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	RA25004	NW 12-40-1 W5M

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.

January 2,2025

Date of signing

[redacted]

Signature

Brett Beechinor

Print name

Corporate name (if applicable)

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)
Lagoon	61m x 61m x3.7m deep
Dairy Barn	95.7m x35.6
In Barn Manuare Pit	3.6mx 3.6m x 3.6m

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

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
None		

NRCB USE ONLY

New CFO

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

Construction completion date for proposed facilities _____

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**
AO Note: Part 1 application provided the following livestock numbers:			
Dairy cows (plus associated dries and replacements)	0	175	175

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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 2 day of January, 2024

[redacted]

Signature of Applicant or Agent

AO Note, water application is in progress

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 ____ day of _____, 20___.

Signature of Applicant or Agent

OPTION 4: Uncertain if *Water Act* licence is needed; acknowledgement of risk (for existing CFOs only)

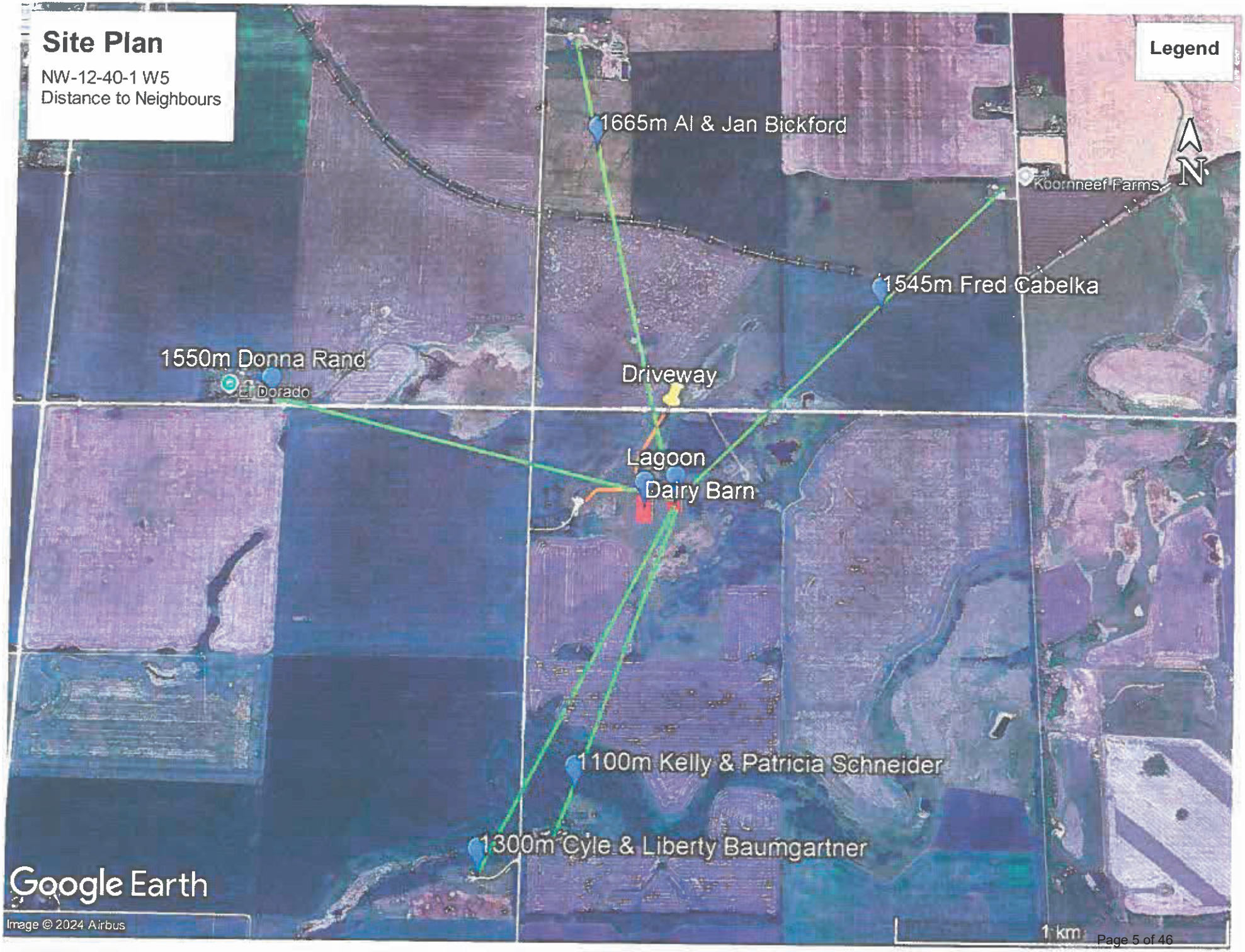
1. At this time, I (we) do not know whether a new water licence is needed from EPA under the *Water Act* for the development or activity proposed in this AOPA application.
2. If a new *Water Act* licence is needed, I (we) request that the NRCB process the AOPA application **independently of** EPA's processing 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 additional 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 my *Water Act* licence application, if a new water licence is needed.
5. I (we) acknowledge that any such construction or livestock increase 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 license number(s) or water conveyance agreement details _____

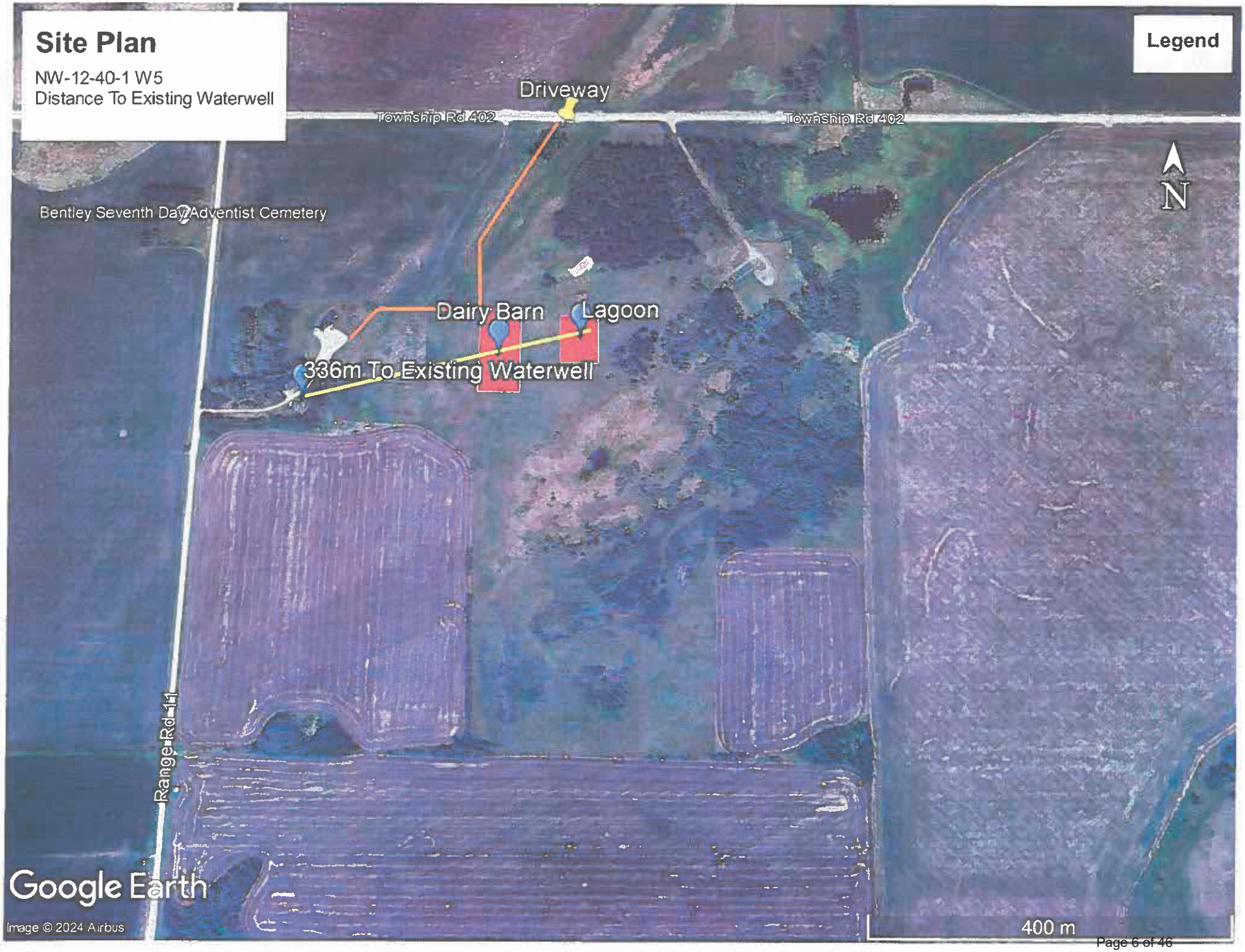
_____

Signed this ____ day of _____, 20____.

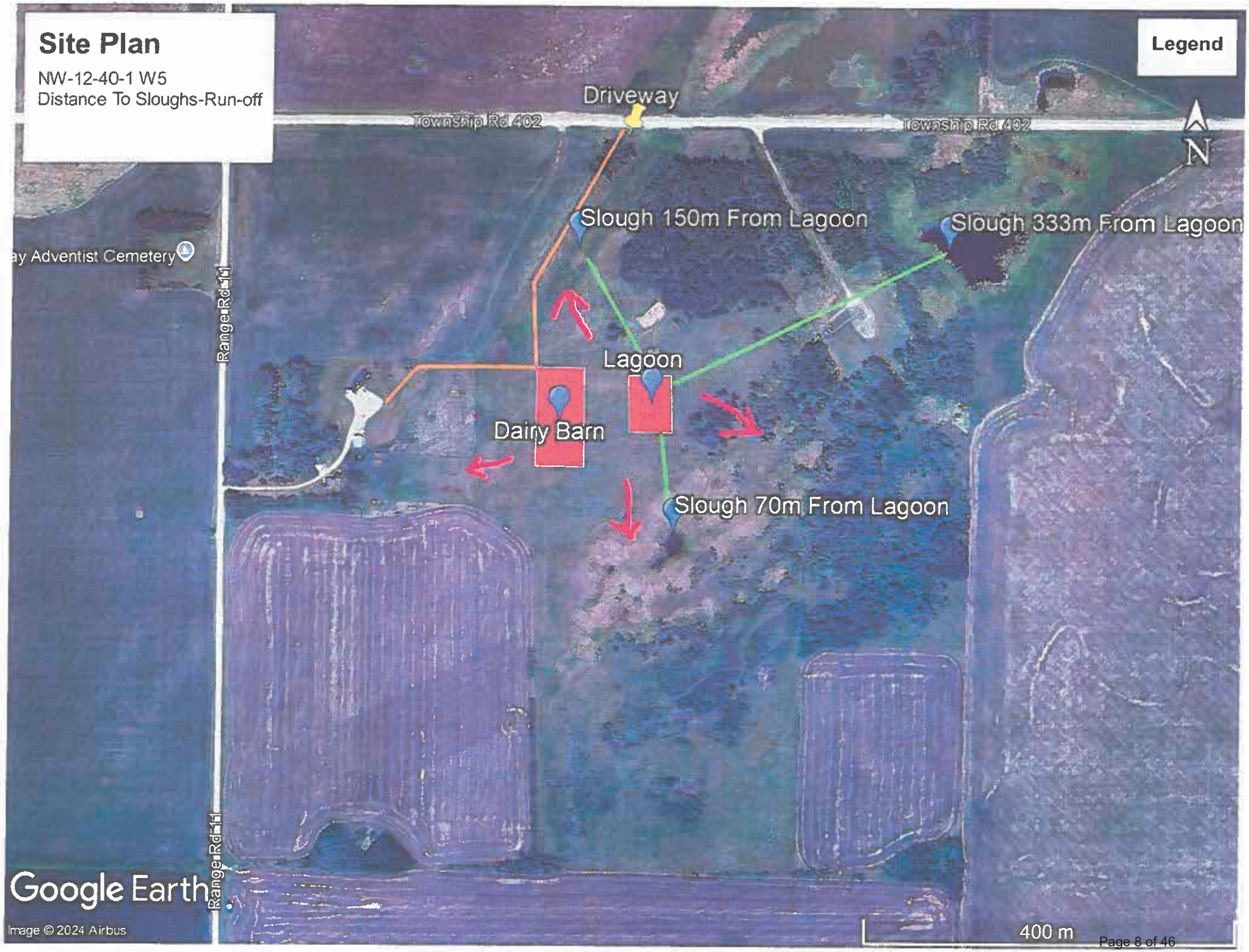
_____

Signature of Applicant or Agent


Site Plan
NW-12-40-1 W5
Distance to Neighbours
Legend
1665m Al & Jan Bickford
Koornneef Farms
1545m Fred Cabelka
1550m Donna Rand
Dorado
Driveway
Lagoon
Dairy Barn
1100m Kelly & Patricia Schneider
1300m Cyle & Liberty Baumgartner
Google Earth
Image © 2024 Airbus
1 km
N


Site Plan
NW-12-40-1 W5
Distance To Existing Waterwell
Legend
Driveway
Township Rd 402
Township Rd 402
N
Bentley Seventh Day Adventist Cemetery
Dairy Barn
Lagoon
336m To Existing Waterwell
Range Rd 11
Google Earth
Image © 2024 Airbus
400 m


Site Plan
Legend
Driveway
Township Rd 402
Township Rd 402
261m Barn To North Property Line
270m EMS to North Property Line
Bentley Seventh Day Adventist Cemetery
N
Lagoon
Dairy Barn
426m Barn to East Property Line
329.69m EMS To East Property Line
Range Rd 14
Google Earth
Image © 2024 Airbus
400 m


Site Plan
NW-12-40-1 W5
Distance To Sloughs-Run-off
Legend
Driveway
Township Rd 402
Township Rd 402
N
Slough 150m From Lagoon
Slough 333m From Lagoon
Lagoon
Dairy Barn
Slough 70m From Lagoon
Range Rd 11
Range Rd 11
Google Earth
Image © 2024 Airbus
400 m

Part 2 – Technical Requirements

NRCB Natural Resources Conservation Board

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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: _____ **Proposed 1:** Lagoon (EMS) and dairy 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	Not in a flood plain
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?		0			☒ YES ☐ NO ☐ YES with exemption	No springs observed at site
	How many water wells are within 100 m of the manure storage facility or manure collection area?		0			☒ YES ☐ NO ☐ YES with exemption	Confirmed
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)		70m			☒ YES ☐ NO ☐ YES with exemption	Confirmed slough approx 70 m from proposed EMS
Groundwater information	What is the depth to the water table?		<13.7m*			☒ YES ☐ NO ☐ YES with exemption	Water table at 4.21 m
	What is the depth to the groundwater resource/aquifer you draw water from?		36.5m			☒ YES ☐ NO ☐ YES with exemption	UGR at 35.7 m in WW 1066173

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

Drilling reports attached

* AO note, the soils investigation report stated that the water table was not found in their boreholes that extended to 13.7 m below grade

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

NRCB Natural Resources Conservation Board

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**
Al & Jan Bickford	NW-13-40-1 W5	1665	Ag	1	1569 m		Yes
Donna Rand	SW-14-40-1 W5	1550	Ag	1	1277 m		Yes
Kelly & Patrricia Schneider	SW-12-40-1 W5	1100	Ag	1	1035 m		Yes
Cyle & Liberty Baumgartner	SE-11-40-1-W5	1300	Ag	1	1226 m		Yes
Fred Cabelka	SE-13-40-1-W5	1545	Ag	1	1678 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)**
Barney & Melody Beechinor	NW-12-40-1-W5	25	Black Soil	25 ha	Yes
John Beechinor	SW-1-40-1-W5	64	Black Soil	64 ha	Yes
L&L Beechinor Acres	SE-5-40-1 W5	48.5	Black Soil	48.5 ha	Yes
Beechinor Land & Livestock	NE-14-39-1-W5	35	Black Soil	35 ha	Yes
Beechinor Land & Livestock	SW-4-40-1 W5	48.5	Black Soil	48.5 ha	Yes
			Total	221 ha	

* 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)

Manure Spreading Agreement

This agreement is between Brett & Jaidyn Beechinor (Beechinor Family Dairy), And Stefon Beechinor (Beechinor Land & Livestock).

LLD	Hectares available for manure spreading	Soil Type
NE-14-39-1 W5	35	Black Soil
SW-4-40-1 W5	48.5	Black Soil

The length of the agreement is for three years

Manure will be produced at LLD NW-12-40-1 W5

Date; Jan 2/25

[redacted]
Brett Beechinor

[redacted]
Jaidyn Beechinor

Beechinor Family Dairy

[redacted]
Stefon Beechinor

Beechinor Land & Livestock

Manure Spreading Agreement

This agreement is between Brett & Jaidyn Beechinor (Beechinor Family Dairy), And Barney & Melody Beechinor (L&L Beechinor Acres).

LLD	Hectares available for manure spreading	Soil Type
NW-12-40-1 W5	25	Black Soil
SE-5-40-1 W5	48.5	Black Soil

The length of the agreement is for three years

Manure will be produced at LLD NW-12-40-1 W5

Date: Jan 2/25

[redacted]
Brett Beechinor

[redacted]
Jaidyn Beechinor

Beechinor Family Dairy

[redacted] PRESIDENT.

[redacted]
Barney Beechinor

[redacted]
Melody Beechinor

L&L Beechinor Acres

Manure Spreading Agreement

This agreement is between Brett & Jaidyn Beechinor (Beechinor Family Dairy), And John Beechinor (Beechinor Bros Simmentals).

LLD	Hectares available for manure spreading	Soil Type
SW-1-40-1 W5	64	Black Soil

The length of the agreement is for three years

Manure will be produced at LLD NW-12-40-1 W5

Date; Jan 2/25

[redacted]

Brett Beechinor

[redacted]

Jaidyn Beechinor

Beechinor Family Dairy

[redacted]

John Beechinor

Beechinor Bros Simmentals

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
Dairy barn	Low	Low	RA25004
EMS	Low	Low	RA25004

ERST for **existing** facilities

Facility	Groundwater score	Surface water score	File number
No existing CFO facilities			

ERST related comments:

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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: 1066173 _____ _____ _____

_____ _____ _____

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:

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NRCB USE ONLY

MINIMUM DISTANCE SEPARATION

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

Margin of error (if applicable): +/- 2 m

Requirements (m): Category 1: 332 m Category 2: 443 m Category 3: 554 m Category 4: 886 m

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: 163 ha

Land base listed: 221 ha

Area not suitable: accounted for

Available area 221 ha 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 _____

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

February 12, 2025	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: January 23, 2025

Municipality: Lacombe 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: Gull Lake Deer Creek Gas Co-op; CNRL ☐ 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

Part 2 — Technical Requirements

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

LIQUID MANURE STORAGE: Earthen manure storage (EMS): Naturally occurring protective layer

*(complete a copy of this section for **EACH** proposed earthen liquid manure storage facility with a naturally occurring protective layer)*

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

1. New lagoon
2. _____

Manure storage capacity *(complete a separate row of this table for each cell of the EMS)*

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	Slope run:rise			NRCB USE ONLY	
					Inside end walls	Inside side walls	Outside walls	Calculated storage capacity (m^3) (excl. 0.5 m freeboard)	Filled in lower ¼? Y/N
1.	61	61	3.7	3.2	3:1	3:1	4:1	7594 cubic m.	yes
2.									
							TOTAL CAPACITY	7594 cubic m.	

Surface water control systems

Describe the run-on and runoff control system

The above grade dykes of .05m will prevent runoff from entering the facility.
The run off from the yard will go to the gully east of the house and run south.
Any over flow from the lagoon will enter a slough east of the Lagoon and be held there.

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	4.2 (m)	Provide details (as required)	
Soil texture	39 % sand	29 % silt	32 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: Bore Hole 24BH01 Depth-9.75m	Hydraulic conductivity (cm/s): 4.2 x10-7cm/sec.	Describe test standard used: Bouwer-rice method

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

NRCB USE ONLY

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

NRCB USE ONLY

Liquid manure storage volume calculator attached: ☒ YES ☐ NO

Depth to water table: 4.21 m Requirements met: ☒ YES ☐ NO

Depth to uppermost groundwater resource: 35.7 m Requirements met: ☒ YES ☐ NO

Comments:

ERST completed: ☒ see ERST page for details

Surface water control systems

Requirements met: ☒ YES ☐ NO Details/comments:

Naturally occurring protective layer details

Layer specification comments (e.g. description of the layer texture, layer thickness/depth and the methodology used to collect this information such as sand lenses, number, and location of boreholes):

Leakage detection system required: ☐ YES ☒ NO If yes, please explain why.

NRCB USE ONLY **LIQUID MANURE STORAGE VOLUME CALCULATOR (if applicable)**	
Facility 1	
Name / description EMS	Capacity 7594 cubic metres
Facility 2	
Name / description In barn pits	Capacity 46.6 cubic metres
Facility 3	
Name / description	Capacity
Facility 4	
Name / description	Capacity
TOTAL CAPACITY	7594 cubic metres
REQUIRED 9 MONTH STORAGE CAPACITY	5644 cubic metres
MEETS THE REQUIREMENTS FOR A MINIMUM OF 9 MONTHS STORAGE	☒ YES ☐ NO

LIQUID MANURE COLLECTION AND/OR STORAGE: In-barn - Concrete liner

*(complete a copy of this section for **EACH** proposed in barn liquid manure storage facility with a concrete liner)*

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

1. Dairy Barn
2. In Barn Manure Pit
3. _____

Manure storage capacity *(use one row in the table for **EACH** in-barn storage. Attach additional pages if you require more rows)*

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	**NRCB USE ONLY** Calculated storage capacity (m^3)
1.	95.7	35.6			
2.	3.6	3.6	3.6	3.6	46.6 cubic m.
3.					
				TOTAL CAPACITY	

Concrete liner details

Scrape alleys or unslatted portions of barn floors (if applicable)	Concrete thickness 0.13m	Method of sulphate protection Type 10 cement with fly ash	
	Concrete strength 32 MPa @ 28 days	Concrete reinforcement size and spacing 10mm rebar at 0.39 spacing both ways	
In-barn manure pit floors	Concrete thickness 0.15m	Method of sulphate protection Type 10 cement with fly ash	
	Concrete strength 32MPa @ 28 days	Concrete reinforcement size and spacing 10mm rebar at 045m spacing both ways	
In-barn manure pit walls	Concrete thickness 0.20m	Method of sulphate protection Type 10 cement fly ash	
	Concrete strength 32MPa @ 28 days	Horizontal reinforcement size and spacing 10mm rebar spaced at 0.6m	Vertical reinforcement size and spacing 15mm rebar spaced at 0.6m

LIQUID MANURE COLLECTION AND/OR STORAGE: In-barn - Concrete liner (cont.)

Describe how the joints at the junction of the pit walls, pit floors and any other joints will be sealed
Water stop or caulked joints

Describe sealing practices for piping, etc. that penetrates the liner
Volclay waterstop Rx101

Concrete requirements can be found in Technical Guideline Agdex 096-93
Guideline minimums:
Solid manure: 25MPa (D)
Solid manure (wet): 30MPa (C)
Liquid manure: 32MPa (B)
Category A is required to be engineered
Method of sulphate protection:
Type 50 or Type 10 with fly ash or equivalent

NRCB USE ONLY

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

Additional information

NRCB USE ONLY

Liquid manure storage volume calculator attached: ☒ YES ☐ NO

Depth to water table: 4.21 m — Requirements met: ☒ YES ☐ NO

Depth to uppermost groundwater resource: 35.7 m — Requirements met: ☒ YES ☐ NO

ERST completed: ☒ see ERST page for details

Concrete liner requirements

Leakage detection system required: ☐ YES ☒ NO If yes, please explain why

AO Note: Applicant is proposing to have a dry cow pen in the barn, that uses a naturally occurring protective layer. This will be within the barn dimensions.

Part 2 — Technical Requirements

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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. Dry Cows Pens
2. _____

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	NRCB USE ONLY Estimated storage capacity (m³)
1.	81	8	0	
2.				
			TOTAL CAPACITY	

☐ 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

In the barn

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	4.2 (m)	Provide details (as required)	
Soil texture	39 % sand	29 % silt	32 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: Bore Hole 24BH01 Depth 9.75m	Hydraulic conductivity (cm/s): 42x10-7cm/sec	Describe test standard used: Bouwer-Rice Method

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

NRCB USE ONLY

Requirements met: ☒ YES ☐ NO

Condition required: ☒ YES ☐ NO

Report attached: ☒ YES ☐ NO

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

NRCB USE ONLY

Nine month manure storage volume requirements met: ☐ YES ☒ YES With STMS ☐ NO

Depth to water table: 4.21 m Requirements met: ☒ YES ☐ NO

Depth to uppermost groundwater resource: 35.7 m Requirements met: ☒ YES ☐ NO

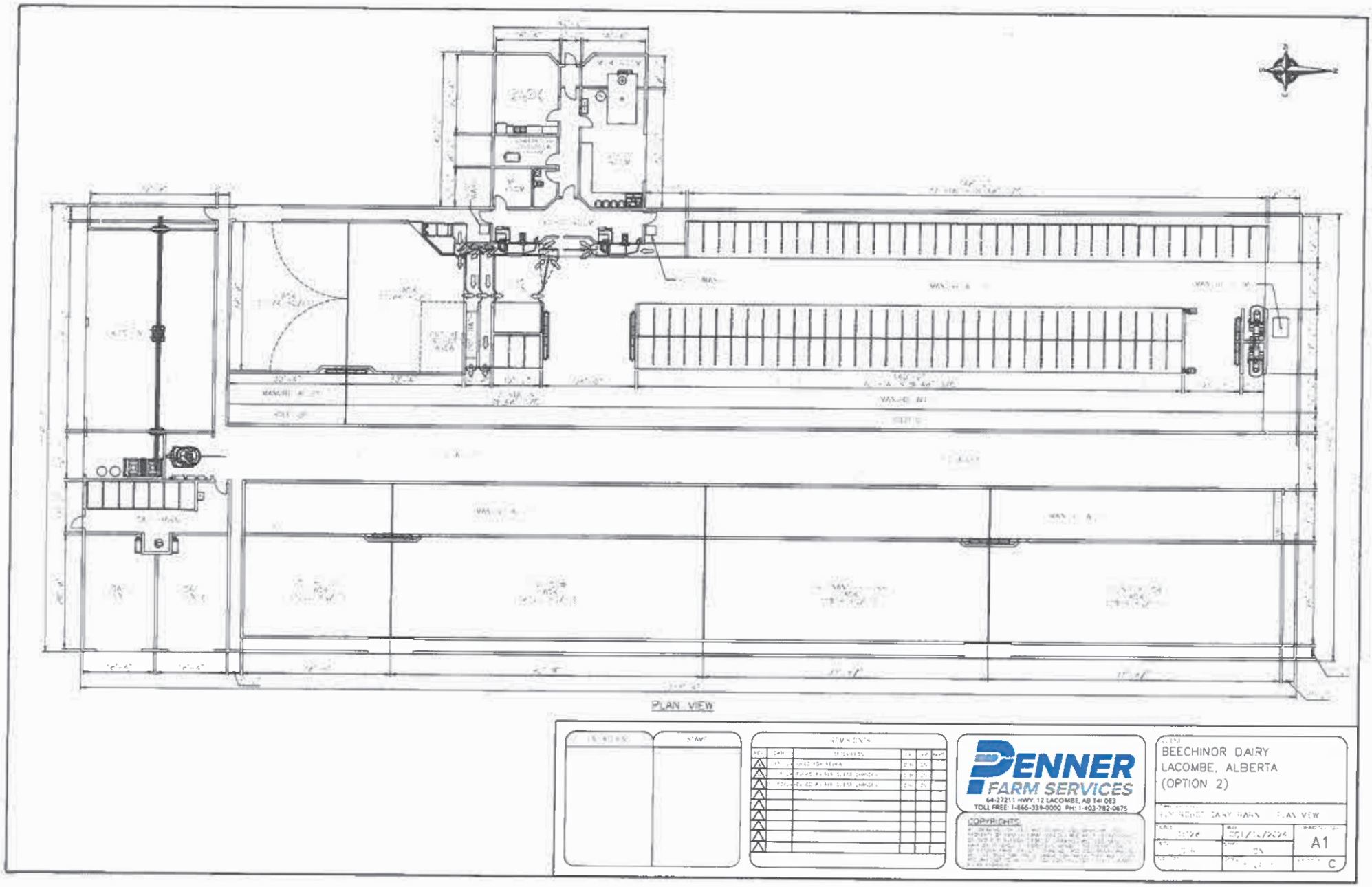
ERST completed: ☒ see ERST page for details

Surface water control systems

Requirements met: ☒ YES ☐ NO Details/comments:

Naturally occurring protective layer details

Layer specification comments (e.g. sand lenses; layering uniform or irregular; number and location of boreholes):


PLAN VIEW
PENNER
FARM SERVICES
64-27211 HWY. 12 LACOMBE, AB T4l 0E3
TOLL FREE: 1-866-339-0000 PH: 1-403-782-0675
COPYRIGHT
BEECHINOR DAIRY
LACOMBE, ALBERTA
(OPTION 2)
A1
C

Alberta

Water Well Drilling Report

View in Metric | Export to Excel

The data supplied in this report is the best available information. The Province of Alberta is not responsible for its accuracy. This information in this report will be reviewed and may be updated.

GIC Well ID 1086173
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 2010/11/30

GOWN ID

Well Identification and Location

Measurement in Imperial

Owner Name		Town	Province	Country	Postal Code
GIBSON, IAN	[redacted]	BENTLEY	ALBERTA	CANADA	T0C 0J0

Location	1/4 or LSD	SEC	TWP	RGE	Wof MER	Lot	Block	Plan	Additional Description
	NW	12	40	1	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 52.432550 Longitude -114.023820
How Location Obtained
Differential corrected handheld GPS 5-10m

Elevation 3003.00 ft
How Elevation Obtained
Differential corrected handheld GPS 5-10m

Drilling Information

Method of Drilling
Rotary - Air

Proposed Well Use
Domestic

Type of Work
New Well

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
15.00		Brown Clay
73.00		Gray Clay
117.00		Gray Shale
146.00	Yes	Gray Sandstone
160.00		Gray Shale

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 10.00 igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)
2010/10/08	25.00	58.00

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
160.00 ft	160.00 ft	2010/10/08	2010/10/08

Borehole

Diameter (in)	From (ft)	To (ft)
6.75	0.00	78.00
5.00	78.00	160.00

Surface Casing (if applicable)
Steel
Size OD 5.56 in
Wall Thickness 0.258 in
Bottom at 78.00 ft

Well Casing/Liner
Steel
Size OD. 4.50 in
Wall Thickness: 0.237 in
Top at 60.00 ft
Bottom at 160.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width (in)	Slot Length (in)	Hole or Slot Interval (in)
120.00	140.00	0.440		12.00

Perforated by Drill

Annular Seal Bentonite Chips/Tablets
Placed from 0.00 ft to 78.00 ft
Amount 50.00 Pounds

Other Seals
Type At (ft)

Screen Type
Size OD in
From (ft) To (ft) Slot Size (in)

Attachment
Top Fittings Bottom Fittings

Pack
Type Grain Size
Amount

Contractor Certification

Name of Journeyman Responsible for drilling/construction of well
RILEY PEARSON

Company Name
ALKEN BASIN DRILLING LTD.

Certification No
83061A

Copy of Well report provided to owner
Yes

Date approval holder signed
2010/10/08

Printed on 10/21/2024 2:12:22 PM

Alberta

Water Well Drilling Report

View in Metric | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be returned in public domain.

GIC Well ID 1066173
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 2010/11/30

GOWN ID

Measurement in Imperial

Well Identification and Location

Owner Name	Address	Town	Province	Country	Postal Code
GIBSON, IAN	[redacted]	BENTLEY	ALBERTA	CANADA	T0C 0J0

Location	1/4 or LSD	SEC	TWP	RGE	Wof M/ER	Lot	Block	Plan	Additional Description
	NW	12	40	1	5				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 52.432560 Longitude -114.023820
How Location Obtained
Differential corrected handheld GPS 5-10m

Elevation 3003.00 ft
How Elevation Obtained
Differential corrected handheld GPS 5-10m

Measurement in Imperial

Additional Information

Distance From Top of Casing to Ground Level 20.00 in
Is Artesian Flow
Rate igpm
Is Flow Control Installed
Describe

Recommended Pump Rate 10.00 igpm
Recommended Pump Intake Depth (From TOC) 120.00 ft
Pump Installed
Type
Depth ft
Make
H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS)
Depth: ft
Gas
Depth: ft
Well Disinfected Upon Completion: Yes
Geophysical Log Taken
Remedial Action Taken
Submitted to ESRD
Sample Collected for Potability
Submitted to ESRD

Additional Comments on Well:
AIR LEFT STEM IN HOLE 160'

Yield Test

Taken From Top of Casing

Measurement in Imperial

Test Date	Start Time	Static Water Level
2010/10/08	10:00 AM	58.00 ft

Method of Water Removal
Type: Pump
Removal Rate: 25.00 igpm
Depth Withdrawn From: 120.00 ft

If water removal period was < 2 hours, explain why

Pumping (ft)	Elapsed Time Minutes:Sec	Depth to water level Recovery (ft)
58.00	0:00	160.00
	1:00	130.00
	2:00	100.00
	3:00	83.00
	4:00	73.00
	5:00	65.00
	6:00	63.00
	7:00	61.00
	8:00	60.00
	9:00	59.00
	10:00	59.00
	12:00	58.00
	14:00	58.00
	16:00	58.00
	18:00	58.00
	20:00	58.00
	25:00	58.00
	120:00	58.00

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
SHOP	1200.00 ig	2010/10/07 3:30 PM

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
RILEY PEARSON
Company Name
AUKEN BASIN DRILLING LTD.
Certificate No.
83061A
Copy of Well report provided to owner
Yes
Date approval holder signed
2010/10/08

Printed on 10/21/2024 2:12:22 PM

Page: 2 / 2

ENVIROWEST
ENGINEERING

SITE AND SOIL ASSESSMENT

Proposed Dairy Operation – Manure Storage Lagoon
NW¼-12-040-01 W5M

Lacombe County, Alberta

Site and Soil Assessment
Proposed Dairy Operation – Manure Storage Lagoon
NW¼-12-40-01 W5M
Lacombe County, Alberta

Prepared For: Brett and Jaidyn Beechinor

Delivered via Email: beechfdairy@gmail.com

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

Report Date: December 24, 2024

Project Number: 2411-43073

Private and Confidential

Table of Contents

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Appendices

A. Figure
B. Borehole Logs
C. Certificate of Analysis

1.0 Introduction and Scope of Work

Envirowest Engineering (Envirowest) was retained by Brett and Jaidyn Beechinor to conduct a Site and Soil Assessment for the proposed construction of an earthen manure storage (EMS) lagoon for a proposed 175 head dairy operation including dries and replacements.

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 NW-12-040-01 W5M in Lacombe County.

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

Four investigative boreholes were drilled using a truck-mounted rotary auger and completed to a maximum depth of 13.7 m below ground surface (mbgs) on October 25, 2024. The boreholes were completed in the area proposed for a manure storage lagoon. The borehole locations are shown on Figure 1 (attached). One borehole was completed as a groundwater monitoring well to allow for in-situ hydraulic conductivity testing, which was completed between December 3 and 10, 2024. A piezometer was installed within a 1.0-meter radius of the monitoring well to allow for assessment of the groundwater table.

Representative soil samples were collected from boreholes within the proposed construction area and was submitted to an accredited third-party laboratory for analysis of soil properties.

2.0 Assessment Results

The results of the soil analysis completed by a third-party accredited laboratory are presented in Table 1 below. The soil sample locations are presented on Figure 1.0. Borehole logs and well completion details can be found in Appendix B.

Table 1: Soil Properties Results

Parameter	24BH01-02	24BH02-01	24BH02-02	24BH03-02	24BH04-01	24BH04-02
Sample Depth (m)	9.75	2.25	5.50	3.75	2.25	7.25
Particle Size (%sand)	39	43	43	42	43	43
Particle Size (%silt)	29	28	30	29	27	28
Particle Size (%clay)	32	29	27	29	30	29
Texture Class	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam
Hydraulic Conductivity (field)		-	-	-	-	-

Clay loam was found beneath topsoil consistently across the Site to the maximum depth of investigation (13.7 mbgs).

The monitoring well installed at borehole 24BH01 (24MW01) was sufficiently hydrated prior to completing the in-situ hydraulic conductivity testing. The in-situ hydraulic conductivity test was completed between December 3 and 10, 2024. The monitoring well was placed to assess the material below surface, and was screened from 10.5 to 13.5 meters below ground surface (mbgs) with bentonite filling the annulus below the screen from surface to 10.5 mbgs.

The initial depth to water was measured in the well. A microdiver was installed to log and measure 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 4.2×10^{-7} cm/sec.

A saturated water table was not encountered during the assessment to a maximum depth of 13.7 mbgs. It was concluded based on the field assessment that a standard water table is present and delineation was not required.

A piezometer was installed at the location of the proposed earthen manure storage lagoon, to a depth of 6.0 mbgs on October 25, 2024. Depth to water table was measured to be 4.21 mbgs on December 10, 2024.

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

3.0 Liner Assessments

3.1 Natural Barrier Assessment (Liquid Manure Storage)

Based on the information obtained it was determined that the native clay within the proposed area of construction for liquid manure storage was found to the maximum depth of investigation to a maximum of 13.7 meters, generally at surface.

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

$$\frac{10\ \text{m}}{1 \times 10^{-6}\ \text{cm/sec}} = \frac{X\ \text{m}}{4.2 \times 10^{-7}\ \text{cm/sec}}$$

$$X = 4.2\ \text{m}$$

A minimum of **4.2** meters of native clay is required to be present to provide a sufficient protective barrier. It is found that there is sufficient protection across the proposed liquid manure storage lagoon.

4.0 Conclusions

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

The naturally occurring soils were determined to be appropriate for the construction of a naturally clay lined liquid manure storage facility.

5.0 Earthen Manure Storage Sizing

The new liquid EMS facility was designed for 175 head including dries and replacements for approximately 12 months storage (exceeding the minimum required 9 months storage). The manure storage lagoon is recommended to have the following specifications:

- To provide the required capacity the new EMS should be 61 m in length x 61 m in width. The overall depth has been designed as 3.7 m. The overall capacity of the new EMS will be 9,365 cubic metres (2.0 million imperial gallons) which accounts for the required 0.5 m of freeboard, a storage capacity of 7,594 cubic metres (1.7 million imperial gallons), approximately 12 months storage. The sizing is based on an inside end and side wall slope of 3:1 (run/rise)
- The overall depth of 3.7 m will be achieved through a below grade depth of 3.2 m. The above-grade dykes of 0.5 m will also prevent runoff from entering the facility. The outside dyke walls should be completed to at slope of 4:1. The crest of the dyke should be sloped slightly outward to direct rainfall away from the storage facility
- The below-grade depth of the EMS must maintain a minimum of a 1.0 m separation above the water table at the time of construction, should one be encountered
- Sand pockets that may be encountered during construction should be removed and replaced with find grained material
- Topsoil, frozen soil or rocks larger than 6 inches should not be included in the liner material
- The freeboard depth of 0.5 m and outside dyke walls should be covered with 0.1-0.2 m of topsoil and seeded to prevent soil erosion.
- The inlet pipe to the EMS should be located in the bottom 1/4 of the lagoon. The annulus around the inlet pipe should be sealed with a bentonite sealer.

Earthen Manure Storage Construction

The following general construction procedures are recommended, though some modifications may be required based on actual site conditions encountered during construction:

- The topsoil should be stripped from the area for construction. The topsoil can be reused on the freeboard area after construction completion
- Sand and gravel seams, if encountered, should be excavated during construction and should be removed
- Construction of the lagoon should be supervised by a professional engineer

Following completion of the lagoon the operator should:

- Ensure that shrubs, trees, and deep-rooted plants are not allowed to grow on or near the walls of the facility

6.0 Closure

Envirowest Engineering is pleased to submit the report to Brett and Jaidyn Beechinor. 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,

2024-12-24

December 24, 2024

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 #: 110275
DATE: December 24, 2024
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

7.0 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, P.Ag., holds a BSc in Sustainable Agriculture from the University of Alberta. She had five years of experience managing rangelands and navigating legislation and regulations for the Government of Alberta prior to commencing her employment with Envirowest Engineering in April 2019. She is a Professional Agrologist in Alberta (Alberta Institute of Agrologists).

8.0 References

GOA (Government of Alberta). (January 2022). Agricultural Operation Practices Act and Regulations. Edmonton, AB: Author.

GOA (Government of Alberta). (2020). Agricultural Operation Practices Act: Standards and Administration Regulation. Edmonton, AB: Author.

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Environmental Assessment Report – General Conditions

1.0 Use of Report

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of Envirowest Engineering's (Envirowest's) client. Envirowest does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than Envirowest's client (hereunder referred to as the "Client") or an approved agent of the Client. Any unauthorized use of or reliance on the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of Envirowest. The Client agrees that it shall use the report for its own internal purposes and it shall not provide the report to another party other than an approved agent.

2.0 Limitation of Report

This report is based solely on the conditions that existed on site at the time of Envirowest's investigation. The Client, and any other parties using this report with the express written consent of the Client and Envirowest, acknowledge that conditions affecting the environmental assessment of the site can vary with time and that the conclusions and recommendations set out in this report are time sensitive.

The Client, and any other party using this report with the express written consent of the Client and Envirowest, also acknowledge that the conclusions and recommendations set out in this report are based on limited observations and testing on the subject site and that conditions may vary across the site which, in turn, could affect the conclusions and recommendations made.

The Client acknowledges that Envirowest is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the site, the decisions on which are the sole responsibility of the Client.

3.0 Information Provided to Envirowest by Others

During the performance of the work and the preparation of this report, Envirowest may have relied on information provided by persons other than the Client. While Envirowest endeavours to verify the accuracy of such information when instructed to do so by the Client, Envirowest accepts no responsibility for the accuracy or the reliability of such information that may affect the report.

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4.0 Limitation of Liability

The Client recognizes that property containing contaminants and hazardous wastes creates a high risk of claims brought by third parties arising from the presence of those materials. In consideration of these risks, and in consideration of Envirowest providing the services requested, the Client agrees that Envirowest's liability shall be limited as follows:

(1) With respect to any claims brought against Envirowest by the Client for damages of any kind whatsoever, including without limitation, incidental, consequential, exemplary or punitive, for any reason whatsoever arising out of the provision or failure to provide services hereunder the amount of such claim and the extent of Envirowest's liability shall be limited to the amount of fees paid by the Client to Envirowest under this Agreement.

(2) With respect to claims brought by third parties arising out of the presence of contaminants or hazardous wastes on the subject site, the Client agrees to indemnify, defend, and hold harmless Envirowest from and against any and all claim or claims, action or actions, demands, damages, penalties, fines, losses, costs and expenses of every nature and kind whatsoever, including solicitor-client costs, arising or alleged to arise either in whole or part out of services provided by Envirowest.

5.0 Disclosure of Information by Client

The Client agrees to fully cooperate with Envirowest with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client acknowledges that in order for Envirowest to properly provide the service, Envirowest requires and shall rely upon the full disclosure and accuracy of any and all such information.

6.0 Standard of Care

Services performed by Envirowest for this report have been conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Engineering and scientific judgment have been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of this report.

7.0 Ownership of Instruments of Service

The Client acknowledges that all reports, plans, and data generated by Envirwoest during the performance of the work and other documents prepared by Envirowest are considered its professional work product and shall remain the copyright property of Envirowest.

Appendix A

Figure

ENVIROWEST ENGINEERING

Title:

Borehole Locations
Site and Soil Assessment
NW¼-Sec.12-Twp.040-Rge.01-W5M
Lacombe County , Alberta

Project No: 2411-43073	**Date:** December 12, 2024
Scale: 1: 2500	**Prepared By:** E.Low
Image Source: Google Earth Pro (June 6, 2023)	

Figure No.: **1.0**

Appendix B

Borehole Logs

ENVIROWEST ENGINEERING

LOG OF BORING 24BH01

Site and Soil Assessment
NW¼-Sec.12-Twp.040-Rge.01-W5M
Lacombe County, Alberta
Project Number: 2411-43073
ASTM D2487/D2488

Driller: : Evergreen Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : October 25, 2024
Logged By: : Emily Low P.Eng.

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Well Elev.	Water Level
0.0				TOPSOIL		
0.3				SANDY CLAY, firm, damp, brown		
0.5						
0.8						
1.0						
1.3						
1.5						
1.8						
2.0						
2.3						
2.5						
2.8						
3.0						
3.3						
3.5						
3.8						
4.0						
4.3						
4.5						
4.8						
5.0						
5.3						
5.5					Solid	
5.8					Bentonite	
6.0						
6.3						
6.5						
6.8						
7.0				grey		
7.3						
7.5						
7.8						
8.0						
8.3						
8.5						
8.8						
9.0						
9.3						
9.5						
9.8				24BH01-02 (CLAY LOAM, Clay 32%)		
10.0						
10.3						
10.5						
10.8						
11.0						
11.3						
11.5						
11.8						
12.0						
12.3					Screen	
12.5					Sand	
12.8						
13.0						
13.3						
13.5						

12-24-2024 Y:\Operations\Client Data\43073 Beechinor\24BH01.bor

ENVIROWEST ENGINEERING

LOG OF BORING 24BH02

Site and Soil Assessment
NW¼-Sec.12-Twp.040-Rge.01-W5M
Lacombe County, Alberta
Project Number: 2411-43073
ASTM D2487/D2488

Driller: : Evergreen Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : October 25, 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					
0.3				TOPSOIL	
0.5				SANDY CLAY, firm, damp, brown	
0.8					
1.0					
1.3					
1.5					
1.8					
2.0					
2.3				24BH02-01 (CLAY LOAM, Clay 29%)	
2.5					
2.8					
3.0					
3.3					
3.5					
3.8					
4.0					
4.3					
4.5					
4.8					
5.0					
5.3				24BH02-02 (CLAY LOAM, Clay 27%)	
5.5					
5.8					
6.0					
6.3					
6.5					
6.8					
7.0					
7.3					
7.5					
7.8					
8.0					
8.3					
8.5					
8.8					
9.0					
9.3					
9.5					
9.8					
10.0					
10.3					
10.5					
10.8					
11.0					
11.3					
11.5					
11.8					
12.0					

12-24-2024 Y:\Operations\Client Data\43073 Beechinon\24BH02.bor

ENVIROWEST ENGINEERING

LOG OF BORING 24BH03

Site and Soil Assessment
NW¼-Sec.12-Twp.040-Rge.01-W5M
Lacombe County, Alberta
Project Number: 2411-43073
ASTM D2487/D2488

Driller: : Evergreen Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : October 25, 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				TOPSOIL	
0.3				SANDY CLAY, firm, damp, brown	
0.5					
0.8					
1.0					
1.3					
1.5					
1.8					
2.0					
2.3					
2.5					
2.8					
3.0					
3.3					
3.5					
3.8				24BH03-02 (CLAY LOAM, Clay 29%)	
4.0					
4.3					
4.5					
4.8					
5.0					
5.3					
5.5					
5.8					
6.0					

12-24-2024 Y:\Operations\Client Data\43073 Beechinor\24BH03.bor

ENVIROWEST ENGINEERING

LOG OF BORING 24BH04

Site and Soil Assessment
NW¼-Sec.12-Twp.040-Rge.01-W5M
Lacombe County, Alberta
Project Number: 2411-43073
ASTM D2487/D2488

Driller: : Evergreen Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : October 25, 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					
0.3				TOPSOIL	
0.5				SANDY CLAY, firm, damp, brown	
0.8					
1.0					
1.3					
1.5					
1.8					
2.0					
2.3				24BH04-01 (CLAY LOAM, Clay 30%)	
2.5					
2.8					
3.0					
3.3					
3.5					
3.8					
4.0					
4.3					
4.5					
4.8					
5.0					
5.3					
5.5					
5.8					
6.0					
6.3					
6.5					
6.8					
7.0				grey	
7.3					
7.5				24BH04-01 (CLAY LOAM, Clay 29%)	
7.8					
8.0					
8.3					
8.5					
8.8					
9.0					
9.3					
9.5					
9.8					
10.0					
10.3					
10.5					
10.8					
11.0					
11.3					
11.5					
11.8					
12.0					

12-24-2024 Y:\Operations\Client Data\43073 Beechinor\24BH04.bor

Appendix C

Certificate of Analysis

AGAT Laboratories

2910 12TH STREET NE
CALGARY, ALBERTA
CANADA T2E 7P7
TEL (403)735-2005
FAX (403)735-2771
http://www.agatlabs.com

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

ATTENTION TO: Emily Low

PROJECT: Beechinor

AGAT WORK ORDER: 24R221130

SOIL ANALYSIS REVIEWED BY: Max Dou, Report Writer

DATE REPORTED: Nov 22, 2024

PAGES (INCLUDING COVER): 7

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 735-2005

*Notes

Disclaimer:

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- *This document is signed by an authorized signatory who meets the requirements of the MELCCFP, CALA, CCN and NELAP.*
- *For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.*

AGAT Laboratories

2910 12TH STREET NE
CALGARY, ALBERTA
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TEL (403)735-2005
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http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 24R221130

PROJECT: Beechinor

CLIENT NAME: ENVIROWEST

ATTENTION TO: Emily Low

SAMPLING SITE:

SAMPLED BY:

Particle Size - Texture (Sand, Silt, Clay)

DATE RECEIVED: 2024-11-13

DATE REPORTED: 2024-11-22

		SAMPLE DESCRIPTION:		24BH01-02	24BH02-01	24BH02-02	24BH03-02	24BH04-01	24BH04-02
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2024-10-25	2024-10-25	2024-10-25	2024-10-25	2024-10-25	2024-10-25
Parameter	Unit	G / S	RDL	6324071	6324073	6324074	6324075	6324076	6324077
Particle Size Distribution (Sand)	%		2	39	43	43	42	43	43
Particle Size Distribution (Silt)	%		2	29	28	30	29	27	28
Particle Size Distribution (Clay)	%		2	32	29	27	29	30	29
Soil Texture				Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam

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

6324071-6324077 Soil Texture is a calculated parameter. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.
% 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 Calgary (unless marked by *)

Certified By: [redacted]

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Quality Assurance

CLIENT NAME: ENVIROWEST
PROJECT: Beechinor
SAMPLING SITE:

AGAT WORK ORDER: 24R221130
ATTENTION TO: Emily Low
SAMPLED BY:

Soil Analysis

RPT Date: Nov 22, 2024

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Particle Size - Texture (Sand, Silt, Clay)															
Particle Size Distribution (Sand)	6324071	6324071	39	38	2.6%	< 2	113%	80%	120%						
Particle Size Distribution (Silt)	6324071	6324071	30	30	0.0%	< 2	87%	80%	120%						
Particle Size Distribution (Clay)	6324071	6324071	31	32	3.2%	< 2	96%	80%	120%						

Comments: Duplicate NA: results are less than 5X the RDL and RDP will not be calculated.

Certified By: [redacted]

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Method Summary

CLIENT NAME: ENVIROWEST

PROJECT: Beechinor

SAMPLING SITE:

AGAT WORK ORDER: 24R221130

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SAMPLED BY:

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