Part 2 – Technical Requirements

NRCB Natural Resources Conservation Board

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

NRCB USE ONLY

☑ Approval ☐ Registration ☐ Authorization ☐ Amendment

Application number: LA25051

Legal land description: SW 27-5-16-4

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.

July 9 2025
Date of signing

[redacted]
Signature

Bluegrass Colony Farming Co. LTD
Corporate name (if applicable)

Joe Wipf
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)
Above ground Tank (75.6 m internal diameter x 4.9 m tall)	248 id x 16 Ft high
Dairy Barn (128 m x 45.7 m)	~~5m~~ ft x 420 x 150
Pit (4.9 m x 4.9 m x 3.7 m deep)	~~x~~ x 12 Deep x 16 x 16 Wide
AO Comment: The proposed pit is to be an in-barn pit that will be part of the proposed dairy barn.	

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

AO Comment: CFO is currently permitted under NRCB Authorization LA16027 and Approval LA05042B.

Existing facilities continued	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
Swine Barn Addition	71 m x 26 m	

Existing Permitted Facilities

Facility	Dimensions	Permit
Swine barn	71 m x 50 m + 133 m x 31 m	Deemed (98-31 and/or existed on January 1, 2002)
Dairy barn	100 m x 40 m	
Corrals and shelter	112 m x 66 m + 60 m x 53 m	
Poultry barn (ducks, geese, turkeys, broilers and layers)	31 m x 20 m	
Poultry outside pens	22 m x 18 m	
Earthen liquid manure storage – cell #1	103 m x 45 m	
EMS – cell #2	103 m x 90 m	


Area for above ground manure storage tank
Location for new dairy barn
Water Well ID# 9961033
Water Well ID# 9961032
Dairy
Township Rd 54
Township Rd 54
500 m
Google Earth
Image © 2025 Airbus

Part 2 — Technical Requirements

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

Convert the Barn to House Dry Cow's & Calves Closeup Cows as well

Construction completion date for proposed facilities October 2028

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
Chicken layers	300	0	300
Sows Farrow to Finish	600	0	600
Milking Cows (plus dries and replacements)	152	198	350
Chicken Broilers	1000	0	1000
Ducks	1500	0	1500
Geese	300	0	300
Turkeys	300	0	300

AO Comment: Animal numbers pulled from Part 1 application, total proposed livestock has not changed.

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

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

DECLARATION AND ACKNOWLEDGMENT OF APPLICANT CONCERNING *WATER ACT* LICENCE
issued by Alberta Environment and Protected Areas (EPA) for a confined feeding operation (CFO)
Date and sign one of the following four options

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

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

Signed this _____day of _____, 20____. _____
Signature of Applicant or Agent

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

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

Signed this _____ day of _____, 20____. _____
Signature of Applicant or Agent

OPTION 3: Additional water licence not required

1. I (we) declare that the CFO will not need a new licence from EPA under the *Water Act* for the development or activity proposed in this AOPA application.
2. **Provide**: Water license number(s) or water conveyance agreement details RID agreement 39 acre feet

Signed this 9 day of July, 2025 [redacted]
Signature of Applicant or Agent

Last updated September 11, 2023

WATER CONVEYANCE AGREEMENT - OTHER USES
Historical Users - no additional water
Irrigation Districts Act section 21(2)(a.1)

This Agreement dated the 31 day of July, 2006.

Between:

Bluegrass Hutterian Brethren
Box 99
Warner, Alberta T0K 2L0
(the "Applicant")

- and -

Raymond Irrigation District
Box 538
Raymond, Alberta T0K 2S0
(the "District")

BACKGROUND:

1. The Applicant has historically been using water delivered from the District for Other Uses and the District and the Applicant wish to confirm and document those deliveries by way of this Agreement.

2. The Applicant has applied to the District under section 21(2)(a.1) of the *Irrigation Districts Act* R.S.A 2000, c. 1-11 (the "Act"), to enter into a water conveyance agreement with the District to continue to receive the additional delivery of water from the District for a purpose other than for use on irrigation acres, for use under an alternate parcel delivery agreement, for rural water use, or for household purposes.

3. The District is the holder of several Licences that authorize the District to deliver water for any of the purposes specified in the Licences.

4. Section 6 of the *Act* authorizes the District to deliver water in accordance with the terms and conditions of the Licences.

5. The Applicant has used the water on the lands legally described as:

   MERIDIAN 4 RANGE 16 TOWNSHIP 6
   SECTION 4
   QUARTER NORTH EAST
   EXCEPTING THEREOUT ALL MINES AND MINERALS
   AREA: 64.7 HECTARES (160 ACRES) MORE OR LESS
   LINC 0022 448 956

   (the "Lands")

6. The Applicant has historically used the following volume of water pursuant to the rights

under the Licences, 39 acre feet (the "Annual Volume"). AE

7. The Applicant proposes to continue to use the water for the following purpose:

Livestock & Garden

(the "Purpose")

8. The District is prepared to continue to deliver the Annual Volume to the Applicant on the Lands subject to the terms and conditions contained in this Agreement.

AGREEMENT:

The parties agree as follows:

1. **Definitions** - In this Agreement:

   a. "Agreement" means this Agreement including the Background;

   b. "Additional Volume" means those volumes of water, in addition to the Annual Volume which the District specifically authorizes in writing from time to time during the term of this Agreement be conveyed to the Applicant, or that volume of water which the Water Supervisor's records record as having been conveyed to the Applicant in excess of the Annual Volume;

   c. "Annual Fee" means the fee applicable to this Agreement established by the District by a Fee By-Law pursuant to section 115 of the *Act*;

   d. "Annual Volume" means that volume of water defined herein as the Annual Volume;

   e. "Conveyance" means the continued conveyance by the District of the Annual Volume to the Applicant through the Point of Delivery;

   f. "Default" includes the happening of any of the following events:

      i. failure of the Applicant to pay the Annual Fee by the due date;

      ii. use of any portion of the Annual Volume for other than the Purpose;

      iii. use of any portion of the Annual Volume on a parcel of land other than the Lands;

      iv. the Applicant has used or is using any portion of the Annual Volume in a manner that is causing or may cause loss or damage to property or personal injury to any person;

      v. waste all or any portion of the Annual Volume or permit all or any portion of the Annual Volume to escape from the Lands;

      vi. the Applicant contravenes any provision of the *Act* or this Agreement, or

      vii. the Applicant files an assignment in Bankruptcy;

g. "Fee Bylaw" means the bylaw passed by the District pursuant to section 115 of the *Act* establishing the Annual Fee;

h. "Irrigation Works" means Irrigation Works as defined in the *Act*;

i. "Licences" means the total of all the licences held by the District pursuant to the provisions of the *Water Act*, R.S.A. 2000 c. W-3;

j. "Meter" means a water measurement device approved by the District for the purpose of measuring the volume of water conveyed to the Applicant;

k. "Metered Volume" means the volume of water conveyed to the Applicant as recorded by the Meter;

l. "Other Uses" means those uses other than irrigation which have historically been permitted under the terms and conditions of the Licences as the Licences have been interpreted pursuant to the *Water Resources Act* R.S.A. 1980 Cpt W-5, as it then was; the *North-west Irrigation Act*, 1898, 57-58 Victoria Chap 30, as amended, as it then was; *The Alberta Act*, 4 and 5 Edward VIII, Chapter 3, as it then was; the *Irrigation Act,* Chapter 61, R.S.C., as it then was, and all applications made by the District and its predecessors for allocations of water as recognized and authorized by the Licences.

m. "Point of Delivery" means that location on the Irrigation Works of the District at which the Annual Volume is conveyed by the District for conveyance to the Applicant;

n. "Purpose" means the purpose for which the Applicant uses the Annual Volume, as defined in the Background in this Agreement;

o. "Turnout Structure" means those structures or works as are required by the District at the Point of Delivery to allow the District to convey to the Applicant the Annual Volume for use by the Applicant on the Lands; and

p. "Water Supervisor" means the individual employed by the District who has responsibility for the conveyance of water to the Applicant and the measurement and recording of the volume of water conveyed.

2. **Conveyance**

a. The District agrees to convey to the Applicant at the Point of Delivery through the Irrigation Works the Annual Volume for the use by the Applicant on the Lands.

b. The Annual Volume shall be conveyed at times, rates and amounts as the District may have water available and capacity in its Irrigation Works for such conveyance.

c. The total volume of water conveyed in each calendar year under this Agreement shall be limited to the Annual Volume unless the District expressly authorizes in writing the conveyance of Additional Volumes.

3. **Purpose and Location** - The Applicant will use the Annual Volume and any Additional Volumes only for the Purpose and only on the Lands.

4. **Term** - This Agreement shall continue in full force and effect until terminated by either party in accordance with its terms.

5. **Annual Fee**

a. In consideration for the Conveyance, the Applicant agrees to pay to the District the Annual Fee, as established by an Fee By-Law and calculated pursuant to the terms of this Agreement.

b. The Annual Fee shall be due and payable on or before the 31st day of December in each year during the currency of this Agreement, and will be invoiced to the Applicant by the District by way of an assessment notice as required by the *Act*.

c. The Annual Fee will be calculated as follows:

i. In each calendar year, for a Point of Delivery on which a Meter has been installed as provided for in this Agreement, the Annual Fee will be calculated as the sum of:

1. the product of the rate per unit volume applicable to the Annual Volume as established by the Fee By-Law and the Metered Volume of water conveyed to the Applicant at the Point of Delivery; plus

2. the product of the rate per unit volume applicable to the Additional Volume of water conveyed as established by the Fee By-Law and the Additional Volume as recored by the Meter conveyed to the Applicant at the Point of Delivery.

ii. In each calendar year, for Points of Delivery on which a Meter has not been installed as provided for in this Agreement, the Annual Fee will be calculated as the sum of:

1. the product of the rate per unit volume applicable to the water conveyed as established by the Fee By-Law and the Annual Volume; plus

2. the product of the rate per unit volume applicable to the Additional Volume of water conveyed as established by the Fee By-Law and the Additional Water as recorded by the Water Supervisor's records conveyed to the Applicant at the Point of Delivery.

6. **Point of Delivery** - The District shall convey the Annual Volume to the Applicant at the Point of Delivery. The water shall be removed from the Irrigation Works of the District at the Point of Delivery through the Turnout Structure. The Turnout Structure shall comply

with the District's standard specifications for such Irrigation Works, and shall be installed by the District, at the expense of the Applicant, and at all times material hereto shall be operated and maintained by the District.

7. **Works** - All turnout structures, equipment or works installed on the Irrigation Works of the District by the Applicant pursuant to this Agreement, shall become the property of the District.

8. **Metering and Water Conveyance Records**

   a. The District may require the Applicant to supply, install and maintain a Meter at the Point of Delivery or such other place as may be designated by the District for the purpose of measuring the amount of the Annual Volume and Additional Water conveyed from time to time by the District to the Applicant.

   b. The Applicant grants to the District the right and licence during the currency of this Agreement to enter upon the Lands and to monitor the use of and record the data collected by the Meter.

   c. All volumes recorded by the Meter shall conclusively be deemed to record the actual volumes conveyed to the Applicant and the Applicant and the District shall be bound by the volumes so recorded, unless it is determined that the Meter was faulty or otherwise materially inaccurate.

   d. At Points of Delivery on which no Meter is installed, the records made and maintained by the Water Supervisor of the volumes of water conveyed to the Applicant by the District shall be conclusively deemed to record the actual volumes conveyed to the Applicant and the Applicant and the District shall be bound by the volumes so recorded.

9. **Ordering Water** - The Applicant shall order the conveyance of water and call for the termination of such conveyance in accordance with the applicable prevailing bylaws and policies of the District.

10. **Indemnity**

   a. The Applicant shall indemnify and keep indemnified the District against any liability for losses and expenses of whatever kind or nature, and the fees and disbursements of counsel on a solicitor and own client basis, and against any losses and expenses, which the District may incur in connection with any one or more of the following events or circumstances (the "Events"):

      i. by reason of having conveyed to the Applicant all or any portion of the Annual Volume;

      ii. by reason of the inability of the District to convey to the Applicant all or any portion of the Annual Volume;

      iii. by reason of the failure of the Applicant to perform or comply with the terms and conditions of this Agreement, and

iv. in enforcing any of the terms and conditions of this Agreement; and

v. any damages or losses, either by way of personal injury or property damage, suffered or incurred by the Applicant or any third party by reason of the Conveyance or the presence of the Annual Volume on the Lands or the use by the Applicant of the Annual Volume on the Lands.

b. The District may pay or compromise any claim, demand, suit, judgment or expense arising out of the Events and any such payment or compromise shall be binding upon the Applicant and included as a liability, loss or expense covered by this indemnity, provided the same was made by the District in the reasonable belief that it was liable for the amount disbursed, or that such payment or compromise was reasonable under all the circumstances.

c. In the event of any such payment or compromise by the District, an itemized statement of it prepared and certified by the manager or assistant manager of the District, itemizing of such payment or compromise shall be prima facie evidence of the fact and amount of the liability of the Applicant under this Agreement, in respect of the payment or compromise.

d. The District shall not be liable for any losses or damage either direct, indirect or consequential, for loss, injury or damage whatsoever arising out of the failure or inability of the District to convey all or any portion of the Annual Volume for any reason whatsoever.

11. **Compliance With Laws** - The Applicant shall comply with and be bound by the provisions of all statutes and regulations applicable to the privileges hereby granted, and with all by-laws of the District regulating the supply and distribution of water.

12. **Default** - In the event the Applicant is in Default of any of the provisions of this Agreement, the District may forthwith stop delivery of water or terminate this Agreement and in such case there shall be no abatement or refund of the Annual Fee paid by the Applicant to the District during the term of this Agreement prior to the stoppage or termination.

13. **Termination** - The Applicant may terminate this Agreement upon providing 30 days written notice to the District of its intention to do so, and following the expiry of the 30 day notice period, this Agreement shall be terminated and at an end and from that point forward, the Applicant shall have no further right or entitlement to or claim to the delivery of Annual Volume.

14. **Water Quality**

a. The Applicant acknowledges that the Irrigation Works of the District are an open ditch system subjecting the water therein to contamination from all manner of environmental, human and animal factors and that the District does not regulate, control or monitor the quality of water in its Irrigation Works.

b. The Applicant acknowledges and agrees that the water in the Irrigation Works of the District may not be potable or may not be suitable for the Purpose, and that the District makes no representation, warranty or guarantee, express or implied that the

water delivered under this Agreement is potable and fit for human or livestock consumption or suitable for the Purpose for use by the Applicant.

c. The Applicant agrees to accept the water conveyed in the condition in which it may be found at the Point of Delivery from time to time and to provide such testing, treatment or filtering as the Applicant considers necessary to determine whether the water is suitable for the use by the Applicant for the Purpose.

15. **Seasonal Delivery** - The Applicant acknowledges that the District can convey the Annual Volume only during the irrigation season and that the water conveyance capacity of the Irrigation Works of the District is limited and the District will convey, from time to time, so much of the Annual Volume as it, in its exclusive discretion, deems advisable.

16. **Assignment or Transfer** - Neither this Agreement nor any of the rights and privileges contained in this Agreement is assignable or transferable by the Applicant, in whole or in part, without prior written consent of the District.

IN WITNESS WHEREOF the District has by its proper officers signed this Agreement and has affixed the seal of the District hereto, and the Applicant has hereunto set his hand and seal on the day and year first above written.

[redacted]

Applicant

Raymond Irrigation District

[redacted]

[redacted]

WP51: Other Uses -Bluegrass Historical

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.

GIC Well ID 9961032
GoA Well Tag No. A8306
Drilling Company Well ID
Date Report Received 2024/02/29

GOWN ID

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
BLUE GRASS FARMING	P.O. BOX 29	WARNER	ALBERTA	CANADA	T0K 2L0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	2	27	5	16	4				

Measured from Boundary of Quarter
366.00 m from North
753.00 m from East

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.409867 Longitude -112.078807
How Location Obtained
Not Verified

Elevation 291.69 m
How Elevation Obtained
Hand held autonomous GPS 20-30m

Drilling Information

Method of Drilling
Rotary - Mud

Proposed Well Use
Domestic

Type of Work
New Well

Formation Log

Measurement in Metric

Depth from ground level (m)	Water Bearing	Lithology Description
24.38		Sand & Clay
36.58		See Comments
200.56		Shale
201.78		Coal
204.83		Rocks
213.97		Dark Shale
218.85		Sandstone
220.07		Rocks
235.31		Sandstone
236.22		Shale

Yield Test Summary

Measurement in Metric

Recommended Pump Rate 45.46 L/min

Test Date	Water Removal Rate (L/min)	Static Water Level (m)
2024/02/28	90.92	51.51

Well Completion

Measurement in Metric

Total Depth Drilled	Finished Well Depth	Start Date	End Date
236.22 m	236.22 m	2024/02/21	2024/02/25

Borehole

Diameter (cm)	From (m)	To (m)
18.42	0.00	236.22

Surface Casing (if applicable)
Steel
Size OD : 13.97 cm
Wall Thickness : 0.732 cm
Bottom at : 236.22 m

Well Casing/Liner
Size OD : cm
Wall Thickness : cm
Top at : m
Bottom at : m

Perforations

From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)	Hole or Slot Interval(cm)
216.41	236.22	0.318	30.48	5.08

Perforated by Machine

Annular Seal Cement Slurry
Placed from 0.00 m to 213.36 m
Amount 90.00 Bags

Other Seals

Type	At (m)

Screen Type
Size OD : 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
RICHARD COVERDALE

Certification No
3836AD

Company Name
MILK RIVER WATER WELL DRILLING

Copy of Well report provided to owner
Yes

Date approval holder signed
2024/02/29

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.

GIC Well ID 9961032
GoA Well Tag No. A8306
Drilling Company Well ID
Date Report Received 2024/02/29

GOWN ID

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
BLUE GRASS FARMING	P.O. BOX 29	WARNER	ALBERTA	CANADA	T0K 2L0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	2	27	5	16	4				

Measured from Boundary of Quarter
366.00 m from North
753.00 m from East

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.409867 Longitude -112.078807
How Location Obtained: Not Verified

Elevation 291.69 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 45.46 L/min
Recommended Pump Intake Depth (From TOC) 137.16 m
Pump Installed Depth m
Type Make H.P.
Model (Output Rating)

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

Sample Collected for Potability Submitted to ESRD

Additional Comments on Well

LITHOLOGY LOG AT 120 FT IS CLAY & SANDSTONE. WATER REMOVAL METHOD FOR YIELD TEST IS SWAB. SWL MEASURED AT 44.82 M BTOC ON JULY 8, 2024. ADDED SWL COMMENT AT REQUEST OF LICENSING STAFF 2024-12-19.

Yield Test

Taken From Top of Casing
Depth to water level

Measurement in Metric

Test Date	Start Time	Static Water Level
2024/02/28	8:00 AM	51.51 m

Method of Water Removal

Type Other
Removal Rate 90.92 L/min
Depth Withdrawn From 137.16 m

If water removal period was < 2 hours, explain why

Pumping (m)	Elapsed Time Minutes:Sec	Recovery (m)
	0:00	147.52
	1:00	143.87
	2:00	140.51
	3:00	137.16
	4:00	134.11
	5:00	131.06
	6:00	128.02
	7:00	125.27
	8:00	122.53
	9:00	119.79
	10:00	117.35
	12:00	113.08
	14:00	109.12
	16:00	105.46
	18:00	102.11
	20:00	98.76
	25:00	92.35
	30:00	86.56
	35:00	84.43
	40:00	77.11
	50:00	70.41
	60:00	65.23
	75:00	59.44
	90:00	55.78
	105:00	53.34
	120:00	51.51

Water Diverted for Drilling

Water Source	Amount Taken		Diversion Date & Time
RESERVOIR	45460.92	L	2024/02/21 8:00 AM

Contractor Certification

Name of Journeyman responsible for drilling/construction of well: RICHARD COVERDALE
Certification No: 3836AD
Company Name: MILK RIVER WATER WELL DRILLING
Copy of Well report provided to owner: Yes
Date approval holder signed: 2024/02/29

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.

GIC Well ID 9961033
GoA Well Tag No. A8307
Drilling Company Well ID
Date Report Received 2024/02/29

GOWN ID

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
BLUE GRASS FARMS	P.O. BOX 29	WARNER	ALBERTA	CANADA	T0K 2L0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	2	27	5	16	4				

Measured from Boundary of Quarter
366.00 m from South
600.00 m from East

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.409715 Longitude -112.076466
How Location Obtained
Map

Elevation 957.00 m
How Elevation Obtained
Hand held autonomous GPS 20-30m

Drilling Information

Method of Drilling
Rotary - Mud

Proposed Well Use
Domestic

Type of Work
New Well

Formation Log

Measurement in Metric

Depth from ground level (m)	Water Bearing	Lithology Description
24.38		Gray Clayey Sand & Clay
36.58		Gray Clayey Clay & Sand
199.64		Dark Shaly Shale
203.30		Dark Shaly Shale & Coal
204.22		Dark Rocky Rocks
210.31		Dark Shaly Shale
217.93		Dark Rocky Sandstone
218.85		Dark Rocky Rocks
234.70		Dark Rocky Sandstone
236.22		Dark Shaly Shale

Yield Test Summary

Measurement in Metric

Recommended Pump Rate 45.46 L/min

Test Date	Water Removal Rate (L/min)	Static Water Level (m)
2024/02/23	45.46	59.74

Well Completion

Measurement in Metric

Total Depth Drilled	Finished Well Depth	Start Date	End Date
236.22 m	235.92 m	2024/02/16	2024/02/21

Borehole

Diameter (cm)	From (m)	To (m)
19.05	0.00	236.22

Surface Casing (if applicable)
Steel
Size OD : 13.34 cm
Wall Thickness : 0.732 cm
Bottom at : 236.22 m

Well Casing/Liner
Size OD : cm
Wall Thickness : cm
Top at : m
Bottom at : m

Perforations

From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)	Hole or Slot Interval(cm)
204.22	236.22	0.318	30.48	5.08

Perforated by Other

Annular Seal Cement Slurry
Placed from 0.00 m to 203.30 m
Amount 95.00 Bags

Other Seals

Type	At (m)

Screen Type
Size OD : 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
RICHARD COVERDALE

Certification No
3836AD

Company Name
MILK RIVER WATER WELL DRILLING

Copy of Well report provided to owner
Yes

Date approval holder signed
2024/02/29

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 9961033
GoA Well Tag No. A8307
Drilling Company Well ID
Date Report Received 2024/02/29

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
BLUE GRASS FARMS	P.O. BOX 29	WARNER	ALBERTA	CANADA	T0K 2L0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	2	27	5	16	4				

Measured from Boundary of Quarter
366.00 m from South
600.00 m from East

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.409715 Longitude -112.076466
How Location Obtained: Map

Elevation 957.00 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 45.46 L/min
Recommended Pump Intake Depth (From TOC) 121.92 m
Pump Installed Depth m
Type Make H.P.
Model (Output Rating)

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

Additional Comments on Well

PERFORATION METHOD IS PLASMA CUTTER AND YIELD TEST WATER REMOVAL METHOD IS SWAB. DRILLER PROVIDED BOREHOLE DIAMETER, RECOMMENDED PUMP RATE & INTAKE DEPTH, PERFORATION METHOD, AND WATER REMOVAL METHOD FOR YIELD TEST 2024-03-13. SWL ON JULY 8, 2024 IS 43.91 M. UPDATED GPS COORDINATES AND ADDED COMMENT REGARDING SWL AT REQUEST OF LICENSING BASED ON INFORMATION FROM CONSULTANT REPORT 2024-12-16.

Yield Test

Taken From Top of Casing
Depth to water level
Measurement in Metric

Test Date	Start Time	Static Water Level
2024/02/23	12:00 PM	59.74 m

Method of Water Removal
Type Other
Removal Rate 45.46 L/min
Depth Withdrawn From 137.16 m

If water removal period was < 2 hours, explain why

Pumping (m)	Elapsed Time Minutes:Sec	Recovery (m)
	0:00	135.64
	1:00	131.37
	2:00	127.41
	3:00	123.44
	4:00	119.79
	5:00	116.43
	6:00	113.39
	7:00	110.03
	8:00	107.29
	9:00	104.55
	10:00	102.11
	12:00	100.28
	14:00	93.57
	16:00	89.61
	18:00	86.56
	20:00	83.21
	25:00	76.81
	30:00	71.93
	35:00	67.67
	40:00	64.31
	50:00	61.87
	60:00	59.74

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
RESERVOIR	54553.10 L	2024/02/12 8:00 AM

Contractor Certification

Name of Journeyman responsible for drilling/construction of well: RICHARD COVERDALE
Certification No: 3836AD
Company Name: MILK RIVER WATER WELL DRILLING
Copy of Well report provided to owner: Yes
Date approval holder signed: 2024/02/29

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: Lagoon's **Proposed 1:** Dairy Barn

Proposed 2: Slurry Tank **Proposed 3:**

Facility and environmental risk information		Facilities				NRCB USE ONLY	
		Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
Flood plain information	What is the elevation of the floor of the lowest manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	☑ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☐ > 1 m ☐ ≤ 1 m	☐ YES ☐ NO ☐ YES with exemption	
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	
	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	
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	250	300	300		☐ YES ☐ NO ☐ YES with exemption	
Groundwater information	What is the depth to the water table?		2.6 M	2.6 M		☐ YES ☐ NO ☐ YES with exemption	
	What is the depth to the groundwater resource/aquifer you draw water from?	204 M	204 M	204 M		☐ YES ☐ NO ☐ YES with exemption	

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)

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**
Curtis Rogers	SE 20-5-16 W4	2686 m					
Bill Fletcher	NW 19-5-16 W4	5260 m					
Cy Fletcher	NE 34-5-16 W4	2434 m					
Randy Kuen	NW 33 5-16 W4	3307 m					

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)**
AO Comment: See next page for land available for manure spreading.					
			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)

AO Comment: Land marked with an "x" is rented land and is not included as land available for manure spreading.

Name	Bluegrass Hutterian Brethren
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
Feedlot Animals	Beef Cows/Finishers (900+ lbs)	0.700	0.700	0.910	0.4459		-
	Beef Feeders (450 - 900 lbs)	0.700	0.700	0.500	0.2450		-
	Beef Feeder Calves (<550 lbs)	0.700	0.700	0.275	0.1348		-
	Horses - PMU	0.650	0.700	1.000	0.4550		-
	Horses - Feeders > 750 lbs	0.650	0.700	1.000	0.4550		-
	Horses - Foals < 750 lbs	0.650	0.700	0.300	0.1365		-
	Mules	0.600	0.700	1.000	0.4200		-
	Donkeys	0.600	0.700	0.670	0.2814		-
	Bison	0.600	0.700	1.000	0.4200		-
							-
Dairy (*count lactating cows only)	Free Stall – Lactating Cows with all associated dries, heifers, and calves*	0.800	1.100	2.000	1.7600	350	616.0
	Free Stall – Lactating Cows with Dry Cows only*	0.800	1.100	1.640	1.4432		-
	Free Stall – Lactating Cows only	0.800	1.100	1.400	1.2320		-
	Tie Stall – Lactating Cows only	0.800	1.000	1.400	1.1200		-
	Loose Housing – Lactating Cows only	0.800	1.000	1.400	1.1200		-
	Dry Cow	0.800	0.700	1.000	0.5600		-
	Replacements – Bred Heifers (Breeding to Calving)	0.800	0.700	0.875	0.4900		-
	Replacements - Growing Heifers (350 lbs to breeding)	0.800	0.700	0.525	0.2940		-
	Calves (< 350 lbs)	0.800	0.700	0.200	0.1120		-
							-
Swine Liquid (*count sows only)	Farrow to finish *	2.000	1.100	1.780	3.9160	600	2,349.6
	Farrow to wean *	2.000	1.100	0.670	1.4740		-
	Farrow only *	2.000	1.100	0.530	1.1660		-
	Feeders/Boars	2.000	1.100	0.200	0.4400		-
	Growers/Roasters	2.000	1.100	0.118	0.2600		-
	Weaners	2.000	1.100	0.055	0.1210		-
							-
Swine Solid (*Count sows only)	Farrow to finish *	2.000	0.800	1.780	2.8480		-
	Farrow to wean *	2.000	0.800	0.670	1.0720		-
	Farrow only *	2.000	0.800	0.530	0.8480		-
	Feeders/Boars	2.000	0.800	0.200	0.3200		-
	Growers/Roasters	2.000	0.800	0.118	0.1888		-
	Weaners	2.000	0.800	0.055	0.0880		-
							-
Poultry	Chicken - Breeders - Solid	1.000	0.700	0.010	0.0070		-
	Chicken - Layers - Liquid (includes associated pullets)	2.000	1.100	0.008	0.0176		-
	Chicken - Layers - (Belt Cage)	2.000	0.700	0.008	0.0112	300	3.4
	Chicken - Layers - (Deep Pit)	2.000	0.700	0.008	0.0112		-
	Chicken - Pullets/Broilers	1.000	0.700	0.002	0.0014	1,000	1.4
	Turkey - Toms/Breeders	1.000	0.700	0.020	0.0140		-
	Turkey - Hens (light)	1.000	0.700	0.013	0.0091		-
	Turkey - Broilers	1.000	0.700	0.010	0.0070	300	2.1
	Ducks	1.000	0.700	0.010	0.0070	1,500	10.5
	Geese	1.000	0.700	0.020	0.0140	300	4.2
							-
Sheep and Goats	Sheep - Ewes/Rams	0.600	0.700	0.200	0.0840		-
	Sheep - Ewes with lambs	0.600	0.700	0.250	0.1050		-
	Sheep - Lambs	0.600	0.700	0.050	0.0210		-
	Sheep - Feeders	0.600	0.700	0.100	0.0420		-
	Goats - Meat/Milk (per Ewe)	0.700	0.700	0.170	0.0833		-
	Goats - Nannies/Billies	0.700	0.700	0.140	0.0686		-
	Goats - Feeders	0.700	0.700	0.077	0.0377		-
							-
Cervid	Elk	0.600	0.700	0.600	0.2520		-
	Deer	0.600	0.700	0.200	0.0840		-
							-
Wild Boar	Feeders	2.000	0.800	0.140	0.2240		-
	Sow (farrowing)	2.000	0.800	0.371	0.5936		-
							-
					Total		2,987.2

For New Operations

Dispersion Factor: 1

Category	Odour Objective	Distance Feet	Distance Metres
1	41.04	2,498	762
2	54.72	3,331	1,015
3	68.4	4,164	1,269
4	109.44	6,662	2,031

For Expanding Operations

Dispersion Factor: 1

Expansion Factor: 0.77

Category	Odour Objective	Distance Feet	Distance Metres
1	41.04	1,924	586
2	54.72	2,565	782
3	68.40	3,206	977
4	109.44	5,130	1,564

Name	Bluegrass Hutterian Brethren	
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)
Feedlot Animals	Cows/Finishers (900+ lbs)	0.0	0.0	0.0	0.0	0.0
	Feeders (450 - 900 lbs)	0.0	0.0	0.0	0.0	0.0
	Feeder Calves (<550 lbs)	0.0	0.0	0.0	0.0	0.0
	Horses - PMU	0.0	0.0	0.0	0.0	0.0
	Horses - Feeders > 750 lbs	0.0	0.0	0.0	0.0	0.0
	Horses - Foals < 750 lbs	0.0	0.0	0.0	0.0	0.0
	Mules	0.0	0.0	0.0	0.0	0.0
	Donkeys	0.0	0.0	0.0	0.0	0.0
	Bison	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
Dairy (*count lactating cows only)	Free Stall – Lactating Cows with all associated dries, heifers, and calves*	350.0	519.8	433.0	324.8	259.7
	Free Stall – Lactating Cows with Dry Cows only *	0.0	0.0	0.0	0.0	0.0
	Free Stall – Lactating Cows only*	0.0	0.0	0.0	0.0	0.0
	Tie Stall – Lactating Cows only	0.0	0.0	0.0	0.0	0.0
	Loose Housing – Lactating Cows only	0.0	0.0	0.0	0.0	0.0
	Dry Cow (Solid manure)	0.0	0.0	0.0	0.0	0.0
	Dry Cow (Liquid manure)	0.0	0.0	0.0	0.0	0.0
	Replacements – Bred Heifers (Breeding to Calving)	0.0	0.0	0.0	0.0	0.0
	Replacements - Growing Heifers (350 lbs to breeding)	0.0	0.0	0.0	0.0	0.0
	Calves (< 350 lbs)	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
Swine Liquid (*count sows only)	Farrow to finish *	600.0	401.0	334.2	250.7	200.5
	Farrow to wean *	0.0	0.0	0.0	0.0	0.0
	Farrow only *	0.0	0.0	0.0	0.0	0.0
	Feeders/Boars	0.0	0.0	0.0	0.0	0.0
	Growers/Roasters	0.0	0.0	0.0	0.0	0.0
	Weaners	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
Swine Solid (*Count sows only)	Farrow to finish *	0.0	0.0	0.0	0.0	0.0
	Farrow to wean *	0.0	0.0	0.0	0.0	0.0
	Farrow only *	0.0	0.0	0.0	0.0	0.0
	Feeders/Boars	0.0	0.0	0.0	0.0	0.0
	Growers/Roasters	0.0	0.0	0.0	0.0	0.0
	Weaners	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
Poultry	Chicken - Breeders - Solid	0.0	0.0	0.0	0.0	0.0
	Chicken - Layers - Liquid (includes associated pullets)	0.0	0.0	0.0	0.0	0.0
	Chicken - Layers - (Belt Cage)	300.0	1.7	1.4	1.0	0.8
	Chicken - Layers - (Deep Pit)	0.0	0.0	0.0	0.0	0.0
	Chicken - Pullets/Broilers	1000.0	3.3	2.7	2.0	1.6
	Turkey - Toms/Breeders	0.0	0.0	0.0	0.0	0.0
	Turkey - Hens (light)	0.0	0.0	0.0	0.0	0.0
	Turkey - Broilers	300.0	1.6	1.3	1.0	0.8
	Ducks	1500.0	2.4	2.0	1.5	1.2
	Geese	300.0	1.0	0.8	0.6	0.5
	Other	0.0				
Goats and Sheep	Sheep - Ewes/Rams	0.0	0.0	0.0	0.0	0.0
	Sheep - Ewes with lambs	0.0	0.0	0.0	0.0	0.0
	Sheep - Lambs	0.0	0.0	0.0	0.0	0.0
	Sheep - Feeders	0.0	0.0	0.0	0.0	0.0
	Goats - Meat/Milk (per Ewe)	0.0	0.0	0.0	0.0	0.0
	Goats - Nannies/Billies	0.0	0.0	0.0	0.0	0.0
	Goats - Feeders	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
Cervid	Elk	0.0	0.0	0.0	0.0	0.0
	Deer	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
Wild Boar	Feeders	0.0	0.0	0.0	0.0	0.0
	Sow (farrowing)	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
	Total Hectares		931	775.3	581.6	465.2
	Total Acres		2,300	1915.8	1437.2	1149.4

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. Dairy Barn
2. In-barn pit
3.

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

	Length (m) (128 m)	Width (m) (45.7 m)	Total depth (m) (3.7 m)	Depth below ground level (m)	NRCB USE ONLY Calculated storage capacity (m^3)
1.	420 Ft	150 Ft	12 Ft	12 Ft (3.7 m)	
2.	4.9	4.9	3.7	3.7	
3.					
				TOTAL CAPACITY	

Concrete liner details

Scrape alleys or unslatted portions of barn floors (if applicable)	Concrete thickness: 7 inches	Method of sulphate protection: Type 50	
	Concrete strength: 32 mpa	Concrete reinforcement size and spacing: ½ 12 x 12"	
In-barn manure pit floors	Concrete thickness: 10"	Method of sulphate protection: Type 50	
	Concrete strength: Mpa 32	Concrete reinforcement size and spacing: ½ 12 x 12"	
In-barn manure pit walls	Concrete thickness: 10"	Method of sulphate protection: Type 50	
	Concrete strength: Mpa 32	Horizontal reinforcement size and spacing: ½" 12 x 12"	Vertical reinforcement size and spacing: ½" 12 x 12"

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

With a Volclay water Stop

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

~~Pipe~~ Use linkseal with S.S. hardware

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

NRCB USE ONLY

Liquid manure storage volume calculator attached: ☐ YES ☐ NO

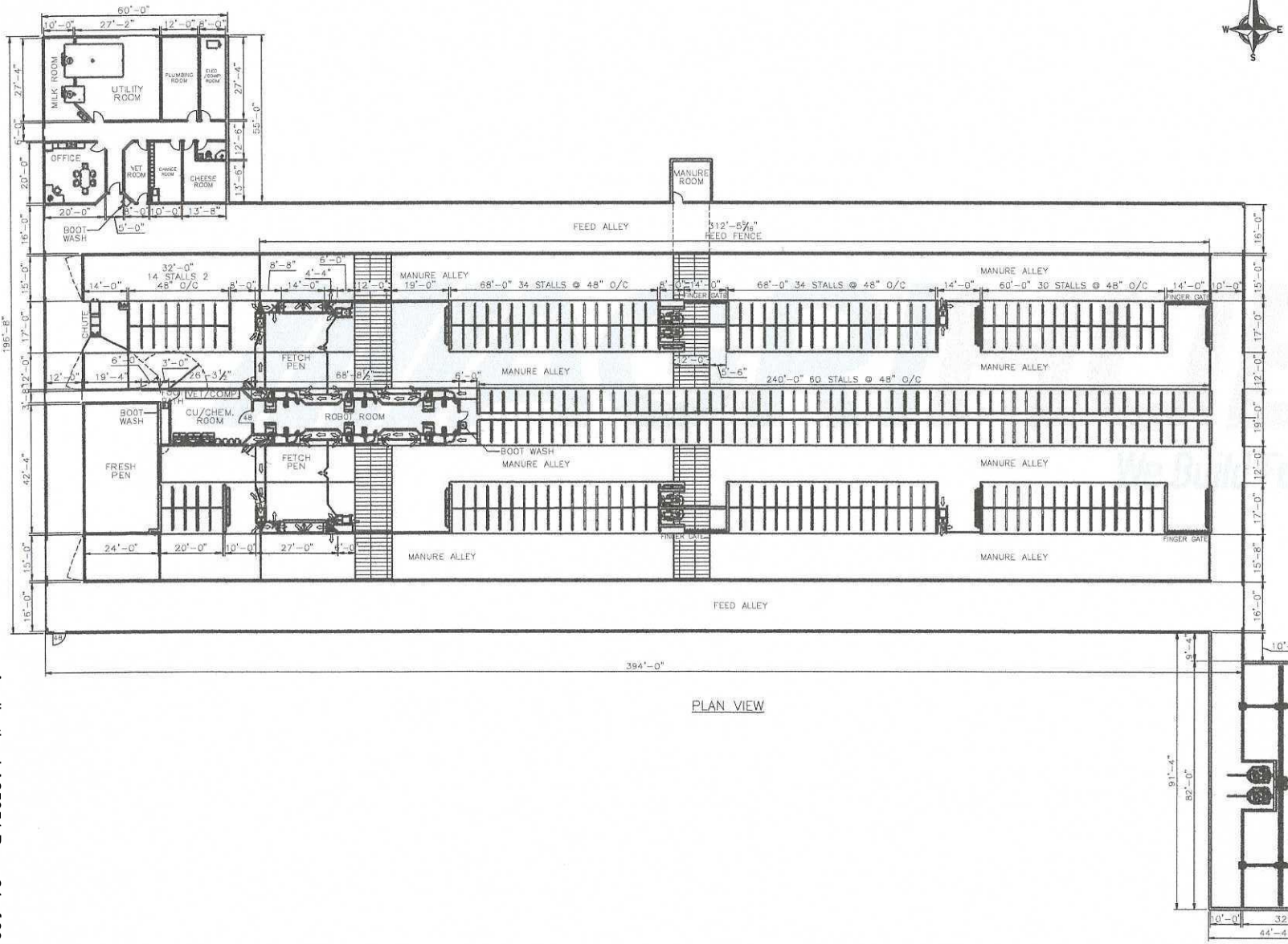
Depth to water table: _____ Requirements met: ☐ YES ☐ NO

Depth to uppermost groundwater resource: _____ Requirements met: ☐ YES ☐ NO

ERST completed: ☐ see ERST page for details

Concrete liner requirements

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



PENNER FARM SERVICES
64-27211 HWY. 12 LACOMBE, AB T4I 0E3
TOLL FREE: 1-866-339-0000 PH: 1-403-782-0675

ENGINEERING | STAMP

REVISION'S

REV.	DATE:	DESCRIPTION:	BY:	CHK:	APPD:
1	6/3/25	ISSUED FOR REVIEW	DJB	DN	
2	6/4/25	REVISED AS PER SALES CHANGES	DJB	DN	
3	6/16/25	REVISED AS PER CLIENT, OPTION 2	DJB	DN	
4	6/18/25	REVISED AS PER SALES CHANGES	DJB	DN	
5	6/26/25	REVISED AS PER CLIENT CHANGES	DJB	DN	
6	7/3/25	REVISED AS PER CLIENT CHANGES	DJB	DN	

CLIENT:
BLUE GRASS COLONY
WARNER, ALBERTA
OPTION 2

DRAWING TITLE:
LELY ROBOT DAIRY BARN - PLAN VIEW

SCALE:	DATE:	DRAWING NO.
1:192	JUNE/2/2025	A1
DWN: DJB	CHK: DN	
JOB NO.:	SHEET: 1 OF 1	REVISION: F

LIQUID MANURE STORAGE: Concrete or steel tank (required to be engineered)

*(complete a copy of this section for **EACH** proposed concrete or steel tank for liquid manure)*

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

1. Slurry Tank
2.

Manure storage capacity

	Dimensions (or length and width / diameter) (m) (75.6 m)	Depth (m) (4.9 m)	Depth below ground level (m) (1.8 m)	NRCB USE ONLY	
				Calculated storage capacity (excl. 0.5 m freeboard) (m^3)	Filled in lower ¼? Y/N
1.	248 Ft	16 Ft	6 Ft		
2.					

Surface water control systems

Describe the run-on and runoff control system

All Wate is Directed to the Storm Pond

Concrete or steel tank details

	Concrete thickness	Method of sulphate protection
Manure tank floor	6"	Type 50
	Concrete strength	Concrete reinforcement size and spacing
	35 mpa	

Manure storage tank walls: provide details on the construction of the proposed manure storage tank walls

12" thick Walls

LIQUID MANURE STORAGE: Concrete or steel tank (cont.)

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

Linkseal with S.S. Hardwire

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

USE Volclay

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: _____ Requirements met: ☐ YES ☐ NO

Depth to uppermost groundwater resource: _____ Requirements met: ☐ YES ☐ NO

ERST completed: ☐ see ERST page for details

Surface water control systems

Requirements met: ☐ YES ☐ NO Details/comments:

Concrete or steel tank requirements

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

STRUCTURAL ABBREVIATIONS

AB	ANCHOR BOLT
ABC	ALBERTA BUILDING CODE
AFF	AFTER FINISHED FLOOR
ALT	ALTERNATE
ARCH	ARCHITECTURAL
BOT	BOTTOM
B.O.	BOTTOM OF
BLDG	BUILDING
BM	BEAM
BP	BASE PLATE
BRG	BEARING
BSMT	BASEMENT
C/C	CENTRE TO CENTRE
C/W	COMPLETE/CONNECT WITH
CANT	CANTILEVER
CL	CLEAR
℄	CENTRE LINE
COMP	COMPOSITE
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
DET	DETAIL
DIA, Ø	DIAMETER
DIM	DIMENSION
DIAG	DIAGONAL
DL	DEAD LOAD
DP	DEEP
DWG	DRAWING
DWL	DOWEL
DN	DOWN
EA	EACH
EE	EACH END
EF	EACH FACE
EJ	EXPANSION JOINT
EL, ELEV	ELEVATION
ELEC	ELECTRICAL
EMBED	EMBEDMENT
EQ	EQUAL
EW	EACH WAY
EX, EXIST	EXISTING
EXT	EXTERIOR
FIN	FINISHED
FL	FLOOR
FTG	FOOTING
GALV	GALVANIZED
GA	GAUGE
GB	GRADE BEAM
GL	GRIDLINE
HE	HOOK EACH END
HH	HOOK - HOOK (HOOK EACH END)
HIF	HORIZONTAL INSIDE FACE
HOF	HORIZONTAL OUTSIDE FACE
HORIZ	HORIZONTAL
HSS	HOLLOW STRUCTURAL SECTION
INT	INTERIOR
ID	INSIDE DIAMETER/IDENTIFICATION
k	KILO
kN	KILONEWTON
kPa	KILOPASCAL
LG	LONG/LENGTH
LL	LIVE LOAD
MAX	MAXIMUM
MECH	MECHANICAL
MEZZ	MEZZANINE
MID	MIDDLE
MISC	MISCELLANEOUS
MIN	MINIMUM
ML	MIDDLE LAYER
m	METRE
mm	MILLIMETRE
MPa	MEGAPASCAL
NBC	NATIONAL BUILDING CODE OF CANADA
NBC(AE)	NATIONAL BUILDING CODE (ALBERTA EDITION)
NTS	NOT TO SCALE
O/C	ON CENTRE
O/O	OUT TO OUT
OPNG	OPENING
OWBJ	OPEN WEB STEEL JOIST
OWWJ	OPEN WEB WOOD JOIST
PC	PRECAST
PL	PLATE
PROJ	PROJECTION
PT	PRESSURE TREATED
PVC	POLYVINYL CHLORIDE
R	REACTION, RADIUS
REF	REFERENCE
REM	REMAINDER
REQ'D	REQUIRED
REV	REVISION
REINF	REINFORCEMENT
R/W	REINFORCE WITH
SECT	SECTION
SIM	SIMILAR
SL	SLAB
SOG	SLAB ON GRADE
SPEC	SPECIFICATION
SPF	SPRUCE-PINE-FIR
STD	STANDARD
STRUCT	STRUCTURAL
STIFF	STIFFENER
SQ	SQUARE
ST	STRAIGHT
STIR	STIRRUP
THK	THICKNESS
T	TOP
T&B	TOP AND BOTTOM
TEMP	TEMPERATURE
TYP	TYPICAL
T/O	TOP OF
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOS	TOP OF SLAB
TOW	TOP OF WALL
U/S	UNDERSIDE
U/N	UNLESS NOTED
U/NO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W	WIDE FLANGE BEAM
WP	WALL PLATE, WORKING POINT
WT	STRUCTURAL TEE
WWF	WELDED WIRE FABRIC
WWF	WELDED WIDE FLANGE

STRUCTURAL NOTES

GENERAL

1. THIS STRUCTURE IS DESIGNED IN ACCORDANCE WITH, AND SHALL BE CONSTRUCTED IN COMPLIANCE WITH, THE NATIONAL BUILDING CODE OF CANADA – 2023 – ALBERTA EDITION.
2. APPLICABLE STANDARDS FOR THE DESIGN INCLUDES THE LATEST REVISION OF THE FOLLOWING:
   a. CSA A23.1 CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION
   b. CSA A23.2 TEST METHODS AND STANDARD PRACTICE FOR CONCRETE
   c. CSA A23.3 DESIGN OF CONCRETE STRUCTURES
   d. AND ALL REFERENCED CODES AND STANDARDS LISTED WITHIN THESE DOCUMENTS.
3. ENVIRONMENTAL LOADS DEVELOPED USING:
   a. LOCATION – WARNER, ALBERTA
   b. IMPORTANCE – NORMAL
   c. SNOW – S_s = 1.4 kPa; S_r = 0.1; α_v = 1.0; α_b = 0.8, α_a = 1.0; C_s = 1.0
   d. WIND – q_{50} = 0.65kPa
   e. SEISMIC – $S_a(0.2)$ = 0.015
4. STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT PROJECT DRAWINGS (MECHANICAL-M##, ARCHITECTURAL-A##, CIVIL-C##, AND ELECTRICAL-E##) AND SPECIFICATIONS. SPECIFICATIONS SHALL CONTROL OVER THESE DRAWINGS.
5. READ AND UNDERSTAND THE INTENT OF THE DESIGN DRAWINGS SHALL BE READ AS A WHOLE IN CONTEXT WITH THE PROJECT AND IN CONJUNCTION WITH DRAWINGS AND INFORMATION BY OTHERS.
6. USE THE DRAWINGS ONLY FOR THE PURPOSE REFERENCED IN THE 'REVISIONS BLOCK, ONLY, "FOR CONSTRUCTION" DRAWINGS SHALL BE USED FOR CONSTRUCTION PURPOSES.
7. DO NOT SCALE DRAWINGS.
8. VERIFY ALL DIMENSIONS, ELEVATIONS, SLOPES, DETAILS, CONDITIONS, ETC., SHOWN ON THE DRAWINGS AND VERIFIED WITH SITE CONDITIONS, PRIOR TO CONSTRUCTION OR PREFABRICATION OF ANY BUILDING COMPONENT.
9. MODIFICATIONS, ALTERNATIONS, OR SUBSTITUTIONS MUST BE AUTHORIZED IN WRITING BY THE ENGINEER.
10. LOCATE ALL EXISTING SUBGRADE SERVICES PRIOR TO CONSTRUCTION.
11. DESIGN AND INSTALL ALL NECESSARY SHORING, BRACING AND FORMWORK. FORMWORK FOR CONSTRUCTION SHALL BE BRIDGED OVER EXISTING SERVICES. PROCEDURE MUST BE APPROVED BY THE ENGINEER.
12. REVIEW LOCATION OF INTENDED AND PROPOSED CONSTRUCTION JOINTS WITHIN THE STRUCTURE WITH THE ENGINEER PRIOR TO PROCEEDING.
13. CONSTRUCTION SAFETY REQUIREMENTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
14. DEFECTIVE OR UNACCEPTABLE WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST OR SCHEDULE DELAY TO THE CONTRACT.

CAST-IN-PLACE-CONCRETE

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH CSA A23.1/A23.2 CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION / METHODS OF TEST AND STANDARD PRACTICES FOR CONCRETE, CONTRACTOR IS TO FOLLOW CCT AFORM RECOMMENDED POURING PROCEDURES.
2. SUPPLEMENTARY CEMENTITIOUS MATERIAL TO CSA A3000-18 CEMENTITIOUS MATERIALS COMPENDIUM.
3. CHEMICAL ADMIXTURES TO ASTM C494/C494M-17 AND ASTM C1017/C1017M-13e1.
4. GENERAL CONTRACTOR TO PROVIDE PROPRIETARY MIX DESIGN PERFORMANCE RECORD AS REQUIRED BY CONCRETE ASSOCIATION OF THE PROVINCE OF JURISDICTION.
5. SUBMIT CONCRETE MIX DESIGN STATEMENTS, SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF JURISDICTION, PRIOR TO CONSTRUCTION. ADDITION OF WATER ONCE BATCHING IS COMPLETED IS PROHIBITED.
6. CONSTRUCT FORMWORK, SHORING, AND BRACING TO MEET DESIGN, CODE, AND CSA A23.1 REQUIREMENTS, CONSTRUCT ACCURATELY, SO THAT RESULTING FINISHED CONCRETE CONFORMS TO SHAPES, LINES, AND DIMENSIONS INDICATED ON THE DRAWINGS.
7. CONCRETE WORKING TIME, FROM BATCHING TO PLACEMENT AND CONSOLIDATION, SHALL NOT EXCEED 2 HOURS.
8. CONTRACTOR SHALL ACCURATELY PLACE AND SECURE ALL COMPONENTS TO BE EMBEDDED IN THE CONCRETE (ie. WELD PLATES, DOWELS FOR CONCRETE, ANCHOR BOLTS, INSERTS, SLEEVING, ETC.) DOUBLE CHECK LOCATION AND POSITION OF ANCHOR BOLTS AND CONFIRM ALL ADDITIONAL REINFORCING BARS ARE IN PLACE PRIOR TO POURING CONCRETE.
9. PROVIDE FLOOR FINISH ACCORDING TO TABLE 22 OF CSA A23.1 CLASS A WITH HAND SCREEDED AND STEEL TROWEL FINISH. ALL WALKABLE EXTERIOR CONCRETE SURFACES TO HAVE BROOM FINISH.
10. CONCRETE TESTING SHALL BE PERFORMED BY A CSA APPROVED TESTING COMPANY RETAINED BY THE CONTRACTOR. A MINIMUM OF THREE CONCRETE TEST CYLINDERS AND ONE SLUMP TEST SHALL BE TAKEN FOR EVERY 75 (OR LESS) CUBIC METERS OF EACH CLASS OF CONCRETE PLACED, OR FOR EACH DAY CONCRETE IS PLACED, WHICHEVER IS GREATER. TESTING SHALL BE PERFORMED IN ACCORDANCE WITH CSA A23.2-19 OR THE LATEST REVISION AT THE TIME OF THE WORK, AND THE RESULTS SHALL BE FORWARDED TO THE ENGINEER.
11. ALL HOLES NOT SHOWN ON THE DRAWINGS TO BE CORED THROUGH REINFORCED CONCRETE TO BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO CORING.
12. CONSTRUCTION JOINTS, CONCRETE PLACEMENT SCHEDULING, AND WORK PROCEDURES SHALL BE DISCUSSED WITH THE ENGINEER PRIOR TO COMMENCING CONSTRUCTION.
13. CURING PERIOD OF CONCRETE SHALL BE A MINIMUM 3 (THREE) DAYS FOR PLACEMENT OF FOUNDATION WALLS/PIERS ON FOOTINGS, 7 (SEVEN) DAYS WITH FORMS IN PLACE OF ALL WALLS/COLUMNS, AND 14 (FOURTEEN) DAYS FOR STRUCTURAL SLABS, UNLESS NOTED OTHERWISE ON THE DRAWINGS. ALL CONCRETE SHALL BE WATER CURED UNLESS WRITTEN PERMISSION IS OBTAINED FROM THE ENGINEER OF RECORD PRIOR TO THE STRIPPING OF FORMS.
14. FOR WARM WEATHER CONCRETE WORK, POURS WITH AN AMBIENT TEMPERATURE AT OR GREATER THAN 27C FOR THE POURING PERIOD, PROVISIONS TO PROTECT THE CONCRETE MUST BE ON-SITE PRIOR TO THE POUR, REFER TO CSA A23.1-A23.2 FOR REQUIREMENTS.
15. NOTIFY THE ENGINEER AT LEAST 48 HOURS PRIOR TO ALL CONCRETE PLACEMENT TO ALLOW FOR SITE OBSERVATIONS.
16. REFER TO TABLE C.1 FOR CONCRETE SPECIFICATIONS.
17. REINFORCING CONCRETE COVER: REFER TO TABLE E.2.

SLAB-ON-GRADE

1. SUB-BASE PREPARATION - PREPARE SUB-BASE AS FOLLOWS:
   A. REMOVE ALL TOPSOIL, SILT, LOOSE FILL, DEBRIS, ORGANIC MATERIAL (INCLUDING TREE ROOTS), EXISTING FOUNDATION ELEMENTS, TANKS, ETC.
   B. FILL ALL VOIDS AND LOW AREAS WITH SCREENED GRANULAR MATERIAL COMPACTED TO A MINIMUM 100% STANDARD PROCTOR DENSITY IF OF CONSOLIDATING NATURE. INSTALL AND COMPACT IN 150mm (6") HIGH LIFTS.
2. GRANULAR BASE: INSTALL A BASE OF SCREENED COARSE CLEAN 20mm GRANULAR FILL WITH NO GREATER THAN 10% FINES (PASS THROUGH 4mm SIEVE) HAUNCHED TO A FLAT FINISHED SURFACE, INSTALL IN 150mm (6") HIGH LIFTS, MINIMUM ONE LIFT. INSTALL A 6mm POLY LAYER ON TOP OF BASE BELOW.
3. IF REQUESTED BY THE ENGINEER, SUBMIT SAMPLES OF PROPOSED GRANULAR BASE AND SUB-BASE MATERIAL TO GEOTECHNICAL CONSULTANT FOR REVIEW AND APPROVAL.
4. COMPACTION TESTS SHALL BE PERFORMED BY A CSA APPROVED TESTING COMPANY RETAINED BY THE CONTRACTOR DURING THE INSTALLATION OF ALL GRANULAR MATERIAL. THE RESULTS SHALL BE FORWARDED TO THE ENGINEER.
5. INSULATION SHALL NOT DISPLACE THE GRANULAR THICKNESS BELOW CONCRETE.
6. PROVIDE 6 MIL POLY MOISTURE BARRIER (WELL LAPPED AND SEALED) BETWEEN COMPACTED GRANULAR BASE AND CONCRETE SLAB UNLESS NOTED OTHERWISE.
7. REFER TO PLAN DRAWINGS FOR SURFACE SLOPES, SEALERS, AND HARDENERS, ETC.
8. INSTALL SAWCUTS AT A MAXIMUM SPACING OF THIRTY TIMES THE SLAB THICKNESS (30XS1 OR 30XHS2). SAWCUTS TO BE 1/4 OF THE SLAB THICKNESS IN DEPTH AND 3mm (1/8") WIDE. DO NOT CUT THROUGH REINFORCING IN THE SLAB. CUT NO SOONER THAN 24 HOURS AND NO LATER THAN 48 HOURS AFTER SLAB IS POURED. FILL SAWCUTS WITH APPROVED BITUMINOUS COMPOUND OR CAULKING.
9. REINFORCING SPLICES: REFER TO TABLE E.1.
10. REINFORCING CONCRETE COVER: REFER TO TABLE E.2.

REINFORCING STEEL

1. REINFORCING STEEL SHALL BE NEW BILLET, DEFORMED BARS, MINIMUM 400MPa TO CSA G30.18-09 (R2014).
2. REINFORCING STEEL SHALL BE DETAILED IN ACCORDANCE WITH THE LATEST RSIC REINFORCING STEEL MANUAL OF STANDARD PRACTICE.
3. ALL REINFORCING TO BE HELD IN PLACE AND TIED BY THE USE OF PURPOSE MADE ACCESSORIES SUCH AS HI-CHAIRS, SPACERS, ETC. SUPPORTS MUST BE PLASTIC OR CONCRETE, AND OF NON-POROUS AND NON-DELETERIOUS NATURE.
4. REINFORCEMENT SUPPORT SPACING SHALL BE AS FOLLOWS:
   a. MAXIMUM SPACING FOR 10M BARS – 610mm (24") O/C
   b. MAXIMUM SPACING FOR 15M BARS – 915mm (36") O/C
   c. MAXIMUM SPACING FOR 20M AND GREATER – 1220mm (48") O/C
5. SUBMIT SHOP DRAWINGS WHICH CLEARLY INDICATE BAR SIZES, GRADE, SPACING, HOOKS, BENDS, SUPPORTING/SPACE DEVICES, ETC. FOR REVIEW PRIOR TO FABRICATION.
6. PRIOR TO PLACING CONCRETE, ENSURE THAT ALL REINFORCING STEEL IS CLEAN, FREE OF LOOSE SCALE, RUST, MUD, OIL, OR OTHER FOREIGN MATERIAL THAT WOULD REDUCE BOND.
7. HEATING, QUENCHING, AND BENDING OF REINFORCING STEEL ON THE SITE IS NOT PERMITTED. BENDING MAY BE PERMITTED BY THE ENGINEER OF RECORD ONLY, AND MUST BE DONE AS DIRECTED BY THE E.O.R.
8. ADJUST REINFORCING TO AVOID OPENINGS LESS THAN 300mmX300mm (12"x12") WITHIN THE MAIN FLOOR SLAB. FOR LARGER OPENINGS MINIMIZE CUTTING APPLICABLE BARS AND PROVIDE ADDITIONAL REINFORCING AS FOLLOWS: 1-10M EACH SIDE OF THE OPENING AND 1-10M ANGLED BAR ON EACH CORNER OF THE OPENING (8 ADDITIONAL BARS TOTAL). ALL 10M BARS TO EXTEND BEYOND THE OPENING 350mm (14").
9. REINFORCING SPLICES: REFER TO TABLE E.1.
10. REINFORCING CONCRETE COVER: REFER TO TABLE E.2.

GEOTECHNICAL INFORMATION

1. SOIL BEARING CAPACITY (ASSUMED USING TABLE 9.4.4.1 OF NBCC 2020) – 150 kPa ON FIRM CLAY
2. SOIL BEARING CAPACITY SHALL BE CONFIRMED BY A GEOTECHNICAL ENGINEER LICENCED IN THE PROVINCE OF ALBERTA, IN GOOD STANDING, PRIOR TO THE PLACEMENT OF FORMWORK AND REINFORCEMENT. A CONFIRMATION LETTER SHALL BE SUBMITTED TO THE E.O.R.

SITE PREPARATION

1. CONTRACTOR AGREES TO PROVIDE THE LABOUR, EQUIPMENT AND MATERIAL NECESSARY FOR ALL OF THE EXCAVATION AND FILL WORK REQUIRED FOR THE COMPLETION OF THE WORK DESCRIBED WITHIN.
2. EXCAVATIONS SHALL BE EXECUTED WITH IN ACCORDANCE OF THE MOST RECENT REVISION OF THE OCCUPATION HEALTH AND SAFETY CODE OF THE PROVINCE OF JURISDICTION.
3. STRIP AND STOCKPILE TOPSOIL AS PER REGULATIONS OF THE LOCAL JURISDICTION.
4. BACKFILL MATERIAL SHALL CONSIST OF CLEAN, WELL GRADED GRANULAR SOILS FREE OF ORGANIC MATERIAL, SILT AND CLAY AS SPECIFIED IN THE EARTH WORKS SPECIFICATION SECTION.
5. BACKFILLING SHALL BE CARRIED OUT IN A MAXIMUM LIFTS OF 300 mm (12 INCHES) OF LOOSE FILL, EACH COMPACTED THE STANDARD PROCTOR MAXIMUM DRY DENSITY INDICATED IN THE SPECIFICATIONS.
6. DO NOT PLACE BACKFILL AGAINST WALLS RETAINING EARTH (OTHER THAN CANTILEVER WALLS) UNTIL THE WALLS AND THE FLOOR CONSTRUCTION AT TOP AND BOTTOM OF THE WALLS HAVE BEEN CAST AND ATTAINED THEIR DESIGN STRENGTH.
7. WHERE BACKFILL IS PLACED ON EACH SIDE OF FOUNDATION WALLS, DO NOT EXCEED A GRADE DIFFERENCE OF 600 mm THROUGHOUT THE PLACEMENT AND COMPACTION OF BACKFILL, UNLESS NOTED OTHERWISE ON THE DRAWINGS.
8. WHERE THE SLAB ON GRADE IS USED TO TIE THE TOP OF A WALL RETAINING EARTH, THAT WALL SHALL BE ADEQUATELY SHORED UNTIL THE SLAB HAS BEEN CAST AND ATTAINED ITS DESIGN STRENGTH.
9. USE LIGHT, HAND-OPERATED COMPACTING EQUIPMENT TO COMPACT BACKFILL ADJACENT TO FOUNDATION WALLS OR RETAINING WALLS.
10. EXCAVATED MATERIAL SHALL BE LEGALLY DISPOSED OF, STORED AT THE SITE, OR USED FOR BACKFILLING OPERATIONS AS REQUIRED IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERS RECOMMENDATIONS AND PROJECT SPECIFICATIONS.
11. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE GEOTECHNICAL INFORMATION AND TO OBTAIN HIS OWN DATA AND TO POINT DISCREPANCIES TO THE CONSULTANT WHERE THEY OCCUR.
12. CONTRACTOR SHALL CARRY OUT EXCAVATION, DEWATERING, BACKFILLING, PILING AND FOUNDATION CONSTRUCTION IN ACCORDANCE WITH RECOMMENDATIONS OF SOILS REPORT COMMISSIONED BY THE CONTRACTOR.
13. EXCAVATIONS SHALL BE COMPLETED WITHIN THE SAFETY STANDARDS OF THE JURISDICTION. SHOULD SLOPES DIFFER FROM PRINTED VALUES IN THE MOST RECENT REVISION OF THE JURISDICTIONAL OCCUPATIONAL HEALTH AND SAFETY MANUAL, IT MUST BE SIGNED OFF AB 'SAFE' BY A LICENCED PROFESSIONAL GEOTECHNICAL ENGINEER PRACTICING WITHIN THE PROVINCE OF THE EXCAVATION.
14. KNOWN PUBLIC UTILITY NETWORKS ARE SHOWN TO THE BEST AVAILABLE INFORMATION BUT CAN NOT BE GUARANTEED. CONTRACTOR SHALL, AT THEIR OWN EXPENSE, AUTHORIZE UTILITY LOCATES AND ACCEPT RESPONSIBILITY FOR EXCAVATION THAT MAY CAUSE DAMAGE TO EXISTING UTILITY.
15. CONTRACTOR SHALL MAKE GOOD ANY DAMAGE TO EXISTING FACILITIES, UTILITIES AND INFRASTRUCTURE NOT NOTED ON THE DRAWINGS BUT WITHIN THE WORK AREA.

TABLE C.1: CONTROLLED CONCRETE PARAMETERS

CONCRETE SECTION	DESIGN STRENGTH	MAX. AGGREGATE	EXPOSURE CLASS	AIR CONTENT	MAX SLUMP	CEMENT TYPE
RETAINING WALL	32 MPa	9.5 mm (3/8")	GU	4 - 7%	80-120 mm	GU/GUb
SLAB ON GRADE	32 MPa	20 mm (3/4")	HS	4 - 7%	50-80 mm	HS/HSe

TABLE E.1: REINFORCEMENT SPLICE

BAR DIAMETER	SPLICE LENGTH
10M	325 mm (13")
15M	400 mm (16")
20M	650 mm (28")

TABLE E.2: REINFORCEMENT CONCRETE COVER

LOCATION	CONCRETE COVER
CONCRETE CAST AGAINST EARTH	75 mm (3")
CONCRETE CAST AGAINST FORMS	50 mm (2")
SLABS	40 mm UNO

DESIGN NOTES

FLOOR DESIGN LOADS (UNFACTORED)		
TYPE	LOCATION	LOAD (kPa)
MANURE FLUID LOAD	SLAB	38.3 kPa

DESIGN VALUES (UNFACTORED)	
TYPE	LOAD (kN/M3)
MANURE FLUID DENSITY	7.85

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PROJECT: BLUEGRASS COLONY VESSEL
BLUEGRASS COLONY
WARNER, AB

DRAWING TITLE: STRUCTURAL NOTES

JOB NO: AB010.30003

DRAWN BY: DBW | CHECKED: DJR

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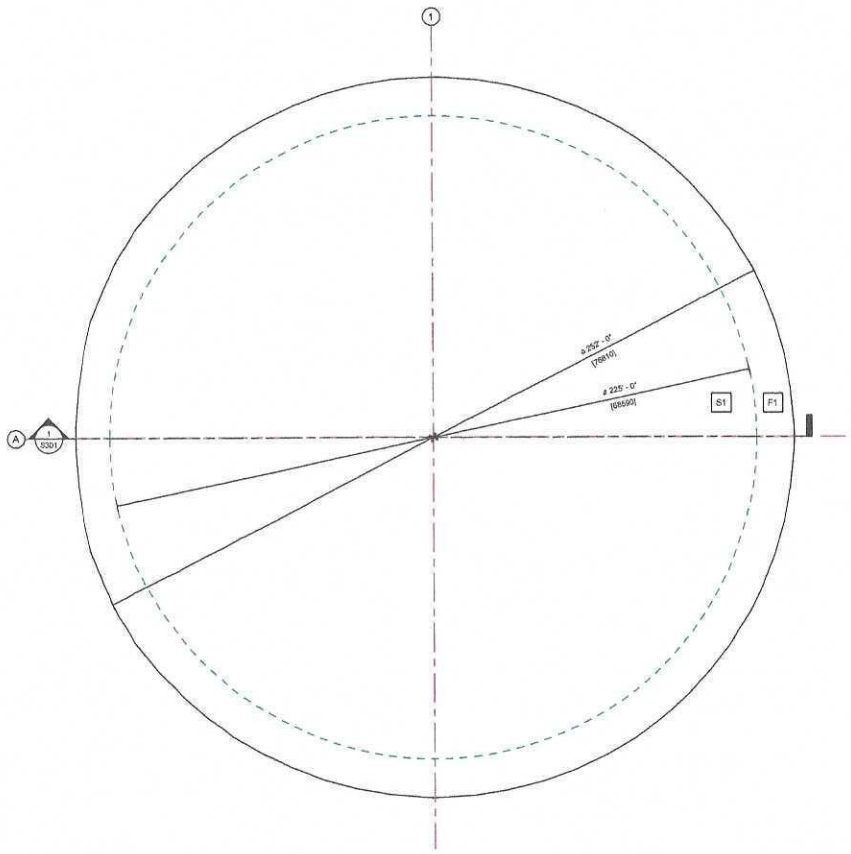
ISSUE FOR CONSTRUCTION



1 S101 **FOUNDATION PLAN**
1" = 20'-0"

Floor Schedule		
Type Mark	Default Thickness	Notes
F1	0' - 0"	REBAR AS DETAILED
S1	0' - 6"	15M @ 300mm E/W

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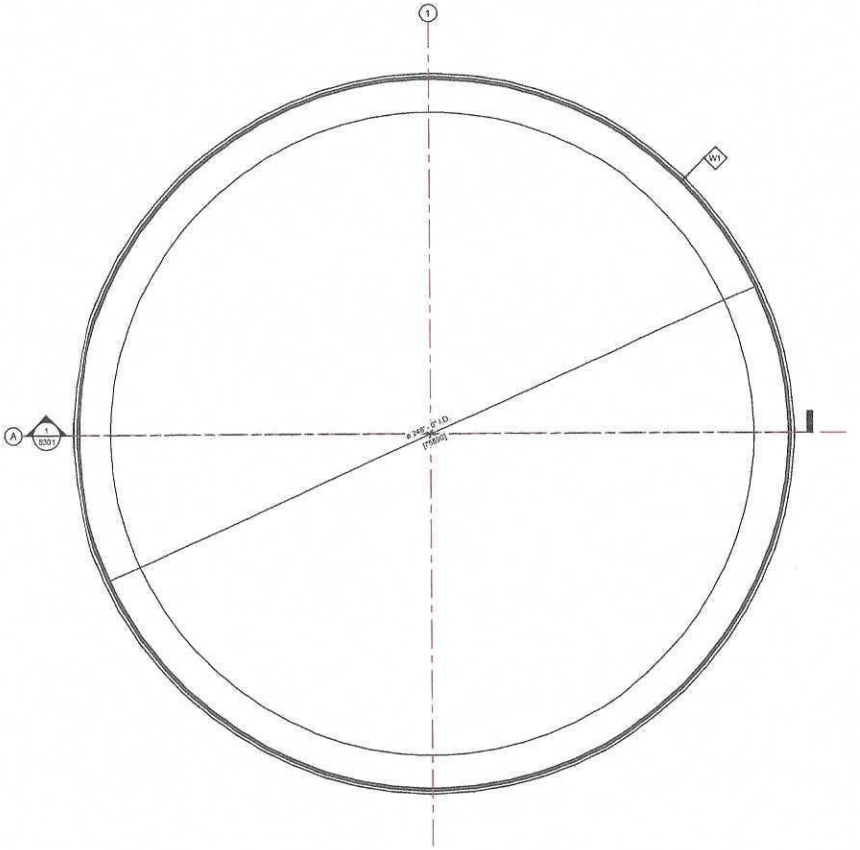

1 S102 **WALL LAYOUT**
1" = 20'-0"

Wall Schedule	
Type Mark	Type Comments
W1	OCTAFORM 12" WALL PANEL c/w REBAR AS DETAILED

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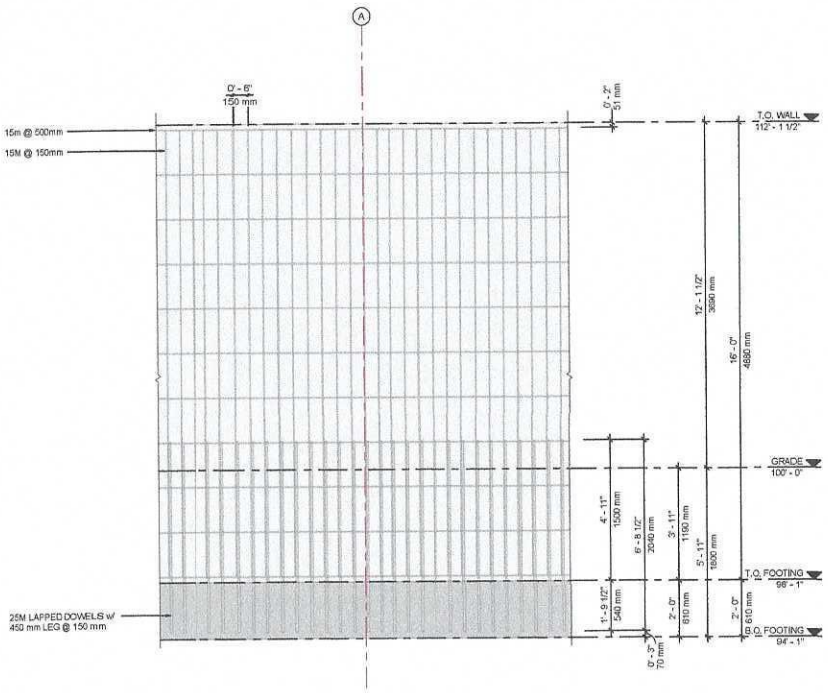
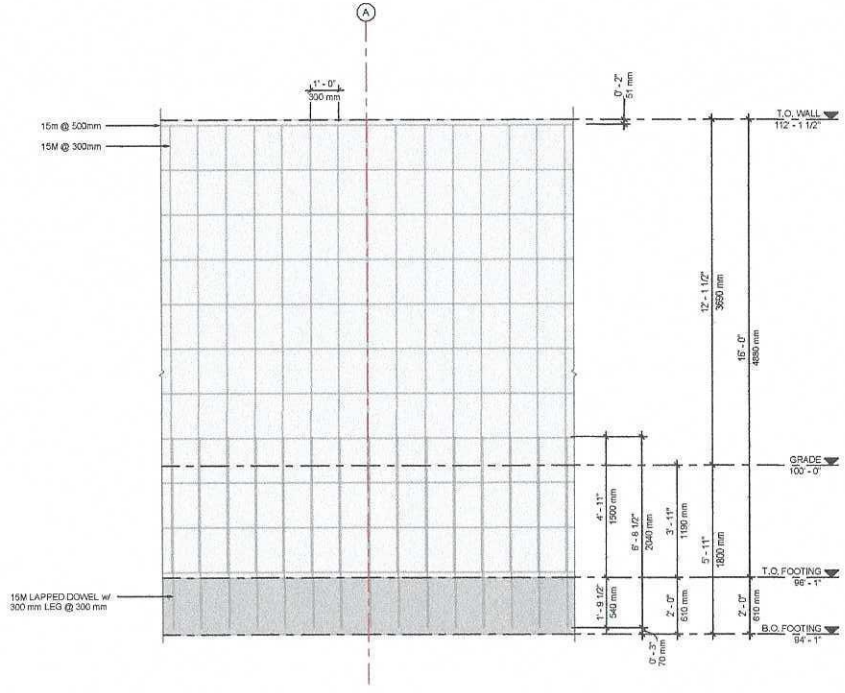


NOTE:
1. FOOTING BARS NOT SHOWN FOR CLARITY.

1 S201 **VESSEL WALL INTERIOR REBAR DETAIL**
1/2" = 1'-0"



NOTE:
1. FOOTING BARS NOT SHOWN FOR CLARITY.

2 S201 **VESSEL WALL EXTERIOR REBAR DETAIL**
1/2" = 1'-0"

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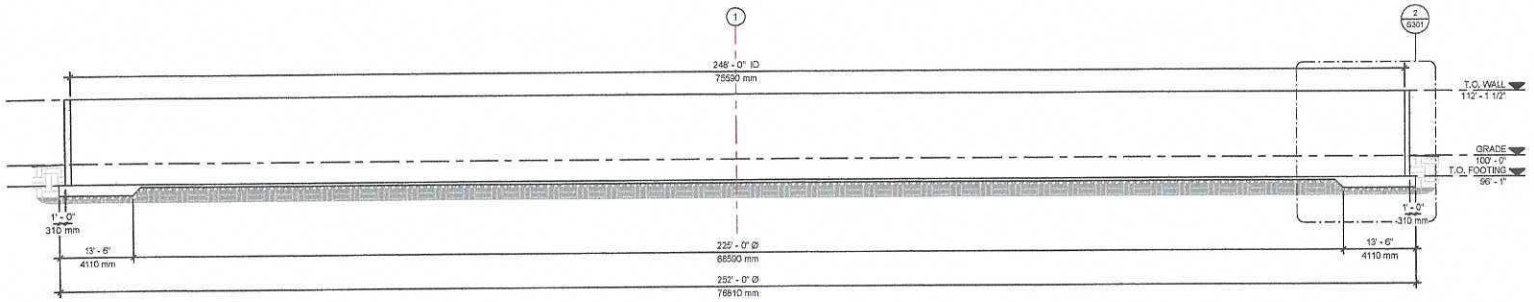
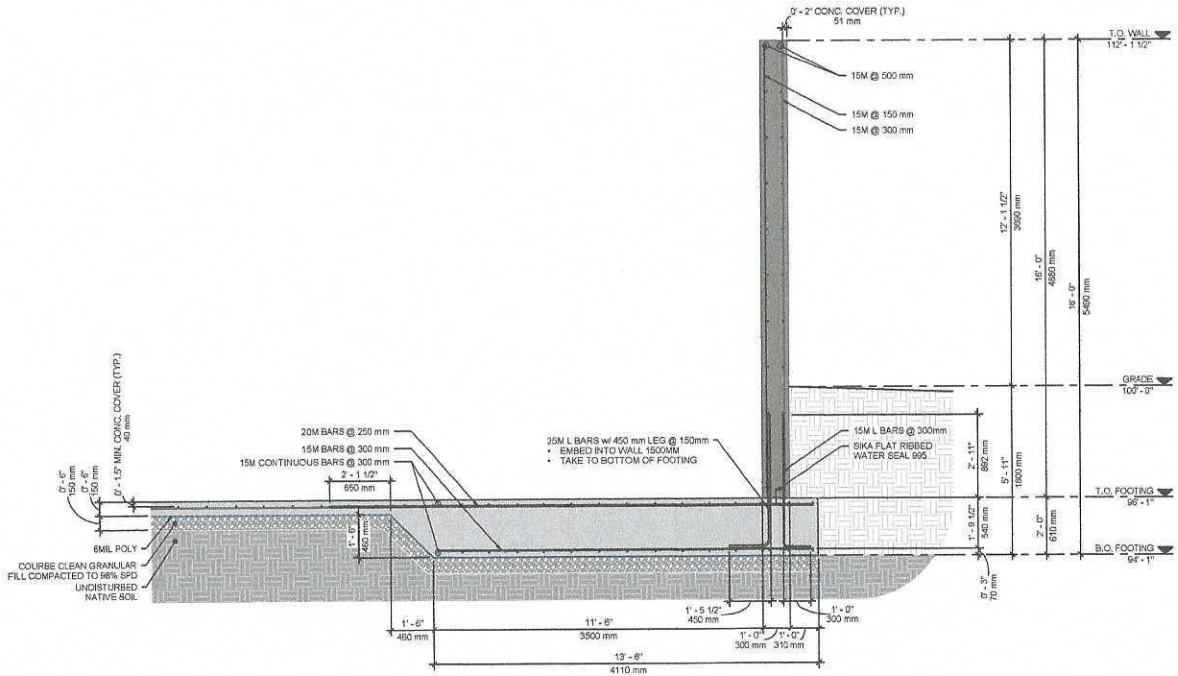


1 S301 **CROSS SECTION**
3/32" = 1'-0"



2 S301 **VESSEL CALLOUT**
1/2" = 1'-0"

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JOB NO: AB010.30003

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DBW	DJR

DWG NO.	SCALE
S301	AS SHOWN

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AO Comment: Drilling logs for the purpose of determining height of water table.

CHILAKO DRILLING SERVICES

BOX 942 COALDALE, ALBERTA ~~TOKOLO~~ TIM-HM8
TELEPHONE: (403) 345-~~4051~~ 3710

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Hole Number	Location	Depth (cm)	Texture	Moisture	Geological Unit	Sample	Remarks
#1	NW	corner of	sewage	lagoon.			
	SW27-5-16-4	0-0.3	CL	F	Topsoil		
	≈35 meters	0.3-0.6	↓	D	Till		
	SE of corner	0.6-0.9	↓	↓	↓	0.6-3.0	Trace sand, pebbles
		0.9-1.2	↓	↓	↓	↓	↓
		1.2-1.5	CL	↓	↓	↓	↓
		1.5-2.0	↓	M	Till	↓	gypsum salts med.
		2.0-3.0	↓	↓	↓	↓	V. Firm - stiff
		3.0-4.5	CL	M	Till	3.0-9.0	stiff, iron stains
		4.5-7.8	CL	M	↓	↓	coal chips
		7.8-9.2	CL	M	↓	a few	small sat. sand
							stringers
#2	SW27-5-16-4	0-0.3	CL	F	Topsoil		
	≈40 meters	0.3-0.6	↓	D	Till		V. Firm -
	SW of NE	0.6-0.9	↓	M	↓	0.6-3.0	V. Firm - stiff, coal
	corner	0.9-1.2	↓	↓	↓	↓	chips, gypsum salts
		1.2-1.5	↓	↓	↓	↓	firm - V. firm
		1.5-3.0	↓	M	Till	↓	med plastic
		3.0-4.7	FSL	UM-ST	↓	3.0-4.5	- stones
		4.7-6.0	CL	M	↓	↓	gravelly
		6.0-9.2	↓	↓	↓	↓	↓ } rocks
#3	SW27-5-16-4	0-0.3	CL	F	Topsoil		
	40 meters	0.3-0.6	↓	M	Till		
	NW of SE	0.6-0.9	↓	↓	↓	↓	V. Firm
	corner	0.9-1.2	↓	↓	↓	↓	↓ med plastic
		1.2-1.5	↓	↓	↓	↓	stiff, pebbles
		1.5-3.0	CL	M	↓	1.5-4.5	↓ ↓ coal
		3.0-4.5	↓	↓	↓	↓	↓ chips
		4.5-6.0	↓	↓	↓	4.5-9.2	↓
		6.0-7.5	↓	↓	↓	↓	↓
		7.5-9.2	↓	↓	↓	↓	↓ ↓ ↓

CHILAKO DRILLING SERVICES

BOX 942 COALDALE, ALBERTA TOK OLO
TELEPHONE: (403) 345-4051

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Hole Number	Location	Depth (m)	Texture	Moisture	Geological Unit	Sample	Remarks
4	SW 27-5-16-4	0-0.3	CL	F	Topsoil		
	≈ 40 meters	0.3-0.6	↓	D	Till		
	NE of SW	0.6-0.9	↓	↓	↓		
	corner	0.9-1.2	↓	↓	↓		U. Firm med. plastic
		1.2-1.5	↓	M	↓		↓
		1.5-3.0	↓	↓	↓	1.5-3.0	U. firm - stiff ↓
		3.0-4.5	CL	↓	↓		↓, Trace sand
		4.5-6.0	↓	M	Till		stiff, stones
		6.0-7.5	↓	↓	↓		↓ ↓
		7.5-9.2	↓	↓	↓		↓ ↓
5	SW 27-5-16-4	0-0.3	CL	F	Topsoil		
	≈ 32 meters	0.3-0.6	↓	D	Till		
	SW of Hole	0.6-0.9	↓	D	↓		
	#2	0.9-1.2	↓	M	↓		U. Firm med plast
		1.2-1.5	↓	↓	↓		↓
		1.5-3.0	CL	↓	↓		↓
		3.0-4.5	↓	↓	↓		stiff, pebbles
		4.5-6.2	CL	M	Till		↓ ↓
			a few sand streaks			4.5-6.2	(moist) (minor)
6	23 meters South	0-0.3	CL	F	Topsoil		
	of #2	0.3-0.6	↓	D	Till		
	SW 27-5-16-4	0.6-0.9	↓	↓	↓		
		0.9-1.2	↓	↓	↓		U. firm - stiff
		1.2-1.5	↓	M	↓		↓ med plastic
		1.5-3.0	CL	M	Till		↓ ↓
		3.0-3.3	↓	↓	↓		stiff
		3.3-3.5	SL	VM	↓		
		3.5-4.5	CL	M	↓		stiff med plastic

CHILAKO DRILLING SERVICES

BOX 942 COALDALE, ALBERTA ~~T0K 0L0~~ T1M -1M5
TELEPHONE: (403) 345-~~4651~~ 3710

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Hole Number	Location	Depth	Texture	Moisture	Geological Unit	Sample	Remarks
7	SW27-5-16-4	0-0.3	CL	F	Topsoil		
	23 meters	0.3-0.6	↓	D	Till		
	SW of NW	0.6-0.9	↓	↓	↓		V. Firm, med plastic
	corner.	0.9-1.2	↓	↓	↓		stiff
	Primary lagoon	1.2-1.5	↓	M	↓		↓
		1.5-2.6	CL	M	Till	1.5-4.5	stiff
		2.6-3.0	CL	VM	↓		V. Firm
		3.0-3.4	↓ *	↓	Till		* Sand lenses in Till (V.F
		3.4-4.2	↓	M	↓		V. Firm, pebbles
		4.2-4.5	↓ *	S.T	↓		* Course Sand layers (S.T
		4.5-6.0	CL	M	Till		
		6.0-7.5	CL	M-VM	↓		Trace sand
		7.5-8.6	CL	↓	Till		↓
		8.6-9.2	FSL	S.T	↓		
8	SW27-5-16-4	0-0.3	CL	F	Topsoil		
	SW of #7	0.3-0.6	↓	D	Till		
	by 26 meters	0.6-0.9	↓	↓	↓		
		0.9-1.2	↓	↓	↓		
		1.2-1.5	↓	↓	↓		V. Firm med plastic
		1.5-3.0	CL	SM	Till		stiff
		3.0-4.5	↓	↓	↓	3.0-8.0	↓
		4.5-6.0	↓	↓	↓		↓
		6.0-7.0	↓	↓	↓		↓
		7.0-8.2	↓	↓	↓		↓
		8.0-9.0	C	↓	↓		V. stiff, gray

CHILAKO DRILLING SERVICES

BOX 942 COALDALE, ALBERTA ~~T0K0L0~~ T1M-1M8
TELEPHONE: (403) 345-~~4051~~ 3710

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Hole Number	Location	Depth	Texture	Moisture	Geological Unit	Sample	Remarks
9	SW27-5-16-4	0-0.3	CL	F	Topsoil		
	36 ~~meters~~ NW	0.3-0.6	↓	D	Till		
	of 8	0.6-0.9	↓	↓	↓		
		0.9-1.2	↓	↓	↓		
		1.2-1.5	↓	↓	↓		STIFF, med plastic
		1.5-3.0	CL	M	Till		↓
		3.0-4.5	↓	↓	↓	3.0-9.0	
		4.5-6.0	↓	↓	↓		
		6.0-7.5	↓	↓	↓		
		7.5-9.2	CL	↓	↓		↓
10	SW27-5-16-4	0-0.3	CL	F	Topsoil		
	28 ~~meters~~ SW	0.3-0.6	↓	D	Till		
	of 9	0.6-0.9	↓	↓	↓		
		0.9-1.2	↓	↓	↓		
		1.2-1.5	↓	M	↓		
		1.5-2.0	CL	↓	↓	1.5-3.0	Trace sand V. Firm
		2.0-2.3	↓	VM	↓		↓ firm
		2.3-4.2	↓	M	↓		↓ V. Firm
		4.2-5.1	SL	SaT	Till	4.2-5.1	SOFT, Clay lenses
		5.1-6.3	CL	M	↓		STIFF
		6.3-7.2	SCL	SaT	↓		SOFT
		7.2-9.2	C	M	Till		STIFF

CHILAKO DRILLING SERVICES

BOX 942 COALDALE, ALBERTA ~~T0K 0L0~~ T1M-1M8
TELEPHONE: (403) 345-~~4051~~ 3710

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Hole Number	Location	Depth	Texture	Moisture	Geological Unit	Sample	Remarks
11	SW27-5-16-4	0-0.3	CL	F	Topsoil		
	~~45~~ meters	0.3-0.6	↓	D	Till		
	NW of SE	0.6-0.9	↓	↓	↓		
	Corner of	0.9-1.2	↓	↓	↓		
	Reservoir	1.2-1.5	↓	↓	↓		stiff
		1.5-2.8	CL	M	Till		↓
		2.8-4.8	CL	M	Till	2.8-4.8	stiff, Trace sand + gravel
		4.8-6.9	M-SL	SaT	Till		Trace gravel
		6.9-7.5	C	M	↓		stiff
12	SW27-5-16-4	0-0.3	CL	F	Topsoil		
	~~38~~ meters	0.3-0.6	↓	D	Till		
	~~W~~SW of 11	0.6-0.9	↓	↓	↓		
		0.9-1.2	↓	↓	↓		
		1.2-1.5	↓	M	↓		stiff, low plastic
		1.5-2.1	CL	↓	Till		↓
		2.1-3.0	↓	↓	↓	low-med plastic	V. firm, Trace sand
		3.0-4.5	CL	M	↓		stiff ↓
13	SW27-5-16-4	0-0.3	CL	F	Topsoil		
	66 meters	0.3-0.6	↓	D	Till		
	N-NW of 12	0.6-0.9	↓	↓	↓		Trace sand
		0.9-1.2	↓	↓	↓		↓
		1.2-1.5	↓	SM	↓		↓ V. firm
		1.5-3.0	CL	M	Till		Trace sand
		3.0-4.5	↓	↓	↓	3.0-4.5	↓ ↓
		4.5-6.2	CL-C	SM	↓		stiff, rocks

CHILAKO DRILLING SERVICES

BOX 942 COALDALE, ALBERTA ~~T0K 0L0~~ T1M-1M8
TELEPHONE: (403) 345-~~4951~~ 3710

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Hole Number	Location	Depth	Texture	Moisture	Geological Unit	Sample	Remarks
14	SW27-5-16-4	0-0.3	CL	F	Topsoil		
	≈70 meters	0.3-0.6		D	Till		
	N-NE of 13	0.6-0.9					
		0.9-1.2		↓			
		1.2-1.5	↓	SM	↓		stiff
		1.5-3.0	CL	M	Till		↓, high plastic
		3.0-4.5	CL	↓	↓		clay layers
		4.5-5.8	CL	↓	↓		↓
		5.8-6.2	SL	SAT	↓		
15	SW27-5-16-4	0-0.3	CL	F	Topsoil		
	≈ 51 meters	0.3-0.6		F	Till		
	SE of NW	0.6-0.9		D			stiff
	corner	0.9-1.2	↓	D			↓
		1.2-1.5	CL	SM			
		1.5-3.0	CL			(1.5-2.0) sand lenses (1)	
		3.0-4.5					stiff
		4.5-6.2	↓	↓	↓		↓
16	SW27-5-16-4	0-0.3	CL	F	Topsoil		
	≈65 meters	0.3-0.6		D	Till		
	S of 15	0.6-0.9		D			
		0.9-1.2	↓	M			stiff, rocks
		1.2-1.5	CL				
		1.5-3.0					
		3.0-4.5	↓	↓	↓		↓
		4.5-4.8	SCL	VM-SAT	Till		soft
		4.8-6.2	CL	M	↓		some gravel

CHILAKO DRILLING SERVICES

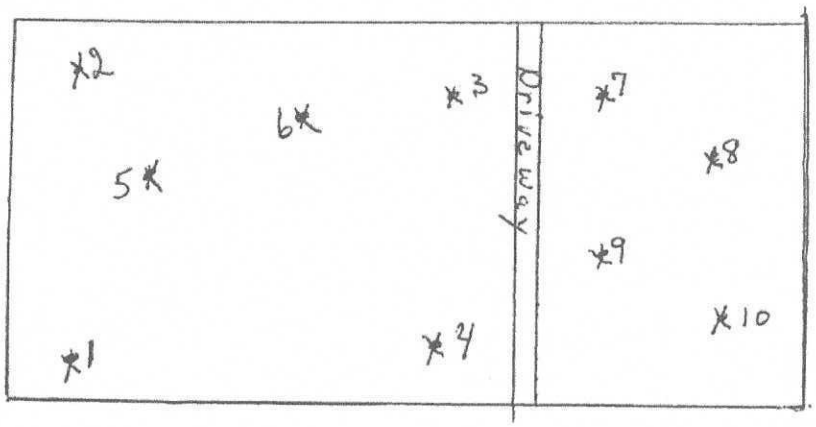
BOX 942 COALDALE, ALBERTA ~~TOK 0L0~~ T1M-1M8
TELEPHONE: (403) 345-~~4051~~ 3710

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Hole Number	Location	Depth	Texture	Moisture	Geological Unit	Sample	Remarks
17	SW20-5-16-4	0-0.3	CL	F	Topsoil		
	~50 metres	0.3-0.6		D	Till		
	south of 16	0.6-0.9		D			
		0.9-1.2	↓	M			Firm - U. Firm
		1.2-1.5	CL				↓
		1.5-3.0	CL				
		3.0-4.5	CL	↓			
		4.5-4.8	SCL	SaT			
		4.8-6.2	SL	VM	↓		loose

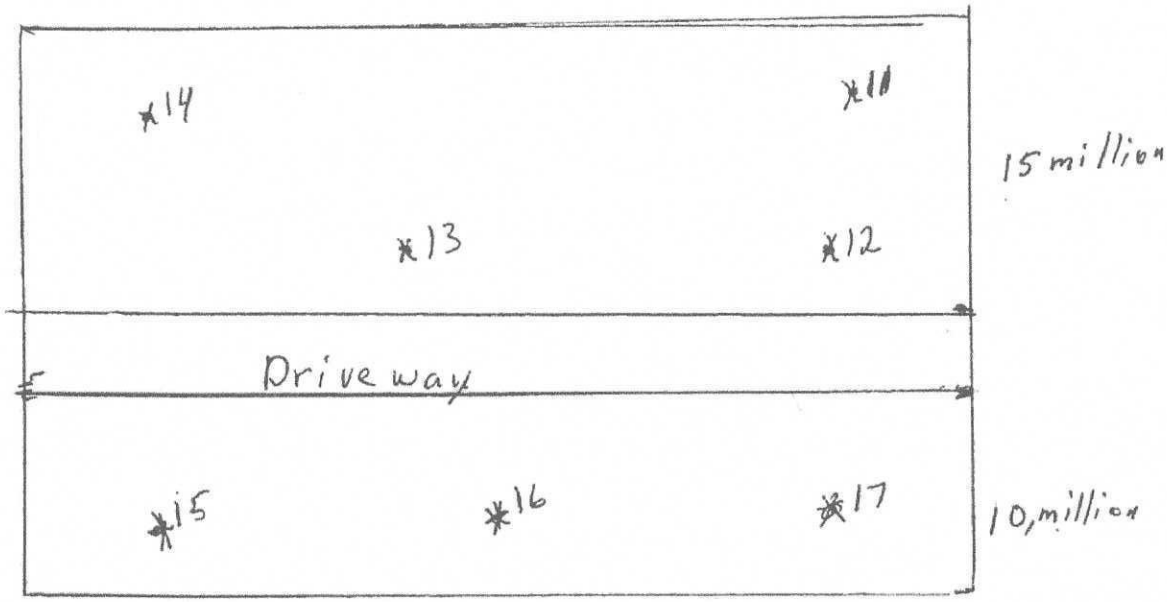
East

Lagoon



rth

South



West