

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	Application number	Legal land description
☒ Approval ☐ Registration ☐ Authorization ☐ Amendment	LA26024	NW 17& SW 20-8-20 W4M

APPLICATION DISCLOSURE

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

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

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

4/1/2026

Date of signing

1143718 Alberta LTD

Corporate name (if applicable)

Signature

Henk van Roekel

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)
Extending south row with two additional pens	76m x 28m
Rebuilding and expanding pens on middle row	201m x 40m
North row will be demolished and rebuilt and extended	161m x 45m
The application also proposes to construct a triangular catch basin. Dimensions 37.5 m x 47 m x 3.7 m deep	

Existing facilities: list ALL existing confined feeding operation facilities and their dimensions		
Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
South row	76m x 20m	
North row	76m x 24m	
Existing catch basin 19 m x 14 m x 4.8 m deep		
NRCB USE ONLY		

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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

Old facilities on row 1,2,3 will be demolished with the exception of bunk pads end of spring. With the dirt work that is needed for proper water management to be completed in summer of 2026 and will start constructing new feedlot pens end of summer 2026.

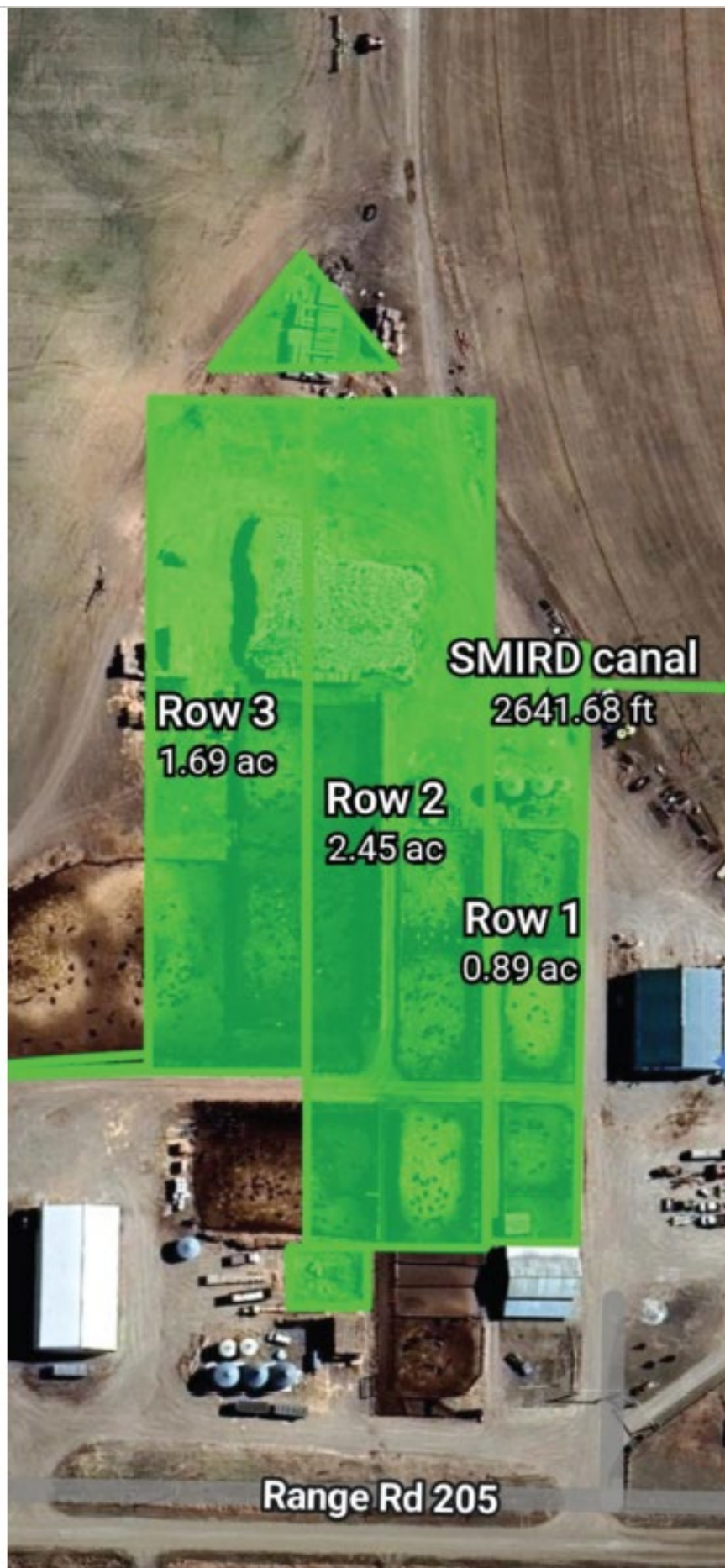
Construction completion date for proposed facilities May 2027

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
background calves		3000	3000

Last updated September 11, 2023

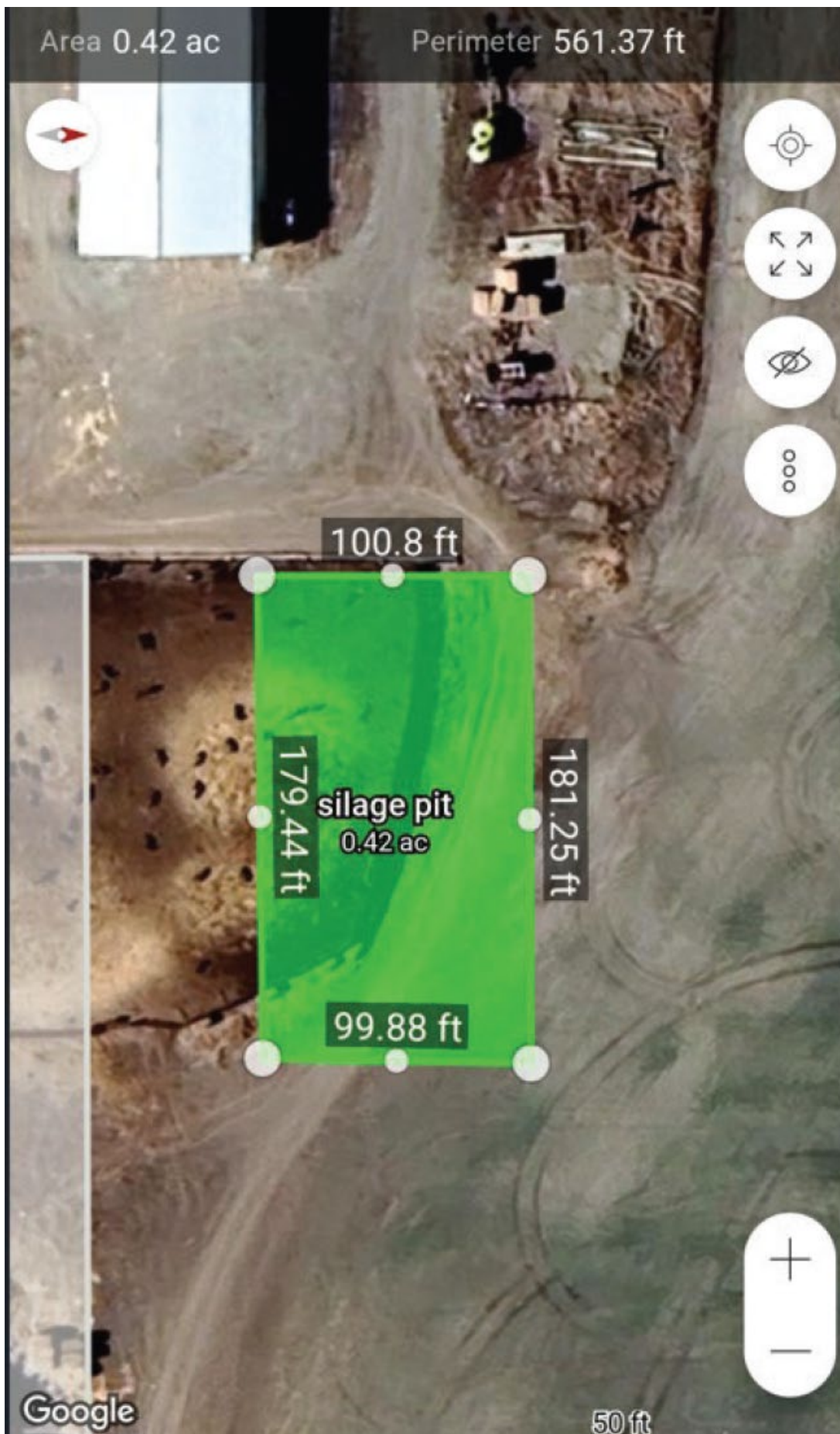












Part 2 – Technical Requirements

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

Part 2 – Technical Requirements



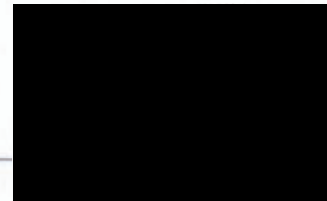
Natural Resources
Conservation Board

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

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) 155298

Signed this day of 28/2 2026



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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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: _____ Broiler barn

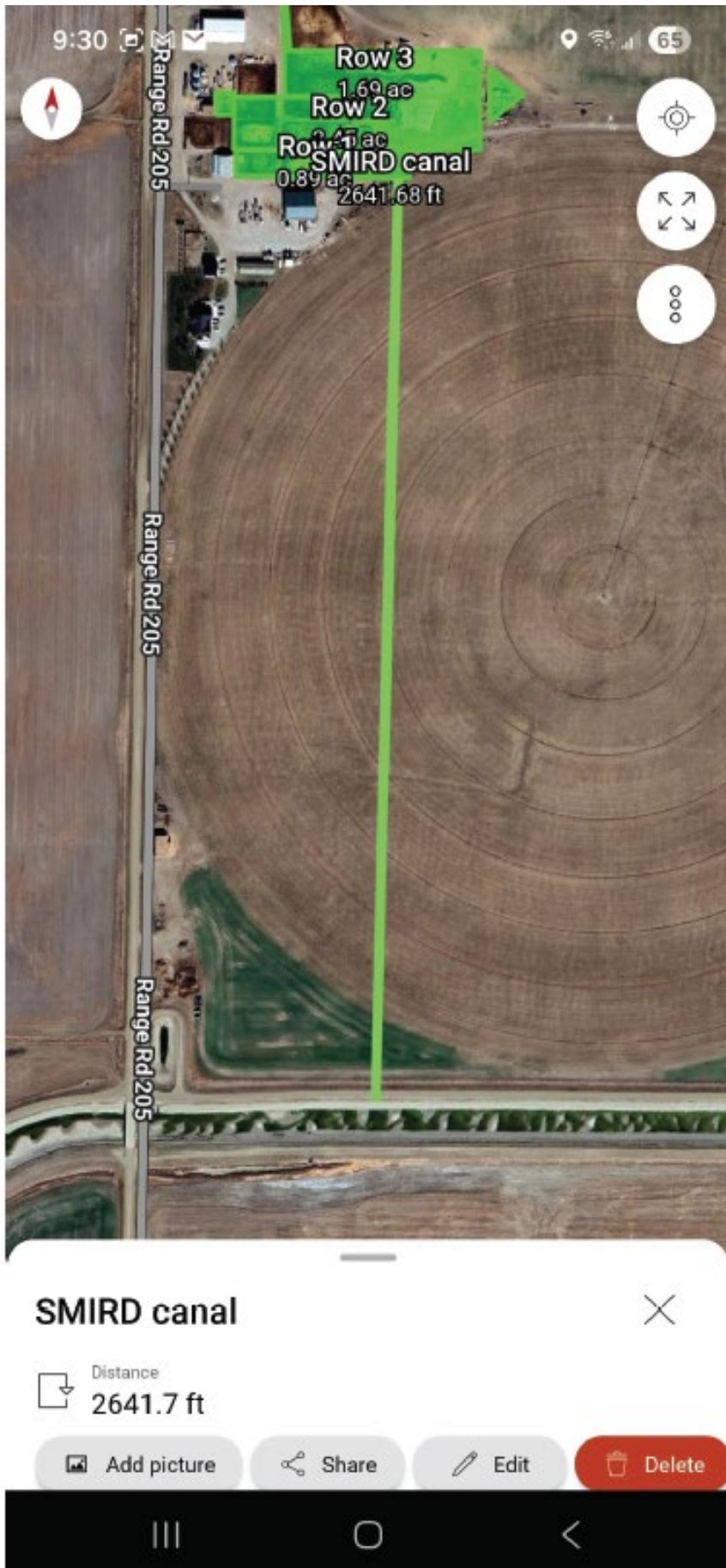
Proposed 1: _____ Feed lot pens

Proposed 2: _____ Catch basin

Proposed 3: _____

Facility and environmental risk information		Facilities				NRCB USE ONLY	
		Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
Surface water information	Flood plain 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 ☐ YES with exemption ☐ NO	
	How many springs are within 100 m of the manure storage facility or manure collection area?	0	0	0		☐ YES ☐ YES with exemption ☐ NO	
	How many water wells are within 100 m of the manure storage facility or manure collection area?	0	0	0		☐ YES ☐ YES with exemption ☐ NO	
Groundwater information	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	800m	800M	800m		☐ YES ☐ YES with exemption ☐ NO	
	What is the depth to the water table?	>9m	>9m	>9m		☐ YES ☐ YES with exemption ☐ NO	
	What is the depth to the groundwater resource/aquifer you draw water from?	N/A	N/A	N/A		☐ YES ☐ YES with exemption ☐ NO	

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



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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)
Gerrit douville	SW20-8-20 W4	697m				
Rosanne	SW 20-8-20 W4	609m				
Harvest Haven	SW 20-8-20 W4	809m				

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)
1143718 ab ltd	NW 17-8-20	62.7 ha	Irrigated		
1143718 ab ltd	NE 17-8-20	62.7 ha	Irrigated		
1143718 ab ltd	SW 20-8-20	56.6 ha	Irrigated		
Total					

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

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

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

Additional information (attach any additional information as required)

Last updated September 11, 2023

Minimum Distance Separation (MDS) Waiver (declaration)

Residence owner(s) information

ALL Names on land title: GARRETT DOLIVILLE, KAYLA DOLIVILLE

Legal land location of residence(s): SW 20-8-20 W4

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

Address(es)¹ and Postal code(s): [REDACTED] LETHBRIDGE COUNTY
T1J 5N7

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

[REDACTED]

GARRETT DOLIVILLE, KAYLA DOLIVILLE
Printed names of all residence owner(s) on title

Date: APRIL 4, 2026

Minimum Distance Separation (MDS) Waiver (declaration)

Applicant information

NRCB application number: _____

Operator/operation name: 1143718 AB LTD.

Address: [REDACTED] sthbridge county

Postal Code: T1K-8H1

Legal land location of confined feeding operation: SW 20-8-20 NW 17-8-20

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:
Beef feeders (450-900lbs) 500 head total
Chicken Broilers 10,000 head total
- My application for a new AOPA permit proposes the following changes to the existing livestock category, type and/or capacity at my CFO:
Beef feeders (450-900lbs) 3000 head total
- 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: APRIL 4, 2026

Signature

Residence owner(s) to initial: [REDACTED]

Minimum Distance Separation (MDS) Waiver (declaration)

Residence owner(s) information

ALL Names on land title: Rosanne Marples

Legal land location of residence(s): SW 20-8-20 W4

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

Address(es) and Postal code(s): [REDACTED] Lethbridge County
T1J 5N7

** 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";
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- 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 _____

[REDACTED]
Signatures of all residence owner(s) on title

Rosanne Marples

Printed names of all residence owner(s) on title

Date: April 3

Minimum Distance Separation (MDS) Waiver (declaration)

Applicant information

NRCB application number: _____

Operator/operation name: 1143718 AB LTD.

Address: [REDACTED] ethbridge county Postal Code: T1K-8H2

Legal land location of confined feeding operation: SW 20-8-20 NW 17-8-20

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:

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- The current scope of my confined feeding operation (CFO), including the type, number, and category of livestock, if any, is:
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- My application for a new AOPA permit proposes the following changes to the existing livestock category, type and/or capacity at my CFO:
Beef feeders (450-900lbs) 3000 head total
- 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.

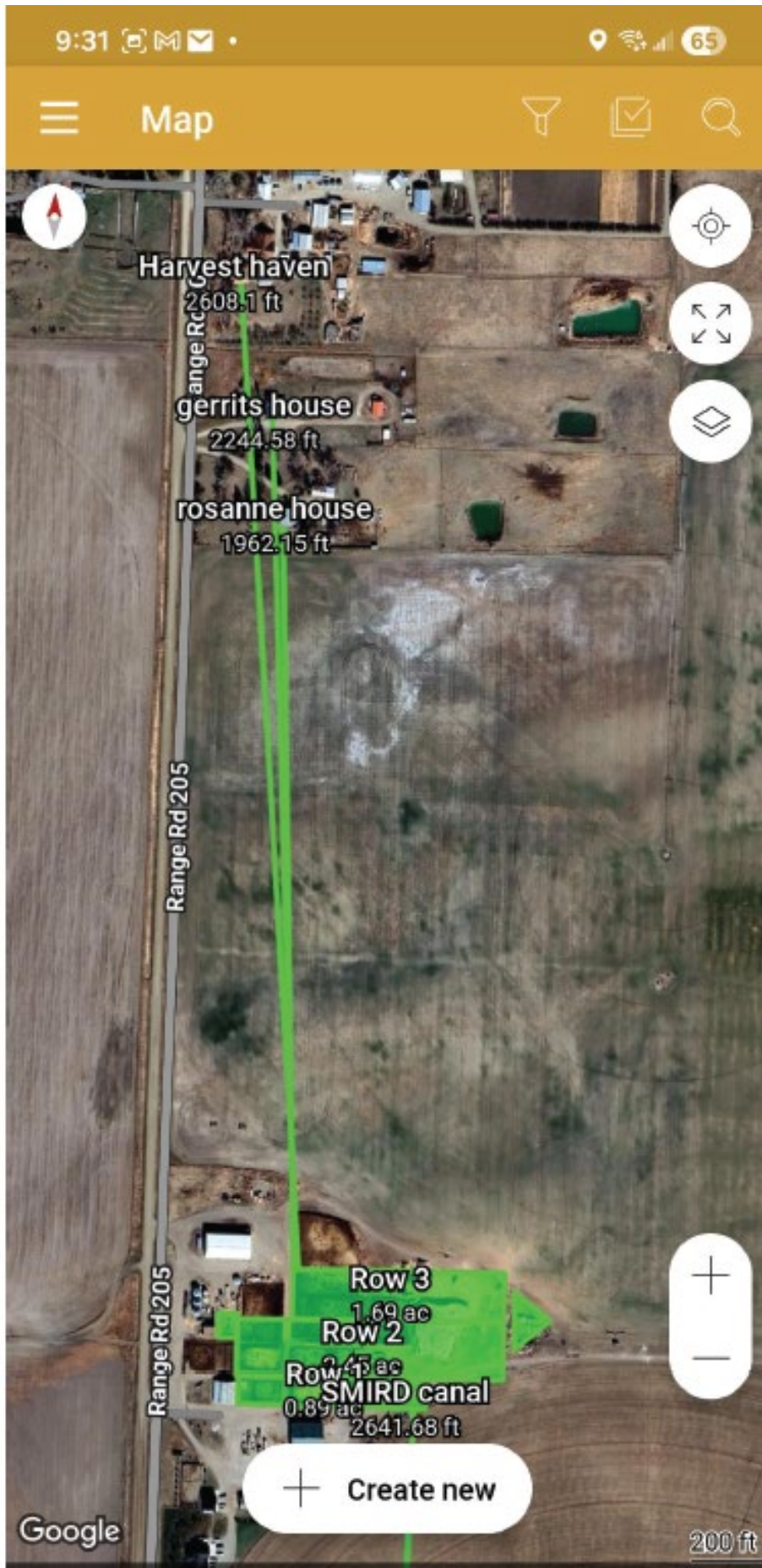
Permit Applicant: [REDACTED]

Signature

Date: April 3/2026

Residence owner(s) to initial: [REDACTED]





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

RUNOFF CONTROL CATCH BASIN: Naturally occurring protective layer

(complete a copy of this section for **EACH proposed** runoff control catch basin with a naturally occurring protective layer)

Facility description / name (as indicated on site plan)

1. West catch basin (old one) _____

2. East catch basin (New one) _____

3. _____

Determination of runoff area

Provide a plan and show how you calculated the area contributing to runoff for each catch basin

East catch basin- 254,000 gallons

total catch area for east area- meters square $19,265 \text{ m}^2 \times 0.90 \times 65\% = 11270 \text{ m}^2$

West catch basin - 79449 gallons

Total catch area for west area- Meters square $5165 \text{ m}^2 \times 0.90 \times 65\% = 3021 \text{ m}^2$

Lethbridge rainfall schedule 2 of administration 1 day rainfall 90mm

(See attach photos for the east and west areas for drainage)

Catch basin capacity

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	Slope run:rise			NRCB USE ONLY Calculated storage capacity (excl. 0.5 m freeboard) (m ³)
					Inside end walls	Inside side walls	Outside walls	
1.	37.5m	47m (triangle)	3.7m	3.7m	3H:1V	3H:1V	NA	
2.	19m	14m	4.8m	4.8m				
3.								
							L CITY	

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	Min 5M _____(m)	Provide details (as required) Soil conditions in JLECS P25033 dated april 22 2025 (attached) Predominate soils are fine sand to clay loam soils overling medium plastic clay till	
Soil texture	46____% sand	29____% silt	25____% clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested Clay till tested from 6m to 9M depth	Hydraulic conductivity (cm/s) 8×10^{-9} cm/s	Describe test standard used in situ following head test

Catch Basin – Technical Guideline Agdex 09 differs per facility include add	agement requirements can be found		NRCB USE ONLY Requirements met: ☐ YES ☐ NO Condition required: ☐ YES ☐ NO Report attached: ☐ YES ☐ NO
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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. Pen areas
- 2.

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	NRCB USE ONLY Estimated storage capacity (m ³)
1.	152.4m	39.6m	0	
2.	192m	39.6m	0	
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

Pen areas will drain into east and west catch basins

Perimeter area will shed away from the corrals and catch basins

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	Min 5M (m)	Provide details (as required) Soil conditions in JLECS P25033 dated April 22 2025 (attached) Predominate soils are fine sand to clay loam soils overlining medium plastic clay till		
Soil texture	46 % sand	29 % silt	25 % clay	
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested HRV425 4m-6m Clay till	Hydraulic conductivity (cm/s) 2.5x10 (-7) cm/s	Describe test standard used IN SITU falling head test	

Additional information (attach copies of soil test reports)

NRCB USE ONLY

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



22 April 2025

J Lobbezoo Engineering & Consulting Services Ltd.

PO Box 96, Monarch, AB T0L1M0

JLECS File: P25033

1143718 Alberta Ltd

82079 Range Road 205

Lethbridge County, Alberta T1K 8H1

Attention: Mr. Gerad Van Roekel

**Re: Geotechnical Review and Evaluation
 NRCB Permitting of Pens & Catch Basin
 NW-17-008-20-W4M / SW-20-008-20-W4M, near Coaldale, Alberta**

As requested, J Lobbezoo Engineering & Consulting Services Ltd. (JLECS) has carried out a geotechnical review and evaluation of the above-captioned site relative to the required protection of the groundwater resource, as required by the Agricultural Operation Practices Act, AB Reg. 267/2001 (hereinafter referred to as "AOPA"). This letter describes the site soil conditions to support a permit application related to a series of existing and proposed pens as well as a potential catch basin at the above captioned site (refer to Figure 1, attached).

In order to demonstrate the suitability of the naturally existing soils for consideration as a naturally occurring protective layer to the groundwater resource, seven boreholes were advanced at the site on March 12, 2025. The boreholes were advanced at the approximate locations denoted as HR1-25 to HR7-25 on Figure 1, attached.

The boreholes were advanced by a truck-mounted drill rig owned and operated by Chilako Drilling Services and extended to depths of 4.5 m to 9.2 m below the existing grade. The boreholes were logged by Larry Delong of Chilako Drilling Services.

In general, the natural mineral soils encountered in the boreholes consisted of minor lacustrine fine sand to clay loam soils overlying stiff, medium plastic clay till, present below 1.5 m to 3.6 m depth. While perched groundwater was identified in a few boreholes at the interface between the lacustrine soils and underlying low-permeable clay till, no groundwater resource (as defined by the AOPA) was encountered within the 9.2 m investigation depth at this site.

Samples of soil collected from the screened zones of boreholes HR4-25 and HR7-25, as well as samples from similar depths at the other boreholes were all subjected to grain size analyses, which was carried out by Down to Earth Laboratories in Lethbridge, Alberta. The lab report is attached, for reference. The results indicate a soil texture breakdown of:

Table 1: Soil Texture Analyses

Borehole/Depth	% Sand	% Silt	% Clay
HR1-25 / 4.0 – 4.5 m	44	32	24
HR2-25 / 4.0 – 4.5 m	45	28	27
HR3-25 / 4.0 – 4.5m	50	30	20
HR4-25 / 4.5 – 5.0m	48	24	28
HR5-25 / 7.0 – 8.0m	46	30	24
HR6-25 / 7.0 – 8.0m	45	29	26
HR6-25 / 7.0 – 8.0m	47	27	26
Average:	46	29	25

To measure the *in situ* permeability of the subsurface soils, 50 mm diameter PVC monitoring wells were constructed in boreholes HR4-25 and HR7-25. Test well HR4-25 was screened from 4.2 m to 5.7 m depth while test well HR7-25 was screened from 5.8 m to 9.0 m depth. Well saturation of the 50 mm diameter monitoring wells was carried out by filling the monitoring well to the top for several consecutive days. After several days of testing, a 4-hour water drop of 0.51 m was determined at HR4-25, and a 24-hour water drop of 0.25 m was determined at HR7-25.

To calculate the permeability of the screened portion of the clay strata at the test well location, a modified falling head test (as outlined in the USBR Engineering Geology Field Manual Volume 2 [2001]) was used. The input variables and output data are outlined on the attached In Situ Permeability Test reports. The results of the permeability testing indicated an *in situ* hydraulic conductivity (k_s) of 2.5×10^{-7} cm/s at HR4-25, and an *in situ* hydraulic conductivity (k_s) of 8.0×10^{-9} cm/s at HR7-25.

Using the measured permeability of the clay at this site, the 1.55 m of clay screened at test hole VF4-25 is estimated to represent the equivalent of about 6 m of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s (the reference standard in AOPA). At test hole HR7-25, the 3.2 m of screened clay is estimated to represent the equivalent of over 100 m of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s. This represents natural material protection in excess of the minimum requirements outlined by the AOPA for catch basins (minimum 5 m, Section 9.5-b) and solid manure storage (minimum 2 m, Section 9.5-c).

Conclusion

Based on the results of the current investigation, permeability testing, and our understanding of the site and development at the site, it is JLECS's opinion that the naturally occurring materials at the site satisfy the AOPA requirements for permitting the proposed pens and catch basin at this location.

Notwithstanding, for the proposed catch basin (if required), it is noted that the upper lacustrine fine sand and loam soils would require removal from the side slope areas at the time of construction, and reconstruction of the upper catch basin side slopes using low permeable clay soils would be required. The existing clay till soils encountered below the upper fine sand and loam soils is considered suitable for the upper side slope construction.



PERMIT TO WORK

DATE 2 April 25

PERMIT NO. ER-000456

The Associated Sessions, Stations and
Shorelines

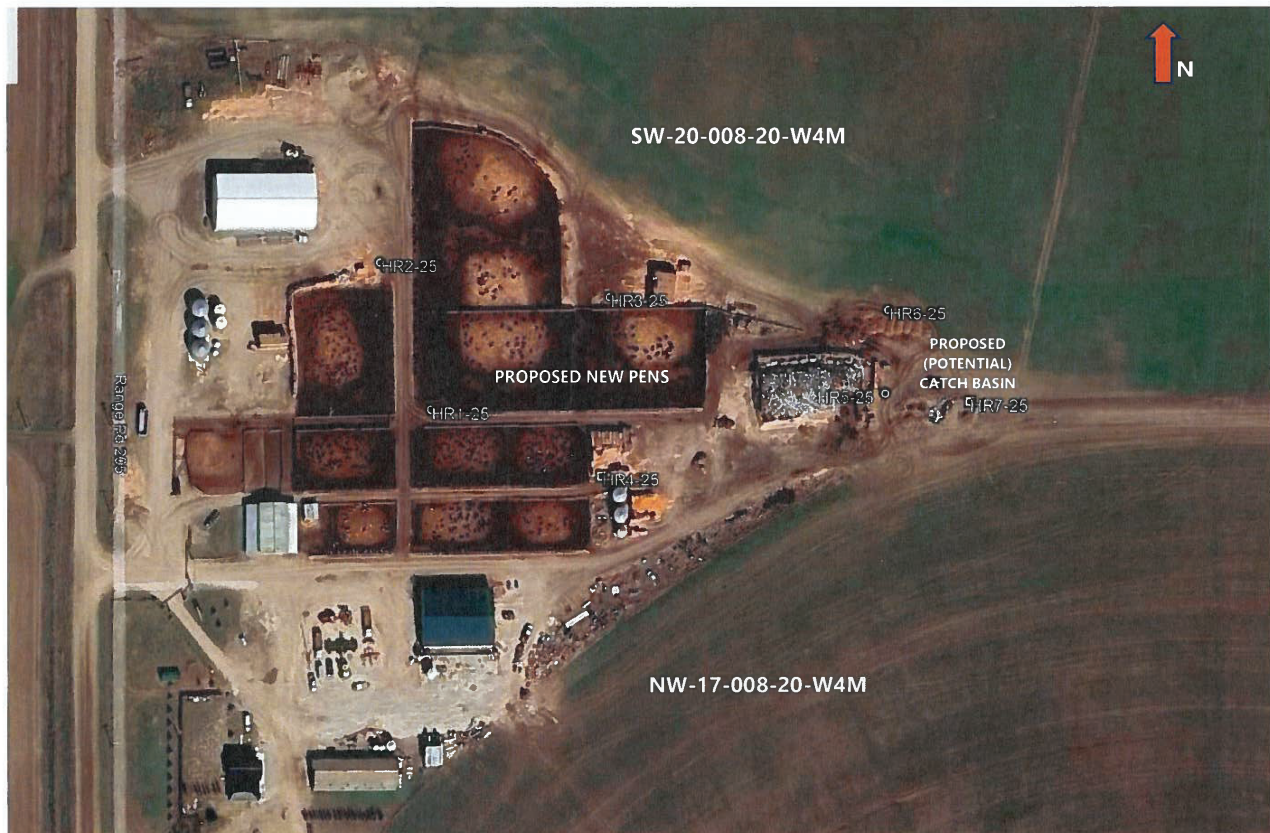


Figure 1: Site Layout & Borehole Locations

Image Credit: Google

HR4-25

In Situ Permeability Test

Modified Falling Head Permeability Equation

$$K_s = \frac{r^2}{2\ell\Delta t} \left[\frac{\sinh^{-1} \frac{\ell}{r_e}}{2} \ln \left[\frac{2H_1 - \ell}{2H_2 - \ell} \right] - \ln \left[\frac{2H_1H_2 - \ell H_1}{2H_1H_2 - \ell H_2} \right] \right]$$

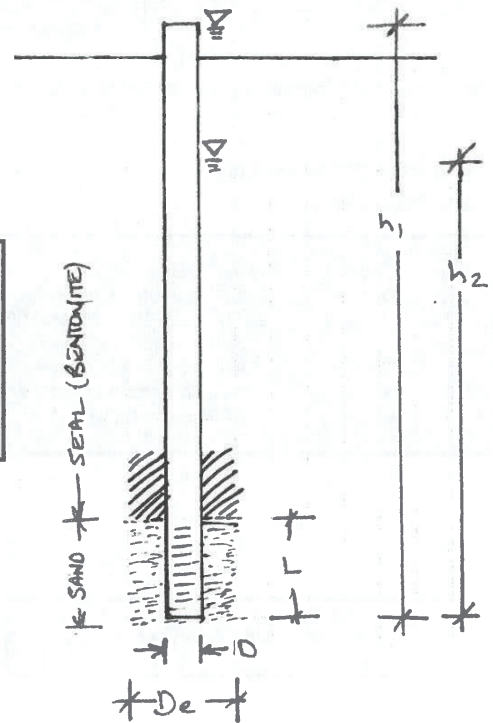
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

HR4-25 - 1143718 Alberta Ltd.

JLECS File: P25033

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	1.55	length of sand section (m)
	h1	6.30	initial height of water above base of hole (m)
	h2	5.79	final height of water above base of hole (m)
	t	4.0	time of test (h)

$$k_s = 2.5E-07 \text{ cm/sec}$$



HR7-25

In Situ Permeability Test

Modified Falling Head Permeability Equation

$$K_s = \frac{r^2}{2\ell\Delta t} \left[\frac{\sinh^{-1} \frac{\ell}{r_e}}{2} \ln \left[\frac{2H_1 - \ell}{2H_2 - \ell} \right] - \ln \left[\frac{2H_1H_2 - \ell H_2}{2H_1H_2 - \ell H_1} \right] \right]$$

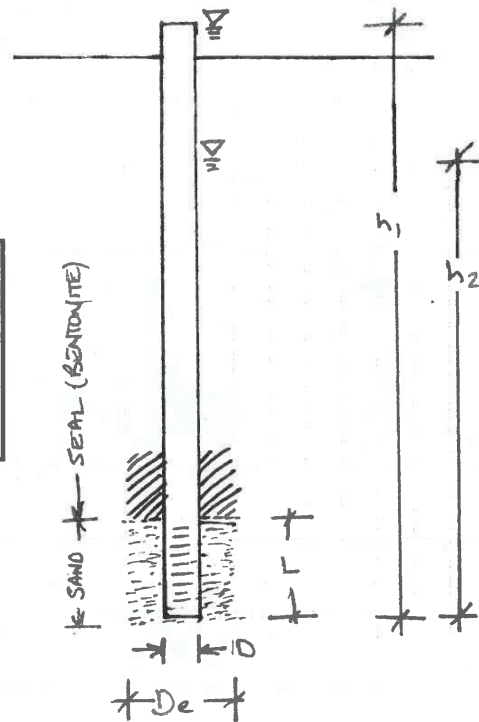
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

HR7-25 - 1143718 Alberta Ltd.

JLECS File: P25033

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	3.20	length of sand section (m)
	h1	9.60	initial height of water above base of hole (m)
	h2	9.35	final height of water above base of hole (m)
	t	24.0	time of test (h)

$k_s = 8.0E-09$ cm/sec





Down To Earth Labs Inc.

The Science of Higher Yields

J. Lobbezoo Engineering +
Consulting Services
Box 96
Monarch, Alberta T0L 1M0

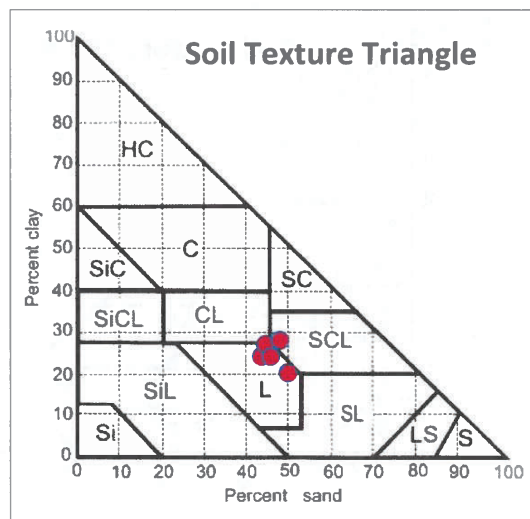
Report #: 204485
Report Date: 2025-04-11
Received: 2025-04-09
Completed: 2025-04-11
Test Done: ST

Project :
Van Rockel

PO:

3510 6th Ave North
Lethbridge, AB T1H 5C3
403-328-1133
www.downtoearthlabs.com
info@downtoearthlabs.com

Sample ID:		250409P001	250409P002	250409P003	250409P004	250409P005
Cust. Sample ID:		HR1-25	HR2-25	HR3-25	HR4-25	HR5-25
Analyte Units		4.0-4.5	4.0-4.5	4.0-4.5	4.5-5.0	7.0-8.0
Sand	%	44.0	44.9	50.2	48.2	46.1
Silt	%	32.0	28.1	29.8	23.8	29.9
Clay	%	24.0	27.0	20.0	28.0	24.0
Soil Texture	-	Loam	Clay Loam	Loam	Sandy Clay Loam	Loam





Down To Earth Labs Inc.

The Science of Higher Yields

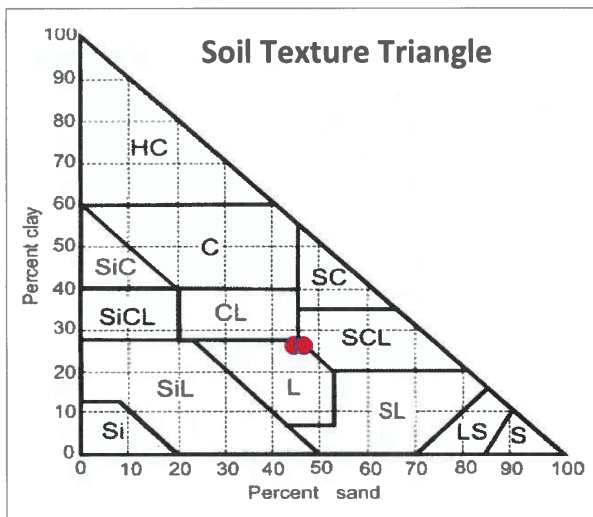
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Report #: 204485
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Lethbridge, AB T1H 5C3
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Sample ID:		250409P006	250409P007
Cust. Sample ID:		HR6-25	HR7-25
Analyte	Units	7.0-8.0	7.0-8.0
Sand	%	44.9	47.0
Silt	%	29.1	27.0
Clay	%	26.0	26.0
Soil Texture	-	Loam	Sandy Clay Loam



Raygan Boyce - Chemist

CHILAKO DRILLING SERVICES LTD

Box 942 Coaldale, Alberta, T1M 1M8
(403) 345-3710

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: NW17-8-20W4, Henk Van Roekel

Date: 12-Mar-24

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
HR1-25	0378186 5501574	0-1.9	FSL	M	Lac		
		1.9-3.6	FSL	VM	Lac	2.0-3.0	Sat @ till contact
		3.6-4.5	CL	M	Till	4.0-4.5	V. Firm, med plastic, dark brown
HR2-25	0378168 5501627	0-2.4	SL	M	Lac		
		2.4-3.0	SL	Sat	Lac		perched water at till contact
		3.0-4.5	CL-C	M	Till	4.0-4.5	Stiff, med plastic, dark brown
HR3-25	0378251 5501612	0-1.1	FSL	D	Lac		
		1.1-1.7	FSCL	M	Lac		
		1.7-3.3	CL	M	Till		Stiff, med plastic, yellow brown
		3.3-4.2	FSL-FSCL	Sat	Till		Soft, low plastic, yellow brown, free water
HR4-25	0378246 5501547	4.2-4.5	CL	M	Till	4.0-4.5	Stiff, med plastic, brown
		0-2.6	FSL	M	Lac		
		2.6-4.4	CL	M	Till		V. Firm, med plastic, yellow brown
		4.4-5.7	CL-C	M	Till	4.5-5.0	Stiff, med plastic, brown 50mm H.C. Well installed to 5.7m BGS Screen: 5.7-4.2m Sand: 5.7-4.15m Bentonite: 4.15-0.0m Stickup: 0.6m Hole Diameter: 0.15m
HR5-25	0378350 5501575	0-1.7	SL	M	Lac		
		1.7-2.4	SL	Sat	Lac		Oxidized, perched water @ till contact
		2.4-3.5	CL	M	Till		
		3.5-9.2	CL-C	M	Till		Stiff, med plastic, brown, oxidized
HR6-25	0378352 5501605	0-0.5	CL	M	Lac		
		0.5-1.1	FSCL	M	Lac		Firm, low plastic, brown
		1.1-1.5	FSCL	VM	Lac		Firm, low plastic, brown, Sat @ till contact
		1.5-3.6	CL-C	M	Till		Stiff, med plastic, brown, mottled, iron staining
HR7-25	0378381 5501570	3.6-9.2	CL-C	M	Till	7.0-8.0	Stiff, med plastic, yellow brown, iron staining
		0-0.8	FSCL	M	Fill		
		0.8-1.5	FSCL	M	Lac		
		1.5-2.4	FSL	M	Lac		VM-Sat @ 2.4m on till contact, no free water
		2.4-3.0	CL	M	Till		Stiff, med plastic, yellow brown
		3.0-4.6	CL-C	M	Till		Stiff, med plastic, yellow brown, iron staining, mottles
		4.6-6.0	CL-C	M	Till		Stiff, med plastic, brown
		6.0-9.0	CL-C	M	Till	7.0-8.0	Stiff, med plastic, yellow brown, oxidized 50mm H.C. Well installed to 9.0m BGS Screen: 9.0-6.0m Sand: 9.0-5.8m Bentonite: 5.8-0.0m Stickup: 0.6m Hole Diameter: 0.15m

Legend: L Loam
C Clay
S Sand
Gr. Gravel
Si Silt
F Fine (sand)
VF Very Fine (sand)