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	LA20001	SW4 8-26-W4 NW 33-7-26-W4

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.

dec 18 2019
Date of signing

Signature

PtH Wesels Farms
Corporate name (if applicable)

Pieter Wesels
Print name

GENERAL INFORMATION REQUIREMENTS

Proposed facilities. List all proposed confined feeding operation facilities and their measurements, including if it is an addition to a an existing facility (attach additional pages if needed)

Proposed manure collection areas & manure storage facilities	Dimensions (m)
	AO: Revised dimensions 40m x 21m x 2.5m
catch basin	34 m x 30 m x 2.5 m
proposed pen 6x 140 x 90	140 x 90 m
AO: Total pen area (includes all pens) is 140m x 90m	
Proposed facilities are located on SW4-8-26-W4	

Existing facilities. List **ALL** existing confined feeding operation facilities and their measurements (use additional pages if needed)

Existing barns, manure collection areas & manure storage facility	Dimensions (m)	NRCB USE ONLY
40 x 40m x 5 m catch basin	40 m x 40 m x 5 m	
pens	190 x 223 m	
AO: Existing facilities are located on NW33-7-26-W4 and permitted under Approval LA19004 Because they are located on a separate land title, have different permit holders, and have the potential to be operated separately, it is being considered a separate CFO.		
NRCB USE ONLY		

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If a new facility is replacing an old facility, what will be done with the old facility and when? ☒ **N/A**

Proposed construction completion date: dec 31 2022

Additional information:

Upgrading seasonal pens to CFO
Constructing a catchbasin and increasing/changing animal numbers.

AO: As noted elsewhere the CFO proposed on SW4-8-26-W4 is considered to be a new CFO

Livestock Numbers: (include all livestock)
Note: Livestock numbers in this table will be used when processing the application)

Livestock type/ category	Existing number	Change in number (if applicable)	Total
beef finishers	2500	2000	4500
AO: Existing 2500 Beef Finishers are permitted under LA19004, located on NW33-7-26-W4 and considered to be a separate CFO			
Proposed 2000 Beef Finishers are to be located in this proposed CFO on SW4-8-26-W4. The existing 2500 finishers are permitted on NW33-7-26-W4 under applrval LA19004. Only the proposed livestock numbers are considered for this permit application			

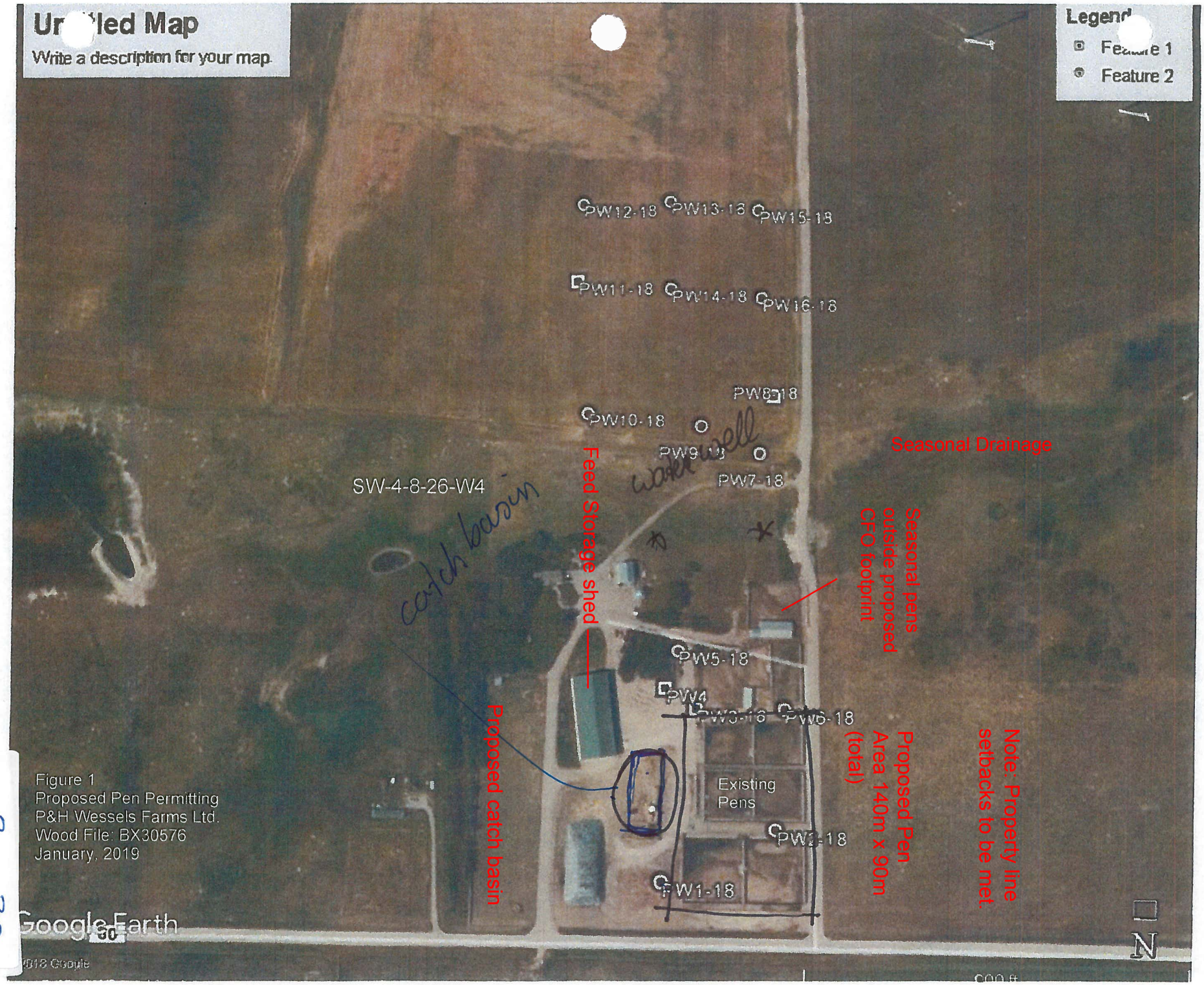

Figure 1
Proposed Pen Permitting
P&H Wessels Farms Ltd.
Wood File: BX30576
January, 2019

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)

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 (or check) 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 de-populate the CFO and/or to cease further construction, or to remove "works" or "undertakings" (as defined in the *Water Act*).
6. **CHECK IF 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 18 day of december, 20 19. _____

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 de-populate the CFO and/or to cease further construction, or to remove "works" or "undertakings" (as defined in the *Water Act*).
6. **CHECK IF 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

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AO: N/A No existing CFO facilities.

GENERAL WATER INFORMATION – EXISTING **Use the existing manure storage facility that is closest to a common body of water or water well**			**NRCB USE ONLY**	
			Comments	**Meets regulations**
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?	5+ (m)	☑ Estimated ☐ From records		☐ YES ☐ NO ☐ YES with exemption
Springs, wells, and surface water information a. How many springs are within 100 m of manure storage facilities or manure collection areas?		0		☐ YES ☐ NO ☐ YES with exemption
b. How many water wells are within 100 m of the manure storage facilities or manure collection areas?		0		☐ YES ☐ NO ☐ YES with exemption
c. What is the shortest distance from an manure collection or storage facility to a surface water body? (ie, lake, creek, slough, seasonal, etc.)		153 m		☐ YES ☐ NO ☐ YES with exemption
Groundwater information a. What is the depth to bedrock?	1,8 (m)	☐ Estimated ☐ Measured ☑ Drilling reports	N/A	
c. What is the shallowest depth to the uppermost groundwater resource?	9,2 (m)	☐ Estimated ☐ Measured ☑ Drilling reports		☐ YES ☐ NO ☐ YES with exemption

Additional information: (attach borehole logs and records, as required)

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 Imperial | Export to Excel

GOWN ID

GIC Well ID 103473
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1989/07/14

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
BEEKMAN, GERALD	P.O. BOX 711 FT MACLEOD				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	SW	4	8	26	4				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.615062 Longitude -113.473431
How Location Obtained
Map

Elevation m
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Cable Tool

Proposed Well Use
Domestic

Type of Work
New Well

Formation Log

Measurement in Metric

Depth from ground level (m)	Water Bearing	Lithology Description
4.57		Clay
9.14		Blue Shale
19.81		Sandstone

Yield Test Summary

Measurement in Metric

Recommended Pump Rate 90.92 L/min

Test Date	Water Removal Rate (L/min)	Static Water Level (m)
1989/06/16	90.92	7.01

Well Completion

Measurement in Metric

Total Depth Drilled	Finished Well Depth	Start Date	End Date
19.81 m		1989/06/13	1989/06/16

Borehole

Diameter (cm)	From (m)	To (m)
0.00	0.00	19.81

Surface Casing (if applicable)
Steel
Size OD : 16.84 cm
Wall Thickness : 0.478 cm
Bottom at : 3.05 m

Well Casing/Liner
Plastic
Size OD : 13.97 cm
Wall Thickness : 0.635 cm
Top at : 3.05 m
Bottom at : 19.81 m

Perforations

From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)	Hole or Slot Interval(cm)
16.76	19.81	0.318		25.40

Perforated by Machine

Annular Seal Driven
Placed from 0.00 m to 3.05 m
Amount

Other Seals

Type	At (m)

Screen Type
Size OD : 0.00 cm

From (m)	To (m)	Slot Size (cm)

Attachment
Top Fittings
Bottom Fittings

Pack
Type
Grain Size
Amount

Contractor Certification

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

Certification No
1

Company Name
H&H DRILLING

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

Water Well Drilling Report

View in Imperial | Export to Excel

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GOWN ID

GIC Well ID 103473
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1989/07/14

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
BEEKMAN, GERALD	P.O. BOX 711 FT MACLEOD				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	SW	4	8	26	4				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.615062 Longitude -113.473431
How Location Obtained
Map

Elevation m
How Elevation Obtained
Not Obtained

Additional Information

Measurement in Metric

Distance From Top of Casing to Ground Level cm
Is Artesian Flow
Rate L/min
Is Flow Control Installed
Describe

Recommended Pump Rate 90.92 L/min
Recommended Pump Intake Depth (From TOC) 17.37 m
Pump Installed Yes Depth m
Type SUB Make H.P. 1
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS) Depth m
Gas Depth m
Well Disinfected Upon Completion
Geophysical Log Taken
Submitted to ESRD
Sample Collected for Potability Submitted to ESRD

Additional Comments on Well

Yield Test

Taken From Ground Level
Measurement in Metric

Test Date	Start Time	Static Water Level
1989/06/16	12:00 AM	7.01 m

Depth to water level

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

Method of Water Removal

Type Bailer & Pump
Removal Rate 90.92 L/min
Depth Withdrawn From 17.37 m

If water removal period was < 2 hours, explain why

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	L	

Contractor Certification

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

Certification No
1

Company Name
H&H DRILLING

Copy of Well report provided to owner Date approval holder signed

Water Well Drilling Report

View in Imperial | 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 103475
GoA Well Tag No.
Drilling Company Well ID
Date Report Received

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
BEEKMAN, G.	FT MACLEOD				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NE	4	8	26	4				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.622294 Longitude -113.462296
How Location Obtained
Not Verified

Elevation 1109.47 m
How Elevation Obtained
Estimated

Additional Information

Measurement in Metric

Distance From Top of Casing to Ground Level cm
Is Artesian Flow
Rate L/min
Is Flow Control Installed
Describe

Recommended Pump Rate 0.00 L/min
Recommended Pump Intake Depth (From TOC) 15.24 m
Pump Installed Yes Depth m
Type SUB Make H.P. .75
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS) Depth m
Gas Depth m
Well Disinfected Upon Completion
Geophysical Log Taken
Submitted to ESRD
Sample Collected for Potability
Submitted to ESRD

Additional Comments on Well
DRILLER REPORTS SOFT WATER

Yield Test

Taken From Ground Level
Measurement in Metric

Test Date	Start Time	Static Water Level
1976/02/14	12:00 AM	4.57 m

Depth to water level

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

Method of Water Removal
Type Bailer
Removal Rate 68.19 L/min
Depth Withdrawn From 0.00 m

If water removal period was < 2 hours, explain why

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	L	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER
Certification No
1
Company Name
VANDRIESTEN WM
Copy of Well report provided to owner
Date approval holder signed

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 Imperial | Export to Excel

GOWN ID

GIC Well ID 103475
GoA Well Tag No.
Drilling Company Well ID
Date Report Received

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
BEEKMAN, G.	FT MACLEOD				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NE	4	8	26	4				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.622294 Longitude -113.462296
How Location Obtained: Not Verified

Elevation 1109.47 m
How Elevation Obtained: Estimated

Drilling Information

Method of Drilling: Rotary

Proposed Well Use: Domestic

Type of Work: New Well

Formation Log

Measurement in Metric

Depth from ground level (m)	Water Bearing	Lithology Description
4.57		Clay
15.24		Shale
19.81		Sandstone

Yield Test Summary

Measurement in Metric

Recommended Pump Rate 0.00 L/min

Test Date	Water Removal Rate (L/min)	Static Water Level (m)
1976/02/14	68.19	4.57

Well Completion

Measurement in Metric

Total Depth Drilled	Finished Well Depth	Start Date	End Date
19.81 m		1976/02/09	1976/02/14

Borehole

Diameter (cm)	From (m)	To (m)
0.00	0.00	19.81

Surface Casing (if applicable)

Size OD : 0.00 cm
Wall Thickness : 0.000 cm
Bottom at : 0.00 m

Well Casing/Liner

Steel
Size OD : 13.97 cm
Wall Thickness : 0.396 cm
Top at : 0.00 m
Bottom at : 19.81 m

Perforations

From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)	Hole or Slot Interval(cm)

Perforated by: Unknown

Annular Seal

Placed from 0.00 m to 0.00 m
Amount

Other Seals

Type	At (m)

Screen Type

Size OD : 0.00 cm

From (m)	To (m)	Slot Size (cm)

Attachment
Top Fittings
Bottom Fittings

Pack

Type
Grain Size
Amount

Contractor Certification

Name of Journeyman responsible for drilling/construction of well: UNKNOWN NA DRILLER
Company Name: VANDRIESTEN WM
Certification No: 1
Copy of Well report provided to owner
Date approval holder signed

Water Well Drilling Report

View in Imperial | 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 2028608
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 2011/01/18

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
BEEKMAN, GERALD	P.O. BOX 711	FORT MACLEOD	ALBERTA	CANADA	T0L 0Z0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	3	4	8	26	4				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.614380 Longitude -113.469470
How Location Obtained
Hand held autonomous GPS 20-30m

Elevation 1097.28 m
How Elevation Obtained
Hand held autonomous GPS 20-30m

Drilling Information

Method of Drilling
Rotary - Mud

Proposed Well Use
Stock

Type of Work
New Well

Formation Log

Measurement in Metric

Depth from ground level (m)	Water Bearing	Lithology Description
0.61		Topsoil
1.83		Dark Clay
2.44		Gray Clay
5.18		Brown Sand
8.84		Sandstone
10.06		Shale
10.36		Sandstone
11.58		Shale
22.25	Yes	Sandstone
22.56		Shale

Yield Test Summary

Measurement in Metric

Recommended Pump Rate 68.19 L/min

Test Date	Water Removal Rate (L/min)	Static Water Level (m)
2007/04/30	113.65	7.47

Well Completion

Measurement in Metric

Total Depth Drilled	Finished Well Depth	Start Date	End Date
22.56 m	19.51 m	2007/04/26	2007/04/30

Borehole

Diameter (cm)	From (m)	To (m)
20.32	0.00	5.18
15.56	5.18	22.56

Surface Casing (if applicable)
Steel
Size OD : 16.84 cm
Wall Thickness : 0.478 cm
Bottom at : 5.79 m

Well Casing/Liner
Plastic
Size OD : 12.55 cm
Wall Thickness : 0.655 cm
Top at : 4.57 m
Bottom at : 19.51 m

Perforations

From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)	Hole or Slot Interval(cm)

Perforated by

Annular Seal Bentonite Chips/Tablets
Placed from 4.57 m to 11.58 m
Amount

Other Seals

Type	At (m)
Driven	0.00
Shale Trap	11.58

Screen Type Stainless Steel
Size OD : 12.70 cm

From (m)	To (m)	Slot Size (cm)
17.98	19.51	0.051

Attachment Attached To Casing
Top Fittings Coupler Bottom Fittings Plug

Pack
Type Natural Grain Size
Amount

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
DAVE MANDEL

Certification No
61332A

Company Name
OUTLAW DRILLING

Copy of Well report provided to owner
Yes

Date approval holder signed
2007/04/30

Water Well Drilling Report

View in Imperial | 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 2028608
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 2011/01/18

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
BEEKMAN, GERALD	P.O. BOX 711	FORT MACLEOD	ALBERTA	CANADA	T0L 0Z0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	3	4	8	26	4				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.614380 Longitude -113.469470
How Location Obtained
Hand held autonomous GPS 20-30m

Elevation 1097.28 m
How Elevation Obtained
Hand held autonomous GPS 20-30m

Additional Information

Measurement in Metric

Distance From Top of Casing to Ground Level 91.44 cm
Is Artesian Flow
Rate L/min
Is Flow Control Installed
Describe

Recommended Pump Rate 68.19 L/min
Recommended Pump Intake Depth (From TOC) 15.24 m
Pump Installed
Type
Depth m
Make
H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS)
Depth m
Gas
Depth m
Well Disinfected Upon Completion
Geophysical Log Taken
Submitted to ESRD
Sample Collected for Potability
Submitted to ESRD

Additional Comments on Well

ALSO BENTONITE FROM 0 - 17', THIS WELL WAS DRILLED TO REPLACE AN EXISTING WELL THAT COLLAPSED, THERE IS A 10' PIECE OF PVC BELOW SCREEN

Yield Test

Taken From Top of Casing
Depth to water level

Measurement in Metric

Test Date	Start Time	Static Water Level
2007/04/30	11:30 AM	7.47 m

Method of Water Removal

Type Pump
Removal Rate 113.65 L/min
Depth Withdrawn From 21.34 m

If water removal period was < 2 hours, explain why

Pumping (m)	Elapsed Time Minutes:Sec	Recovery (m)
7.47	0:00	10.24
8.15	1:00	8.41
8.38	2:00	8.28
8.59	3:00	8.15
8.66	4:00	8.10
8.71	5:00	8.08
8.74	6:00	8.03
8.84	7:00	8.00
8.86	8:00	7.98
8.92	9:00	7.92
8.97	10:00	7.85
9.02	12:00	7.85
9.07	14:00	7.80
9.20	16:00	7.75
9.30	20:00	7.72
9.45	25:00	7.64
9.53	30:00	7.64
9.58	35:00	
9.63	40:00	
9.68	50:00	
9.83	60:00	
9.96	75:00	
10.11	90:00	
10.19	105:00	
10.24	120:00	

Water Diverted for Drilling

Water Source	Amount Taken		Diversion Date & Time
SE-28-9-24-W4	2727.66	L	2007/04/26 8:00 AM

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
DAVE MANDEL

Company Name
OUTLAW DRILLING

Certification No
61332A

Copy of Well report provided to owner
Yes

Date approval holder signed
2007/04/30

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 WATER INFORMATION – PROPOSED **Use the proposed manure storage facility that is closest to a common body of water or water well**			**NRCB USE ONLY** **Comments**	**Meets regulations**
Proposed facility name catch basin				
Flood plain information What is the elevation of the floor of the lowest **proposed** manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	5 (m)	☒ Estimated ☐ From records	Not in flood plain	☒ YES ☐ NO ☐ YES with exemption
Springs, wells, and surface water information a. How many springs are within 100 m of **proposed** manure storage facilities or manure collection areas?		0	No known springs within 100m	☒ YES ☐ NO ☐ YES with exemption
b. How many water wells are within 100 m of **proposed** manure storage facilities or manure collection areas?		0	None	☒ YES ☐ NO ☐ YES with exemption
c. What is the shortest distance from a **proposed** manure collection or storage facility to a surface water body? (ie, lake, creek, slough, seasonal, etc.)		153 m	180m	☒ YES ☐ NO ☐ YES with exemption
Groundwater information a. What is the depth to bedrock?	0 (m)	☐ Estimated ☐ Measured ☒ Drilling reports	N/A 19.81m WW103475	
b. What is the depth to the water table?	9.2 (m)	☐ Estimated ☐ Measured ☒ Drilling reports	4.57m WW103475	☒ YES ☐ NO ☐ YES with exemption
c. What is the shallowest depth to the uppermost groundwater resource?	9.2 (m)	☐ Estimated ☐ Measured ☒ Drilling reports	4.57m WW103475	☒ YES ☐ NO ☐ YES with exemption

Additional information: (attach borehole logs and records, as required)

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 WATER INFORMATION – PROPOSED **Use the proposed manure storage facility that is closest to a common body of water or water well**			**NRCB USE ONLY** **Comments**	**Meets regulations**
Proposed facility name pens				
Flood plain information What is the elevation of the floor of the lowest **proposed** manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	5 (m)	☒ Estimated ☐ From records	Not in flood plain	☒ YES ☐ NO ☐ YES with exemption
Springs, wells, and surface water information a. How many springs are within 100 m of **proposed** manure storage facilities or manure collection areas?		0	No known springs within 100m	☒ YES ☐ NO ☐ YES with exemption
b. How many water wells are within 100 m of **proposed** manure storage facilities or manure collection areas?		0	None	☒ YES ☐ NO ☐ YES with exemption
c. What is the shortest distance from a **proposed** manure collection or storage facility to a surface water body? (ie, lake, creek, slough, seasonal, etc.)		153 m	134m	☒ YES ☐ NO ☐ YES with exemption
Groundwater information a. What is the depth to bedrock?	4,5 (m)	☐ Estimated ☐ Measured ☒ Drilling reports	N/A 19.81m WW103475	
b. What is the depth to the water table?	9,2 (m)	☐ Estimated ☐ Measured ☒ Drilling reports	4.57m WW103475	☒ YES ☐ NO ☐ YES with exemption
c. What is the shallowest depth to the uppermost groundwater resource?	9,2 (m)	☐ Estimated ☐ Measured ☒ Drilling reports	4.57m WW103475	☒ YES ☐ NO ☐ YES with exemption

Additional information: (attach borehole logs and records, as required)

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

Well IDs: 103473 _____ 103475 _____ 2028608 _____

_____ _____ _____

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

ERST for **proposed** facilities

Facility	Groundwater score	Surface water score	File number
Pens	54 (Low)	20.9 (Low)	LA20001
Catch Basin	67.2 (Low)	20.9 (Low)	LA20001

ERST for **existing** facilities N/A

Facility	Groundwater score	Surface water score	File number

Part 2 — Technical Requirements

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DISTANCE OF ANY MANURE STORAGE FACILITY (EXISTING OR PROPOSED) TO NEIGHBOURING RESIDENCES

Name	Legal Land Description	Distance (m)	Zoning (LUB) Category	MDS Cat (1-4)	Distance (m)	Meets Regulations
Rick Beusekom	33-7-26 SW	850	RG	1	860	Yes
Marc Meach	SE 32-7-26	1000	RG	1	1000	Yes
Donna Friesen	SE 4-8-26	750	RG	1	755	Yes

Methods used/margins of error to determine distance:

Additional information: RG = Rural General

NRCB USE ONLY

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

Margin of error (if applicable): _____

Requirements: Category 1: 659m Category 2: 878m Category 3: 1098m Category 4: 1756m

Technology factor: ☐ YES ☒ NO

Expansion factor: ☐ YES ☒ NO

Waivers required: ☐ YES ☒ NO # _____

Waivers attached: ☐ Waivers in file: ☐

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

Comments:

As identified elsewhere, approval LA19004 permits a 2500 beef finishers on NW33-7-26-W4. The proposed 2000 beef finisher CFO is on SW4-8-26-W4 and will be permitted separately. For the purpose of MDS these two CFO's are considered to be one. (SAR 3(11))

Name
Address
Legal Land
Location

MDS Spreadsheet based on 2006 AOPA Regulations

Category of Livestock	Type of Livestock	Factor A	Technology Factor	MU	LSU Factor	Number of Animals	LSU
Beef	Cows/Finishers (900+ lbs)	0.700	0.700	0.910	0.446	4,500	2,006.6
	Feeders (450 - 900 lbs)	0.700	0.700	0.500	0.245		-
	Feeder Calves (<550 lbs)	0.700	0.700	0.275	0.135		-
	Other						-
Dairy (*count lactating cows only)	*Free Stall – Lactating Cows with all associated dries, heifers, and calves	0.800	1.100	2.000	1.760		-
	*Free Stall – Lactating cows with Dry Cows only	0.800	1.100	1.640	1.443		-
	Free Stall – Lactating Cows only	0.800	1.100	1.400	1.232		-
	Tie Stall – Lactating cows only	0.800	1.000	1.400	1.120		-
	Loose Housing – Lactating cows only	0.800	1.000	1.400	1.120		-
	Dry Cow (Solid manure)	0.800	0.700	1.000	0.560		-
	Dry Cow (Liquid manure)						
	Replacements – Bred Heifers (Breeding to Calving)	0.800	0.700	0.875	0.490		-
	Replacements - Growing Heifers (350 lbs to breeding)	0.800	0.700	0.525	0.294		-
	Calves (<350 lbs)	0.800	0.700	0.200	0.112		-
	Other						-
Swine Liquid (*count sows only)	Farrow to finish *	2.000	1.100	1.780	3.916		-
	Farrow to wean *	2.000	1.100	0.670	1.474		-
	Farrow only *	2.000	1.100	0.530	1.166		-
	Feeders/Boars	2.000	1.100	0.200	0.440		-
	Growers/Roasters	2.000	1.100	0.118	0.260		-
	Weaners	2.000	1.100	0.055	0.121		-
	Other						-
Swine Solid (*Count sows only)	Farrow to finish *	2.000	0.800	1.780	2.848		-
	Farrow to wean *	2.000	0.800	0.670	1.072		-
	Farrow only *	2.000	0.800	0.530	0.848		-
	Feeders/Boars	2.000	0.800	0.200	0.320		-
	Growers/Roasters	2.000	0.800	0.118	0.189		-
	Weaners	2.000	0.800	0.055	0.088		-
							-
Poultry	Chicken - Breeders - Solid	1.000	0.700	0.010	0.007		-
	Chicken - Layers – Liquid (includes associated Pullets)	2.000	1.100	0.008	0.018		-
	Chicken - Layers - (Belt Cage)	2.000	0.700	0.008	0.011		-
	Chicken - Layers - (Deep Pit)	2.000	0.700	0.008	0.011		-
	Chicken - Pullets/Broilers	1.000	0.700	0.002	0.001		-
	Turkey - Toms/Breeders	1.000	0.700	0.020	0.014		-
	Turkey - Hens (light)	1.000	0.700	0.013	0.009		-
	Turkey - Broilers	1.000	0.700	0.010	0.007		-
	Ducks	1.000	0.700	0.010	0.007		-
	Geese	1.000	0.700	0.020	0.014		-
	Other						-
Horses	PMU	0.650	0.700	1.000	0.455		-
	Feeders > 750 lbs	0.650	0.700	1.000	0.455		-
	Foals < 750 lbs	0.650	0.700	0.300	0.137		-
	Mules	0.600	0.700	1.000	0.420		-
	Donkeys	0.600	0.700	0.670	0.281		-
	Other						-
Sheep	Ewes/Rams	0.600	0.700	0.200	0.084		-
	Ewes with lambs	0.600	0.700	0.250	0.105		-
	Lambs	0.600	0.700	0.050	0.021		-
	Feeders	0.600	0.700	0.100	0.042		-
	Other						-
Goats	Meat/Milk (per Ewe)	0.700	0.700	0.170	0.083		-
	Nannies/Billies	0.700	0.700	0.140	0.069		-
	Feeders	0.700	0.700	0.077	0.038		-
	Other						-
Bison	Bison	0.600	0.700	1.000	0.420		-
	Other						-
Cervid	Elk	0.600	0.700	0.600	0.252		-
	Deer	0.600	0.700	0.200	0.084		-
	Other						-
Wild Boar	Feeders	2.000	0.800	0.140	0.224		-
	Sow (farrowing)	2.000	0.800	0.371	0.594		-
	Other						-
					Total		2,006.6

For New Operations

Dispersion Factor: 1

Category	Odour Objective	Distance Feet	Distance Metres
1	41.04	2,161	659
2	54.72	2,881	878
3	68.4	3,601	1,098
4	109.44	5,762	1,756

For Expanding Operations

Dispersion Factor: 1
Expansion Factor: 0.77

Category	Odour Objective	Distance Feet	Distance Metres
1	41.04	1,664	507
2	54.72	2,218	676
3	68.40	2,773	845
4	109.44	4,437	1,352

PLANS

Submitted and attached construction plans ☐ YES ☒ NO

Submitted aerial photos ☒ YES ☐ NO

Submitted photos ☐ YES ☒ NO

GRANDFATHERING:

On this application: ☐ Yes ☒ No

Comments:

Converting a seasonal feeding site to a CFO

On a previous application/decision: ☐ Yes ☒ No If yes, list application/decision number _____

Comments:

DEEMING CAPACITY:

☐ Yes ☒ No

Comments:

ALL SIGNATURES IN FILE: ☒ Yes ☐ No

DATES OF APPROVAL OFFICER SITE VISITS:

May 8, 2020	(Note: Other approval officer had conducted several site visits prior to my taking over the file)

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES:

Date deeming letters sent February 11, 2020

Municipality: MD Willow Creek

☒ 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: _____

☐ Letter sent ☐ Response received ☐ written/email ☐ verbal ☐ no comments received

Other: _____

☐ 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)

RUNOFF CONTROL CATCH BASINS: Synthetic liner

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

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

1. catch basin
2. _____
3. _____

Determination of minimum required catch basin volume

Show your calculations for determining the minimum required catch basin volume	Provide details: See attached

Catch basin capacity

	Length (m)	Width (m)	Depth (m)	Slope run:rise			Estimated storage capacity (excl. freeboard) (m^3)	Depth below grade of the bottom of the synthetic liner (m)
				Inside end walls	Inside side walls	Outside walls		
1.	~~37~~	~~22~~	~~3.5~~	~~3~~	~~3~~			~~3.5~~
2.	40	21	2.5	3	3			2.5
3.	AO: Revised catch basin dimensions							
						TOTAL CAPACITY		

NRCB USE ONLY

Catch basin calculator (calculation attached). Total volume @ freeboard level 768m^3 Requirements met: ☒ YES ☐ NO

Depth to water table: 4.57m WW103475 Requirements met: ☒ YES ☐ NO

Depth to UGR: 4.57m Requirements met: ☒ YES ☐ NO

WW103475 provides worst case scenario

ERST completed: ☒ YES ☐ NO

Groundwater risk level: Low (67.2) Surface Water risk level: Low (20.9)

Catch basin dimensions have been revised from original application

UGR: Uppermost Groundwater Resource as defined under AOPA's *Standards and Administration Regulation*.

RUNOFF CONTROL CATCH BASINS: Synthetic liner (cont.)

Synthetic liner details

a. Synthetic liner	Thickness and type of liner material :	Provide liner material details:
HDPE 40	40 mil	see attached.

Additional information:

See attached

NRCB USE ONLY

Liner requirements met: ☒ YES ☐ NO Condition required: ☒ YES ☐ NO

Comments:

Condition will be required to confirm that catch basin is constructed and liner installed as proposed.

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

A leakage detection system will be required to be installed under the synthetically lined catch basin to monitor liner performance

Comments:

Construction plans approved by professional engineer: ☐ YES ☒ NO

Installed by approved contractor: ☒ YES ☐ NO

Preparation of liner bed (comments):

A condition will be included to ensure that the catch basin construction and liner installation is carried out in accordance with the liner manufacturers requirements under the supervision of an engineer.

Catch Basin Dimensions Calculator

Construction Dimensions of Catch Basin

Size of Catch Basin	Metric		English Units	
			Capacity of Catch Basin	
Length*$_4$	40.0	m	131.23	Feet
Width*$_4$	21.0	m	68.90	Feet
Total Depth*$_4$	2.5	m	8.20	Feet
Water Depth	2.00	m	6.56	Feet
End Slope*$_4$	3	run:rise	3	run:rise
Side Slope*$_4$	3	run:rise	3	run:rise
Length of Bottom	25.0			
Width of Bottom	6.0			
Total Capacity @ top of Bank	**1,144**	**m^3**	**40,391**	**ft^3**
			251,590	**Imp. Gal.**

* Only cells in blue can be changed.

Name$_1$: Test

Land Location$_1$: 1-1-4-W5

Area$_2$	Length (m)	Width (m)	Area (m^2)
1	140	90	12,600
2			0
3			0
4			0
5			0
Total Area			12,600

Select Town$_3$: Lethbridge 90

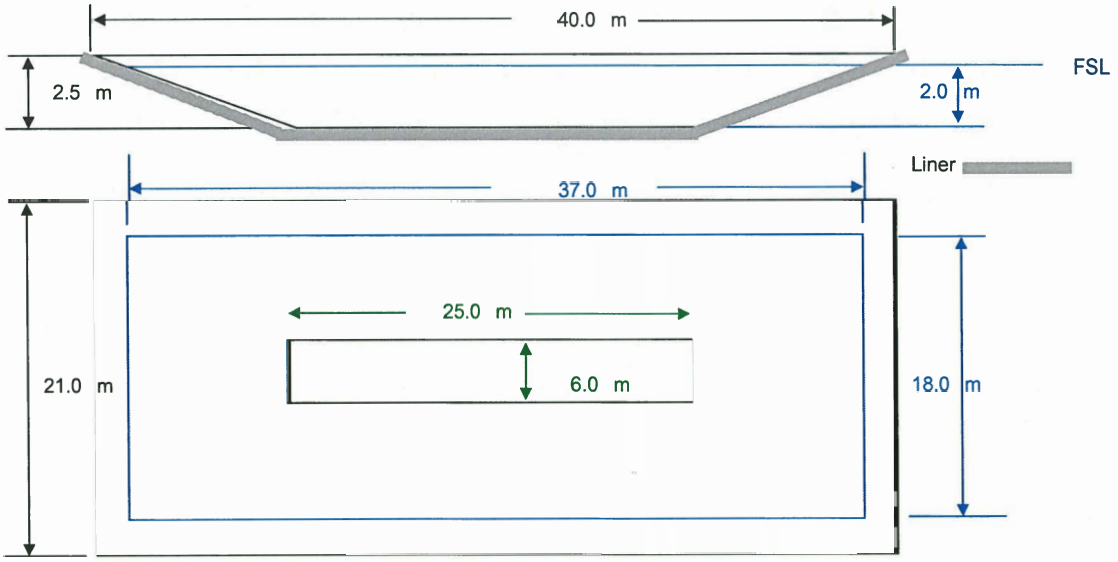
Design Rainfall: 90 mm

Storage Volume of Catch Basin at Design Capacity (without freeboard)			Volume at Freeboard	
Length (Top of liquid level)	37.0	m	121.39	Feet
Width (Top of liquid level)	18.0	m	59.06	Feet
Depth	2.5	m	8.20	Feet
Water Depth	2.00	m	6.56	Feet
End Slope	3	run:rise	3	run:rise
Side Slope	3	run:rise	3	run:rise
Total Volume@ freeboard depth	**768**	**m^3**	**27,122**	**ft^3**
			168,936	**Imp. Gal.**
Surface Area of Liquid Manure	**666**	**m^2**	**7,169**	**ft^2**

Catch Basin Design Volume

737 m^3 | **26,030 ft^3** | **162,139 Imp. Gal.**

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



Lines in Black - Catch basin dimension

Lines in Blue - full level

NTS - Not Drawn To Scale

LAYFIELD

Geomembrane [HDPE 40 Textured (SS) Black]

Our HDPE 40 geomembranes are designed in accordance with the Geomembrane Research Institute GM 13 standard. It is manufactured to meet the properties of GRI GM13 textured High Density Polyethylene and has been extensively used in a variety of containment applications. HDPE geomembranes have low permeability, good ultra violet resistance properties and excellent chemical resistance. HDPE 40 is a field assembled lining material that must be installed by trained installers. HDPE is used in a multitude of applications as a landfill liner, pond linings, and water containment projects.

Property	ASTM	HDPE 40 Textured[1] Black Single Sided (SS)
Thickness nom. (min.avg)	D5994	40 mil (36 mil) 1.00 mm (0.915 mm)
Thickness	D5994 Lowest Individual for 8 out of 10 values Lowest individual for any of the 10 values	 36 mil/0.93 mm 34 mil/0.88 mm
Asperity Height (min.ave)	D 7466	16 mil 0.4 mm
Sheet Density (minimum)	D792	≥0.940 g/cc
Dimensional Stability	D 1204	±2%
Tensile Properties (min. avg) ASTM D 6693; Modified Type IV Die Gage length break: 2" (50 mm) Gage length yield: 1.3" (33 mm)	Tensile Strength @ Break Tensile Strength @ Yield	60 ppi 10 kN/m 84 ppi 15 kN/m
	Tensile Elongation @ Break Tensile Elongation @ Yield	100% 12%
Tear Resistance (min. avg)	D1004	28 lbs 125 N
Puncture Resistance (min. avg)	D4833	60 lbs 267 N
High Pressure Oxidative Induction Time (HPOIT)	D5885	400 mins
Stress Cracking	D5397	500 hrs
Carbon Black Content[1]	D1603	2.0-3.0 %
Carbon Black Dispersion[2]	D5596	CAT 1 or 2
Oven Aging 85° C, HPOIT retained after 90 days	D5721 D 5885	80%
UV Resistance- % HPOIT retained after 1600 hrs	D7238 D5885	50%
Typical Roll Dimensions (Rolls dimensions may vary ± 1%)		
Roll Width	-	22.5 feet 6.86 mtrs
Roll Length	-	780 feet 237.8 mtrs

[1] *This product is designed and manufactured to meet the GRI GM13 specification*

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. pens **2.** _____

Manure storage capacity

	Length (m)	Width (m)	Estimated storage capacity (m^3)	Depth below grade of the top protective layer surface (m)
1.	140	90		0
2.				

NRCB USE ONLY

Depth to water table: 4.57m WW103475 Requirements met: ☒ YES ☐ NO

Depth to UGR: 4.57m Requirements met: ☒ YES ☐ NO

WW103475 provides worst case scenario

ERST completed: ☒ YES ☐ NO

Groundwater risk level: Low Surface Water risk level: Low

UGR: Uppermost Groundwater Resource as defined under AOPA's *Standards and Administration Regulation*.

Surface water control systems

☐ Under roof: Surface water will be controlled by the walls and roof of the building and by the finished landscaping.

☐ Outdoor: Describe the run-on and runoff control system proposed for feedlots and outdoor manure storage facilities:

Runoff to be controlled using a catch basin.

NRCB USE ONLY

Requirements met: ☒ YES ☐ NO Details/comments:

Pens will have a naturally occurring protective layer to protect groundwater. Runoff will be directed to a catch basin with synthetic liner. Pens have sufficient capacity to store manure for at least 9 months.

SOLID MANURE, COMPOST & COMPOSTING MATERIALS: Barns, feedlots & storage facilities - Naturally occurring protective layer (cont.)

Naturally occurring protective layer details

a. Naturally occurring protective layer	Thickness of naturally occurring protective layer: 1,5 (m)	Provide details:	
b. Soil texture	_____% sand	_____% silt	_____% clay
c. Hydraulic conductivity - naturally occurring protective layer	Material tested	Hydraulic conductivity (cm/s)	Describe test standard used
	Borehole: PW 3.18 Depth: 1,8 (m)	AO: 3.6 x 10^{-8}cm/s Woods report 3,6 x-10	

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

See attached report (Woods report)

NRCB USE ONLY

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

Woods report confirms that groundwater protection requirements for pens can be met using a naturally occurring protective layer.

Protective layer requirements met: ☒ YES ☐ NO Condition required: ☐ YES ☒ NO

Comment:

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

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LAND BASE FOR MANURE AND COMPOST APPLICATION (for approvals and registrations only)

Name of landowner(s)*	Legal Land Description	Area ** (usable hectares)	Soil Zone	NRCB USE ONLY Area unsuitable:
See attached.	1160 686			Land base agreements for 1,541 acres were provided
	TOTAL			

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

** Available manure spreading area (do not include required setback areas from residences, common bodies of water, water wells, etc.) (to convert from acres to hectares divide acres by 2.47)

Additional information: (attach copies of all signed land use agreements)

NRCB USE ONLY

Land base required: 1,390 acres (dark brown)

Land base listed: 1,541 acres

Area not suitable: Already accounted for

Available area 1,390 acres

Requirement Met: ☒ YES ☐ NO

Land spreading agreements required: ☒ YES ☐ NO If yes, Agreements in file: ☒ Agreements attached: ☒

Manure Management Plan: ☐ YES ☒ NO Plan attached: ☐ Plan in file: ☐

Name	0
Address	0
Legal Land	
Location	0

Landbase Requirements (hectares) based on 2006 AOPA requirements

Category of Livestock	Type of Livestock	Number of Animals	Dark Brown & Brown (ha)	Grey Wooded (ha)	Black (ha)	Irrigated (ha)
Beef	Cows/Finishers (900+ lbs)	4500	562.5	468	351	279
	Feeders (450 - 900 lbs)	0	0	0	0	0
	Feeder Calves (<550 lbs)	0	-	-	-	-
	Other	0				
Dairy (*count lactating cows only)	*Free Stall – Lactating Cows with all associated dries, heifers, and calves	0	0	0	0	0
	*Free Stall – Lactating cows with Dry Cows only	0	-	-	-	-
	Free Stall – Lactating Cows only	0	-	-	-	-
	Tie Stall – Lactating cows only	0	-	-	0	0
	Loose Housing – Lactating cows only	0	-	-	-	-
	Dry Cow (Solid manure)	0	-	-	-	-
	Dry Cow (Liquid manure)	0	-	-	-	-
	Replacements – Bred Heifers (Breeding to Calving)	0	-	-	-	-
	Replacements - Growing Heifers (350 lbs to breeding)	0	-	-	-	-
	Calves (< 350 lbs)	0	-	-	-	-
	Other	0				
Swine Liquid (*count sows only)	Farrow to finish *	0	-	0	-	-
	Farrow to wean *	0	-	-	-	-
	Farrow only *	0	-	-	-	-
	Feeders/Boars	0	-	0	0	0
	Growers/Roasters	0	-	-	-	-
	Weaners	0	-	-	-	-
	Other	0				
Swine Solid (*Count sows only)	Farrow to finish *	0	-	-	-	-
	Farrow to wean *	0	-	-	-	-
	Farrow only *	0	-	-	-	-
	Feeders/Boars	0	-	-	-	-
	Growers/Roasters	0	-	-	-	-
	Weaners	0	-	-	-	-
	Other	0				
Poultry	Chicken - Breeders - Solid	0	-	-	-	-
	Chicken - Layers - Liquid (includes associated pullets)	0	-	0	0	0
	Chicken - Layers - (Belt Cage)	0	-	-	-	-
	Chicken - Layers - (Deep Pit)	0	-	-	-	-
	Chicken - Pullets/Broilers	0	-	0	0	0
	Turkey - Toms/Breeders	0	0	0	0	0
	Turkey - Hens (light)	0	-	-	-	-
	Turkey - Broilers	0	-	-	-	-
	Ducks	0	0	0	0	0
	Geese	0	0	0	0	0
	Other	0				
Horses	PMU	0	0	0	0	0
	Feeders > 750 lbs	0	-	0	-	-
	Foals < 750 lbs	0	-	-	-	-
	Mules	0	-	-	-	-
	Donkeys	0	-	-	-	-
	Other	0				
Sheep	Ewes/Rams	0	-	0	0	0
	Ewes with lambs	0	-	-	-	-
	Lambs	0	-	-	-	-
	Feeders	0	-	-	-	-
	Other	0				
Goats	Meat/Milk (per Ewe)	0	0	0	0	0
	Nannies/Billies	0	-	-	-	-
	Feeders	0	-	-	-	-
	Other	0				
Bison	Bison	0	0	0	0	0
	Other	0				
Cervid	Elk	0	0	0	0	0
	Deer	0	0	0	0	0
	Other	0				
Wild Boar	Feeders	0	-	0	0	0
	Sow (farrowing)	0	-	-	-	-
	Other	0				
	Total Hectares		562.5	468.0	351.0	279.0
	Total Acres		1389.9	1156.4	867.3	689.4

Sent:
To:
Subject: Fields suitable for manure Wessels farms

Goodmorning Adria,

Thank you for making it work to do a site visit at our farm yesterday with Joe.

Here is a list of our own acres that we can use for spreading manure.

SW 33-7-26 W4	146.29	acr
E 1/2 5-8-26 W4	210	acr
NW 4-8-26 W4	50	acr
SW 4-8-26 W4	95	acr

If you are looking for any more info or have questions you can also contact me

Have a good day.

Manure Spreading Agreement

GAF Farms Ltd agree to allow P+H Weeds (applicant) to spread manure on the following fields during 2019 - 2025 (calendar year).

Land location	Acres	Suitable for spreading	Soil zone
SE 33-7-26-W	~~150~~ 160	150	
SE 29-7-26 W	~~120~~ 160	120	
SW 29-7-26-W	~~150~~ 160	150	

Signed: Don Yetta

Date: Jan 30, 2019

Manure Spreading Agreement

Beckman

Gerald & Rita agree to allow P&H Wessels (applicant) to spread manure on the following fields during 10 years (calendar year).
2019 to 2030.

Land location	Acres	Suitable for spreading	Soil zone
	630	620	Thin Black.
Section 32, 116-99			Thin Black.
SW-33-116-99	150	150	Thin Black. listed elsewhere

Signed: Gerald Beckman.

Date: R Beckman

We, Gerald and Rita Beekman are fully aware that Pieter and Henriette Wessels have applied for permits for a feedlot on SW 4-8-26 W4 and we are aware that this will be one operation with the already approved feedlot on NW 33-7-26 W4.

Gerald Beekman — R. Beekman.

H Wessels

Jan 20, 2020

wood.

469 – 40 Street S
Lethbridge, Alberta T1J 4M1
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www.woodplc.com

January 25, 2019
Wood File: BX30576

Pieter Wessels
P & H Wessels Farms Ltd.
Box 1511
Fort Macleod, AB T0L 0Z0

Dear Mr. Wessels:

Re: Geotechnical Review and Evaluation
Existing Pens Permitting
SW 4-8-26-W4, near Fort Macleod, Alberta

As requested, Wood Environment & Infrastructure Solutions (Wood) 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 encompasses the soil conditions associated with a series of existing pens located at the southeast corner of SW-4-8-26-W4 (see Figure 1).

In order to demonstrate the suitability of the natural soils for consideration as a naturally occurring protective layer, a total sixteen boreholes were advanced at the site in January 2019. The boreholes were advanced at the approximate locations illustrated on Figure 2. As illustrated, test holes PW1-18, PW2-18, PW3-18 and PW6-18 were advanced in the area of the subject existing pens.

The boreholes were advanced by a truck-mounted drill rig owned and operated by Chilako Drilling Services and extended to depths of 3.0 m to 9.2 m below existing grades. The boreholes were logged by Larry Delong of Chilako Drilling Services (see attachments).

In general, the natural mineral soils encountered within the four boreholes at the existing were generally comprised of clay and silty clay overlying minor gravel, with mudstone at depth. No groundwater resource (as defined by the AOPA) was identified within the 9.2 m drilling depth at the site.

In order to demonstrate the permeability of the subsurface soils in the area of the existing pens, a 50 mm diameter PVC monitoring well was constructed in borehole PW3-18. The test well was screened from 3.3 m to 1.8 m depth. Well saturation of the 50 mm diameter monitoring wells was carried out by filling the monitoring well to the top for several consecutive days. After several days, the average 24-hour water drop in the standpipe was measured to be about 0.23 m.

In order to calculate the permeability of the screened portion of the monitoring well, 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 In Situ Permeability Test report, attached. As outlined

on the report, the results of the *in situ* permeability testing indicate a hydraulic conductivity, k_s, of 3.6×10^{-8} cm/s.

Using the measured permeability of the clay and mudstone strata, the 1.5 m portion of clay and mudstone which has been screened at borehole PW3-19 has been estimated to represent an equivalent of about 41 m of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s.

This represents natural material protection in excess of the minimum requirements outlined by the AOPA for solid manure storage (minimum 2 m, Section 9.5-a).

Conclusion

Based on the results of the current investigation and permeability testing, and our understanding of the site and proposed development at the site, it is Wood's opinion that the naturally occurring materials at the site satisfy the AOPA requirements for a naturally occurring 'protective layer' for permitting the existing pens.

Given the presence of coarse-grained soils and bedrock at depth, it is noted that the subsurface soils would not meet the requirements as a naturally occurring liner for a catch basin. Accordingly, a compacted clay liner or synthetic (i.e., HDPE) liner would be required for a catch basin.

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

Yours truly,

Wood Environment and Infrastructure Solutions,
A Division of Wood Canada Limited

PROFESSIONAL ENGINEERS ALBERTA JOHN LOBBEZOO Jan 25, 2019

John Lobbezoo, P.Eng.
Associate Engineer, Geotechnical
Branch Manager, Lethbridge & Medicine Hat

Co-Authored by:
Bogdan Masala, E.I.T.
Geotechnical Services

Permit to Practice No. P-4546

Attachments
- Figure 1 Borehole Locations
- In Situ Permeability Test Calculations (PW3-18)
- Soil Profile and Parent Material Description, Chilako Drilling Services

Figure 1
Proposed Pen Permitting
P&H Wessels Farms Ltd.
Wood File: BX30576
January, 2019

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PW3-18

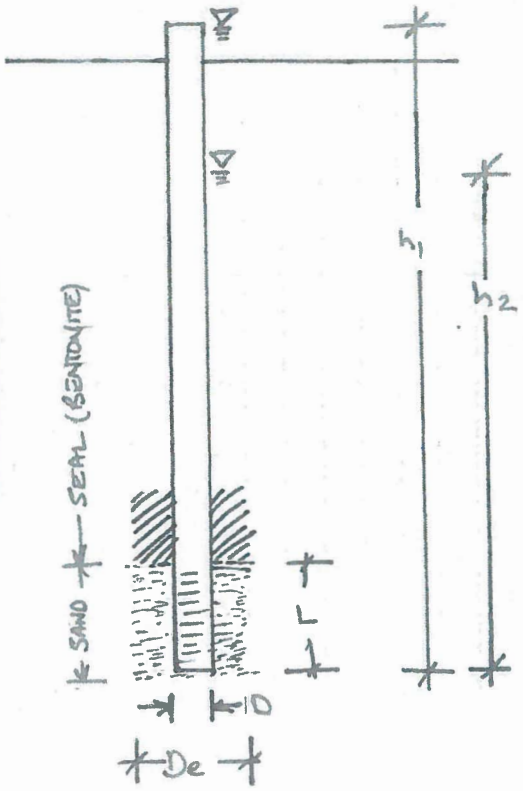
wood.

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)



PW3-18 - P+H Wessels Farms - SW 4-8-26-W4

Wood File: BX30576

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	1.50	length of sand section (m)
	h1	3.60	initial height of water above base of hole (m)
	h2	3.37	final height of water above base of hole (m)
	t	24.0	time of test (h)

Ks =	**3.6E-08 cm/sec**

CHILAKO DRILLING SERVICES LTD

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

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: P+H Wessels Farms, SW4-8-26W4 Date: 15-Nov-18

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
PW1-18	0321605	0-1.8	CL	D	Fluv		Stiff, med plastic, some gravel
	5498420	1.8-4.7	S+Gr	D	Fluv		
		4.7-7.5	Mudstone	M	Bedrock		Soft bedrock
PW2-18	0321688	0-0.3	Gravel	F	Fill		Pitrun gravel
	5498453	0.3-2.1	CL-SiCL	D	Fluv		Stiff, med plastic, olive brown
		2.1-3.0	S+Gr	D	Fluv		
PW3-18	0321632	0-0.4	Gravel	M	Fill		
	5498541	0.4-0.5	CL	M	Topsoil		
		0.5-2.1	CL-SiCL	M	Fluv		V. Firm, low-med plastic
		2.1-3.3	Mudstone	D	Bedrock		Soft, oxidized, volcanic ash @ 2.2m
							50mm H.C. well installed to 3.3m
							Screen: 3.3-1.8m
							Sand: 3.3-1.8m
							Bentonite: 1.8-0.0m
							Stickup: 0.3m
							Hole Diameter: 0.15m
PW4-18	0321671	0-0.6	Gravel	D	Fill		
	5498556	0.6-0.8	CL	M	Organic		
		0.8-1.8	CL	M	Fluv		
		1.8-2.7	Mudstone	M	Bedrock		Soft
		2.7-3.3	Sandstone	SM	Bedrock		Soft bedrock, yellow brown
		3.3-8.8	Siltstone	D	Bedrock		Soft bedrock
		8.8-9.2	Shale	D	Bedrock		Soft bedrock, gray
							50mm H.C. well installed to 8.5m
							Bentonite: 9.2-8.5m
							Screen: 8.5-5.5m
							Sand: 8.5-5.0m
							Bentonite: 5.0-1.0m
							Stickup: 0.6m
							Hole Diameter: 0.15m
PW5-18	0321621	0-1.9	CL	M	Fluv		
	5598584	1.9-2.7	SiCL	VM	Fluv		Soft, med plastic
		2.7-3.0	C+Gr	Sat	Fluv		
		3.0-4.5	Siltstone	D	Bedrock		Soft bedrock, yellow brown, oxidized
		4.5-4.9	Siltstone	D	Bedrock		Hard bedrock, olive brown
		4.9-8.4	Siltstone	D	Bedrock		Soft bedrock, olive brown
		8.4-9.2	Shale	M	Bedrock		Soft bedrock, dark gray

PW6-18	0321699	0-0.6	Gravel	F	Fill		Pitrun gravel
	5498540	0.6-2.0	CL-SiCL	D	Fluv		V. firm, low-med plastic
		2.0-3.0	Siltstone	D	Bedrock		Soft bedrock, oxidized
PW7-18	0321688	0-1.0	CL	D	Fluv		
	5498738	1.0-1.6	S+Gr	D	Fluv		
		1.6-3.8	Mudstone	SM	Bedrock		Soft bedrock, olive brown, oxidized
		3.8-4.0	Siltstone	D	Bedrock		Soft bedrock, olive brown
		4.0			Bedrock		Auger refusal, hard cemented bedrock
PW8-18	0321700	0-0.2	CL	M	Topsoil		
	5498823	0.2-1.5	CL	M	Till		
		1.5-2.6	Mudstone	M	Bedrock		Soft bedrock, yellow brown
		2.6-3.3	Sandstone	D	Bedrock		Soft bedrock, olive gray
		3.3-4.6	Mudstone	D	Bedrock		Soft bedrock, yellow brown
		4.6-5.0	Sandstone	D	Bedrock		Hard bedrock, olive brown
		5.0-6.3	Mudstone	D	Bedrock		Soft bedrock, yellow brown
		6.3-6.4	Sandstone	D	Bedrock		Hard bedorck, auger refusal
							50mm H.C. well installed to 6.2m
							Screen: 6.2-3.2m
							Sand: 6.2-3.0m
							Bentonite: 3.0-0.0m
							Stickup: 0.6m
							Hole Diameter: 0.15m
PW9-18	0321643	0-0.2	CL	M	Topsoil		
	5498760	0.2-1.5	CL	M	Till		
		1.5-1.9	CL+G	D	Till		Gravel mixed into the CL
		1.9-2.9	CL-C	D	Till		
		2.9-4.0	Sandstone	D	Bedrock		Hard bedrock, olive gray
		4.0-4.8	Mudstone	D	Bedrock		Soft bedrock, olive brown
		4.8-5.4	Sandstone	D	Bedrock		Hard bedrock, olive gray
		5.4-6.4	Mudstone	D	Bedrock		Soft bedrock, olive brown
							Auger refusal @6.4m
PW10-18	0321553	0-0.2	FSCL	D	Topsoil		
	5498773	0.2-1.0	FSCL	D	Till		
		1.0-1.9	CL	D	Till		Stiff, low-med plastic, brown
		1.9-3.0	S+Gr	D	Fluv		
PW11-18	0321547	0-0.2	FSCL	M	Topsoil		
	5498882	0.2-0.8	CL-FSCL	D	Till		
		0.8-1.1	Mudstone	D	Bedrock		Soft bedrock, olive brown
		1.1-2.1	Sandstone	D	Bedrock		Soft bedrock, olive
		2.1-3.0	Siltstone	D	Bedrock		Soft bedrock, olive gray
							50mm H.C. well installed to 3.0m
							Screen: 3.0-1.5m
							Sand: 3.0-1.4m
							Bentonite: 1.4-0.0m
							Stickup: 0.6m
							Hole Diameter: 0.15m

PW12-18	0321551	0-0.2	CL	D	Topsoil		
	5498949	0.2-1.2	CL	D	Till		
		1.2-1.6	Mudstone	D	Bedrock		Soft bedrock
		1.6-3.0	Sandstone	D	Bedrock		Soft bedrock, olive grey
PW13-18	0321622	0-0.2	CL	D	Topsoil		
	5498950	0.2-0.7	CL-FSCL	D	Till		Esker
		0.7-3.0	S&Gr	D	Till		Esker, auger refusal @ 3.0m
PW14-18	0321621	0-0.2	CL	D	Topsoil		
	5498874	0.2-0.7	CL-FSCL	D	Till		
		0.7-2.0	S&Gr	D	Till		Esker, some clay, auger refusal @ 2.0m
PW15-18	0321694	0-0.2	CL	D	Topsoil		
	5498941	0.2-1.1	CL	D	Till		Some silt
		1.1-3.0	S&Gr	D	Till		Esker, auger refusal @ 3.0m
PW16-18	0321694	0-0.2	CL	D	Topsoil		
	5498866	0.2-1.2	CL	D	Till		V. firm, low-med plastic
		1.2-2.0	S&Gr	D	Till		Esker, auger refusal @ 2.0m

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