

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
<input checked="" type="checkbox"/> Approval <input type="checkbox"/> Registration <input type="checkbox"/> Authorization <input type="checkbox"/> Amendment	LA24045	NE 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.

Date of signing <u>October 18/24</u>	Signature
Corporate name (if applicable)	Print name Rose Niedermier

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)
Feedlot Pens (east)	35 m x 115 m
Feedlot Row (west)	31 m x 96 m
Catch Basin (east)	33 m x 13 m x 2 m deep
Catch Basin (west)	29 m x 13 x 2 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
Historic livestock pens	80 m x 95 m (irregular shape)	
These pens are included above in the proposed pen area. These are not grandfathered as they have been used for seasonal feeding and bedding.		

NRCB USE ONLY Application for a new CFO

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

New feedlot pens will replace old livestock pens.
 Old livestock barn will be removed.
 Install new feedbunk and cattle alley
 Proposed feedlot pens are mostly on the existing footprint

Construction completion date for proposed facilities Dec 1, 2025

Additional information

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

Livestock category and type (Available in the Schedule 2 of the Part 2 Matters Regulation)	Permitted number	Proposed increase or decrease in number (if applicable)	Total
The application is for a new CFO with 800 beef finishers			
n/a			

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GENERAL ENVIRONMENTAL INFORMATION

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

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

Existing: _____

Proposed 1: Feedlot Pens (east and west)

Proposed 2: Catch basin (west)

Proposed 3: Catch basin (east)

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 checked="" type="checkbox"/> >1 m <input type="checkbox"/> ≤ 1 m	<input checked="" type="checkbox"/> >1 m <input type="checkbox"/> ≤ 1 m	<input checked="" 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 a flood plain
	How many springs are within 100 m of the manure storage facility or manure collection area?		0	0	0	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	None reported or observed
Surface water information	How many water wells are within 100 m of the manure storage facility or manure collection area?		0	0	0	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	No water wells registered to LLD
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)		2800m	2800m	2800m	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	Irrigation canal 2300 m south of proposed CFO
Groundwater information	What is the depth to the water table?		>10m	>10m	>10m	<input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES with exemption	According to the soil investigation report it appears that the water table is 1.5m below grade but that can fluctuate. Condition required
	What is the depth to the groundwater resource/aquifer you draw water from?		>10m	>10m	>10 m	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	>9.2 m according to soil investigation report provided

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

See attached geotechnical and drilling report from John Lobbezoo and Chilako Drilling

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NRCB USE ONLY
ENVIRONMENTAL RISK SCREENING INFORMATION

ERST for **proposed** facilities

Facility	Groundwater score	Surface water score	File number
West feedlot pens	Low	Low	LA24045
East feedlot pens	Low	Low	LA24045
West catch basin	Low	Low	LA24045
East catch basin	Low	Low	LA24045

ERST for **existing** facilities

Facility	Groundwater score	Surface water score	File number
None			

ERST related comments:

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NRCB USE ONLY

WATER WELL AND SURFACE WATER INFORMATION

Well IDs: 118301 (approx 1.2 km SE of CFO) _____

118297 (approx 2.5km W of proposed CFO) _____

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

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 Murray Fry	NE NW 20-8-20W4M	560m	Ag	1	630 m		Yes
2 David Schapansky	NW 21-8-20W4M	150m	Ag	1	150 m	Yes	Yes
3 Marcus Schapansky	NW SW 21-8-20W4M	560m	Ag	1	560 m		Yes
4 Steve Gulyas	NE SE 20-8-20W4M	470m	Ag	1	470 m		Yes

See TD LA24045 pg 15 for corresponding site map

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)
Rose Niedermier	Section 29-8-20W4M	600 acres	Irrigated	243 ha / 600 ac	NA
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)

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NRCB USE ONLY

MINIMUM DISTANCE SEPARATION

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

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

Requirements (m): Category 1: 351 m Category 2: 467 m Category 3: 584 m Category 4: 935 m

Technology factor: YES NO

Expansion factor: YES NO

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

Category 2 is for residences on land zoned as country residential, rural commercial business, etc.

Category 4 is for residences on land zoned as large-scale country residential (defined as ten or more adjacent lots, each zoned as country residential) (Operational policy 2018-1 Large Scale Country Residential Developments for Determining Minimum Distance Separation Policy).

LAND BASE FOR MANURE AND COMPOST APPLICATION

Land base required: 49.6 ha / 122.6 ac

Land base listed: 243 ha / 600 ac

Area not suitable: Already subtracted

Available area: 243 ac / 600 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 _____

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NRCB USE ONLY

ALL SIGNATURES IN FILE

YES NO

DATES OF APPROVAL OFFICER SITE VISITS

December 17, 2024	
June 4, 2024	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: November 5, 2024

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: Atco Gas N/A

letter sent response received written/email verbal no comments received

Other: SMRID N/A

letter sent response received written/email verbal no comments received

County of Lethbridge Rural Water Association

letter sent no comments received

Minimum Distance Separation (MDS) Waiver (declaration)

Residence owner(s) information

ALL Names on land title: David & Sharlene Schapansky

Legal land location of residence(s): NW-21-08-20 W4

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

Address(es)¹ and Postal code(s)¹: [REDACTED] Lethbridge County, AB 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 LA24045

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

David Schapansky

Printed names of all residence owner(s) on title

Sharlene Schapansky

Date: October 9, 2024

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

DECLARATION AND ACKNOWLEDGMENT OF APPLICANT CONCERNING WATER ACT LICENCE

issued by Alberta Environment and Protected Areas (EPA) for a confined feeding operation (CFO)

Date and sign one of the following four options

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

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

Signed this ____ day of _____, 20____.

Signature of Applicant or Agent

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

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

Signed this 18 day of October, 2024.

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

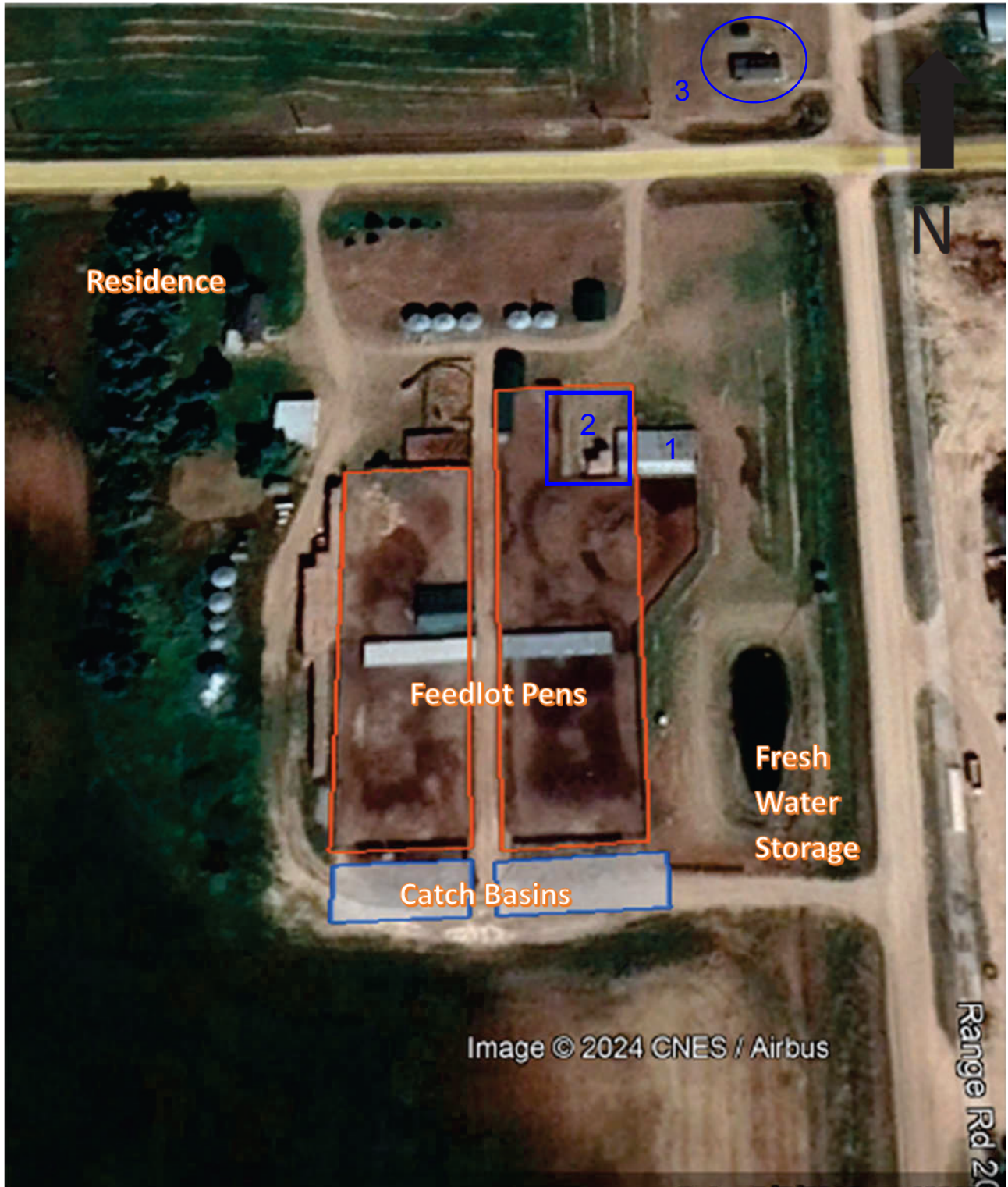


Figure 1 – Niedermier Feedlot Application – Site Map

1. Livestock barn that has been removed

2. Fenceline and dirtwork has been completed in the NE corner of the east pen (near the old livestock barn). The existing fenceline has been constructed where the proposed fenceline is marked in red. The newly constructed area is fenced off with temporary livestock panels so it is not populated.

3. Residence owned by Rose Niedermier



Figure 2 – Niedermier Feedlot Application - Area Map with residences (yellow star)

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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. Feedlot pens (east) _____
2. Feedlot pens (west) _____

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	NRCB USE ONLY Estimated storage capacity (m ³)
1.	35	115	0	
2.	31	96	0	
TOTAL CAPACITY				Feedlot pens are considered 9 months storage

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

Surface water control systems

Describe the run-on and runoff control system

Pens runoff will be directed into the catchbasin to the south of the pens

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	Provide details (as required) See borehole CF5-24		
	3.5 (m)		
Soil texture	41.9 % sand	25.1 % silt	33 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested 6.5 - 8.0 m bgs	Hydraulic conductivity (cm/s) 3.6 x 10-8 cm/s	Describe test standard used In-situ permability test

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

See attached geotechnical report from John Lobbezoo Consulting for additional information

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 (cont.)

NRCB USE ONLY

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

Depth to water table: 1.5 m Requirements met: YES NO

Depth to uppermost groundwater resource: >9.2 m Requirements met: YES NO

ERST completed: see ERST page for details

Surface water control systems

Requirements met: YES NO Details/comments:

Naturally occurring protective layer details

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

[See attached report](#)

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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. Catch Basin (west) _____
2. 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

See attached catch basin calculations for both structures (west and east)

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.	33	13	2	2	1:3 3:1	1:3 3:1	n/a	221 m ³
2.	29	13	2	2	1:3 3:1	1:3 3:1	n/a	188 m ³
3.								
TOTAL CAPACITY								409 m ³

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	3.5 (m)	Provide details (as required) See borehole CF5-24		
Soil texture	41.9 % sand	25.1 % silt	33 % clay	
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested 6.5 - 8.0 m bgs	Hydraulic conductivity (cm/s) 3.6 x 10 ⁻⁸ cm/s	Describe test standard used In-situ permeability test	

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

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

NRCB USE ONLY

Catch basin calculator. Total volume @ freeboard level: 409 m3 Runoff capacity requirements met: YES NO

Calculation of the volume attached: YES NO

Depth to water table: 1.5m but can fluctuate

Requirements met: YES NO
Condition required to ensure condition is met

Depth to uppermost groundwater resource: >9.2 m

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):

[See attached report](#)

Leakage detection system required: YES NO

If yes, please explain.

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NRCB USE ONLY	
RUNOFF CONTROL CATCH BASIN CAPACITY SUMMARY (if applicable)	
Facility 1	
Name / description Catch basin (east)	Capacity 221 m3
Facility 2	
Name / description Catch basin (west)	Capacity 188 m3
Facility 3	
Name / description	Capacity
Facility 4	
Name / description	Capacity
TOTAL CAPACITY	409 m3
RUNOFF VOLUME FROM CONTRIBUTING AREAS	357 m3
MEETS AOPA RUNOFF CONTROL VOLUME REQUIREMENTS	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO

Catch Basin Dimensions Calculator

Construction Dimensions of Catch Basin

	Metric
Size of Catch Basin	
Length* ₄	33.0 m
Width* ₄	13.0 m
Total Depth* ₄	2.0 m
Water Depth	1.50 m
End Slope* ₄	3 run:rise
Side Slope* ₄	3 run:rise
Length of Bottom	21.0
Width of Bottom	1.0
Total Capacity @ top of Bank	402 m³

* Only cells in blue can be changed.

Storage Volume of Catch Basin at Design Capacity (without freeboard)	
Length (Top of liquid level)	30.0 m
Width (Top of liquid level)	10.0 m
Depth	2.0 m
Water Depth	1.50 m
End Slope	3 run:rise
Side Slope	3 run:rise
Total Volume@ freeboard depth	221 m³
Surface Area of Liquid Manure	300 m²

English Units	
Capacity of Catch Basin	
108.27 Feet	
42.65 Feet	
6.56 Feet	
4.92 Feet	
3 run:rise	
3 run:rise	
3 run:rise	
14,196 ft³	
88,428 Imp. Gal.	
Volume at Freeboard	
98.43 Feet	
32.81 Feet	
6.56 Feet	
4.92 Feet	
3 run:rise	
3 run:rise	
7,787 ft³	
48,503 Imp. Gal.	
3,229 ft²	

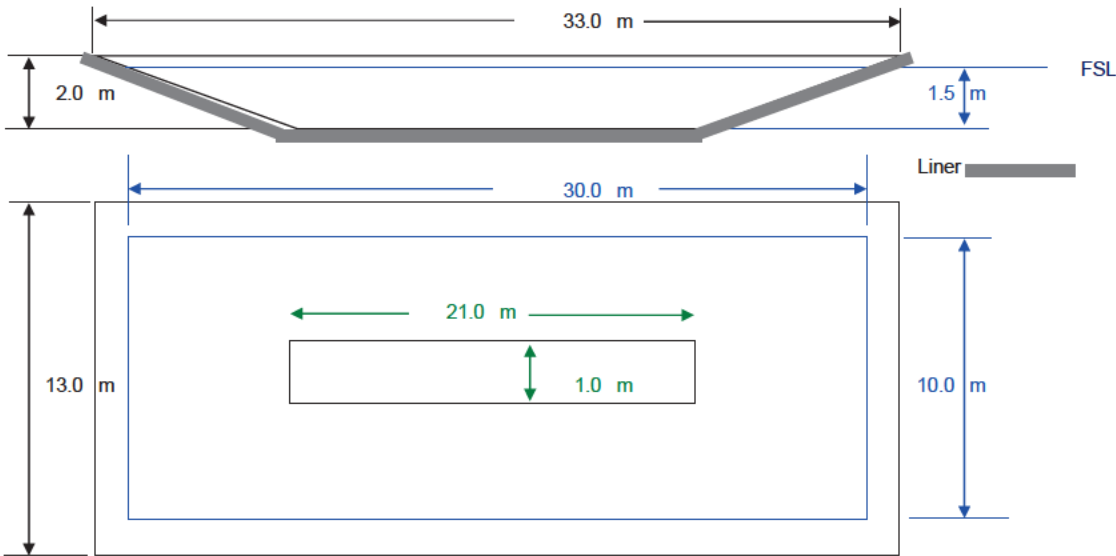
Name ₁	Niedermier - CB (east)		
Land Location ₁	1-1-4-W5		
Area ₂	Length (m)	Width (m)	Area (m ²)
1	35	115	4,025
2			0
3			0
4			0
5			0
Total Area			4,025

Select Town₃
Coaldale 85
Design Rainfall 85 mm

Catch Basin	Length (m)	Width (m)	Area (m ²)
1	33	13	429

Catch Basin Design Volume	
205 m³	7,249 ft³
	45,154 Imp. Gal.

** Storage volume should be same or slightly greater than design storage volume.



— Lines in Black - Catch basin dimension
— Lines in Blue - full level

NTS - Not Drawn To Scale

Catch Basin Dimensions Calculator

Construction Dimensions of Catch Basin

	Metric
Size of Catch Basin	
Length* ₄	29.0 m
Width* ₄	13.0 m
Total Depth* ₄	2.0 m
Water Depth	1.50 m
End Slope* ₄	3 run:rise
Side Slope* ₄	3 run:rise
Length of Bottom	17.0
Width of Bottom	1.0
Total Capacity @ top of Bank	346 m ³

* Only cells in blue can be changed.

Storage Volume of Catch Basin at Design Capacity (without freeboard)	
Length (Top of liquid level)	26.0 m
Width (Top of liquid level)	10.0 m
Depth	2.0 m
Water Depth	1.50 m
End Slope	3 run:rise
Side Slope	3 run:rise
Total Volume@ freeboard depth	188 m ³
Surface Area of Liquid Manure	260 m ²

English Units	
Capacity of Catch Basin	
	95.14 Feet
	42.65 Feet
	6.56 Feet
	4.92 Feet
	3 run:rise
	3 run:rise
	3 run:rise
	12,219 ft ³
	76,109 Imp. Gal.
Volume at Freeboard	
	85.30 Feet
	32.81 Feet
	6.56 Feet
	4.92 Feet
	3 run:rise
	3 run:rise
	6,622 ft ³
	41,244 Imp. Gal.
	2,799 ft ²

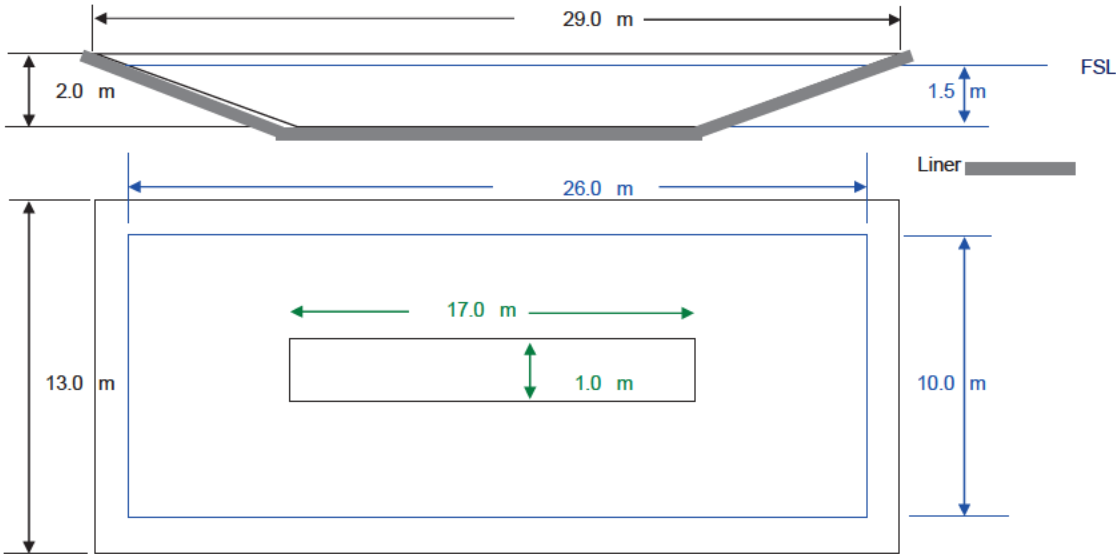
Name ₁	Niedermier - CB (west)		
Land Location ₁	1-1-4-W5		
Area ₂	Length (m)	Width (m)	Area (m ²)
1	31	96	2,976
2			0
3			0
4			0
5			0
	Total Area		2,976

Select Town₃
Coaldale 85
Design Rainfall 85 mm

Catch Basin	Length (m)	Width (m)	Area (m ²)
1	29	13	377

Catch Basin Design Volume	
152 m ³	5,360 ft ³
	33,386 Imp. Gal.

** Storage volume should be same or slightly greater than design storage volume.



— Lines in Black - Catch basin dimension
— Lines in Blue - full level

NTS - Not Drawn To Scale

12 September 2024

J Lobbezoo Engineering & Consulting Services Ltd.

PO Box 96, Monarch, AB T0L1M0

JLECS File: P24044

Schapansky Farms Ltd.

83069 Range Road 204

County of Lethbridge, Alberta T1J 5N7

Attention: Mr. Jesse Schapanski

**Re: Geotechnical Review and Evaluation
NRCB Permitting of Pens and Catch Basins
NE-20-008-20-W4M, near Lethbridge, 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 site soil conditions to support a permit application related to a series of proposed pens and a catch basin within NE-20-008-20-W4M, located near the northeast corner of the quarter section. More specifically, it is understood that the existing (grandfathered) pens will be reconstructed with a minor change in footprint, and that a catch basin will be added to the south side of the pen area.

In order to demonstrate the suitability of the naturally existing soils for consideration as a naturally occurring protective layer to the groundwater, five boreholes were advanced at the site on June 20, 2024 & August 15, 2024. The boreholes were advanced at the approximate locations denoted as CF1-24 to CF5-24 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 lacustrine clay loam with localized sandy clay loam, transitioning to medium plastic clay till at depth. While soft and wet clay soils were noted at in the near surface lacustrine deposit, no groundwater resource (as defined by the AOPA) was identified within the 9.2 m investigation depth at the proposed lagoon site.

A sample of soil collected from the screened zone of boreholes CF4-24 and CF5-25 as well as samples from the same depth at boreholes CF1-24 and CF3-24 were all subjected to grain size analyses, which was carried out by Down to Earth Laboratories in Lethbridge, Alberta. The results, which are also appended, indicate a soil texture breakdown of:

Table 1: Soil Texture Analyses

Borehole/Depth	% Sand	% Silt	% Clay
CF1-24 / 6.5 – 8.0 m	44	25	31
CF3-24 / 3.4 – 4.5 m	26	37	37
CF4-24 / 3.0 – 4.5 m	31	40	29
CF5-24 / 6.5 – 8.0 m	42	25	33
Average:	36	32	33

To measure the *in situ* permeability of the subsurface soils, 50 mm diameter PVC monitoring wells were constructed in boreholes CF4-24 & CF5-24. Test well CF4-24 was screened from 2.9 m to 4.5 m depth while test well CF5-24 was screened from 6.0 m to 9.2 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 24-hour water drop of 0.61 was determined at CF4-24, and a 24-hour drop of 1.05 m was determined at CF5-24.

To calculate the permeability of the screened portion of the clay till 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 report. The results of the permeability testing indicate an *in situ* hydraulic conductivity, k_s , of 7.1×10^{-8} cm/s at CF4-24, and 3.6×10^{-8} cm/s at CF5-24.

Using the measured permeability of the clay stratum, the 1.6 m of clay screened at CF4-24 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), while the 3.2 m of clay screened at CF5-24 is estimated to represent the equivalent of over 80 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 solid manure storage (minimum 2 m, Section 9.5-c) and catch basins (minimum 5 m, Section 9.5-b).

Conclusion

Based on the results of the current investigation, permeability testing, and our understanding of the site and proposed 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.

It is noted that, depending upon the final location and size of the catch basin, some soft and wet soils may be encountered in the upper 2 m at the site. These soft soils may require subexcavation, and bank reconstruction using recompacted clay at a moisture content within about three percent of optimum (as determined by standard Proctor testing).

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.



John Lobbezoo, P. Eng.
Principal Geotechnical Engineer

Attachments

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

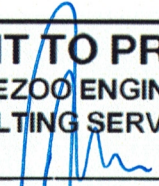
PERMIT TO PRACTICE	
J LOBBEZOO ENGINEERING & CONSULTING SERVICES LTD.	
RM SIGNATURE: _____	
RM APEGA ID #: _____	110450
DATE: _____	12 Sept 2024
PERMIT NUMBER: P016456	
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)	



Figure 1: Site Layout & Borehole Locations

Image Credit: Google

CF4-24

In Situ Permeability Test

Modified Falling Head Permeability Equation

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

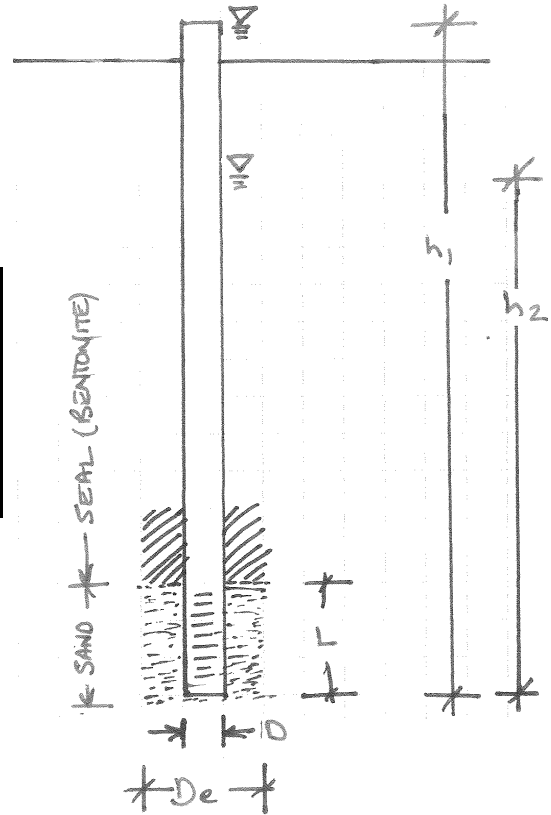
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

CF4-24 - Schapansky Farms

JLECS File: P24044

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	1.60	length of sand section (m)
	h1	4.65	initial height of water above base of hole (m)
	h2	4.04	final height of water above base of hole (m)
t	24.0	time of test (h)	

$k_s =$	7.1E-08 cm/sec
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CF5-24

In Situ Permeability Test

Modified Falling Head Permeability Equation

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

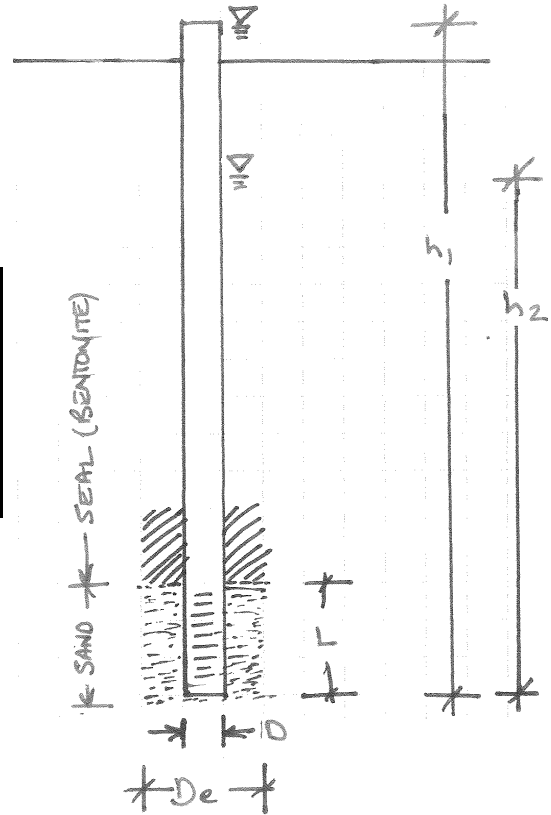
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

CF5-24 - Schapansky Farms

JLECS File: P24044

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	9.35	initial height of water above base of hole (m)
	h2	8.30	final height of water above base of hole (m)
t	24.0	time of test (h)	

$k_s = 3.6E-08$ cm/sec





Down To Earth Labs Inc.

The Science of Higher Yields

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

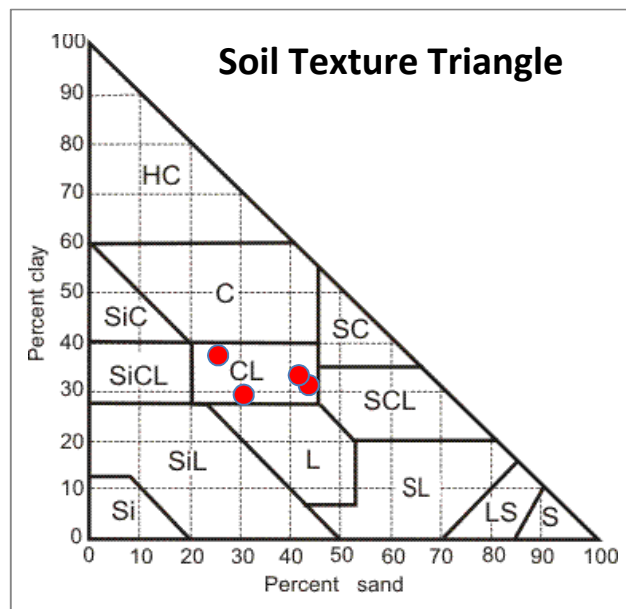
Report #: 186314
Report Date: 2024-09-12
Received: 2024-09-10
Completed: 2024-09-12
Test Done: ST

Project :

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

PO:

		Sample ID: 240910O001	240910O002	240910O003	240910O004
	Cust. Sample ID:	CF 1-24	CF 3-24	CF 4-24	CF 5-24
	Analyte Units	6.5-8.0	3.4-4.5	3.0-4.5	6.5-8.0
	Sand %	43.9	25.8	30.9	41.9
	Silt %	25.1	37.2	40.1	25.1
	Clay %	31.0	37.0	29.0	33.0
	Soil Texture	Clay Loam	Clay Loam	Clay Loam	Clay Loam



Raygan Boyce - Chemist

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(403) 345-3710

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: NE20-8-20W4, Schpansky Farms

Date: 2024-06-20, 2024-08-15

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
CF1-24	0379632 5502977 beside existing drain ditch	0-0.4	CL	M	Fill		
		0.4-1.2	CL	M	Lac		
		1.2-1.5	CL	VM	Lac		
		1.5-1.9	CL	Sat	Lac		V. Soft, med plastic, light gray
		1.9-4.1	CL	M	Lac		Stiff, med plastic, brown
		4.1-4.4	CL-SCL	M-Sat	Lac		V. Firm, low plastic brown
		4.4-9.2	CL-C	M	Till	6.5-8.0	Stiff, med plastic, dark brown, oxidized sand lensing @ 5.2m Slough and perched water @ 1.9m
CF2-24	0379600 6602975	0-1.1	CL	M	Lac		
		1.1-1.5	CL	Sat	Lac		V. Soft med plastic, light gray
		1.5-3.2	CL	VM	Lac		Soft, med plastic, yellow brown
		3.2-4.6	FSCL	Sat	Lac		V. Soft, low plastic yellow brown
		4.6-9.2	CL-C	M	Till		Stiff, med plastic, brown, oxidized
CF3-24	0379647 5503033	0-0.5	CL	M	Lac		
		0.5-1.5	SL-SCL	M	Lac		
		1.5-3.2	SL-SCL	Sat	Lac	1.5-3.0	V. Soft, low plastic, grayish brown
		3.2-4.5	CL-SiCL	M	Lac	3.4-4.5	Soft, med plastic, olive brown Perched water @ 1.5m
CF4-24	0379651 5503091	0-0.5	CL	M	Lac		
		0.5-1.0	SL-SCL	M	Lac		
		1.0-2.7	SL-SCL	Sat	Lac		V. Soft, low plastic, grayish brown
		2.7-4.5	CL-SiCL	M	Lac	3.0-4.5	Soft, med plastic, olive brown, sand lensing Free water @ 1.0m 50mm H.C. Well installed to 4.5m BGS Screen: 4.5-3.0m Sand: 4.5-2.9m Bentonite: 2.9-0.0m Stickup: 0.6m Hole Diameter: 0.15m
CF5-24	0379625 5502988	0-0.3	CL	M	Fill		
		0.3-1.4	CL	M	Lac		
		1.4-2.0	CL	VM	Lac		
		2.0-3.9	CL	M	Lac		Stiff, med plastic, brown
		3.9-4.4	FSCL	Sat	Till		V soft, low plastic, brown, free water
		4.4-9.2	CL-C	M	Till	6.5-8.0	Stiff, med plastic, dark brown, oxidized 50mm H.C. Well installed to 9.2m BGS Screen: 9.2-6.2m Sand: 9.2-6.0m Bentonite: 6.0-0.0m 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)