Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

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

NRCB USE ONLY	Application number	Legal land description
☒ Approval ☐ Registration ☐ Authorization ☐ Amendment	FA21002	SW 32-84-9 W6M

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.

October 28/2021
Date of signing

Signature

Hutterian Brethren Church of Cleardale
Corporate name (if applicable)

Albert Stahl
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)

feedlot pens dimensions are each pen

Proposed facilities	Dimensions (m) (length, width, and depth)
Pen's 11, 12, 13 are 300' x 172' length x width	length x width (m) 91.44 x 52.43
Pen's 14, 15, 16, 17, 18, 19 300' x 190' length x width	91.44 x 58 (m)
Pens 20, 21 280' x 210' length x width	85.34 x 64 (m)
Pen 22, 23, 24, 338' x 210' length x width	103 x 64 (m)
Catch Basins x 2	112.17 x 44.5 x 5.49 (each catch basin dimensions)

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

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
Pens 1, 2, 3, 4 are 180' x 180' length x width	54.86 x 54.86 (m)	
Pens 5, 6, 7 are 210 x 182 length x width	64 x 55 (m)	
Pens 8, 9, 10 are 160 x 208	49 x 63 (m)	

NRCB USE ONLY

See Decision summary Appendix E regarding existing facilities

Last updated February 26, 2021

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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

N/A

Construction completion date for proposed facilities End 2023

Additional information

N/A

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**
Finisher's	3000	3000	6000
	see grandfathering determination of existing facilties		
Blank			

Last updated February 26, 2021

Part 2 — Technical Requirements

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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)

Existing facilities continued	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
North Barn Pen	788' x 500'	240m x 152m
South Barn Pen	272' x 500'	83m x 152m

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 Parks (AEP) 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 AEP 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** AEP'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 AEP 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 AEP'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.

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 AEP under the *Water Act* for the development or activity proposed in this AOPA application.

Signed this 28 day of October, 2021. _____

Signature of Applicant or Agent

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 AEP 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** AEP'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 AEP 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 AEP'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.

Signed this ____ day of _____, 20____. _____

Signature of Applicant or Agent

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: claimed pens **Proposed 1:** proposed pens/catch basins

Proposed 2: _____ **Proposed 3:** _____

Facility and environmental risk information		Facilities				NRCB USE ONLY	
		Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
Flood plain information	What is the elevation of the floor of the lowest manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	☑ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☐ >1 m ☐ ≤ 1 m	☐ > 1 m ☐ ≤ 1 m	☑ YES ☐ NO ☐ YES with exemption	not in known flood plain
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?	0	0			☑ YES ☐ NO ☐ YES with exemption	None known
	How many water wells are within 100 m of the manure storage facility or manure collection area?	0	0			☑ YES ☐ NO ☐ YES with exemption	No wells near site. >152 m per test hole on site
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	½ mile to a seasonal slough	same as Existing			☑ YES ☐ NO ☐ YES with exemption	Wetland 650 m NW
Groundwater information	What is the depth to the water table?	N/A	—			☑ YES ☐ NO ☐ YES with exemption	>6m
	What is the depth to the groundwater resource/aquifer you draw water from?	N/A	—			☑ YES ☐ NO ☐ YES with exemption	No wells on site

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
All pens	Low	Low	FA21002
Catch basins	Low	Low	FA21002

ERST for **existing** facilities

Facility	Groundwater score	Surface water score	File number
Refer to grandfathering determination Decision Summary Appendix E			

ERST related comments:

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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)

NRCB USE ONLY

WATER WELL AND SURFACE WATER INFORMATION

Well IDs: No wells on site

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:

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

	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)	John Bueckert	SE 5 85 9 W6	1396	Ag1	Cat 1	1205 m	N/A	Yes
(2)	Frank Peters	SW 29 84 9 W6	1489	Ag1	Cat 1	1332 m	N/A	Yes
(3)	John Peters	SE 29 84 9 W6	1523	Ag1	Cat 1	1325 m	N/A	Yes

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

Name of land owner(s)*	Legal land description	Usable area** (ha)	Soil zone ***	NRCB USE ONLY: Usable area (ha)	Agreement attached (if required)
Cleardale Colony LTD	31 84 9 W6	400 Acres			
Cleardale Colony LTD	32 84 9 W6	450 Acres			
Cleardale Colony LTD	NE 29 84 9 W6	130 Acres			
Cleardale Colony LTD	NW 29 84 9 W6	130 Acres			
Cleardale Colony LTD	6 85 9 W6	500 Acres			
			Total		

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

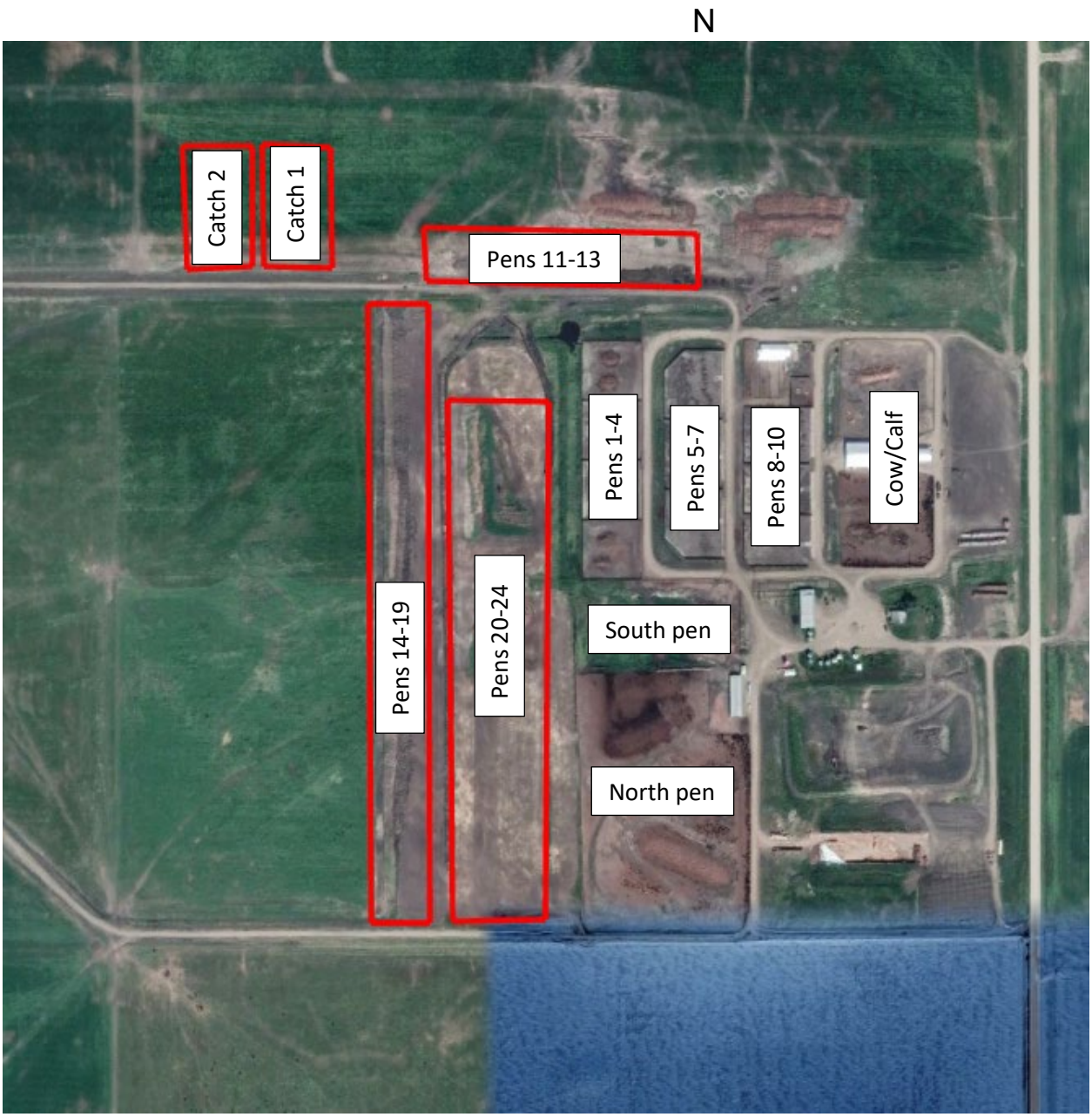
** Available manure spreading area (excluding setback areas from residences, common bodies of water, water wells, etc. as identified in Agdex 096-5 Manure Spreading Regulations)

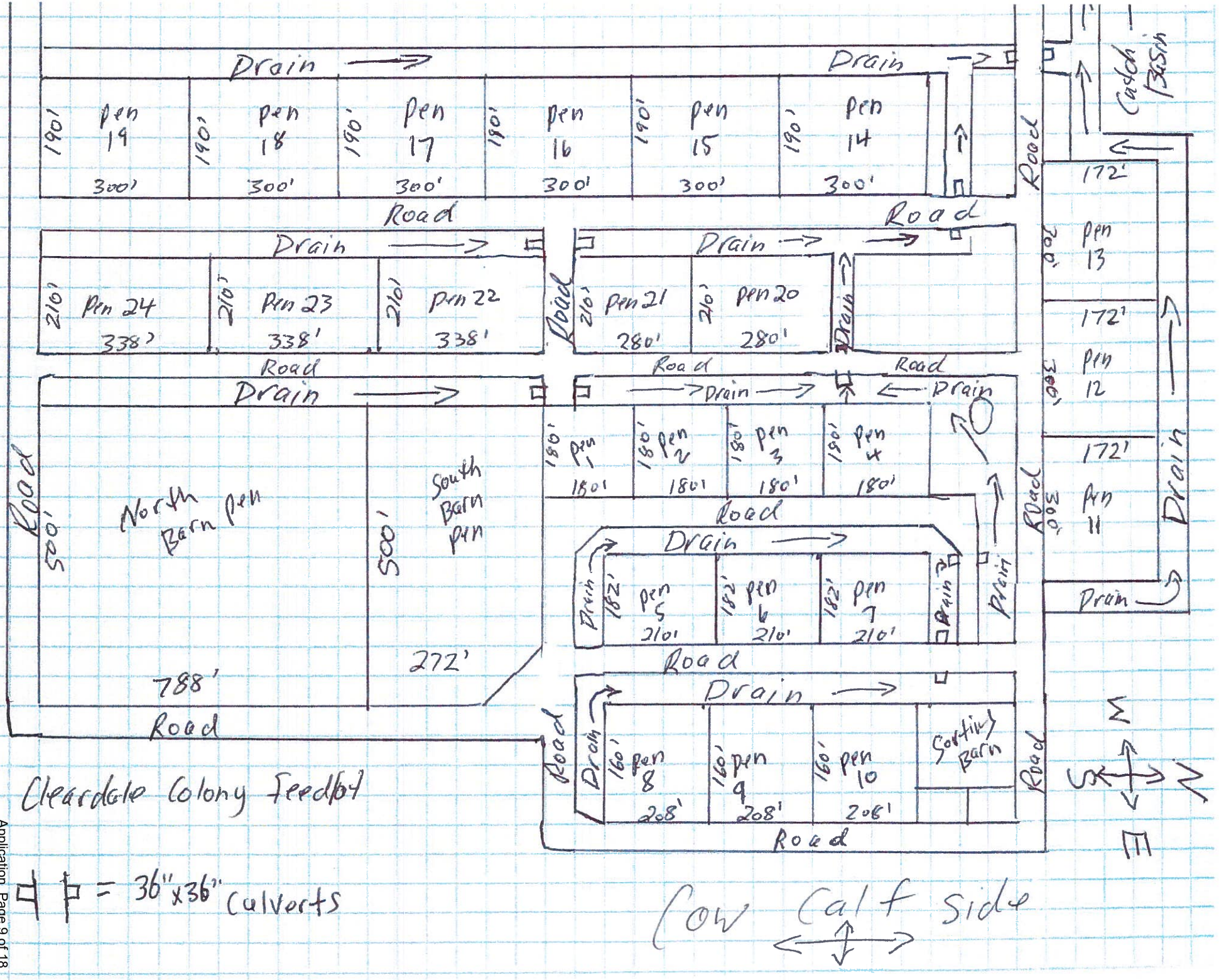
*** Brown, dark brown, black, grey wooded, or irrigated

Additional information (attach any additional information as required)

MDS

AO note: see next page for labels


N
Catch 2
Catch 1
Pens 11-13
Pens 14-19
Pens 20-24
Pens 1-4
Pens 5-7
Pens 8-10
Cow/Calf
South pen
North pen


Drain
Drain
190'
Pen 19
300'
190'
Pen 18
300'
190'
Pen 17
300'
190'
Pen 16
300'
190'
Pen 15
300'
190'
Pen 14
300'
Road
Road
Road
Drain
Drain
Drain
210'
Pen 24
338'
210'
Pen 23
338'
210'
Pen 22
338'
Road
210'
Pen 21
280'
210'
Pen 20
280'
Drain
Road
Road
Road
Drain
Drain
Drain
Drain
180'
Pen 1
180'
180'
Pen 2
180'
180'
Pen 3
180'
190'
Pen 4
180'
Road
Road
500'
North Barn pen
500'
South Barn pen
788'
272'
Road
Drain
Drain
182'
Pen 5
210'
182'
Pen 6
210'
182'
Pen 7
210'
Drain
Drain
Drain
Road
Drain
Road
160'
Pen 8
208'
160'
Pen 9
208'
160'
Pen 10
208'
Sorting Barn
Road
Road
Drain
Cedar Basin
Road
172'
200'
Pen 13
172'
300'
Pen 12
172'
300'
Pen 11
Drain
Drain
N
S
E
W
Cleardale Colony Feedlot
= 36" x 36" Culverts
Cow Calf Side

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): N/A

Requirements (m): Category 1: 731 m Category 2: 975 m Category 3: 1219 m Category 4: 1951 m

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: 624 ha

Land base listed:

Area not suitable:

Available area

Applicant owns more land than required and is able to provide additional.

Requirement met: ☑ YES ☐ NO

Land spreading agreements required: ☐ YES ☑ NO

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

PLANS

Submitted and attached construction plans: ☑ YES ☐ NO

Submitted aerial photos: ☑ YES ☐ NO

Submitted photos: ☐ YES ☑ NO

GRANDFATHERING

Already completed: ☐ YES ☑ NO ☐ N/A

If already completed, see See Decision summary Appendix E and images on following pages.

N

1999-2003 valtus

N

2010 valtus

N

2011 valtus

N

2012 valtus

N

2013 valtus

N

2014 valtus

N

2015 valtus

N

2018 google earth

N

2019 google earth

N

2019 google earth

N

2020 google earth

N

Valtus

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

Sept 30, 2022	
March 15, 2022	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: March 30, 2022

Municipality: Clear Hills County

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

Alberta Health Services:

☑ 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: _____ ☑ N/A

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

Other: _____ ☐ N/A

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

Part 2 — Technical Requirements

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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)

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

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

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

1. Hutterian Brethren Church of Clearsdale
2. _____

Manure storage capacity

	Length (m)	Width (m)	Depth below grade to the bottom of the liner (m)	NRCB USE ONLY Estimated storage capacity (m³)
1.	See proposed	facility	liner is ontop of Grade	
2.	and Existing	facility	0	
			TOTAL CAPACITY	9 month storage requirement met

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

Surface water control systems

Describe the run-on and runoff control system

The run OF from all the pens Exits at the back of the pen into a drain that flows to the catch Basin

Liner protection

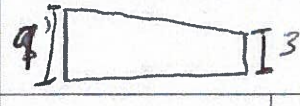
Describe how the physical integrity of the liner will be maintained

After each pen is cleaned out yearly we bring clay fill from the borrow pit to level out the gouges from the manure Equipment and Compact it with vibrating Compactor before pens get used Again

NRCB USE ONLY
Requirements met: ☑ YES ☐ NO

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

Compacted soil liner details

Thickness of compacted liner	Avg 4.5' (m)	Provide compacted liner details (as required)  Slope is 2.5-1 Compacted clay liner	
Soil texture	2.6 % sand	16.9 % silt	80.5 % clay
Atterberg limits	Plastic limit	Liquid limit	Plasticity Index
Hydraulic conductivity	Hydraulic conductivity (cm/s) 6.7x10-9	Describe test standard used	

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

NRCB USE ONLY

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

NRCB USE ONLY

Nine month manure storage volume requirements met ☑ YES ☐ YES With STMS ☐ NO

Depth to water table: >6m Requirements met: ☑ YES ☐ NO

Depth to uppermost groundwater resource: no wells in area Requirements met: ☑ YES ☐ NO

ERST completed: ☐ see ERST page for details

Surface water control systems

Requirements met: ☑ YES ☐ NO Details/comments:

Compacted soil liner details

Hydraulic conductivity after adjustment: 6.7×10^{-8}

Liner specification comments (e.g. compaction, moisture content, thickness):

Safety factor of 10 applied to recompacted sample resulting in 6.7×10^{-8} cm/s

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

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: Compacted soil liner

*(complete a copy of this section for **EACH proposed** runoff control catch basin with a compacted soil liner)*

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

1. Hutterian Brethren Church of Clearvale
2. _____
3. _____

Determination of runoff area

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

Catch basin capacity

		Length (m)	Width (m)	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)
x2	1.	112.17	44.5	5.49	5.49	3:1	3:1	3:1	25,660 m^3
	2.								
	3.								
								TOTAL CAPACITY	

Compacted soil liner details

Thickness of compacted soil liner	>1 (m)	Provide details (as required)	
Soil texture	2.6 % sand	16.9 % silt	80.5 % clay
Atterberg limits	Plastic limit: _____	Liquid limit: _____	Plasticity index: _____
Hydraulic conductivity	Hydraulic conductivity (cm/s): 6.7×10^{-9}		
	Describe test standard used		

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

NRCB USE ONLY

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

RUNOFF CONTROL CATCH BASIN: Compacted soil liner (cont.)

NRCB USE ONLY

Catch basin calculator (calculation attached). Total volume @ freeboard: 25,660 m^3

Runoff capacity requirements met: ☑ YES ☐ NO

Calculation of the volume attached: ☑ YES ☐ NO

Depth to water table: >6m Requirements met: ☑ YES ☐ NO

Depth to Uppermost Groundwater Resource: no wells in area Requirements met: ☑ YES ☐ NO

ERST completed: ☑ see ERST page for details

Liner specification comments (e.g. compaction required, moisture content, thickness):

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

Part 2 — Technical Requirements

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

NRCB USE ONLY **RUNOFF CONTROL CATCH BASIN CAPACITY SUMMARY (if applicable)**	
Facility 1	
Name / description: Catch basin 1	Capacity: 12,830 m^3
Facility 2	
Name / description: Catch basin 2	Capacity: 12,830 m^3
Facility 3	
Name / description	Capacity
Facility 4	
Name / description	Capacity
TOTAL CAPACITY	25,660 m^3
RUNOFF VOLUME FROM CONTRIBUTING AREAS	9,721 m^3
MEETS AOPA RUNOFF CONTROL VOLUME REQUIREMENTS	☑ YES ☐ NO

See Decision summary Appendix E

Catch Basin Storage Volume Calculator

Construction Dimensions of Catch Basin

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

Overall Dimensions of Catch Basin			Catch Basin Dimensions
Total Length*[4]	112.0	m	367 ft
Total Width*[4]	44.5	m	146 ft
Total Depth*[4]	5.5	m	18 ft
Design Capacity Depth	*5.00*	m	16 ft
End Slope*[4]	3	run:rise	3 run:rise
Side Slope*[4]	3	run:rise	3 run:rise
Length of Bottom	79.0	m	259 ft
Width of Bottom	11.5	m	38 ft
Capacity @ top of Bank	*15,206*	m^3	*Capacity @tob* *536,999* ft^3 *3,344,879 Imp. Gal.*

Design Capacity of Catch Basin (freeboard level)			Design Capacity (freeboard level)
Length (design capacity depth)	109.0	m	358 ft
Width (design capacity depth)	41.5	m	136 ft
Total Depth	*5.5*	m	*18* ft
Design Capacity Depth	5.00	m	16 ft
End Slope	3	run:rise	3 run:rise
Side Slope	3	run:rise	3 run:rise
Design Capacity (freeboard level)	**12,830**	m^3	453,087 ft^3
			2,822,204 Imp. Gal.
level)	*4,524*	m^2	*48,691* ft^2

CFO Name [1]	Cleardale
Land Location [1]	SW 32-84-9 W6M

Paved Runoff Catchment Area(s)

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

Unpaved Runoff Catchment Area(s)

Area [2]	Length (m)	Width (m)	Area (m^2)
6	278	313	87,014.0
7	446	259	115,514.0
8			0.0
9			0.0
10			0.0
		Total Area (m^2)	**202,528**

Rainfall (Select Town [3])

Fairview 80

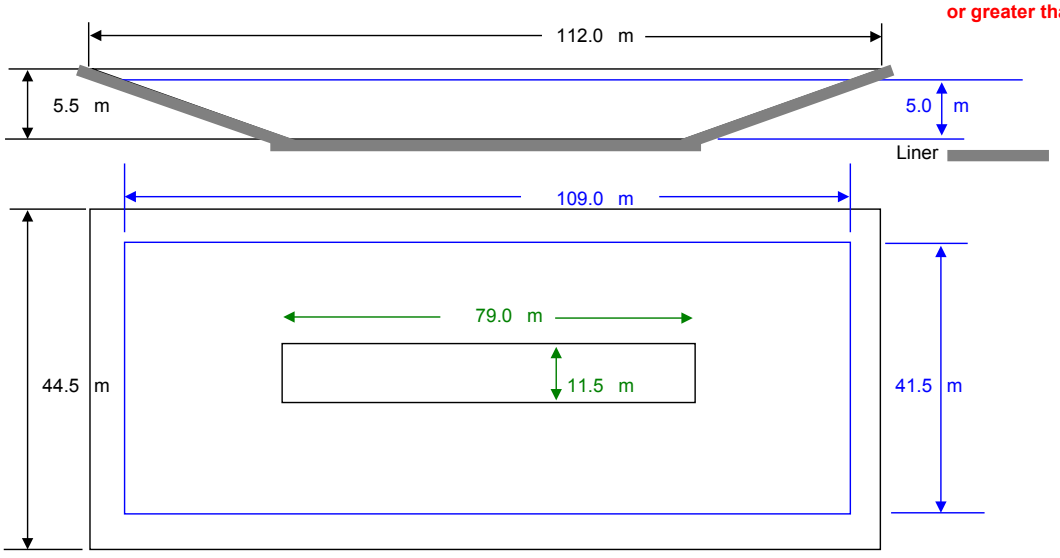
AOPA Design Rainfall **80 mm**

Minimum Catchbasin Storage Volume Required

9,721 m^3 ** 343306.02 ft^3

2138395.9 Imp. Gal.

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



Lines in Black - Overall catch basin dimensions

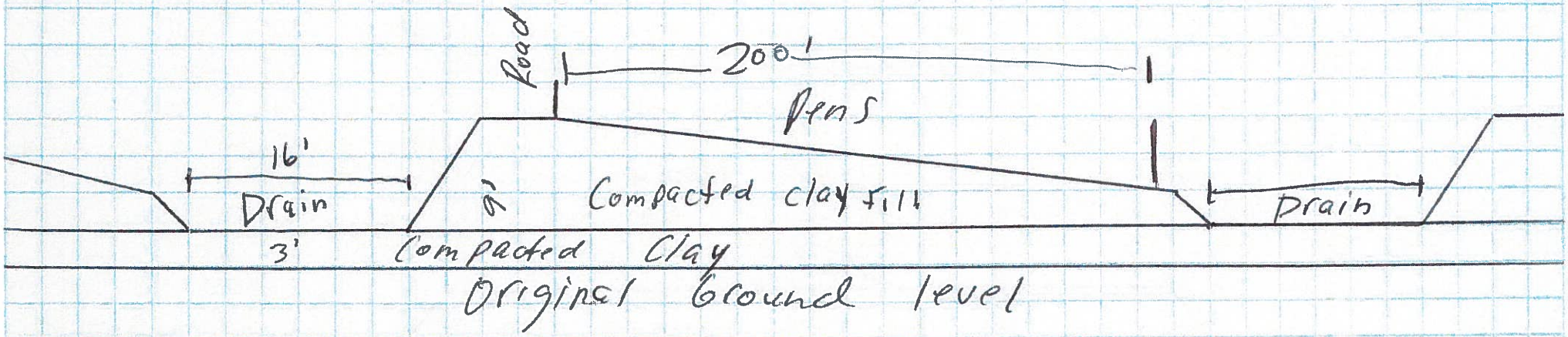
Lines in Blue - Design capacity depth dimensions (excludes freeboard)

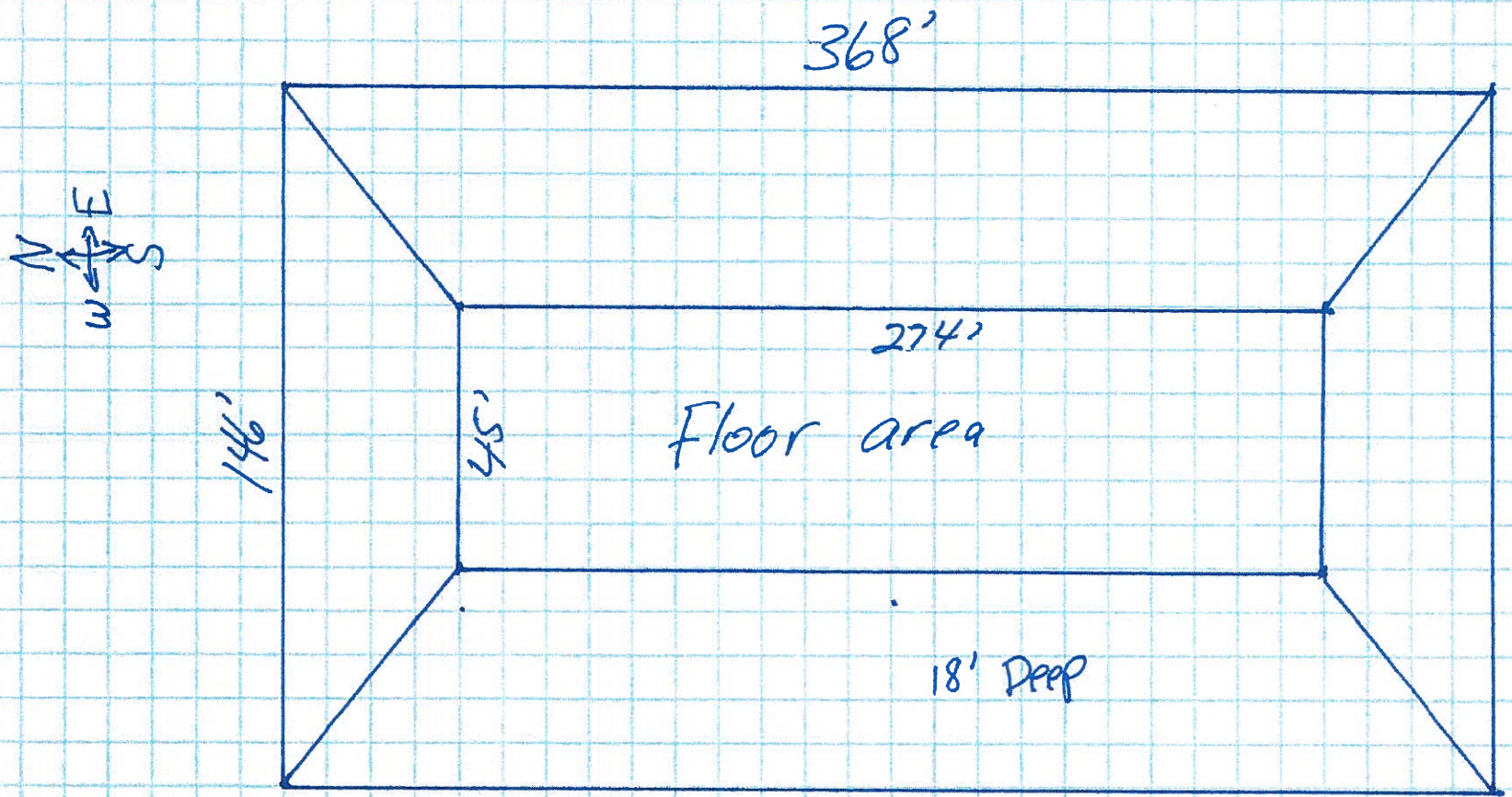
NTS - Not To Scale

Clear dale Colony Feed lot

this is a side view of how the clay was compacted to build the slope for the pen's and the drain there is a minimum of 3' of compacted liner to a maximum of 9' We had to do that to be able to get our slope to a 2.5 - 100' and make road & drain work

2.5 | 100





Cleardale Colony Feedlot
Runoff Control Catch Basin

TRIAXIAL HYDRAULIC CONDUCTIVITY TEST

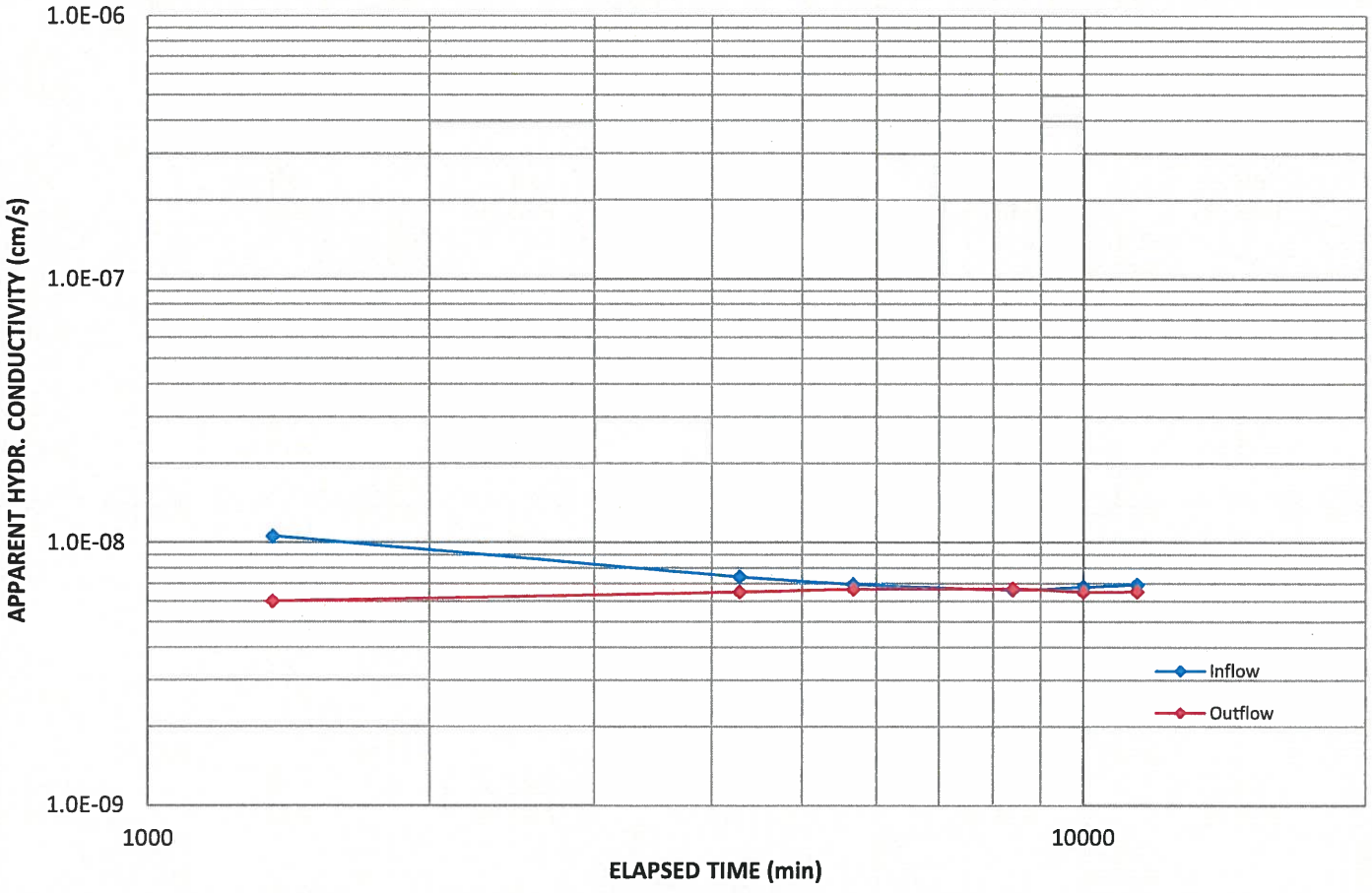
ASTM D5084

PROJECT: Hutterian Brethren Feedout
PROJECT#: GP5323
CLIENT: 0
SOIL TYPE: 0
SAMPLE TYPE: Remolded

SAMPLE DATE: May 19, 2020
TEST DATE: November 23, 2021
SAMPLE ID: Proctor 1 @36.5%
LOCATION: 0
PERMEANT LIQUID: Deaired Water

Parameter	Value	
Initial Height:	40.4	mm
Initial Diameter:	71.6	mm
Initial Water Content:	42.5	%
Initial Compaction:	92.0	%
Initial Dry Density:	1.21	Mg/m^3

Parameter	Value	
Final Height:	39.9	mm
Final Diameter:	71.3	mm
Final Water Content:	45.1	%
Average Temperature:	22	°C
Average Confining Pressure:	13.19	kPa
Average Hydraulic Gradient:	0.75	



COEFFICIENT OF PERMEABILITY				
K_{20}=	6.7E-09	cm/s @	11406	minutes
K_{20}=	6.7E-11	m/s @	11406	minutes

V1.1 U20150126
P:\GP Projects\GP5001-GP5500\GP5323\GP5323 Hydraulic Conductivity Proctor 1 @36.5%.xls

TECH: CP/OH
CHECKED: DY

MOISTURE DENSITY RELATIONSHIP WORKSHEET

V2.3 U20141001

Parkland GEO

PROJECT: Hutterian Brethren Feedlot
PROJECT #: GP5323
DATE:
CLIENT:

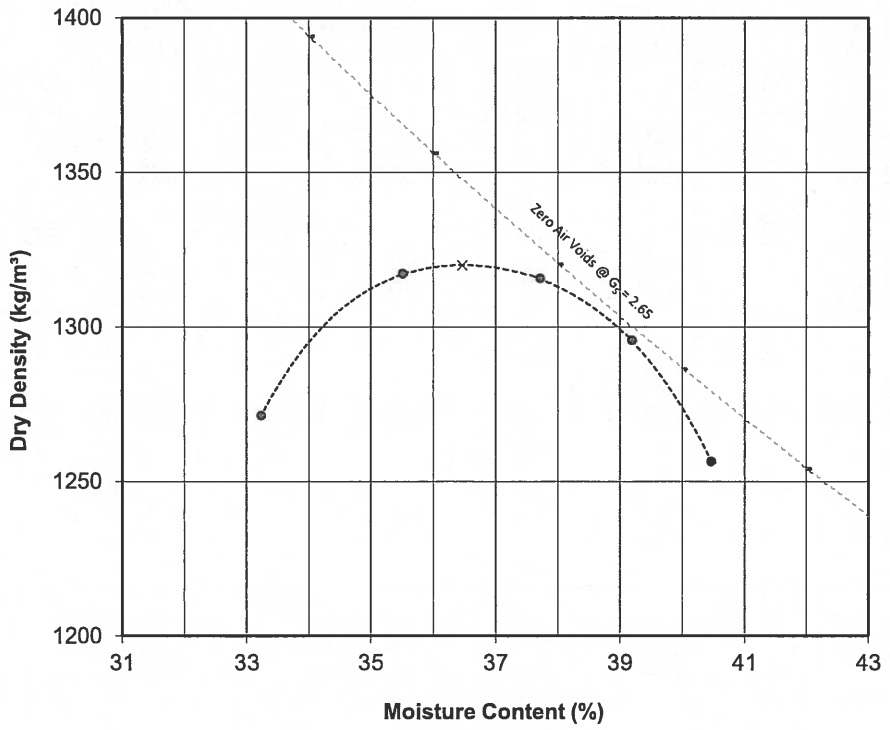
	SAMPLE NUMBER	1	2	3	4	5	
DRY DENSITY	Wt. Sample Wet + Mold	5828.2	5913.7	5938.9	5931.0	5895.2	
	Wt. Small Mold	4240.5	4240.5	4240.5	4240.5	4240.5	
	Wt. Sample Wet	1587.7	1673.2	1698.4	1690.5	1654.7	
	Volume Mold, cm³	937.6	937.6	937.6	937.6	937.6	
	Wet Density, kg/m³	1693	1785	1811	1803	1765	
	Dry Density, kg/m³	1271	1317	1315	1295	1256	
	Corr. Density, kg/m³						

DATE SAMPLED: 3-Nov-21
CONTRACTOR:
SOURCE: On Site

	CONTAINER NUMBER	34	38	53	46	13	
MOISTURE	Wt. Sample Wet + Tare	308.6	322.3	327.1	304.3	318.3	
	Wt. Sample Dry + Tare	234.6	240.9	240.7	222.0	231.3	
	Wt. Water	74.0	81.4	86.4	82.3	87.0	
	Tare Container	11.9	11.7	11.6	12.0	16.3	
	Wt. Dry Soil	222.7	229.2	229.1	210.0	215.0	
	Moisture Content	33.2	35.5	37.7	39.2	40.5	
	Corr. Moisture Content						

SAMPLED BY: NB
PROCTOR #: 1

PREPARATION: Dry
RAMMER TYPE: Manual
COMPACTION STANDARD: ASTM D698



SOIL TYPE: Very High Plastic Clay

COMMENTS:

ROCK CORRECTION

% Oversize Retained

4.75 mm Sieve: 0
19.0 mm Sieve:

Oversize (%)	OMC (%)	Max Dry Density (kg/m³)
5		
10		
15		
20		
25		
30		

MAXIMUM DRY DENSITY (Uncorrected): 1320 kg/m³

OPTIMUM MOISTURE CONTENT (Uncorrected): 36.5 %

TECHNICIAN: JX

CHECKED: ITH

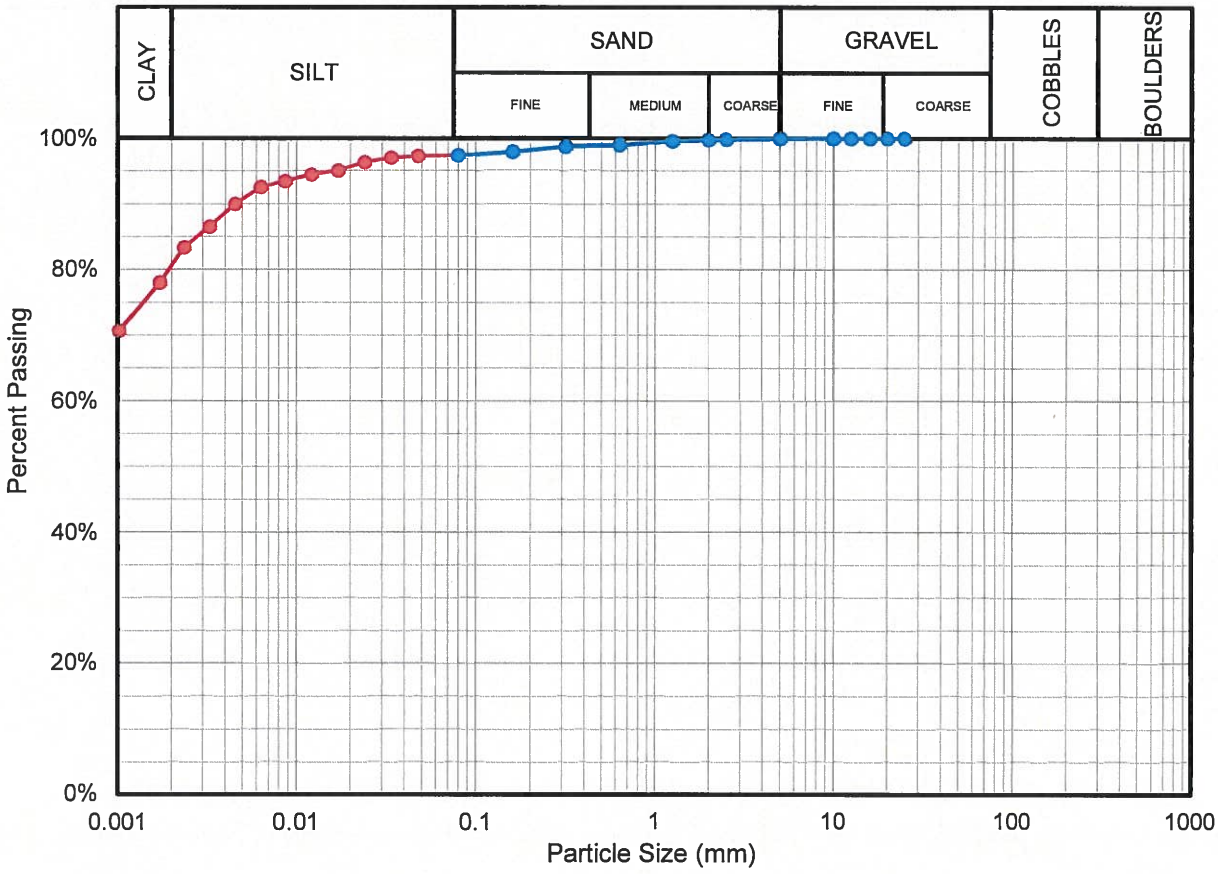
Results are valid for <40 percent retained on 4.75 mm sieve, and <30 percent retained on 19 mm sieve as per ASTM D4718.

PARTICLE-SIZE ANALYSIS, LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY

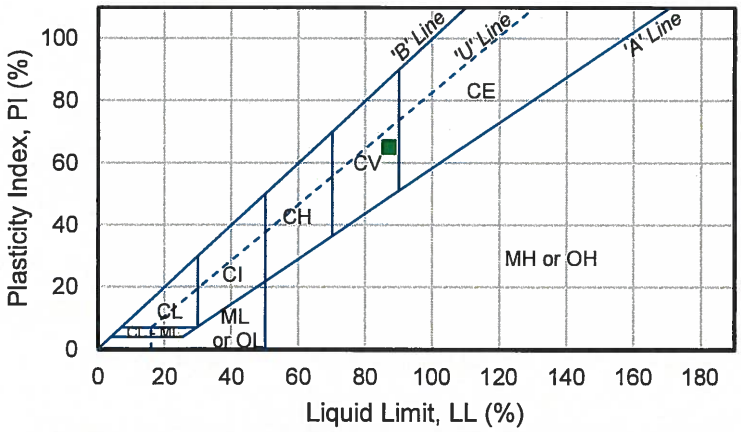
ASTM D422 & ASTM D4318

PROJECT: Hutterian Brethren Feedlot
PROJECT#: GP5323
CLIENT: Brethren
SOIL DESCRIPTION: clay, little silt, trace sand

SAMPLE DATE: November 3, 2021
TEST DATE: November 18, 2021
SAMPLE ID: Proctor (1)
DEPTH: 4.5 m



PARTICLE-SIZE ANALYSIS	Gravel	0.0%
	Sand	2.6%
	Silt	16.9%
	Clay	80.5%
	D_{10}	---
	D_{30}	---
	D_{60}	---
	C_U	---
	C_C	---
LIMITS	PL	22
	LL	87
	PI	65



Modified Unified Soil Classification	Group Symbol
Extremely high plastic clay	CE

TECH: JL
CHECKED: MT

Parkland GEO

FIELD DENSITY TESTING REPORT

PROJECT	Hutterian Brethren Feedlot	**PROJECT NUMBER**	GP5323
SITE LOCATION	Cleardale, AB	**MATERIALS TESTER**	NB
CONTRACTOR	Brethen	**DATE**	3-Nov-21

TYPE OF CONSTRUCTION

■ Eng Fill	☐ Bldg Pad	☐ Water Line	☐ Sanitary Line	☐ Storm Line	☐ Rd. Subgrade	☐ SW Berms	☐ 1st lift gravel	☐ 2nd lift gravel	☐ Other

TEST NO.	LOCATION	GRADE (m)	SOIL TYPE	PROBE DEPTH	DRY DENSITY	MOISTURE CONTENT		PROCTOR DENSITY	% COMPACTION
						FIELD	OPTIMUM		
1	Lagoon, SW corner	-4.500	Clay	300	1484	29.1	36.5	1320	112.4
2	Lagoon, NE Corner	-4.500	Clay	300	1462	24.3	36.5	1320	110.8
3	Lot 19, Center of Lot, South End	0.000	Clay	300	1551	15.7	36.5	1320	117.5
4	Lot 21, Center of Lot, South End	0.000	Clay	300	1615	15.4	36.5	1320	122.3
5	Lot 15, Gate Entrance	0.000	Clay	300	1530	24.3	36.5	1320	115.9
6	Lot 17, Gate Entrance	0.000	Clay	300	1510	25.5	36.5	1320	114.4

COMMENTS

CHECKED BY IRVING A. TOM HUETE