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

☑ Approval ☐ Registration ☐ Authorization ☐ Amendment

Application number: RA24001

Legal land description: E ½ 17-34-2 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.

December 11, 2023
Date of signing

[redacted]
Signature

Ference Land and Cattle Corp.
Corporate name (if applicable)

Craig Ference
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)
North Pen Area	335m x 131m
North Catch Basin	40m x 70m x 4m
South Pen Area	198m x 274m
South Catch Basin	40m x 40m x 4m (*)

(*) the applicant corrected the dimensions to 41 m x 40 x 4 m

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

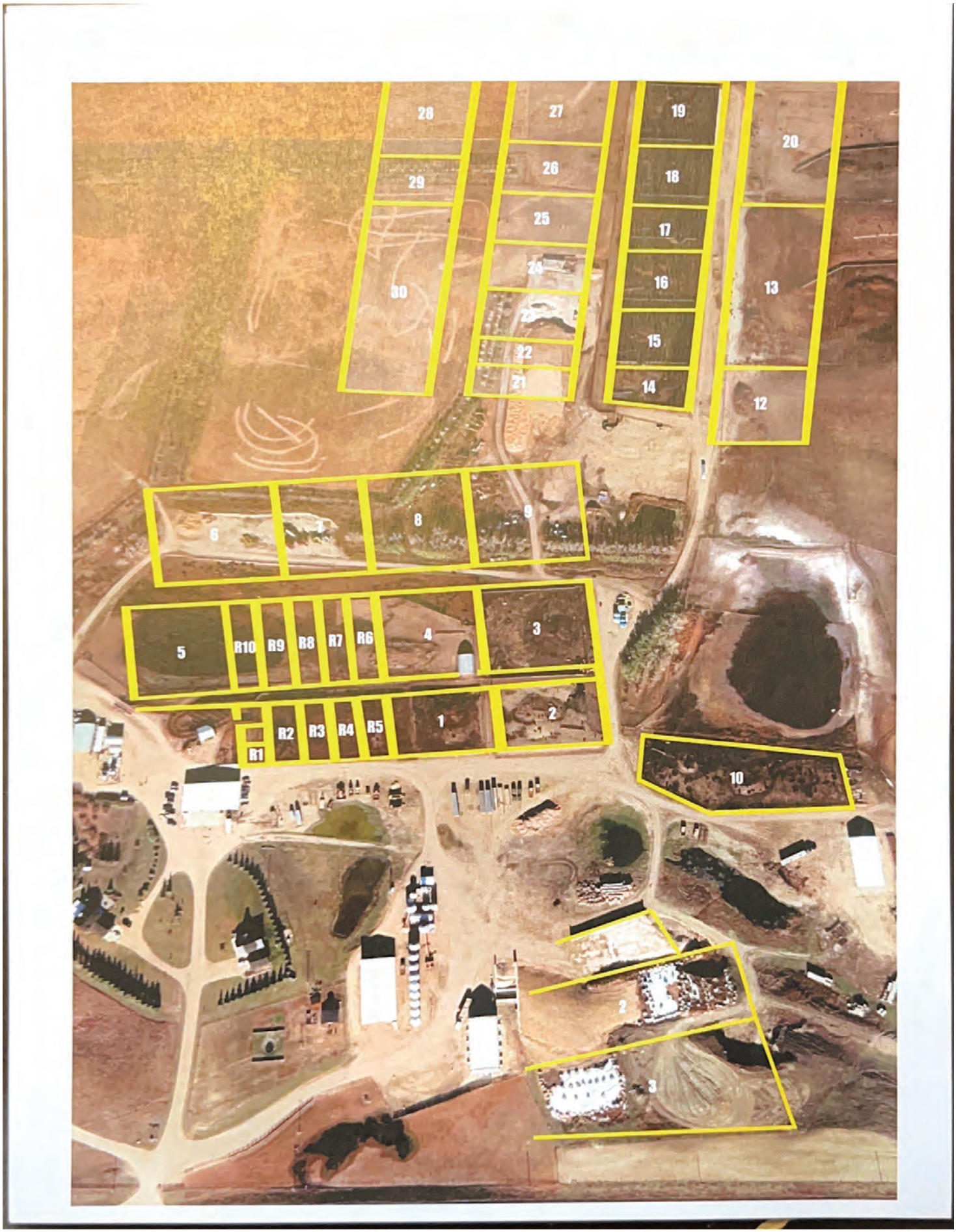
Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY

NRCB USE ONLY

Application for a new beef CFO. The applicant has already constructed some of the feedlot pens and is now applying to get them permitted

Last updated September 11, 2023

Proposed Pens	Dimensions
R1	71.2' x 55'
R2	71.2' x1 65'
R3	71.2 x 165'
R4	71.2' x 165'
R5	71.2' x 165'
R6	71.2' x 205'
R7	71.2' x 205'
R8	71.2' x 205'
R9	71.2' x 205'
R10	71.2' x 205'
1	172' x 165'
2	172' x 165'
3	172' x 205'
4	172' x 205'
5	200' x 205'
6	220' x 205'
7	220' x 205'
8	172' x 205'
9	172' x 205'
10	Seasonal
12	Seasonal
13	Seasonal
20	Seasonal
14	150' x 200'
15	200' x 200'
16	210' x 200'
17	150' x 200'
18	210' x 200'
19	210' x 200'
21	75' x 200'
22	75' x 200'
23	200' x 200'
24	200' x 200'
25	200' x 200'
26	150' x 200'
27	220' x 200'
30	Seasonal
29	Seasonal
28	Seasonal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R1
10
2
3

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)

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

The old facility was torn down end of August 2023. New construction of pens started immediately after ground work was complete. We did not realize a permit was required until NRCB came by. We finished construction of pens November 2023 other than Pen 8 & 9 which will be complete in the spring of 2024.

Construction completion date for proposed facilities May 2024

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**
Beef Finishers		6000	6000

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)

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 177646, 1435034, 1501879, license 16835, license 14937

Signed this 11th day of December, 2023. [redacted]

Signature of Applicant or Agent

Last updated September 11, 2023

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

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

_____

Signed this ____ day of _____, 20____. _____ [redacted]

Signature of Applicant or Agent

N

Figure #1


12
NW 17-34-2 W4
NE 17-34-2 W4
NW 16-34-2 W4
SW 17-34-2 W4
SE 17-34-2 W4
SW-16-34-2 W4
residence located 300m from feedlot pens
TWP RD 342
residence located 115m from feedlot pens
residence located 115m from feedlot pens
NW-8-34-2 W4
NE-8-34-2 W4
NW 7-34-2 W4
proposed pens
0 200 400 800 m

Figure 2

Figure 2

North Catch basin 40m x 70m x 4m

South Catch Basin 41m x 40m x 4m

North Pen area 290m x 360m (including seasonal pens)

South Pen area 198m x 274m

property line

E 1/2 17-34-02 W4

Figure-2 Waterwell Locations

X water wells

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)

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: none

Proposed 1: new feedlot pens

Proposed 2: convert cow - calf to feedlot

Proposed 3: 2 catch basins

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	> 1 m above flood plain
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?		0	0	0	☐ YES ☐ NO ☐ YES with exemption	None observed during a site visit
	How many water wells are within 100 m of the manure storage facility or manure collection area?		600m	400m	400m	☐ YES ☐ NO ☑ YES with exemption	There are 3 water wells located within 100 m to the proposed CFO facilities
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)		76m	76m	76m	☑ YES ☐ NO ☐ YES with exemption	75m to a slough on the applicant's property. 425 m to a common body of water
Groundwater information	What is the depth to the water table?		30m	30m	30m	☑ YES ☐ NO ☐ YES with exemption	> 5 m
	What is the depth to the groundwater resource/aquifer you draw water from?					☑ YES ☐ NO ☐ YES with exemption	UGR identified in WW ID# 1501807 at 41.2 m

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

Part 2 — Technical Requirements

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

NRCB USE ONLY

ENVIRONMENTAL RISK SCREENING INFORMATION

ERST for **proposed** facilities

Facility	Groundwater score	Surface water score	File number
Feedlot pens	Low	Low	RA24001
Catch basin #1	Low	Low	RA24001
Catch basin #2	Low	Low	RA24001

ERST for **existing** facilities

Facility	Groundwater score	Surface water score	File number
N/A			

ERST related comments:

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

WATER WELL AND SURFACE WATER INFORMATION

Well IDs: _1435304, 177646, 1501879, 1501807, 177647_____ _____

_____ _____ _____

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
1501807 (scale)	6	N/A	South pens and South catch basin
177647	8	N/A	South pens

Groundwater or surface water related comments:

Preliminary Screening Score (maximum 45)
Exemption less likely; action required; continue to next section >28
Continue to next section 10-28
Exemption more likely; do not complete next section <10

Secondary Screening Score (maximum 29):
Exemption less likely >20
Exemption more likely 4-19

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)

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
Glen Vert	SW 7-34-02w4	1800m	Agriculture	1	1,780		Yes

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

				NRCB USE ONLY	
Name of land owner(s)*	Legal land description	Usable area** (ha)	Soil zone ***	Usable area (ha)	Agreement attached (if required)
Ference Land and Cattle Corp.	see attached spreadsheet	618.30	dark brown/brown		
Ference Farms Ltd. Edward Ferenc	see attached spreadsheet	155.7	dark brown/brown		Yes
		774			
			Total	774	

* 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

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

MINIMUM DISTANCE SEPARATION

Methods used to determine distance (if applicable): __Google Earth_____

Margin of error (if applicable): _____

Requirements (m): Category 1:__731_____ Category 2:__975_____ Category 3:__1,219___ Category 4:__1,951__

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: ___750 hectares_____

Land base listed: __774 hectares_____

Area not suitable: _____

Available area _774_hectares_ Requirement met: ☑ YES ☐ NO

Land spreading agreements required: ☑ YES ☐ NO

Manure management plan: ☐ YES ☑ NO If yes, plan is attached: ☐

PLANS

Submitted and attached construction plans: ☑ YES ☐ NO

Submitted aerial photos: ☑ YES ☐ NO

Submitted photos: ☐ YES ☑ NO

GRANDFATHERING

Already completed: ☐ YES ☐ NO ☑ N/A

If already completed, see _____

Part 2 — Technical Requirements

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

NRCB USE ONLY

ALL SIGNATURES IN FILE ☑ YES ☐ NO

DATES OF APPROVAL OFFICER SITE VISITS

September 19, 2023	
March 12, 2024	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: ___January 24, 2024_____

Municipality: _Special Area No 4_____

☑ 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: _____Telus_____ ☐ N/A

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

Other: ____Dry Land Country Co-op_____ ☐ N/A

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

Name of Land Owner	Legal Land Description	Usable Area ** (ha)	Soil Zone ***
Ference Land and Cattle	SE 7-34-02 W4	60.7	Dark brown/brown
Ference Land and Cattle	NW 8-34-02 W4	55.4	Dark brown/brown
Ference Land and Cattle	SW 18-34-02 W4	46.9	Dark brown/brown
Ference Land and Cattle	SW 17-34-02 W4	54.6	Dark brown/brown
Ference Land and Cattle	N 17-34-02 W4	136	Dark brown/brown
Ference Land and Cattle	16-34-02 W4	177	Dark brown/brown
Ference Land and Cattle	NE 17-34-02 W4	27.1	Dark brown/brown
Ference Land and Cattle	SE 20-34-02 W4	14.6	Dark brown/brown
Ference Land and Cattle	SE 17-34-02 W4	46	Dark brown/brown
Ference Farms Ltd. Edward Ference	E 13-34-03 W4	68	Dark brown/brown
Ference Farms Ltd. Edward Ference	SW 13-34-03 W4	57	Dark brown/brown
Ference Farms Ltd. Edward Ference	NW 13-34-03 W4	30.7	Dark brown/brown
	Total	774	

FERENCE
LAND & CATTLE CORP.

Harvey R. Ference
(780) 753 0353 cell
(403) 552 3753 office
(403) 552 3751 fax

Craig H. Ference, BSc.
(780) 753 1283 cell
craig@doubleffarms.ca

Box 707 Kirriemuir, AB T0C 1R0
www.doubleffarrms.ca

FARM LEASE-CASH RENTAL

Between

Ference Farms Ltd. Edward Ference
of Box 708, Kirriemuir AB, T0C 1R0 (lessor)

and

Ference Land and Cattle Corp, Craig Ference
of Box 707, Kirriemuir AB, T0C 1R0 (lessee)

Ference Farms agrees to cash rent the following parcels of land to FLCC

The South Half of Section 34, Township 35, Range 3, West of the 4th Meridian. AB (246 acres).

The North Half of Section 34, Township 35, Range 3, West of the 4th Meridian. AB (258 acres).

The East Half of Section 33, Township 35, Range 3, West of the 4th Meridian. AB (170 acres).

The Northeast Quarter of Section 28, Township 35, Range 3, West of the 4th Meridian. AB (88 acres).

The Southwest Quarter of Section 33, Township 35, Range 3, West of the 4th Meridian. AB (103 acres)

The Northwest Quarter of Section 33, Township 35, Range 3, West of the 4th Meridian. AB (64 acres) less the 26 acres of new hay

The Northwest Quarter of Section 28, Township 35, Range 3, West of the 4th Meridian. AB (67 acres)

The Southwest Quarter of Section 28, Township 35, Range 3, West of the 4th Meridian. AB (117 acres)

The Northwest Quarter of Section 13, Township 34, Range 3, West of the 4th Meridian. AB (80 acres)

The Southwest Quarter of Section 13, Township 34, Range 3, West of the 4th Meridian. AB (146 acres)

The East Half of Section 13, Township 34, Range 3, West of the 4th Meridian. AB (175 acres)

The NE quarter of Section 33, Township 35, Range 3, West of the 4th Meridian. AB (24 acres)

The Section 28, Township 35, Range 3, West of the 4th Meridian. AB (63 acres).

The SE Quarter of Section 28, Township 35, Range 3, West of the 4th Meridian. AB (20, 15 and 15 total of 50 acres)

The NW of Section 27, Township 35, Range 3, West of the 4th Meridian. AB (66)
The South half of Section 3, Township 36, Range 3, West of the 4th Meridian. AB (140)

The NW of Section 33, Township 36, Range 3, West of the 4th Meridian. AB (25)

The acres total 1882 acres

2023- 2026 yearly rent shall be [redacted] per acre payable on November 30 of each year.

FLCC will graze all lands in fall and will pay [redacted]cre for the 518 acres not farmed for a total of [redacted]

The lessee shall receive all crop insurance payouts or subsidies on the above lands for grain or feed that the lessee has insured

Crop damage to be paid to FLCC based on fair market value.

This shall be a three year lease beginning January 1st, 2023 and ending on March 1st, 2026 with the lessee having a yearly option of renewal

Land taxes will be paid by lessor.

Grainary use will be available to lessee at [redacted] per bushel. Aeration fans, if needed, will be rented at [redacted] per year and the extra power used on Ed power bill during time when fans are used will be paid by FLCC.

FLCC has first right to future rent. Rent beginning in 2026 will be decided on/or before December 31, 2025.

January 1, 2023

[redacted] [redacted]

(Edward Ference for Ference Farms Ltd) (Craig Ference for Ference Land and Cattle.)

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)

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. North Pen Area
2. South Pen Area

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	**NRCB USE ONLY** Estimated storage capacity (m^3)
1.	335	137	0	6 month
2.	274	198	0	6 month
			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 be shaped so that run-on is directed around the pen areas, and that run-off from the pen areas will flow into the catch basins.

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	>17 (m)	Provide details (as required): equivalent 1E-6 cm/s tested thicknesses of clay are 17m to >50m (see attached report)	
Soil texture	34 % sand	49 % silt	17 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: 2.0m to 6.0m Clay Till	Hydraulic conductivity (cm/s): 2.9 to 9.7E-8 cm/s	Describe test standard used: in-situ modified falling head

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

Soils data summarized in WSP report BX30763 dated 1 December 2023 (see attached)

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: _____>5m_____ Requirements met: ☑ YES ☐ NO

Depth to uppermost groundwater resource: _____41.2 m_____ Requirements met: ☑ YES ☐ NO

ERST completed: ☑ see ERST page for details

Surface water control systems

Requirements met: ☑ YES ☐ NO Details/comments:

A condition will be included in the approval requiring a final post construction site visit of the constructed pens

Naturally occurring protective layer details

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

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)

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. North Catch Basin
2. South Catch Basin
3. _____

Determination of runoff area

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

North Pen Area = approx 290m by 360m = 104,400m2
30yr event for Provost = 80mm; runnoff coefficient = 0.6; Min calculated North CB volume is 5,011m3;
South Pen Area = approx 198m by 274m = 54,252m2
30yr event for Provost = 80mm; runnoff coefficient = 0.6; Min calculated South CB volume is 2,605m3

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.	40	70	4	4	3	3	--	5,369
2.	40	40	4	4	3	3	--	2,679
3.								
							TOTAL CAPACITY	8,048

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	>60m (m)	Provide details (as required) equivalent thickness of 1x10E-6 cm/s = 60+m	
Soil texture	41 % sand	31 % silt	28 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: 5m to 7.5m depth Clay Till	Hydraulic conductivity (cm/s): 4.2E-8 cm/sec to 2.9E-9 cm/sec	Describe test standard used: in-situ modified falling head 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.

Soils data for this site is summarize in WSP report BX30763 dated 1 December 2023 (see attached)

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: _8,048 m^3__Runoff capacity requirements met: ☑ YES ☐ NO

Calculation of the volume attached: ☑ YES ☐ NO

Depth to water table:_____> 5m_____ Requirements met: ☑ YES ☐ NO

Depth to uppermost groundwater resource: _____41.2 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):

A condition will be included in the approval requiring a final post construction site visit of the constructed catch basins

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

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

RUNOFF CONTROL CATCH BASIN CAPACITY SUMMARY (if applicable)

Facility 1	
Name / description Catch basin #1	Capacity 5,369 m^3
Facility 2	
Name / description Catch basin #2	Capacity 2,679 m^3
Facility 3	
Name / description	Capacity
Facility 4	
Name / description	Capacity
TOTAL CAPACITY	8,048 m^3
RUNOFF VOLUME FROM CONTRIBUTING AREAS	7,973 m^3
MEETS AOPA RUNOFF CONTROL VOLUME REQUIREMENTS	☑ YES ☐ NO

1 December 2023

WSP File: BX30763

3102 – 12 Avenue North
Lethbridge, Alberta T1H 5V1
T: +1 403 327-7474
www.wsp.com

Ference Land & Cattle Co.
Box 707
Kirriemuir, Alberta T0C 1R0

Attention: Mr. Craig Ference

Re: Geotechnical Review and Evaluation
NRCB Permitting of Existing and Proposed Pens and Catch Basins
Sec-17-034-02-W4M, near Kirriemuir, Alberta

As requested, WSP E&I Canada Limited (WSP) 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 an area of existing and proposed feedlot pens and catch basins within Section 17-034-02-W4M (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, fifteen (15) boreholes were advanced at the site on October 17, 2023. The boreholes were advanced at the approximate locations denoted as DF1-23 to DF15-23 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 ranging between 3.0 m and 9.2 m below existing grades. The boreholes were logged by Larry Delong of Chilako Drilling Services.

In general, the natural mineral soils encountered within the boreholes comprised of a layer of lacustrine silty clay loam, which was generally underlain by stiff medium to high plastic clay till below approximately 3.0 m depth. In addition to the predominant clay loam and clay till, minor sand lenses were noted in several boreholes, resulting in localized perched water conditions. The localized perched water encountered in this area are not considered to be a groundwater resource as defined by the AOPA.

Samples of soil collected from the screened zone of the boreholes DF2-23, DF9-23, DF12-23, and DF14-23 were subjected to laboratory grain size (i.e., hydrometer) analyses. The results (attached) indicate a textural breakdown of approximately:

Table 1: Soil Textural Analyses

Borehole/Depth	% Sand	% Silt	% Clay
DF2-23 / 6.0-7.5m	41	31	28
DF9-23 / 2.5 – 3.0m	34	49	17
DF12-23 / 4.0-4.5m	47	37	16
DF14-23 / 1.6-3.2m	35	47	18

To measure the *in situ* permeability of the subsurface soils, 50 mm diameter PVC monitoring wells were constructed in boreholes DF2-23, DF6-23, DF8-23, DF12-23 and DF14-23. The test wells were screened at

various depths from 2.0 m to 7.5 m below existing grades (see Table 2). 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 saturation, the 24-hour water drop for the wells ranged between 0.08 m and 1.22 m. The 24-hour water drop for each of the monitoring wells are listed in Table 2.

To calculate the permeability of the screened portion of the clay strata at the test well locations, 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 indicate *in situ* hydraulic conductivity, k_s, values ranging between 2.9 x 10^{-9} cm/s and 9.7 x 10^{-8} cm/s (see Table 2).

Using the measured permeability of the clay stratum, the equivalent natural soil thicknesses of naturally occurring material having a hydraulic conductivity of 1 x 10^{-6} cm/s (the reference standard in AOPA) at the monitoring well locations was calculated, and those thickness equivalents are presented in Table 2. As indicated, the equivalent thicknesses range between 17 m and greater than 100 m. 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 for catch basins (minimum 5 m, Section 9.5-b).

Table 1: Permeability Test Results

Borehole	24-hr Water Drop in Well (m)	Length of Screened Zone (m)	Depth of Screen (m)	Calculated Permeability	Calculated Equivalent 1x10^{-6} cm/s Thickness (m)
DF2-23	0.08	3.20	4.3 – 7.5	2.9 x 10^{-9} cm/s	>100
DF6-23	0.91	2.50	5.0 – 7.5	4.2 x 10^{-8} cm/s	60
DF8-23	1.22	1.60	4.4 – 6.0	9.7 x 10^{-8} cm/s	17
DF12-23	0.30	1.70	2.8 – 4.5	2.9 x 10^{-8} cm/s	59
DF14-23	0.29	1.60	2.0 – 3.6	3.7 x 10^{-8} cm/s	43

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 WSP's opinion that the naturally occurring materials at the site satisfy the AOPA requirements for permitting the existing and proposed pens and catch basins 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,

WSP E&[redacted]da Limited

[redacted] 1 Dec 2023

John Lobbezoo, P.Eng.
Principal Geotechnical Engineer

Co-authored by:
James Le, EIT
Geotechnical Services

Reviewed by:
Kevin Spencer, P.Eng., M.Eng.
Senior. Associate, Geotechnical Engineer

PERM[redacted]RACTICE
WSP E[redacted]DA LIMITED
RM SIGNATURE: [redacted]
RM APEGA ID #: 110450
DATE: 1 Dec 2023.
PERMIT NUMBER: P004546
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Attachments
- Figure 1 Borehole Locations
- In Situ Permeability Test Calculations
- Hydrometer Test
- Soil Profile and Parent Material Description, Chilako Drilling Services


Figure 1
Borehole Locations
Ference Land & Cattle Co.
WSP File: BX30763
October, 2023
NW-17-034-02-W4
NE-17-034-02-W4
SW-17-034-02-W4
SE-17-034-02-W4
PROPOSED CATCH BASIN
EXISTING & PROPOSED PEN AREA
PROPOSED CATCH BASIN
EXISTING & PROPOSED PEN AREA
DF1-23
DF2-23
DF3-23
DF4-23
DF5-23
DF6-23
DF7-23
DF8-23
DF9-23
DF10-23
DF11-23
DF12-23
DF13-23
DF14-23
DF15-23
Legend
Feature 1
GS4-23
Google Earth
300 m
N

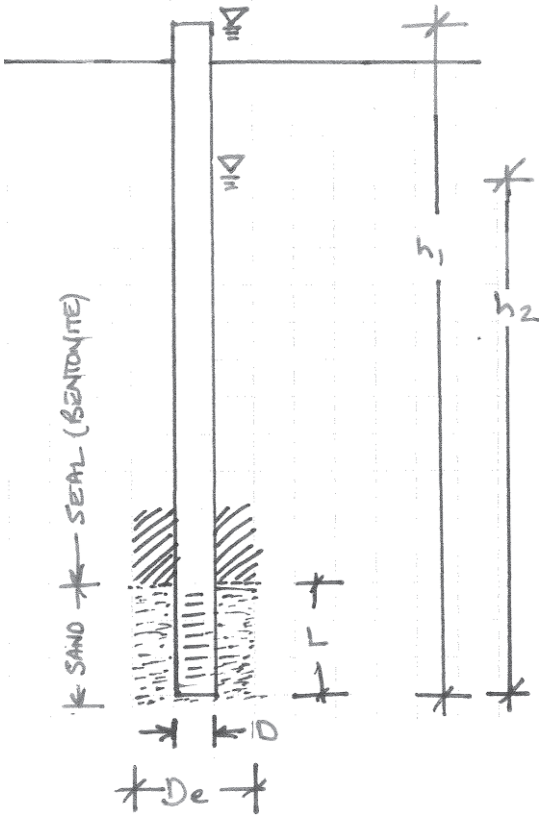
DF2-23

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)



DF2-23 - Double F Farms

WSP File: BX30763

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	8.10	initial height of water above base of hole (m)
h2	8.02	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 2.9E-09 cm/sec

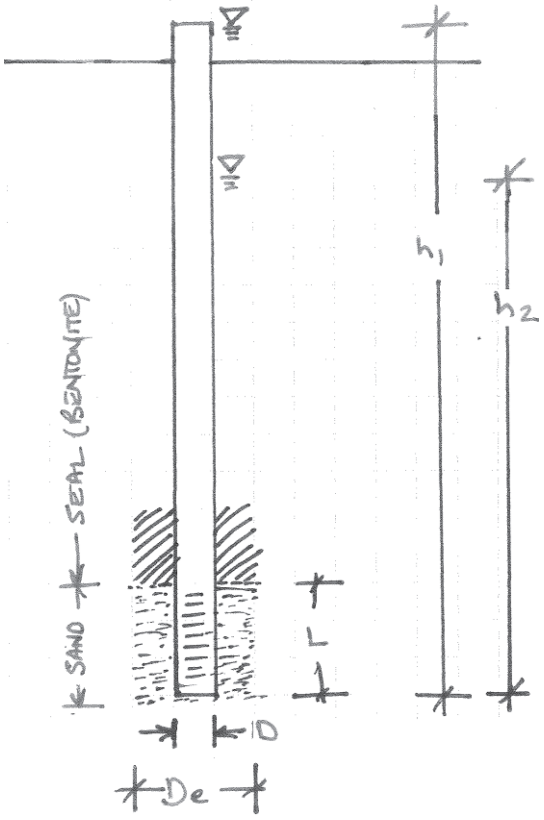
DF6-23

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)



DF6-23 - Double F Farms

WSP File: BX30763

INPUT VARIABLES

Terms	Value	Definition
D	0.0520	diameter of standpipe (m)
De	0.1500	diameter of borehole (m)
L	2.50	length of sand section (m)
h1	8.40	initial height of water above base of hole (m)
h2	7.49	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 4.2E-08 cm/sec

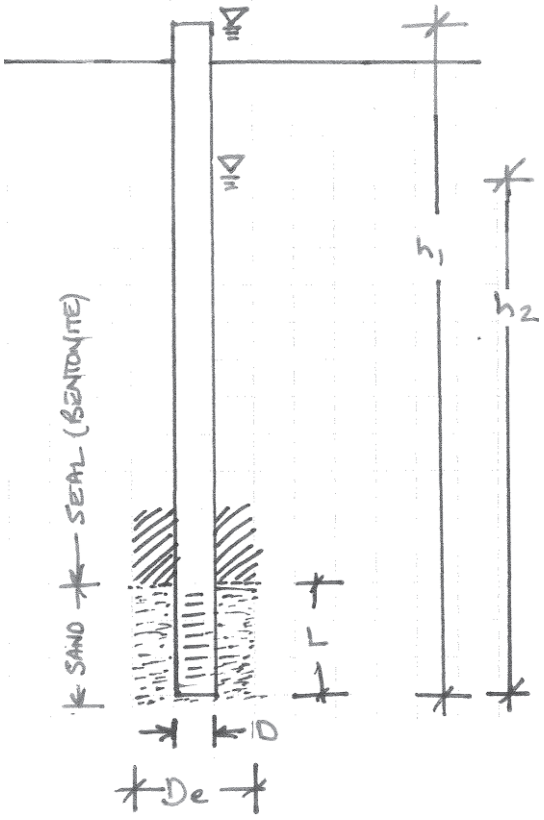
DF8-23

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)



DF8-23 - Double F Farms

WSP File: BX30763

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	6.80	initial height of water above base of hole (m)
h2	5.58	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 9.7E-08 cm/sec

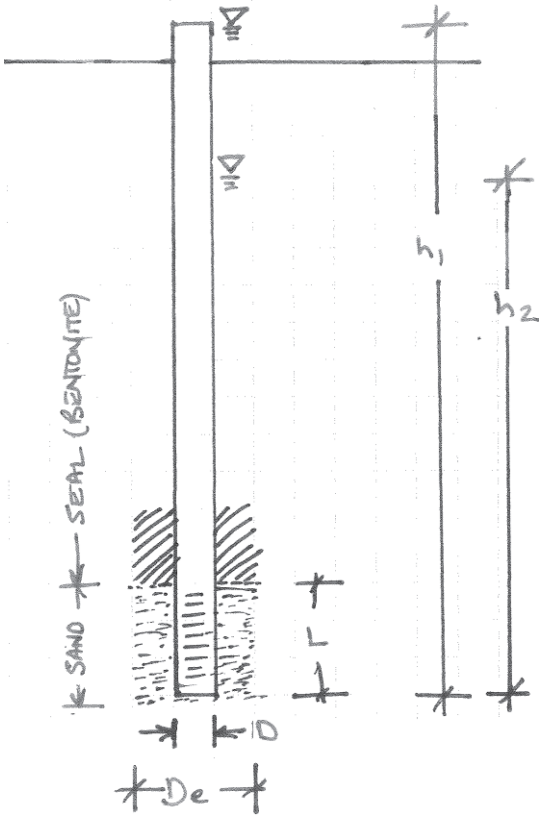
DF12-23

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)



DF12-23 - Double F Farms

WSP File: BX30763

INPUT VARIABLES

Terms	Value	Definition
D	0.0520	diameter of standpipe (m)
De	0.1500	diameter of borehole (m)
L	1.70	length of sand section (m)
h1	5.15	initial height of water above base of hole (m)
h2	4.85	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 2.9E-08 cm/sec

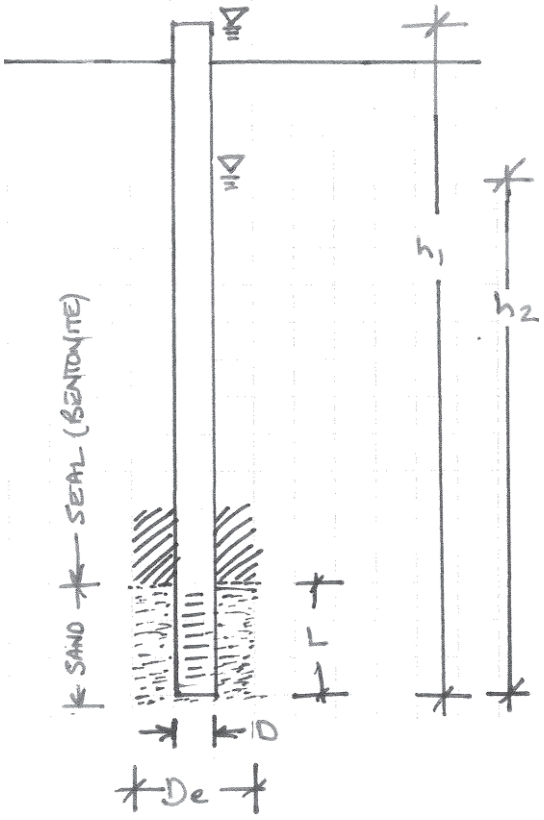
DF14-23

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)



DF14-23 - Double F Farms

WSP File: BX30763

INPUT VARIABLES

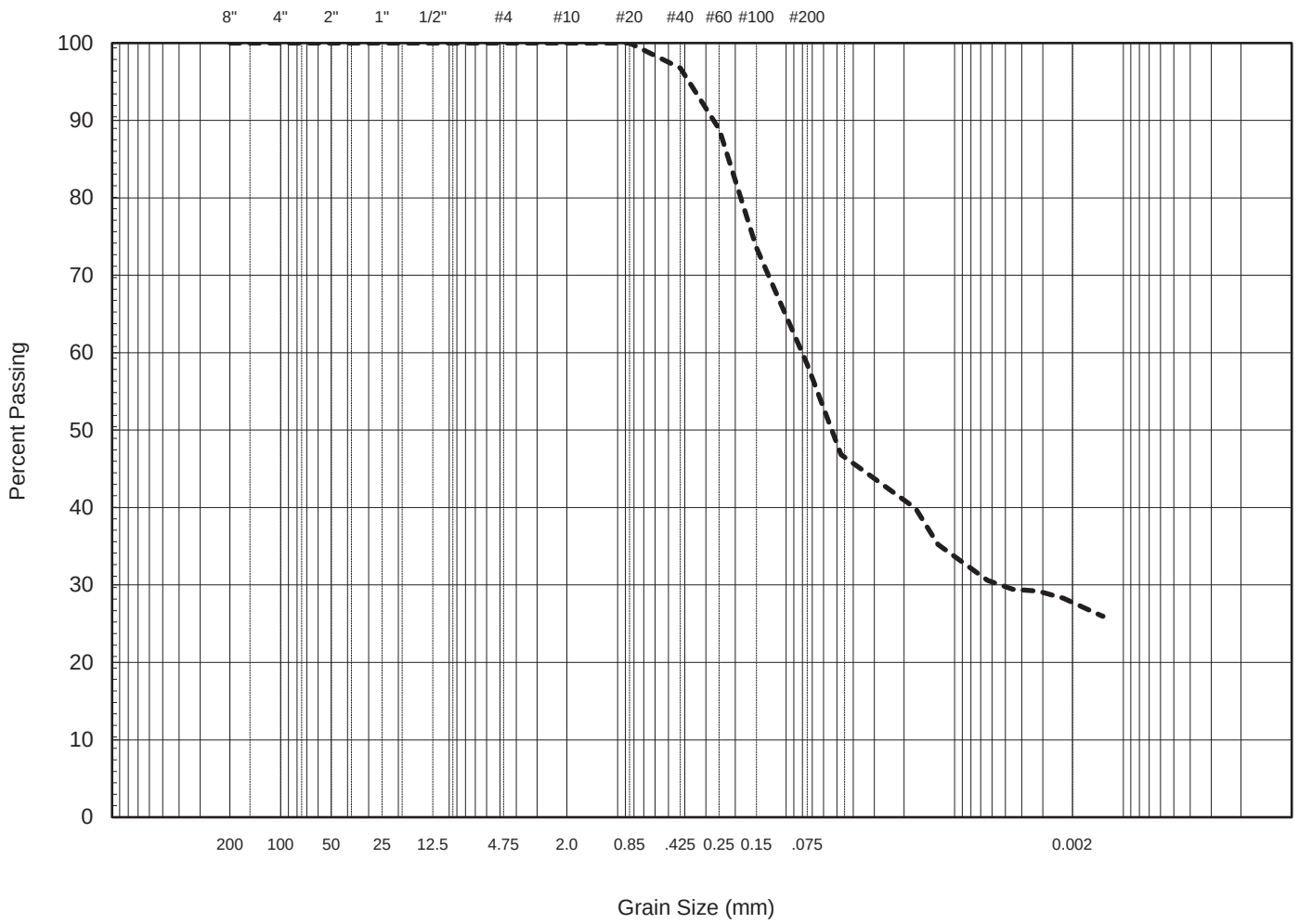
Terms	Value	Definition
D	0.0520	diameter of standpipe (m)
De	0.1500	diameter of borehole (m)
L	1.60	length of sand section (m)
h1	4.20	initial height of water above base of hole (m)
h2	3.91	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 3.7E-08 cm/sec

HYDROMETER TEST

WSP E&I Canada Limited

COBBLES	GRAVEL		SAND			SILT	CLAY
	Coarse	Fine	C	M	F		



Remarks:

Summary

D10 =	#N/A	mm	**Gravel**	0	**%**
D30 =	0.0054	mm	**Sand**	41	**%**
D60 =	0.0824	mm	**Silt**	31	**%**
Cu =	#N/A		**Clay**	28	**%**
Cc =	#N/A				

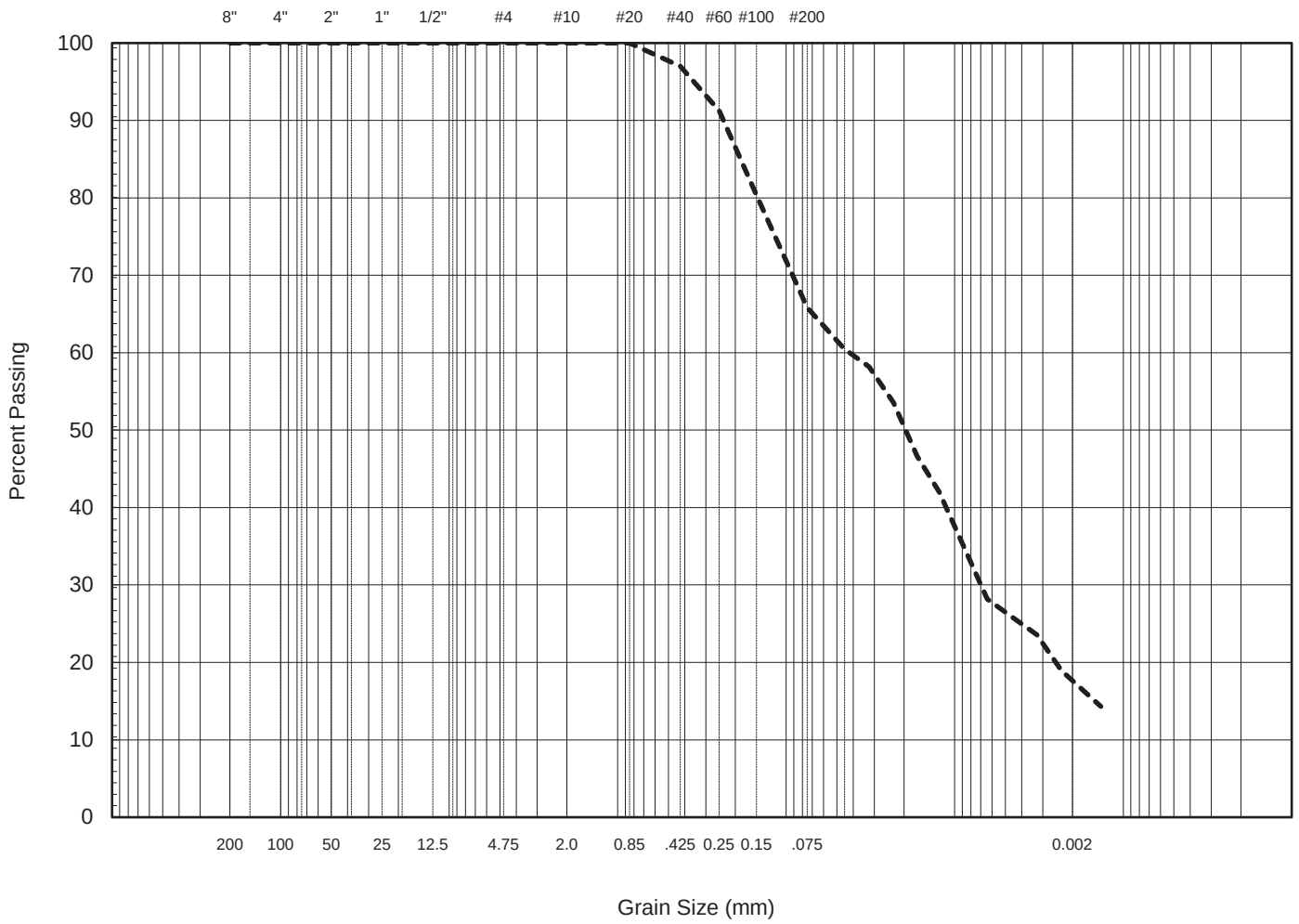
Project No: BX30763
Hole No: DF 2-23
Depth (m): 6.0-7.5

Client: Ference Land & Cattle Co.
Sample: --
Date: November 16, 2023 **Tech:** S.G

HYDROMETER TEST

WSP E&I Canada Limited

COBBLES	GRAVEL		SAND			SILT	CLAY
	Coarse	Fine	C	M	F		



Remarks:

Summary

D10 =	#N/A	mm	**Gravel**	0	**%**
D30 =	0.0071	mm	**Sand**	34	**%**
D60 =	0.0423	mm	**Silt**	49	**%**
Cu =	#N/A		**Clay**	17	**%**
Cc =	#N/A				

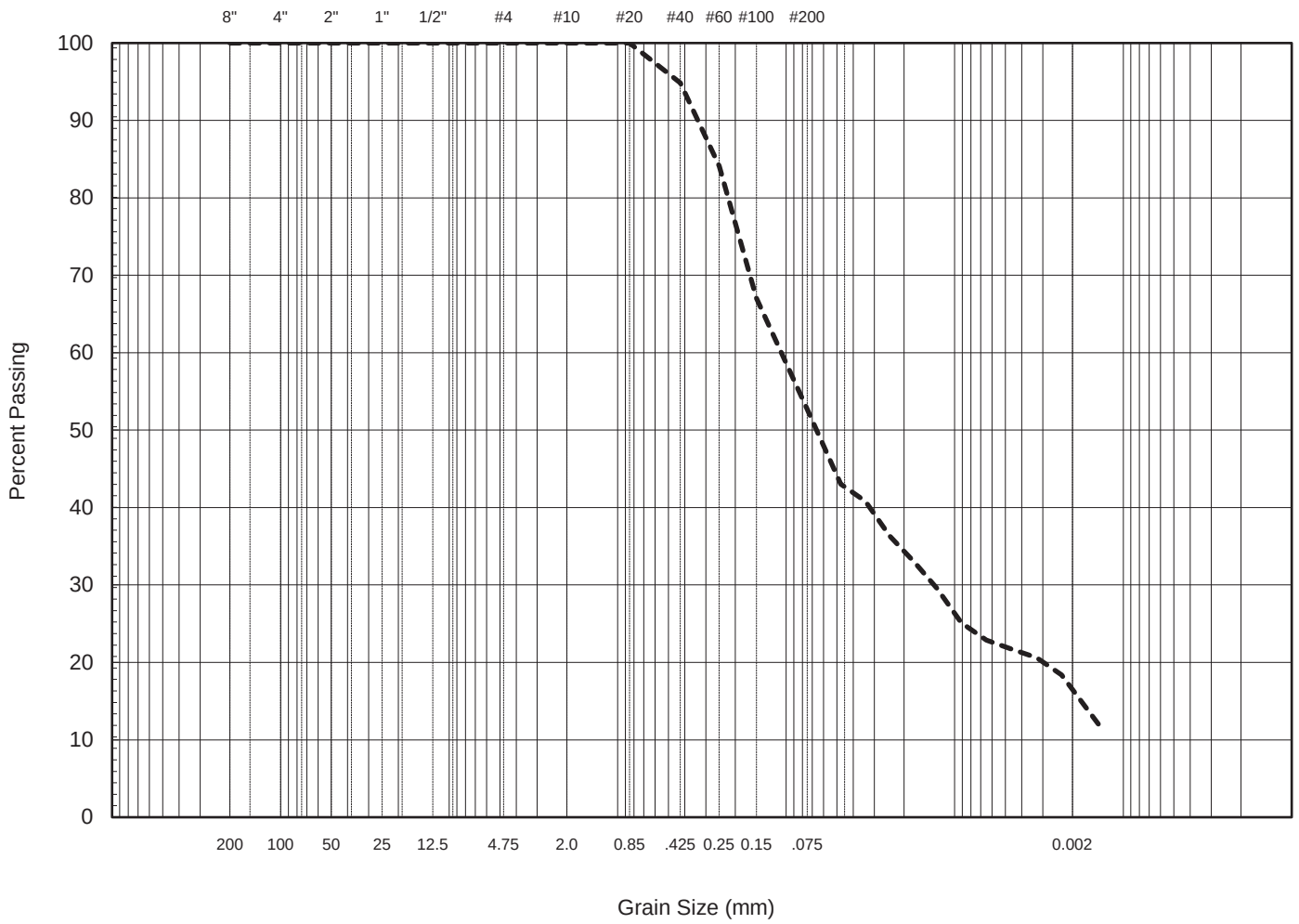
Project No: BX30763
Hole No: DF 9-23
Depth (m): 2.5 - 3

Client: Ference Land & Cattle Co.
Sample: --
Date: November 16, 2023 **Tech:** S.G

HYDROMETER TEST

WSP E&I Canada Limited

COBBLES	GRAVEL		SAND			SILT	CLAY
	Coarse	Fine	C	M	F		



Remarks: 0

Summary					
D10 =	#N/A	mm	**Gravel**	0	**%**
D30 =	0.0133	mm	**Sand**	47	**%**
D60 =	0.1132	mm	**Silt**	37	**%**
Cu =	#N/A		**Clay**	16	**%**
Cc =	#N/A				

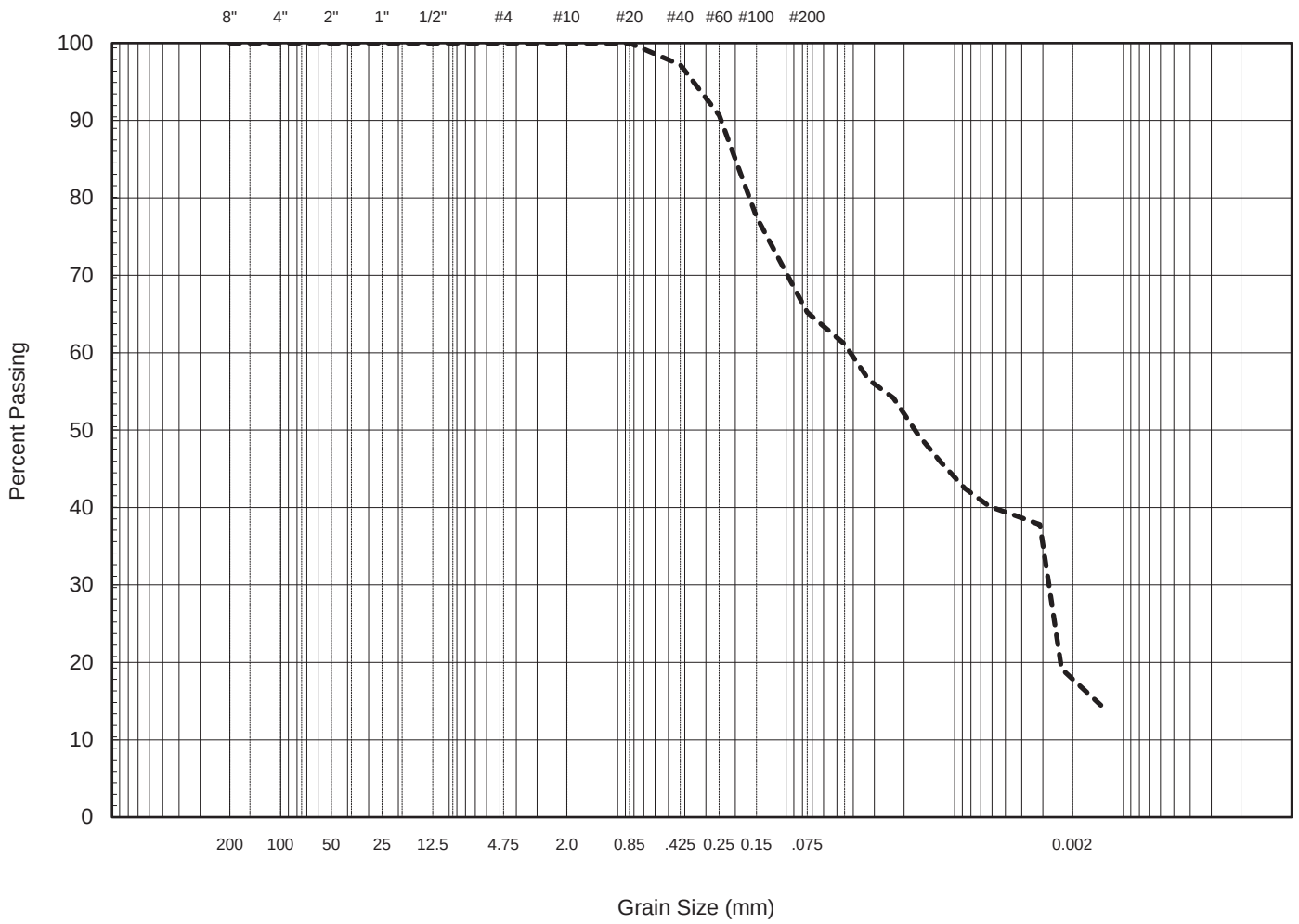
Project No: BX30763
Hole No: DF 12-23
Depth (m): 4.0 - 4.5

Client: Ference Land & Cattle Co.
Sample: --
Date: November 16, 2023 **Tech:** S.G

HYDROMETER TEST

WSP E&I Canada Limited

COBBLES	GRAVEL		SAND			SILT	CLAY
	Coarse	Fine	C	M	F		



Remarks:

Summary					
D10 =	#N/A	mm	**Gravel**	0	**%**
D30 =	0.0028	mm	**Sand**	35	**%**
D60 =	0.0420	mm	**Silt**	47	**%**
Cu =	#N/A		**Clay**	18	**%**
Cc =	#N/A				

Project No: BX30763
Hole No: DF 14-23
Depth (m): 1.6-3.2

Client: Ference Land & Cattle Co
Sample: --
Date: November 16, 2023 **Tech:** S.G

CHILAKO DRILLING SERVICES LTD

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

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: SE17-34-2W4, Double F Farms Date: 17-Oct-23

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
DF1-23	0551289	0-1.3	CL	SM	Till		
	5751792	1.3-4.1	CL	M	Till		V. Firm-stiff, med plastic, brown
		4.1-4.9	CL-C	M	Till		Stiff, high plastic, gray
		4.9-5.0	Sand	Sat	Till		Sat sand lens
		5.0-6.2	C	M	Till		Stiff, med plastic, brown
		6.2-9.2	C	M	Till	7.5-9.0	Stiff, med plastic, gray
DF2-23	0551357	0-0.2	CL	SM	Topsoil		
	5751807	0.2-3.6	CL	M	Till		Stiff, med plastic, brown
		3.6-7.5	C	M	Till	6.0-7.5	Stiff, med-high plastic, gray
							50mm H.C. Well installed to 7.5m BGS
							Screen: 7.5-4.5m
							Sand: 7.5-4.3m
							Bentonite: 4.3-0.0m
							Stickup: 0.6m
							Hole Diameter: 0.15m
DF3-23	0551304	0-0.2	CL	M	Topsoil		
	5751817	0.2-1.5	CL	M	Till		
		1.5-2.0	CL-C	M	Till		Sat sand lens @ 2.0m
		2.0-4.2	CL-C	M	Till		Stiff, med plastic, brown
		4.2-9.2	CL-C	M	Till	6.0-7.5	Stiff, med-high plastic, gray
DF4-23	0551768	0-0.3	FSL	M	Eol		
	5752464	0.3-1.0	FSL	VM	Eol		
		1.0-1.5	SL	Sat	Eol		Free water
		1.5-1.8	SiCL	VM	Lac		Soft, med plastic, olive brown
		1.8-2.9	FSCL	VM	Lac	2.0-3.0	V. Soft, low plastic, olive brown
		2.9-4.5	CL-C	M	Lac		Stiff, high plastic, gray
		4.5-9.2	CL-C	M	Till	6.0-7.0	Stiff, high plastic, gray
DF5-23	0551804	0-1.2	SCL	M	Fill		
	5752446	1.2-1.5	SCL	M	Topsoil		
	on berm	1.5-2.0	LS	VM	VM		
		2.0-3.0	LS	Sat	Sat	2.5-3.0	Free water
		3.0-9.0	CL-C	M	M		Stiff, high plastic, gray
DF6-23	0551782	0-0.6	LS	M	Eol		
	5752367	0.6-1.0	LS	M	Eol		
		1.0-1.6	LS	Sat	Lac		
		1.6-2.7	SiCL	M	Lac		Firm, med plastic, yellow brown
		2.7-3.4	C	M	Lac		Stiff, med plastic, yellow brown
		3.4-4.0	SiCL	VM	Lac		Sat sand lenses, yellow brown
		4.0-7.5	C	M	Till	5.5-6.5	Stiff, med-high plastic, gray
							50mm H.C. Well installed to 7.5m
							Screen: 7.5-5.5m
							Sand: 7.5-5.0m
							Bentonoite: 5.0-0.0m
							Stickup: 0.9m
							Hole Diameter: 0.15m
DF7-23	0551760	0-1.1	SiCL	M	Lac		V. Firm, med plastic, mottled, brown
	5752256	1.1-1.7	C	M	Lac		Stiff, med plastic, varved, brown
		1.7-3.0	C	M	Till		Stiff, med plastic, dark brown

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION (CONTINUED)

Hole #	Location	Depth	Texture	Moisture	Geologica	Sample	Remarks
DF8-23	0551752	0-2.5	S+Gr	M	Lac		
	5752152	2.5-2.9	FSL	M-VM	Lac		
		2.9-4.0	SiCL	M	Lac		V. Firm, med plastic, olive brown
		4.0-6.0	C	M	Lac		Stiff, med-high plastic, gray
							50mm H.C. Well installed to 6.0m BGS
							Screen: 6.0-4.5m
							Sand: 6.0-4.4m
							Bentonite: 4.4-0.0m
							Stickup: 0.8m
							Hole Diameter: 0.15m
DF9-23	0551748	0-1.8	S+Gr	SM	Lac		
	5752047	1,8-2.3	SiCL	M	Lac		V. Firm, med plastic, olive brown
		2.3-3.0	CL-C	M	Till	2.5-3.0	Stiff, med plastic, brown
DF10-23	0551611	0-1.8	SCL	M	Fill		
	5752277	1.8-3.0	CL	M	Till		V. Firm, med plastic
DF11-23	0551602	0-0.4	FSCL	M	Fill		
	5752170	0.4-1.6	LFS	M	Lac		
		1.6-2.5	SiCL	M	Lac		V. Firm, med plastic, olive brown
		2.5-4.1	SIC	M	Lac		Stiff, med-high plastic, olive brown
		4.1-4.5	SCL	VM	Lac		Sat sand pockets
		4.5-4.8	SiCL	M	Lac		V. Firm, med plastic, olive brown
		4.8-6.2	C	M	Till		Stiff, med-high plastic, gray
DF12-23	0551592	0-0.3	CL	M	Fill		
	5752068	0.3-1.6	LS	SM	Lac		
		1.6-4.5	CL-C	M	Till	4.0-4.5	Stiff, med plastic,
							50mm H.C. Well installed to 4.5m BGS
							Screen: 4.5-3.0m
							Sand: 4.5-2.8m
							Bentonite: 2.8-0.0m
							Stickup: 0.65m
							Hole Diameter: 0.15m
DF13-23	0551433	0-3.0	CL	M	Till	2.5-3.0	Stiff, med plastic, brown
	5751721						
DF14-23	0551536	0-3.6	CL	M	Till	1.6-3.2	
	5751704						50mm H.C. Well installed to 3.6m BGS
							Screen: 3.6-2.1m
							Sand: 3.6-2.0m
							Bentonite: 1.9-0.0m
							Stickup: 0.6m
							Hole Diameter: 0.15m
DF15-23	0551630	0-0.7	CL	D	Fill		
	5751708	0.7-3.0	CL	M	Till	1.5-3.0	Stiff, med plastic, dark brown
Owner plans on lining catch basins if needed							

Legend:

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

Eg. VFSCL = Very Fine Sandy Clay Loam

Alberta
ENVIRONMENT

LICENCE
to DIVERT AND USE WATER

Pursuant to the
WATER RESOURCES ACT

File No. 22407

Priority No. 1989-12-15-02

Purpose	Agricultural
Drainage Basin	Manito Lake
First Issued	1994 06 01

Double F Farms Ltd.
PO Box 707
Kirriemuir, Alberta
T0C 1R0

HAVING COMPLIED with the applicable provisions of the Water Resources Act, the Regulations and Interim Licence No. 16835, a copy of which is attached and incorporated herein,

IS GRANTED A LICENCE to divert and use the quantities of water prescribed in the interim licence in accordance with and subject to all other applicable provisions of the Act and the regulations, and the conditions attached, at locations described in the interim licence,

BY MEANS AND THROUGH works and undertakings described in the interim licence.

1994 06 01
Dated at Edmonton

rces

WR 4 (April/90)

Alberta
ENVIRONMENT

INTERIM LICENCE

Pursuant to the
WATER RESOURCES ACT
No 16835

Double F Farms Ltd.
P.O. Box 707
Kirriemuir, Alberta
T0C 1R0

File No. 22407
Priority No. 1989-12-15-02

having complied with the applicable provisions of the Water Resources Act and the regulations thereunder is hereby authorized, as soon as right-of-way is obtained:

A. To construct works as shown on plans and reports filed, approved and identified in departmental records as:

22407- Water Transmission System Double F Farms
L.S.D. 2 - S.E. 17-34-2-W4

B To divert and use water as hereinafter specified and described subject to the terms and conditions attached hereto and incorporated herein:

PURPOSE: Agricultural (Feedlot)

SOURCE OF SUPPLY: Aquifer

GROSS DIVERSION: Up to 4 acre-feet (1.1 million Canadian gallons) per annum consisting of:

1. Estimated Consumptive Use: 1.1 million gallons
2. Estimated Losses: NIL
3. Estimated Return Flow: NIL

POINT OF DIVERSION	WELL NUMBER	PRODUCTION INTERVAL	MAXIMUM PUMP RATE	MAXIMUM ANNUAL DIVERSION
2-17-34-2-4	89-12-15-02	144'-152'	15 Cgpm	1. mCg

The term within which construction is to be completed expires on 99 0 22

1990 01 22
Date Issued

ces

Original — Department
Copy — Licensee (See over for excerpts)
WR2 (Jan./89)

w/6212

TERMS AND CONDITIONS INTERIM LICENCE NO. 16835

If deemed necessary by the Controller of Water Resources, the licensee may be required to measure the water levels in the production well(s), while the pump is operating, on a monthly or weekly basis and to make such modifications to the well(s) as necessary to obtain the water level(s).

2. *When requested by the Controller of Water Resources, the ~~The~~ production well(s) shall be equipped with a cumulative meter which registers the number of gallons or cubic metres pumped, or the quantity of water pumped from the well(s) each month (in gallons) shall be estimated by multiplying the average number of cattle being watered each month by 360.

3. If deemed necessary by the Controller of Water Resources the licensee shall obtain water samples for purposes of chemical analyses from the production well(s). The analyses must include total dissolved solids, pH, Ca, Mg, Na+K, CO_3, HCO_3, SO_4, Cl, Fe and NO_3.

4. If deemed necessary by the Controller of Water Resources, the licensee may be required to install and equip an observation well or wells, completed in the same aquifer as the production well(s), to provide data for the evaluation of the effect of this withdrawal on the aquifer and the effect on other ground water users.

* AMENDED DATED 1994 06 01

5. *When requested by the Controller of Water Resources, the ~~The~~ licensee shall submit an annual return to the Controller of Water Resources on or before January 31 in each year for the preceding year including:

   Monthly estimations or readings of the number of Canadian gallons or cubic metres pumped from the well(s) as per clause 2.

   The total annual quantity pumped expressed in Canadian gallons or cubic metres,

   and such other information as may from time to time be required.

6. When requested to do so by the Controller of Water Resources, the licensee shall have the annual return detailed in clause 5 prepared, in whole or in part, by a qualified ground water consultant who is a member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta.

7 This interim licence and the attached terms and conditions are based on knowledge available at the time of issue and therefore the Controller of Water Resources reserves the right to revise the following portions of the interim licence and attached terms and conditions:

   Gross diversion;

.../2

w/6212

Maximum pumping rate;

Number, type and location of observation wells required;

Frequency and method of measurement of observation wells,

any time that the Controller of Water Resources has information indicating unreasonable interference with water supplies which cannot be satisfactorily remedied or that damage to aquifer(s) is occurring.

8. The rights and privileges hereby granted are subject to periodic review and to modification to ensure the most beneficial use of the water in the public interest and more particularly to ensure preservation of the rights of other water users.

9. The rights and privileges hereby granted can only be extended, modified, transferred or assigned with the approval of the Controller of Water Resources and are subject to cancellation or modification as provided in the Water Resources Act.

10. This interim licence and its terms and conditions shall be attached to and become part of the licence to use water issued pursuant to Section 33 of the Water Resources Act.

1990 01 22
Dated at Edmonton

ɔurces

w/6212

Alberta
ENVIRONMENT

LICENCE
to DIVERT AND USE WATER

Pursuant to the
WATER RESOURCES ACT

File No. 22407

Priority No. 1986-09-29-05
1986-09-29-06

Purpose Agricultural

Drainage Basin Manito Lake

First Issued 1988 04 18

Double F Farms Ltd.
P.O. Box 707
Kirriemuir, Alberta
T0C 1R0

HAVING COMPLIED with the applicable provisions of the Water Resources Act and the regulations thereunder and Interim Licence No 14937 , a copy of which is attached hereto and incorporated herein,

IS HEREBY GRANTED LICENCE to divert and use the quantities of water prescribed in the Interim Licence in accordance with and subject to all other applicable provisions of that Act and the regulations thereunder, and the terms and conditions attached hereto and incorporated herein, at locations described in the Interim Licence,

BY MEANS AND THROUGH works and undertakings described in the Interim Licence

1988 04 18
Date

0604s

WR 4 (Sept./86)

Alberta
ENVIRONMENT

INTERIM LICENCE

Pursuant to the
WATER RESOURCES ACT

Nº 14937

Double F Farms Ltd.
P.O. Box 707
Kirriemuir, Alberta
TOC 1R0

File No. 22407

Priority No. 1986-09-29-05
1986-09-29-06

having complied with the applicable provisions of the Water Resources Act and the regulations thereunder is hereby authorized, as soon as right-of-way is obtained:

A. To construct works as shown on plans and reports filed, approved and identified in departmental records as:

22407- Water Transmission System Double F Farms
L.S.D. 2-S.E. 17-34-2-W4

B. To divert and use water as hereinafter specified and described subject to the terms and conditions attached hereto and incorporated herein:

PURPOSE: Agricultural (Feedlot)

SOURCE OF SUPPLY: Aquifer

GROSS DIVERSION: Up to 9 acre-feet (2.5 million Canadian gallons) per annum consisting of:

1. Estimated Consumptive Use: 2.5 million gallons
2. Estimated Losses: NIL
3. Estimated Return Flow: NIL

POINT OF DIVERSION	WELL NUMBER	PRODUCTION INTERVAL	MAXIMUM PUMP RATE	MAXIMUM ANNUAL DIVERSION
2-17-34-2-4	86-09-29-05	76'-80'	16 Cgpm	.1 mCg
2-17-34-2-4	86-09-29-06	144'-148'	24 Cgpm	.4 mCg

The term within which construction is to be completed expires on N/A

1987 03 16
Date Issued

02260

Original — Department
Copy — Licensee (See over for excerpts)
WR2 (Aug 84)

File: 22407

TERMS AND CONDITIONS INTERIM LICENCE NO. 14937

1. If deemed necessary by the Controller of Water Resources, the licensee may be required to measure the water levels in the production well(s), while the pump is operating, on a monthly or weekly basis and to make such modifications to the well(s) as necessary to obtain the water level(s).

2. *When requested by the Controller of Water Resources, the ~~The~~ production well(s) shall be equipped with a cumulative meter which registers the number of gallons or cubic metres pumped, or the quantity of water pumped from the well(s) each month (in gallons) shall be estimated by multiplying the average number of cattle being watered each month by 360.

3. If deemed necessary by the Controller of Water Resources the licensee shall obtain water samples for purposes of chemical analyses from the production well(s). The analyses must include total dissolved solids, pH, Ca, Mg, Na+K, CO_3, HCO_3, SO_4, Cl, Fe and NO_3.

4. If deemed necessary by the Controller of Water Resources, the licensee may be required to install and equip an observation well or wells, completed in the same aquifer as the production well(s), to provide data for the evaluation of the effect of this withdrawal on the aquifer and the effect on other ground water users.

* AMENDED DATED 1994 06 01

5. *When requested by the Controller of Water Resources, the ~~The~~ licensee shall submit an annual return to the Controller of Water Resources on or before January 31 in each year for the preceding year including:

   Monthly estimations or readings of the number of Canadian gallons or cubic metres pumped from the well(s) as per clause 2.

   The total annual quantity pumped expressed in Canadian gallons or cubic metres,

   and such other information as may from time to time be required

6. When requested to do so by the Controller of Water Resources, the licensee shall have the annual return detailed in clause 5 prepared, in whole or in part, by a qualified ground water consultant who is a member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta.

7 This interim licence and the attached terms and conditions are based on knowledge available at the time of issue and therefore the Controller of Water Resources reserves the right to revise the following portions of the interim licence and attached terms and conditions:

   Gross diversion;

./2

02260

(b) Maximum pumping rate;

(c) Number, type and location of observation wells required;

(d) Frequency and method of measurement of observation wells,

any time that the Controller of Water Resources has information indicating unreasonable interference with water supplies which cannot be satisfactorily remedied or that damage to aquifer(s) is occurring.

8. The rights and privileges hereby granted are subject to periodic review and to modification to ensure the most beneficial use of the water in the public interest and more particularly to ensure preservation of the rights of other water users.

9. The rights and privileges hereby granted can only be extended, modified, transferred or assigned with the approval of the Controller of Water Resources and are subject to cancellation or modification as provided in the Water Resources Act.

This interim licence and its terms and conditions shall be attached to and become part of the licence to use water issued pursuant to Section 33 of the Water Resources Act.

1987 03 16
Dated at Edmonton

fc

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02260

Water Well Drilling Report

View in Metric | Export to Excel

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

GOWN ID

GIC Well ID 1435304
GoA Well Tag No.
Drilling Company Well ID 00304789-00-00
Date Report Received 2013/05/10

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
FERENCE, CRAIG	P.O. BOX 707	KIRRIEMUIR	ALBERTA	CANADA	T0C 1R0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	SE	17	34	2	4				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 51.914479 Longitude -110.247163
How Location Obtained
Not Verified

Elevation ft
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary - Mud

Proposed Well Use
Domestic

Type of Work
New Well

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
1.00		Topsoil
42.00		Brown Till
60.00		Brown Sand
104.00		Gray Till
148.00	Yes	Gray Sandstone
155.00		Gray Shale

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 27.00 igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)
2012/02/03	27.00	52.19

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
155.00 ft	150.00 ft	2012/02/01	2012/02/03

Borehole

Diameter (in)	From (ft)	To (ft)
7.78	0.00	155.00

Surface Casing (if applicable)
Size OD : in
Wall Thickness : in
Bottom at : ft

Well Casing/Liner
Plastic
Size OD 6.00 in
Wall Thickness 0.390 in
Top at -2.00 ft
Bottom at 120.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width(in)	Slot Length (in)	Hole or Slot Interval(in)

Perforated by

Annular Seal Bentonite Chips/Tablets
Placed from 0.00 ft to 120.00 ft
Amount 10.00 Bags

Other Seals

Type	At (ft)

Screen Type Stainless Steel
Size OD : 5.00 in

From (ft)	To (ft)	Slot Size (in)
120.00	150.00	0.020

Attachment Attached To Casing
Top Fittings Coupler
Bottom Fittings Plug

Pack
Type Artificial
Grain Size 10/20
Amount 39.00 Bags

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
JOHN LARSON

Company Name
LARSON'S WATERWELL SERVICING LTD.

Certification No
5882AD

Copy of Well report provided to owner
Yes

Date approval holder signed
2012/07/03

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Page: 1 / 2

Water Well Drilling Report

View in Metric | Export to Excel

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

GIC Well ID 1435304
GoA Well Tag No.
Drilling Company Well ID 00304789-00-00
Date Report Received 2013/05/10

GOWN ID

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
FERENCE, CRAIG	P.O. BOX 707	KIRRIEMUIR	ALBERTA	CANADA	T0C 1R0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	SE	17	34	2	4				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 51.914479 Longitude -110.247163
How Location Obtained: Not Verified

Elevation ft
How Elevation Obtained: Not Obtained

Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level 24.00 in
Is Artesian Flow
Rate igpm
Is Flow Control Installed
Describe

Recommended Pump Rate 27.00 igpm
Recommended Pump Intake Depth (From TOC) 120.00 ft
Pump Installed Yes
Type Submersible
Make
Depth 120.00 ft
H P 1
Model (Output Rating)

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

Yield Test

Taken From Top of Casing
Depth to water level

Measurement in Imperial

Test Date 2012/02/03
Start Time 12:00 PM
Static Water Level 52.19 ft

Method of Water Removal
Type PUMP
Removal Rate 27.00 igpm
Depth Withdrawn From 120.00 ft

If water removal period was < 2 hours, explain why

Pumping (ft)	Elapsed Time Minutes:Sec	Recovery (ft)
52.20	0:00	75.92
66.60	1:00	62.07
70.37	2:00	58.23
71.69	3:00	57.38
72.28	4:00	56.50
72.57	5:00	56.10
72.80	6:00	55.97
72.97	7:00	55.84
73.13	8:00	55.74
73.23	9:00	55.68
73.29	10:00	55.58
73.39	12:00	55.41
73.56	14:00	55.28
73.72	16:00	55.18
73.85	20:00	55.05
74.21	25:00	54.86
74.31	30:00	54.69
74.44	35:00	54.59
74.61	40:00	54.46
74.80	50:00	54.33
75.03	60:00	54.23
75.26	75:00	54.10
75.49	90:00	54.00
75.66	105:00	53.90
75.92	120:00	53.84

Water Diverted for Drilling

Water Source	Amount Taken		Diversion Date & Time
VILLAGE OF ALTARIO	4000.00	ig	2012/02/01 10:00 AM

Contractor Certification

Name of Journeyman responsible for drilling/construction of well: JOHN LARSON
Certification No: 5882AD
Company Name: LARSON'S WATERWELL SERVICING LTD.
Copy of Well report provided to owner: Yes
Date approval holder signed: 2012/07/03

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Page: 2 / 2

Water Well Drilling Report

View in Metric | Export to Excel

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

GOWN ID

GIC Well ID 177646
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1986/10/21

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
DOUBLE F FARMS LTD	KIRRIEMUIR				T0C 1R0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	SE	17	34	2	4				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 51.914567 Longitude -110.247192
How Location Obtained: Map

Elevation ft
How Elevation Obtained: Not Obtained

Drilling Information

Method of Drilling: Rotary

Proposed Well Use: Stock

Type of Work: New Well

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
1.00		Topsoil
24.00		Brown Till
42.00		Brown Sand
60.00		Gray Silty Sand
94.00		Gray Till
97.00		Brown Sand
120.00		Gray Till
136.00		Brownish Gray Dirty Sand
140.00		Gray Till
152.00		Brownish Gray Sand

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 0.00 igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)
1986/08/19	24.00	36.00

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
152.00 ft		1986/08/19	1986/08/19

Borehole

Diameter (in)	From (ft)	To (ft)
0.00	0.00	152.00

Surface Casing (if applicable)
Plastic
Size OD: 5.00 in
Wall Thickness: 0.265 in
Bottom at: 144.00 ft

Well Casing/Liner
Size OD: 0.00 in
Wall Thickness: 0.000 in
Top at: 0.00 ft
Bottom at: 0.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width(in)	Slot Length (in)	Hole or Slot Interval(in)

Perforated by

Annular Seal Sand Pack
Placed from 0.00 ft to 140.00 ft
Amount

Other Seals

Type	At (ft)

Screen Type Stainless Steel
Size OD: 3.00 in

From (ft)	To (ft)	Slot Size (in)
144.00	148.00	0.020

Attachment: Attached To Casing
Top Fittings: Coupler
Bottom Fittings: Plug

Pack
Type: Artificial
Grain Size: 10-20
Amount: 600.00 Pounds

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
MCALLISTER HOLDINGS LTD.

Copy of Well report provided to owner | Date approval holder signed

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Page: 1 / 2

Water Well Drilling Report

View in Metric | Export to Excel

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

GOWN ID

GIC Well ID 177646
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1986/10/21

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
DOUBLE F FARMS LTD	KIRRIEMUIR				T0C 1R0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	SE	17	34	2	4				

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 51.914567 Longitude -110.247192
How Location Obtained
Map

Elevation ft
How Elevation Obtained
Not Obtained

Additional Information

Measurement in Imperial

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

Recommended Pump Rate 0.00 igpm
Recommended Pump Intake Depth (From TOC) 112.00 ft
Pump Installed Yes Depth ft
Type Make BERKLEY 3/4 HP H.P
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS) Depth ft
Gas Depth ft
Remedial Action Taken
Well Disinfected Upon Completion
Geophysical Log Taken Electric
Submitted to ESRD Electric

Sample Collected for Potability Submitted to ESRD

Additional Comments on Well
DRILLER REPORTS HARD WATER.

Yield Test

Taken From Ground Level
Depth to water level

Measurement in Imperial

Test Date	Start Time	Static Water Level
1986/08/19	12:00 AM	36.00 ft

Pumping (ft)	Elapsed Time Minutes:Sec	Recovery (ft)

Method of Water Removal
Type Air
Removal Rate 24.00 igpm
Depth Withdrawn From 112.00 ft

If water removal period was < 2 hours, explain why

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	ig	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER
Company Name
MCALLISTER HOLDINGS LTD.

Certification No
1
Copy of Well report provided to owner
Date approval holder signed

Printed on 11/28/2023 3:11:11 PM

Page: 2 / 2

Water Well Drilling Report

View in Metric | Export to Excel

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

GOWN ID

GIC Well ID 1501879
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 2010/01/18

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
DOUBLE F FARMS	P.O. BOX 707	KIRRIMAIR	ALBERTA	CANADA	T0C 1R0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	2	17	34	2	4				

Measured from Boundary of
915.00 ft from South
450.00 ft from West

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 51.912142 Longitude -110.250618
How Location Obtained
Not Verified

Elevation ft
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary - Air

Proposed Well Use
Domestic & Stock

Type of Work
Test Hole-Decommissioned
View Decommissioning Report

Plugged 2009/09/19
Plugged with Bentonite Chips
Amount 6.00 Bags

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
12.00		Brown Till
30.00		Gray Till
36.00		Brown Sand
40.00		Gray Till
53.00		Brown Sand
61.00		Gray Till
66.00		Brown Sand
120.00		Gray Till
128.00		Brown Fine Grained Sand
136.00		Gray Till
150.00		Gray Shale

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
150.00 ft		2009/09/19	2009/09/19

Borehole

Diameter (in)	From (ft)	To (ft)
5.13	0.00	150.00

Surface Casing (if applicable)

Size OD : in
Wall Thickness : in
Bottom at : ft

Well Casing/Liner

Size OD in
Wall Thickness in
Top at ft
Bottom at : ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width(in)	Slot Length (in)	Hole or Slot Interval(in)

Perforated by

Annular Seal

Placed from ft to ft
Amount

Other Seals

Type	At (ft)

Screen Type

Size OD : in

From (ft)	To (ft)	Slot Size (in)

Attachment
Top Fittings
Bottom Fittings

Pack

Type
Grain Size
Amount

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
BRYON MCALLISTER

Certification No
VA4003

Company Name
MCALLISTER DRILLING INC.

Copy of Well report provided to owner
Yes

Date approval holder signed
2009/09/19

Water Well Drilling Report

View in Metric | Export to Excel

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

GIC Well ID 1501879
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 2010/01/18

GOWN ID

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
DOUBLE F FARMS	P.O. BOX 707	KIRRIMAIR	ALBERTA	CANADA	T0C 1R0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	2	17	34	2	4				

Measured from Boundary of
915.00 ft from South
450.00 ft from West

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 51.912142 Longitude -110.250618
How Location Obtained
Not Verified

Elevation ft
How Elevation Obtained
Not Obtained

Additional Information

Measurement in Imperial

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

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

Did you Encounter Saline Water (>4000 ppm TDS) Depth ft
Gas Depth ft
Well Disinfected Upon Completion
Geophysical Log Taken Electric
Remedial Action Taken
Submitted to ESRD
Sample Collected for Potability
Submitted to ESRD
Additional Comments on Well
TESTHOLE ABANDONED USING 6 BAGS OF HIGH SOLIDS BENTONITE.

Yield Test

Taken From Ground Level Measurement in Imperial

Test Date	Start Time	Static Water Level
		ft

Method of Water Removal
Type
Removal Rate igpm
Depth Withdrawn From ft
If water removal period was < 2 hours, explain why

Water Diverted for Drilling

Water Source	Amount Taken		Diversion Date & Time
SE 17-34-2-W4	2800.00	ig	2009/09/19 11:00 AM

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
BRYON MCALLISTER
Company Name
MCALLISTER DRILLING INC.
Certification No
VA4003
Copy of Well report provided to owner
Yes
Date approval holder signed
2009/09/19

Printed on 11/28/2023 3:09:33 PM