liner)*

Facility description / name *(as indicated on site plan)*

1. New Poultry Barn
2. _____

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	**NRCB USE ONLY** Estimated storage capacity (m^3)
1.	91.4	18.3	0	
2.				
			TOTAL CAPACITY	Sufficient storage

☐ I plan to use a short-term solid manure storage (STMS) as part of my manure storage and handling plan for this CFO. (The AOPA requirements for STMS are set out in the NRCB Short-Term Solid Manure Storage Requirements Fact Sheet.

Surface water control systems

Describe the run-on and runoff control system

Solid manure storage will be with in a cover barn

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	2.9 (m)	Provide details (as required) As outlined in the attached report. Clay loam found beneath compacted clay foundation to a maximum depth of investigation (4.5m)	
Soil texture	37-39 % sand	26-28 % silt	35 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: 1.6 to 4.5 m	Hydraulic conductivity (cm/s): 3.37 x 10(-9)	Describe test standard used: Bouwer-Rice (Aqtesolv)

Additional information *(attach copies of soil test reports)*

NRCB USE ONLY

Requirements met:	☒ YES ☐ NO
Condition required:	☐ YES ☒ NO
Report attached:	☒ YES ☐ NO

Last updated February 26, 2021

Part 2 — Technical Requirements

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

NRCB USE ONLY

ALL SIGNATURES IN FILE ☒ YES ☐ NO

DATES OF APPROVAL OFFICER SITE VISITS

August 15, 2024	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: August 27, 2024

Municipality: Wetaskiwin County

☒ letter sent ☒ response received ☒ written/email ☐ verbal ☐ no comments received

Alberta Health Services: ☒ N/A

☐ letter sent ☐ response received ☐ written/email ☐ verbal ☐ no comments received

Alberta Environment and Parks: ☐ N/A

☒ letter sent ☐ response received ☐ written/email ☐ verbal ☒ no comments received

Alberta Transportation: ☐ N/A

☒ letter sent ☐ response received ☐ written/email ☐ verbal ☒ no comments received

Alberta Regulatory Services: ☒ N/A

☐ letter sent ☐ response received ☐ written/email ☐ verbal ☐ no comments received

Other: Battle River Power Coop., Battle River Natural Gas Co-op., and Canadian Natural Resources Ltd. ☐ N/A

☒ letter sent ☐ response received ☐ written/email ☐ verbal ☒ no comments received

Other: _____ ☐ N/A

☐ letter sent ☐ response received ☐ written/email ☐ verbal ☐ no comments received

ENVIROWEST
ENGINEERING

SITE AND SOIL ASSESSMENT

Proposed Solid Manure Storage
SW¼-12-044-23-W4M

County of Wetaskiwin, Alberta

Site and Soil Assessment
Proposed Solid Manure Storage
SW¼-12-044-23-W4M
County of Wetaskiwin, Alberta

Prepared For: Scott Olson
Garry Olson Farms Ltd.

Delivered via Email: [redacted]

Prepared By: Envirowest Engineering
Box 4248, Ponoka, AB, T4J 1R6
(403) 783-8229

Report Date: January 13, 2025

Project Number: 2411-43075

Private and Confidential

Table of Contents

List of Tables

Appendices

1.0 Introduction and Scope of Work

Envirowest Engineering (Envirowest) was retained by Scott Olson to conduct a Site and Soil Assessment for the proposed construction of solid manure storage for a turkey confined feeding operation for 10,000 toms/breeders.

The assessment was completed to determine conditions beneath the proposed construction area and assess soil properties for construction of proposed facilities. The operation, herein referred to as "the Site," is located on SW¼-12-044-23-W4M in the County of Wetaskiwin.

The assessment has been completed in accordance with the standards and regulations associated with the amended Agricultural Operation Practices Act and associated regulations which govern all new and modified confined feeding operations.

Scope of Work

Three investigative boreholes were drilled using a truck-mounted rotary auger and completed to a maximum depth of 4.5 m below ground surface (mbgs) on November 20, 2024. The boreholes were completed in the areas proposed for a solid manure storage. The borehole locations are shown on Figure 1.0 (attached).

One borehole was completed as a groundwater monitoring well to allow for in-situ hydraulic conductivity testing, which was completed from December 10 to 16, 2024. An uppermost groundwater resource (UGR) was conservatively determined to be below 4.5 mbgs. No further assessment was completed to confirm the UGR.

2.0 Assessment Results

The proposed area of construction is relatively flat. The quarter section slopes steeply from the north to the south-southeast. Historically used barns are found in the area surrounding the proposed construction.

Potential liner construction material (noted in borehole logs as sandy clay) was typically found beneath compacted clay. Bedrock was not encountered to the maximum depth of investigation (4.5 mbgs).

Boreholes were backfilled with the material removed by back spinning the solid stem auger and compacting to depth of the borehole.

A saturated water table (as defined in the field by saturated soils) was absent to the maximum depth of investigation (4.5 mbgs). The depth of the water table should be confirmed at the time of construction however, the topography and field-observed soil properties indicate that the water table will be below 3.0 mbgs.

The results of the soil analysis completed by a third-party laboratory are presented in Table 1 below. The soil sample locations are presented on Figure 1.0, and borehole logs are attached.

Table 1: Soil Properties Results

Sample	Depth (mbgs)	Sand (%)	Silt (%)	Clay (%)	Soil Texture
24BH01-01	0.25	33	26	41	Clay
24BH02-01	3.75	39	26	35	Clay Loam
24BH03-01	*3.50*	*37*	*28*	*35*	*Clay Loam*

Field tested for hydraulic conductivity
Highlighted cells indicate suspected natural barrier material

The soils suspected to be a potential natural barrier were identified as clay loam with a clay content of 35%.

The monitoring well installed at borehole 24BH02 (24MW01) was screened from 3.41 to 1.91 mbgs and was sufficiently hydrated prior to completing the in-situ hydraulic conductivity testing. The in-situ hydraulic conductivity test was completed between December 10 and 16, 2024.

The initial depth to water was measured in the well. A microdiver was installed to measure and log the water level, temperature, and time. A volume of water was then removed from the well and the change in depth measured over time to assess hydraulic conductivity of the clay strata. It is assumed (as per AGDEX 096-01) that all flow occurs under saturated conditions. The depth was measured every minute for 1 week. The results of the test were analyzed as a falling head test using AQTESOLV Bouwer-Rice method for unconfined wells. The results of the assessment were an in-situ hydraulic conductivity of 3.37×10^{-9} cm/sec.

3.0 Liner Assessments

3.1 Natural Barrier Assessment (Solid Manure Storage Pens)

Based on the information obtained it was determined that the native clay within the proposed area of construction for solid manure storage was found to have a minimum thickness of 2.9 meters.

Minimum Required Liner Depth for a natural barrier for solid manure storage:

$$\frac{2 \text{ m}}{1 \times 10^{-6} \text{ cm/sec}} = \frac{\mathbf{X} \text{ m}}{3.37 \times 10^{-9} \text{ cm/sec}}$$

$$\mathbf{X} = 0.007 \text{ m}$$

It is found that there is sufficient protection across the proposed solid manure storage area.

4.0 Conclusions

The following conclusions are based on the discussed scope of the construction.

The soils beneath the proposed area of construction were determined to be appropriate for a naturally occurring protective layer for solid manure.

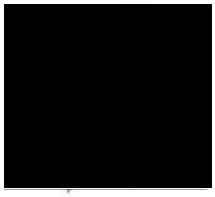
5.0 Closure

Envirowest Engineering is pleased to submit the report to Scott Olson of Garry Olson Farms Ltd. The information and conclusions contained in this report are for their sole use. No other party is to rely upon the information contained within the report without the express written authorization of Envirowest Engineering.

Envirowest Engineering is not responsible for any damages that may be suffered as the result of any unauthorized use of, or reliance on, this report. Envirowest Engineering has performed the work and made the findings and conclusions set out in the report in a manner consistent with the level of care and skill normally exercised by members of the environmental engineer profession practicing under similar conditions at the time the work was performed. Envirowest Engineering accepts no responsibility for any deficiency, misstatement or inaccuracy in this report resulting from misinformation from any individuals or parties that provided information as part of this report.

We trust that this report meets your present needs. Please feel free to contact the undersigned with any questions or should you require additional information.

Respectfully submitted,



January 13, 2025

Prepared by:
Emily J. Low, P.Eng.
Envirowest Engineering

Reviewed by:
Leah Predy, P.Ag.
Envirowest Engineering

PERMIT TO PRACTICE
2206165 ALBERTA LTD.

RM SIGNATURE: _____

RM APEGA ID #: 110373

DATE: January 13, 2025

PERMIT NUMBER: P014810
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

2206165 Alberta Ltd. o/a Envirowest Engineering
Association of Professional Engineers and Geoscientists of Alberta
Permit to Practice No. P14810

6.0 Qualifications of Assessors

Ms. Emily Low, B.Sc., P.Eng, is an Environmental Engineer with Envirowest Engineering and has approximately 15 years of environmental assessment, monitoring, and remediation experience in the agricultural, industrial, real estate and development, and oil and gas sectors. Ms. Low has a Bachelor of Science in Chemical Engineering from the University of Alberta and is a certified Professional Engineer in Alberta (Association of Professional Engineers and Geoscientists of Alberta).

Leah Predy, B.A., B.Sc., P.Ag., is a Professional Agrologist with Envirowest Engineering and has approximately 5 years of experience in the environmental field, both in field data collection and report preparation for environmental assessments, monitoring, and remediation, as well as agricultural projects. Prior to her employment with Envirowest Engineering, Leah had five years of experience managing rangelands and navigating legislation and regulations as a Rangeland Agrologist with the Government of Alberta. She is a Professional Agrologist in Alberta (Alberta Institute of Agrologists).

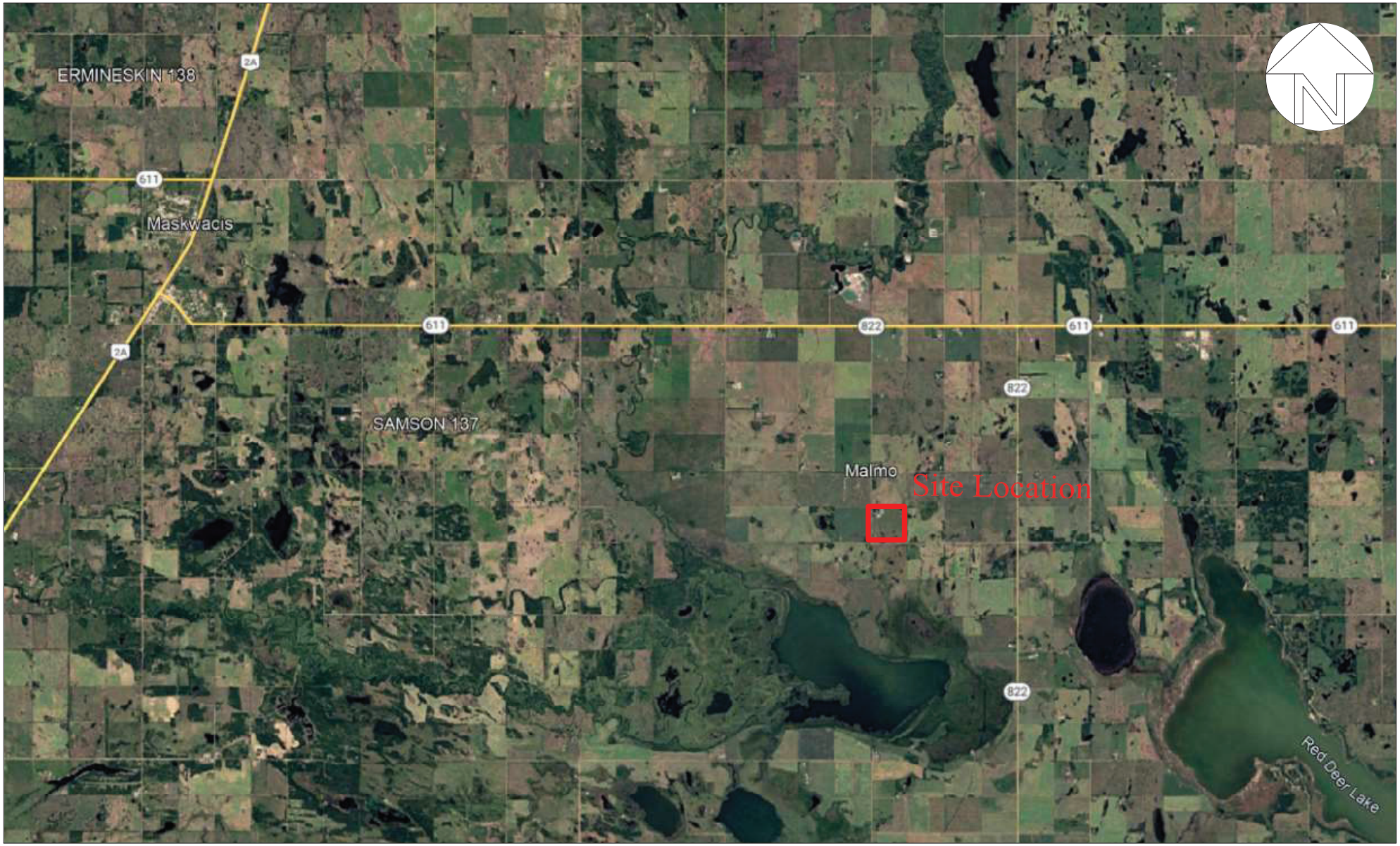
7.0 References

GOA (Government of Alberta). (January 2020). Agricultural Operation Practices Act and Regulations. Edmonton, AB: Author.

GOA (Government of Alberta). (2017). Agricultural Operation Practices Act: Standards and Administration Regulation. Edmonton, AB: Author.

Appendix A

Figures



ENVIROWEST ENGINEERING

Title:

Site Location
Site and Soil Assessment
SW¼-Sec.12-Twp.044-Rge.23-W4M
County of Wetaskiwin, Alberta

Project No: 2411-43075	**Date:** January 8, 2025	**Figure No.:** 1.0
Scale:	**Prepared By:** E.Low	
Image Source: Google Earth Pro (September 11, 2023)		

ENVIROWEST ENGINEERING

Title:

Borehole Locations
Site and Soil Assessment
SW¼-Sec.12-Twp.044-Rge.23-W4M
County of Wetaskiwin, Alberta

Project No: 2411-43075	**Date:** January 9, 2025	**Figure No.:** 2.0
Scale:	**Prepared By:** E.Low	
Image Source: Google Earth Pro (September 11, 2023)		

Appendix B

Borehole Logs

ENVIROWEST ENGINEERING

LOG OF BORING 24BH01

Site and Soil Assessment
Solid Manure Storage
SW-12-44-23 W4M

Garry Olson Farms Ltd.
Project Number: 2411-43075

Driller: : Ever Green Drilling
Drilling Method: : Track Mounted Auger
Drill Date : November 20, 2024
Logged By: : Emily Low P.Eng.

Well:
Elev.:

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Water Level
0.0				Compacted Clay, firm, dry, light brown	
0.3				BH01-01 (41% Clay)	
0.5					
0.8				SANDY CLAY, dry, loose	
1.0					
1.3					
1.5				damp, firm, medium plasticity	
1.8					
2.0					
2.3					
2.5					
2.8					
3.0					
3.3					
3.5					
3.8					
4.0					
4.3					
4.5					

01-09-2025 Y:\Operations\Client Data\43075 Scott Olsen\24BH01.bor

ENVIROWEST ENGINEERING

LOG OF BORING 24BH02

Site and Soil Assessment
Solid Manure Storage
SW-12-44-23 W4M

Garry Olson Farms Ltd.
Project Number: 2411-43075

Driller: : Ever Green Drilling
Drilling Method: : Track Mounted Auger
Drill Date : November 20, 2024
Logged By: : Emily Low P.Eng.

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Well: MW01 Elev.:	Water Level
0.0				Compacted Clay, firm, dry, light brown		
0.3						
0.5						
0.8				SANDY CLAY, dry, loose		
1.0						
1.3						
1.5				damp, firm, medium plasticity	Bentonite	
1.8					Solid	
2.0						
2.3						
2.5						
2.8						
3.0						
3.3						
3.5						
3.8				BH02-01 (35% Clay)	Sand	
4.0					Screen	
4.3						
4.5						

01-09-2025 Y:\Operations\Client Data\43075 Scott Olsen\24BH02.bor

ENVIROWEST ENGINEERING

LOG OF BORING 24BH03

Site and Soil Assessment
Solid Manure Storage
SW-12-44-23 W4M

Garry Olson Farms Ltd.
Project Number: 2411-43075

Driller: : Ever Green Drilling
Drilling Method: : Track Mounted Auger
Drill Date : November 20, 2024
Logged By: : Emily Low P.Eng.

Well:
Elev.:

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Water Level
0.0				Compacted Clay, firm, dry, light brown	
0.3					
0.5					
0.8				SANDY CLAY, damp, firm, medium plasticity	
1.0					
1.3					
1.5					
1.8					
2.0					
2.3					
2.5					
2.8					
3.0					
3.3					
3.5				BH03-01 (35% Clay)	
3.8					
4.0					
4.3					
4.5					

01-09-2025 Y:\Operations\Client Data\43075 Scott Olsen\24BH03.bor

Appendix C

Certificate of Analysis

AGAT Laboratories

6310 ROPER ROAD
EDMONTON, ALBERTA
CANADA T6B 3P9
TEL (780)395-2525
FAX (780)462-2490
http://www.agatlabs.com

CLIENT NAME: ENVIROWEST
BOX 4248, 5118-50th STREET
PONOKA, AB T4J1R6
(403) 783-8229

ATTENTION TO: Emily Low

PROJECT: Olson

AGAT WORK ORDER: 24E226326

SOIL ANALYSIS REVIEWED BY: Melinda Guay, Technical Reviewer

DATE REPORTED: Nov 30, 2024

PAGES (INCLUDING COVER): 6

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (780) 395-2525

*Notes

AGAT Laboratories

6310 ROPER ROAD
EDMONTON, ALBERTA
CANADA T6B 3P9
TEL (780)395-2525
FAX (780)462-2490
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 24E226326

PROJECT: Olson

CLIENT NAME: ENVIROWEST

ATTENTION TO: Emily Low

SAMPLING SITE:

SAMPLED BY:

Particle Size by Hydrometer

DATE RECEIVED: 2024-11-26

DATE REPORTED: 2024-11-30

		SAMPLE DESCRIPTION:		BH01-01	BH02-01	BH03-01
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2024-11-26	2024-11-26	2024-11-26
Parameter	Unit	G / S	RDL	6364581	6364582	6364583
Particle Size Distribution (Sand)	%		2	33	39	37
Particle Size Distribution (Silt)	%		NA	26	26	28
Particle Size Distribution (Clay)	%		NA	41	35	35
Soil Texture				Clay	Clay Loam	Clay Loam

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

6364581-6364583 % Silt is a calculated parameter. The calculated value is determined by subtracting the percent sand and clay values from 100 percent.

Analysis performed at AGAT Edmonton (unless marked by *)

Certified By:

AGAT Laboratories

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Quality Assurance

CLIENT NAME: ENVIROWEST
AGAT WORK ORDER: 24E226326
PROJECT: Olson
ATTENTION TO: Emily Low
SAMPLING SITE:
SAMPLED BY:

Soil Analysis

RPT Date: Nov 30, 2024			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Particle Size by Hydrometer															
Particle Size Distribution (Sand)	334	6346909	45	45	0.0%	< 2	103%	80%	120%	NA			NA		
Particle Size Distribution (Silt)	334	6346909	34	34	0.0%		102%	80%	120%	NA			NA		
Particle Size Distribution (Clay)	334	6346909	21	21	0.0%		97%	80%	120%	NA			NA		

Certified By:

AGAT Laboratories

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Method Summary

CLIENT NAME: ENVIROWEST

AGAT WORK ORDER: 24E226326

PROJECT: Olson

ATTENTION TO: Emily Low

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Particle Size Distribution (Sand)	INOR-171-6010	JONES 2001; SHEPPARD 2007	HYDROMETER
Particle Size Distribution (Silt)	INOR-171-6010	JONES 2001; SHEPPARD 2007	HYDROMETER
Particle Size Distribution (Clay)	SOIL 0520; SOIL 0110; SOIL 0120	JONES 2001; SHEPPARD 2007	HYDROMETER

AGAT Laboratories

2910 12 Street NE
Calgary, Alberta T2E 7P7
P: 403-735-2005 • F: 403-735-2771
webearth.agatlabs.com

Laboratory Use Only
Arrival Temperature: N/A
Cooler Quantity: 1
Custody Seal Intact: ☐ Yes ☐ No ☑ N/A
AGAT Job Number: 24E226326

Chain of Custody Record

Emergency Support Services Hotline 1-855-AGAT 245 (1-855-242-8245)

Report Information
Company: Enwaest Engineering
Contact: Emily Low
Address:
Phone: 403-783-9229

Project Information
Client Project #: Olson
Site Location:
Sample By:
AGAT Quote #:
If a quotation number is not provided, client will be billed at standard rates. See terms and conditions of quote for full details.

Invoice To Same as Report to ☑
Company:
Contact:
Email:
Address
Phone:
PO/CC #:

Report Information
1. Name: Emily Low
Email: elow@enwaestengineering.ca
2. Name:
Email:
3. Name:
Email:

Requirements *(Selection may impact detection limits)*

CCME	AB Tier 1	Alberta Surface Water
☐ Agricultural	☐ Agricultural	☐ Chronic
☐ Industrial	☐ Industrial	☐ Acute
☐ Residential/Park	☐ Residential/Park	☐ SK Notice of Site Cond.
☐ Commercial	☐ Commercial	☐ Drinking Water
☐ FWAL	☐ Natural Area	☐ Other:

Is this part of the Alberta SRP program? ☐ YES ☐ NO (If yes, please fill below)
Application Number:
Grant Amount:
Well/Facility/Location ID:
UWI:

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 Business Days
Rush TAT ☐ <24 Hours (200%) ☐ Next Business Day (100%) ☐ 2 Business Days (50%) ☐ 3 Business Days(25%)
Date Required:

LABORATORY USE (LAB ID #)	SAMPLE IDENTIFICATION	DEPTH	DATE/TIME SAMPLED	SAMPLE MATRIX	COMMENTS	# OF CONTAINERS: VIALS / JARS	BAGS	BOTTLES	Field Filtered (Y/N)	Preserved (Y/N)	Detailed Salinity: ☐ AB ☐ SK ☐ BC ☐ D50	☐ CCME/AB : BTEX/F1-F4 ☐ CCME/AB : BTEX /F1-F2	☐ BC: BTEXS/VPH/EPH ☐ BC: LEPH/HEPH	SK: BTEX/TVH/C11-C22, C23-C60	Soil Metals: ☐ HWS-B ☐ SP-B ☐ Hg ☐ Cr^{6+}	Water Metals: ☐ Dissolved ☐ Total ☐ Hg ☐ Cr^{6+}	Routine Water Chemistry	Landfill: ☐ AB Class 2 ☐ BC ☐ SK	Coliforms: ☐ Total ☐ Fecal ☐ E.coli	Particle Size: ☐ Sieve (75µm) ☐ Texture	Hold For 30 Days No Analysis (Additional Fees May Apply)	Long Term Storage - 6 Months	Long Term Storage - 1 Year	Hazardous (Y/N)
1	BH01-01		Nov 26/24	Soil			1	4												X				
2	BH02-01		↓	↓			1													X				
3	BH03-01						1													X				
4																								
5																								
6																								
7																								
8																								
9																								
10																								

'24 NOV 26 10:45 AM

Samples Relinquished By (Print Name and Sign)	Date/Time	Samples Received By (Print Name and Sign)	Date/Time
Emily Low [redacted]	Nov 26/24 10:30	[redacted]	

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page 1 of 1
N°: AB 174911

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: Enviromart

Courier: Drop off Prepaid Collect

Waybill#_____

Branch: EDM GP FN FM RD VAN LYD FSJ EST SASK Other:___

If multiple sites were submitted at once: Yes No

Custody Seal Intact: Yes No NA

TAT: <24hr 24-48hr 48-72hr Reg Other_____

Cooler Quantity: 1

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes No

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Color , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry:_____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES NO Precaution Taken:_____

Legal Samples: Yes No

International Samples: Yes No

Tape Sealed: Yes No

Coolant Used: Icepack Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar)___+___+___=____°C 2(Bottle/Jar)___+___+___=____°C

3 (Bottle/Jar)___+___+___=____°C 4 (Bottle/Jar)___+___+___=____°C

5 (Bottle/Jar)___+___+___=____°C 6 (Bottle/Jar)___+___+___=____°C

7 (Bottle/Jar)___+___+___=____°C 8 (Bottle/Jar)___+___+___=____°C

9 (Bottle/Jar)___+___+___=____°C 10 (Bottle/Jar)___+___+___=____°C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: 24E226326

Samples Damaged: Yes No If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial_____

General Comments: _____

* Subcontracted Analysis (See CPM)

Date issued: March 11, 2020
Document ID: SR-9505.004

Data Set: Y:\Operations\Client Data\43075 Scott Olsen\24MW01.aqt
Date: 01/09/25
Time: 14:19:31

PROJECT INFORMATION

Company: Envirowest Engineering
Client: Scott Olsen
Project: 2411-43075
Test Date: Dec 10 - 16, 2024
Test Well: 24MW01

AQUIFER DATA

Saturated Thickness: 1.5 m
Anisotropy Ratio (Kz/Kr): 1.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.642

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	3.365E-9	cm/sec
y0	2.938	m

T = K*b = 5.048E-7 cm²/sec