

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 <input checked="" type="checkbox"/> Approval <input type="checkbox"/> Registration <input type="checkbox"/> Authorization <input type="checkbox"/> Amendment	Application number <div style="font-size: 1.2em; font-weight: bold;">BA25011</div>	Legal land description <div style="font-size: 1.2em; font-weight: bold;">NW 27-60-3 W5M</div>
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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.

<div style="font-size: 1.5em; font-family: cursive;">April 1 2025</div> Date of signing	<div style="background-color: black; width: 100px; height: 40px; margin: 0 auto;"></div> Signature
<div style="font-size: 1.5em; font-family: cursive;">Linguenda Dairy</div> Corporate name (if applicable)	<div style="font-size: 1.5em; font-family: cursive;">San Otten</div> 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)
New Barn	152m 60m
Manure Storage sand recovery unit	76m 24m
Lagoon	91m x 76m x 5m
utility/tank/ calf room	70' x 78'
Lean too youngstock attached to barn	40' x 125'

Existing facilities: list ALL existing confined feeding operation facilities and their dimensions		
Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
Existing Barn (to be converted to youngstock barn)		
Existing Lagoon		
Shelter		

NRCB USE ONLY	Confirmed, existing CFO see appendix of Approval BA25011
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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)



Last updated September 11, 2023

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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

convert old Barn to Heifer Barn

Construction completion date for proposed facilities Dec 2028

Additional information

Expand existing CFO to 270 milking cows (plus associated dries and replacements)

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

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)

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 ____ day of _____, 20____.

Signature of Applicant or Agent

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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 1 day of April, 2025.

Signature of Applicant or Agent

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: _____

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?	<input type="checkbox"/> >1 m <input type="checkbox"/> ≤ 1 m	<input type="checkbox"/> >1 m <input type="checkbox"/> ≤ 1 m	<input type="checkbox"/> >1 m <input type="checkbox"/> ≤ 1 m	<input type="checkbox"/> > 1 m <input type="checkbox"/> ≤ 1 m	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	Not in flood plain
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?					<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	None known
	How many water wells are within 100 m of the manure storage facility or manure collection area?					<input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> 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)					<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	dug out/seasonal drain north, 285 m
Groundwater information	What is the depth to the water table?					<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	Confirmed
	What is the depth to the groundwater resource/aquifer you draw water from?					<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	water well ID 394393, Gray Shale

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

NRCB USE ONLY
ENVIRONMENTAL RISK SCREENING INFORMATION
ERST for proposed facilities

Facility	Groundwater score	Surface water score	File number
See Decision Summary BA25011			

ERST for existing facilities

Facility	Groundwater score	Surface water score	File number
Dairy barn	Low	Low	BA25011
EMS	Low	Low	BA25011

ERST related comments:

NRCB USE ONLY
WATER WELL AND SURFACE WATER INFORMATION

ID394393

Well IDs:

ID354623

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
ID 354623	17	5	Dairy barn
ID 394393	17	9	Dairy barn

Groundwater or surface water related comments:

769



200m

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

	Neighbour name(s)	Legal land description	Distance (m)	NRCB USE ONLY				
				Zoning (LUB) category	MDS category (1-4)	Distance (m)	Waiver attached (if required)	Meets regulations
①	Bilker	NE 28-60-3 W5		Ag	Cat 1	214 & 276*	Yes	Yes
②	Bentz	SE 28-60-3 W5		Ag	Cat 1	1035	n/a	Yes
③	Van Leeuwen	NE 21-60-3 W5		Ag	Cat 1	1020	n/a	Yes
④	Grailach	NE 27-60-3 W5		Ag	Cat 1	1236	n/a	Yes

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

Name of land owner(s)*	Legal land description	Usable area** (ha)	Soil zone ***	NRCB USE ONLY	
				Usable area (ha)	Agreement attached (if required)
NW 207 owned		140ac	grey soil zone		
SW 27 owned		140ac			
SE 27 owned		140ac			
see attached					
Total				Applicant has provided enough land with agreements	

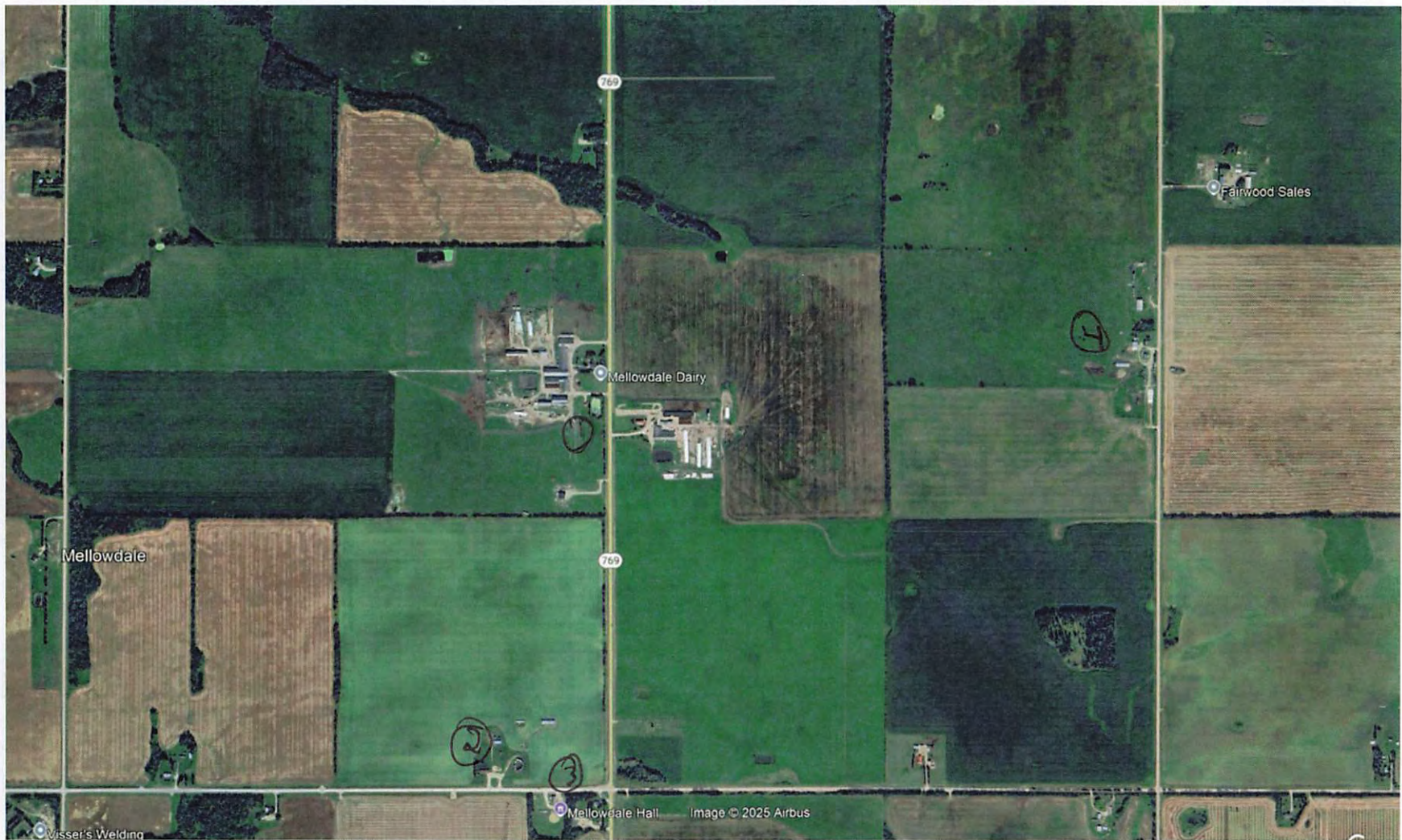
* If you are **not** the registered landowner, you must attach copies of land use agreements signed by all landowners.

** 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)

*neighbour has 2 residences that the waiver is for.





Minimum Distance Separation (MDS) Waiver (declaration)

Applicant information

NRCB application number: _____

Operator/operation name: Jan Otten Looquenda dairy

Address: [REDACTED] Postal Code: [REDACTED]

Legal land location of confined feeding operation: NW 27 TWP 60 Range 3 W 5

I have requested the residence owner(s) named below to waive the required minimum distance separation (MDS) to their residence for the *Agricultural Operation Practices Act* (AOPA) permit application identified above. In making this request, I have provided the owner(s) with an opportunity to review my permit application and a copy of the Natural Resources Conservation Board (NRCB) Fact Sheet "Minimum Distance Separation (MDS) Waivers" available on the NRCB website at www.nrcb.ca. I have also explained:

- The MDS requirement set out in section 3 of the Standards and Administration Regulation of AOPA. I have advised the owner(s) that section 3(6)(a) of the Standards and Administration Regulation allows this requirement to be waived by the owners of residences, if they agree in writing to grant a waiver;
- That my proposed development does not meet the required MDS to the owner's residence; and,
- That this waiver applies only to this application as described. An increase in livestock capacity, annual manure production, level of odour production, change to the site plan or change to a facility that would increase the MDS would require a new waiver.

Following is a summary of the proposed development:

- The current scope of my confined feeding operation (CFO), including the type, number, and category of livestock, if any, is:

150 Dairy Cows milking + youngstock

- My application for a new AOPA permit proposes the following changes to the existing livestock category, type and/or capacity at my CFO:

Barn, Storage Shed, Lagoon

270 milking + young Stock Lagoon

- The proposed new CFO facility(ies), or changes to the existing CFO facilities, including manure storage, manure storage volume and any other pertinent details, if any, are (attach a site layout plan if available):

I the applicant understand that the waiver is not valid unless ALL registered owners of the residence sign this document.

Permit Applicant: [REDACTED] Date: March 17 2025

Signature

Residence owner(s) to initial: _____

2 residences owned by waiver

Minimum Distance Separation (MDS) Waiver (declaration)

Residence owner(s) information

ALL Names on land title: Gerrit Bikker Anita Bikker

Legal land location of residence(s): 28 NE Twp 60 Range 3 W5

Telephone number(s)¹: [REDACTED] Email address(es)¹: _____

Address(es)¹ and Postal code(s)¹: [REDACTED]

¹ Please note that personal contact information is for NRCB use ONLY and not publicly released

I am/we are the legal landowner(s) of a residence(s) located at the above noted legal land location/address:

- I/we have read the NRCB Fact Sheet "Minimum Distance Separation (MDS) Waivers";
- I/we have discussed this application with the applicant and understand its potential impacts to our residence(s);
- I/we understand that the application **does not** meet the MDS requirement to my/our residence(s), under the *Agricultural Operation Practices Act* (AOPA);
- I/we understand that this waiver is not valid unless signed by ALL parties identified on the land title as owners;
- I/we are not obligated to waive the MDS requirement to our residence(s);
- I/we understand that if I/we choose to waive the MDS requirement, I/we can revoke the waiver, by providing written notice to the NRCB approval officer, as set out in the "Minimum Distance Separation (MDS) Waivers" Fact Sheet; and
- I/we understand that this waiver is a public document.

Having considered my/our rights, I/we hereby waive the MDS requirement to my/our residence, with respect to

Application number

BA25011

Signatures of all residence owner(s) on title

Printed names of all residence owner(s) on title

Gerrit Bikker and Anita Bikker, Meadowdale Dairy

Date: March 20 2025

Manure Spreading Agreement

This agreement is between Linguenda Dairy, manure producer, and
Linda Lindquist manure receiver.

Length of agreement: This agreement is valid for a time period of 5
(minimum of one year)

Legal land location	Soil type ¹	Acres suitable for manure spreading ²
SW-26-60-3-W5		140
NW-23-60-3-W5		140

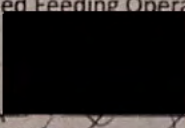
¹ Soil type choices: Dark brown and brown, Grey wooded, Black, Irrigated.

² Land within required setbacks from water bodies, water wells, residences, etc. is not to be included.

Other comments:

Manure producer (Confined Feeding Operation) Legal Land Location NW-27-60-3-W5

April 4 2025
Date of signing

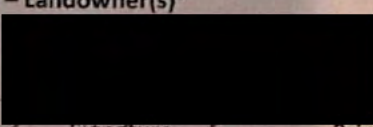

Signature

Jan Otten
Print name

Linguenda Dairy
Corporate name(if appl)

Manure Receiver – Landowner(s)³

April 4/25
Date of signing


Signature

LINDA LINDQUIST
Print name

Corporate name(if appl)

Date of signing

Signature

Print name

Corporate name(if appl)

³ All registered owners of land, or authorized signing authorities must sign.

Manure Spreading Agreement

This agreement is between Linguenda Dairy, manure producer, and
Aldert + Saakje Otten manure receiver.

Length of agreement: This agreement is valid for a time period of 5
(minimum of one year)

Legal land location	Soil type ¹	Acres suitable for manure spreading ²
<u>SE-27-60-3-W5</u>		<u>140</u>

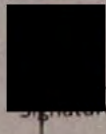
¹ Soil type choices: Dark brown and brown, Grey wooded, Black, Irrigated.

² Land within required setbacks from water bodies, water wells, residences, etc. is not to be included.

Other comments:

Manure producer (Confined Feeding Operation) Legal Land Location NW-27-60-3-W5

April 4 2025
Date of signing

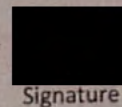

Signature

Jan Otten
Print name

Linguenda Dairy
Corporate name(if appl)

Manure Receiver – Landowner(s)³

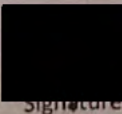
April 4 2025
Date of signing


Signature

Aldert Otten
Print name

Corporate name(if appl)

April 4 2025
Date of signing


Signature

Saakje Otten
Print name

Corporate name(if appl)

³ All registered owners of land, or authorized signing authorities must sign.

Manure Spreading Agreement

This agreement is between Linguenda Dairy, manure producer, and
Daryl + Veronica Lindquist manure receiver.

Length of agreement: This agreement is valid for a time period of 5
(minimum of one year)

Legal land location	Soil type ¹	Acres suitable for manure spreading ²
<u>NE-22-60-3-W5</u>		<u>140</u>

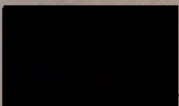
¹ Soil type choices: Dark brown and brown, Grey wooded, Black, Irrigated.

² Land within required setbacks from water bodies, water wells, residences, etc. is not to be included.

Other comments:

Manure producer (Confined Feeding Operation) Legal Land Location NW-27-60-3-W5

April 4 2025
Date of signing

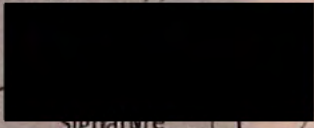

Signature

Jan Otten
Print name

Linguenda Dairy
Corporate name(if appl)

Manure Receiver – Landowner(s)³

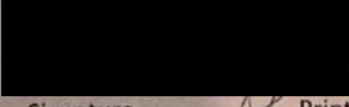
April 4/25
Date of signing


Signature

Daryl Lindquist
Print name

Corporate name(if appl)

April 4/25
Date of signing


Signature

Veronica Lindquist
Print name

Corporate name(if appl)

³ All registered owners of land, or authorized signing authorities must sign.

NRCB USE ONLY
MINIMUM DISTANCE SEPARATION

Methods used to determine distance (if applicable): _____ Google earth

Margin of error (if applicable): _____ n/a

Requirements (m): Category 1: 389 Category 2: 519 Category 3: 649 Category 4: 1038

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: _____ 619ac Applicant has access to adequate spreading lands.

Land base listed: _____ 840ac

Area not suitable: _____

Available area _____ ~840ac 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 Decision Summary BA25011

NRCB USE ONLY
ALL SIGNATURES IN FILE
☒ YES ☐ NO

DATES OF APPROVAL OFFICER SITE VISITS

April 1, 2025	April 11, 2025

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: _____ April 29, 2025 _____

Municipality: _____ **Barrhead 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: _____ **Axiom oil and gas** _____ ☐ 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



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)

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. New barn
2. Manure Storage (sand recovery building)
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.	152	60	3	3	
2.	76	24	4	4	
3.					
TOTAL CAPACITY					Adequate storage available

Concrete liner details

Scrape alleys or unslatted portions of barn floors (if applicable)	Concrete thickness 6"		Method of sulphate protection T 50	
	Concrete strength 32 mpa		Concrete reinforcement size and spacing 16" on center	
In-barn manure pit floors	Concrete thickness 8"		Method of sulphate protection T50	
	Concrete strength 32 mpa		Concrete reinforcement size and spacing 16" on center	
In-barn manure pit walls	Concrete thickness 8"		Method of sulphate protection T 50	
	Concrete strength 32 mpa	Horizontal reinforcement size and spacing 16" on center	Vertical reinforcement size and spacing 16" on center	

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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

Sika flex or similar

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

Colar

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: _____ >6 m

Requirements met: ☒ YES ☐ NO

Depth to uppermost groundwater resource: _____ 7.62 m

Requirements met: ☒ YES ☐ NO

Sand recovery building, is segmented into 3 portions first being a liquid pit to separate sand and liquid and following areas to recycle sand for bedding.

ERST completed: ☒ see ERST page for details

Concrete liner requirements

Applicant to submit concrete document confirming type and strength.

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

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SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - Concrete liner

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

Facility description / name (as indicated on site plan) 1. Lean to youngstock
2. Calf room

Manure storage capacity

	Length (m)	Width (m)	Depth below grade to the bottom of the liner (m)	NRCB USE ONLY Estimated storage capacity (m ³)
1.	38	12	0	
2.	21	24	0	
TOTAL CAPACITY				Adequate 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

Under roof and water diverted around.

Liner protection

Describe how the physical integrity of the liner will be maintained

Monitor for cracks and fix as needed

NRCB USE ONLY

Requirements met: ☒ YES ☐ NO

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)

SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - Concrete liner (cont.)

Concrete liner details

Concrete thickness >5"	Method of sulphate protection: T50 or similar
Concrete strength 30 mpa/25 mpa	Concrete reinforcement size and spacing 15" o/c

Concrete requirements can be found in Technical Guideline Agdex 096-93

Guideline minimums:

Solid manure: 25MPa (D)

Solid manure (wet): 30MPa (C)

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

Report attached:

☐ YES ☒ NO

Additional information *(attach as required)*

NRCB USE ONLY

Nine month manure storage volume requirements met ☒ YES

☐ YES With STMS

☐ NO

Depth to water table: >6 m

Requirements met:

☒ YES ☐ NO

Depth to Uppermost groundwater resource: 7.62 m

Requirements met:

☒ YES ☐ NO

ERST completed: ☐ see ERST page for details

See Decision Summary BA25011

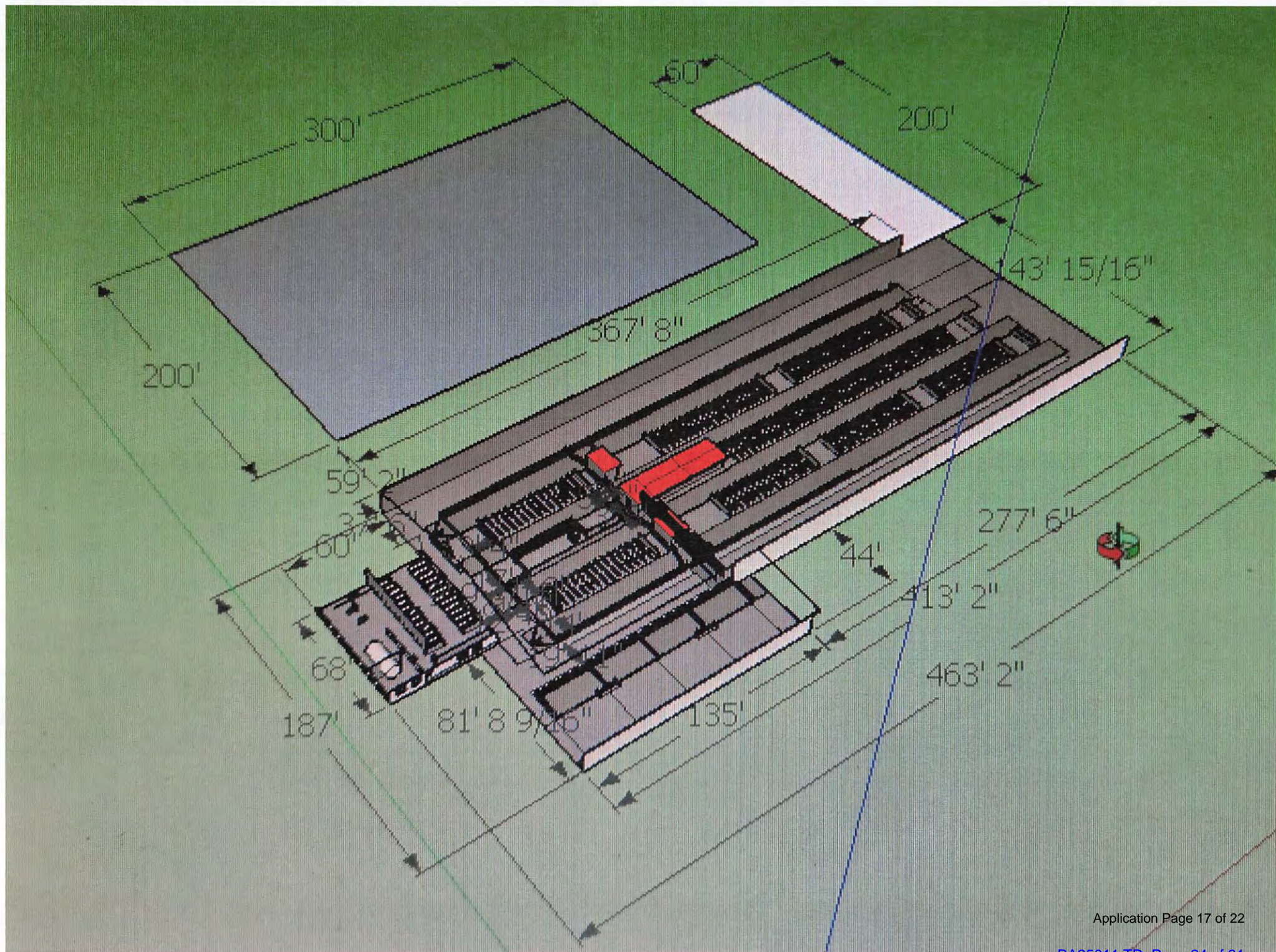
Surface water control systems

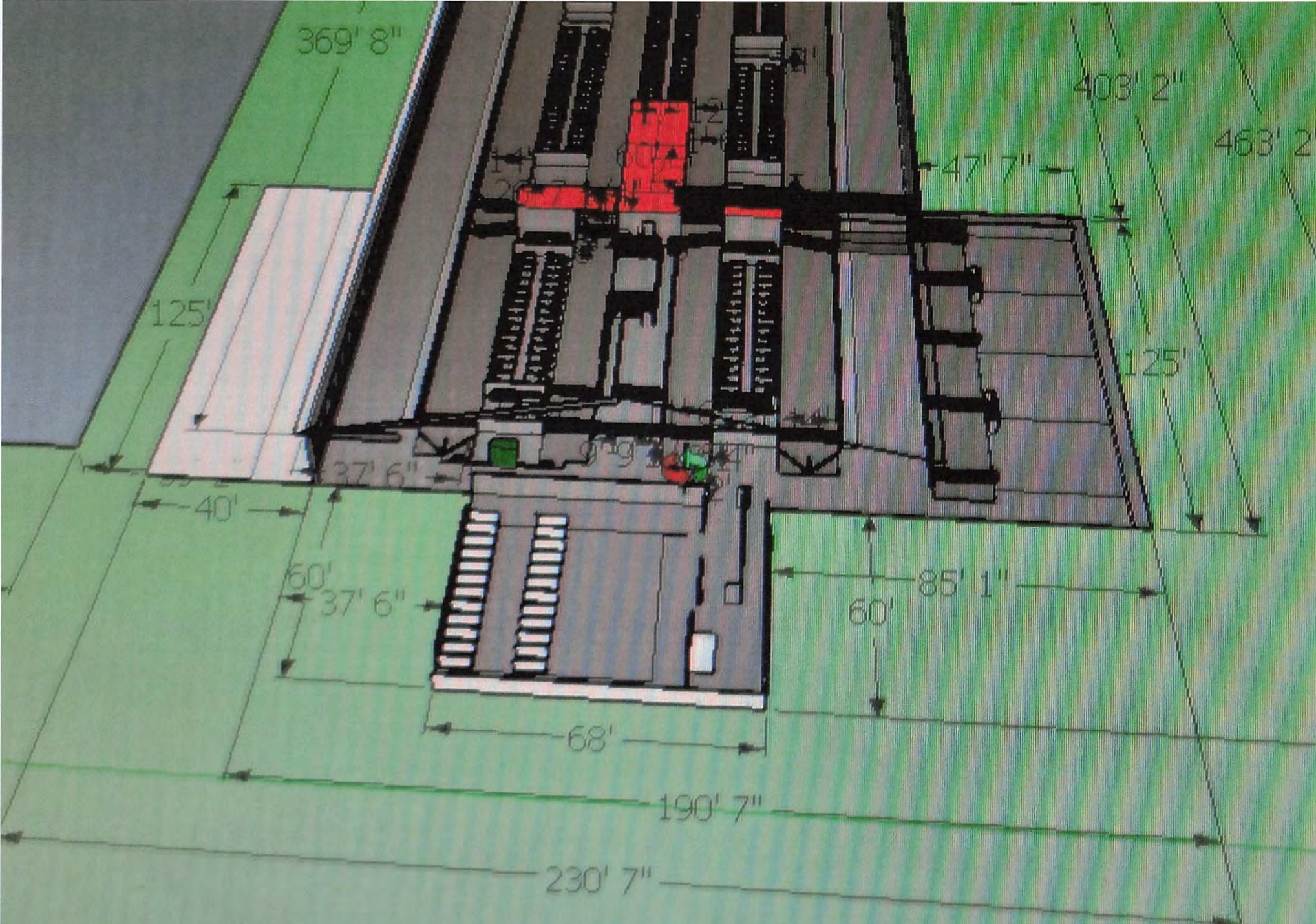
Requirements met: ☒ YES ☐ NO Details/comments:

Concrete liner details

Applicant to provide documentation confirming concrete information

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





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)

LIQUID MANURE STORAGE: Synthetic liner

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

Facility description / name (as indicated on site plan)

1. synthetic lagoon

2. _____

Manure storage capacity (use one row in the table for **EACH** cell of the synthetic lined storage, attach additional pages if you require more rows)

	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 (excl. 0.5 m freeboard) (m ³)	Filled in lower ¼? Y/N
1.	91	76	65	4.5	3	3	4		
2.									
TOTAL CAPACITY								20,221 m ³	

Surface water control systems

Describe the run-on and runoff control system

Berms around lagoon water flows away.

Sealing

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

Bentonite collar

NRCB USE ONLY

Requirements met: ☒ YES ☐ NO

Liner protection

Describe how the inside walls, bottom and outside walls are protected from erosion

agitation pad

Describe how the physical integrity of the liner will be maintained from other damage

NRCB USE ONLY

Requirements met: ☒ YES ☐ NO

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)

LIQUID MANURE STORAGE: Synthetic liner (cont.)

Synthetic liner details

Provide synthetic liner material details

30mm see attached

Additional information (attach copies of design/engineering 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: >6 m

Depth to uppermost groundwater resource: 7.62 m

Requirements met: ☒ YES ☐ NO

Requirements met: ☒ YES ☐ NO

ERST completed: ☒ see ERST page for details

Surface water control systems

Requirements met: ☒ YES ☐ NO

Details/comments:

Synthetic liner requirements

Leakage detection system required: ☐ YES ☒ NO

If yes, please explain why.

Construction plans approved by professional engineer:

☒ YES ☐ NO

Will liner be installed by manufacturer approved contractor and qualified third party?:

☒ YES ☐ NO

Preparation of liner bed (comments):

Applicant to submit completion report

Condition required: ☒ YES ☐ NO

NRCB USE ONLY
LIQUID MANURE STORAGE VOLUME CALCULATOR (if applicable)

Facility 1		
Name / description	New synthetic lagoon	Capacity 20,221 m3
Facility 2		
Name / description	Old EMS	Capacity 4,691 m3
Facility 3		
Name / description		Capacity
Facility 4		
Name / description		Capacity
TOTAL CAPACITY		24, 912
REQUIRED 9 MONTH STORAGE CAPACITY		8,627 m3
MEETS THE REQUIREMENTS FOR A MINIMUM OF 9 MONTHS STORAGE		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO

Earthen Manure Storage Volume Calculator

Dimensions of EMS

Capacity of EMS

Length*	91.0 m
Width*	76.0 m
Total Depth*	5.0 m
Water Depth	4.50 m
End Slope*	3 run:rise
Side Slope*	3 run:rise
Length of Bottom	61.0
Width of Bottom	46.0

Total Capacity @ top of Bank 23,555 m³

* Only cells in blue can be changed.

Metric

English Units

Capacity of EMS

298.56	Feet
249.34	Feet
16.40	Feet
14.76	Feet
3 run:rise	
3 run:rise	
3 run:rise	

831,837 ft³

5,181,374 Imp. Gal.

Volume of Liquid Manure at Specified Depth

Length (liquid manure level)	88.0 m
Width (liquid manure level)	73.0 m
Depth	5.0 m
Water Depth	4.50 m
End Slope	3 run:rise

Side Slope 3 run:rise

Total Volume@ freeboard depth 20,221 m³

Surface Area of Liquid Manure 6,424 m²

Volume at Freeboard

288.71	Feet
239.50	Feet
16.40	Feet
14.76	Feet
3 run:rise	

3 run:rise

714,089 ft³

4,447,941 Imp. Gal.

69,147 ft²

Nine Month Storage Requirement

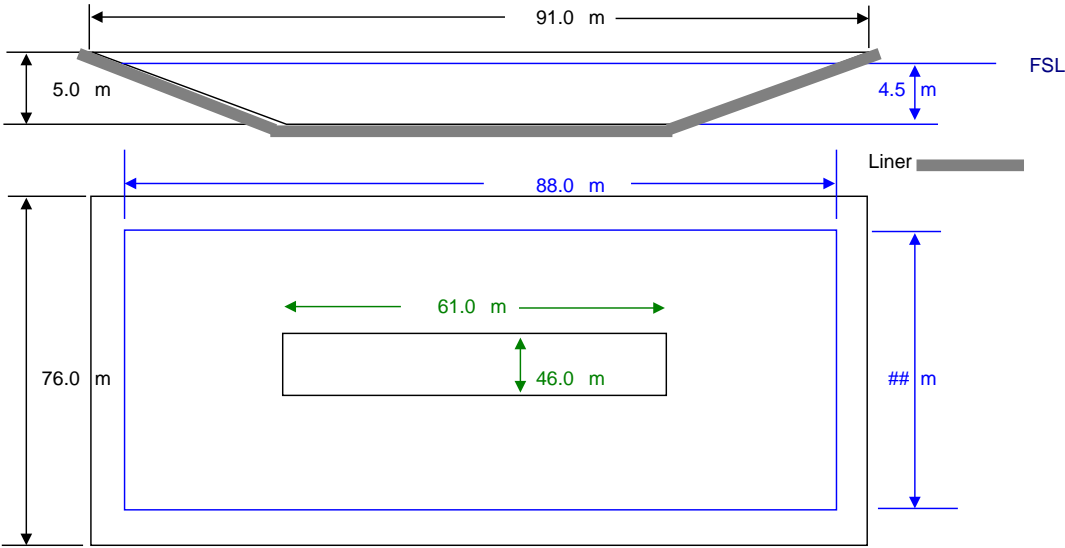
8,627 m³
304,642 ft³
1,897,564 Imp. Gal.

<--- Use Sheet "1. Nine Month Storage Calc" to calculate this number

Twelve Month Storage Requirement

11,502 m³
406,189 ft³
2,530,085 Imp. Gal.

<--- Use Sheet "1. Nine Month Storage Calc" to calculate this number



NTS - Not Drawn To Scale

SECTION 1

PRODUCT OVERVIEW

"Enviro Liner® 6000 is a specialized fortified polyolefin alloy that is designed for extended life in most geomembrane applications. Fortified geomembranes are manufactured with special prime grade resins that are stabilized with advanced UV stabilizers and antioxidant additives. This provides the geomembrane with superior physical, mechanical, and endurance properties."

Enviro Liner® 6000 is fortified with the latest in Ultra Violet/Anti Oxidant (UV/AO) stabilization packages that provides exceptional UV resistance. It is designed for long term exposed applications and very good chemical resistance. It is an excellent product choice for applications such as landfill caps, secondary containment of hydrocarbons, frac produced water, tailings dams, and waste water containment. Enviro Liner® 6000 series is manufactured by Layfield in North America and is available in thicknesses of 20, 30, 40, 50, 60 and 80 mils (0.5, 0.75, 1.0, 1.25, 1.5, 2.0 mm).

Every step in the production of an Enviro Liner® 6000 geomembrane is completed to our ISO 9000 quality management system. The Enviro Liner® 6000 series has been tested for various key performance properties and the results of these tests have been documented in this booklet. Both standard and extended warranties are available on approved applications for our Enviro Liner® 6000 series in thicknesses of 30, 40, 50, 60 and 80 mil (0.75, 1.0, 1.25, 1.5, 2.0 mm).



Figure 1. Layfield's headquarters and manufacturing facility in Vancouver, Canada.

Key performance advantages of Enviro Liner® 6000 include superior UV resistance, multiaxial properties, flexibility and chemical resistance. Enviro Liner® 6000 is NSF 61 certified allowing it to be used in drinking water applications. It also complies with the Australia water standard AS/NZS 4020 and is fish grade approved.



Figure 2. Layfield's Line 9, a wide width geomembrane manufacturing line.

Enviro Liner® 6000 is an excellent choice as a high performance geomembrane barrier in a variety of markets and applications. These include water & wastewater treatment, mining, oil & gas, waste management, agriculture, aquaculture and commercial vapor management. Enviro Liner® 6000 can be used in both primary and secondary geomembrane containment applications and for floating covers.

SECTION 2

PRODUCT SPECIFICATIONS

Table 1. Enviro Liner 6000 Specifications

	Performance Properties	ASTM	EL 6030	EL 6040	EL 6050	EL 6060	EL 6080
Index	Thickness	D 5199	30 mils 0.75 mm	40 mils 1.0 mm	50 mils 1.25 mm	60 mils 1.5 mm	80 mils 2.0 mm
	Strength at Break (min. avg)	D 66693	141 ppi 25 N/mm	180 ppi 31.5 N/mm	220 ppi 38.5 N/mm	255 ppi 44.5 N/mm	304 ppi 53 N/mm
	Elongation at Break (min. avg) Gauge Length - 2"(50mm)	D 6693	800%	800%	800%	800%	800%
	Trapezoidal Tear Resistance (typical)	D 751	63 lbs 280 N	90 lbs 400 N	108 lbs 480 N	132 lbs 590 N	176 lbs 780 N
	Puncture Resistance (min. avg)	D 4833	53 lbs 236 N	67 lbs 298 N	75 lbs 333 N	90 lbs 400 N	112 lbs 500 N
Performance	Hydrostatic Burst Strength	D 751	828 kPa 120 psi	1148 kPa 166 psi	1482 kPa 215 psi	1863 kPa 270 psi	
	Axi-Symmetric Break Strain ¹	D 5617	50%	50%	80%	80%	50%
	Critical Cone Height ¹ (Large Scale Puncture Test)	D 5514	2.0 inches 50 mm	2.0 inches 50 mm	2.0 inches 50 mm	2.0 inches 50 mm	
	Dynamic Puncture Test			306 psi 2117 kPa		560 psi 3881 kPa	
	Ozone Resistance 100 pphm @ 40°C, 168 hrs.	D 1149	No Cracks Observed				
	Flexibility Cycles Without Cracking ⁵	D 6182	8000				
	Stress Crack Under Constant Load	D 5397	> 1000 hrs				
	Solvent Vapour Permeability ^{1,3}	D 814	Fuel C (Toluene/Octane) < 4 grams/m ² .hr Diesel Fuel < 0.4 grams/m ² .hr				
	Methane Permeability ^{1,4}	D 1434	2.40 x 10 ⁻⁵ m ³ /m ² .day, atm				
	Water Vapor Transmission ^{1,2}	F 1249	3 x 10 ⁻¹³ cm/sec				
Endurance	Oxidative Induction Time (OIT)	D 3895	> 200 mins				
	High Pressure Oxidative Induction Time (HPOIT)	D 5885	> 2000 mins				
	Oven Aging at 85°C ¹ % OIT retained after 90 days % HPOIT retained after 90 days	D 5721 D 3895/D5885	>70% >90%				
	Brine Resistance @ 90°C ¹ % HPOIT retained	D 1693 1000 hrs	>90%				
	UV Resistance ¹ % HPOIT retained after 1600 Hours	GRI GM13/17	>80%				
	UV Resistance Strength Retained (Black) ^{1,2}	D 4329 40,000 hrs	>90%				
	Coefficient of Liner Thermal Expansion ^{1,3}	D 696	1.4 x 10 ⁻⁴ m/m/ °C 7.8 x 10 ⁻⁵ ft/ft/ °F				

Notes: ¹ Performance Properties once per formulation (as tested values) | ² Tested on 30 mil | ³ Tested on 40 mil | ⁴ Tested on 60 mil. | ⁵ Measured on 30 mil thickness.