


PUBLIC HEARINGS AND MEETINGS
PLANNING AND DEVELOPMENT REPORT TO COUNCIL
LAND USE BLAW AMENDMENT
September 17, 2025
To be heard at: 1:30 PM

APPLICATION INFORMATION		FILE NO. 25R051
	SUBJECT LANDS: Ptn. SE 11-17-27-W4 (160 ac)	
	LANDOWNERS: Chinook Feeders 2024 Ltd.	
	APPLICANT: 2716438 Alberta Ltd	
	AGENT: Daniele Chiodini of Taurus Canada Renewable Natural Gas Corporation	
	CURRENT LAND USE: Agricultural District	
PROPOSAL: An application to allow for a site-specific amendment to the Agricultural District on Ptn. SE 11-17-27-W4 (160 acres), to allow for: <ul style="list-style-type: none"> a. an Anaerobic Digester Facility as a Permitted Use a b. Exception to the maximum height requirements as follows: <ul style="list-style-type: none"> i Anaerobic Digesters up to a maximum height of 30m ii Accessory building (Biogas upgrading building) up to maximum height of 16m iii Flare Tower up to a maximum height of 16m 		
DIVISION NO: 1	COUNCILLOR: Rob Siewert	FILE MANAGER: Heather Hemingway

EXECUTIVE SUMMARY

Summary of Proposal

An application to allow for a site-specific amendment to the Agricultural District on Ptn. SE 11-17-27-W4 (160 acres), to allow for:

- a. an Anaerobic Digester Facility as a Permitted Use a
- b. Exception to the maximum height requirements as follows:
 - iv Anaerobic Digesters up to a maximum height of 30m
 - v Accessory building (Biogas upgrading building) up to maximum height of 16m
 - vi Flare Tower up to a maximum height of 16m

Location and Site Information

The subject lands are located approximately 10 kilometers northeast of the Town of Nanton in the southeast corner of Foothills County.

The project is adjacent to the existing Chinook Feeders operation, a feedlot with approval for 56,000 cattle. The subject lands are adjacent to the Municipal District of Willowcreek boundary on the south side and is approximately 2.4 km west of the County of Vulcan municipal boundary.

Access to the parcel is off 264 St. E. (gravel road) on the east side, just south of the 690 Ave. E. intersection.

The subject lands are currently zoned Agricultural District.

Referral Considerations

This application was subject to a 30-day circulation to referral agencies prior to this hearing: Referral comments have been provided within the staff report for your reference.

Policy Evaluation

The application for a site specific amendment application has been reviewed in terms of the South Saskatchewan Regional Plan (SSRP), Foothills County's Growth Management Strategy, Foothills County's Municipal Development Plan 2010, and Land Use Bylaw 60/2014.

The subject lands are also located within the following Intermunicipal Development Plan Areas:

- Foothills County & Vulcan County Intermunicipal Development Plan
- Foothills County & M.D of Willow Creek Intermunicipal Development Plan

The proposed site specific amendment has been deemed to align with policies and guiding principles within these documents.

BACKGROUND INFORMATION

Feedlot Approval:

The landowners have an existing NRCB approval for a confined feeding operation (feedlot) to allow for a total of 56,000 beef finishers located on N1/2 and SW 11-17-27-W4. This NRBC approval was granted for expansion from 25,000 to 56,000 cattle was approved in 2022.

PURPOSE OF APPLICATION

The purpose of this application is to apply for a site specific amendment under the Agricultural District on the subject lands (Ptn. SE 11-17-27-W4 -160 acres), to allow for:

- a. an Anaerobic Digester Facility as a Permitted Use a
- b. Exception to the maximum height requirements as follows:
 - i Anaerobic Digesters up to a maximum height of 30m
 - ii Accessory building (Biogas upgrading building) up to maximum height of 16m
 - iii Flare Tower up to a maximum height of 16m

Future Applications:

A Development Permit application approval is required prior to the development of an Anaerobic Digester Facility on the subject lands.

SITE CONSIDERATIONS

Site Location:

The subject lands are located approximately 10 kilometers northeast of the Town of Nanton in the southeast corner of Foothills County. The project is on the site of the existing Chinook Feeders operation, a feedlot with approval for 56,000 cattle.

The subject lands are adjacent to the Municipal District of Willowcreek municipal boundary on the south side and is approximately 2.4 km west of the County of Vulcan municipal boundary.

Access

Access to the parcel is off 264 St. E. (gravel road) on the east side, just south of the 690 Ave. E. intersection.

Land Use

The subject lands are currently zoned Agricultural District. The majority of the land in the area is Agricultural District lands. Within Foothills County, the nearest CR parcels appear to be approximately 6.4 kilometers to the north of the subject parcel and there are two Natural Resource Extraction District parcels located in the 8 kilometer radius.

A land use map for the subject lands and surrounding area can be found in **Appendix A** of the report.

DETAILS OF THE DEVELOPMENT

The applicant is proposing to develop a manure-only biodigester facility that will produce renewable natural gas (RNG) through an anaerobic digestion process where the resultant RNG will be injected into the TransCanada pipeline.

The facility is intended to be a 2-phased approach where

- Phase 1 will accommodate 70% of the cattle at the feed yard with a plant capacity that allows it to process approximately 136,000 tonnes/year of manure, producing 406,000 GJ/year of RNG.
- The second phase of the Project would increase capacity to meet 100% of the cattle on feed, processing 190,000 tonnes of manure per year generating 566,000 GJ/year of RNG.

Project Overview

The facility will process livestock manure, primarily delivered from the adjacent Chinook Feeders operation, with some capacity to accept material from other local farms if necessary. At full operation, up to 190,000 tonnes of manure will be processed each year.

In the event of emergencies such as disease outbreaks or crop failures, the plant can also receive limited non-manure materials (e.g., damaged crops or residues) to ensure operations continue without interruption.

Through anaerobic digestion, the manure is broken down to produce renewable natural gas (RNG), which will be upgraded to pipeline quality and injected into the TC Energy system.

Two options are being reviewed for the pipeline connection:

1. Construction of a new on-site pipeline and metering station in collaboration with TC/ATCO; or
2. A tie-in to the existing natural gas collection system of a nearby oil and gas operator, thereby avoiding the need for a new metering station.

The digestion process also produces a nutrient-rich byproduct called digestate. This material is largely odourless and will be separated into solid and liquid forms:

- Solid digestate will be stored temporarily and later applied to farmland as fertilizer.
- Liquid digestate will be stored in a covered lagoon and applied to fields by irrigation.
- Ammonium sulfate will be stored in a tank on site (approximately 70 days to fill) and then trucked to farmers to utilize as fertilizer.

Overall, manure volumes will be reduced by about half, from 190,000 tonnes annually to approximately 97,000 tonnes of solid digestate, along with recoverable liquid nutrients.

In addition, the project is assessing the potential to capture and store the carbon dioxide (CO₂) separated during gas upgrading. If geological conditions are suitable, this CO₂ could be injected into underground formations through a sequestration well, further reducing greenhouse gas emissions. Should this component move forward, it would require additional provincial approvals to ensure that CO₂ storage is conducted safely and with ongoing monitoring and reporting. (See Regulatory Approvals below).

Setback Requirements

The proposed manure-only anaerobic biodigester is not classified as a “waste management facility” under the provincial *Matters Related to Subdivision and Development Regulation (MRSDR)* and therefore is not subject to the 300m setback requirement from a property line of any school, hospital or residence for waste storage sites as was the case with the Rimrock Digester Facility. Since this project’s feedstock is exclusively livestock manure (with limited emergency use of crop residues), those setbacks do not apply.

Instead, the project must demonstrate compliance with Agricultural Operation Practices Act (AOPA), with oversight by the Natural Resources Conservation Board (NRCB), manure and digestate setback standards to protect neighbouring residences, surface water, and groundwater.

Key AOPA setbacks include:

- 150 metres from the nearest residence not under the operator’s control for short-term manure or digestate storage areas.
- 30 metres from a common body of water, subject to slope conditions.
- 100 metres from a spring or water well.
- Engineered storage facilities must also maintain at least 1 metre of vertical separation above the water table and meet liner/containment standards.

Traffic

The proposed facility will not result in significant increases to public road traffic. Manure is sourced directly from the adjacent feedyard, eliminating the need for additional hauling on County roads. The primary traffic generated will be related to the removal of digestate products for land application. It is estimated that approximately 20–25 trucks per day will operate during peak removal periods, spread across an eight-month window to avoid spring road bans. This approach reduces peak congestion compared to existing manure hauling practices and minimizes road maintenance impacts.

The biodigester facility is expected to operate 365 days per year, with crew on site and/or deliveries Monday to Saturday 7:00 AM to 7:00 PM.

Any proposed signage proposed on County road allowances require approval from Council.

Water Requirements and Consumption

The project will source all of its water requirements from Chinook's effluent pond, which collects runoff from the Chinook feedlot. This design avoids the use of fresh water and integrates with the existing feedlot water management.

Water requirements for the project at commissioning are anticipated to be approximately 60,000 m³, primarily for conducting tank leak testing and commencement of operations. Subsequently, up to 120,000 m³ of water annually will be required for ongoing operations (water consumption may vary dependent on the annual rainfall affecting the moisture content of the feedstock).

Three types of water use are proposed within Facility:

1. Dilution water – for preparing manure slurry in feedstock processing.
2. Industrial/process water – softened/filtered water used in plant systems.
3. Sanitary/potable water – purified on site for staff use in offices and amenities.

The report indicates that 790m³ of water will be accessible at all times for firefighting purposes.

- Discussions are ongoing with Chinook regarding access to their water pump, failing this a pond or cistern will be required.
 - Water for firefighting capacity to be sized appropriately according to site requirements and confirmed by the designing engineer

Stormwater Management

The facility has been designed to contain and control all stormwater within the project footprint. Runoff will be directed by grading, ditches, and culverts to a lined digestate lagoon, which provides storage capacity for both liquid digestate and stormwater, including a 1:100 year rainfall event.

The digestate lagoon will utilize an impermeable cover to both preserve ammonia and prevent the release of odors.

Collected stormwater will be applied to land in accordance with nutrient management plans, ensuring no uncontrolled discharge from the site.

Public works has noted the following requirements:

- Storm Water Management Plan/lot grading and drainage plan stamped by a professional engineer to be provided
- Will meet the requirements of '*Guidelines for secondary containment for above ground storage tanks industrial waste and wastewater branch Alberta environmental protection*'
- Geotechnical study to be conducted to assess soil conditions and groundwater
 - Soil compaction is to be conducted where manure is stored as per NRCB guidelines to meet secondary containment requirements
 - Will require the report to be stamped by the engineer.
- IFC plan required to show entire site, including grading and stormwater management infrastructure
- As-builts will be required upon completion along with a letter of conformation from an engineer for all site grading and SWMP.

These requirements will be conditions of the Development Permit.

Nuisance Control (Emissions, Odour, Noise)

Odour and emissions are expected to be reduced compared to traditional feedlot manure storage and spreading practices. Key mitigation measures include:

- Enclosed reception and processing buildings with rapid-close doors to prevent odour release.
- Covered digestate lagoon to prevent ammonia loss and odour.
- Biogas capture and upgrading for pipeline injection, with an emergency flare to prevent uncontrolled venting.
- Air quality modelling and odour studies to demonstrate compliance with Alberta Ambient Air Quality Objectives.
- Noise and dust impacts are expected to be minor and limited to normal truck traffic and on-site equipment.

Safety Measures and Emergency Planning

The facility will be fenced with controlled access for authorized personnel only.

Safety measures include:

- Comprehensive health and safety programs and emergency response plans.
- Gas detection, alarms, emergency flares, and overpressure safeguards.
- Fire prevention systems, including hydrants, extinguishers, and emergency power shut off.
- Clear signage, protective railings, and piping colour coding to support safe operations.

Land Reclamation

A reclamation plan is required as part of the EPA Approval, including financial security to ensure reclamation is completed. The land will be reclaimed in accordance with provincial requirements to ensure it is safe, stable, and suitable for future farming use.

Outdoor Lighting

Section 9.15 of the Land Use Bylaw requires all exterior lighting in the County to meet the requirements set forth in the *Dark Sky Bylaw*.

The applicants have indicated that placement and intensity of the lighting will respect the *Dark Sky Bylaw*.

A copy of the complete “*Renewable Natural Gas Facility Project Description*” is included in **Appendix B** of this report.

REGULATORY APPROVALS REQUIRED

The project is subject to multiple municipal and provincial approvals, including:

- **Foothills County** – Site-specific land use amendment, development permit, and building permit.
- **Alberta Environment and Protected Areas (EPA)** – Environmental Protection and Enhancement Act (EPEA) Industrial Approval and related studies (air quality, groundwater, wildlife).
- **Alberta Utilities Commission (AUC)** – Approval under Rule 007 for on-site cogeneration.
- **Alberta Energy Regulator (AER)** – Compliance with Directives 006, 056, and 077 for RNG injection to pipeline.
- **Aboriginal Consultation Office (ACO)** – Consultation process assessment.
- **Ministry of Arts, Culture and Status of Women** – Historical Resources Act clearance.

Additional oversight may apply through the Natural Resources Conservation Board (digestate land application), and Alberta Fire Code compliance.

Separate approvals for the Carbon capture and sequestration (CCS) include:

- **Alberta Energy Regulator (AER)** - Authorization for the well and injection process and compliance with Directives 056, 065.
- **Ministry of Energy and Minerals (MEM)** – Carbon Sequestration Tenure rights and Subsurface Pore Space Unit Agreement.
- **Alberta Environment and Protected Areas (EPA)** – Notification and updates to environmental approvals under the Environmental Protection and Enhancement Act.

POLICY EVALUATION

The proposal aligns with relevant planning frameworks including:

South Saskatchewan Regional Plan (SSRP)

The SSRP provides a high-level policy framework for all lands in the South Saskatchewan River Basin within Alberta, including all sub basins. Objectives under the Agriculture section of the SSRP support the maintenance and diversification of the region's agricultural industry through: maintaining agricultural land base, supporting diverse and innovative irrigated agriculture, maximizing opportunities for value-added agricultural products, recognizing the contribution of local production in addition to existing domestic and international market opportunities, supporting the next generation of agricultural, food and rural entrepreneurs, and recognizing and rewarding continued stewardship and conservation of private agricultural land and diversification of the agricultural economy.

The redesignation generally aligns with the policy direction within the SSRP with consideration of policy sections related to: Economy (Agriculture, Energy), and Efficient Use of Land.

Summarized – supports diversification of agricultural operations, the creation of value-added agricultural products and local renewable energy production.

Foothills County Growth Management Strategy (GMS)

The subject property is located within the East District of the Foothills County's Growth Management Strategy. The East District is predominantly made up of agricultural lands with little fragmentation and some natural resource extraction.

Very little growth is anticipated in the East District, outside of the area defined within the Blackie ASP. In order to keep agriculture viable fragmentation should be carefully managed so while it is possible that first parcels out may continue to be supported, more intensive development is less likely to be.

Land use conflicts in this area should be carefully considered both in terms of the impact of new development on agriculture and the impact of agricultural activities on new development.

The application has been evaluated in the context of the County's Growth Management Strategy and is generally consistent with the goals and objectives within that plan.

Summarized – Compatible with predominant agricultural use in the East district.

Municipal Development Plan (MDP 2010)

Policies under the Agricultural Section of the MDP2010 support maintaining the integrity of the agricultural land base and note that agricultural uses and industries that support agriculture should be encouraged. Non-agricultural uses should only be permitted on land where the County judges the proposal to have minimal negative impacts on the agricultural resource, and potential agricultural use of the property and properties that may be affected.

The application has been evaluated in the context of the County's MDP 2010 and is generally consistent with the goals and objectives within that plan.

Summarized – Encourages agricultural innovation and non-agricultural uses that support rural viability without adversely impacting surrounding farmland.

Intermunicipal Development Plan (IDP) (MD of Willow Creek No. 26 & Foothills County, 2015)

The MD of Willowcreek – Foothills County IDP emphasizes cooperation between the municipalities to ensure orderly, efficient, and sustainable development while protecting agricultural integrity, natural features, and minimizing intermunicipal conflict.

Policies under the IDP support coordination and cooperation between the two municipalities to ensure that development along the shared boundary occurs in an orderly, efficient, and sustainable manner. The Plan emphasizes protection of agriculture, orderly land use, and the need for intermunicipal consultation on subdivision, redesignation, and discretionary use applications within the Plan Area. The intent is to reduce potential conflict, ensure compatible development, and support rural viability for both municipalities.

The application has been evaluated in the context of the Willow Creek–Foothills IDP and is consistent with the goals of cooperative rural development and agricultural protection.

Summarized – Supports cooperative, orderly rural development along the municipal boundary while protecting agriculture and requiring consultation on uses that may have cross-boundary impacts.

Intermunicipal Development Plan (IDP) (Vulcan County & Foothills County, 2021)

The Vulcan County –Foothills IDP establishes a framework for collaboration along the shared municipal boundary, focusing on agriculture as the primary land use while providing for compatible rural development.

Policies under the Vulcan County emphasize the protection of agricultural operations, coordinated land use decisions, and the need for intermunicipal referrals of subdivision, redesignation, and discretionary development proposals within the Plan Area. The intent is to promote orderly and efficient development while minimizing conflict and ensuring cross-boundary compatibility.

The application has been reviewed in the context of the Vulcan–Foothills IDP and is consistent with its goals of encouraging agricultural innovation, supporting rural-based economic development, and requiring consultation where there may be potential cross-boundary impacts.

Summarized – Supports agricultural protection and coordinated rural development, requiring consultation on proposals with potential cross-boundary impacts.

Land Use Bylaw 60/2014 (LUB)

The purpose and intent of the Agricultural District under the land use bylaw is to promote a wide range of agricultural land uses that encourage growth, diversification and development of the agricultural industry while having regard for the agricultural value and rural character of the area consistent with the policies outlined in the Municipal Development Plan.

The proposed use is not currently contemplated under the Land Use Bylaw. The application is for an amendment under the Agricultural District land use to allow for new innovation to support existing intensive agriculture use and amendments to the Land Use Bylaw to support the use in Foothills County.

Summarized – Proposes a use consistent with the Agricultural District's intent to support diverse agricultural development. Amendments ensure consistency with the County's regulatory framework.

CIRCULATION REFERRALS

The application was circulated to all necessary internal departments and external agencies. The responses received are summarized in the table below.

CIRCULATION REFERRALS	
REFEREE	COMMENTS
INTERNAL	
Mapping	No concerns
Public Works:	<p>A summary of Public work has commented as follows:</p> <ul style="list-style-type: none"> • Water firefighting capacity to be sized appropriately according to site requirements and confirmed by the designing engineer • SWMP/lot grading and drainage plan stamped by a professional engineer to be provided • Will meet the requirements of '<i>Guidelines for secondary containment for above ground storage tanks industrial waste and wastewater branch Alberta environmental protection</i>' • Geotechnical study to be conducted to access soil conditions and groundwater <ul style="list-style-type: none"> ○ Soil compaction is to be conducted where manure is stored as per NRCB guidelines to meet secondary containment requirements ○ Will require the report to be stamped by the engineer. • Signage is mentioned under 7.2, if any are proposed to be installed within Foothills County road allowances, approval from council will be required for any regulatory signs. • IFC plan required to show entire site, including grading and stormwater management infrastructure • As-builts will be required upon completion along with a letter of conformation from an engineer for all site grading and SWMP. <p>A copy of the full response from Public Works is included as Appendix C of the report.</p>
CIRCULATION REFERRALS	
EXTERNAL	
Municipal District of Willow Creek	No Comments
County of Vulcan	No Comments
ATCO Gas	There are no ATCO gas distribution facilities in the proposed area.
TELUS	No Concerns
Fortis Alberta	No Concerns

PUBLIC	
Western Wheel	Public Hearing was advertised on September 3, 2025, and September 10, 2025.
Land Owners (1/2 Mile)	<p>Notice of the Public Hearing was mailed to Foothills County landowners within approximately 1½ miles of the subject quarter section on September 3, 2025.</p> <p>Notice was sent to landowners in the Municipal District of Willow Creek within a one mile radius of the subject parcel.</p> <ul style="list-style-type: none"> • No letters of concern received at this time.

SUMMARY

BYLAW XX/2025 proposes a site specific amendment under the Agricultural District on the subject lands (Ptn. SE 11-17-27-W4 -160 acres), to allow for:

- a. an Anaerobic Digester Facility as a Permitted Use a
- b. Exception to the maximum height requirements as follows:
 - i Anaerobic Digesters up to a maximum height of 30m
 - ii Accessory building (Biogas upgrading building) up to maximum height of 16m
 - iii Flare Tower up to a maximum height of 16m

DECISIONS:

REQUEST FOR SITE SPECIFIC AMENDMENT

OPTIONS FOR COUNCIL’S CONSIDERATION:

OPTION #1 – APPROVAL (First Reading to Bylaw XX/2025).

Should Council believe that the proposal for a site-specific amendment has merit, is consistent with the existing regional and municipal policy frameworks, not in conflict with existing Provincial approvals and no significant planning considerations have been brought forward through the public hearing that cannot be resolved through the planning / approval process:

Council may choose to grant 1st reading to Bylaw XX/2025 approving the application for a site specific amendment to allow for an Anaerobic Digester Facility as a Permitted Use on the subject lands and to allow for exceptions to the maximum height requirement for the project as included in the draft bylaw attached as **Appendix D**.

Note: Council may be supportive of the addition of the use “Anaerobic Digester Facility” as a Site Specific amendment to the Agricultural District but may not be supportive of it being a Permitted Use. In this case, Council would stipulate in the motion for approval that the use shall be added as a Discretionary Use rather than a Permitted Use.

Recommended Conditions for Option #1:

1. Submission of a completed Development Permit application including necessary fees.
2. 2nd and 3rd reading granted on this bylaw for the site specific amendment.

OPTION #2: POSTPONE DECISION

Should Council believe that they require additional information or deem more discussion of the application at a municipal or intermunicipal level is required prior to rendering a decision; Council may choose to postpone their decision on the application for a site specific amendment to allow an Anaerobic Digester Facility as a Permitted Use on the subject lands and proposed exceptions to the maximum height requirement for the project as included in the draft bylaw attached and provide further direction to administration and/or the applicant.

OPTION #3: REFUSAL

Should Council believe that the proposed application for site specific amendment to allow an Anaerobic Digester Facility as a Permitted Use on the subject lands and proposed exceptions to the maximum height requirement for the project as included in the draft bylaw attached, does not have sufficient merit, is not consistent with the existing regional and municipal policy framework or that planning considerations have been brought forward through the public hearing process that Council feels cannot be addressed adequately through the planning / approval process, Council may choose to refuse the application.

APPENDICES

APPENDIX A: MAP SET:

1. Location Map
2. Area Land Use Map
3. Air Photo
4. Project location map
5. Project layout map

APPENDIX B: APPLICATION PACKAGE

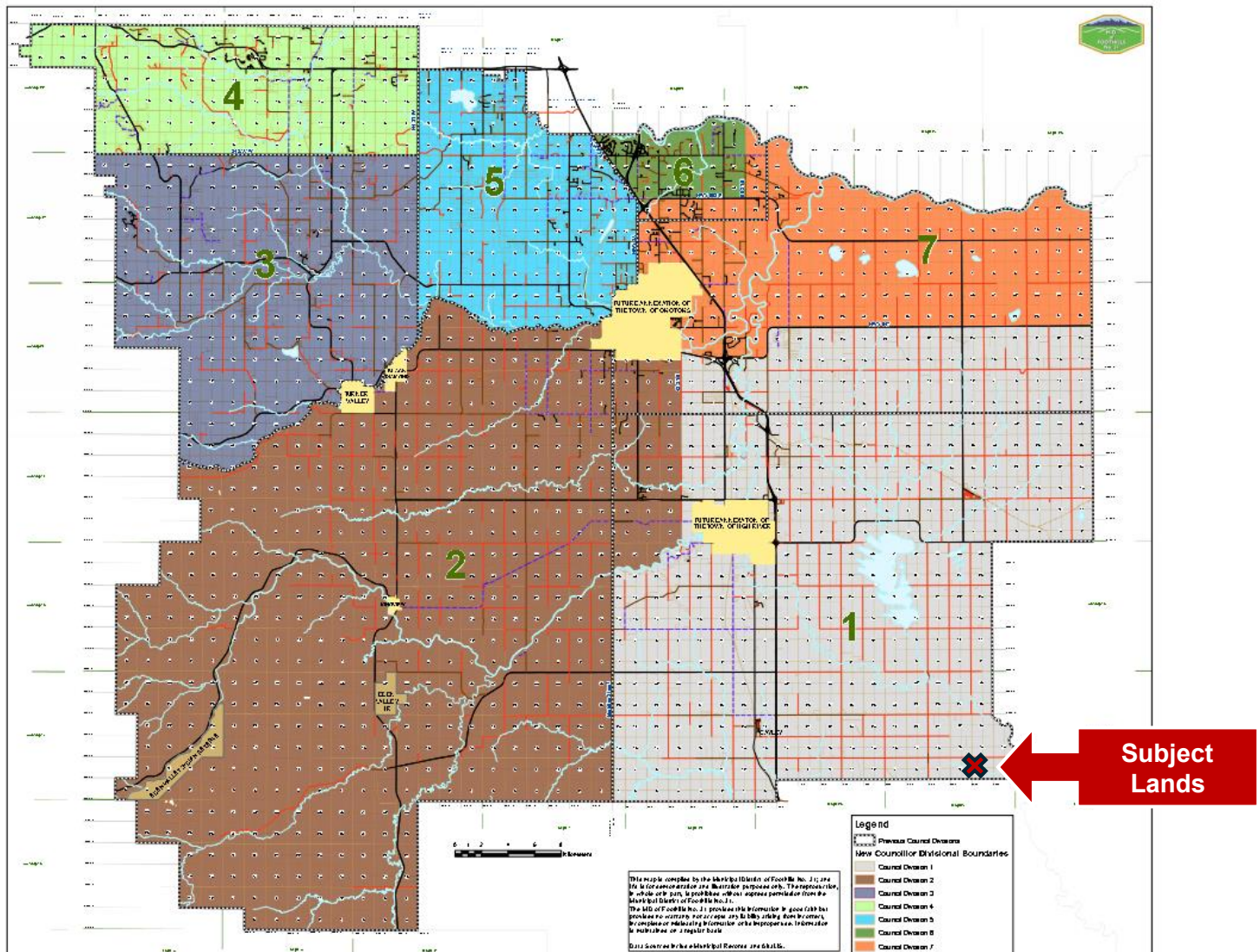
1. Introduction letter from Taurus Canada Renewable Natural Gas Corp.
2. Renewable Natural Gas Facility Project Description

APPENDIX C: FOOTHILLS COUNTY PUBLIC WORKS REFERRAL RESPONSE

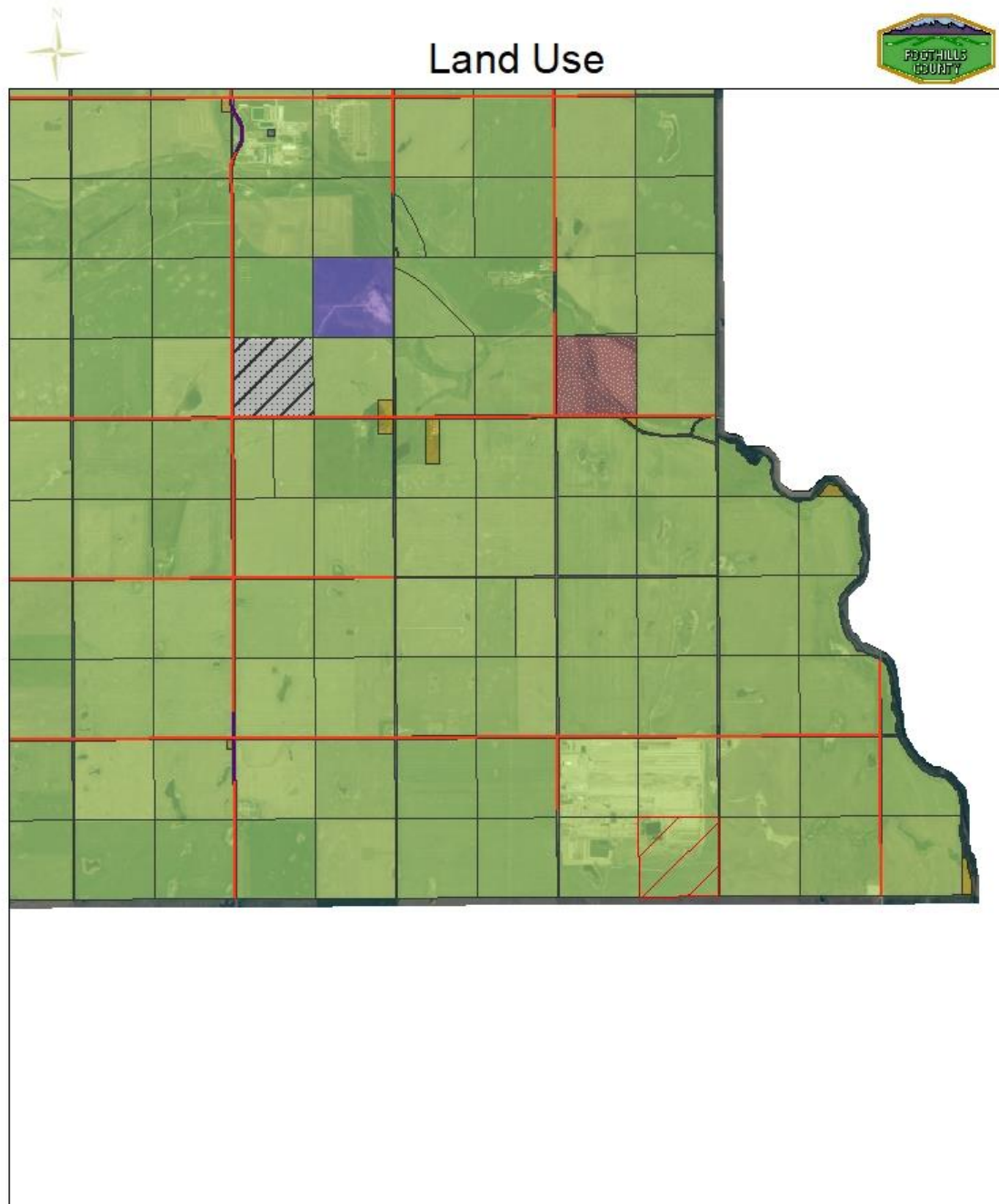
APPENDIX D: PROPOSED BYLAW

1. Draft Bylaw XX/2025 – Proposed Site Specific Amendment

APPENDIX A: MAP SET: Location Map



APPENDIX A: MAP SET: Area Land Use Map



Legend
Parcels

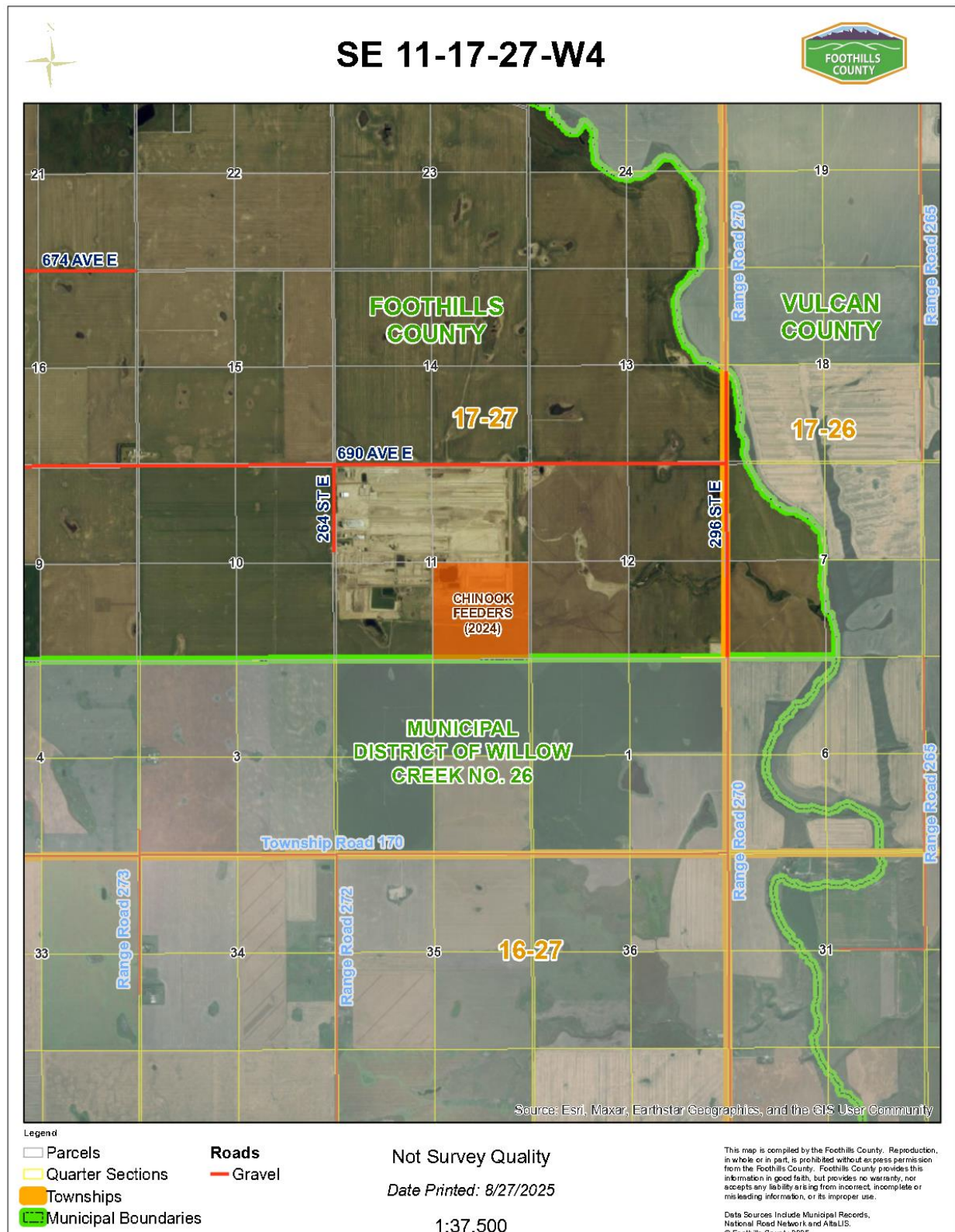
Document Path: C:\P\PlanningData\WQF_P\Planning.mxd

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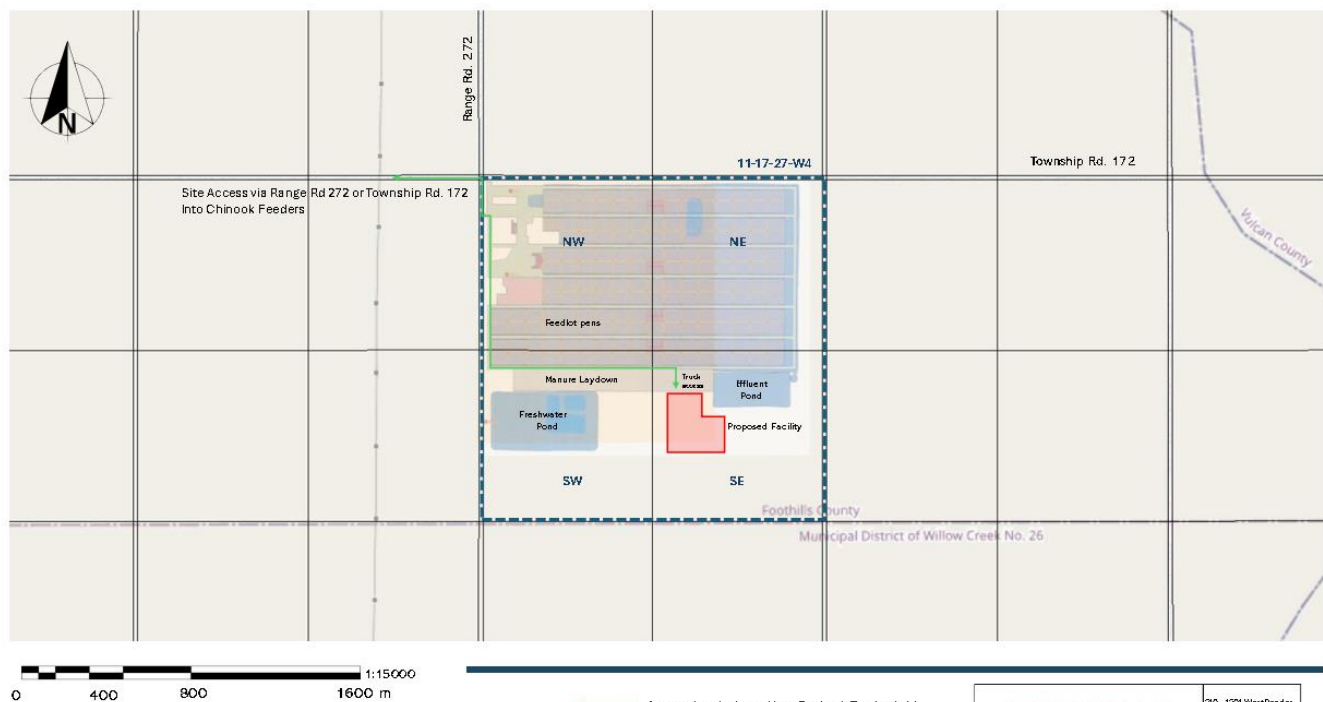
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Data Sources include Municipal Records and Aerials.
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APPENDIX A: MAP SET: Air Photo



APPENDIX A: MAP SET: Project location map



Approximate Location Project Footprint*

*See Document 2501-EDC-Site-Layout-Chinook_Feeders for detailed components of the facility

TAURUS RNG		250- 1201 WestPender Street, Vancouver, BC, Canada, V6E 2V2 Email: info@taurusrng.com
<small>ALL DRAWINGS, TECHNICAL DATA AND ALL OTHER INFORMATION SET FORTH IN THIS DOCUMENT ARE CONFIDENTIAL AND ARE THE EXCLUSIVE PROPERTY OF TAURUS RNG. ACCESS TO AND USE OF SUCH INFORMATION IS CONTROLLED AND LIMITED TO THE PURPOSE FOR WHICH IT WAS PROVIDED, AND MUST NOT BE USED, COPIED OR DISCLOSED EXCEPT AS EXPRESSLY AUTHORIZED BY TAURUS RNG, INC.</small>		
Document Name	DATE	
2506-Project location		

Site Access via Range R6.272 or Township R6.172 into Chinook Feeders

2640' [804.7m] Quarter Parcel

PARCEL BOUNDARY

65'-3" [20m]

FEEDLOT EFFLUENT POND

65'-3" [20m]

DATUM

330'-6" [100.7m]

1404'-6" [428m]

2640' [804.7m] Quarter Parcel

COVERED FACILITY DIGESTATE LAGOON

1076'-6" [328.1m]

PARCEL BOUNDARY

South West 11-17-27 M4

South East 11-17-27 M4

QUARTER PARCEL 160 ACRES

FOOTHILLS COUNTY

Municipal District of Willow Creek

PARCEL BOUNDARY

REFERENCE ONLY

FOOTHILLS COUNTY, ALBERTA

NAD83-UTM 12
E 114885.14
N 5088281.58
Est. ELEV: 3289M/1000m

APPROXIMATE DATUM LOCATION:
Coordinates:
Lat: 50.4173
Long: -113.6080

PROPERTY BOUNDARY
APPROX. 16.085 Acres
(704,680M²/180000M²)

DATE	REV.	COMMENTS	DRAWN BY	CHECKED BY	APPROVED BY
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TAUPOUS
S.N.G.
255-1287 West "Parade" Rd.
Edmonton, Alberta T6E 6K6
Phone: 780-443-8888
Fax: 780-443-8889
Email: info@tauplus.com

255-EGG-LAYOUT, SETBACKS-GINCOSS-05

PROJECT: 2021 - CHINOOK

DATE: 11-17-27

1 of 1

APPENDIX B: APPLICATION PACKAGE

Introduction letter from Taurus Canada Renewable Natural Gas Corp.



On behalf of our wholly-owned subsidiary, 2716438 Alberta Ltd. (the Developer), we are submitting this application for a site-specific amendment of the Land Use Bylaw the parcel of land (the Site) located in the eastern portion of Foothills County, as identified more precisely in the attached project location site plan.

The site-specific amendments being sought in this application are:

1. The designation of the proposed anaerobic digestion facility as a site-specific permitted use to the current agricultural use of the site;
2. Allowance for the installation of anaerobic digesters up to a total installed height of 30m.
3. Allowance for the installation of accessory buildings (Biogas upgrading building) up to a total installed height of 16m.
4. Allowance for the installation of flare tower up to a total installed height of 16m.

The Site is the parcel of land in a legal address of SE 11-17-27-W4 and is currently zoned as Agricultural District (A). The proposed development is immediately adjacent to a cattle feedlot operated by Chinook Feeders Ltd. (Chinook) occupying approximately 16 ac. (6.4 ha.) show in the attached site plan.

The Developer, in partnership with Chinook, is proposing to develop, construct, own and operate a manure-only biodigester facility (the Facility) that will produce renewable natural gas (RNG) through the anaerobic digestion process (the Project). RNG produced at the Facility will be injected into the TransCanada pipeline. The Project will also convert cattle manure into four different products: two solid digestate products, liquid digestate and ammonium sulfate, a potent fertilizer.

The Developer will separately submit a development permit application to Foothills County in respect of the Facility.

The Facility will be primarily regulated under the *Environmental Protection and Enhancement Act*, as well as other under applicable Provincial location, and will undergo thorough regulatory review. In support of these reviews, the Developer will undertake various studies to inform engineering activities and provide the various regulators the required information.

The Developer has also undertaken initial public consultation efforts in connection with the Project. As of June 24th 2025, Chinook has contacted neighbours approximately between 5-8 km from the proposed site (6 neighbours) and received 4 responses. None of the respondents are opposed to the Project; we will continue to reach out to neighbours who were not available and follow up with the respondents who are interested in learning more about the Project with an in-person meeting scheduled for later in July.





Please find attached as part of the application requirements:

1. The Project Location plan "2501-RRX-Project-Location-plan"
2. The Project Site Plan "2501-EDC-Project-Site-Plan"
3. Land Title Certificate of the Proposed Parcel
4. AER abandoned wells search.
5. The Applicable Fees Authorization form
6. Letter of Authorization - Land Use Bylaw
7. Detailed Process Summary "2501-ERP-Detailed-Process-Summary"
8. Civil Drawing Package
9. Credit Card Authorization Form - Taurus

Regards,

Daniele Chiodini
Taurus Canada Renewable Natural Gas Corp.



2501

RENEWABLE NATURAL GAS FACILITY

PROJECT DESCRIPTION

WO 2501

July 16th 2025

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ATTACHMENTS

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General	
1	2501-RRX-Project-Location-00
2	2501-RRX-Project-Location-plan-00
3	2501-EDC-Layout-MAP-Chinook_Feeders
Civil Package	
1	2501-EDC-Amm_Tank-00.pdf
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4	2501-EDC-Building-C1C2-00.pdf
5	2501-EDC-Building-C3C4-00.pdf
6	2501-EDC-Building-D-00.pdf
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11	2501-EDC-Dig_Buffer_Tank-00.pdf
12	2501-EDC-Digestate_Lagoon-00.pdf
13	2501-EDC-Digesters-00.pdf
14	2501-EDC-Dil_Buffer_Tank-00.pdf
15	2501-EDC-E-Rooms-00.pdf
16	2501-EDC-External_Storage-00.pdf
17	2501-EDC-Flare-00.pdf
18	2501-EDC-Gas_Holder-00.pdf
19	2501-EDC-Int-Storage-Tank-00.pdf

In this report, the units of measurement will refer to the International System (SI) or metric system.

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1 INTRODUCTION

1.1 Overview

2716438 ALBERTA LTD. (the “Developer”) is proposing to develop a manure-only biodigester facility that will produce renewable natural gas (RNG) through an anaerobic digestion process (the “Project”) where the resultant RNG will be injected into the TransCanada pipeline. The Project will also convert cattle manure into four different products: two solid digestate products, liquid digestate and ammonium sulfate, a potent fertilizer. The facility is intended to be a 2-phased approach where the initial capacity will accommodate 70% of the cattle at the feed yard with a plant capacity that allows it to process approximately 136,000 tonnes/year of manure producing 406,000 GJ/year of RNG. The second phase of the Project would increase capacity to meet 100% of the cattle on feed, processing 190,000 tonnes of manure per year generating 566,000 GJ/year of RNG. Moreover, the developer will assess the geology of the subsurface for the potential to store carbon. A by-product of the anaerobic digestion process is CO₂. If there is favourable geology, the developer may pursue a CO₂ sequestration well to further reduce greenhouse gasses (GHGs).

The Developer is a wholly owned subsidiary of Taurus Canada Renewable Natural Gas Corp. (“Taurus”), a Vancouver based company focused on the development, design, construction and operation of renewable natural gas facilities. The Project is being developed in collaboration with Chinook Feeders Ltd. (“Chinook”), a key stakeholder providing both the site and a consistent supply of manure feedstock from its cattle operations. Taurus is actively developing several manure-only RNG projects in the southern Alberta region, where the high concentration of large-scale cattle feedlots presents a significant opportunity to mitigate greenhouse gas emissions by capturing methane that would otherwise be released from unmanaged manure. The region’s existing natural gas infrastructure, including access to the TransCanada and other natural gas pipeline networks, enables efficient RNG injection and distribution to downstream users. Taurus’s projects in the area are strategically located to take advantage of locally sourced feedstock, strong agricultural partnerships, and established offtake pathways, forming a closed-loop solution that turns waste into energy while supporting local economic and environmental goals.

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1.2 Project Description

The plant is designed to receive manure delivered to the plant and process the manure such that it is fed into the anaerobic digesters. Anaerobic digestion is a naturally occurring process that consumes organic material (carbon) to produce biogas, a methane and carbon dioxide mixture. The digesters are designed to maximize biogas extraction by optimizing the process conditions of the anaerobic bacteria such as pressure

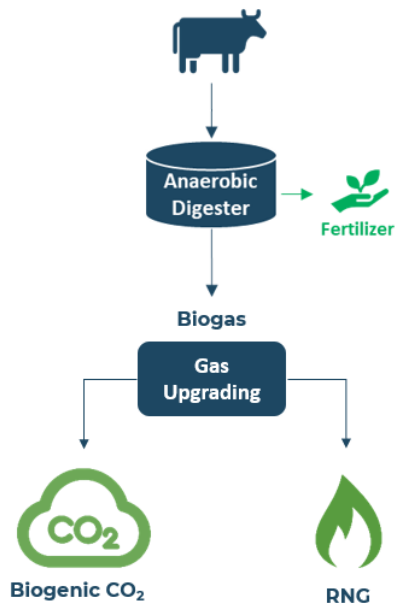


Figure 1: How RNG is created by anaerobic digestion

and temperature. The biogas will undergo an upgrading process that will produce a pure stream of biomethane, also known as RNG, that will be ultimately injected into an NGTL Pipeline.

The removal of a substantial portion of the organic material stabilizes the manure, producing digestate as a byproduct. Digestate is a largely odourless compound that has a concentrated nutrient profile (nitrogen and phosphorous, N-P). The digestate will undergo various solid/liquid separation processes as well as an ammonia stripping process to produce solid digestate, liquid digestate and ammonium sulfate. Unlike raw manure, the concentrated nature of the solid digestate and ammonium sulfate makes long distance transport feasible, while the more difficult to transport liquid digestate will be applied to the surrounding region

closer to the facility.

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1.3 Project Location

The Project will be located on a parcel of land with a legal description of LSD 6 and 7 of 11-17-27W4 in the municipality of Foothills County, Alberta, Canada. The Project site is currently on an agricultural quarter, lying approximately 5 kilometers west of Provincial Highway 804, and 10 kilometers northeast of the Town of Nanton. The Developer will enter into a lease agreement with the landlord for the entirety of the Project’s expected operational life of 25 years.

Table 1-1: Project Location

County	Foothills
Province	<i>Alberta</i>
Address	<i>SE-11-17-27-W4M</i>
Latitude, Longitude	<i>50.414721°, -113.604379°</i>
General Map	<i>2501-RRX-Project-Location-00</i>
Site Plan	<i>2501-EDC-Project-Project-Site-Plan-00</i>
Site Layout	<i>2501-EDC-Site-Layout-Chinook_Feeders</i>

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2 PROJECT BACKGROUND

2.1 Project Rationale

Alberta contains 40% of Canada's 11 million cattle herd, with over 2.3 million head in a pocket in southern Alberta. In addition to beef cattle, there are hogs, chickens and sheep that are grown to maturity and contributing to Canada's food production system. Feedlot owners also manage large areas of crops. These large fields grow cereal, beans and oilseeds to either feed and provide bedding for their cattle or are sold to generate additional revenue streams. The number of farms is increasing by 2.1% per year¹. Critical to understanding the systemic opportunity for Taurus is that the animal waste (manure) from the feedlots is typically currently reapplied to the land as a fertilizer on the farmers' fields.



In Alberta, background and finishing cattle are fed to 900 and 1500 lbs. respectively, from a starting weight of 500 lbs, with the latter delivered to food processors. Feedlot manure management has always been an issue for farmers, giving rise to such challenges as foot-rot disease, community odour complaints and GHG emissions from the unrealized energy from manure as well as nitrogen that volatilizes to ammonia. Manure itself plays a vital role as a fertilizer, supplementing commercial fertilizers with the primary nutrients nitrogen, phosphorous, and potassium. Nutrient management can be challenging as volatilization and weather systems can upset the nutrient profile of the manure. Feedlot owners prefer to have a manure solution that advances their ability to manage the nutrient load onto their crop yielding land.

¹ <https://www150.statcan.gc.ca/n1/pub/96-325-x/2021001/article/00009-eng.htm>

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Anaerobic digesters can play a key role in facilitating Canada’s commitment to low carbon, clean fuels, and soil health. There is a unique opportunity for the region to harness this otherwise wasted energy while retaining nutrients for land application, improving soil health and supporting the local economy.

The anaerobic digestion process is an integrated waste management system that recovers both nutrients and energy from organic matter. Unlike exclusively aerobic processes (such as composting) which primarily produce CO₂ as a gaseous end-product dispersed into the atmosphere, anaerobic digestion transforms volatile organic substances into energy rich biogas while retaining the valuable soil nutrients in the organic byproduct, the digestate. To maximize nutrient flexibility for its feedlot partners, the Project will further separate the digestate into an ammonium sulfate fertilizer, an ammonia rich liquid, a balanced solid digestate, and a separate phosphorous-rich solid digestate. These four streams allow farmers more options for land application. For example, where soil conditions may be limited by phosphorous or where crops (such as canola) may have requirements for a specific element such as sulfur.

2.1 Benefits from the Project implementation

Anaerobic digestion is recognized² as a manure treatment system that helps livestock producers to reduce environmental risks and abate some of the social concerns that are associated with intensive cattle feeding operations. Some of the key benefits to be realized from the Project are:

Benefits for feedlot operators:

1. Economic opportunity to offset manure management costs.
2. Reduce manure inventories for improved animal health and streamlined operations.
3. Reduce the farming operation’s overall carbon footprint / positive image for the industry.
4. Opportunity to reduce the use of chemical fertilizers.
5. Improved soil nutrient management opportunity by having different digestate fractions to apply as opposed to only manure that is currently being land applied.

Benefits for the local community:

² See, for example, [Beneficial Management Practices – Environmental Manual for Feedlot Producers in Alberta](#) developed by Alberta Agriculture, Food and Rural Development

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1. Opportunity to play a significant role in the energy transition by becoming the largest renewable natural gas producing region in Canada.
2. Improvements in air quality arising out of the contained operations of a biodigester system.
3. Economic support deriving from the locally sourced construction and operational crews and vendors.
4. New commercial operations in the region.
5. Support for local farming operations by providing additional revenue for manure management.
6. Seamless integration with the gas pipeline, without requirements to build new infrastructure.

Benefits for the Province:

1. Ability to support and strengthen the cattle industry in Alberta economically and from an environmental footprint perspective.
2. Creation of a new industry that will play a major role in the energy transition.
3. Attract capital investments from around the world to build renewable energy infrastructure in Alberta
4. Ability to leverage existing network of natural gas pipelines to capture and deliver renewable energy throughout North America.

Benefits for the Environment:

1. Renewable natural gas has a negative carbon intensity score because it is derived from organic materials that would otherwise decompose and release greenhouse gases into the atmosphere. By processing these organics through anaerobic digestion, not only are these emissions avoided but the natural gas that is generated can be used to off-set the use of fossil-derived natural gas.
2. The anaerobic digestion process stabilizes the manure in the form of digestate which is odorless compared to raw manure. Because of a more frequent collection of the manure, nitrogen losses are much lower than traditional manure management practices, thus displacing more synthetic fertilizer during the farming season.
3. By improving manure management practices, anaerobic digestion provides better protection for groundwater.
4. This solution aligns with and exceeds the recommended practices for livestock manure management as described in the *Beneficial Management Practices* manual for livestock producers in Alberta.

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2.2 Planning Framework

The cascading structure of the Alberta's Stewardship legislation provides regional guidance (South Saskatchewan Regional plan) and instructs municipal development plans such as the [Foothills Municipal Development Plan 2010](#) (MDP2010) to provide vision, goals policies in how the land is developed for the community in the next 10-20 years. These policies help develop legislation in the form of land use bylaws and subdivision and development bylaws.

Foothills's MDP recognizes the importance of agriculture and livestock operations in the county. The Project benefits these operations by helping to close the loop for farmers and the cattle feeding industry. The Project will improve the land stewardship of the farmers through improved nutrient management and reducing truck traffic. The Project will align, and comply, with the regulatory requirements set by the various municipal and provincial regulators, such as the Foothills County Development Office and Alberta Environment and Protected Areas (AEP).

2.2.1 Municipal Application

The Developer is seeking a site-specific zoning amendment for the permitted use of a manure-only anaerobic digester as well as a development permit from the County of Foothills. The Developer will seek a building permit prior to construction following applicable standards such as [CSA](#), and, at a minimum, those standards set forth in the [National Building Code Alberta 2023](#).

2.2.2 Provincial legislation

At the provincial level, the Project will be regulated under the terms of Alberta's [Environment Protection and Enhancement Act](#) (EPEA) and its regulations, including the [Environmental Assessment \(Mandatory and Exempted Activities\) Regulation](#). Per the terms of the latter regulation, the Project does not fall within the definition of a mandatory project and the Developer will accordingly seek an exemption from a requirement to perform an additional Environmental Impact Assessment (EIA) and will seek an Industrial Approval per the EPEA's [Activities Designation Regulation](#). This approval is expected to establish requirements for the protection of air, water, land and biodiversity management. The Project will provide the following studies to EPEA for its review:

- an air quality study to demonstrate the Project's ability to meet [Alberta Ambient Air Quality Objectives](#) (AAQOs)
- wildlife and vegetation surveys to identify any potential Species at Risk (SAR).

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- geotechnical surveys to meet all groundwater and stormwater requirements
- groundwater and soil assessments to establish baseline conditions

The Developer understands that Alberta Environment and Protected Areas (EPA) previously entered into a [memorandum of understanding](#) with the Natural Resources Conservation Board (NRCB), wherein it was agreed that, in certain circumstances, the management of manure and digestate will fall under the jurisdiction of the NRCB. This understanding has since been codified pursuant to Bill 44 *Agricultural Operation Practices Amendment Act*, 2025, regulatory amendments under AOPA and EPEA, and the updated On-Farm Storage and Land Application Code. Accordingly, for the purposes of this Project, it is understood that EPA will regulate manure and digestate within the bounds of the facility, while the NRCB will regulate the application of digestate outside the facility boundaries.

The Project will meet the requirements of Alberta Energy Regulator (AER) Directives [006](#), [056](#), and [077](#) for the construction of any pipeline and the injection of RNG into the TransCanada system.

The Project will meet the requirements of the Alberta Utilities Commission (AUC) of the Project related to on-site cogeneration under its guideline such as Rule 007 [Applications for Power Plants, Substations, Transmission Lines, and Industrial System Designations](#)

Alberta has a duty to consult with first nations of which the Aboriginal Consultation Office (ACO) oversees [the consultation process](#). Moreover, a [Historical Resources Act](#) (HRA) approval is required to evaluate the risk of encountering historical artifacts prior to any construction of the site. The Ministry of Arts, Culture and Status of Women oversees the HRA approval. The Project will meet its obligations and seek to receive approvals as part of the development process.

Carbon capture and sequestration may be possible for the Project given favourable geological conditions and a regulatory regime in Alberta which enables small scale sequestration projects. Carbon capture is regulated by both Alberta Energy and Minerals (MEM), who grant the Carbon Sequestration Tenure and Pore Space Unit Agreement, and the AER who regulate the wellbore, injection scheme, and reporting requirements under directive [056](#) and [065](#).

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The following table summarizes the permits that the Project will be applying for before construction of the RNG facility.

Governing Body	Authorization
EPA (Environment and Protected Areas)	EPEA Approval (environment)
EPA	EIA exemption
AER (Alberta Energy Regulator)	Directives 006,077,056 (pipeline)
AUC (Alberta Utilities Commission)	Rule 007 (Cogeneration)
Aboriginal Consultation office (ACO)	Pre-consultation assessment
Arts Culture and Status of Women	Historical Resources Act (HRA)
Foothills County	Site Specific Amendment
Foothills County	Development permit
Foothills County	Building Permit

The Following table summarizes the permits that the CCS scheme requires before the injection of CO₂ is permitted.

Governing Body	Authorization
EPA (Environment and Protected Areas)	EPEA Approval/Notification
MEM (Ministry of Energy and Minerals)	Carbon Sequestration Tenure
MEM	Pore Space Unit Agreement
AER (Alberta Energy Regulator)	Directives 056,065

3 PROJECT CHARACTERISTICS

3.1 Accepted materials

3.1.1 Livestock manure

Feedstock for the anerobic digestion process consists of livestock manure delivered by truck from Chinook. The total amount of manure delivered in one year at full, phase 2 capacity is expected to be 190,000 tonnes per year on a wet basis, subject to seasonal variability based on climate conditions. While the vast majority of the feedstock is expected to come from Chinook, the facility is open to receive livestock manure from other farms in the vicinity of the facility.

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The only livestock manure to be accepted by the Project will be as described in section 1(c.2) of the Alberta [Agricultural Operation Practices Act](#), namely " livestock excreta, associated feed losses, bedding, litter, soil and wash water, but does not include manure to which the [Fertilizers Act](#) applies".

3.1.2 Emergency Feedstock

There may be some emergency periods during the operation of the Project where manure cannot be delivered for an extended duration (such as, for example, if there are outbreaks of cattle disease, or natural events affecting crop quality). For certainty, such emergency periods would not include normal winter conditions. In these emergency cases, the Project will be designed to be capable of receiving non-manure material to ensure continuity in the digester, protect beneficial bacteria and preserve the production of RNG. Acceptable materials during these emergency periods will be limited to energy crops, damaged or rejected crops, crop residues and glycerol.

3.1.3 Unaccepted material

Except as described above in this section 3.1, no other materials will be accepted by the Project.

3.2 Water

Water requirements for Project at commissioning are anticipated to be approximately 60,000 m³, primarily for conducting tank leak testing and commencement of operations. Subsequently, up to 120,000 m³ of water per year will be required for the Project's ongoing operations. Water consumption will be dependent on the annual rainfall affecting the moisture content of the feedstock. The Project will source all of its water requirements from Chinook's effluent pond, which collects runoff from the Chinook feedlot. In doing so, the Project avoids the use of fresh water and alleviates stormwater management from the feedlot. Ultimately, this returns water through the application of liquid digestate (described in [Section 5.4.2](#)) ensuring that no surface water leaves the terrestrial water cycle.

3.3 Natural Gas Injection

The Project is evaluating two options for natural gas injection into the NGTL system. The first option is to work with TC/ATCO and construct a pipeline and a metering station at the site for the receipt of RNG. Alternatively, to avoid building a new metering station, the Project is also evaluating the potential to tie into the existing collection system of a nearby oil and gas operator of natural gas wells.

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3.4 Process Flow Diagram

Figure 2 shows the detailed process flow diagram of plant operations:

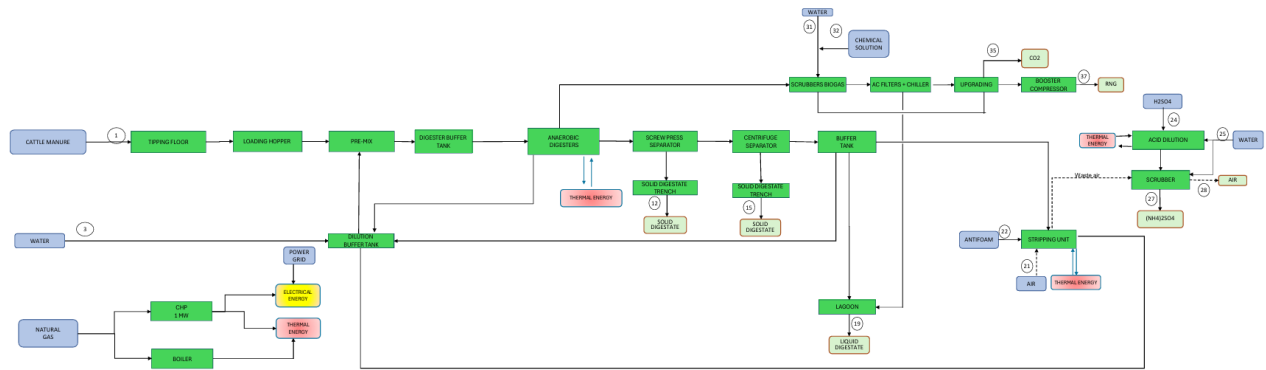


Figure 2: Process flow diagram

3.5 Mass Balance

Table 2 shows the detailed mass balance of the facility on an annual basis:

Table 2: Annual mass balance

MASS BALANCE 7d/w; 24h/d																
Parameter	UM	1	3	12	15	19	21	22	24	25	27	28	31	32	35	37
Flow	tonnes/d	521.6	246.6	96.4	110.8	157.6	58.6	0.06	1.08	2.46	3.83	69.8	1.2	0.09	60.2	30.31
Flow	tonnes/h	21.7	10.3	4.0	4.6	6.6	2.4	0.0	0.0	0.1	0.2	2.9	0.0	0.0	2.5	1.3
Temperature (T)		5	5	-	-	-	15	15	15	10	65	65	10	15	20	49
Parameter	UM	1	3	12	15	19	21	22	24	25	27	28	31	32	35	37
Energy	GJ/h	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	64.7
Gas Flow (Normal:0C-1atm)	Nm3/h	-	-	-	-	-	-	-	-	-	-	-	-	-	1285	1691
Gas Flow (T adjusted)	m3/h	-	-	-	-	-	-	-	-	-	-	-	-	-	1380	1994

4 THE ANAEROBIC DIGESTION PROCESS

Anaerobic digestion is a natural process that occurs in nature to stabilise organic material. The volatile solid component of the feedstock is degraded by anaerobic microorganisms to produce biogas, a mixture comprising mainly of carbon dioxide (CO₂) and methane (CH₄). The methane is then purified and upgraded to RNG. This process captures the methane that would otherwise be released to the atmosphere as a greenhouse gas.

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The anaerobic digester process is contained in closed vessels. Its design uses technology, equipment, and operating systems that promote the growth of specialized anaerobic bacteria and optimize natural biological processes. The design will also maximize energy recovery and stabilize the effluent streams so that the primary nutrients – nitrogen and phosphorous – are recovered for agricultural use.

The anaerobic digester is sized to guarantee a minimum residence time of the feedstock to ensure adequate removal of the volatile organics and its corresponding chemical oxygen demand, and ultimately to produce biogas.

The process of transforming complex organic material into methane takes place in four different phases (Figure 3.). Each phase is governed by a distinct metabolic group of microorganisms that differ in both the substrates they consume and the metabolic products they produce.

- 1st phase: Hydrolysis
Hydrolysis breaks down and transforms complex organic substrates (i.e. sugars, fats, proteins) into simple compounds such as monosaccharides, fatty acids, and amino acids.
- 2nd phase: Acidogenesis
In this stage, certain bacteria called acidogenic bacteria convert the simple sugars and amino acids into carbon dioxide, hydrogen, ammonia, and organic acids.
- 3rd phase: Acetogenesis
The products of acidogenesis are then reduced to their base compounds, acetic acid, formic acid, carbon dioxide, and molecular hydrogen.
- 4th phase: Methanogenesis
Methane is produced via two pathways: the catabolism of acetic acid and the reduction of carbon dioxide using hydrogen as an electron source.

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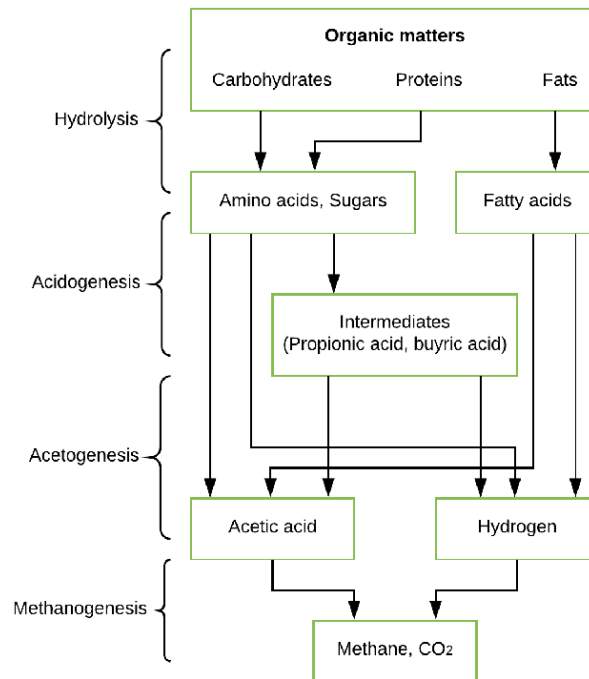


Figure 3: The Chemical Processes involved in Anaerobic digestion process

5 PROJECT TECHNICAL DESCRIPTION

The plant will be composed of the following sections:

1. Feedstock Receiving and pretreatment
 - Traffic, feedstock receiving and storage
 - Dilution and pre-processing
 - Digester buffer tank
2. Anaerobic Digestion
 - Anaerobic digestion tanks
3. Nutrient recovery system
 - Digestate dewatering
 - Ammonia stripping
4. Digestate Management
 - Solid Digestate
 - Liquid Digestate
5. Biogas line
 - Biogas storage

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- Biogas cleanup
- Upgrading to RNG
- Safety flare

6. Utilities production

- Electric and thermal energy
- Water
- Compressed air

7. Auxiliary Facility systems

- Stormwater Management
- Grading and Excavation
- Leachate collection
- Septic

Civil drawings indicating the building profiles are attached in the *ProjectCivilDrawings* folder.

Here follows a detailed description of the processing areas:

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5.1 Feedstock receiving and pretreatment

5.1.1 Traffic, feedstock receiving and storage

The facility operations are designed to be operated according to the following schedules:

- Operating days with crews on site and/or deliveries: Monday to Saturday, 7.00 am to 7.00 pm
- Operating days of the biodigester: 7/24, 365 days per year

Manure is delivered by trucks to the facility's reception with different type of trucks, depending on the hauling company that delivers the feedstock: Tractor with semi-trailer, A-Train, B-Train configurations are anticipated. Trucks may vary in size and capacity, typically ranging from 24 to 30 tonne trucks.



Figure 4: Different kinds of manure hauling trucks; some have manure spreaders attached at the rear

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No additional road traffic is expected to result from fresh manure deliveries to the facility, as the biodigester is directly connected to the feedyard, keeping all manure transport off public roads.

Digestate removal will utilize existing road infrastructure. In traditional manure management without a biodigester, manure is removed from the pens three to four times per year, causing peak traffic, intersection congestion, and added strain on roads. Because of the efficient conversion of carbon into renewable natural gas by the anaerobic bacteria, the average manure tonnage of 190,000 per year, will be reduced to only 97,440 tonnes per year of solid digestate, representing approximately a 50% weight reduction. Additionally, the biodigester’s continuous operation (together with the ability to stockpile digestate when not required on fields) is expected to significantly reduce peak traffic by spreading the transportation of the digestate to farm fields over several months.

An average of 20-25 trucks per day (on a 5 day a week basis) will remove solid digestate from the facility over an eight-month window to avoid transportation during spring when roads are more exposed to damage by heavy vehicles. This approach is expected to drastically reduce road maintenance costs incurred by the County, both because of total tonnage reduction as well as avoiding spring time when conditions for transportation are more restrictive. Traffic outside the facility will follow similar haul routes as the current practices and based on nutrient management plans for the land application of nutrients.

Seasonal factors like precipitation and climate may affect manure and digestate volumes. Truck numbers may also vary depending on manure quantity and differences in truck models and sizes.

On arrival, deliveries are weighed and sampled to determine energy content. Following the initial registration procedures, the trucks drive up to the maneuvering area in front of the receiving building.



Figure 5: Left to right; an example of a weigh station and reception building

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The reception building is equipped with two roll-up doors and the vehicles will reverse into one of the available receiving bays. The door will be opened, and the truck will be maneuvered to discharge the manure onto the tipping floor. The tipping floor has a storage capacity of approximately 2 days. In order to reduce odour emissions, the roll-up door will immediately be closed once the feedstock off-load is completed.



Figure 6: An example of a reception building with four roll-up doors

The Project will also contain an outdoor manure overflow storage area to provide operational flexibility. It is anticipated that this outdoor storage will be used to stockpile inventory in the following situations:

- in anticipation of freezing conditions where truck traffic might be restricted;
- in anticipation of holidays or festivities;
- to accommodate pen cleaning operations at the feedyard during herd replacement or extreme weather conditions;

The inventory stockpiled in the overflow storage area will be delivered inside the reception building by means of a wheel loader dedicated to the operation.

5.1.2 Dilution and pre-processing

The reception building is equipped with an overhead bridge crane for automatic pick-up and feeding into the pre-processing system.

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The feedstock preparation system is composed of a set of loading hoppers that deliver the feedstock into the dilution and grinding equipment, which are designed to prepare a homogeneous slurry for processing in the anaerobic digestion tanks. The feedstock preparation system is fed with liquid digestate recycled from the end of the process as well as fresh water added according to process needs. All the liquids are blended into the dilution buffer tank and pumped to the pre-processing system to dilute the incoming materials. To ensure proper handling and control over the mixture composition, a metering or feeding mechanism is employed to accurately measure and feed the desired quantity of manure into the mixing process.

5.1.3 Digester buffer tank

The discharge of the feedstock preparation system is sent to the digester buffer tank. The buffer tank further homogenizes the feedstock and feeds the resultant diluted mix to the digesters. This tank allows for equalization between the different digesters' feeding cycles and the operation of the pretreatment system.

5.2 Anaerobic digestion section

Anaerobic digestion is performed inside of enclosed tanks (anaerobic digesters) where biogas is produced from the bacterial decomposition of organic matter. To maintain a stable equilibrium and a reliable process that maximises the gas production, a heating and mixing system are installed.

5.2.1 Anaerobic digestion tanks

The facility comprises multiple digester tanks where the bulk of the biogas production takes place. The digesters are operated with carefully controlled parameters to maximize the degradation of the organic materials and subsequent production of biogas. The primary digesters will operate under mesophilic conditions at 40°C, the optimal temperature for the anaerobic bacteria to grow.

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Figure 7: Example of anaerobic digesters and associated heat exchangers

The digesters are sized on the basis of a retention time of more than 30 days and they are constructed with bolted steel panels, with a concrete bottom, and insulated cladding to reduce heat loss. The primary digester will be equipped with an external heating system to maintain the process temperature at optimal levels.

5.2.2 Heating System

The heating system for the Project is designed to operate efficiently and reliably. Equipment redundancies and a modular design allow for easy maintenance in the event of failures or malfunctions in the system. Servicing can be carried out by isolating the heat exchanger from the process, without the need for shutting down and emptying the digester, a problem common to traditional internal heating systems. A tube-in-tube heat exchanger is used for the digester to obtain efficient heat transfer while minimizing construction and clogging in the system. Figure 8. shows a typical example of a tube-in-tube heat exchanger installed in a biogas plant.

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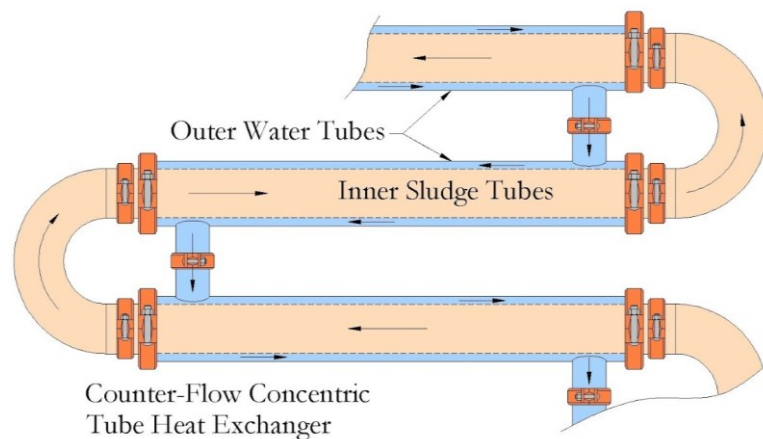


Figure 8: “Tube in tube” heat exchanger

This type of heat exchanger is composed of two concentric tubes, in a counterflow arrangement in which the two fluids flow in opposite directions at different temperatures. Hot water from the boiler unit and CHP exhaust is used as the service fluid and will flow through the outer pipe, transferring heat to the inner pipe. The incoming water temperature will be between 70°C and 90°C. To minimize heat losses, the pipes will be insulated.

The inner pipe is fed with feedstock material combined with recirculated contents from the digester (digestate, or organic matter in the process of degradation). The recirculated digestate is pumped through the heat exchangers with lobe pumps before being returned to the digesters.

PLC and SCADA systems will be used to monitor and manage optimal temperatures for the anaerobic organisms.

5.2.3 Digester Mixing System

Mixing in the digesters will be carried out by one vertical mixer per digester, which ensures complete and even mixing of the organic material. The vertical mixers, placed on the roof of the tank, are composed of a vertical shaft equipped with an engine and driving geared motor. In addition to mixing, they will also break up any foaming on the surface. This will ensure optimal mixing of the digester content, optimal biogas yields, and prevention of overflow from foaming.

By minimizing dead zones, the mixing system will maximize digester retention time and allow for a high degree of efficiency in the anaerobic digestion process. Furthermore, it will minimize sediment build-up in the tank by keeping fine material suspended.

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The digestate portion will be discharged from digesters to the dewatering system using lobe pumps. The intake pipes are located nearby the bottom of the tank to allow for the continuous removal of coarse and/or inert material that may have settled inside the tank.

5.3 Nutrient Recovery System

After anaerobic digestion, the digestate portion is further processed into solid and liquid fractions with various process units to manage the nitrogen and phosphorous loads. Managing these nutrients is crucial for the use of digestate as land application. Some of the liquid fraction is also used to recycle water in the process, thereby lowering water demand. Digestate is managed through the following processes:

- Primary Solid/Liquid Separation system with screw presses
- Secondary Solid/Liquid Separation with centrifuge
- Ammonia Stripping (NH_{FREE} System)

5.3.1 Primary Solid/Liquid Separation with screw presses

Digestate exiting the reactor is processed by an array of screw presses which are located inside of a mechanical room, protected from the elements to extend the lifetime of the equipment and protect them from the harsh winter conditions. The screw press is a physical separation system with the following operating principle:

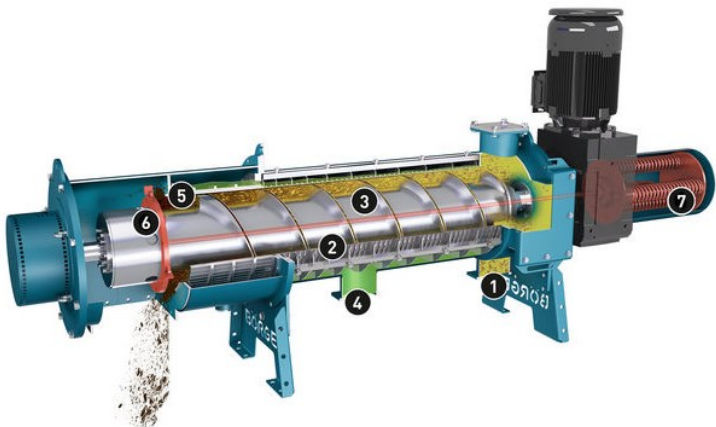


Figure 9: A screw press separates the bulk solids from the liquid phase

The digestate to be separated find their way through the inlet opening (1) into the dewatering vessel. The outer cylinder is separated from the auger (3) by a mesh wire screen (2). The auger has a connection to the drive. The digestate flows into the screen area next to the drive. The liquid flows through the mesh wire

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screen (2) into the outer vessel area. The liquid drains through the liquid outlet (4) and it is sent to the secondary dewatering phase.

The solid contents remain on the screen surface. Solids are conveyed into the press channel (5) by the rotating auger (3). Powerful subsequent dewatering takes place in the press channel (5). The rotating auger has a multi disc (6) (sealing disk), which can be shifted in axial direction, at the non-drive end. The adjusting unit (7) presses the multi disc against the auger and the compressed thick matter plug. The solid phase drops onto the digestate storage pad where it is stored until the farming season allows for land application.

5.3.2 Secondary Solid/Liquid Separation with centrifuge

Centrifuges, unlike screw presses, create centrifugal force to separate solids and liquids. Typically consisting of a horizontal bowl which continuously turns at a high velocity, centrifuges have a conveyor which rotates at a slightly different speed than the bowl; conveying cake to one end of the centrifuge for discharge, and centrate on the other end.

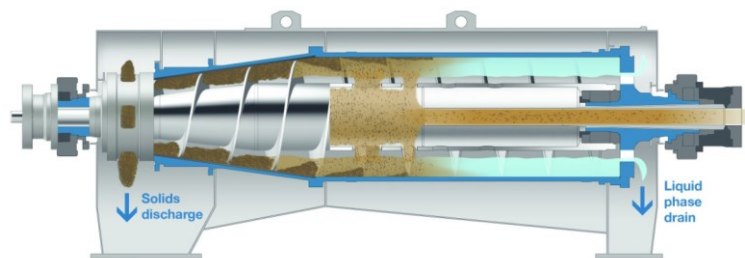


Figure 10: A centrifuge further separates finer solids from the liquid phase

The centrifuge is located in the same mechanical room with the screw presses. The digestate is pumped to the centrifuge by a lobe pump. Once separated, the cake is gravity fed onto the digestate storage area, whereas the liquid effluent called centrate is pumped to the buffer tank for distribution into the downstream processes. From the buffer tank, the liquid is directed to the following sections:

- Dilution buffer tank
- Ammonia stripping process
- Liquid digestate storage lagoon

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5.3.3 Ammonia stripping system

The ammonia stripping process involves the removal of ammonia (NH₃) from the liquid fraction of the liquid digestate which is pumped from the buffer tank into this section of the Project. The process typically involves the following steps:

- Digestate heating: the temperature of the liquid digestate is increased up to 60-70 C to improve process efficiency
- Ammonia Stripping: ambient air is introduced into the ammonia stripping tank by a blower. The air captures the free ammonia in the liquid digestate, which leaves the tank from the top.
- Ammonia scrubbing: the air, rich in ammonia, is processed into a wet scrubber where the ammonia reacts with sulfuric acid to generate ammonium sulfate, a highly valuable liquid fertilizer. The resulting air, free of ammonia, is then vented from the stack of the wet scrubber
- Ammonium sulfate storage: a dedicated storage tank is provided to store the ammonium sulfate to accommodate the deliveries of the product to the farmers.



Figure 11: An Ammonia stripping system to pull out excess nitrate

5.4 Digestate management

Liquid and solid digestate is nutrient rich and will be used as fertilizers by farmers for land application purposes. Solid digestate may be transported farther due to its nutrient density while the liquid digestate must be applied closer to the Project site.

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5.4.1 Solid digestate

Solid digestate will be stored on a digestate storage pad. The storage pad is designed to hold up to 5 months' worth of solid digestate as the farmers are expected to backhaul digestate to their fields to save on transportation costs. Land application of solid digestate can be performed using the same equipment as currently in use. The nutrient composition and the density of the digestate is within the limits of existing equipment to land apply using vertical beaters.

5.4.2 Liquid digestate

Liquid digestate will be stored in a liquid digestate lagoon. The lagoon will have a storage capacity sufficient to hold the sum of

- 9 months' worth of liquid digestate;
- the annual rainfall onto the facility footprint (inclusive of a 1:100 year rainfall event) as stormwater management;
- the secondary confinement for the Project;

The digestate pond is lined with an HDPE plastic bottom liner as well as LDPE top cover to prevent ammonia losses and odours. Liquid digestate will be applied by irrigation line or drag hose system to the surrounding farmlands.



Figure 12: Empty Lagoon with liner

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5.5 Biogas Line

The biogas produced in the anaerobic digesters will be conveyed by pipe to the biogas pre-treatment (i.e. desulfurization and condensate removal) and upgrading processes. In case of shutdowns or excess biogas production, an emergency safety flare is installed to ensure that no gas is vented into the atmosphere.

5.5.1 Biogas Collection system

The biogas produced in the anaerobic digesters is collected from the headspace of the tanks and piped towards the biogas treatment system. The collection system operates at low pressure (10-25 mbar) and a ground-mounted gasholder provides operating flexibility to the gas treatment system.

The gasholder is designed to regulate pressure in the biogas line ensuring consistent flow of gas is maintained in the process. A double-membraned system is used for better process control and for reduction of biogas losses compared to a single membrane system.



Figure 13: biogas gasholder with 2-layered membrane

The biogas produced by the anaerobic process is a mixture of approximately 55% CH₄, 45% CO₂ with minor trace components such as N₂, O₂, H₂S and VOC which will be removed by the pretreatment system before being processed by the upgrading unit.

5.5.2 Biogas Cleaning

Biogas contains hydrogen sulfide (H₂S) which is removed prior to the gas upgrading equipment to avoid damage to the mechanical components. To remove H₂S, the biogas passes through two 2-stage scrubbing columns. The scrubbing solution is sodium hydroxide and an additive based on iron salts which flows counter to the biogas. Biogas will move upwards in the column and sodium hydroxide will be sprayed downwards.

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The columns are usually filled with plastic media that have a high specific surface area. This allows for a very high contact surface between the biogas and countercurrent flow of sodium hydroxide solution.

The washing solution is then sent to an adjacent tank for regeneration, to lower the chemical consumption for the gas cleanup. The regeneration occurs by bubbling air into a rectangular tank to oxidise the sulfur which is then removed by gravity separation into a traditional clarifier. The elemental sulfur is then sent to the digestate storage lagoon to increase the fertiliser value of the liquid whereas the biogas, clean from H₂S, is sent to the gas upgrading system.



Figure 14: A two-stage H₂S scrubbing system

5.5.3 Biogas Upgrading

The process gas is compressed and treated in the following sequence:

H₂S and VOC polishing

The raw biogas first passes through a blower where the gas is compressed at 100 mbar, providing a positive pressure and conveying the gas into the H₂S and VOC polishing unit. This system is composed of two vessels containing a granular media where H₂S and VOC are captured and converted into a non-hazardous compound which is disposed of via third party service once the vessels are fully saturated.

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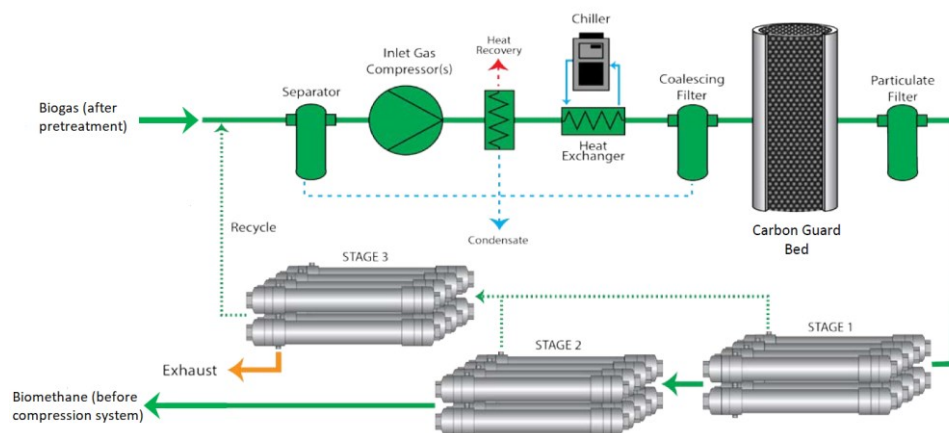


Figure 15: Multistage polishing ensures that biogas meets standards for injection

Compression and dehydration

Here the gas is compressed to the optimum process pressure and dehydrated to the optimum temperature and humidity level to maximize efficiency and performance of the membrane upgrading process.

Membrane Upgrading

The membrane biogas upgrading system includes three stages of permeable membrane filters installed in a container with all associated interconnecting stainless-steel piping, VFD driven exhaust gas vacuum blowers and PLC controls. The membrane filters use the principle of selective permeation. Smaller molecule gases such as carbon dioxide (CO₂), oxygen (O₂) and water (H₂O) selectively permeate (pass through) the membrane while larger methane (CH₄) and nitrogen (N₂) molecules do not.

The result is a separation of CO₂, O₂ and H₂O from the CH₄ and N₂. The gas first passes through the Stage 1 membrane where the bulk of the CO₂ is separated. The gas then passes through the Stage 2 membrane, where the remainder of the CO₂ is separated, resulting in high purity RNG at the outlet. To maximize methane recovery, the rejected gases from Stages 1 and 2 pass through a third stage of membranes to recover any methane. The methane at the outlet of the Stage 3 membranes is reinjected upstream of the raw gas compressor, and the exhaust is released to atmosphere.

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Figure 16: Membrane system

Booster Compressor

Finally, the clean and dry gas passes through the reciprocating booster compressor where it is compressed to the required pipeline injection pressure and then cooled using an ambient air aftercooler.

Metering station

Before being injected into the gas pipeline, the RNG is metered, and the quality is checked by the pipeline operator to ensure compliance with quality specifications. In case of noncompliance, the gas is returned to the gas upgrading system for further polishing; otherwise, it is injected into the pipeline.

5.5.4 Emergency Flare

During maintenance activities of the gas upgrading unit, in case of shut downs or power outages, plant start-up and unforeseen events, the biogas is flared with an emergency safety flare. The system is linked to the biogas line pressure through the system programmable logic controller (PLC).

When the flare is in operation, the temperature and the flow rate of biogas is monitored continuously, and the combustion air flow rate is automatically adjusted for these conditions. The safety flare will be able to dispose of the entire biogas flow if needed.

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Figure 17: Example of a safety flare

The burner will be a natural draft burner and will consist of:

- Pilot light with thermocouple, powered with natural gas
- Manual shut-off valve
- On-off valve controlled by the operation logics of the system
- Flame arrester
- Supply pilot line complete with on-off block valve
- Sample intake
- Pressure indicator

5.6 Utilities and chemicals

The Project has been carefully designed to minimize the consumption of external resources through the adoption of the following technologies:

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5.6.1 Electrical and thermal energy

The Project includes a cogeneration unit (CHP) for the combined production of electrical energy and thermal energy which will be both used in the anaerobic digestion process. The CHP has a nameplate capacity of 1.56 MW and it is maximising the waste heat recovery from the oil jacket as well as the exhausts.



Figure 18: Cogeneration System supplies both thermal and electrical energy

To fulfill peak demand from the equipment, a dedicated power line connection is available from Fortis Alberta. Also, in case of downtime of the CHP and to ensure maximum reliability of the system during cold winters, a back up boiler powered with natural gas is available in stand-by.

Both the grid connection and the boiler are sized to maintain production when the CHP is out of service.

5.6.2 Water

Water for the Project is broken down into 3 categories:

- Dilution water: this water is used for feedstock dilution, and it requires a screen filtration before being used by the system. This water will be sourced as described in [section 3.2](#).
- Industrial water: after the filtering system, this water is further processed with a water softener to comply with the equipment quality requirements. This water will be sourced as described in [section 3.2](#).
- Sanitary water and potable water: Water is purified on site with a prepackaged system for office use that will be installed inside the office to provide water for the employees working at site.

5.6.3 Compressed air

A dedicated air compressor with accumulator is installed on site to provide compressed air to the project.

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5.6.4 Chemicals

The Project uses the following chemicals:

- Anaerobic digesters - antifoam dosing
- Biogas washing towers – Caustic soda and ferric solution
- Ammonia stripping system – Sulfuric acid at 93% diluted to 50%
- Water treatment system: Sodium chloride for the regeneration of the water softener’s resins

Chemicals will be stored in IBC (Intermediate Bulk Container) totes, or vertical tanks depending on the type of chemical and the quantities used:

IBCs are useful for transporting and storing small quantities of bulk liquid. The IBC is typically made of polyethylene resin and comes equipped with a steel cage and pallet, features that make these tanks useful for storing hazardous chemicals. The storage, preparation, and dosage of chemicals from IBCs will take place inside the chemical room. The storage area includes housing for dosing pumps and a containment basin to capture any leaks. The dosing lines will be made of suitable material depending on material compatibility with the chemical.

Chemical storage tanks are designed for storing large quantities of bulk liquids. These tanks are typically HDPE or fiberglass with double wall containment to prevent spills as secondary containment. As with IBCs, dosing pumps are placed close to the tank and lines will be plastic or suitable material depending on chemical compatibility.

5.7 Other Systems

5.7.1 Stormwater Management

All stormwater is contained within the Project footprint. Runoff will be conveyed through the grading of the site, drainage ditches, culverts, and pipes to the digestate lagoon. The collected stormwater, in combination with the liquid digestate, will be stored in the digestate pond and applied to land following nutrient management plans. Stormwater management will meet the requirements of *Guidelines For*

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5.7.2 Grading and Excavation

A geotechnical study will be conducted to assess the conditions of the soil and probe for the presence of groundwater. Earthworks and excavation will follow the design of the facility with any necessary consolidation of soil. Soil compaction will be conducted where manure is stored per NRCB guidelines to meet secondary containment requirements. Grading of the site will be done in accordance with the stormwater management plan.

5.7.3 Leachate collection

The leachate network refers to the multiple points where potential leachate is collected.

Leachate from the reception and processing area is collected into a dedicated sump and recycled into the dilution buffer tank to dilute the feedstock to minimize water consumption and recover the energy contained in the leachate.

Leachate from the storage areas, mechanical rooms, concrete foundations where equipment is installed is collected into a dedicated sump and sent by gravity or by a pumping station into the digestate lagoon.

Condensate from gas line and gas upgrading system flow by gravity to a dedicated sump located near the biogas scrubbers and is pumped into the lagoon.

5.7.4 Septic

Septic will be constructed following appropriate guidelines such as *Alberta Private Sewage systems, Standard Practice 2021*. A conventional septic system collects the wastewater from toilets and drains located in the office. It retains solids and scum in a septic tank and pipes the liquids to a septic drain field. The septic tank system operates as follows:

- Wastewater from toilet, shower, sinks, washing machine, and dishwasher runs into a main drainage pipe that leads to the septic tank
- Solid materials sink to the bottom of the septic tank and form sludge
- Fats, oils, and greases float to the top of the septic tank and form scum
- Anaerobic bacteria feed on organic wastewater pollutants
- Liquids pass through an effluent filter near the outlet of the septic tank
- Filtered liquids flow through a pipe that leads to the septic drain field

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- Perforated pipes in the drain field allow wastewater to seep into a layer of gravel



Figure 19: Septic tank setup

6 EMISSIONS

The Project will generate emissions to process the manure and maintain the AD process and RNG upgrading. Air dispersion models are done using historical wind and weather conditions as well as ground terrain that are combined with the facility's emissions to evaluate the impacts against the base line ambient air conditions using reference from [AAAQOs](#). EPA will perform this evaluation as part of the Industrial Approval process.

Emissions are composed of 2 categories: point and fugitive emissions. Point sources are considered constant sources of emissions whereas fugitive emissions are intermittent and more nuanced in the modelling assumption. Air dispersion models are often done from a conservative standpoint. An example is the flare; it should be considered a fugitive emission as it shouldn't operate under normal conditions but is often modelled as point source to show its impacts per AER guidelines (directive 60).

The Project will implement various design considerations to further minimize impacts, and will also conduct an odour modelling study to evaluate the impact of the facility as part of the air dispersion modelling. Overall the Project is expected to reduce the overall odour impact as the decomposition of manure is taking place in an enclosed environment.

6.1 Point sources

The emission sources of the Project consist of:

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Point Emission Sources:

- Cogeneration unit
- Safety flare
- Boiler
- Dewatering
- Reception Building

Emissions from these point sources will be products of combustion (NO_x, SO_x, PM) as well as H₂S and NH₄. The stack associated with the biogas upgrading equipment is not considered an air emission point source; CO₂ and CH₄ are the effluent emissions and are not regulated by AAAQOs; they are emissions that are regulated through legislation such as the [Clean Fuels Regulation](#) that implement the federal carbon tax.

Fugitive Sources:

Emissions from manure may be considered fugitive as they enter the reception building; however, it is important to consider that manure existing storage practices generate equivalent emissions and the facility will divert manure to the digester tanks which are closed systems, resulting in a net reduction in emissions. Emissions from transportation are not considered fugitive as they are negligible. Moreover, manure management and hence, transportation, would still occur with current practices.

6.2 Odour Reduction and Control

Enclosed process:

The [Reception building](#) where manure is deposited is designed with fast rollup doors such that the manure is not exposed to wind drift or uncontrolled environmental emissions. This approach will greatly reduce the amount of feedlot manure stockpiled outdoor at Chinook's manure laydown area, hence reducing the overall odor impact of the feedlot operation.

Scrubber Towers and Polishing:

The [biogas cleaning line](#), is where the odorous compounds in the biogas are captured. H₂S is removed in 2 stages by the wet scrubbing tower. The bulk of H₂S is removed in this stage. Subsequently, the biogas enters a [polishing column](#) where the remaining H₂S and VOCs (volatile organic compounds) are removed.

Steel Top Digesters:

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The Developer's experience in the biogas industry has led the company to the adoption of steel top roofs as opposed to gas membrane covered roofs. Figure 7 in [Section 5.2.1](#) illustrates this. Membrane topped roofs serve the same function as the gas holder in [Section 5.5.1](#) but require maintenance and replacement (typically every 7-10 years). Replacement of these gas holder tops may generate significant odour events without proper maintenance plans. Moreover, the time to replace these tops directly impacts revenues as biogas is not generated. The Project's gas holder is a separate entity that can be bypassed during maintenance and replaced avoiding potential odour issues. The design of the anaerobic digesters is such that they never need to be opened, avoiding potential odour events.

Digestate Lagoon covered with top liner:

The Project will utilize a covered lagoon approach as mentioned in the section above. This will both preserve ammonia that would otherwise be volatilized and prevent the release of odors. Ammonia is an odorous compound that tends towards the gaseous phase. The top liner is impermeable similar to the design of biogas lagoons.

Safety flare:

During the events described in 5.5.4, the flare combusts the biogas, avoiding direct venting into the atmosphere and destroying the odorous compounds present in the gas.

7 PLANT SAFETY

7.1 Public safety

The facility will be designed, constructed, and operated to meet all applicable health and safety standards, codes, and regulations. Detailed health and safety plans, emergency response plans, operations plans, shutdown keys, alarm systems, and control narratives are also being developed to ensure the safe operation of the facility.

Access to the facility will be limited to operational personnel and approved third-party personnel. The site is fenced and restricted access to the facility will be maintained through a controlled entry point.

7.2 Signage

The plant will be equipped with signs that describe operations performed in each area and, based on the risks involved, the potential dangers and safety precautions required to be taken.

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Four different types of signs will be used:

- **Horizontal signs:** For traffic route management, vehicle transitions, walking paths, and handling of materials.
- **Vertical signs (pole mounted):** For road regulations and dangers, including speed limits, area access restrictions, weight limits, and other hazards.
- **Wall signs:** For identifying equipment, its use, and hazards. The signs will show the TAG of each piece of equipment, a description of the intended use of the area, the hazards present, PPE use requirements, and the location of the nearest safety and emergency devices (eyewash, shower, first aid).
- **Fire warning:** For identifying equipment and procedures to be used in case of fire (e.g. fire extinguishers, fire hoses, fire-fighting equipment).

7.3 Ladders and railings

Fixed ladders will be constructed and maintained to withstand the maximum loads (e.g. use during emergency conditions). Steps will have treads and risers, dimensioned for ease of use and to meet regulations. The top and bottom of fixed ladders and their landings will be equipped with railings or equivalent protection.

7.4 Piping Colour

Plant piping will be marked by coloured labels which identify the fluid inside according to applicable standards.

7.5 Alarms

Alarms caused by mechanical, or process faults will be displayed on the control desk SCADA in the control room. Alarms will follow a standard colour scheme for normal, warning, and alarm operations. In addition, auditory warnings accompany each visual alarm.

- **Green light:** The process is operating normally.
- **Orange light:** The process is operating under abnormal conditions (pre-warning)
- **Red light:** The process is operating outside of operating conditions (alarm)

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7.6 Electrical grounding system

The ground network will be built using cables with PVC insulation and/or copper-bounded steel rods (electrodes). The ground network will be designed such that the voltage to the ground at any one electrode in the network does not exceed 65V (under normal conditions).

7.7 General protection switch

In case of emergency (e.g. fire), the entire facility will be disconnected from the electrical network.

7.8 Safety Flare

For a detailed description of this safety equipment please refer to Section 5.5.4

7.9 Emergency vents and hydraulic guards

In the event of biogas overpressure, the digester is designed with multiple safety systems. It will be equipped with a mechanical overpressure valve, vacuum breaker valve and flame arrester. Biogas venting is not anticipated to be part of regular operation as the emergency flare is designed to handle 100% of the biogas production.

A liquid overflow system will be installed to allow emergency overflow of liquid from the digester. The digester overflow is protected with a hydraulic guard designed to protect the structure of the digester and prevent biogas escaping from the overflow system. In the event of overpressure, this measure is secondary to the overpressure hydraulic guard in the downstream biogas line and would be activated in the event of a downstream gas line blockage.

7.10 Plant start-up

During the first filling of the digester tank, the air contained in the headspace of the digester is vented because it doesn't contain enough methane to be flared. This practise is anticipated to last for several hours during the first filling of the tanks and it stops as soon as the methane concentration in the biogas achieves flammable concentration. During the plant start-up, the feedstock load to the digesters is slowly increased and the rate of biogas production will grow proportionally. The biogas produced will be flared until the feedstock loading is high enough to sustain a biogas production rate of at least 50% of the design value. This is the minimum quantity required to operate the gas upgrading system.

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7.11 Fire

In the event of fire, emergency responses and procedures are activated to isolate and shut down various components of the plant, including the power supply to the upgrading unit. Only the safety flare will continue operation to ensure no biogas is accumulated in the system.

7.11.1 Water Supply and Hydrants

Following the National Building code (AB Edition), the facility will ensure that 790 m³ of water will be accessible at all times for firefighting purposes. The Project is in discussion with Chinook and may access their water pump for fire suppression purposes or erect a water cistern with a hydrant.

8 ADDITIONAL CONSIDERATIONS

8.1 Lighting

Lighting needs will be determined after plant design is finalized. Placement and intensity of lighting will be based on plant layout and surrounding structures and will respect local regulations such as the *Dark Sky* Bylaw.

8.2 Land Reclamation

As part of the [EPA approval](#), the Project is required to have a reclamation plan as a condition precedent to operating the facility and the Developer will be required to post and maintain financial security for indicated reclamation costs. The Project will create and estimate financial security costs when factors such as excavation and concrete volumes are indicated and develop a reclamation plan as the Project approaches construction.

8.3 Noise

The Project will ensure that noise emissions are minimized following the considerations of the [AUC rule 012](#): Noise Control. The Project may consider sound proofing walls, mufflers or enclosing equipment to minimize noise emissions.

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APPENDIX C: FOOTHILLS COUNTY PUBLIC WORKS REFERRAL RESPONSE



FOOTHILLS COUNTY

309 Macleod Trail, Box 5605

High River, Alberta T1V 1M7

Phone: 403-652-2341

Fax: 403-652-7880

www.FoothillsCountyAB.ca

25R051 (Chinook Feeders 2024 Ltd.): Engineering Review
REVIEW BY: Patrick Antle
DATE: August 28, 2025

Site Access and Hauling

- Existing access and internal roadways are proposed to be used for this development
- Majority of the manure is expected to come from Chinook; however, the facility is open to receive livestock manure from other farms in the vicinity of the facility.
 - Farmers are expected to backhaul digestate for application to fields to save on transportation costs
- A reduction of approximately 50% of current truck traffic is expected once in operation, and will be hauling solid digestate as opposed to manure
 - Average of 20-25 trucks per day over an 8 month window is proposed, to avoid transportation during spring when roads are more susceptible to damage by heavy vehicles
- Signage is mentioned under 7.2, if any are proposed to be installed within Foothills County road allowances, approval from council will be required for any regulatory signs

Water:

- All water requirements for the operation of the facility are to be sourced from Chinook's effluent pond, which collects runoff from the feedlot.
- Report indicates that 790 m³ of water is to be accessible at all times for firefighting purposes
 - Water firefighting capacity to be sized appropriately according to site requirements and confirmed by the designing engineer
 - Discussions ongoing with Chinook regarding access to their water pump, failing this a pond or cistern will be required

SWMP & Grading:

- All stormwater is contained by the digestate lagoon, and is to be conveyed through site grading, drainage ditches, culverts, and pipes
 - SWMP/lot grading and drainage plan stamped by a professional engineer to be provided
 - Also will meet the requirements of '*Guidelines for secondary containment for above ground storage tanks industrial waste and wastewater branch Alberta environmental protection*'
- The pond is sized to contain 9 months worth of liquid digestate with storage for a 1:100-year rainfall event.
- Pond also acts as a secondary line of defence in the event of leaks/failures
- The pond will be lined with a HDPE bottom liner as well as an LDPE top cover to prevent ammonia losses and odours
- Geotechnical study to be conducted to assess soil conditions and groundwater
 - Soil compaction is to be conducted where manure is stored as per NRCB guidelines to meet secondary containment requirements
 - Will require the report to be stamped by the engineer.

Construction Drawings and As-builts:

- IFC plan required to show entire site, including grading and stormwater management infrastructure
- As-builts will be required upon completion along with a letter of conformation from an engineer for all site grading and SWMP.

Regards,



Patrick Antle
Engineering Technologist
Foothills County
Direct (403) 336-7253

APPENDIX D: PROPOSED BYLAW

BYLAW XX/2025

**BEING A BYLAW OF FOOTHILLS COUNTY TO AUTHORIZE AN AMENDMENT TO THE LAND
USE BYLAW NO. 60/2014 AS AMENDED**

WHEREAS pursuant to the provisions of the Municipal Government Act, Chapter M-26 Revised Statutes of Alberta 2000, and amendments thereto, the Council of Foothills County in the Province of Alberta, has adopted Land Use Bylaw No. 60/2014 and amendments thereto.

AND WHEREAS the Council has received an application to further amend the Land Use Bylaw by authorizing a Site-Specific Amendment to the Agricultural District land use rules to allow for an Anaerobic Manure-Only Biodigester Facility as a permitted use and to allow for an exception to the maximum height requirements as follows:

- i Anaerobic Digesters up to a maximum height of 30m;
- ii Accessory building (Biogas upgrading building) up to maximum height of 16m;
- iii Flare Tower up to a maximum height of 16m.

all on Ptn. SE 11-17-27 W4M.

NOW THEREFORE THE COUNCIL ENACTS AS FOLLOWS:

1. Under SECTION 12.1 AGRICULTURAL DISTRICT, the following shall be added under Section 12.1.4 PERMITTED USES on Ptn. SE 11-17-27 W4M:

To allow for an Anaerobic Manure-Only Biodigester Facility and to allow for an exception to the maximum height requirements as follows:

- i Anaerobic Digesters up to a maximum height of 30m;*
- ii Accessory building (Biogas upgrading building) up to maximum height of 16m;*
- iii Flare Tower up to a maximum height of 16m.*

On the lands described as Ptn. SE 11-17-27 W4M (subject lands).

2. This Bylaw shall have effect on the date of its third reading and upon signing.

FIRST READING:

Reeve

CAO

SECOND READING:

Reeve

CAO

THIRD READING:

Reeve

CAO

PASSED IN OPEN COUNCIL assembled at the Town of High River in the Province of Alberta this day
of 20 .