Technical Document LA24023

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: LA24023

Legal land description: NW 16-9-25 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.

May 22, 2024
Date of signing

[redacted]
Signature

Beyer Feeders LTD
Corporate name (if applicable)

Erik Beyer
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)
Group pens	27 m ~~27m~~ x 66m
Hutch area	54m x 66m
Extended catch basin	59 m x 20 m x 1.5 m (total dimensions)
AO note: on August 19, 2024, the applicant requested to add the catch basin extension to the application	

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

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
Group pen area	27 x 66 m	Facilities confirmed
Pen area	27m x 132m	
Catch Basin	40 m x 20 m x 1.5 m deep	

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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**

Construction completion date for proposed facilities December 1, 2024

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**
Beef feeder Calves	1200	+1000	2200

Last updated September 11, 2023

- property line E - shop F - House G - Barn H - water well I - existing catch basin

J - Range road 254 K - Highway 3 L - nearest residence

M of Willow creek NW-16-9-25-W4 M - dugout

A - existing corrals D - existing group pens B - new group pen area C - new hutch area

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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 WW ID # 256433

Signed this 22 day of May, 20 24. [redacted]

Signature of Applicant or Agent

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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: corrals and group pens **Proposed 1:** group pens / Hutches

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 located in floodplain
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?	0	0			☒ YES ☐ NO ☐ YES with exemption	No springs identified during site visit or reported on AEP database
	How many water wells are within 100 m of the manure storage facility or manure collection area?	1	1			☐ YES ☐ NO ☒ YES with exemption	Water well 256433 ~80 m from proposed pen; ~40 m from catch basin
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	0	0			☒ YES ☐ NO ☐ YES with exemption	195 m east of a seasonal wetland complex, 1,000 m south of the Old Man River
Groundwater information	What is the depth to the water table?	1	0			☒ YES ☐ NO ☐ YES with exemption	> 3.5 m in pen area, >6.3 m in CB area
	What is the depth to the groundwater resource/aquifer you draw water from?	200 Ft	200 Ft			☒ YES ☐ NO ☐ YES with exemption	Water well 256433 static water level 12.19 m

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

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WATER WELL AND SURFACE WATER INFORMATION

Well IDs: 256433 _____ _____ _____

_____ _____ _____

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
256433	26/45	11/29	catch basin
Preliminary score = "continue to next section"			
Secondary score = "exemption more likely			

Groundwater or surface water related comments:

The geotechnical review indicated variable soil conditions across the site, and sand lensing / saturated conditions at many of the borehole locations in the proposed area of the proposed facilities. The underlying topography slopes to the west and northwest towards the Old Man River, indicating the groundwater flow moves towards well 256433.

Overall, the combination of water well exemption screening tool scores, the groundwater flow path, distance from sources to well site, and domestic well use of the water well, there will be a condition included that well 256433 will be sampled on an annual basis for NO3-N (nitrate nitrogen), and Chloride.

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ENVIRONMENTAL RISK SCREENING INFORMATION

ERST for **proposed** facilities See DS LA24023

Facility	Groundwater score	Surface water score	File number
Extended catch basin	low	low	LA24023
Pen/hutch area	low	low	LA24023

ERST for **existing** facilities

Facility	Groundwater score	Surface water score	File number
Existing pens 1-6	low	low	LA22045
Catch basin	low	low	LA22045

ERST related comments:

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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
tevnis and amanda	NW-16-9-25-W4 (south side)	230m	RG	1	270	yes	yes w waiver

RG = rural general

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)
JL Farms LTD	NW-23-9-25-W4	135	brown	54.6	yes
JL Farms LTD	NE-23-9-25-W4	135	brown	54.6	yes
			Total	109.2 ha	

* 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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NRCB USE ONLY

MINIMUM DISTANCE SEPARATION

Methods used to determine distance (if applicable): Aerial photography

Margin of error (if applicable): +/- 5 m

Requirements (m): Category 1: 328 Category 2: 437 Category 3: 546 Category 4: 874

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: 68 ha

Land base listed: 109.2 ha

Area not suitable: N/A

Available area 109.2 ha 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 _____

NRCB | Natural Resources Conservation Board

Minimum Distance Separation (MDS) Waiver (declaration)

Applicant information NRCB application number: LA24023

Operator/operation name: Beyer Feeders LTD

Address: P.O. Box 1981 Fort Macleod, AB Postal Code: T0L 0Z0

Legal land location of confined feeding operation: NW-16-9-25-W4 (North side)

I have requested the residence owner(s) named below to waive the required minimum distance separation (MDS) to their residence for the *Agricultural Operation Practices Act* (AOPA) permit application identified above. In making this request, I have provided the owner(s) with an opportunity to review my permit application and a copy of the Natural Resources Conservation Board (NRCB) Fact Sheet "Minimum Distance Separation (MDS) Waivers" available on the NRCB website at www.nrcb.ca. I have also explained:

- The MDS requirement set out in section 3 of the Standards and Administration Regulation of AOPA. I have advised the owner(s) that section 3(6)(a) of the Standards and Administration Regulation allows this requirement to be waived by the owners of residences, if they agree in writing to grant a waiver;
- That my proposed development does not meet the required MDS to the owner's residence; and,
- That this waiver applies only to this application as described. An increase in livestock capacity, annual manure production, level of odour production, change to the site plan or change to a facility that would increase the MDS would require a new waiver.

Following is a summary of the proposed development:

- The current scope of my confined feeding operation (CFO), including the type, number, and category of livestock, if any, is:
  1200 beef feeder Calves
- My application for a new AOPA permit proposes the following changes to the existing livestock category, type and/or capacity at my CFO:
  2200 beef feeder Calves
- The proposed new CFO facility(ies), or changes to the existing CFO facilities, including manure storage, manure storage volume and any other pertinent details, if any, are (attach a site layout plan if available):

I the applicant understand that the waiver is not valid unless ALL registered owners of the residence sign this document.

Permit Applicant: [redacted] Date: May 10, 2024

Signature

Residence owner(s) to initial: EB

Minimum Distance Separation (MDS) Waiver (declaration)

Residence owner(s) information

ALL Names on land title: Tennis & Amanda Beyer

Legal land location of residence(s): NW - 16-9-25-W4 (southside)

Telephone number(s)[1]: 403 894-6226 Email address(es)[1]: peakpastureranch@gmail.com

Address(es)[1] and Postal code(s)[1]: Box 540 Coalhurst, AB T0C 0V0

[1] ***Please note that personal contact information is for NRCB use ONLY and not publicly released***

I am/we are the legal landowner(s) of a residence(s) located at the above noted legal land location/address:

- I/we have read the NRCB Fact Sheet "Minimum Distance Separation (MDS) Waivers";
- I/we have discussed this application with the applicant and understand its potential impacts to our residence(s);
- I/we understand that the application **does not** meet the MDS requirement to my/our residence(s), under the *Agricultural Operation Practices Act* (AOPA);
- **I/we understand that this waiver is not valid unless signed by ALL parties identified on the land title as owners;**
- **I/we are not obligated to waive the MDS requirement to our residence(s)**;
- I/we understand that if I/we choose to waive the MDS requirement, I/we can revoke the waiver, by providing written notice to the NRCB approval officer, as set out in the "Minimum Distance Separation (MDS) Waivers" Fact Sheet; and
- I/we understand that this waiver is a public document.

Having considered my/our rights, I/we hereby waive the MDS requirement to my/our residence, with respect to **application number** LA24023.

[redacted] [redacted]

Signatures of **all** residence owner(s) on title

Tennis Beyer Amanda Beyer

Printed names of **all** residence owner(s) on title

Date: May 10, 2024

Land Base for Manure Agreement

This is an agreement between _JL Farms Ltd and Beyer Feeders LTD that they will provide 270 acres of land to spread manure/compost for the proposed facility and existing facility.

Legal land descriptions:__NW-23-9-25-W4th

:_NE-23-9-25-W4th

Print Name:__[redacted]

Sign:_____[redacted]_____

Print Name:_____Erik Beyer_____

Sign:_____[redacted]_____

Date:_____5/23/2024_____

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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. Pen/group pen/Hutch area
2.

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	NRCB USE ONLY Estimated storage capacity (m^3)
1.	~~132 m~~	~~81 m~~	0	
2.	hutch area: 54 m Group pen: 27 m	x 66 m x 66 m		
			TOTAL CAPACITY	5,346 m^2

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

Surface water control systems

Describe the run-on and runoff control system

All run off will be slaped to catch basin

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	See note 1.6 (m)	Provide details (as required) Report attached NRCB HaJ soil report.	
Soil texture	17 % sand	69 % silt	14 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested clay fill	Hydraulic conductivity (cm/s) 1x10-6	Describe test standard used modified falling Head test

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

AO note: the engineer reported the layer's hydraulic conductivity is equivalent to 5 m of 1E-6 cm/s

NRCB USE ONLY

Requirements met: ☒ YES ☐ NO

Condition required: ☒ YES ☐ NO

Report attached: ☒ YES ☐ NO

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

NRCB USE ONLY

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

Depth to water table: > 3.5 m Requirements met: ☒ YES ☐ NO

Depth to uppermost groundwater resource: 12.19 m Requirements met: ☒ YES ☐ NO

ERST completed: ☒ see ERST page for details

Surface water control systems

Requirements met: ☒ YES ☐ NO Details/comments:

Surface water runoff will be directed toward catch basin.

Naturally occurring protective layer details

Layer specification comments (e.g. sand lenses; layering uniform or irregular; number and location of boreholes):

Fairly uniform layering of firm, low plastic silty-clay loam lacustrine material. The water table in the area of the proposed feedlot pens is below the drilling zone (3.5 m).

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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 (extended)
2.
3.

Determination of runoff area

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

AO note: Existing runoff dimensions = 132 m x 54 m = 7,128 m²

Proposed runoff dimensions = (66 m x 27 m) + (66 m x 54 m) = 5,346 m²

~~see attached~~ total runoff = 12,474 m²

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) (m³)
1.	59	20	1.5	1.5	3:1	3:1	3:1	
2.	Existing + proposed dimensions							
3.								
							TOTAL CAPACITY	745 m³

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	see note above 1.6 (m)	Provide details (as required) report attached	
Soil texture	17 % sand	69 % silt	14 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested clay till	Hydraulic conductivity (cm/s) 1x10-6	Describe test standard used modified falling head test

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

RUNOFF CONTROL CATCH BASIN: Naturally occurring protective layer (cont.)

NRCB USE ONLY

Catch basin calculator. Total volume @ freeboard level: 745 m^3 Runoff capacity requirements met: ☒ YES ☐ NO

Calculation of the volume attached: ☒ YES ☐ NO

Depth to water table: >6.3 m Requirements met: ☒ YES ☐ NO

Depth to uppermost groundwater resource: 12.19 m Requirements met: ☒ YES ☐ NO

ERST completed: ☒ See ERST page for details

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

Borehole EB3-23 (catch basin location) had saturated sand lenses at 5.0 meters (water table below 6.3 m).
A condition will be included in the permit requiring the applicant to have any sand lenses encountered during the expansion of the catch basin over-excavated and backfilled with clay material.

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

Catch Basin Storage Volume Calculator

Construction Dimensions of Catch Basin

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

CFO Name [1]	Beyer Feeders Ltd.
Land Location [1]	

Overall Dimensions of Catch Basin			Catch Basin Dimensions
Total Length*[4]	59.0	m	194 ft
Total Width*[4]	20.0	m	66 ft
Total Depth*[4]	1.5	m	5 ft
Design Capacity Depth	*1.00*	m	3 ft
End Slope*[4]	3	run:rise	3 run:rise
Side Slope*[4]	3	run:rise	3 run:rise
Length of Bottom	50.0	m	164 ft
Width of Bottom	11.0	m	36 ft
Capacity @ top of Bank	*1,277*	m^3	*Capacity (@tob)* *45,106* ft^3 *280,956 Imp. Gal.*

Design Capacity of Catch Basin (freeboard level)			Design Capacity (freeboard level)
Length (design capacity depth)	56.0	m	184 ft
Width (design capacity depth)	17.0	m	56 ft
Total Depth	*1.5*	m	*5* ft
Design Capacity Depth	1.00	m	3 ft
End Slope	3	run:rise	3 run:rise
Side Slope	3	run:rise	3 run:rise
Design Capacity (freeboard level)	**745**	m^3	26,309 ft^3
			163,877 Imp. Gal.
level)	*952*	m^2	*10,247* 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	132	54	7,128.0
7	66	27	1,782.0
8	66	54	3,564.0
9			0.0
10			0.0
		Total Area (m^2)	**12,474**

Rainfall (Select Town [3])

Fort Macleod 90

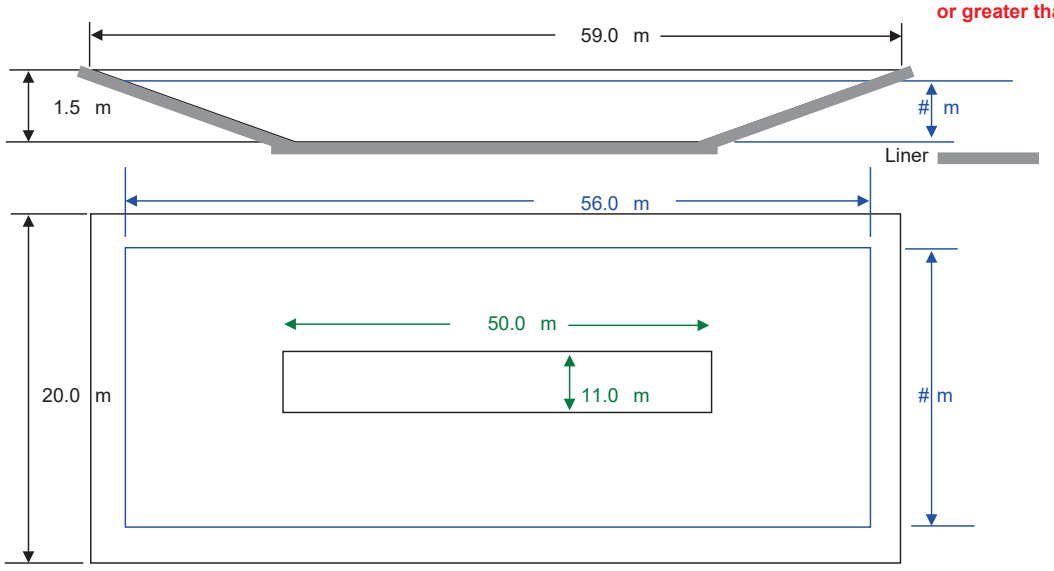
AOPA Design Rainfall **90 mm**

Minimum Catchbasin Storage Volume Required

730 m^3 ** **25770.136 ft^3**

160517.88 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

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NRCB USE ONLY **RUNOFF CONTROL CATCH BASIN CAPACITY SUMMARY (if applicable)**	
Facility 1 Extended catch basin	
Name / description	Capacity 745 m^3
Facility 2	
Name / description	Capacity
Facility 3	
Name / description	Capacity
Facility 4	
Name / description	Capacity
TOTAL CAPACITY	745 m^3
RUNOFF VOLUME FROM CONTRIBUTING AREAS	730 m^3
MEETS AOPA RUNOFF CONTROL VOLUME REQUIREMENTS	☒ YES ☐ NO

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NRCB USE ONLY

ALL SIGNATURES IN FILE ☒ YES ☐ NO

DATES OF APPROVAL OFFICER SITE VISITS

May 22, 2024	
June 18, 2024	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: June 26, 2024

Municipality: M.D. Willow Creek

☒ 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: Town of Fort Macleod ☐ N/A

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

Other: Atco Gas & Pipelines, Telus, Fortis Alberta Inc. ☐ N/A

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

3102 – 12 Avenue South
Lethbridge, Alberta T1H 5V1
T: +1 403 327-7474
www.WSPplc.com

2 February 2023

WSP File: BX30740

Beyer Feeders Ltd.
P.O. Box 1981
Fort Macleod, AB T0L 0Z0

Attention: Erik Beyer

Re: Geotechnical Review and Evaluation
NRCB Permitting of Proposed Pens & Catch Basin
NW-16-009-25-W4M, near Fort Macleod, Alberta

As requested, WSP E&I Canada Limited (WSP) has carried out a geotechnical review and evaluation of the above-captioned site relative to the required protection of the groundwater resource, as required by the Agricultural Operation Practices Act, AB Reg. 267/2001 (hereinafter referred to as "AOPA"). This letter describes site soil conditions to support a permit application related to proposed pens and a catch basin to be located just existing of the existing farmyard (refer to Figure 1, attached).

In order to demonstrate the suitability of the naturally existing soils for consideration as a naturally occurring protective layer to the groundwater, eight boreholes were advanced at the site on January 9, 2023. The boreholes were advanced at the approximate locations denoted as EB1-23 to EB8-23 on Figure 1, attached.

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

In general, the natural mineral soils encountered within the boreholes comprised of a lacustrine complex of fine sand, silt and clay loam to the completion depths of the boreholes. At boreholes EB1-23 and EB2-23, saturated sand loam soils were encountered, so the investigation was shifted to the area east of the existing yard, where the depth to wet soils was deeper. At EB3-23, saturated fine sand-clay loam was encountered below 6.3 m depth, while at EB4, wet silty clay was encountered below approximately 3.5 m depth. At boreholes EB5-23 to EB8-23, groundwater was not encountered within the 3.5 m drilling depth.

Samples of soil collected from EB3-23, EB4-23 and EB6-23 were subjected to laboratory grain size (i.e., hydrometer) analyses. The results (attached) indicate a textural breakdown of approximately:

Table 1: Soil Textural Analyses

Borehole/Depth	% Sand	% Silt	% Clay
EB3-23 / 4-5m	5	69	26
EB4-23 / 2-3m	5	80	15
EB6-23 / 1.5-3m	17	69	14

To measure the *in situ* permeability of the subsurface soils, 50 mm diameter PVC monitoring wells were constructed in boreholes EB3-23 (proposed catch basin), and EB6-23 (proposed pen area). Test well EB3-23 was screened from 3.0 m to 6.2 m depth while test well EB6-23 was screened from 1.5 m to 3.1 m

depth. Well saturation of the 50 mm diameter monitoring wells was carried out by filling the monitoring wells to the top for several consecutive days. After several days, the average 24-hour water drop at borehole EB3-23 was 1.83 m while the 24-hour water drop at borehole EB6-23 was 1.52 m. During the water monitoring and testing, the wells were protected from freezing.

To calculate the permeability of the screened portion of the clay till strata at the test well location, a modified falling head test (as outlined in the USBR Engineering Geology Field Manual Volume 2 [2001]) was used. The input variables and output data are outlined on the attached In Situ Permeability Test report. The results of the permeability testing indicate an *in situ* hydraulic conductivity, k_s, of 1.0×10^{-7} cm/s at EB3-23, and an *in situ* hydraulic conductivity, k_s, of 3.3×10^{-7} cm/s at EB6-23.

Using the measured permeability of the clay stratum, the 3.2 m of clay screened at EB3-23 is estimated to represent the equivalent of 32 m of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s (the reference standard in AOPA), and the 1.6 m of clay screened at EB6-23 is estimated to represent the equivalent of approximately 5 m of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s. This represents natural material protection in excess of the minimum requirements outlined by the AOPA for solid manure storage (minimum 2 m, Section 9.5-c), and basins (minimum 5 m, Section 9.5-b).

Conclusion

Based on the results of the current investigation, permeability testing, and our understanding of the site and proposed development at the site, it is WSP's opinion that the naturally occurring materials at the site satisfy the AOPA requirements for permitting the proposed catch basin and pens at this location.

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

Yours truly,

WSP E&I Canada Limited

PROFESSIONAL ENGINEER ALBERTA JOHN P. LOBBEZOO D 110450 6/Feb/2023

John Lobbezoo, P.Eng.
Associate Engineer, Geotechnical
Lethbridge & Medicine Hat Area Lead

Reviewed by:
Kevin Spencer, P.Eng., M.Eng.
Sr. Associate, Geotechnical Engineer

PERMIT TO PRACTICE
WSP E&I CANADA LIMITED
RM SIGNATURE:
RM APEGA ID #: 110450
DATE: 6/Feb/2023.
PERMIT NUMBER: P004546
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Attachments
- Figure 1 Borehole Locations
- In Situ Permeability Test Calculations
- Hydrometer Tests
- Soil Profile and Parent Material Description, Chilako Drilling Services

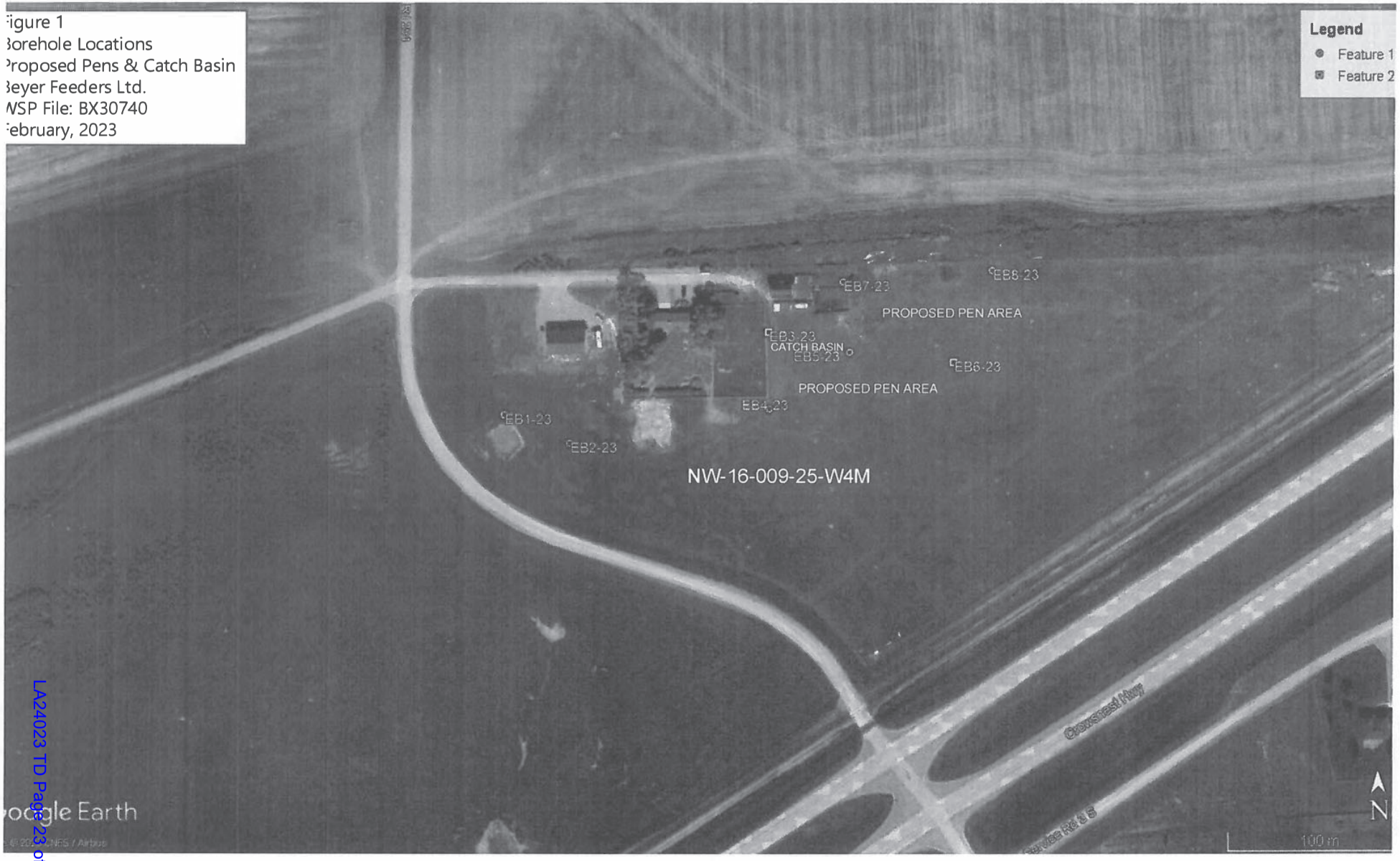
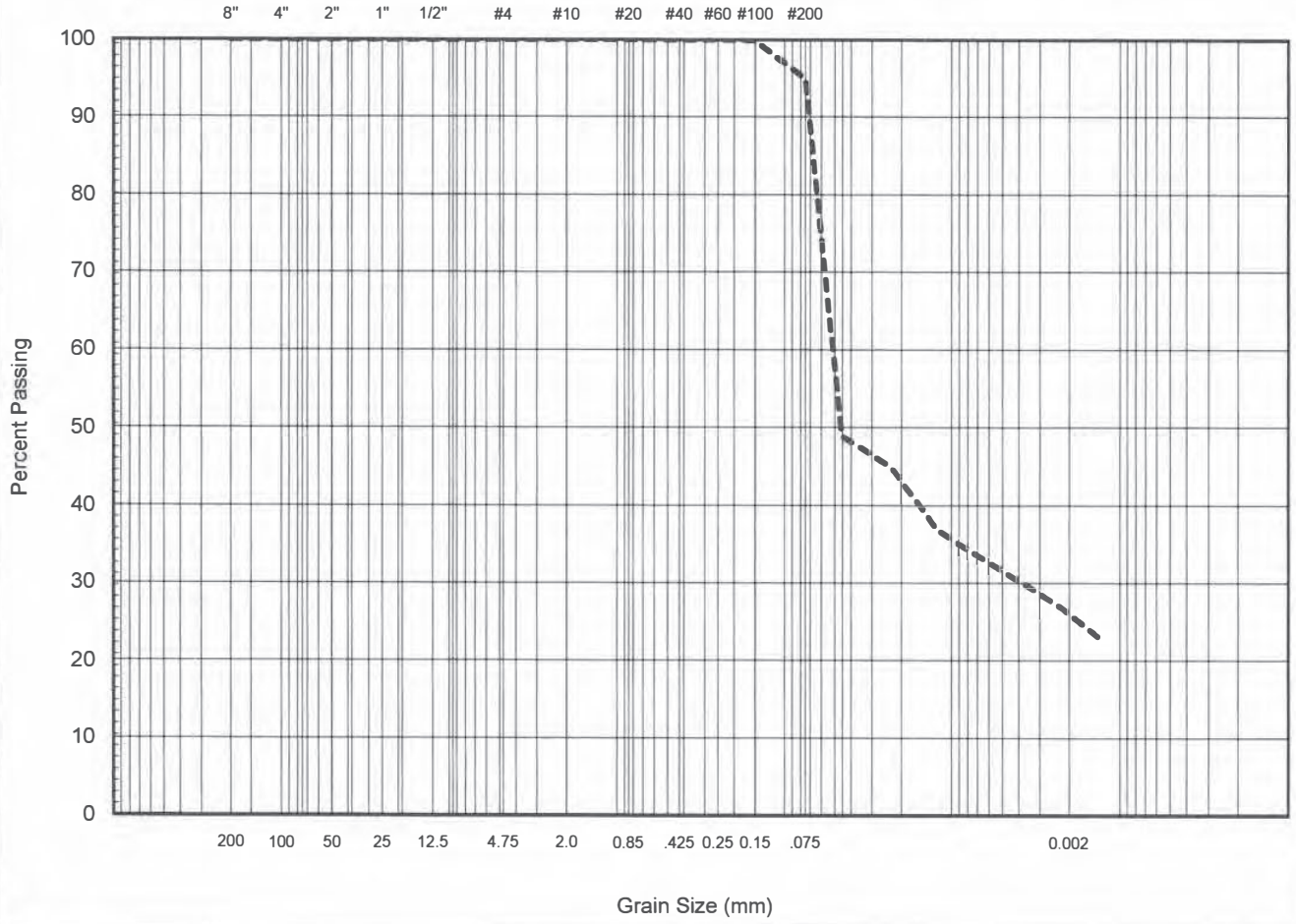


Figure 1
Borehole Locations
Proposed Pens & Catch Basin
Beyer Feeders Ltd.
MSP File: BX30740
February, 2023
Legend
Feature 1
Feature 2
EB8-23
EB7-23
PROPOSED PEN AREA
EB3-23
CATCH BASIN
EB5-23
EB6-23
PROPOSED PEN AREA
EB4-23
EB1-23
EB2-23
NW-16-009-25-W4M
Google Earth
100 m
N

HYDROMETER TEST

WSP E&I Canada Limited

COBBLES	GRAVEL		SAND			SILT	CLAY
	Coarse	Fine	C	M	F		



Remarks:

Summary

D10 =	#N/A	mm	**Gravel**	0	%
D30 =	0.0038	mm	**Sand**	5	%
D60 =	0.0525	mm	**Silt**	69	%
Cu =	#N/A		**Clay**	26	%
Cc =	#N/A				

Project No: BX30740
Hole No: EB3-23
Depth (m): 4-5m

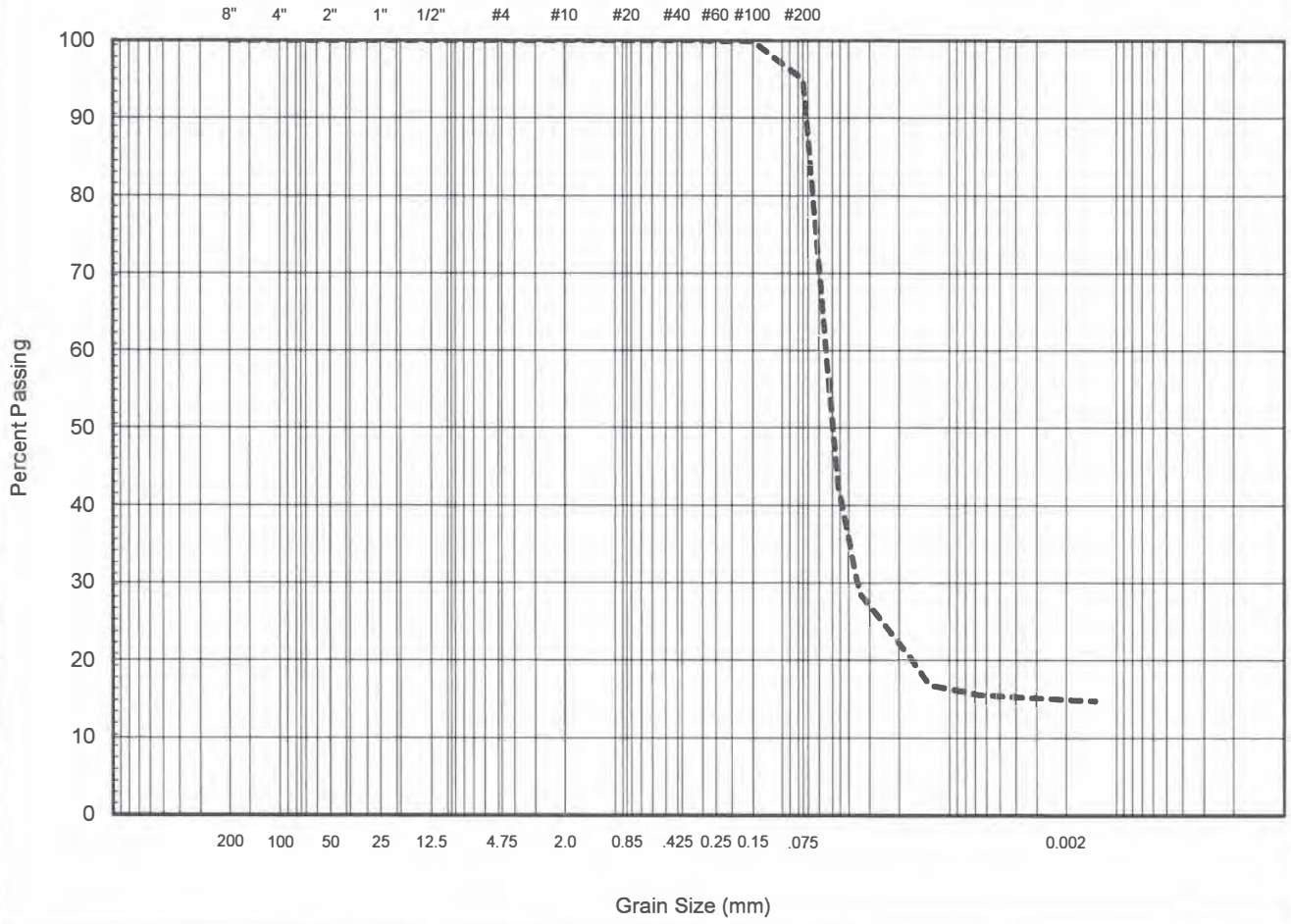
Client: Beyer Feeders Ltd.
Sample: -
Date: January 30, 2023

Tech: TMW / SG

HYDROMETER TEST

WSP E&I Canada Limited

COBBLES	GRAVEL		SAND			SILT	CLAY
	Coarse	Fine	C	M	F		



Remarks:

Summary					
D10 =	#N/A	mm	**Gravel**	0	%
D30 =	0.0355	mm	**Sand**	5	%
D60 =	0.0559	mm	**Silt**	80	%
Cu =	#N/A		**Clay**	15	%
Cc =	#N/A				

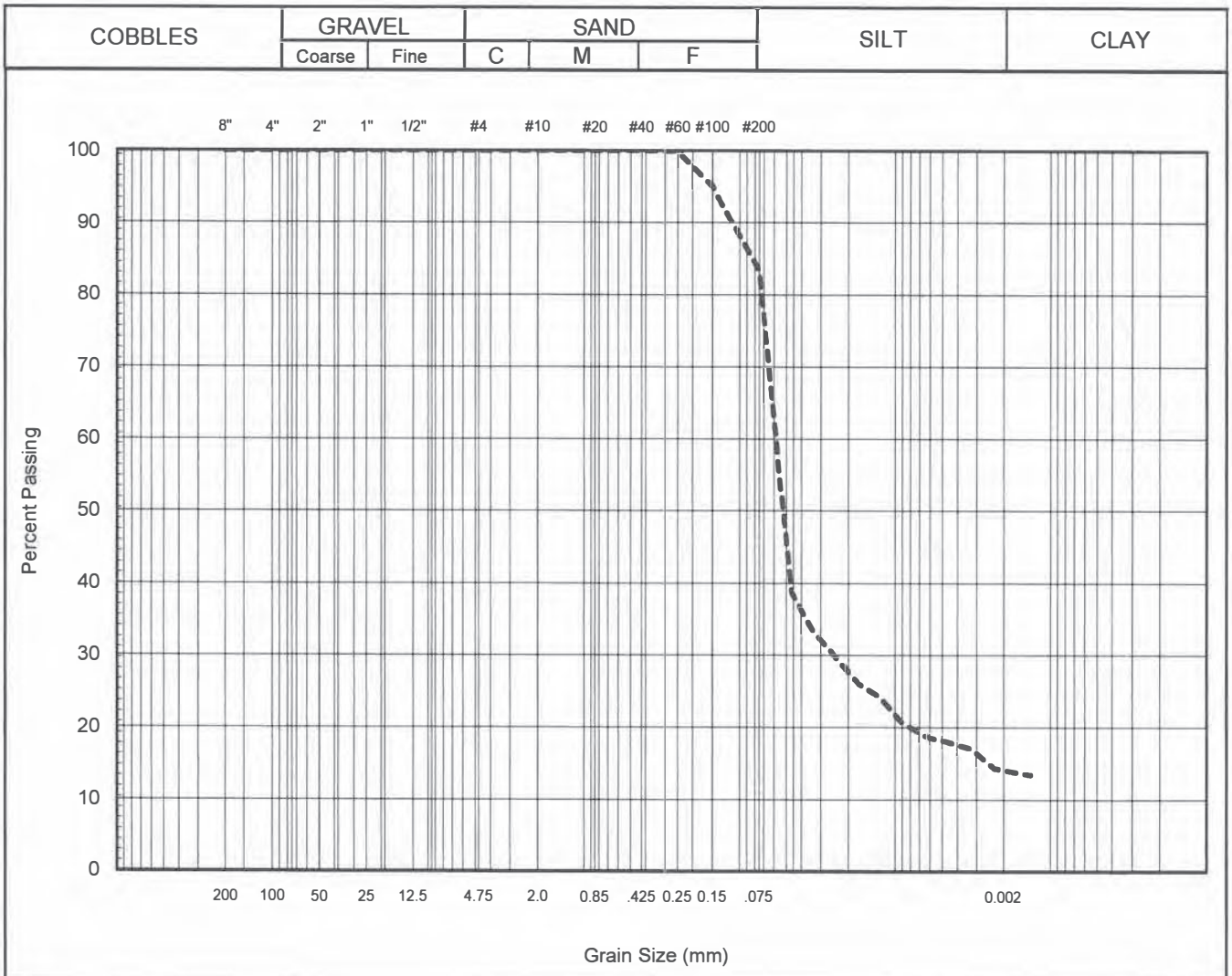
Project No: BX30740
Hole No: EB4-23
Depth (m): 2-3m

Client: Beyer Feeders Ltd.
Sample: -
Date: January 30, 2023

Tech: TMW / SG

HYDROMETER TEST

WSP E&I Canada Limited



Remarks:

Summary					
D10 =	#N/A	mm	**Gravel**	0	%
D30 =	0.0247	mm	**Sand**	17	%
D60 =	0.0600	mm	**Silt**	69	%
Cu =	#N/A		**Clay**	14	%
Cc =	#N/A				

Project No: BX30740
Hole No: EB6-23
Depth (m): 1.5-3m

Client: Beyer Feeders Ltd.
Sample: -
Date: January 30, 2023

Tech: TMW / SG

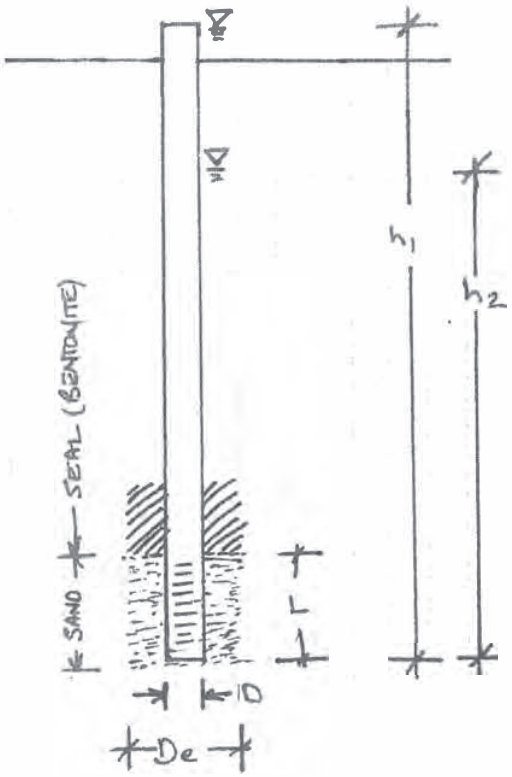
EB3-23

In Situ Permeability Test

Modified Falling Head Permeability Equation

$$K_s = \frac{r^2}{2\ell\Delta t}\left[\frac{\sinh^{-1}\frac{\ell}{r_e}}{2}\ln\left[\frac{2H_1-\ell}{2H_2-\ell}\right]-\ln\left[\frac{2H_1H_2-\ell H_2}{2H_1H_2-\ell H_1}\right]\right]$$

taken from USBR Engineering Geology Field Manual Volume 2 (2001)



EB3-23 - Beyer Feeders Ltd.

Wood File: BX30733

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	3.20	length of sand section (m)
	h1	6.80	initial height of water above base of hole (m)
	h2	4.97	final height of water above base of hole (m)
	t	24.0	time of test (h)

k_s =	1.0E-07 cm/sec

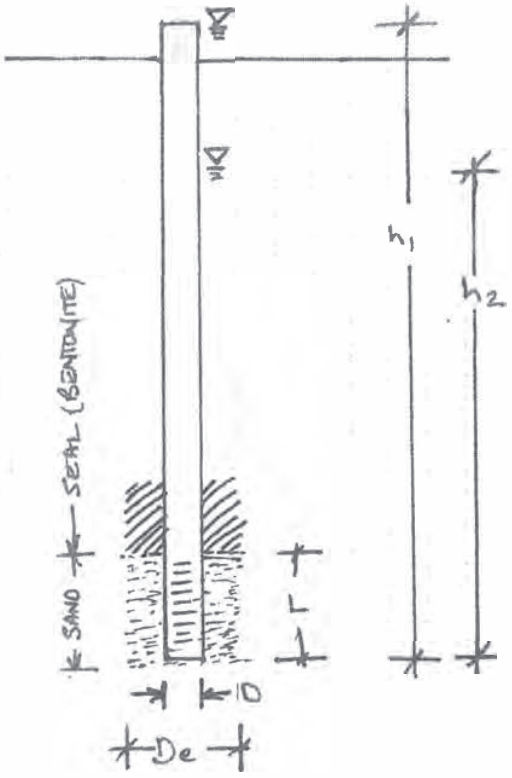
EB6-23

In Situ Permeability Test

Modified Falling Head Permeability Equation

$$K_s = \frac{r^2}{2\ell\Delta t}\left[\frac{\sinh^{-1}\frac{\ell}{r_e}}{2}\ln\left[\frac{2H_1-\ell}{2H_2-\ell}\right]-\ln\left[\frac{2H_1H_2-\ell H_2}{2H_1H_2-\ell H_1}\right]\right]$$

taken from USBR Engineering Geology Field Manual Volume 2 (2001)



EB6-23 - Beyer Feeders Ltd.

Wood File: BX30733

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	1.60	length of sand section (m)
	h1	3.40	initial height of water above base of hole (m)
	h2	1.89	final height of water above base of hole (m)
	t	24.0	time of test (h)

k_s =	3.3E-07 cm/sec

CHILAKO DRILLING SERVICES LTD

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

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: NW16-9-25W4, Erik Beyer Date: 9-Jan-23

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
EB1-23	0331201	0-0.15	CL	F	Topsoil		
	5512541	0.15-12	CL	M	Lac		
		1.2-4.4	LS	Sat	Lac		
		4.4-5.0	Silt	VM	Lac		V. Soft, gray
		5.0-6.2	SiC	VM	Lac		Stiff, high plastic, gray
EB2-23	0331239	0-0.15	FSCL	F	Topsoil		
	5512522	0.15-1.1	SL	M	Lac		
		1.1.1-7	SL	VM	Lac		
		1.7-2.6	Lc.S	Sat	Lac		
		2.6-3.1	SiC	VM	Lac		V. Firm, high plastic, olive brown
		3.1-4.7	Silt	Sat	Lac		V. Soft, gray
		4.7-6.2	SL	Sat	Lac		V. Soft, gray
EB3-23	0331352	0-0.15	SiCL	F	Topsoil		
	5515280	0.15-3.5	SiCL	M	Lac		
		3.5-6.3	SiCL	VM	Lac		Soft, med plastic, olive brown, sat sand lenses @ 5.0m
		6.3-9.2	FSL-FSCL	VM-Sat	Lac		Soft, gray, silt layers 50mm H.C. Well installed to 6.1m BGS Drilled new hole for well 3' over Screen: 6.2-3.1m Sand: 6.2-3.0m Bentonite: 3.0-0.0m Stickup: 0.6m Hole Diameter: 0.15m
EB4-23	0331350	0-0.15	SiCL	F	Topsoil		
	5512536	0.15-3.5	SiCL	M	Lac	2.0-3.0	Soft, layered with Silt, SiCL, FSL
		3.5-4.6	SiL	Sat	Lac		V. Soft
		4.6-9.2	SiL-SiCL	Sat	Lac		V. Soft, sand layers
EB5-23	0331397	0-0.15	SiCL	F	Topsoil		
	5512566	0.15-3.5	SiCL	M	Lac		V. Soft, low plastic, olive brown
		3.5-4.6	SiL-SiCL	Sat	Lac		V. Soft, low plastic, olive brown, S+SiC layers
		4.6-6.4	SiCL	VM	Lac	5.0-5.5	Soft, low-med plastic, olive brown, S+SiC layers
		6.4-8.4	SiCL	VM-Sat	Lac		Soft, med plastic, gray
		8.4-9.2	SiL-SiCL	Sat	Lac		Soft, low-med plastic, gray
EB6-23	0331455	0-0.15	SiL	F	Topsoil		
	5512556	0.15-1.1	SiL	SM	Lac		V. Firm, sand lensing
		1.1-3.1	SiCL	M	Lac		V. Firm, sand lensing 50mm H.C. Well installed to 3.1m BGS Screen: 3.1-1.6m Sand: 3.1-1.5m Bentonite: 1.5-0.0m Stickup: 0.3m Hole Diameter: 0.15m
EB7-23	0331399	0-1.0	SiCL	SM	Lac		V. Firm, med plastic, olive brown
	5512607	1.0-1.5	SiCL	M	Lac		V. Firm, med plastic, olive brown
		1.5-3.0	SiL-SiCL	M	Lac		Firm, low plastic, olive brown, silt-VFS
EB8-23	0331482	0-1.5	SiCL	M	Lac		V. Firm
	5512608	1.5-3.0	SiL-SiCL	M	Lac		Firm, low plastic, olive brown, sandy (VFS)

Legend:

L	Loam
C	Clay
S	Sand
Gr.	Gravel
Si	Silt
F	Fine (sand)
VF	Very Fine (sand)