Technical Document LA25038

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	LA25038	NW 14-10-22 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.

March 19th
Date of signing

[redacted]
Signature

Slingerland Cattle LTD
Corporate name (if applicable)

Ken Slingerland
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)
4 east pens expansion Middle and north row to each be expanded by 72 m x 91 m	235' x 300' 72 m x 91 m each
Catch basin (historically used as a dugout)	41 m x 41 m x 5.5 m deep
New proposal of 4 corrals southest feedlot pens	370 ft x 260 ft total dimensions:113 m x 80 m

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

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
Original north row of 6 corrals	710 ft x 218 ft 212.1 m x 62.2 m	To be expanded
Original middle row of 6 corrals	710 ft x 202 ft 212 m x 56 m	To be expanded
Original south row of 4 corrals	310 ft x 180 ft 94.5 m x 55 m	

NRCB USE ONLY

Confirmed existing CFO facilities

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Existing facilities continued	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
West catch basin	36.6 m x 48.8 m x 4.1 m average depth	
This catch basin has a sloped bottom with one end being 3.7 m deep	and the other end being 4.5 m deep.	

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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 Oct 15th 2025

Additional information

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

Livestock category and type (Available in the Schedule 2 of the Part 2 Matters Regulation)	**Permitted number**	**Proposed increase or decrease in number (if applicable)**	**Total**
No changes from part 1 application			
Beef feeder calves	2,500	2,500	5,000

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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 19 day of March, 2025.

[redacted]

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) [redacted]

Signed this 19 day of March, 2025.

[redacted]

Signature of Applicant or Agent

May 13, 2025: Confirmed with applicant that they choose "option 2" and will purchase additional water conveyance from the LNID

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 19 day of March, 2025.

[redacted]

Signature of Applicant or Agent

New 4 Pens

Proposed southeast feedlot pens

North

Catch basin

The proposed catch basin has historically been used as a dugout

Water storage

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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: North row feedlot pens **Proposed 1:** Feedlot pens expansion and new feedlot pens

Proposed 2: East catch basin **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	Confirmed not in a flood plain
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?	none	none	none		☑ YES ☐ NO ☐ YES with exemption	None observed during site visit
	How many water wells are within 100 m of the manure storage facility or manure collection area?	none	none	none		☑ YES ☐ NO ☐ YES with exemption	None registered to LLD and none observed during site visit
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	2 km Park lake				☑ YES ☐ NO ☐ YES with exemption	Park Lake 2 km SW of CFO
Groundwater information	What is the depth to the water table?					☑ YES ☐ NO ☐ YES with exemption	9 mbgs very moist soils encountered according to drilling report
	What is the depth to the groundwater resource/aquifer you draw water from?	below 10 m	below 10m	below 10m		☑ YES ☐ NO ☐ YES with exemption	>9.2 mbgs. Groundwater not encountered during drilling No nearby water wells with UGR information

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

- no wells in area

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NRCB USE ONLY

ENVIRONMENTAL RISK SCREENING INFORMATION

ERST for **proposed** facilities

Facility	Groundwater score	Surface water score	File number
North feedlot pens expansion	Low	Low	LA25038
Middle feedlot pens expansion			LA25038
New feedlot pens			LA25038
Catch basin			LA25038

ERST for **existing** facilities

Facility	Groundwater score	Surface water score	File number
North feedlot pens	Low	Low	LA17006
Middle feedlot pens			LA17006
South feedlot pens			LA17006
Catch basin			LA17006

ERST related comments:

Proposed facilities that meet or exceed AOPA requirements are presumed to pose a low risk to surface water and groundwater.

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WATER WELL AND SURFACE WATER INFORMATION

Well IDs: None registered to LLD. No water wells within 2+ miles.

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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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**
Park Lake Feeders	NE 15-10-22 W4M	470 m	Rural Ag	1	470 m	NA	Yes
Beyer Dairy	SE 15-10-22 W4M	770 m	Direct Control	1	740 m	NA	
~~Jake~~ Evert* Beyer	SE 15-10-22 W4M	310 m	Rural Ag	1	310 m	Yes	
Pete Heins	NW 11-10-22 W4M	850 m	Rural Ag	1	870 m	NA	

*confirmed with the applicant that Evert Beyer owns the residence within the MDS and provided an MDS waiver

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)**
Slingerland Cattle LTD	NW 14 10 22 w4	120 acre	Irrigated	120 ac	
Slingerland Cattle LTD	NW 13-11-22 w4	150 acre	Irrigated	146 ac	
Slingerland Cattle LTD	S 1/2 14-13-24 w4	320 acre	Brown	315 ac	
Slingerland Cattle LTD	NE 13-12-~~15~~ 25 w4	160 acres	Brown	138 ac	
Slingerland Cattle LTD	SE 24-12-25 w4	160 acres	Brown	160 ac	
			Total	879	

* 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)

Minimum Distance Separation (MDS) Waiver (declaration)

Applicant information NRCB application number: LA25038

Operator/operation name: Slingerland cattle Ltd

Address: Box 72 Diamond city Postal Code: T0K 0T0

Legal land location of confined feeding operation: NW 14-10-22 W4

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:

  To Add 4 pens to the east of existing CFO
  To increase permits to 5000 feeders
  K.S E.B

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

  Increase to 5000 Feeders
  KS E.B

- 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):

  Add 4 pens to the east

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 26
Signature

Residence owner(s) to initial: [redacted]

Minimum Distance Separation (MDS) Waiver (declaration)

Residence owner(s) information

ALL Names on land title: Evert BEIJER

Legal land location of residence(s): SE-15-10-22-W4

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

Address(es)[1] and Postal code(s)[1]: Box 1200 Coalhurst . com T0L0V0

[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 LA25038

[redacted]

Signatures of all residence owner(s) on title

Printed names of all residence owner(s) on title

Date: April 7 2025

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MINIMUM DISTANCE SEPARATION

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

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

Requirements (m): Category 1: 442 Category 2: 590 Category 3: 737 Category 4: 1,179

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: 185 acres irrigated or 383 acres brown

Land base listed: 910 ac irrigated/brown

Area not suitable: 31 ac

Available area 879 ac 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 Approval LA17006

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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. Slingerland cattle Ltd Southeast feedlot pens
2. East pens Expansion of north and middle feedlot pens to the east

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	NRCB USE ONLY Estimated storage capacity (m^3)
1.	new pens total dimensions 113	80	0	
2.	no solid manure storage needed			
	235'	300'	TOTAL CAPACITY	Feedlot pens are considered 9 months of manure storage

North and middle row to each be expanded by 72 m x 91 m (235' x 300')

☐ 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

The original corrals are setup that the runoff goes west to the catch basin

The new proposal , for the 4 corrals - 725 hd the run off will go directly into the catch basin east of the corrals

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	_____(m)	Provide details (as required) See Attached report	
Soil texture	_____% sand	_____% silt	_____% clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested	Hydraulic conductivity (cm/s)	Describe test standard used

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

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

Condition required: ☑ YES ☐ NO

Report attached: ☑ YES ☐ NO

Last updated February 26, 2021

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: 9 mbgs Requirements met: ☑ YES ☐ NO

Depth to uppermost groundwater resource: > 9.2 mbgs Requirements met: ☑ YES ☐ NO

ERST completed: ☑ see ERST page for details

Surface water control systems

Requirements met: ☑ YES ☐ NO Details/comments:

Catch basin will collect manure contaminated run off

Naturally occurring protective layer details

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

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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 (Original)~~ This catch basin is already permitted
2. New Catch Basin (East)
3. _____

Determination of runoff area

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

Catch basin capacity

	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)
1.	~~165~~	~~115~~	~~18~~		~~3:1~~	~~3:1~~	~~4:1~~	
2.	135	135	18		3:1	3:1	~~4:1~~	3,020 m3
	41 m x 41 m x 5.5 m deep							
3.					Confirmed with applicant that the slopes are proposed to be 3:1			
							TOTAL CAPACITY	3,020 m3

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	_____(m)	Provide details (as required) See Attached report	
Soil texture	_____% sand	_____% silt	_____% clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested	Hydraulic conductivity (cm/s)	Describe test standard used

Catch Basin – Design and management requirements can be found in Technical Guideline Agdex 096-101

If soil info differs per facility include additional soils page.

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

Condition required: ☑ YES ☐ NO

Report attached: ☑ YES ☐ NO

RUNOFF CONTROL CATCH BASIN: Naturally occurring protective layer (cont.)

NRCB USE ONLY

Catch basin calculator. Total volume @ freeboard level: 3,020 m3 Runoff capacity requirements met: ☑ YES ☐ NO

Calculation of the volume attached: ☑ YES ☐ NO

Depth to water table: 9 mbgs Requirements met: ☑ YES ☐ NO

Depth to uppermost groundwater resource: >9.2 mbgs Requirements met: ☑ YES ☐ NO

ERST completed: ☑ See ERST page for details

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

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

Catch Basin Storage Volume Calculator

Construction Dimensions of Catch Basin

*** Only cells in blue can be changed.**

Overall Dimensions of Catch Basin			Catch Basin Dimensions	
Total Length*[4]	41.0	m	135	ft
Total Width*[4]	41.0	m	135	ft
Total Depth*[4]	5.5	m	18	ft
Design Capacity Depth	*5.00*	m	16	ft
End Slope*[4]	3	run:rise	3	run:rise
Side Slope*[4]	3	run:rise	3	run:rise
Length of Bottom	8.0	m	26	ft
Width of Bottom	8.0	m	26	ft
Capacity @ top of Bank	*3,801*	m^3	*Capacity (@tob)* *134,213*	ft^3
			835,993	*Imp. Gal.*

Design Capacity of Catch Basin (freeboard level)			Design Capacity (freeboard level)	
Length (design capacity depth)	38.0	m	125	ft
Width (design capacity depth)	38.0	m	125	ft
Total Depth	*5.5*	m	*18*	ft
Design Capacity Depth	5.00	m	16	ft
End Slope	3	run:rise	3	run:rise
Side Slope	3	run:rise	3	run:rise
Design Capacity (freeboard level)	**3,020**	m^3	**106,650**	ft^3
			664,307	**Imp. Gal.**
level)	*1,444*	m^2	*15,543*	ft^2

CFO Name [1]	Slingerland Cattle
Land Location [1]	

Paved Runoff Catchment Area(s)

Area [2]	Length (m)	Width (m)	Area (m^2)
1			0.0
2			0.0
3			0.0
4			0.0
5			0.0
		Total Area (m^2)	**0**

Unpaved Runoff Catchment Area(s)

Area [2]	Length (m)	Width (m)	Area (m^2)
6	113	80	9,040.0
7	72	91	6,552.0
8	72	91	6,552.0
9			0.0
10			0.0
		Total Area (m^2)	**22,144**

Rainfall (Select Town [3])

Coaldale 85

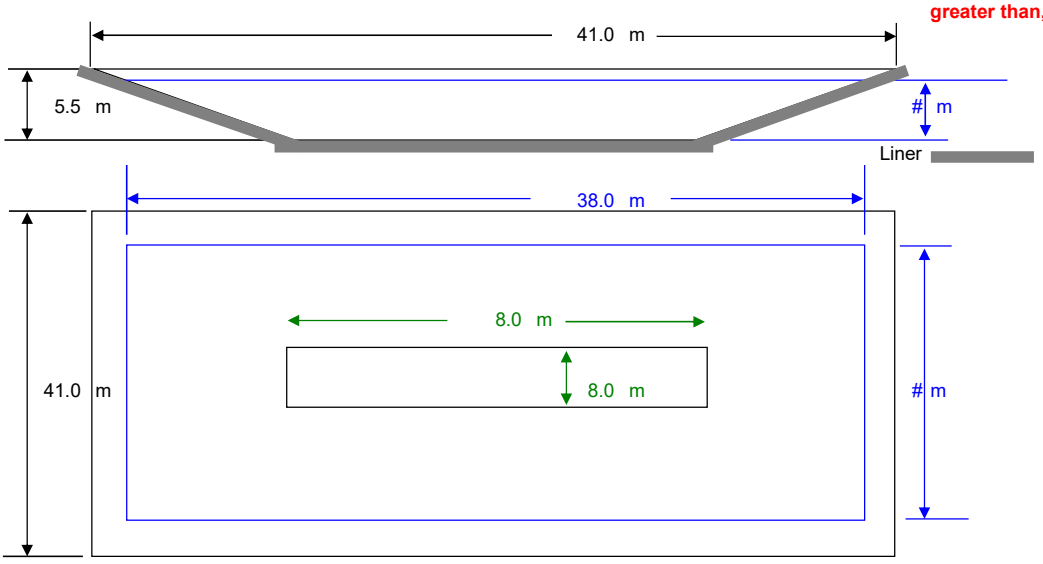
AOPA Design Rainfall **85 mm**

Minimum Catchbasin Storage Volume Required

1,129 m^3 ** **39882.40697 ft^3**

248420.8527 Imp. Gal.

**** Design capacity of catch basin should be equal to, greater than, minimum storage volume required.**



Lines in Black - Overall catch basin dimensions

Lines in Blue - Design capacity depth dimensions (excludes freeboard)

NTS - Not To Scale

NRCB USE ONLY **RUNOFF CONTROL CATCH BASIN CAPACITY SUMMARY (if applicable)**	
Facility 1	
Name / description: West catch basin	Capacity: 2,843 m3
Facility 2	
Name / description: East catch basin	Capacity: 3,020 m3
Facility 3	
Name / description	Capacity
Facility 4	
Name / description	Capacity
TOTAL CAPACITY	5,863 m3
RUNOFF VOLUME FROM CONTRIBUTING AREAS	2,004 m3
MEETS AOPA RUNOFF CONTROL VOLUME REQUIREMENTS	☑ YES ☐ NO

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NRCB USE ONLY

ALL SIGNATURES IN FILE ☑ YES ☐ NO

DATES OF APPROVAL OFFICER SITE VISITS

March 26, 2025	
April 2, 2025	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: May 27, 2025

Municipality: Lethbridge 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: Lethbridge Northern Irrigation District ☐ N/A

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

Other: Lethbridge North County Potable Water Coop ☐ N/A

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

JLECS

J Lobbezoo Engineering & Consulting Services Ltd.
PO Box 96, Monarch, AB T0L1M0

8 May 2025

JLECS File: P25035

Slingerland Cattle Ltd
PO Box 72
Diamond City, AB T0K 0T0

Attention: Mr. Ken Slingerland

Re: Geotechnical Review and Evaluation
NRCB Permitting of Proposed Pens & Catch Basin
NW-14-010-22-W4M, near Diamond City, 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 proposed pens as well as a proposed catch basin at the above captioned site (refer to Figure 1, attached). It is noted that the proposed catch basin was already present (former dugout or lagoon).

In order to demonstrate the suitability of the naturally existing soils for consideration as a naturally occurring protective layer to the groundwater resource, six boreholes were advanced at the site on April 28, 2025. The boreholes were advanced at the approximate locations denoted as BH25-01 to BH25-06 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 4.6 m to 9.2 m below the existing grade. The boreholes were logged by John Lobbezoo, P.Eng..

In general, the natural mineral soils encountered in the boreholes consisted of medium plastic clay till to the termination depths of all the boreholes. Neither groundwater, nor a groundwater resource (as defined by the AOPA) were encountered within the 9.2 m investigation depth at this site.

Samples of soil collected from the screened zones of boreholes BH25-02, BH25-04 and BH25-05, 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
BH25-01 / 4.0 – 4.5 m	40	28	32
BH25-02 / 4.0 – 4.5 m	34	38	28
BH25-03 / 4.0 – 4.5m	24	22	54
BH25-04 / 4.0 – 4.5m	26	26	48
BH25-05 / 7.0 – 8.0m	30	29	41
BH25-06 / 7.0 – 8.0m	34	34	32
Average:	*31*	*30*	*39*

To measure the *in situ* permeability of the subsurface soils, 50 mm diameter PVC monitoring wells were constructed in boreholes BH25-02, BH25-04 and BH25-05. Test well BH25-02 was screened from 2.7 m to 5.0 m depth, BH25-04 was screened from 2.7 m to 4.6 m depth, and test well BH25-05 was screened from 5.8 m to 9.1 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, the following 24-hour water drops were determined: 1.05 m at BH25-02; 0.1 m at BH25-04; and 0.76 m at BH25-05.

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 9.1×10^{-8} cm/s at BH25-02, 8.7×10^{-9} cm/s at BH25-04, and an *in situ* hydraulic conductivity (k_s) of 2.4×10^{-8} cm/s at BH25-05.

Using the measured permeability of the clay at this site, the 2 m of clay screened at test hole BH25-02 is estimated to represent the equivalent of about 22 m of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s (the reference standard in AOPA). At the other test holes, the 1.9 m of screened clay at BH25-04 and the 3.3 m of screened clay at BH25-05 are both 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.

We trust that this report satisfies your present requirements. Should you have any questions, please contact the undersigned at your convenience.

Yours truly,

J Lobbezoo Engineering & Consulting Services Ltd.

PROFESSIONAL ENGINEER ALBERTA
JOHN P. LOBBEZOO
ID 110450
8 May 2025

John Lobbezoo, P.Eng.
Principal Geotechnical Engineer

PERMIT TO PRACTICE
J LOBBEZOO ENGINEERING & CONSULTING SERVICES LTD.
RM SIGNATURE:
RM APEGA ID #: 110450
DATE: 8 May 2025
PERMIT NUMBER: P016456
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Attachments
- Figure 1 Borehole Locations
- In Situ Permeability Test Calculations
- Down to Earth Soil Texture Results
- Soil Profile and Parent Material Description, Chilako Drilling Services

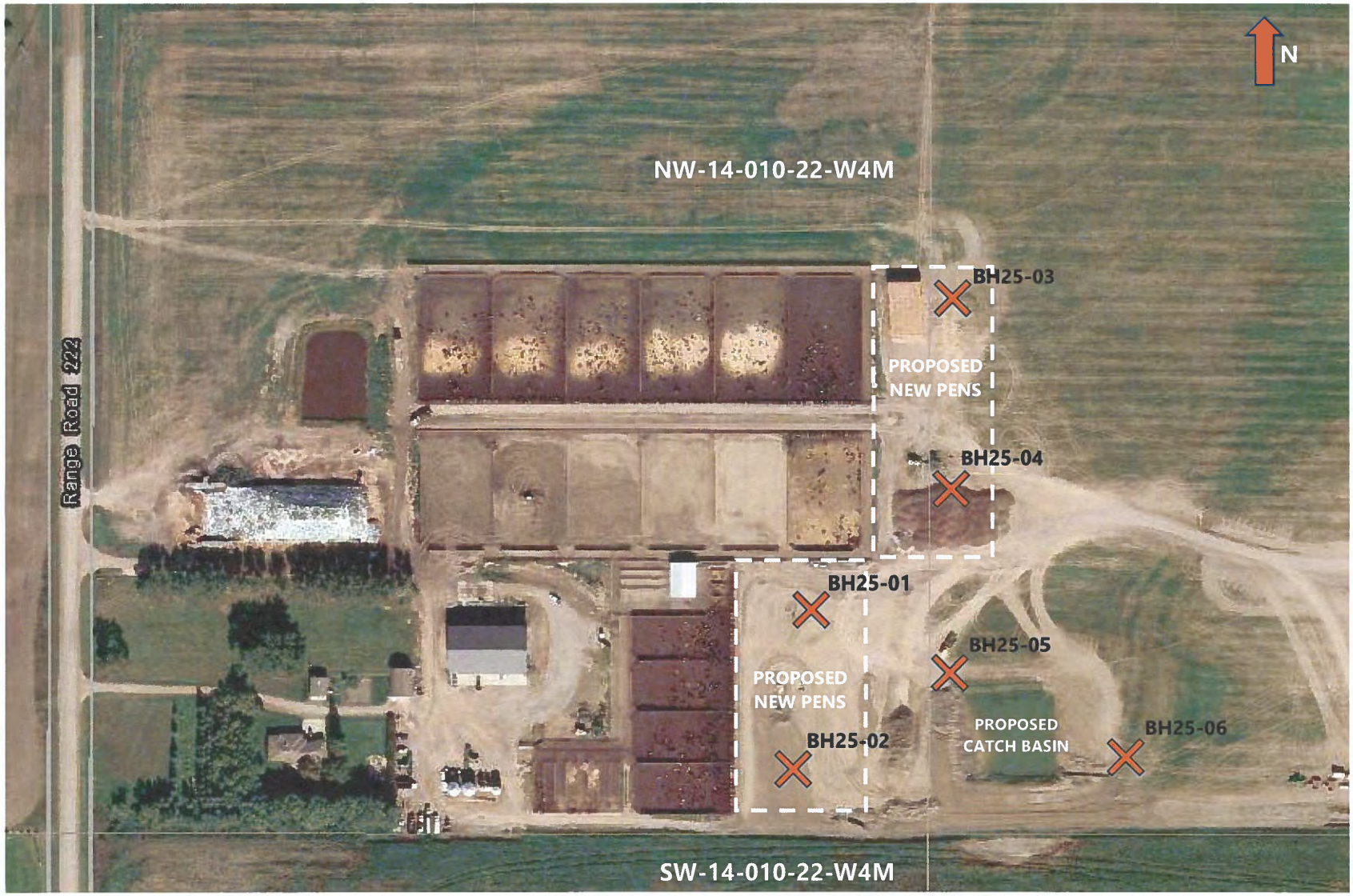


Figure 1: Site Layout & Borehole Locations

BH25-02

In Situ Permeability Test

Modified Falling Head Permeability Equation

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

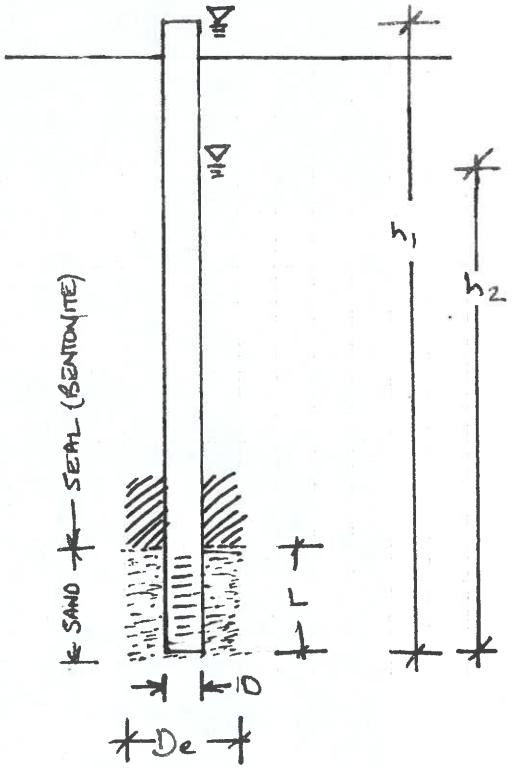
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

BH25-02 - Slingerland Cattle Ltd.

JLECS File: P25035

INPUT VARIABLES

Terms	Value	Definition
D	0.0520	diameter of standpipe (m)
De	0.1500	diameter of borehole (m)
L	2.00	length of sand section (m)
h1	5.60	initial height of water above base of hole (m)
h2	4.55	final height of water above base of hole (m)
t	24.0	time of test (h)



k_s = 9.1E-08 cm/sec

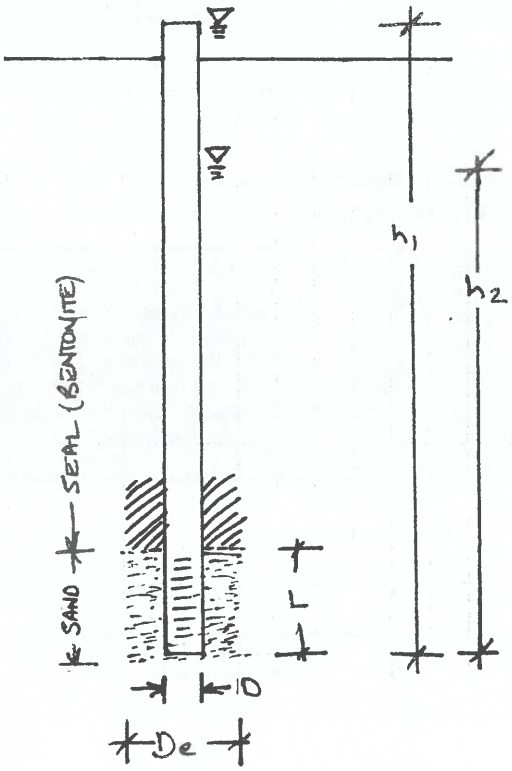
BH25-04

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)



BH25-04 - Slingerland Cattle Ltd.

JLECS File: P25035

INPUT VARIABLES

Terms	Value	Definition
D	0.0520	diameter of standpipe (m)
De	0.1500	diameter of borehole (m)
L	1.90	length of sand section (m)
h1	5.20	initial height of water above base of hole (m)
h2	5.10	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 8.7E-09 cm/sec

BH25-05

In Situ Permeability Test

Modified Falling Head Permeability Equation

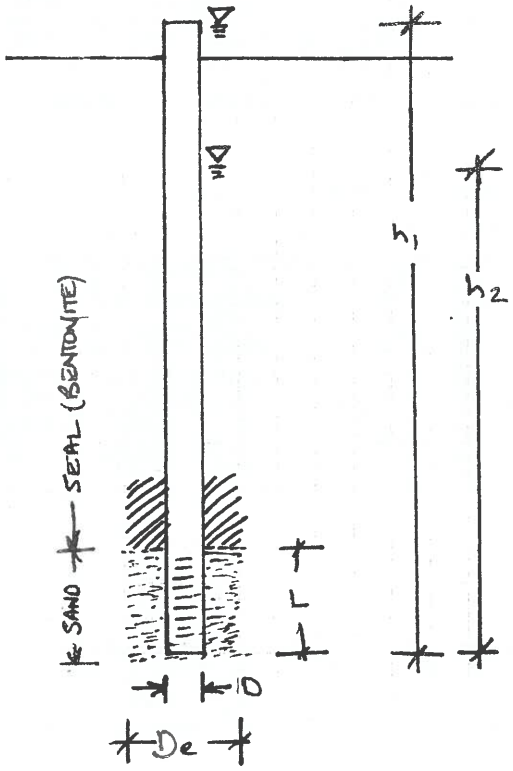
$$K_s = \frac{r^2}{2\ell\Delta t}\left[\frac{\sinh^{-1}\frac{\ell}{r_e}}{2}\ln\left[\frac{2H_1-\ell}{2H_2-\ell}\right]-\ln\left[\frac{2H_1H_2-\ell H_2}{2H_1H_2-\ell H_1}\right]\right]$$

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

BH25-05 - Slingerland Cattle Ltd.

JLECS File: P25035

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	3.30	length of sand section (m)
	h1	9.70	initial height of water above base of hole (m)
	h2	8.94	final height of water above base of hole (m)
	t	24.0	time of test (h)



k_s =	2.4E-08	cm/sec

Down To Earth Labs Inc.

The Science of Higher Yields

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

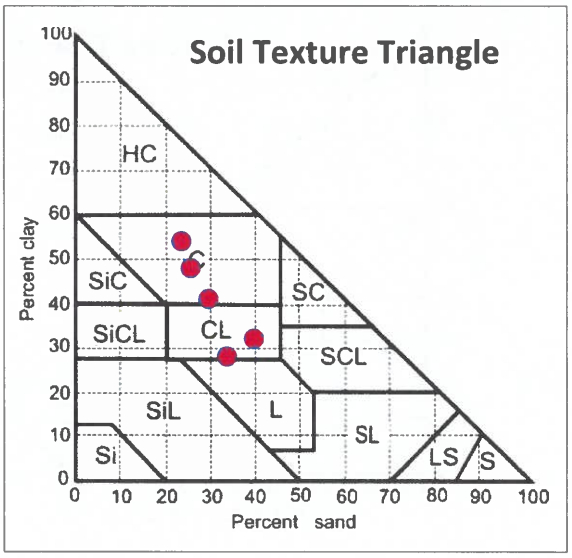
Report #: 205587
Report Date: 2025-05-06
Received: 2025-05-02
Completed: 2025-05-06
Test Done: ST

Project : Slingerland Cattle Co.

PO:

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

Sample ID:		250502L056	250502L057	250502L058	250502L059	250502L060
Cust. Sample ID:		BH25-01	BH25-02	BH25-03	BH25-04	BH25-05
Analyte	**Units**	4-4.5	4-4.5	4-4.5	4-4.5	7-8
Sand	%	40.0	34.0	23.9	25.9	29.9
Silt	%	28.0	38.0	22.1	26.1	29.1
Clay	%	32.0	28.0	54.0	48.0	41.0
Soil Texture	-	Clay Loam	Clay Loam	Clay	Clay	Clay



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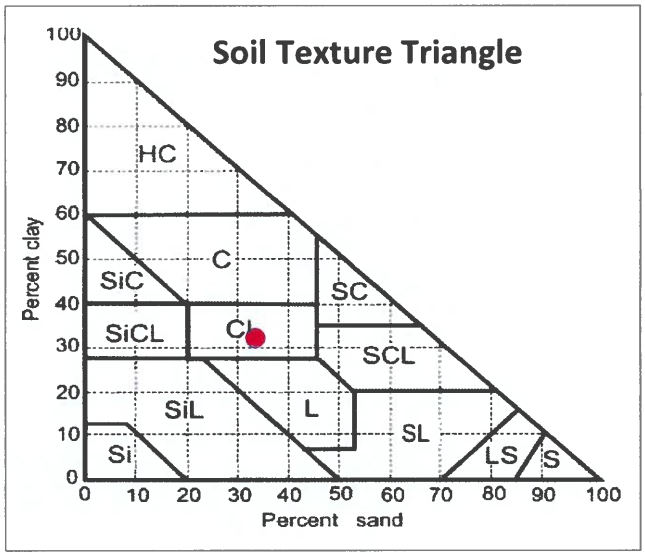
3510 6th Ave North
Lethbridge, AB T1H 5C3
403-328-1133
www.downtoearthlabs.com
info@downtoearthlabs.com

	Sample ID:	250502L061
	Cust. Sample ID:	BH25-06
Analyte	**Units**	7-8
Sand	%	33.9
Silt	%	34.1
Clay	%	32.0
Soil Texture	-	Clay Loam



Raygan Boyce - Chemist

JLECS

Borehole Summary Table

JLECS File: P25035
Project: Slingerland Cattle Ltd., Proposed Pens & Catch Basin, NW-14-10-22-W4M
Date of Drilling: 28 April, 2025

BH25-01		
Depth (m):		
0 – 4.6	**CLAY TILL** – medium plastic, trace sand, coal & oxide inclusions, stiff to very stiff, damp to moist, light brown -moist below 1.2m depth -moist to very moist below 2m depth	*Samples* S1: 2-2.5m S2: 4-4.5m
4.6	**End of Borehole at 4.6 m depth** *-borehole open and dry upon completion* *-borehole backfilled with drill cuttings upon completion*	

BH25-02		
Depth (m):		*Samples*
0 – 1.5	**CLAY FILL –** medium plastic, silty, trace sand, light brown, damp, stiff	S1: 2-2.5m S2: 4-4.5m
1.5 – 5.0	**CLAY TILL** – medium plastic, trace sand, firm to stiff, very moist, grey	Test Well Details 50mm diameter
5.0	**End of Borehole at 5.0 m depth** *-borehole open and dry upon completion* *-50mm diameter permeability test well installed at completion*	*Screen:* 3.2 to 4.7m *Backfill* Sand: 2.7 to 5.0m Bentonite: 0 to 2.7m *Stickup:* 0.6m

BH25-03		
Depth (m):		
0 – 0.15	**TOPSOIL**	
0.15 – 4.6	**CLAY TILL** – medium plastic, trace sand, trace gravel, coal & oxide inclusions, very stiff, damp to moist, brown	*Samples* S1: 2-2.5m S2: 4-4.5m
4.6	**End of Borehole at 4.6 m depth** *-borehole open and dry upon completion* *-borehole backfilled with drill cuttings upon completion*	

Borehole Summary Table
(continued)

JLECS

BH25-04		
Depth (m): 0 – 0.15 0.15 – 4.6 4.6	**TOPSOIL** **CLAY TILL** – medium plastic, trace sand, trace gravel, very stiff, damp to moist, brown -moist below 1.5m **End of Borehole at 4.6 m depth** *-borehole open and dry upon completion* *-50mm diameter permeability test well installed at completion*	*Samples* S1: 2-2.5m S2: 4-4.5m Test Well Details 50mm diameter *Screen:* 3.1 to 4.6m *Backfill* Sand: 2.7 to 4.6m Bentonite: 0 to 2.7m *Stickup:* 0.6m

BH25-05 – *NW of Catch Basin*		
Depth (m): 0 – 0.3 0.3 – 9.1 9.1	**TOPSOIL** **CLAY TILL** – medium plastic, trace sand, trace gravel, very stiff, moist, brown -very moist, grey, firm to stiff below 2m -moist, brown, very stiff below 4.5m **End of Borehole at 9.1 m depth** *-borehole open and dry upon completion* *-50mm diameter permeability test well installed at completion*	*Samples* S1: 2-2.5m *S2: 4-4.5m* S3: 5-6m S4: 7-8m Test Well Details 50mm diameter *Screen:* 6.1 to 9.1m *Backfill* Sand: 5.8 to 9.1m Bentonite: 0 to 5.8m *Stickup:* 0.6m

BH25-05 – *SE of Catch Basin*		
Depth (m): 0 – 0.3 0.3 – 9.1 9.2	**TOPSOIL** **CLAY TILL** – medium plastic, trace sand, trace gravel, very stiff, moist, brown -very moist, firm to stiff below 2m -moist, very stiff below 4.5m **End of Borehole at 9.2 m depth** *-borehole open and dry upon completion* *-borehole backfilled with drill cuttings upon completion*	*Samples* S1 2-2.5m S2: 4-4.5m S3: 5-6m S4: 7-8m

Table Notes:
- borehole information to be read in conjunction with JLECS report P25035.
- boreholes drilled on April 28, 2025, using a truck-mounted drill operated by Chilako Drilling Services Ltd.
- see Figure 1 for borehole locations