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	BA20002	NE 10-49-27 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.

January 4
Date of signing

Cameron DeWit Digitally signed by Cameron DeWit Date: 2021.01.09 09:39:36 -07'00'
Signature

Alieda Farms Ltd
Corporate name (if applicable)

Cameron DeWit
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)
#1 Dairy Barn	76.2 x 20.7
#2 Calf Barn (0-6 months)	24.4 x 17.1
#3 Heifer Barn (6-2 years)	48.8 x 21.3
#4 Dry Cow Barn	24.4 x 21.3
#5 Milk house/office/Storage/ Box stalls(Lean to's to be built on each side of dairy ba	18.3 x 6.1 Ancillary structure

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 new CFO

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		

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.

January 4 2021

Date of signing

Signature

Alieda Farms Ltd.

Corporate name (if applicable)

Cameron DeWit

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)
#6 Manure Pit/ Lagoon	58 x 54 x 4.5
#7 solid manure pad	20 x 30

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

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**

Construction completion date for proposed facilities December 2025

Additional information

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

Livestock category and type (Available in the Schedule 2 of the Part 2 Matters Regulation)	**Permitted number**	**Proposed increase or decrease in number (if applicable)**	**Total**
Milking Cows and	-	160	160
Associated Drys and Replacements (heifers)			

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 13 day of May, 2021. Vanessa Welsh

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 ____ day of _____, 20____. _____

Signature of Applicant or Agent

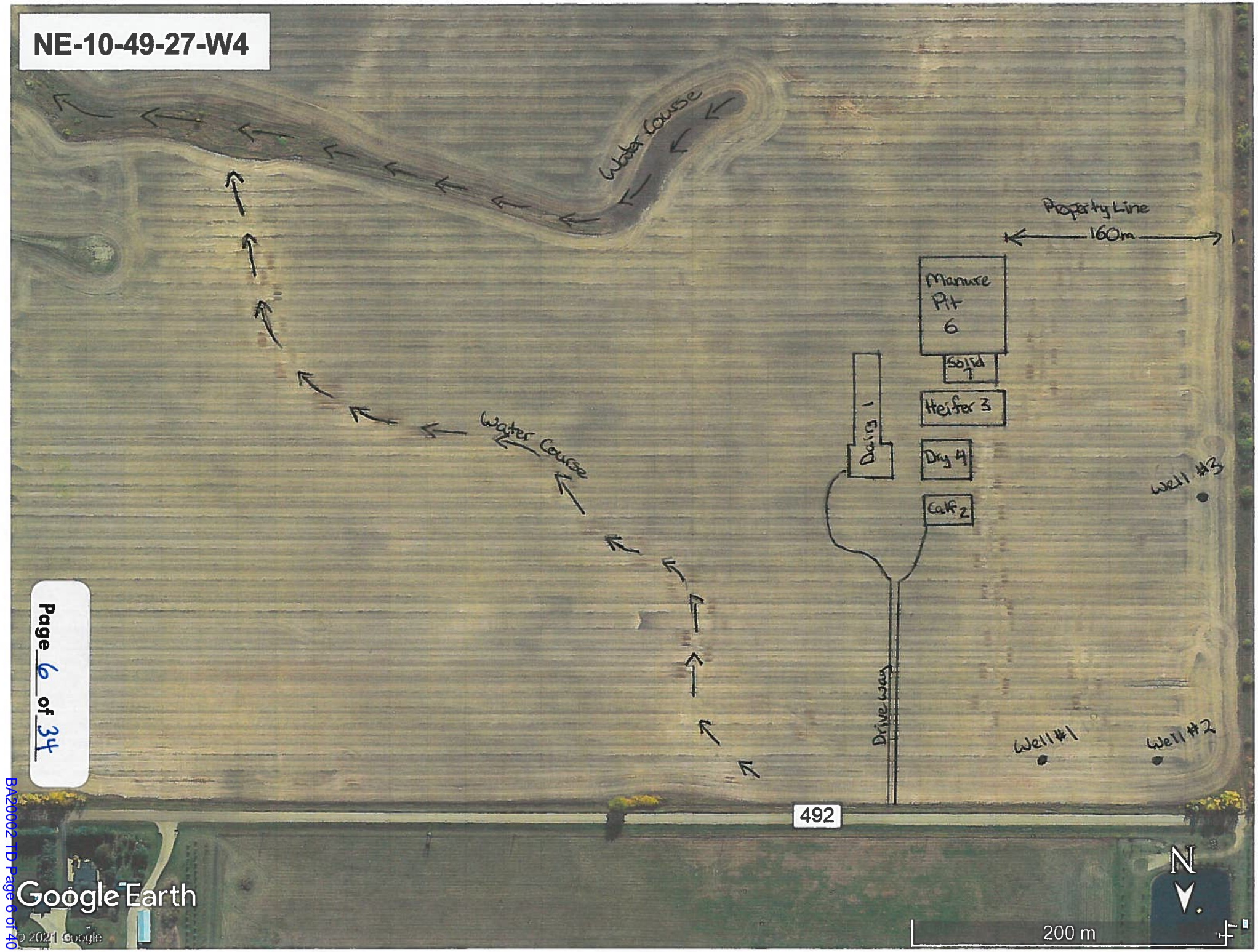
OPTION 4: Uncertain if *Water Act* licence is needed; acknowledgement of risk (for existing CFOs only)

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


SE16-49-27-W4
Acreage
SW15-49-27-W4
980m
492
SW14-49-27-W4
720m
NE9-49-27-W4
NW10-49-27-W4
NE10-49-27-W4
SE9-49-27-W4
SW10-49-27-W4
950m
SE10-49-27-W4
SW11-49-27-W4
1400
Google Earth
273
272
900 m
N



AO note: Updated site map provided by applicant: shows property line setbacks and dugout location.

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: _____ **Proposed 1:** Manure Pit/ Lagoon

Proposed 2: Barn **Proposed 3:** solid manure pad

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 height 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 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 known
	How many water wells are within 100 m of the manure storage facility or manure collection area?		0	0	0	☑ YES ☐ NO ☐ YES with exemption	Confirmed
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)		200	250	280	☑ YES ☐ NO ☐ YES with exemption	115 m from drainage wetland
Groundwater information	What is the depth to the water table?		5	5	5	☑ YES ☐ NO ☐ YES with exemption	Meets requirements
	What is the depth to the groundwater resource/aquifer you draw water from?		54.86	54.86	54.86	☑ YES ☐ NO ☐ YES with exemption	ID 285622 potential shallower at 24.99 m

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

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: _____ **Proposed 1:** Dairy Barn

Proposed 2: Calf Barn **Proposed 3:** Dry Cow Barn

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 height 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	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	0	☑ YES ☐ NO ☐ YES with exemption	Confirmed
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)		150	200	200	☑ YES ☐ NO ☐ YES with exemption	100 m from seasonal drainage 200 m from drainage wetland
Groundwater information	What is the depth to the water table?		5	5	5	☑ YES ☐ NO ☐ YES with exemption	Meets requirements
	What is the depth to the groundwater resource/aquifer you draw water from?		54.86	54.86	54.86	☑ YES ☐ NO ☐ YES with exemption	ID 285622 potential shallower at 24.99 m

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

Hole #1 - Customer Copy

Alberta

Water Well Drilling Report

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.

View in Metric

GIC Well ID 1166175
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 2018/05/24

GOWN ID

Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Country	Postal Code
ALIEDA FARMS	R.R # 1	THORSBY	ALBERTA	CANADA	T0C 2P0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	15	10	49	27	4				THORSBY

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 53.220711 Longitude -113.864591
How Location Obtained
Hand held autonomous GPS 20-30m

Elevation 2446.00 ft
How Elevation Obtained
Hand held autonomous GPS 20-30m

Drilling Information

Method of Drilling
Combination

Proposed Well Use
Domestic

Type of Work
New Well

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
9.00		Brownish Yellow Till
28.00		Gray Medium Grained Sandstone
38.00		Dark Gray Shale
39.00		Coal
45.00		Dark Gray Fractured Shale
55.00		Greenish Gray Shale
56.00		Brown Shale
57.00		Dark Brown Shale
59.00		Brown Shale
72.00		Gray Shale
77.00		Gray Medium Grained Sandstone
80.00		Gray Shale
84.00		Light Brown Shale
93.00		Light Gray Shale
95.00		Gray Medium Grained Sandstone
100.00		Gray Shale
105.00		Coal
107.00		Brown Shale
123.00		Gray Shale
125.00		Coal
134.00		Gray Shale
135.00		Siltstone
141.00		Gray Shale
144.00		Coal
153.00		Light Brown Shale
158.00		Gray Medium Grained Sandstone
162.00		Light Gray Shale
165.00		Coal
168.00		Gray Shale
169.00		Coal
172.00		Gray Medium Grained Sandstone
173.00		Coal

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 10.00 igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)
2018/03/26	15.00	60.00

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
260.00 ft	260.00 ft	2018/03/21	2018/03/26

Borehole

Diameter (in)	From (ft)	To (ft)
8.75	0.00	205.00
5.12	205.00	260.00

Surface Casing (if applicable)
Plastic
Size OD : 6.00 in
Wall Thickness : 0.390 in
Bottom at : 205.00 ft

Well Casing/Liner
Plastic
Size OD : 4.50 in
Wall Thickness : 0.237 in
Top at : 195.00 ft
Bottom at : 260.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width(in)	Slot Length (in)	Hole or Slot Interval(in)
228.00	253.00	0.040	12.00	36.00

Perforated by Saw

Annular Seal Bentonite Chips/Tablets
Placed from 171.00 ft to 204.50 ft
Amount 100.00 Pounds

Other Seals

Type	At (ft)
Formation Seal	205.00
Shale Trap	204.50

Screen Type
Size OD in

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

Attachment
Top Fittings
Bottom Fittings

Pack
Type
Grain Size
Amount

Contractor Certification

...sible for drilling/construct... Well

Hole #2 Customer Copy.

Alberta Water Well Drilling Report

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.

View in Metric

GIC Well ID 1186176
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 2018/05/25

GOWN ID

Measurement in Imperial

Well Identification and Location

Owner Name	Address	Town	Province	Country	Postal Code
ALIEDA FARMS	R.R # 1	THORSBY	ALBERTA	CANADA	T0X 2P0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	15	10	49	27	4				THORSBY (HOLE # 2)

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 53.219373 Longitude -113.866014
How Location Obtained
Hand held autonomous GPS 20-30m

Elevation 2443.00 ft
How Elevation Obtained
Hand held autonomous GPS 20-30m

Drilling Information

Method of Drilling
Combination

Proposed Well Use
Domestic

Type of Work
New Well

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
7.00		Brownish Yellow Till
19.00		Brown Medium Grained Sandstone
55.00		Dark Gray Shale
67.00		Gray Shale
72.00		Gray Medium Grained Sandstone
73.00		Coal
81.00		Brown Shale
86.00		Light Gray Shale
89.00		Gray Medium Grained Sandstone
95.00		Gray Shale
97.00		Coal
102.00		Brown Shale
119.00		Gray Shale
122.00		Coal
134.00		Gray Shale
135.00		Siltstone
140.00		Coal
144.00		Brownish Gray Shale
145.00		Siltstone
148.00		Gray Shale
154.00		Gray Medium Grained Sandstone
159.00		Gray Shale
162.00		Coal
165.00		Brown Shale
166.00		Coal
171.00		Gray Shale
173.00		Gray Medium Grained Sandstone
179.00		Gray Shale
180.00		Coal
187.00		Green Fractured Shale
199.00		Gray Medium Grained Sandstone
206.00		Green Shale

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 5.00 igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)
2018/03/29	5.00	60.00

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
300.00 ft	300.00 ft	2018/03/22	2018/03/29

Borehole

Diameter (in)	From (ft)	To (ft)
8.75	0.00	200.50
5.12	200.50	300.00

Surface Casing (if applicable)
Plastic
Size OD : 6.00 in
Wall Thickness : 0.390 in
Bottom at : 200.50 ft

Well Casing/Liner
Plastic
Size OD : 4.50 in
Wall Thickness : 0.237 in
Top at : 110.00 ft
Bottom at : 300.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width(in)	Slot Length (in)	Hole or Slot Interval(in)
206.00	261.00	0.040	12.00	36.00
266.00	296.00	0.040	12.00	36.00

Perforated by Saw

Annular Seal Bentonite Chips/Tablets
Placed from 167.00 ft to 200.00 ft
Amount 100.00 Pounds

Other Seals

Type	At (ft)
Formation Seal	200.50
Shale Trap	200.00

Screen Type
Size OD : in

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

Attachment
Top Fittings
Bottom Fittings
Pack
Type
Amount
Grain Size

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
PIERRE THIBODEAU

Company Name

Certification No
126989A

Copy provided to owner

Date approval holder signed
2018/04/24

Hole #3 Customer Copy.

Alberta Water Well Drilling Report

View in Metric

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 1166177
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 2018/05/25

GOWN ID

Measurement in Imperial

Well Identification and Location

Owner Name	Address	Town	Province	Country	Postal Code
ALIEDA FARMS	R.R # 1	THORSBY	ALBERTA	CANADA	T0X 2P0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	15	10	49	27	4				THORSBY (HOLE # 3)

Measured from Boundary of
ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 53.220756 Longitude -113.865858
How Location Obtained
Hand held autonomous GPS 20-30m

Elevation 2466.00 ft
How Elevation Obtained
Hand held autonomous GPS 20-30m

Drilling Information

Method of Drilling
Combination

Proposed Well Use
Domestic

Type of Work
New Well

Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
9.00		Brownish Yellow Till
34.00		Brownish Gray Medium Grained Sandstone
62.00		Dark Gray Shale
71.00		Gray Shale
75.00		Brown Shale
81.00		Gray Medium Grained Sandstone
83.00		Coal
84.00		Brown Shale
85.00		Coal
101.00		Gray Shale
107.00		Dark Gray Fractured Shale
109.00		Coal
115.00		Brown Shale
128.00		Gray Shale
130.00		Coal
135.00		Brown Shale
136.00		Siltstone
145.00		Gray Shale
150.00		Coal
152.00		Brown Shale
157.00		Dark Gray Shale
164.00		Gray Fine Grained Sandstone
168.00		Gray Shale
170.00		Coal
174.00		Brown Shale
176.00		Coal
183.00		Gray Shale
190.00		Greenish Gray Fractured Shale
198.00		Gray Medium Grained Sandstone
212.00		Green Shale
225.00	Yes	Gray Fine Grained Sandstone
235.00	Yes	Dark Green Fractured Shale

Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 5.00 igpm

Test Date	Water Removal Rate (igpm)	Static Water Level (ft)
2018/04/03	5.00	61.00

Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
300.00 ft	300.00 ft	2018/03/22	2018/04/03

Borehole

Diameter (in)	From (ft)	To (ft)
8.75	0.00	205.50
5.12	205.50	300.00

Surface Casing (if applicable)
Plastic
Size OD : 6.00 in
Wall Thickness : 0.390 in
Bottom at : 205.50 ft

Well Casing/Liner
Plastic
Size OD : 4.50 in
Wall Thickness : 0.237 in
Top at : 195.00 ft
Bottom at : 300.00 ft

Perforations

From (ft)	To (ft)	Diameter or Slot Width(in)	Slot Length (in)	Hole or Slot Interval(in)
212.00	292.00	0.040	12.00	36.00

Perforated by Saw

Annular Seal Bentonite Chips/Tablets
Placed from 172.00 ft to 205.00 ft
Amount 100.00 Pounds

Other Seals

Type	At (ft)
Formation Seal	205.50
Shale Trap	205.00

Screen Type
Size OD : in

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

Attachment
Top Fittings
Bottom Fittings

Pack
Type
Amount
Grain Si...

UNVALIDATED

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
PIERRE THIBODEAU

Company Name
CALIBRE DRILLING LTD.

Certification No
126969A

Copy of Well report provided to owner
Yes

Date approval holder signed
2018/04/24

Printed on 5/25/2018 11:07:40 AM

NRCB Natural Resources Conservation Board

NRCB USE ONLY

WATER WELL AND SURFACE WATER INFORMATION

Well IDs: ID 1168175 ID 1168176 ID 1168177

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 New CFO no facilities to assess.

Water Well ID	Preliminary Screening Score	Secondary Screening Score	Facility

Groundwater or surface water 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 Natural Resources Conservation Board

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**
T Weldon	SE15-49-27-W4	480	AG	Cat 1	464 m	N/A	Yes
R WURBAN	SW10-49-27-W4	1400	AG	Cat 1	1302 m	N/A	Yes
ACERAGE	04-15-49-27-W4	980	AG	Cat 1	973 m	N/A	Yes
P FANDRICK	NW11-49-27-W4	720	AG	Cat 1	691 m	N/A	Yes
A&E&E FEHLAUER	SW11-49-27-W4	950	AG	Cat 1	978 m	N/A	Yes

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

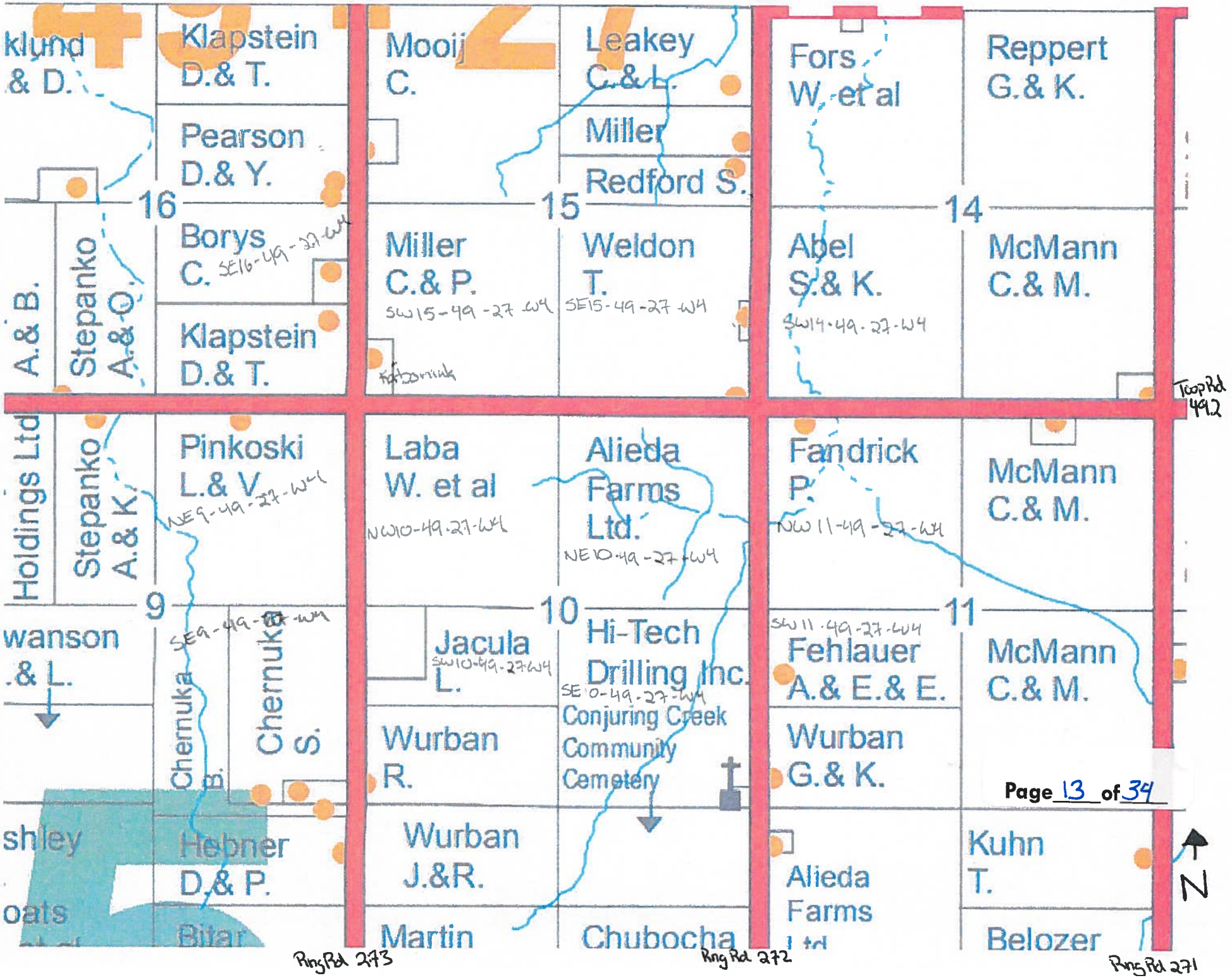
				NRCB USE ONLY	
Name of land owner(s)*	**Legal land description**	**Usable area** (ha)**	**Soil zone *** **	**Usable area (ha)**	**Agreement attached (if required)**
Alieda Farms Ltd.	NE-10-49-27-W4	60	Black	Applicant removed	unusble acreage
Alieda Farms Ltd.	NW-2-49-27-W4	49.8	Black		
Alieda Farms Ltd.	SW-6-50-27-W4	32.38	Black		
Peter and Alieda DeWit	NW-10-50-26-W4	32.38	Grey-Wooded		
		174.56			
			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)


klund & D.
Klapstein D.& T.
Pearson D.& Y.
16
Borys C. SE16-49-27 W4
Klapstein D.& T.
A.& B.
Stepanko A.& O.
Mooij C.
Leakey C.& L.
Miller
Redford S.
15
Miller C.& P. SW15-49-27 W4
Weldon T. SE15-49-27 W4
Fors W. et al
Reppert G.& K.
14
Abel S.& K. SW14-49-27-W4
McMann C.& M.
Twp Rd 492
Holdings Ltd
Stepanko A.& K.
Pinkoski L.& V. NE9-49-27-W4
9
wanson & L.
SE9-49-27-W4
Chernuka B.
Chernuka S.
Laba W. et al NW10-49-27-W4
Alieda Farms Ltd. NE10-49-27-W4
10
Jacula L. SW10-49-27-W4
Hi-Tech Drilling Inc. SE10-49-27-W4
Conjuring Creek Community Cemetery
Wurban R.
Wurban J.&R.
Martin
Chubocha
Fandrick P. NW11-49-27-W4
McMann C.& M.
11
SW11-49-27-W4
Fehlauer A.& E.& E.
Wurban G.& K.
Alieda Farms Ltd
Kuhn T.
Belozer
shley
oats
Hebner D.& P.
Bitar
N
Rng Rd 273
Rng Rd 272
Rng Rd 271

Manure Spreading Agreement

This agreement is between Alieda Farms Ltd, manure producer, and

Peter + Alieda DeWit manure receiver.

Length of agreement: This agreement is valid for a time period of 15 years (minimum of one year).

Legal land location	Soil type[1]	Acres suitable for manure spreading[2]
NW10-50-26-W4	Grey Wooded	75

[1] Soil type choices: Dark brown and brown, Grey wooded, Black, Irrigated.

[2] Land within required setbacks from water bodies, water wells, residences, etc. is not to be included.

Other comments:

Manure producer (Confined Feeding Operation) Legal Land Location NW10-49-27-W4

Date of signing	Signature	Print name	Corporate name(if appl)
Jan 9, 2021	Cameron DeWit	Cameron DeWit	Alieda Farms Ltd.

Manure Receiver – Landowner(s)[3]

Date of signing	Signature	Print name	Corporate name(if appl)
Jan 9, 2021		Peter DeWit	
Jan 9, 2021		Alieda DeWit	

[3] All registered owners of land, or authorized signing authorities must sign.

NRCB Natural Resources Conservation Board

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: 322 m Category 2: 429 m Category 3: 536 m Category 4: 858 m

Technology factor: ☐ YES ☑ NO

Expansion factor: ☐ YES ☑ NO

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

MDS concern related to odour nuisances.

LAND BASE FOR MANURE AND COMPOST APPLICATION

Land base required: 148.5 ha

Land base listed: 174.5 ha

Area not suitable: Unusable area already removed

Available area 174.5 ha Requirement met: ☑ YES ☐ NO

Land spreading agreements required: ☑ YES ☐ NO

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

Applicant does have access to more land if needed.

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 _____

NRCB USE ONLY

ALL SIGNATURES IN FILE ☑ YES ☐ NO

DATES OF APPROVAL OFFICER SITE VISITS

May 13, 2021	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: May 28, 2021

Municipality: Leduc 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

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 - Concrete liner

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

Facility description / name *(as indicated on site plan)* **1.** Calf Barn

2. Dry Cow Barn

Manure storage capacity

	Length (m)	Width (m)	Depth below grade to the bottom of the liner (m)	**NRCB USE ONLY** Estimated storage capacity (m^3)
1.	24.4	17.1	0	
2.	24.4	21.3	0	
			TOTAL CAPACITY	

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

Surface water control systems

Describe the run-on and runoff control system

All Barns will be built above grade

All Barns will be completely under roof

All barns will have concrete floor

Liner protection

Describe how the physical integrity of the liner will be maintained

All floors will be made of Type 50 concrete; air entrained with a strength of 30 Mpa

All floors will be reinforced by 10mm re-bar on a 16inch grid

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

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 - Concrete liner

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

Facility description / name *(as indicated on site plan)* **1.** Heifer Barn

2. _____

Manure storage capacity

	Length (m)	Width (m)	Depth below grade to the bottom of the liner (m)	**NRCB USE ONLY** Estimated storage capacity (m^3)
1.	48.8	21.3	0	
2.				
			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

Heifer Barn will be built above grade

Heifer Barn will be completely under roof and will have a concrete floor with Type 50 concrete at a strength of 30mpa

Liner protection

Describe how the physical integrity of the liner will be maintained

The floors will be made with Type 50 concrete: Air entrained at a strength of 30Mpa

All floors will be reinforced with 10mm re-bar on a 16inch grid

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

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

Concrete liner details

Concrete thickness 5 inch	Method of sulphate protection: Type 50 concrete; air entrained
Concrete strength 30Mpa	Concrete reinforcement size and spacing 10 mm re-bar on a 16 inch grid

Concrete requirements can be found in Technical Guideline Agdex 096-93
Guideline minimums:
Solid manure: 25MPa (D)
Solid manure (wet): 30MPa (C)
Method of sulphate protection:
Type 50 or Type 10 with fly ash or equivalent

NRCB USE ONLY
Requirements met: ☑ YES ☐ NO
Condition required: ☑ YES ☐ NO
Report attached: ☑ YES ☐ NO

Additional information *(attach as required)*

NRCB USE ONLY

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

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

Depth to Uppermost groundwater resource: 24.99m Requirements met: ☑ YES ☐ NO

ERST completed: ☐ see ERST page for details

Surface water control systems

Requirements met: ☑ YES ☐ NO Details/comments:

Concrete liner details

Applicant to provide concrete documentation.

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)

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

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

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

1. Dairy Barn

2. Additional Box stalls

Manure storage capacity

	Length (m)	Width (m)	Depth below grade to the bottom of the liner (m)	**NRCB USE ONLY** Estimated storage capacity (m^3)
1.	76.2	21	0	
2.	18.3	6.1	0	
			TOTAL CAPACITY	

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

Surface water control systems

Describe the run-on and runoff control system

Dairy barn and additional box stall areas will be built above grade

All manure areas will be completely under roof

Liner protection

Describe how the physical integrity of the liner will be maintained

All floors will be made with 30 MPA Type 50 concrete with air entrained.

All floors will be reinforced by 10mm re-bar on a 16inch grid

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

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

Concrete liner details

Concrete thickness 5 inches	Method of sulphate protection: Type 50; air entrained
Concrete strength 30 MPA	Concrete reinforcement size and spacing 10mm re-bar on a 16 inch grid

Concrete requirements can be found in Technical Guideline Agdex 096-93
Guideline minimums:
Solid manure: 25MPa (D)
Solid manure (wet): 30MPa (C)
Method of sulphate protection:
Type 50 or Type 10 with fly ash or equivalent

NRCB USE ONLY
Requirements met: ☑ YES ☐ NO
Condition required: ☑ YES ☐ NO
Report attached: ☑ YES ☐ NO

Additional information *(attach as required)*

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: 24.99m Requirements met: ☑ YES ☐ NO

ERST completed: ☐ see ERST page for details

Surface water control systems

Requirements met: ☑ YES ☐ NO Details/comments:

Concrete liner details

Applicant to provide concrete documentation.

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)

SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - ~~Compacted soil~~ liner Concrete 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. Manure storage pad
2. _____

Manure storage capacity

	Length (m)	Width (m)	Depth below grade to the bottom of the liner (m)	**NRCB USE ONLY** Estimated storage capacity (m^3)
1.	30	20	0.5	
2.				
			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

Berms and sloped into lagoon.

Liner protection

Describe how the physical integrity of the liner will be maintained

monitor and best management practices.

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

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

Concrete liner details

Concrete thickness 5 inches	Method of sulphate protection: Type 50 concrete
Concrete strength 30 Mpa	Concrete reinforcement size and spacing 10mm re-bar on a 16 inch grid

Concrete requirements can be found in Technical Guideline Agdex 096-93
Guideline minimums:
Solid manure: 25MPa (D)
Solid manure (wet): 30MPa (C)
Method of sulphate protection:
Type 50 or Type 10 with fly ash or equivalent

NRCB USE ONLY
Requirements met: ☑ YES ☐ NO
Condition required: ☑ YES ☐ NO
Report attached: ☑ YES ☐ NO

Additional information *(attach as required)*

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: 24.99m Requirements met: ☑ YES ☐ NO

ERST completed: ☐ see ERST page for details

Surface water control systems

Requirements met: ☑ YES ☐ NO Details/comments:

Concrete liner details

Applicant to provide concrete documentation.

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

LIQUID MANURE COLLECTION AND/OR STORAGE: In-barn - Concrete liner

*(complete a copy of this section for **EACH** proposed in-barn liquid manure storage facility with a concrete liner)*

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

1. Manure Collection Pit
2. Feed Fence scrape alley
3. Bed scrape alley

Manure storage capacity *(use one row in the table for **EACH** in-barn storage. Attach additional pages if you require more rows)*

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	NRCB USE ONLY Calculated storage capacity (m^3)
1.	13	3.05	2.4	2.3	
2.	73	4.1	0.15	0	
3.	58	3.1	0.15	0	
				TOTAL CAPACITY	

Concrete liner details

Scrape alleys or unslatted portions of barn floors (if applicable)	Concrete thickness: 5 inches	Method of sulphate protection: Type 50 concrete Air Entrained	
	Concrete strength: 30 Mpa	Concrete reinforcement size and spacing: 10mm re-bar on a 16 inch grid	
In-barn manure pit floors	Concrete thickness: 6 inches	Method of sulphate protection: Type 50 concrete Air Entrained	
	Concrete strength: 32 Mpa	Concrete reinforcement size and spacing: 10mm re-bar on a 16 inch grid	
In-barn manure pit walls	Concrete thickness: 8 inches	Method of sulphate protection: Type 50 concrete Air Entrained	
	Concrete strength: 32 Mpa	Horizontal reinforcement size and spacing: 10 mm re-bar 2 foot spacing	Vertical reinforcement size and spacing: 10 mm re-bar 2 foot spacing

LIQUID MANURE COLLECTION AND/OR STORAGE: In-barn - Concrete liner (cont.)

Describe how the joints at the junction of the pit walls, pit floors and any other joints will be sealed

All Pitt walls will be poured at the same time to ensure that there are no voids in walls

r will be placed on joint between the pit walls and floor.

Sika flex type product

Describe sealing practices for piping, etc. that penetrates the liner

Any penetration to concrete linear should be coated in tar to ensure seal.

Concrete requirements can be found in Technical Guideline Agdex 096-93
Guideline minimums:
Solid manure (wet): 30MPa (C)
Liquid manure: 32MPa (B)
Category A is required to be engineered
Method of sulphate protection:
Type 50 or Type 10 with fly ash or equivalent

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

Condition required: ☑ YES ☐ NO

Additional information

Manure to be pumped from collection tank to lagoon/manure pit
Slots for manure scrappings to be poured into floor
Scrape alley floors will be cleaned 6 times a day by automatic barn cleaner

NRCB USE ONLY

Liquid manure storage volume calculator attached: ☑ YES ☐ NO

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

Depth to uppermost groundwater resource: 24.99m Requirements met: ☑ YES ☐ NO

ERST completed: ☐ see ERST page for details

Concrete liner requirements

Applicant to provide concrete documentation.

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

LIQUID MANURE STORAGE: Synthetic liner

*(complete a copy of this section for **EACH** proposed liquid manure storage facility with a synthetic liner)*

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

1. Manure Pit Synthetic lined lagoon
2. _____

Manure storage capacity *(use one row in the table for **EACH** cell of the synthetic lined storage, attach additional pages if you require more rows)*

	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)	Filled in lower ¼? Y/N
1.	58	54	4	4	3:1	3:1	4:1	6900 m3	Yes
2.									
							TOTAL CAPACITY		

Surface water control systems

Describe the run-on and runoff control system

Dykes to be built around manure pit are to be 0.5m above grade and are to have a 4:1 slope

Crest sloped slightly outwards to direct rainfall away

Sealing

Describe sealing practices for piping, etc. that penetrates the liner

Layfield will be installing pipe into pit where it penetrates the liner

NRCB USE ONLY
Requirements met: ☑ YES ☐ NO

Liner protection

Describe how the inside walls, bottom and outside walls are protected from erosion

The walls will be a geotextile underlay (cushion layer between liner and subgrade)

Describe how the physical integrity of the liner will be maintained from other damage

There will be a geo web concrete ramp that will allow the pump to enter and exit without damaging the liner

There will 100mm wide horizontal wick strip drains, 9 strips in each direction. See option 6 of gas venting optoins in Layfield quote.

NRCB USE ONLY
Requirements met: ☑ YES ☐ NO

LIQUID MANURE STORAGE: Synthetic liner (cont.)

Synthetic liner details

Provide synthetic liner material details

60mil smooth HDPE geomembrane will be the liner from Layfield

Additional information *(attach copies of design/engineering reports)*

See quote P21516 from Layfield

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

Condition required: ☑ YES ☐ NO

Report attached: ☑ YES ☐ NO

NRCB USE ONLY

Liquid manure storage volume calculator attached: ☑ YES ☐ NO

Depth to water table: >5m — Requirements met: ☑ YES ☐ NO

Depth to uppermost groundwater resource: 24.99m — Requirements met: ☑ YES ☐ NO

ERST completed: ☐ see ERST page for details

Surface water control systems

Requirements met: ☑ YES ☐ NO — Details/comments:

Synthetic liner requirements

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

Added measure based on information of available for the area.

Construction plans approved by professional engineer: ☐ YES ☑ NO

Will liner be installed by manufacturer approved contractor and qualified third party?: ☑ YES ☐ NO

Preparation of liner bed (comments):

Applicant to provide third party sign off report when facility is constructed.

Condition required: ☑ YES ☐ NO

NRCB USE ONLY **LIQUID MANURE STORAGE VOLUME CALCULATOR (if applicable)**	
Facility 1	
Name / description Synthetic lined liquid manure storage	Capacity 6900 m3
Facility 2	
Name / description	Capacity
Facility 3	
Name / description	Capacity
Facility 4	
Name / description	Capacity
TOTAL CAPACITY	6900 m3
REQUIRED 9 MONTH STORAGE CAPACITY	5112 m3
MEETS THE REQUIREMENTS FOR A MINIMUM OF 9 MONTHS STORAGE	☑ YES ☐ NO

Earthen Manure Storage Volume Calculator

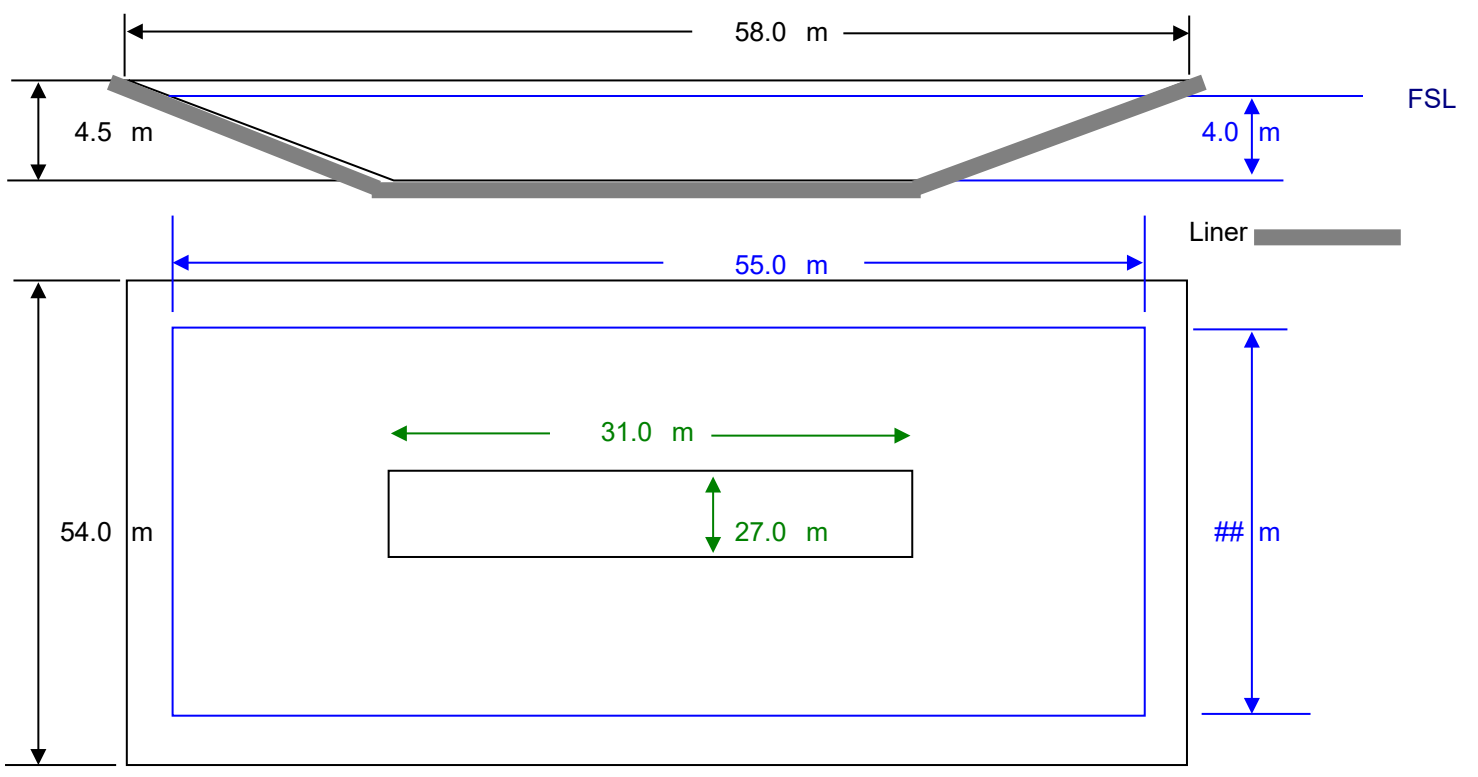
Dimensions of EMS	Metric		English Units	
Capacity of EMS			**Capacity of EMS**	
Length*	58.0	m	190.29	Feet
Width*	54.0	m	177.17	Feet
Total Depth*	4.5	m	14.76	Feet
Water Depth	4.00	m	13.12	Feet
End Slope*	3	run:rise	3	run:rise
Side Slope*	3	run:rise	3	run:rise
Length of Bottom	31.0			
Width of Bottom	27.0			
Total Capacity @ top of Bank	**8,384**	**m^3**	**296,061**	**ft^3**
			1,844,111	**Imp. Gal.**

* Only cells in blue can be changed.

Volume of Liquid Manure at Specified Depth			Volume at Freeboard	
Length (liquid manure level)	55.0	m	180.45	Feet
Width (liquid manure level)	51.0	m	167.32	Feet
Depth	4.5	m	14.76	Feet
Water Depth	4.00	m	13.12	Feet
End Slope	3	run:rise	3	run:rise
Side Slope	3	run:rise	3	run:rise
Total Volume@ freeboard depth	**6,900**	**m^3**	**243,671**	**ft^3**
			1,517,787	**Imp. Gal.**
Surface Area of Liquid Manure	**2,805**	**m^2**	**30,193**	**ft^2**

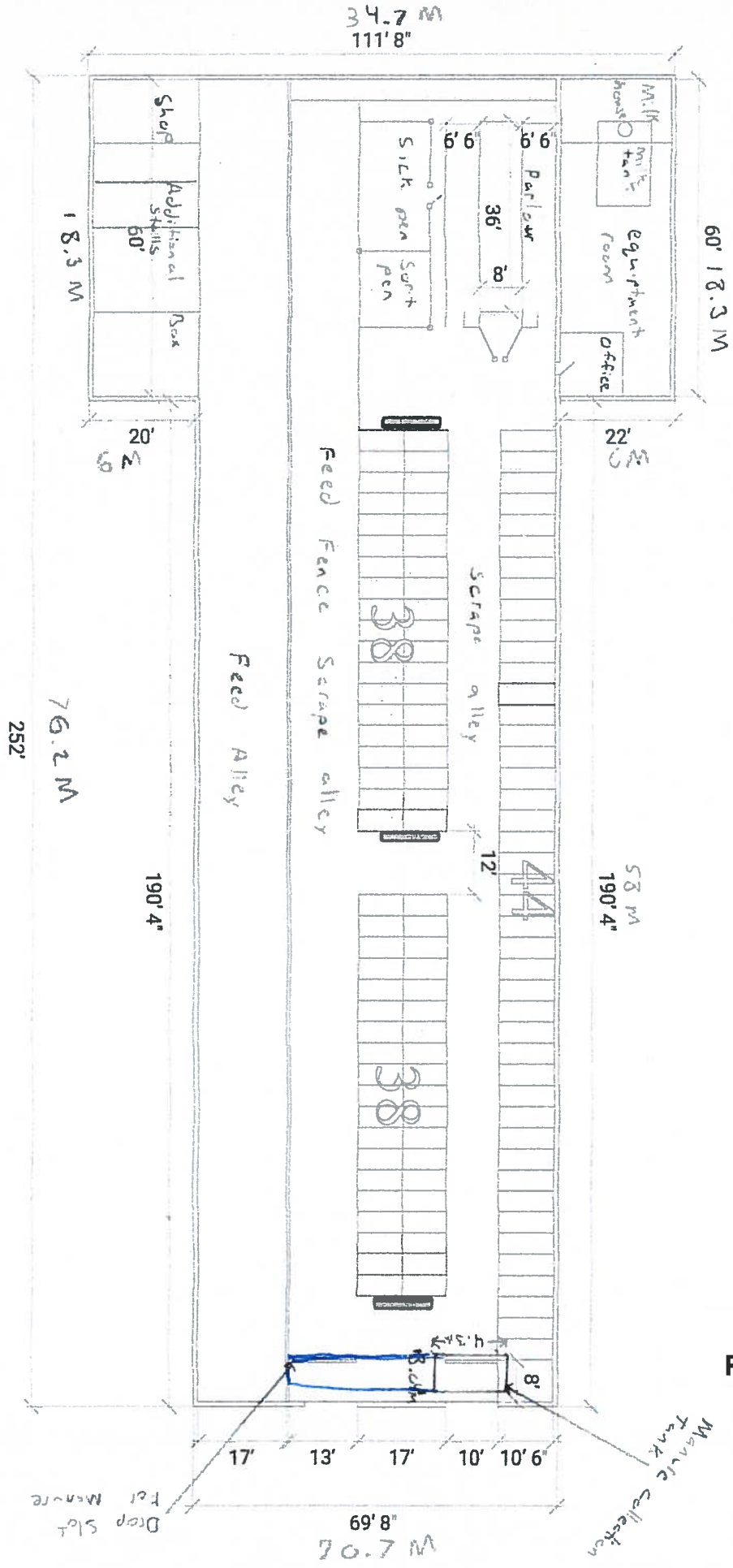
Nine Month Storage Requirement	
5,112 **m^3**	<--- Use Sheet "1. Nine Month Storage Calc" to calculate this number
180,529 **ft^3**	
1,124,482 **Imp. Gal.**	

Twelve Month Storage Requirement	
6,816 **m^3**	<--- Use Sheet "1. Nine Month Storage Calc" to calculate this number
240,705 **ft^3**	
1,499,310 **Imp. Gal.**	

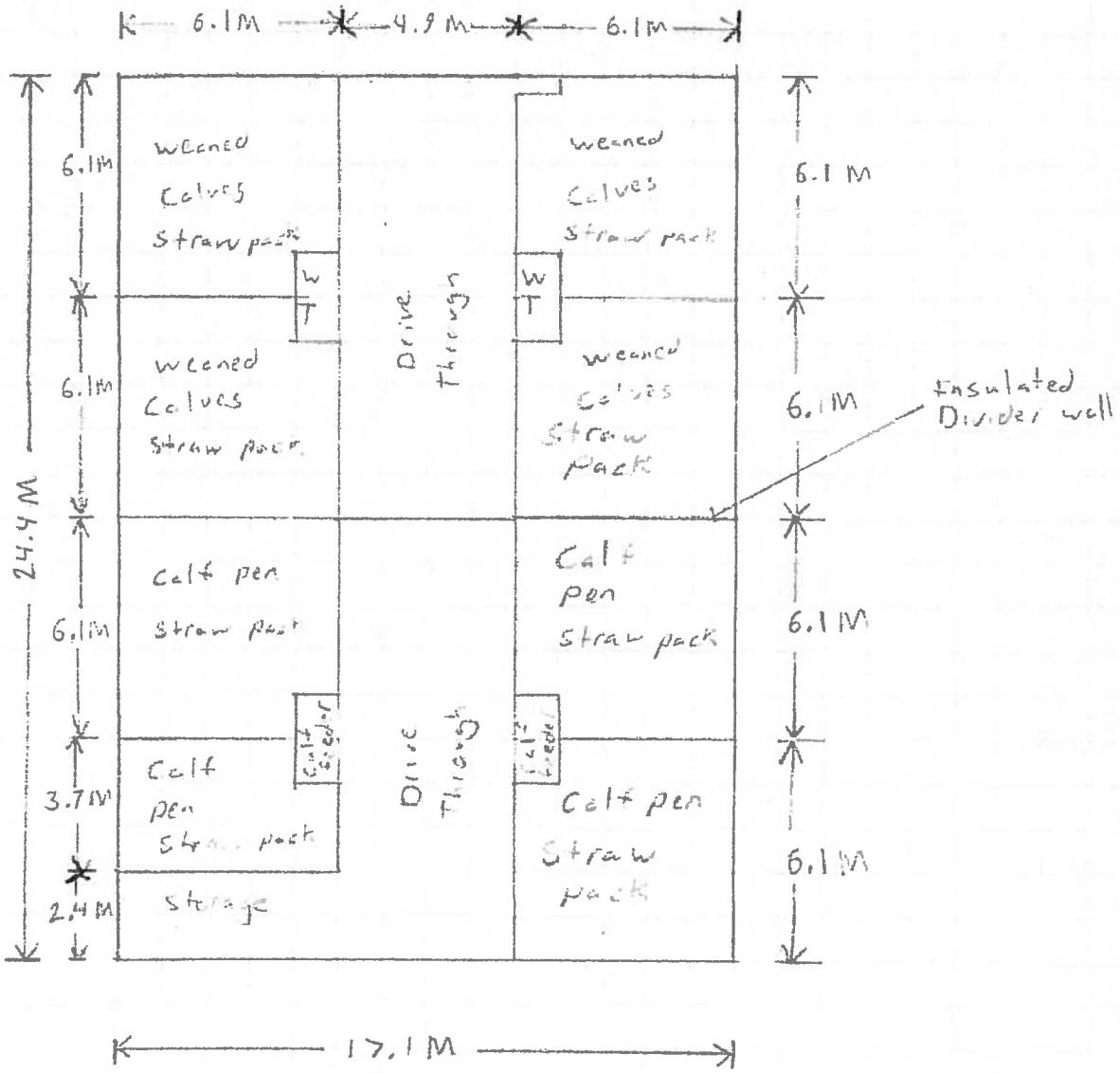


NTS - Not Drawn To Scale

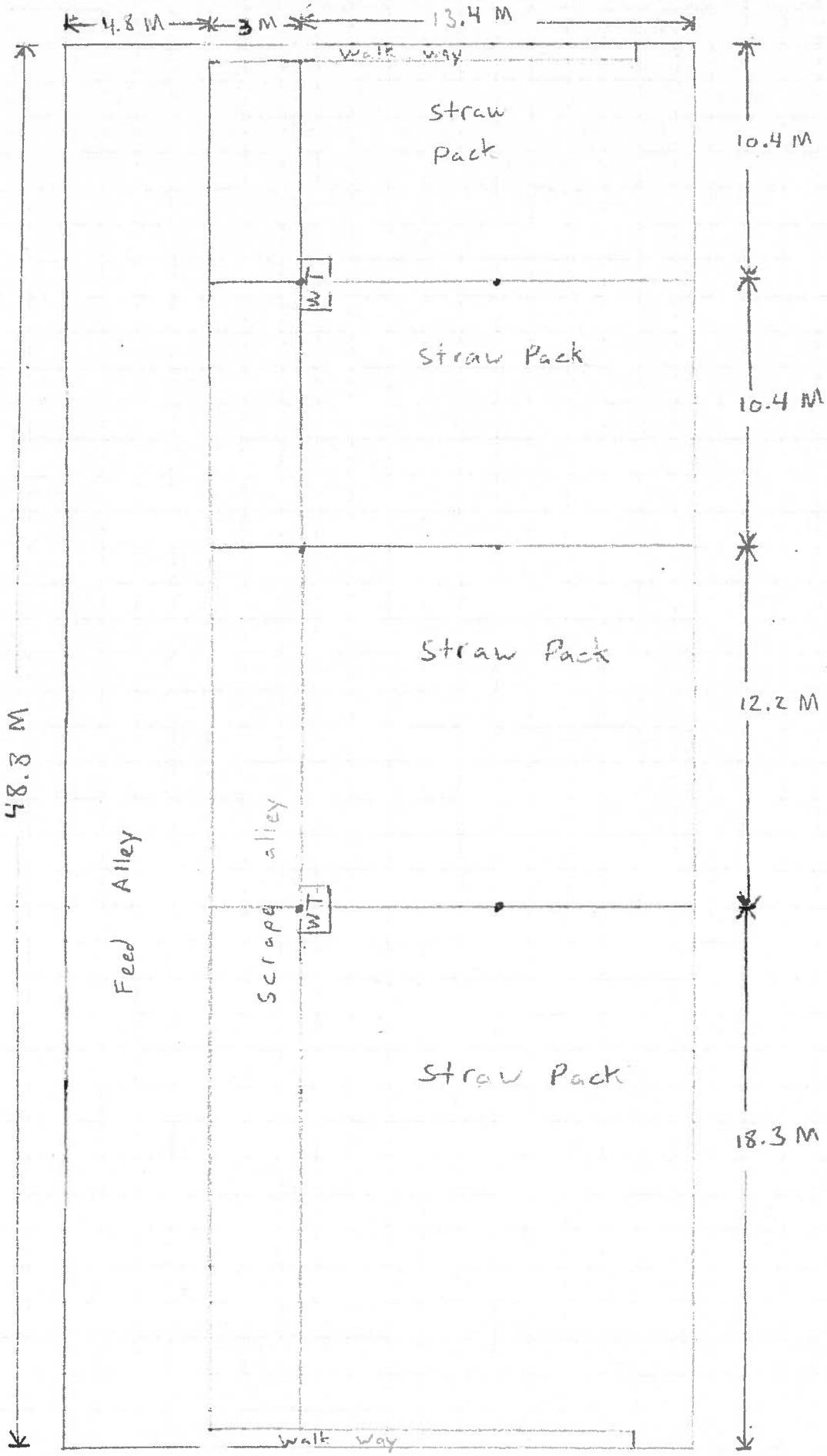
#1 Main Dairy Barn



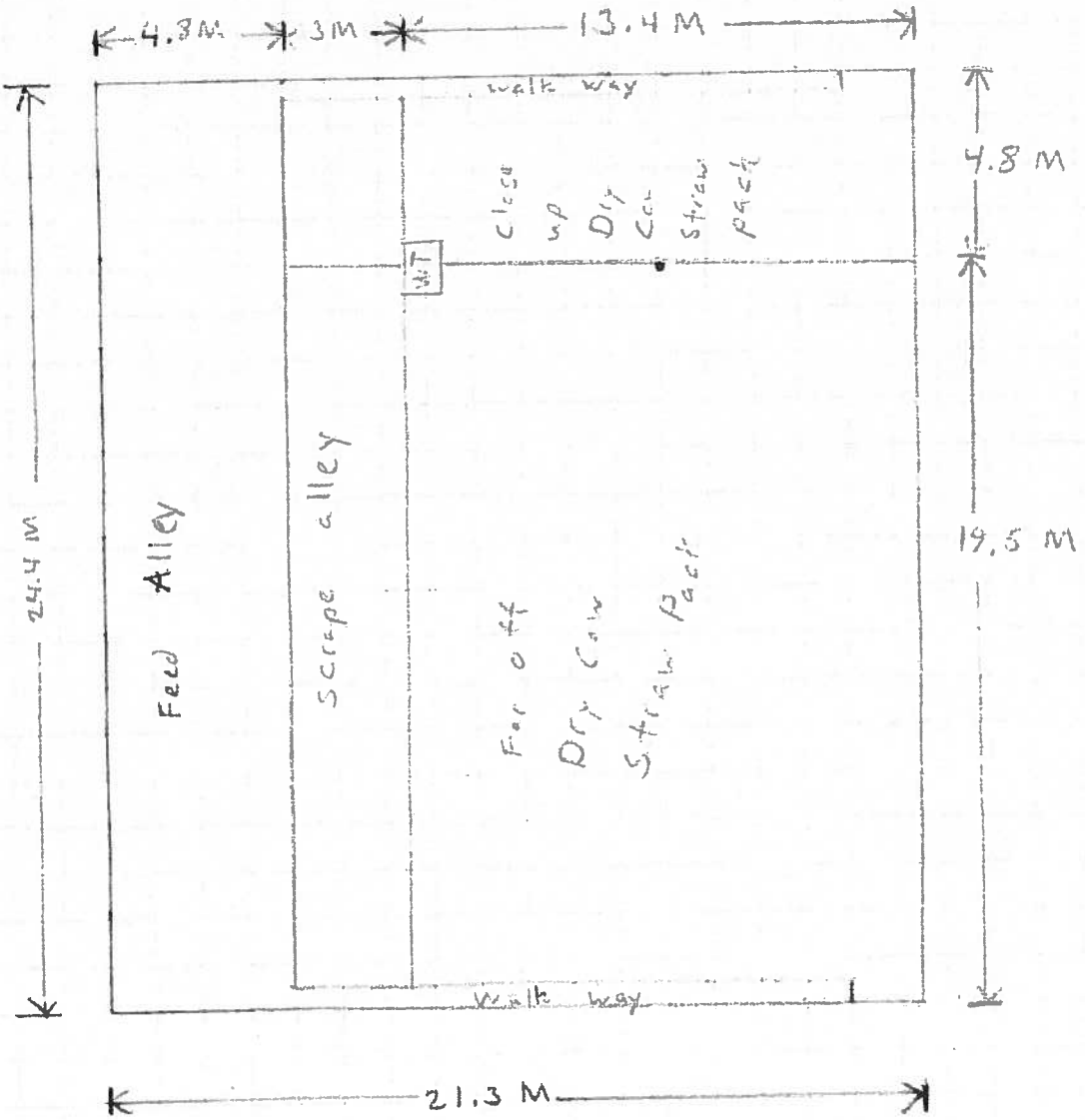
#2 Calf Barn (24.4M x 17.1M)



#3 Heifer Barn (48.8M x 21.3M)



#4 Dry Cow Barn (24.4 M x 21.3 M)



LAYFIELD CANADA LTD.

EDMONTON
17720 – 129 Avenue
Edmonton, AB T5V 0C4
Ph: (780)453-6731

TORONTO
Unit 2, 117 Basaltic Rd
Vaughan, ON L4K 1G4
Ph: (905) 761-9123

VANCOUVER
11131 Hammersmith Gate
Richmond, BC V7A 5E6
Ph: (604) 275-5588

CALGARY
Bay 5, 10551 – 50 Street SE
Calgary, AB T2C 3E3
Ph: (403) 236-4726

Environmental Solutions with Geosynthetics

Web: www.geomembranes.com

Toll free: 1 800 840-2884

Date: April 26, 2021

To: Crow Enterprises Ltd.

Attn: Len Taschuk

Email:

Pages: 4

Quote: P21516

Re: Manure Lagoon Liner – near Calmar, AB

Layfield Canada Ltd. ("Layfield") is pleased to provide you with our Budgetary Proposal with respect to the above-mentioned project. Our Project Scope is defined below for your reference.

Project Scope & Pricing:

	Scope Item	Qty	UoM	Unit Price	Total
1	Supply and installation of 60 mil smooth HDPE geomembrane. Pricing based on lagoon neat area of 3,615m² (dimensions as noted in clarification a.1)	1	LS	[redacted]	[redacted]
				Total Estimate (All Taxes Extra)	[redacted]

Optional Lagoon Upgrades

Geoweb Ramp

2	Supply and installation of 6" Cell Depth Geoweb ramp (5.2m wide by 16.4m long), includes LP16 non-woven geotextile cushion layer;	1	Each	+ [redacted]	+ [redacted]
	**Approximate volume of Concrete 13 m³ (by others)*	13	m^3	[redacted]	[redacted]

Geotextile Cushion Underlay

3	Supply and installation of LP8 (8oz) non-woven geotextile underlay (cushion layer between liner and subgrade). Pricing based on lagoon neat area of 3,615m;	1	LS	[redacted]	+ [redacted]

- No De-Watering

Gas Venting Options

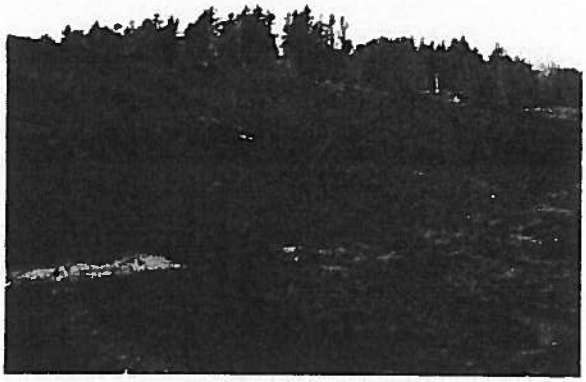
4	Supply and installation of TN220-2-6 geocomposite (geonet layer with 6oz nw-geotextile bonded on either side). Pricing based on lagoon neat area of 3,615m, with 36 gas vents installed around the top perimeter of the lagoon;	1	LS	[redacted]	[redacted]
5	Supply and installation of TN220-2-6 geocomposite strips (geonet layer with 6oz nw-geotextile bonded on either side). Pricing based on 9 strips @ 2.2m wide each in each direction (1 strip approx. every 6.7m) with 36 gas vents installed around the top perimeter of the lagoon;	1	LS	[redacted]	[redacted]
6	Supply and installation of 100mm wide horizontal wick strip drain. Pricing based on 9 strips in each direction (1 strip approx. every 6.7m) with 36 gas vents installed around the top perimeter of the lagoon;	1	LS	[redacted]	[redacted]

LAYFIELD

Subgrade Preparation

Subgrade Preparation

The integrity of a lining system depends largely on the condition of the prepared subgrade.



Earthworks can be used to support, cover, protect, drain and separate components of a geosynthetic lining system. One of the most critical earthworks for lining systems is the prepared subgrade, since it forms the founding surface for the lining system. The short and long term integrity of the lining system depends on the condition of the prepared subgrade. This Tech Note discusses some key items to consider when evaluating the acceptability of a prepared subgrade.

Most soil materials can be used in a prepared subgrade. Both locally available fill materials as well as imported processed materials can be used. Fine grained, non-cohesive soils, such as sand or silty sand and most cohesive soils, such as clayey-silt glacial till, can be used as subgrade construction materials.

The prepared surface should be uniform, well compacted, and free of sharp rock fragments or stones, large stones and other deleterious matter such as tree roots, construction debris and metallic objects. The surface should not have any natural or foreign object that protrudes above the surface of the subgrade.

In a number of instances, the locally available source of fill is limited to coarse grained, non-cohesive soil such as pit run gravel. In addition, sometimes the area to be lined lies within a coarse grained deposit. Although these materials can be graded and compacted to a uniform and level subgrade surface, this surface should receive further treatment by the application of a finer material, such as sand, to form a cushion or bedding for the lining system. The bedding material should be a minimum of 150 mm (6") thick and should be compacted. This bedding thickness may have to be increased depending on local site conditions. Where bedding sand is not available, a non-woven geotextile may be used as an alternative.

Fine grained, cohesive clay soils can also be used as a subgrade construction material. Native clayey-silt or silty-clay glacial tills are often found in lining subgrades. These materials can be worked, graded, compacted and trimmed to create a smooth, level and competent surface, however, all angular and sharp rocks or stones should be removed from the surface or picked out of the prepared subgrade. Smooth, rounded stones less than 50 mm (2") may remain within the prepared subgrade, however, these should be driven into the clay subgrade by applying a compactive effort so that these do not protrude above the finished surface. The general rule of thumb is that all stones and rocks, regardless of shape and size, and clay lumps that lie above the subgrade surface should be removed.

The prepared subgrade should be compacted in accordance with design specifications and standard engineering practice. Generally this means that the subgrade should be compacted to a minimum 95% of maximum dry density according to the standard Proctor test (ASTM D698). The design of a prepared subgrade should carefully consider load bearing requirements, the amount of subgrade deformation expected, and whether or not local differential settlement may occur. Deformation of a subgrade beneath a lining system can result in excessive stresses in the liner material which, in turn, may cause the lining system to fail and leak. As a minimum, the subgrade should be firm and unyielding, and should be compacted to a level that permits the movement of construction equipment, liner deployment equipment, and other related traffic without causing rutting and/or deformation of the surface.

Compaction is especially important around pipe penetrations and concrete appurtenances. Often the piping

is added after the earthworks are completed and compaction around the piping is done by a different method than that of the overall earthworks. The use of different compaction techniques can lead to differential settlement at the pipe penetration which can cause lining system failure.

Final grading and the finished condition of the prepared subgrade is another important issue. The surface should be levelled and prepared to a uniform finish free of abrupt or sharp changes in grade. The surface should not include pockets or voids of any kind and should not be rutted or contain soil windrows along the surface. In addition, the surface should be free of frost lumps and ice. The use of a cushion of bedding sand or a geotextile cushion should be considered if other methods are not feasible. The prepared subgrade should also be shaped and graded to facilitate surface drainage both prior to, and during the installation of the lining system.

Care must be taken to maintain the prepared subgrade following completion. Vehicular traffic on the completed subgrade should be limited. Marks or ruts left in the subgrade by vehicular traffic should be repaired as soon as possible. The subgrade should be protected from desiccation, flooding and freezing. Standing water should be removed so that the earthwork does not become saturated (or frozen in cold weather). A frozen subgrade, which is not unsuitable in itself, can be covered with a bedding layer if the removal of small frost lumps is not practical. Again a geotextile cushion layer could be used to correct an imperfect surface.

On projects that involve the Layfield Construction Group, the subgrade will be inspected upon arrival at site. Our project supervisors will inspect the condition of the subgrade and will issue a "Certificate of Acceptance of Soil Subgrade Surface" if suitable. Corrective actions and activities to maintain the subgrade in a suitable condition for lining (including dewatering) are the responsibility of the owner or the general contractor.

In some locations a clay subgrade can be prepared and combined with a synthetic liner to create a composite lining system. When a low permeability subgrade is placed in intimate contact with a geomembrane, then the combination of these two components form a composite lining system. Composite liners are not double liners. The purpose of a composite liner is to combine the advantages of two materials, such as a geosynthetic liner and compacted clay soil, so that they compliment each other. Composite liners are more effective in reducing the rate of leakage than either a geosynthetic or a soil liner alone.