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	BA25001	NW 24-68-22 W4M

APPLICATION DISCLOSURE

This information is collected under the authority of the *Agricultural Operation Practices Act* (AOPA), and is subject to the provisions of the *Freedom of Information and Protection of Privacy Act*. This information is public unless the NRCB grants a written request that certain sections remain private.

Any construction prior to obtaining an NRCB permit is an offence and is subject to enforcement action, including prosecution.

I, the applicant, or applicant's agent, have read and understand the statements above, and I acknowledge that the information provided in this application is true to the best of my knowledge.

April 30, 2025
Date of signing

[redacted]
Signature

Deep Creek Farms Inc 2020
Corporate name (if applicable)

Wesley Walter
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)	
Feedlot Pens	470m 102m	
Catch Basin	85m 60m 4.5m	
Cattle handling / Processing		Ancillary, not considered CFO facilities 61 m x 102 m based on site drawing.
Commodity / Silage Pad		Ancillary, not considered CFO facilities 61 m x 143 m based on site drawing.

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

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

NRCB USE ONLY

Application for new CFO

Last updated September 11, 2023

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

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

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

Construction completion date for proposed facilities December 30, 2028

Additional information

Application for new CFO

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**
finishers (beef)	0	3000	3000

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 _____

Signed this ____ day of _____, 20____. _____

Signature of Applicant or Agent

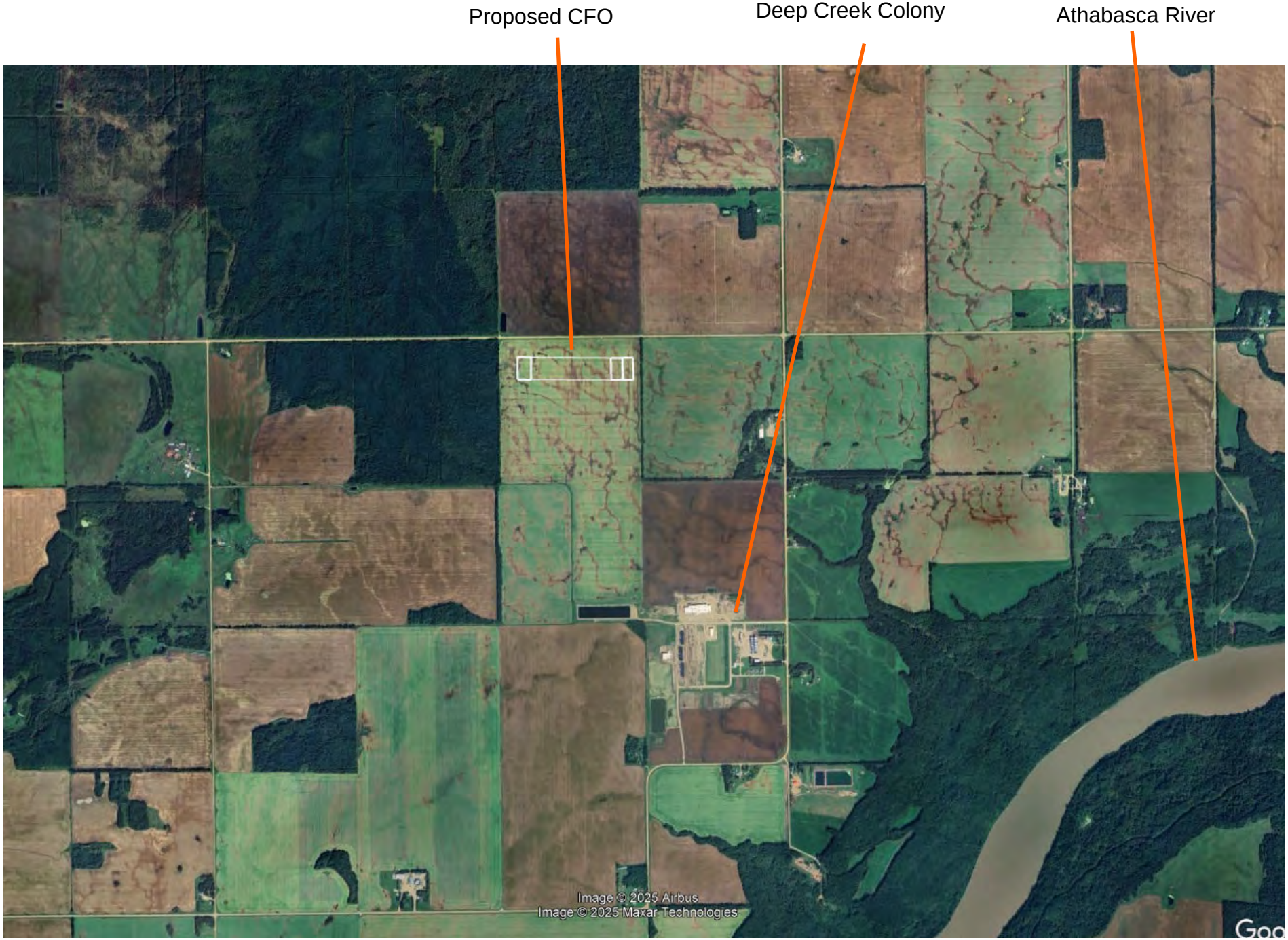
OPTION 4: Uncertain if *Water Act* licence is needed; acknowledgement of risk (for existing CFOs only)

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

Signed this 30 day of April, 2025.

[redacted]

Signature of Applicant or Agent


Proposed CFO
Deep Creek Colony
Athabasca River
Image © 2025 Airbus
Image © 2025 Maxar Technologies


Processing
Seasonal drainage
Pens
Catch basin
Commodities
Community hall
Image © 2025 Airbus

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

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

GENERAL ENVIRONMENTAL INFORMATION

(complete this section for the worst case of the existing facility which is the closest to water bodies or water wells and for each of the proposed facilities)

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

Existing: _____ **Proposed 1:** Feedlot

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

Facility and environmental risk information		Facilities				NRCB USE ONLY	
		Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
Flood plain information	What is the elevation of the floor of the lowest manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	☐ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☐ >1 m ☐ ≤ 1 m	☐ > 1 m ☐ ≤ 1 m	☑ YES ☐ NO ☐ YES with exemption	Not in flood plain
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?		0			☑ YES ☐ NO ☐ YES with exemption	None known
	How many water wells are within 100 m of the manure storage facility or manure collection area?		0			☑ YES ☐ NO ☐ YES with exemption	None within 100 m
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)		200m			☑ YES ☐ NO ☐ YES with exemption	67 m seasonal drainage
Groundwater information	What is the depth to the water table?		5.7			☑ YES ☐ NO ☐ YES with exemption	5.7 m as per engineering report
	What is the depth to the groundwater resource/aquifer you draw water from?		>6 m			☑ YES ☐ NO ☐ YES with exemption	no wells within 800m

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

Part 2 — Technical Requirements

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

NRCB USE ONLY

ENVIRONMENTAL RISK SCREENING INFORMATION

ERST for **proposed** facilities

Facility	Groundwater score	Surface water score	File number
See Decision Summary BA25001			

ERST for **existing** facilities

Facility	Groundwater score	Surface water score	File number
N/A			

ERST related comments:

Part 2 — Technical Requirements

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

NRCB USE ONLY

WATER WELL AND SURFACE WATER INFORMATION

Well IDs: n/a _____ _____ _____

_____ _____ _____

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

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

Water wells ☑ N/A

If applicable, exemption for 100 m distance requirements applied: ☐ YES ☐ NO Condition required: ☐ YES ☐ NO

Surface water ☑ N/A

If applicable, exemption for 30 m distance requirements applied: ☐ YES ☐ NO Condition required: ☐ YES ☐ NO

Water Well Exemption Screening Tool ☑ N/A

Water Well ID	Preliminary Screening Score	Secondary Screening Score	Facility

Groundwater or surface water related comments:

No wells within 800m of location. 30 m setback to a seasonal drainage met. Concerns addressed in Decision Summary BA25001.

Part 2 — Technical Requirements

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

NRCB Natural Resources Conservation Board

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

	Neighbour name(s)	Legal land description	Distance (m)	NRCB USE ONLY: Zoning (LUB) category	MDS category (1-4)	Distance (m)	Waiver attached (if required)	Meets regulations
①	Salamon	NE 24 68 22 w4	970	Ag	Cat 1	949 m	n/a	yes
②	Wolanuk	SW 19 68 21 w4	1000	Ag	Cat 1	1102 m		yes
③	Lamoureux	SW 19 68 21 w4	1200	Ag	Cat 1	1274 m		yes
④	Holt	SE 25 68 22 w4	1000	Ag	Cat 1	1150 m		yes
⑤	Roberge	NW 30 68 21 w4	1400	Ag	Cat 1	1478 m		yes

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

Name of land owner(s)*	Legal land description	Usable area** (ha)	Soil zone ***	NRCB USE ONLY: Usable area (ha)	Agreement attached (if required)
Deep Creek	SW/NE 25-68-22-W4	308	grey wooded		n/a
	W½ 32-68-21-W4	308		Applicant has provided adequate land base, see attached map	
	E½ 5-69-21-W4	308			
	See attached				
			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)

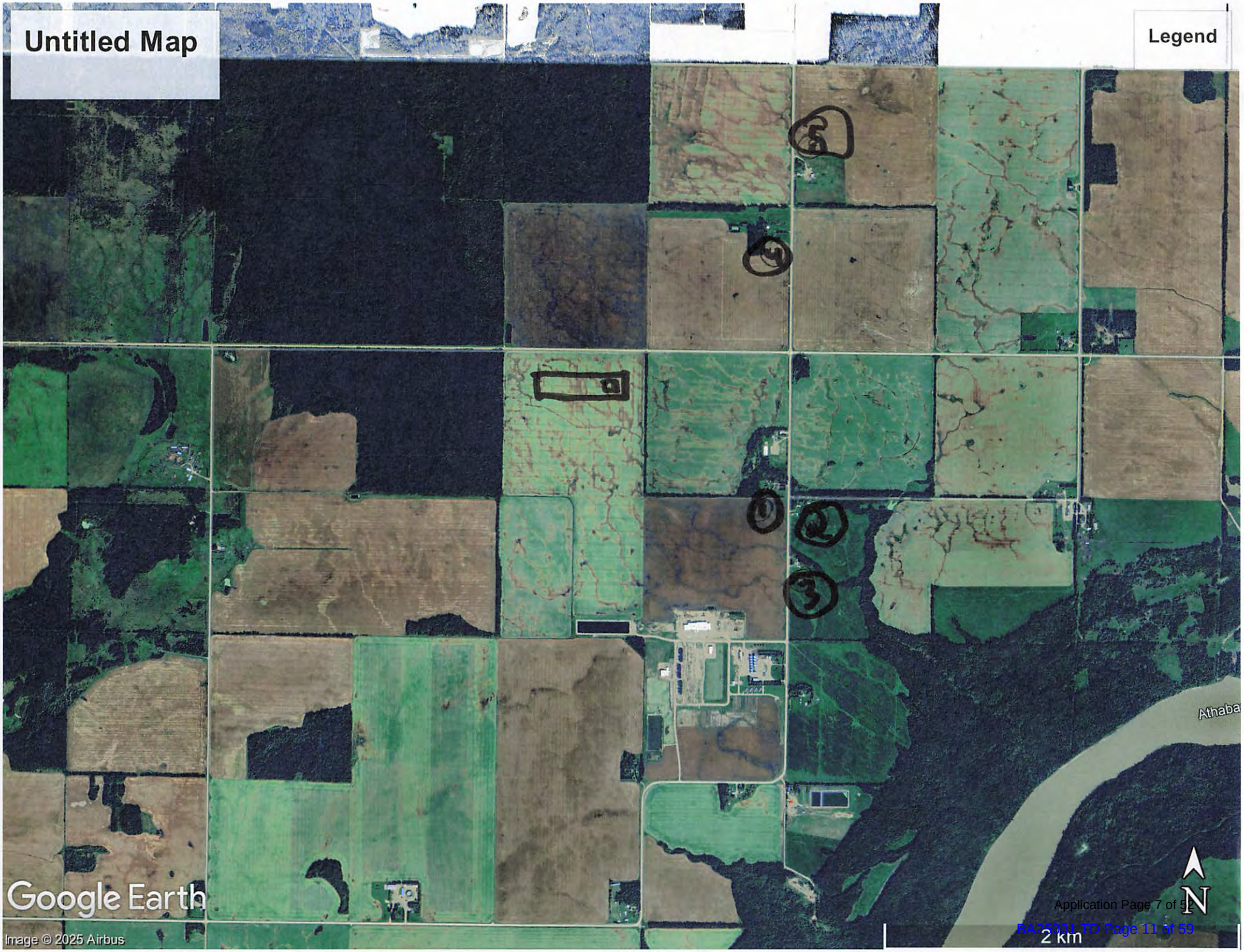

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Image © 2025 Airbus
2 km
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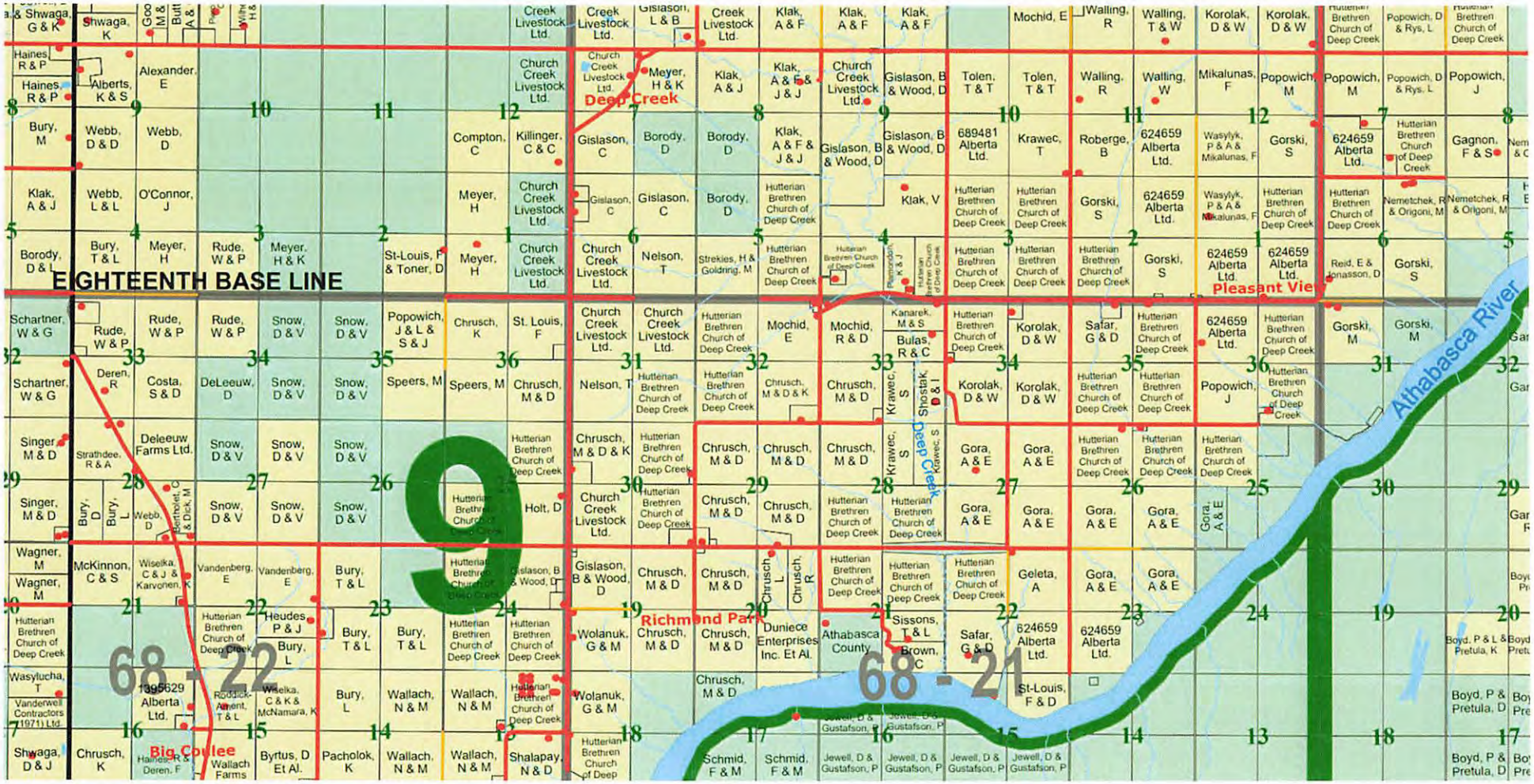


Hutterian Brethren Church of Deep Creek land is available spreading quarters.

Part 2 — Technical Requirements

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

NRCB USE ONLY

MINIMUM DISTANCE SEPARATION

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

Margin of error (if applicable): N/A

Requirements (m): Category 1: 568 m Category 2: 757 m Category 3: 947 m Category 4: 1515 m

Technology factor: ☐ YES ☑ NO

Expansion factor: ☐ YES ☑ NO

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

LAND BASE FOR MANURE AND COMPOST APPLICATION

Land base required: 312 ha (771 ac)

Land base listed: 924 ac plus additional owned quarters

Area not suitable: exceeds volume of land required

Available area _____ Requirement met: ☑ YES ☐ NO

Land spreading agreements required: ☐ YES ☑ NO

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

PLANS

Submitted and attached construction plans: ☑ YES ☐ NO

Submitted aerial photos: ☑ YES ☐ NO

Submitted photos: ☐ YES ☑ NO

GRANDFATHERING

Already completed: ☐ YES ☐ NO ☑ N/A

If already completed, see _____

Part 2 — Technical Requirements

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

NRCB USE ONLY

ALL SIGNATURES IN FILE ☑ YES ☐ NO

DATES OF APPROVAL OFFICER SITE VISITS

April 30, 2025	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: May 2, 2025

Municipality: Athabasca County

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

Alberta Health Services: n/a

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

Alberta Environment and Parks: ☐ N/A

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

Alberta Transportation: ☑ N/A

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

Alberta Regulatory Services: ☑ N/A

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

Other: Cenovus Energy ☐ N/A

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

Other: _____ ☐ N/A

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

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

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

SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - 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.** Feed lot Pens

2. _____

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	**NRCB USE ONLY** Estimated storage capacity (m^3)
1.	470 m	102	0	
2.				
			TOTAL CAPACITY	Adequate storage for solid manure on site

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

Surface water control systems

Describe the run-on and runoff control system

Run off towards cath Basin

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	6 (m)	Provide details (as required)	
Soil texture	45 % sand	24 % silt	31 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: 4.2 m	Hydraulic conductivity (cm/s): 4.5x10-9 4.85x10-9	Describe test standard used: Insitu

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

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

Condition required: ☑ YES ☐ NO

Report attached: ☑ YES ☐ NO

RUNOFF CONTROL CATCH BASIN: Naturally occurring protective layer

*(complete a copy of this section for **EACH proposed** runoff control catch basin with a naturally occurring protective layer)*

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

1. Catch Basin
2. _____
3. _____

Determination of runoff area

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

See attached

Catch basin capacity

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	Slope run:rise			NRCB USE ONLY
					Inside end walls	Inside side walls	Outside walls	Calculated storage capacity (excl. 0.5 m freeboard) (m^3)
1.	85m	60m	4.5m	4.5m	3	3	4	
2.								
3.								
							TOTAL CAPACITY	12,792 m3

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	6 (m)	Provide details (as required)	
Soil texture	47 % sand	25 % silt	28 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: 4.2m	Hydraulic conductivity (cm/s): 4.85×10^{-9}	Describe test standard used: Insitu

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

If soil info differs per facility include additional soils page.

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

Condition required: ☑ YES ☐ NO

Report attached: ☑ YES ☐ NO

Catch Basin Storage Volume Calculator

Construction Dimensions of Catch Basin

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

CFO Name [1]	Deep Creek
Land Location [1]	NW 24-68-22 W4M

Overall Dimensions of Catch Basin			Catch Basin Dimensions	
Total Length*[4]	85.0	m	279	ft
Total Width*[4]	60.0	m	197	ft
Total Depth*[4]	4.5	m	15	ft
Design Capacity Depth	*4.00*	m	13	ft
End Slope*[4]	3	run:rise	3	run:rise
Side Slope*[4]	3	run:rise	3	run:rise
Length of Bottom	58.0	m	190	ft
Width of Bottom	33.0	m	108	ft
Capacity @ top of Bank	*15,235*	m^3	*Capacity (@tob)* *538,010*	ft^3
			3,351,175	*Imp. Gal.*

Design Capacity of Catch Basin (freeboard level)			Design Capacity (freeboard level)	
Length (design capacity depth)	82.0	m	269	ft
Width (design capacity depth)	57.0	m	187	ft
Total Depth	*4.5*	m	*15*	ft
Design Capacity Depth	4.00	m	13	ft
End Slope	3	run:rise	3	run:rise
Side Slope	3	run:rise	3	run:rise
Design Capacity (freeboard level)	**12,792**	m^3	451,745	ft^3
			2,813,846	Imp. Gal.
level)	*4,674*	m^2	*50,311*	ft^2

Paved Runoff Catchment Area(s)

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

Unpaved Runoff Catchment Area(s)

Area [2]	Length (m)	Width (m)	Area (m^2)
6	500	125	62,500.0
7			0.0
8			0.0
9			0.0
10			0.0
		Total Area (m^2)	**62,500**

Rainfall (Select Town [3])

Athabasca 80

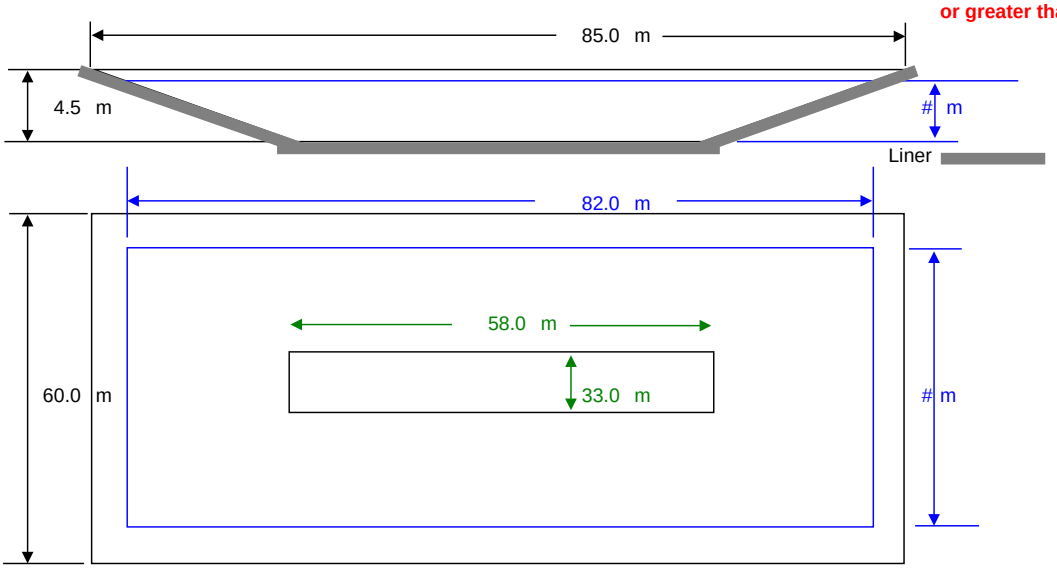
AOPA Design Rainfall **80 mm**

Minimum Catchbasin Storage Volume Required

3,000 m^3 ** **105944 ft^3**

659907.48 Imp. Gal.

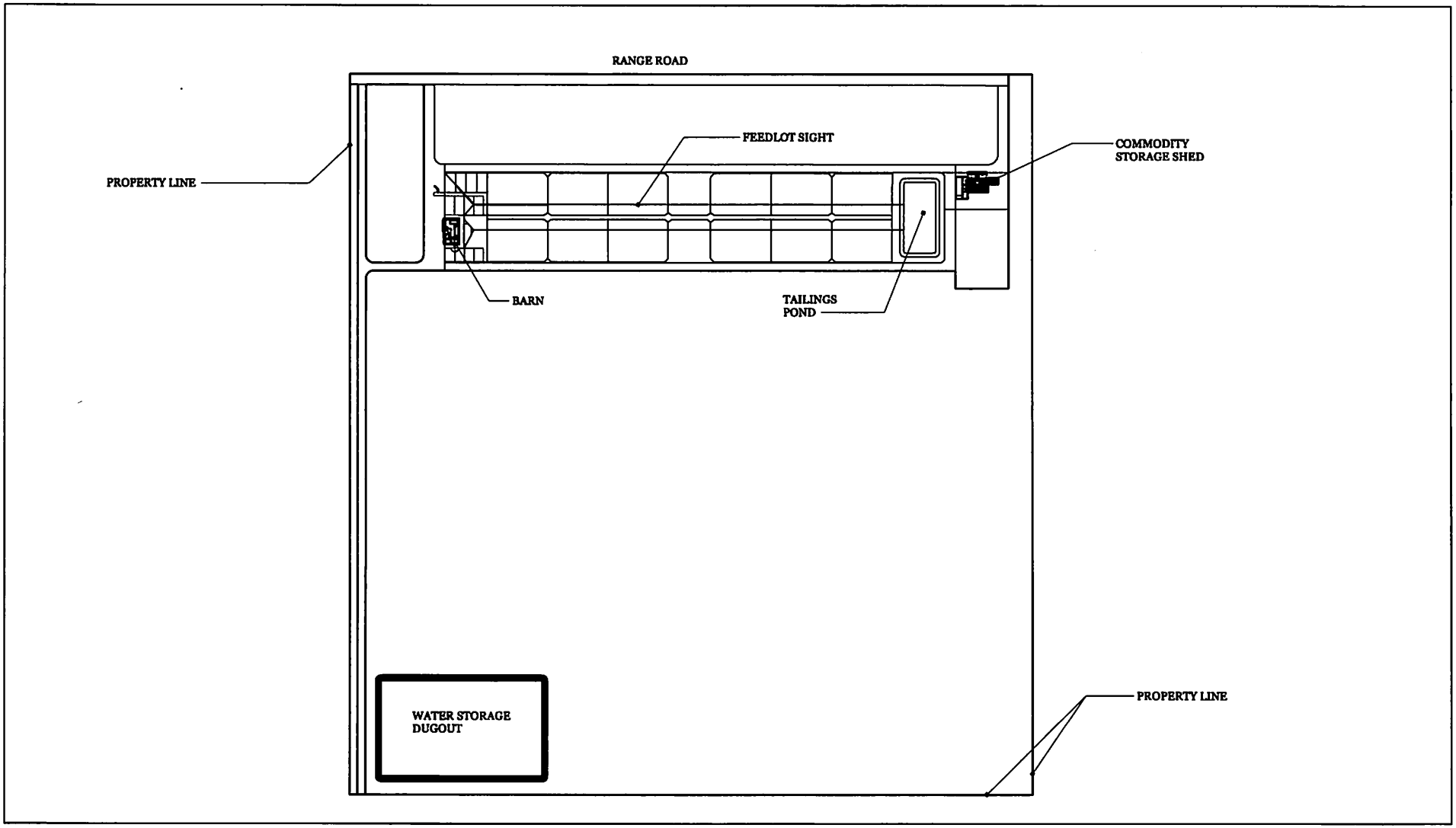
**** Design capacity of catch basin should be equal to or greater than, minimum storage volume required.**



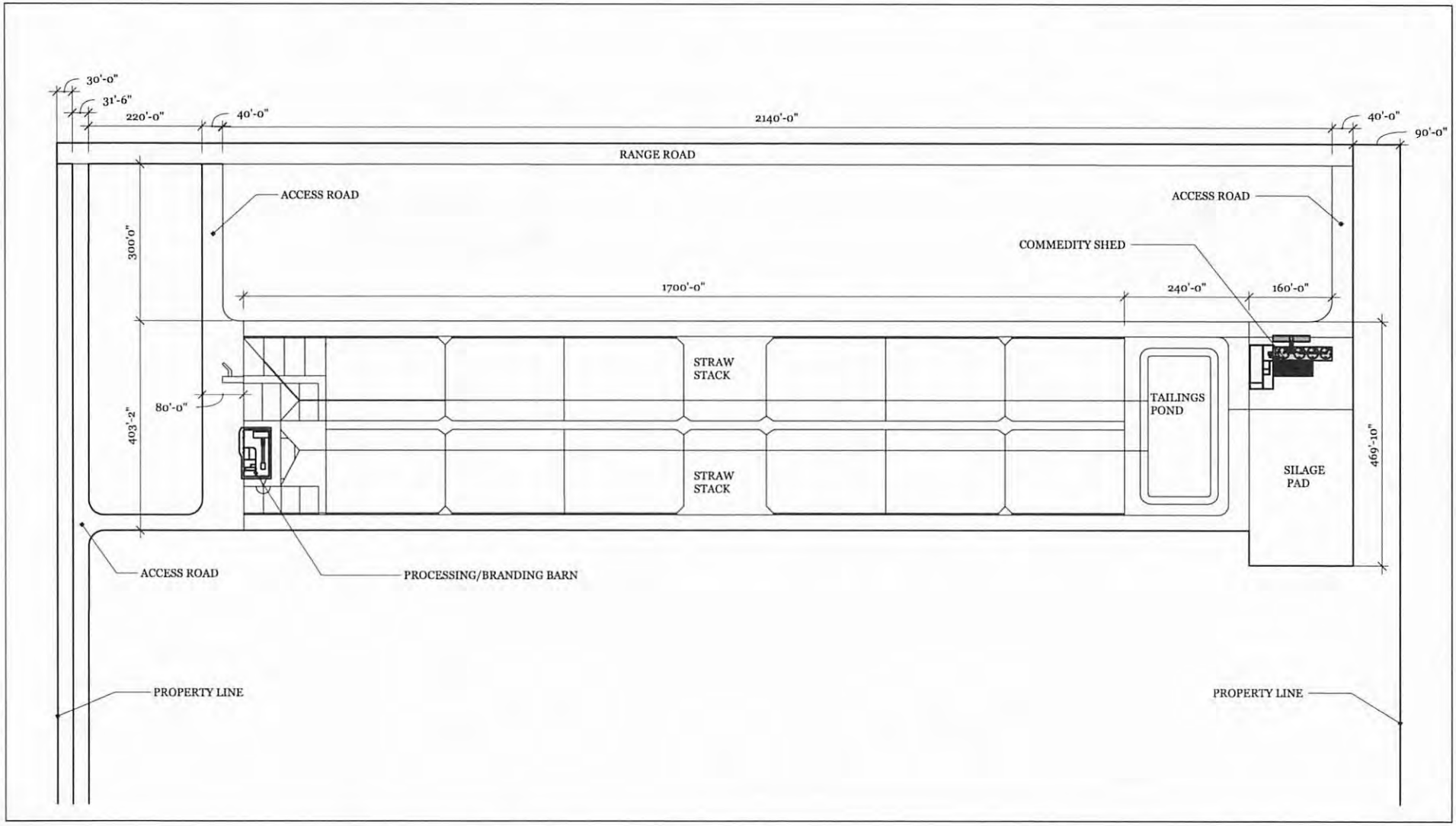
Lines in Black - Overall catch basin dimensions

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

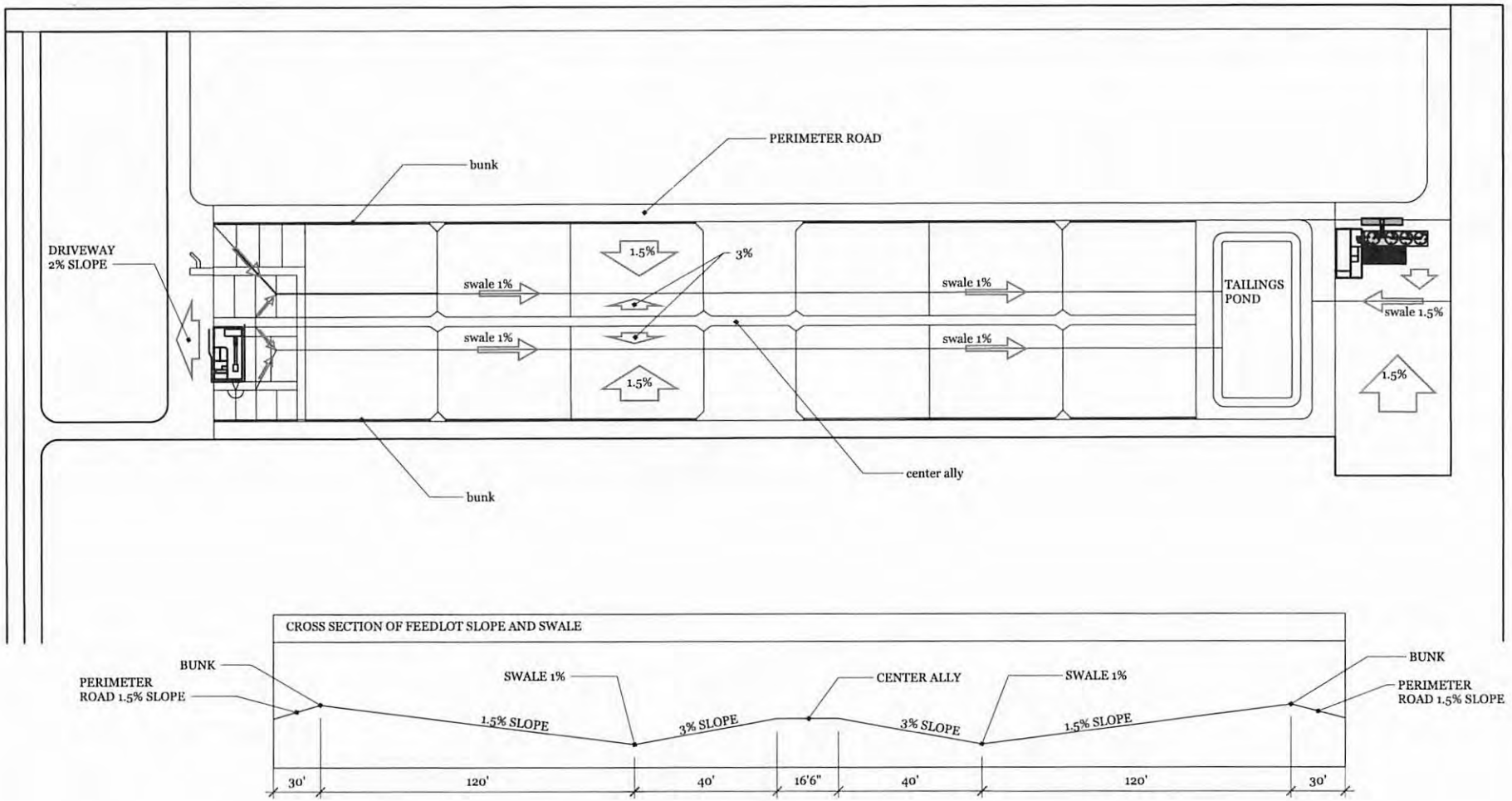
NTS - Not To Scale



FEEDLOT LAYOUT PLAN	DEEP CREEK FARMS	FINAL REVISION
		May 2, 2025

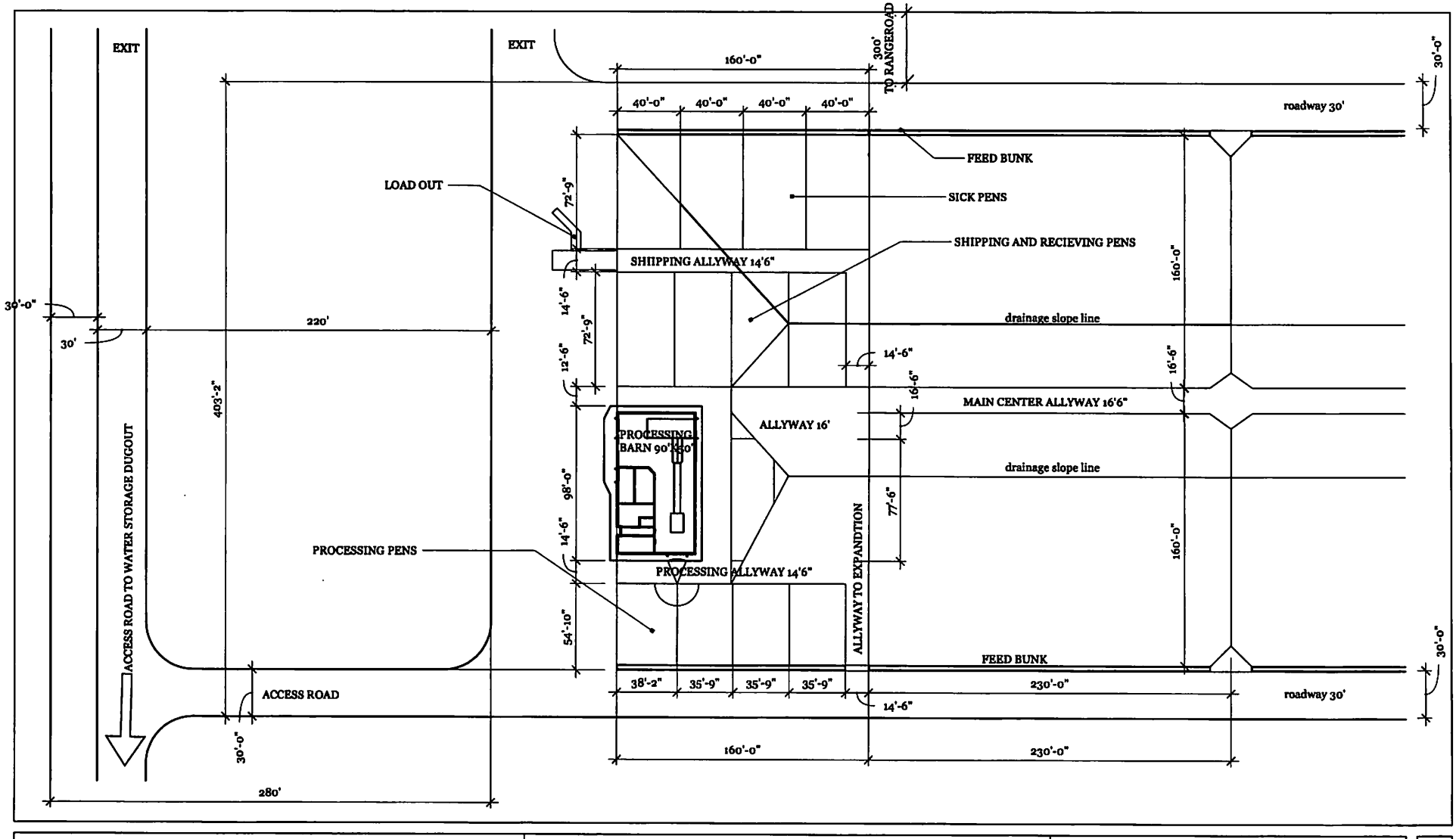


FEEDLOT LAYOUT PLAN		FINAL REV
	DEEP CREEK FARMS	MM/DD/YY REMARKS 1 __/__/__ – 2 __/__/__ – 3 __/__/__ – 4 __/__/__ – 5 __/__/__ –
		A 01



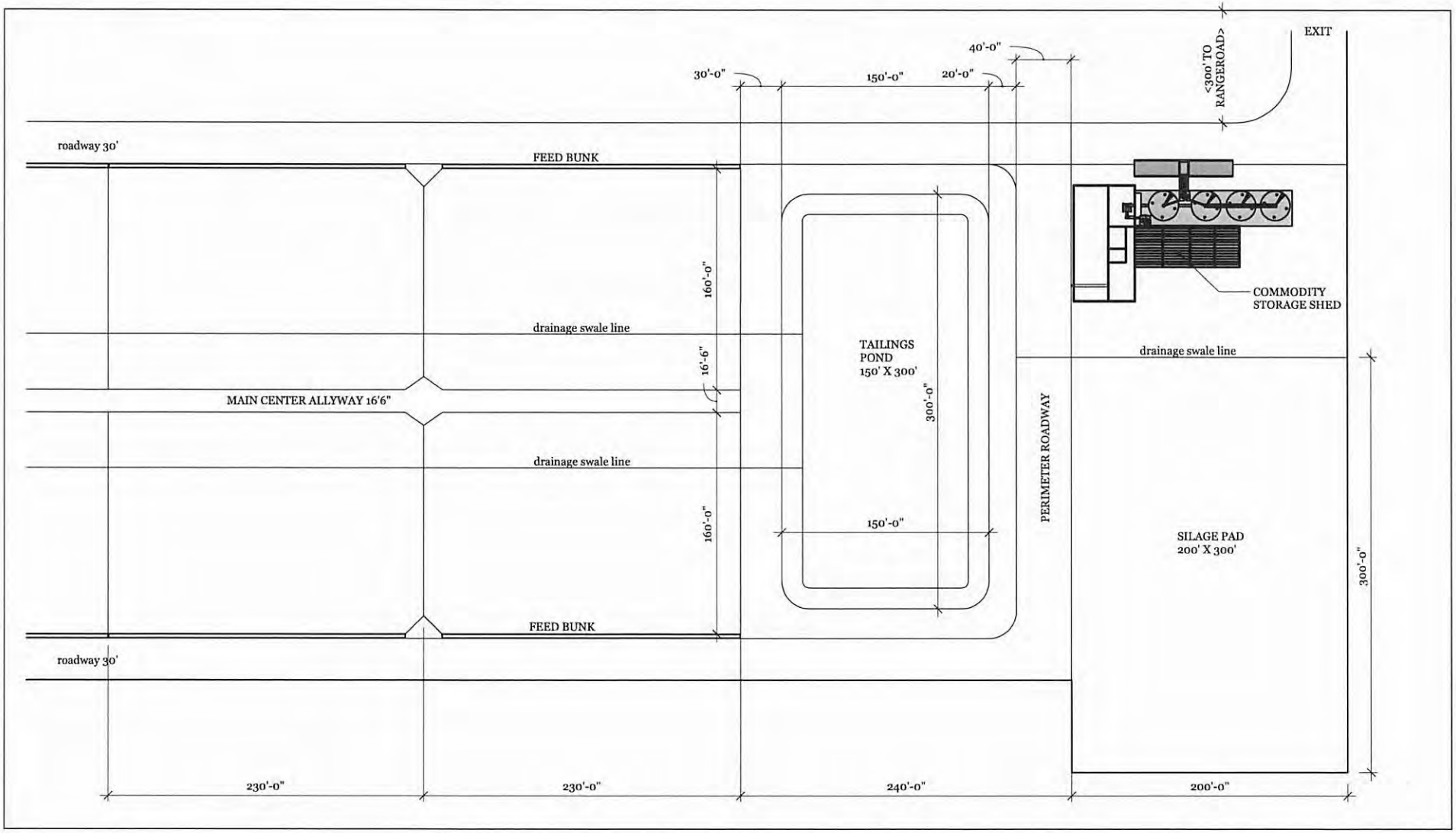
		FINAL REV	
		MM/DD/YY	REMARKS
		1 __/__/__	...
		2 __/__/__	...
	DEEP CREEK FARMS	3 __/__/__	...
		4 __/__/__	...
		5 __/__/__	...

A 02

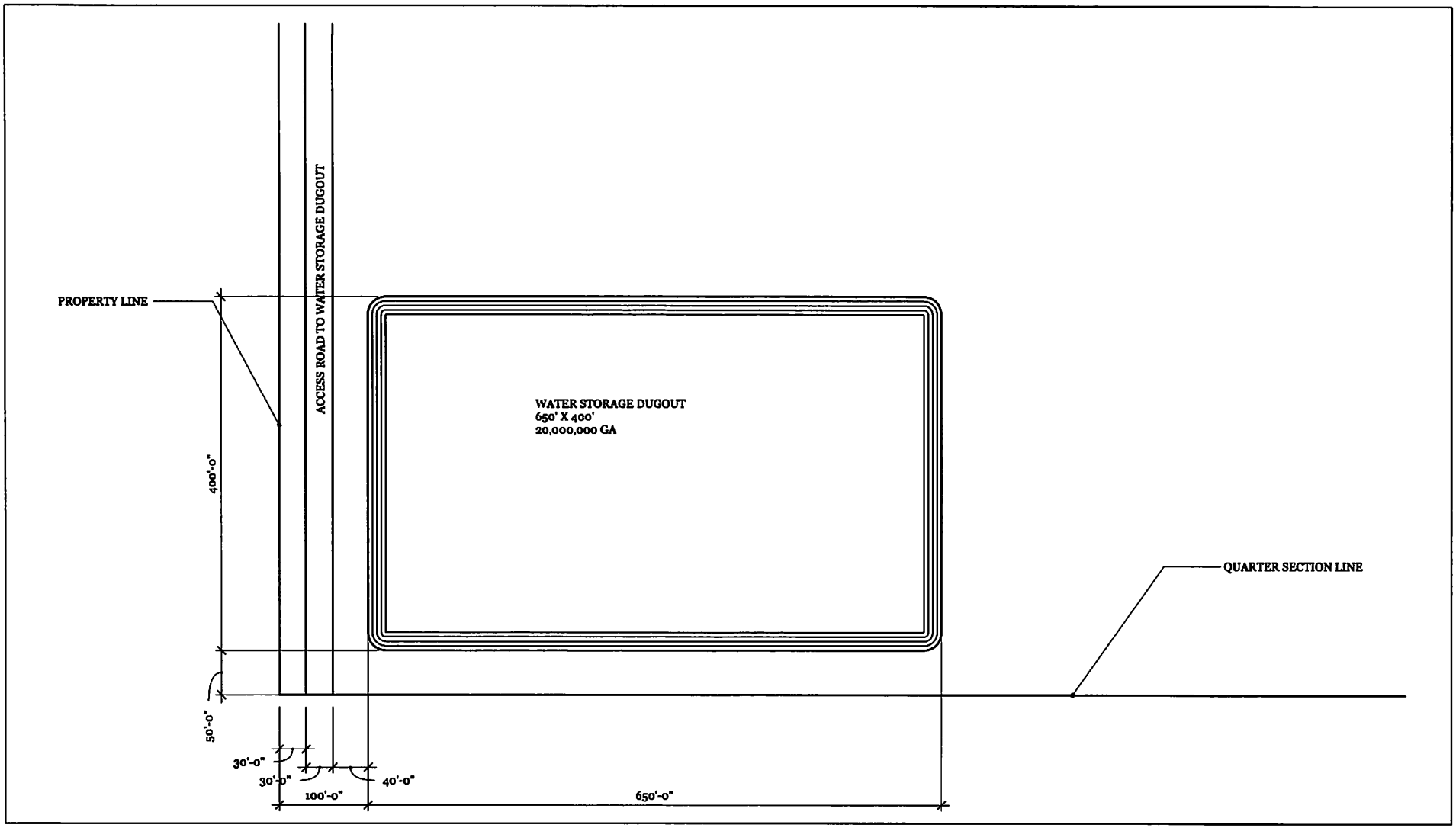


PROCESSING BARN AREA LAYOUT		FINAL REV
	DEEP CREEK FARMS	03
		A

	MM/DD/YY	REMARKS
1	--/--/--	--
2	--/--/--	--
3	--/--/--	--
4	--/--/--	--
5	--/--/--	--



FEED STORAGE AREA LAYOUT		FINAL REV
	DEEP CREEK FARMS	MM/DD/YY | REMARKS 1 __/__/__ ... 2 __/__/__ ... 3 __/__/__ ... 4 __/__/__ ... 5 __/__/__ ...
		A 04



DUGOUT AREA LAYOUT		FINAL REV
		MM/DD/YY: 1 --/--/-- 2 --/--/-- 3 --/--/-- 4 --/--/-- 5 --/--/--
	DEEP CREEK FARMS	REMARKS: -- -- -- -- --
		05 A

ENVIROWEST
ENGINEERING

SITE AND SOIL ASSESSMENT

Proposed Solid Manure Storage and Catch Basin
NW¼-24-068-22-W4M

Athabasca County, Alberta

Site and Soil Assessment
Proposed Solid Manure Storage and Catch Basin
NW¼-24-068-22-W4M
Athabasca County, Alberta

Prepared For: Wes Walter
Deep Creek Farms 2020 Inc.

Delivered via Email: [redacted]

Prepared By: Envirowest Engineering
Box 4248, Ponoka, AB, T4J 1R6
(403) 783-8229

Report Date: April 24, 2025

Project Number: 2502-43077

Private and Confidential

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B. Borehole Logs
C. Certificate of Analysis

1.0 Introduction and Scope of Work

Envirowest Engineering (Envirowest) was retained by Wes Walter of Deep Creek Farms 2020 Inc. to conduct a Site and Soil Assessment for the proposed construction of solid manure storage pens and a catch basin associated with a proposed feedlot operation.

The assessment was completed to determine conditions beneath the proposed construction area and assess soil properties for construction of proposed facilities. The operation, herein referred to as "the Site," is located on NW-24-068-22-W4M in Athabasca County.

The assessment has been completed in accordance with the standards and regulations associated with the amended Agricultural Operation Practices Act and associated regulations which govern all new and modified confined feeding operations.

Scope of Work

Seven investigative boreholes were drilled using a truck-mounted rotary auger and completed to a maximum depth of 6.0 m below ground surface (mbgs) on February 20, 2025. The boreholes were completed in the area proposed for solid manure storage (feedlot pens) and for the catch basin. The borehole locations are shown on Figure 1.0 (attached).

2.0 Assessment Results

The Site is in an area of relatively flat. The Site is currently utilized as cropland.

Seven investigative boreholes were drilled using a truck-mounted rotary auger and completed to a maximum depth of 6.0 m below ground surface (mbgs) on February 20, 2025. The boreholes were completed in the area proposed for solid manure storage (feedlot pens) and for the catch basin. The borehole locations are shown on Figure 1.0 (attached).

Potential natural barrier material (noted in borehole logs as sandy clay) was typically found beneath topsoil and intermittent clayey sand. A sand pocket was noted at 3.5 mbgs to 4.25 mbgs within borehole 25BH02. Bedrock was not encountered to the depth of investigation (6.0 mbgs).

Boreholes were backfilled with the material removed by back spinning the solid stem auger and compacting to depth of the borehole.

The results of the soil analysis completed by a third-party laboratory are presented in Table 1a and 1b below. The soil sample locations are presented on Figure 1, and borehole logs are attached.

Table 1a: Soil Properties Results: Proposed Pen Area

Parameter	25BH01-01	25BH01-02	25BH01-04	25BH04-01	25BH05-01	25BH06-01
Sample Depth (mbgs)	0.5	2.25	5.5	2.5	2.25	2.25
Particle Size (%sand)	40	44	44	46	45	41
Particle Size (%silt)	24	25	25	23	24	24
Particle Size (%clay)	36	32	31	31	31	35
Texture Class	Clay Loam	Clay Loam	Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Clay Loam
Field Hydraulic Conductivity (cm/sec)	-	-	4.85×10^{-9}	-	-	-

Table 1b: Soil Properties Results: Proposed Catch Basin Area

Parameter	25BH02-01	25BH02-03	25BH03-01	25BH03-02	25BH03-03	25BH03-04	25BH07-01	25BH07-02	25BH07-03	25BH07-04
Sample Depth (mbgs)	0.75	5.25	0.75	2.25	3.75	5.25	0.5	2.25	3.5	5.25
Particle Size (%sand)	47	49	45	43	43	45	47	45	47	43
Particle Size (%silt)	24	21	24	26	23	22	25	24	22	24
Particle Size (%clay)	29	30	31	31	34	33	28	31	31	33
Texture Class	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Clay Loam	Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Clay Loam
Field Hydraulic Conductivity (cm/sec)	-	-	-	-	-	-	-	-	-	-

The soils were identified as clay loam or sandy clay loam. The natural barrier material had an average clay content of 32%, ranging from 29 to 36%.

The monitoring well installed at borehole 24BH01 (24MW01) was sufficiently hydrated prior to completing the in-situ hydraulic conductivity testing. The in-situ hydraulic conductivity test was completed between March 21 to 28, 2025. The monitoring well was placed to assess the material below surface, and was screened from 4.24 to 5.74 meters below ground surface (mbgs) with bentonite filling the annulus below the screen from surface to 4.0 mbgs.

The initial depth to water was measured in the well. A microdiver was installed to log and measure water level, temperature, and time. A volume of water was then removed from the well and the change in pressure head measured over time to assess hydraulic conductivity of the clay strata. It is assumed (as per AGDEX 096-01) that all flow occurs under saturated conditions. The depth was measured every minute for 1 week. The results of the test were analyzed as a falling head test using AQTESOLV Bouwer-Rice method for unconfined wells. The results of the assessment were an in-situ hydraulic conductivity of 4.85×10^{-9}cm/sec.

A saturated water table was not encountered during the assessment to a maximum depth of 6.0 mbgs.

A piezometer was installed at the location of the proposed catch basin, to a depth of 6.0 mbgs on February 20, 2025. Depth to water table was measured to be 5.7 mbgs on April 23, 2025.

Boreholes were backfilled with the material removed by back spinning the solid stem auger and compacting to depth of the borehole.

3.0 Liner Assessments

3.1 Natural Barrier Assessment (Solid Manure Storage)

Based on the information obtained it was determined that the native clay within the proposed area of construction for solid manure storage was found to the maximum depth of investigation to a maximum of 3.0 meters, generally at surface.

Minimum Required Liner Depth for a natural barrier for solid manure storage:

$$\frac{2\text{ m}}{1 \times 10^{-6}\text{ cm/sec}} = \frac{X\text{ m}}{4.85 \times 10^{-9}\text{ cm/sec}}$$

$$\mathbf{X} = 0.01\text{ m}$$

A minimum of **0.5** meters of native clay is required to be present to provide a sufficient protective barrier. It is found that there is sufficient protection across the proposed solid manure storage area.

3.1 Natural Barrier Assessment (Catch Basin)

Based on the information obtained it was determined that the native clay within the proposed area of construction for a catch basin was found to the maximum depth of investigation to a maximum of 6.0 meters, generally at surface.

Minimum Required Liner Depth for a natural barrier for liquid manure storage:

$$\frac{5\text{ m}}{1 \times 10^{-6}\text{ cm/sec}} = \frac{X\text{ m}}{4.85 \times 10^{-9}\text{ cm/sec}}$$

$$\mathbf{X} = 0.02\text{ m}$$

A minimum of **0.5** meters of native clay is required to be present to provide a sufficient protective barrier. It is found that there is sufficient protection across the proposed catch basin area.

4.0 Conclusions

The following conclusions are based on the discussed scope of the construction.

The naturally occurring soils were determined to be appropriate for the construction of a naturally clay lined solid manure storage (pens) and a catch basin.

5.0 Design and Construction Considerations

5.1 Solid Manure Storage

The area measures approximately 375 meters by 230 meters. The pen area should be graded to ensure 0.5% slope towards the catch basin.

5.2 Catch Basin

The proposed area of contributing run-off for Catch Basin, is conservatively 86,250 m^2. The size of the catch basin is requested to be 2.0 million gallons.

The storage capacity required for the Catch Basin is 4,140 m^3 (based on local 1 in 30 year precipitation data) and will have the following specifications:

- To provide the required capacity, the catch basin should be 62 m in length x 62 m in width. The overall depth has been designed as 4.5 m. The overall capacity of the catch basin will be 10,858 m^3, which accounts for the required 0.5 m of freeboard, and provides a storage capacity of 9,028 m^3. The sizing is based on an inside end and side wall slope of 3:1 (run/rise).
- The bottom of the liner must be not less than 1.0 m above the top of the shallow groundwater level at the time of construction.
- The overall depth of 4.5 m will be achieved through a below grade depth of 4.5 m. Above-grade dykes may be needed to redirect unimpacted surface flow. The outside dyke walls should be completed to a slope of 4:1. The crest of the dyke should be sloped slightly outward to direct rainfall away from the storage facility.

6.0 Closure

Envirowest Engineering is pleased to submit the report to Wes Walter of Deep Creek 2020 Inc. The information and conclusions contained in this report are for their sole use. No other party is to rely upon the information contained within the report without the express written authorization of Envirowest Engineering.

Envirowest Engineering is not responsible for any damages that may be suffered as the result of any unauthorized use of, or reliance on, this report. Envirowest Engineering has performed the work and made the findings and conclusions set out in the report in a manner consistent with the level of care and skill normally exercised by members of the environmental engineer profession practicing under similar conditions at the time the work was performed. Envirowest Engineering accepts no responsibility for any deficiency, misstatement or inaccuracy in this report resulting from misinformation from any individuals or parties that provided information as part of this report.

We trust that this report meets your present needs. Please feel free to contact the undersigned with any questions or should you require additional information.

Respectfully submitted,

2025-04-24

Prepared by:
Emily J. Low, P.Eng.
Envirowest Engineering

PERMIT TO PRACTICE
2206165 ALBERTA LTD.
RM SIGNATURE:
RM APEGA ID #: 110373
DATE: April 24, 2025
PERMIT NUMBER: P014810
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Emily Jocelyn Low -- P. Eng. - APEGA

Digitally signed by Emily Jocelyn Low -- P. Eng. - APEGA
Date: 2025.04.24 11:58:46 -06'00'

2206165 Alberta Ltd. o/a Envirowest Engineering
Association of Professional Engineers and Geoscientists of Alberta
Permit to Practice No. P14810

7.0 Qualifications of Assessors

Ms. Emily Low, B.Sc., P.Eng, is an Environmental Engineer with Envirowest Engineering and has approximately 15 years of environmental assessment, monitoring, and remediation experience in the agricultural, industrial, real estate and development, and oil and gas sectors. Ms. Low has a Bachelor of Science in Chemical Engineering from the University of Alberta and is a certified Professional Engineer in Alberta (Association of Professional Engineers and Geoscientists of Alberta).

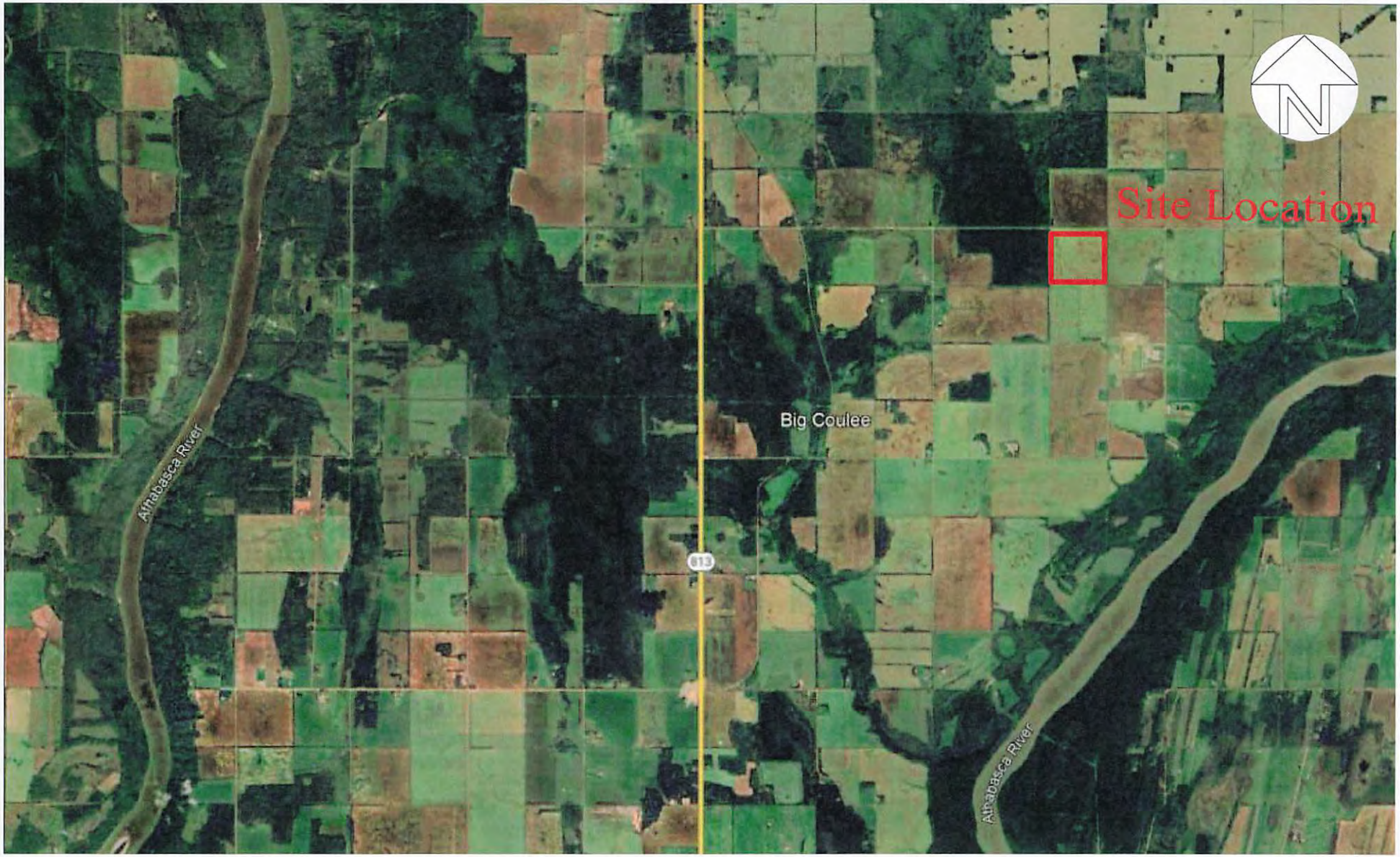
8.0 References

GOA (Government of Alberta). (January 2020). Agricultural Operation Practices Act and Regulations. Edmonton, AB: Author.

GOA (Government of Alberta). (2017). Agricultural Operation Practices Act: Standards and Administration Regulation. Edmonton, AB: Author.

Appendix A

Figure

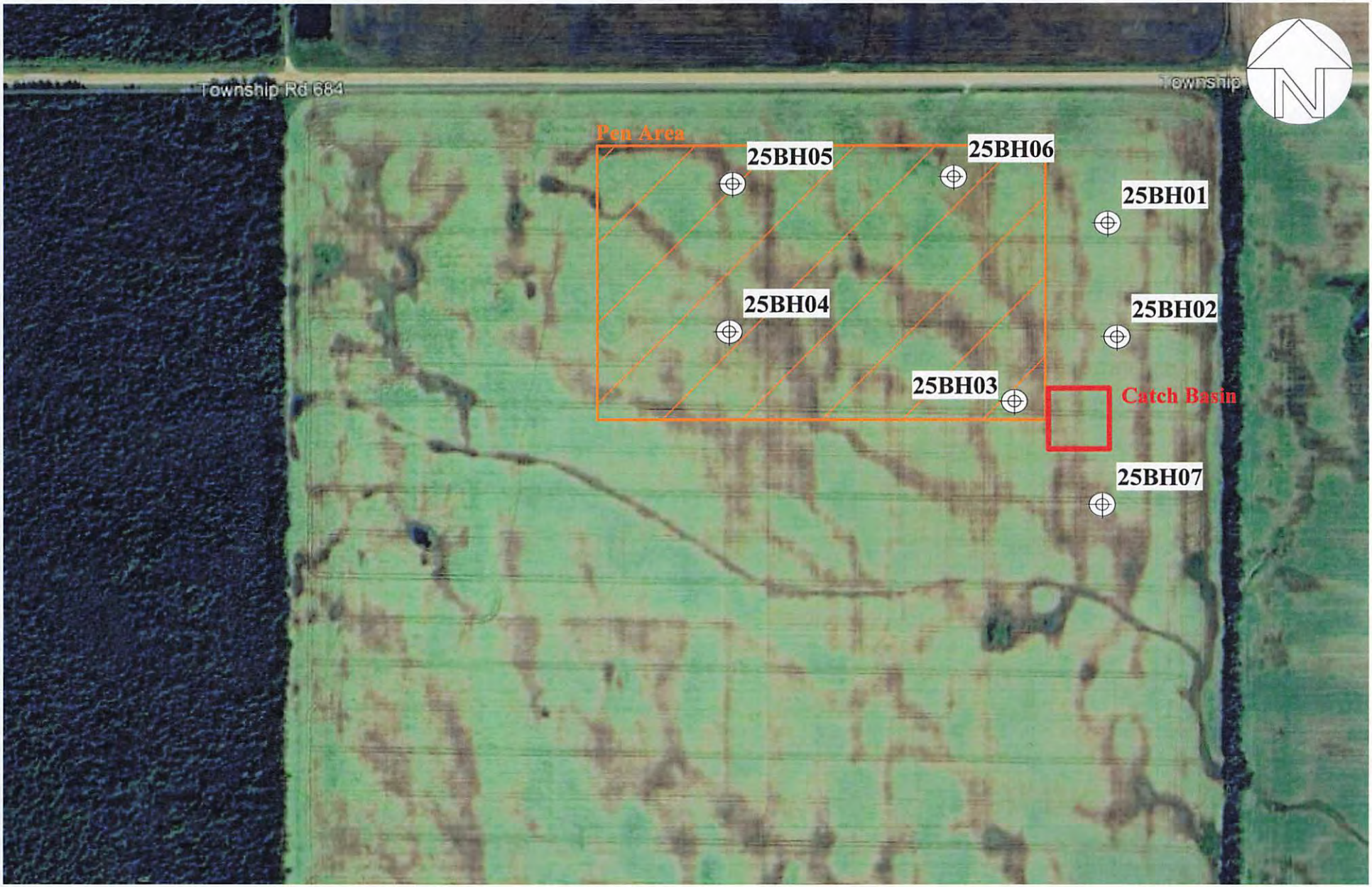


ENVIROWEST ENGINEERING

Title:

Site Location
Site and Soil Assessment
NW¼-Sec.24-Twp.068-Rge.22-W4M
Athabasca County, Alberta

Project No: 2502-43077	**Date:** April 20, 2025	**Figure No.:** 1.0
Scale:	**Prepared By:** E.Low	
Image Source: Google Earth Pro (August 25, 2023)		



ENVIROWEST ENGINEERING

Title:

Site Location
Site and Soil Assessment
NW¼-Sec.24-Twp.068-Rge.22-W4M
Athabasca County, Alberta

Project No: 2502-43077	**Date:** April 24, 2025	**Figure No.:** 2.0
Scale:	**Prepared By:** E.Low	
Image Source: Google Earth Pro (September 11, 2023)		

Appendix B

Borehole Logs

ENVIROWEST ENGINEERING

LOG OF BORING 25BH01

Site and Soil Assessment
NW-24-068-22-W4M
Athabasca County, Alberta

Project Number: 2502-43077

Driller: : Ever Green Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : February 20, 2025
Logged By: : Emily Low P.Eng.

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Well: Elev.:	Water Level
0.0				SANDY CLAY, brown, firm, damp		
0.3						
0.5						
0.8						
1.0						
1.3						
1.5						
1.8						
2.0					Bentonite	
2.3				grey	Solid	
2.5						
2.8						
3.0						
3.3						
3.5						
3.8						
4.0						
4.3						
4.5						
4.8						
5.0					Sand	
5.3					Screen	
5.5						
5.8						
6.0						

04-24-2025 Y:\Operations\Client Data\43077 Wes Walter\25BH01.bor

ENVIROWEST ENGINEERING

LOG OF BORING 25BH02

Site and Soil Assessment
NW-24-068-22-W4M
Athabasca County, Alberta

Project Number: 2502-43077

Driller: : Ever Green Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : February 20, 2025
Logged By: : Emily Low P.Eng.

Well:
Elev.:

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Water Level
0.0				SANDY CLAY, brown, firm, damp	
0.3					
0.5					
0.8					
1.0					
1.3					
1.5					
1.8					
2.0					
2.3				grey	
2.5					
2.8					
3.0					
3.3					
3.5				sand pocket (3.5 - 4.25)	
3.8					
4.0					
4.3					
4.5					
4.8					
5.0					
5.3					
5.5					
5.8					
6.0					

04-24-2025 Y:\Operations\Client Data\43077 Wes Walter\25BH02.bor

ENVIROWEST ENGINEERING

LOG OF BORING 25BH03

Site and Soil Assessment
NW-24-068-22-W4M
Athabasca County, Alberta

Project Number: 2502-43077

Driller: : Ever Green Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : February 20, 2025
Logged By: : Emily Low P.Eng.

Well:
Elev.:

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Water Level
0.0				SANDY CLAY, brown, firm, damp	
0.3					
0.5					
0.8					
1.0					
1.3					
1.5					
1.8					
2.0					
2.3				grey	
2.5					
2.8					
3.0					
3.3					
3.5					
3.8					
4.0					
4.3					
4.5					
4.8					
5.0					
5.3					
5.5					
5.8					
6.0					

04-24-2025 Y:\Operations\Client Data\43077 Wes Walter\25BH03.bor

ENVIROWEST ENGINEERING

LOG OF BORING 25BH04

Site and Soil Assessment
NW-24-068-22-W4M
Athabasca County, Alberta

Project Number: 2502-43077

Driller: : Ever Green Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : February 20, 2025
Logged By: : Emily Low P.Eng.

Well:
Elev.:

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Water Level
0.0				CLAYEY SAND, yellowish brown, compact, damp	
0.3					
0.5					
0.8					
1.0					
1.3					
1.5					
1.8				SANDY CLAY, brown, firm, damp	
2.0					
2.3					
2.5					
2.8					
3.0					

04-24-2025 Y:\Operations\Client Data\43077 Wes Walter\25BH04.bor

ENVIROWEST ENGINEERING

LOG OF BORING 25BH05

(Page 1 of 1)

Site and Soil Assessment
NW-24-068-22-W4M
Athabasca County, Alberta

Project Number: 2502-43077

Driller: : Ever Green Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : February 20, 2025
Logged By: : Emily Low P.Eng.

Well:
Elev.:

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Water Level
0.0				SANDY CLAY, brown, firm, damp	
0.3					
0.5					
0.8					
1.0					
1.3					
1.5					
1.8					
2.0					
2.3					
2.5					
2.8					
3.0					

04-24-2025 Y:\Operations\Client Data\43077 Wes Walter\25BH05.bor

ENVIROWEST ENGINEERING

LOG OF BORING 25BH06

Site and Soil Assessment
NW-24-068-22-W4M
Athabasca County, Alberta

Project Number: 2502-43077

Driller: : Ever Green Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : February 20, 2025
Logged By: : Emily Low P.Eng.

Well:
Elev.:

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Water Level
0.0				CLAYEY SAND, yellowish brown, compact, damp	
0.3					
0.5					
0.8					
1.0					
1.3					
1.5					
1.8				SANDY CLAY, brown, firm, damp	
2.0					
2.3					
2.5					
2.8					
3.0					

04-24-2025 Y:\Operations\Client Data\43077 Wes Walter\25BH06.bor

ENVIROWEST ENGINEERING

LOG OF BORING 25BH07

(Page 1 of 1)

Site and Soil Assessment
NW-24-068-22-W4M
Athabasca County, Alberta

Project Number: 2502-43077

Driller: : Ever Green Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : February 20, 2025
Logged By: : Emily Low P.Eng.

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Well: 25MW01 Elev.:	Water Level
0.0				SANDY CLAY, brown, firm, damp		
0.3						
0.5						
0.8						
1.0						
1.3					Bentonite	
1.5					Solid	
1.8						
2.0						
2.3				grey		
2.5						
2.8						
3.0						
3.3						
3.5						
3.8						
4.0						
4.3					Sand	
4.5					Slotted	
4.8						
5.0						
5.3						
5.5						
5.8						
6.0						

04-24-2025 Y:\Operations\Client Data\43077 Wes Walter\25BH07.bor

Appendix C

Certificate of Analysis

AGAT Laboratories

2910 12TH STREET NE
CALGARY, ALBERTA
CANADA T2E 7P7
TEL (403)735-2005
FAX (403)735-2771
http://www.agatlabs.com

CLIENT NAME: ENVIROWEST
BOX 4248, 5118-50th STREET
PONOKA, AB T4J1R6
(403) 783-8229

ATTENTION TO: Emily Low

PROJECT: 43077

AGAT WORK ORDER: 25R254137

SOIL ANALYSIS REVIEWED BY: Max Dou, Report Writer

DATE REPORTED: Mar 10, 2025

PAGES (INCLUDING COVER): 9

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 735-2005

*Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information is available on request from AGAT Laboratories, in accordance with ISO/IEC 17025:2017, ISO/IEC 17025:2005 (Quebec), DR-12-PALA and/or NELAP Standards.*
- *This document is signed by an authorized signatory who meets the requirements of the MELCCFP, CALA, CCN and NELAP.*
- *For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.*

AGAT Laboratories

2910 12TH STREET NE
CALGARY, ALBERTA
CANADA T2E 7P7
TEL (403)735-2005
FAX (403)735-2771
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 25R254137

PROJECT: 43077

CLIENT NAME: ENVIROWEST

ATTENTION TO: Emily Low

SAMPLING SITE:

SAMPLED BY:

Particle Size - Texture (Sand, Silt, Clay)

DATE RECEIVED: 2025-02-27

DATE REPORTED: 2025-03-08

		SAMPLE DESCRIPTION:		25BH01-01	25BH01-02	25BH01-04	25BH02-01	25BH02-03	25BH03-01	25BH03-02	25BH03-03
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2025-02-20	2025-02-20	2025-02-20	2025-02-20	2025-02-20	2025-02-20	2025-02-20	2025-02-20
Parameter	Unit	G / S	RDL	6554888	6554889	6554891	6554892	6554894	6554895	6554896	6554897
Particle Size Distribution (Sand)	%		2	40	44	44	47	49	45	43	43
Particle Size Distribution (Silt)	%		2	24	25	25	24	21	24	26	23
Particle Size Distribution (Clay)	%		2	36	32	31	29	30	31	31	34
Soil Texture				Clay Loam	Clay Loam	Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Clay Loam	Clay Loam

		SAMPLE DESCRIPTION:		25BH03-04	25BH04-01	25BH05-01	25BH06-01	25BH07-01	25BH07-02	25BH07-03	25BH07-04
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2025-02-20	2025-02-20	2025-02-20	2025-02-20	2025-02-20	2025-02-20	2025-02-20	2025-02-20
Parameter	Unit	G / S	RDL	6554898	6554899	6554900	6554901	6554902	6554903	6554904	6554905
Particle Size Distribution (Sand)	%		2	45	46	45	41	47	45	47	43
Particle Size Distribution (Silt)	%		2	22	23	24	24	25	24	22	24
Particle Size Distribution (Clay)	%		2	33	31	31	35	28	31	31	33
Soil Texture				Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Clay Loam

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

6554888-6554905 Soil Texture is a calculated parameter. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.
% Silt is a calculated parameter. The calculated value is determined by subtracting the percent sand and clay values from 100 percent.

Analysis performed at AGAT Calgary (unless marked by *)

Certified By: [redacted]

AGAT Laboratories

2910 12TH STREET NE
CALGARY, ALBERTA
CANADA T2E 7P7
TEL (403)735-2005
FAX (403)735-2771
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: ENVIROWEST

AGAT WORK ORDER: 25R254137

PROJECT: 43077

ATTENTION TO: Emily Low

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Particle Size - Texture (Sand, Silt, Clay)															
Particle Size Distribution (Sand)	6560805	6560805	17	16	5.9%	< 2	106%	80%	120%						
Particle Size Distribution (Silt)	6560805	6560805	42	43	2.4%	< 2	94%	80%	120%						
Particle Size Distribution (Clay)	6560805	6560805	41	41	0.0%	< 2	95%	80%	120%						

Comments: Duplicate NA: results are less than 5X the RDL and RDP will not be calculated.

Certified By: [redacted]

AGAT Laboratories

2910 12TH STREET NE
CALGARY, ALBERTA
CANADA T2E 7P7
TEL (403)735-2005
FAX (403)735-2771
http://www.agatlabs.com

Method Summary

CLIENT NAME: ENVIROWEST

AGAT WORK ORDER: 25R254137

PROJECT: 43077

ATTENTION TO: Emily Low

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Particle Size Distribution (Sand)	SOIL 0520; SOIL 0110; SOIL 0120	JONES 2001	HYDROMETER
Particle Size Distribution (Silt)	SOIL 0520; SOIL 0110; SOIL 0120	JONES 2001	HYDROMETER
Particle Size Distribution (Clay)	SOIL 0520; SOIL 0110; SOIL 0120	JONES 2001	HYDROMETER

AGAT Laboratories

2910 12 Street NE
Calgary, Alberta T2E 7P7
P: 403-735-2005 • F: 403-735-2771
webearth.agatlabs.com

Laboratory Use Only
Arrival Temperature:
Cooler Quantity:
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
AGAT Job Number: 25B254177

Chain of Custody Record

Emergency Support Services Hotline 1-855-AGAT 245 (1-855-242-8245)

Report Information
Company: Envirowest Engineering
Contact: Emily Low
Address:
Phone: 403-783-8229

Project Information
Client Project #: 43077
Site Location:
Sample By:
AGAT Quote #:
If a quotation number is not provided, client will be billed at standard rates. See terms and conditions of quote for full details.

Invoice To Same as Report to ☑
Company:
Contact:
Email:
Address
Phone:
PO/CC #:

Report Information
1. Name: Emily Low
Email: elow@envirowestengineering.ca
2. Name:
Email:
3. Name:
Email:

Requirements *(Selection may impact detection limits)*

CCME	AB Tier 1	Alberta Surface Water
☐ Agricultural	☑ Agricultural	☐ Chronic
☐ Industrial	☐ Industrial	☐ Acute
☐ Residential/Park	☐ Residential/Park	☐ SK Notice of Site Cond.
☐ Commercial	☐ Commercial	☐ Drinking Water
☐ FWAL	☐ Natural Area	☐ Other:

Is this part of the Alberta SRP program? ☐ YES ☐ NO (If yes, please fill below)
Application Number:
Grant Amount:
Well/Facility/Location ID:
UWI:

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 Business Days
Rush TAT ☐ <24 Hours (200%) ☐ Next Business Day (100%) ☐ 2 Business Days (50%) ☐ 3 Business Days(25%)
Date Required:

LABORATORY USE (LAB ID #)	SAMPLE IDENTIFICATION	DEPTH	DATE/TIME SAMPLED	SAMPLE MATRIX	COMMENTS	# OF CONTAINERS: VIALS / JARS	BAGS	BOTTLES	Field Filtered (Y/N)	Preserved (Y/N)	Detailed Salinity: ☐ AB ☐ SK ☐ BC ☐ D50	☐ CCME/AB : BTEX/F1-F4 ☐ CCME/AB : BTEX,/F1-F2	☐ BC: BTEX/VPH/EPH ☐ BC: LEPH/HEPH	SK: BTEX/TVH/C11-C22, C23-C60	Soil Metals: ☐ HWS-B ☐ SP-B ☐ Hg ☐ Cr^{6+}	Water Metals: ☐ Dissolved ☐ Total ☐ Hg ☐ Cr^{6+}	Routine Water Chemistry	Landfill: ☐ AB Class 2 ☐ BC ☐ SK	Coliforms: ☐ Total ☐ Fecal ☐ E.coli	Particle Size: ☐ Sieve (75µm) ☐ Texture			Hold For 30 Days No Analysis (Additional Fee)	Long Term Storage - 6 Months	Long Term Storage - 1 Year	Hazardous (Y/N)
1	25BH01-01		Feb20/25	Soil			1													X						
2	25BH01-02						1													X						
3	25BH01-03						1													X						
4	25BH01-04						1													X						
5	25BH02-01						1													X						
6	25BH02-02						1													X						
7	25BH02-03						1													X						
8	25BH03-01						1													X						
9	25BH03-02						1													X						
10	25BH03-03						1													X						

Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
Emily Low [redacted]	Feb 20/25	E Martell [redacted] AJW	Feb 27 2025 11:35 RECEIVED
Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page 1 of 2
N°: AB 174912

Document ID: DIV-50-1507.007.
Date Revised: Oct 14, 2021
FEB 27 2025

AGAT Laboratories
2910 12 Street NE
Calgary, Alberta
T2E 7P7
webearth.agatlabs.com
P: 403.735.2005 · F: 403.735.2771

Chain of Custody Record

Report to:

Company: Envirowest Engineering Same as COC#: 174912

LABORATORY USE (LAB ID #)	SAMPLE IDENTIFICATION	SAMPLE MATRIX	DATE/TIME SAMPLED	COMMENTS - SITE SAMPLE INFO. SAMPLE CONTAINMENT	# OF CONTAINERS	Detailed Soil Salinity (Saturated Paste)	CCME BTEX/F1-F4	Soil Metals ☐ HWS-B ☐ Cr^6 ☐ Hg	Water Metals ☐ Dissolved ☐ Total ☐ Hg	Routine Water Potability	AB Class 2 Landfill	BC Landfill	D50 Detailed Soil Salinity (As Received)	Microtox	BTEXS/VPH/EPH ☐ LEPH/HEPH ☐	Texture	HOLD FOR 60 DAYS	PRESERVED (Y/N)	CONTAMINATED/HAZARDOUS (Y/N)
	25BH03-04	Soil	Feb 20/25		1											X			
	25BH04-01				1											X			
	25BH05-01				1											X			
	25BH06-01				1											X			
	25BH07-01				1											X			
	25BH07-02				1											X			
	25BH07-03				1											X			
	25BH07-04				1											X			

Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
Emily Law [redacted]	Feb 20/25	E. Marshall [redacted]	FEB 27 2025 11:35am
Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page 2 of 2

N°: AB 004951 A

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: Enviroweest Engineering.

Courier: JAZOO Prepaid ☐ Collect ☐

Waybill# _____

Branch: EDM ☐ GP ☐ FN ☐ FM ☐ RD ☑ VAN ☐ LYD ☐ FSJ ☐ EST ☐ SASK ☐ Other: ☐

If multiple sites were submitted at once: Yes ☑ No ☐

Custody Seal Intact: Yes ☐ No ☑ NA ☐

TAT: <24hr ☐ 24-48hr ☐ 48-72hr ☐ Reg ☑ Other _____

Cooler Quantity: 1

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes ☐ No ☑

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Color , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry: _____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES ☐ NO ☑ Precaution Taken: _____

Legal Samples: Yes ☐ No ☑

International Samples: Yes ☐ No ☑

Tape Sealed: Yes ☑ No ☐

Coolant Used: Icepack ☐ Bagged Ice ☐ Free Ice ☐ Free Water ☐ None ☑

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar)___+___+___=___°C 2 (Bottle/Jar)___+___+___=___°C

3 (Bottle/Jar)___+___+___=___°C 4 (Bottle/Jar)___+___+___=___°C

5 (Bottle/Jar)___+___+___=___°C 6 (Bottle/Jar)___+___+___=___°C

7 (Bottle/Jar)___+___+___=___°C 8 (Bottle/Jar)___+___+___=___°C

9 (Bottle/Jar)___+___+___=___°C 10 (Bottle/Jar)___+___+___=___°C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: 25R254137

Samples Damaged: Yes ☐ No ☐ If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____ have they been notified of the above issues: Yes ☐ No ☐

Whom spoken to: _____ Date/Time: _____

CPM Initial____

General Comments: _____

* Subcontracted Analysis (See CPM)

Date issued: March 11, 2020
Document ID: SR-9505.004

JAZOO EXPRESS COURIER

www.jazoocourier.com

CLIENT USE ONLY

Sender Name:	Elaine	Receiver Name:		Billed To:	AGAT
Date:	Feb 27, 2025	Delivery From:	AGAT #12 7471 Edgar Industrial Bend Red Deer, AB		
		Delivery To:	AGAT Labs 2910 12th Street NE; Calgary, AB		
Total # Items:	4	Item Description: envelope, sm/med/lg box, cooler, etc.	2 Small coolers Sinopec. 1 Small cooler - Lynx Energy. 1 large cooler - Enviroest		
			Job/PO/Reference #:		
Authorized Shipper Signature:	[redacted]				

DRIVER USE ONLY

P/U Driver Name:	RB	P/U Time:	am	D/O Time:	am
# Items P/U:	4		1:05 pm		15:15 pm

# Of Overweight	# Of TDG	# Of Same Day	Surcharge

Additional Info:

Total # Items Dropped Off:	4	D/O Driver Name:	ORAO
Authorized Receiver Signature:			

HOTSHOT DETAILS

Total Km:		Or Total Charge ($):	

OFFICE USE ONLY

Verified By:		Invoiced By:	

To schedule a pickup please contact dispatch at the city nearest you:

Calgary, Alberta | 403-660-5504
calgary.operations@jazoocourier.com

Edmonton, Alberta | 780-903-3628
edmonton.operations@jazoocourier.com

Red Deer, Alberta | 403-357-7222
reddeer.operations@jazoocourier.com

Fort McMurray, Alberta | 587-645-6364
fortmac.operations@jazoocourier.com

Grande Prairie, Alberta | 587-297-8406
gp.operations@jazoocourier.com

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: Enviro West

Courier: JAZZ Prepaid Collect

Waybill#

Branch: EDM GP FN FM (RD) VAN LYD FSJ EST SASK Other:

If multiple sites were submitted at once: (Yes) No

Custody Seal Intact: (Yes) No NA

TAT: <24hr 24-48hr 48-72hr (Reg) Other

Cooler Quantity: 1

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes (No)

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Color , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry:

Hydrocarbons: Earliest Expiry

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES (NO) Precaution Taken:

Legal Samples: Yes (No)

International Samples: Yes (No)

Tape Sealed: (Yes) No

Coolant Used: Icepack Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar)___+___+___=____°C 2(Bottle/Jar)___+___+___=____°C

3 (Bottle/Jar)___+___+___=____°C 4 (Bottle/Jar)___+___+___=____°C

5 (Bottle/Jar)___+___+___=____°C 6 (Bottle/Jar)___+___+___=____°C

7 (Bottle/Jar)___+___+___=____°C 8 (Bottle/Jar)___+___+___=____°C

9 (Bottle/Jar)___+___+___=____°C 10 (Bottle/Jar)___+___+___=____°C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No:

Samples Damaged: Yes No If YES why?

No Bubble Wrap Frozen Courier

Other:

Account Project Manager: have they been notified of the above issues: Yes No

Whom spoken to: Date/Time:

CPM Initial

General Comments:

* Subcontracted Analysis (See CPM)

Date issued: March 11, 2020
Document ID: SR-9505.004

Data Set: Y:\Operations\Client Data\43077 Wes Walter\25MW01.aqt
Date: 04/10/25
Time: 12:25:51

PROJECT INFORMATION

Company: Envirowest Engineering
Client: Wesley Walter
Project: 2502-43077
Test Date: March 21 - 28, 2025
Test Well: 25MW01

AQUIFER DATA

Saturated Thickness: 1.5 m
Anisotropy Ratio (Kz/Kr): 1.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.953

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	4.852E-9	cm/sec
y0	2.928	m

T = K*b = 7.277E-7 cm²/sec