2 Project Description

2.1 Introduction

The applicant, Mr. James Foran and Nephin Renewable Gas - Reatagh Limited, proposes to develop an Anaerobic Digestion Facility (herein referred to as the Proposed Development) on a site located in the townlands of Curraghnagarraha, Reatagh, and Curraghballintlea, Co. Waterford.

This chapter will provide a detailed description of the Proposed Development and the key processes therein.

2.1.1 Description of the Proposed Development

The development will consist of the following:

- Construction of 3 no. digesters (c. 15.5m in height), 2 no. digestate storage structures (c. 15.5m and 12m in height), 4 no. pump houses (c. 2.59m in height), a liquid feed tank (c. 4m in height), located in the northeastern section of the site.
- Construction of 4 no. pasteurisation tanks (each c. 6m in height), a post pasteurisation cooling tank (c. 4m in height) and pre fertiliser manufacturing tank (c. 4m in height) located in the centre of the site.
- Construction of a part single-storey and part two-storey reception hall (with a gross floor area (GFA) of c. 2,113 sq.m and an overall height of c. 16.5m) to accommodate reception and storage areas, a laboratory, panel room, tool store, workshop, located in the northwestern section of the site.
- Construction of a single-storey solid digestate storage and a nutrient recovery building (with a GFA of c. 880 sq.m and an overall height of c. 12.4m) located to the south of the reception hall, in the central section of the site.
- Odour abatement plant and equipment and a fuel tank will be provided to the south of the solid digestate storage and nutrient recovery building.
- 2 no. CO_2 tanks (c. 10.7m in height), a CO_2 loading pump (c. 2.5m in height), CO_2 auxiliaries (c. 2.6m in height), CO_2 liqueufactor (c. 8.2m in height), a CO_2 compressor (c. 5.9m in height), a CO_2 pre-treatment skid (c. 3.5m in height), and associated plant including a backup boiler / biomethane boiler and a Compressed Natural Gas compression unit / biogas compression system located in the southern portion of the site.
- A H_2S washing tower (c. 7.8m in height), a biogas treatment skid (c. 4.1m in height), a combined heat and power (CHP) unit and panel room (c. 10m in height), a biogas compression system, a biogas upgrading module, and an emergency biogas flare (c. 11.3m in height), also located within the southern section of the site.
- Construction of a two-storey office and administration building with an overall height of c. 8.5m and a GFA of c. 272sq.m, located within the western area of the site, adjacent to the main site access.
- Construction of a grid injection unit (c. 2.75m in height) within a fenced compound, an ESB substation (c. 3.4m in height and a GFA of c. 23.5 sq.m), and 2 no. propane tanks located in the south-western portion of the site.

- Alterations to the existing public road (c. 475m to the south of the main site area) including provision of boundary setbacks and replacement planting, providing a new site entrance and access road to serve the development.
- Associated and ancillary works including parking (6 no. standard, 3 no. EV and 1 no. disabled parking spaces and bike storage for 10 no. bikes), a weighbridge, solar PV arrays at roof level, wastewater treatment equipment, bunding and surface treatments, attenuation pond, boundary treatments, lighting, services, lightning protection masts, drainage, landscaping, and all associated and ancillary works.

2.1.2 Site Location

General

The Proposed Development site is located in the townlands of Curraghnagarraha, Reatagh, and Curraghballintlea, Co. Waterford approximately 2.9km southeast of the town of Carrick-on-Suir, Co. Tipperary and approximately 19.5km northwest of Waterford City, Co. Waterford. The approximate grid reference location for the centre of the site is S 42576 19569, ITM: 642523, 619604.

An overview of the site location is provided in **Figure 2.1**.

Figure 2.1: Site Location

The total site area measures *ca*. 7.7ha. The site is currently used as agricultural pastureland and bounded to the north, south, east, and west by further agricultural pastureland. An operational piggery is located ca. 200m to the south.

The site is *ca*. 500m north of Scrouty Road and *ca.* 500m northeast of the Scrouty Road/Rath Road/R677 crossroad junction. An unmarked local road is located *ca.* 300m west of the site.

The Proposed Development will be accessed via Scrouty Road and a new access road leading north.

Topography

The site is characterised as being rolling to gently undulating. A peak in the site topography, 107m Above Ordnance Datum (AOD), is situated along the west boundary of the site with a gradual gradient to the east. The site topography falls to 104m AOD at the west and falls to 96m AOD along the eastern boundary. A small stream occurs adjacent to the eastern site boundary.

The proposed site entrance and access road location has an existing topography of 122m AOD, sloping from south to north from 122m AOD to 103m AOD at the main site.

Proximity to Designated Sites

The Proposed Development site is not within or immediately adjacent to any site that has been designated as a Special Area of Conservation (SAC) or a Special Protection Area (SPA) under the EU Habitats or EU Birds Directive.

There are three European Designated sites within 15km of the Proposed Development, each of which are designated as Special Areas of Conservation (SACs) (Refer to **Chapter 5: Biodiversity**). These sites are illustrated in **Figure 2.2**.

An appraisal of the potential effects of the Proposed Development on the constitutive characteristics of European sites identified within 15km of the Proposed Development is set out in the Natura Impact Statement which accompanies the planning application.

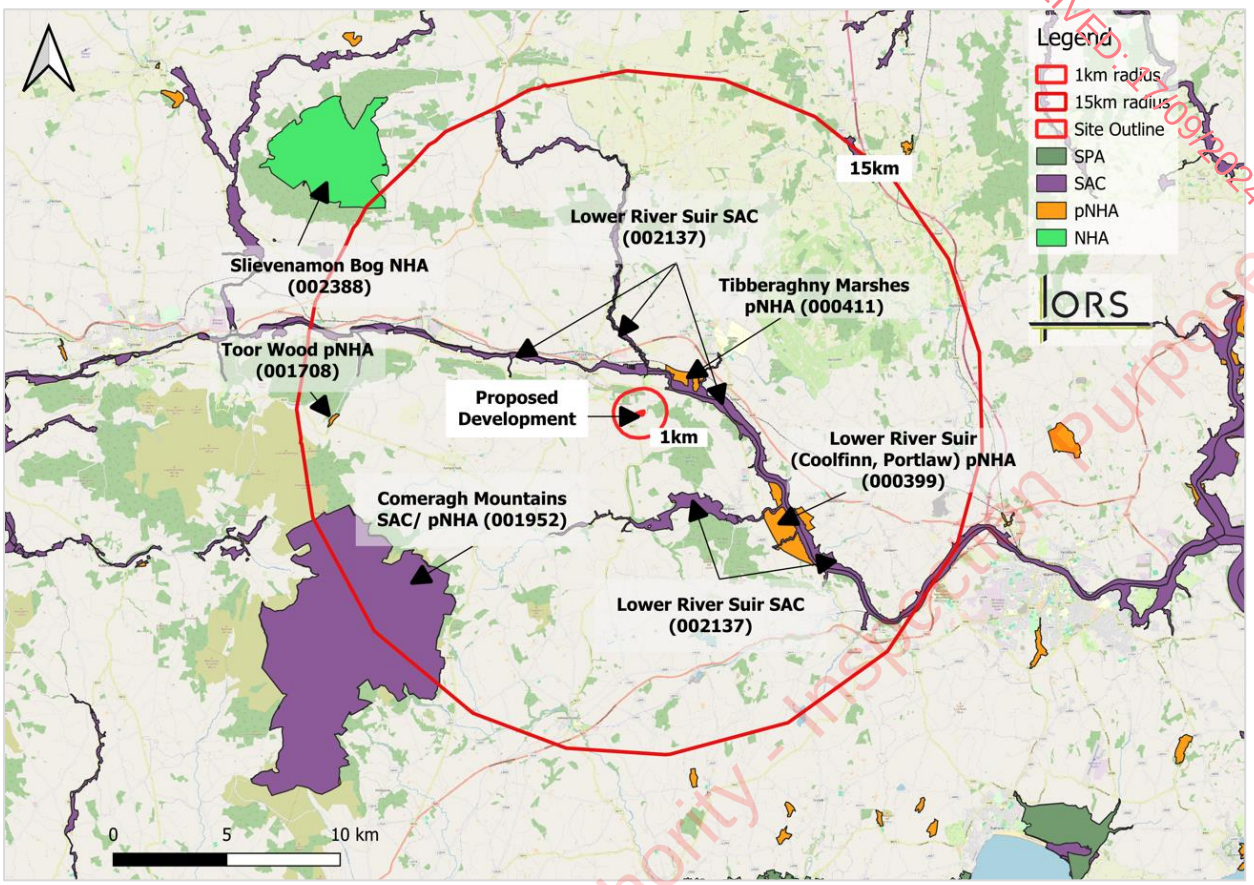


Figure 2.2: Map of Natura 2000 Sites within 15km of the Proposed Site

Habitat

No part of the site lies within nor is it immediately adjacent to any area that has been designated for nature conservation purposes. All proposed works within the site will take place in areas of low biodiversity value on a local level.

The site consists of one large field (proposed location of anaerobic digestion facility) and this field will be accessed via a proposed access road that traverses a strip of land through three other fields.

The dominant habitat within the site is highly modified Improved Agricultural Grassland (GA1). The sward is dominated by rye grasses (*Lolium sp*) and meadow grasses (*Poa sp.*), and there is a low proportion of broadleaved species in the grass sward. There are no wetland indicators within the grassland habitat, e.g., no rushes (*Juncus sp.)*, meadowsweet (*Filipendula ulmaria)* or Flag iris (*Iris pseudocorus)*. The improved grassland habitat extends throughout the four fields that will form part of the site, i.e., the portion of the fields that will be used for the access road, and the final field where the anaerobic digestion facility will be located. The overall ecological value of the grassland habitat within all fields is low.

The perimeters of the application site consist of high value Hedgerows (WL1), Treelines (WL2), Streams (FW1) and Drainage Ditches (FW4). These features are of high ecological value on a local level. The proposed access road will be constructed in the eastern section of the first three fields. There is a mature treeline along this eastern perimeter. There is a mixture of native species in this treeline, including gorse (*Ulex europaeus*), holly (*Ilex aquifolium*), elder

(*Sambucus nigra*), bramble (*Rubus fruticosus agg*), hawthorn (*Crataegus monogyna*), alder (*Alnus glutinosa*) and willow (*Salix sp.*). There are also some mature beech (*Fagus sylvatica*) and ash (*Fraxinus excelsior*) along this treeline.

The main part of the site (location of the anaerobic digestion facility) consists of a large field that is bordered to the north, east and south by Hedgerows (WL1) or Treelines (WL2). The western perimeter consists of a fence. The northern perimeter of this field consists of a hedgerow that is dominated by gorse and holly, with an occasional mature ash. There is a wet drainage ditch (FW4) along this hedgerow. The southern perimeter of this field consists of a low, sparse gorse hedgerow, with an occasional mature ash. There is also a wet drain present along this boundary. The eastern perimeter of the main field is a continuation of the treeline described above that will be close to the proposed access road.

Surface Water

The main hydrological feature in the vicinity of the site is Tinhalla Stream which is located adjacent to the eastern and runs from south to north, where it discharges into the River Suir approximately 1.6km north of the site.

The section of the Robe Suir to the north of the site flows in a west to east direction and turns southeast towards Waterford City centre, *ca*. 19km southeast of the Proposed Development.

One arterial drainage channel is located *ca*. 2.8km northwest of the northern site boundary. This channel forms part of the River Suir which flows through Carrick-on-Suir. The site is not directly hydrologically connected to this arterial drainage channel. Given the natural drainage of the site following existing topography and the surface water receptor located along the eastern site boundary which discharges to the River Suir to the north of the site, the site and this drainage channel form part of the same hydrological network.

Proximity to Existing Gas Network

An existing medium pressure distribution pipeline is located *ca*. 2.5km north of the site at Carrickbeg, Carrick-on-Suir, Co. Tipperary. The existing medium pressure distribution gas pipeline and the proposed route for the pipeline linking the site to the existing local gas network are shown in **Figures 2.3** and **2.4.**

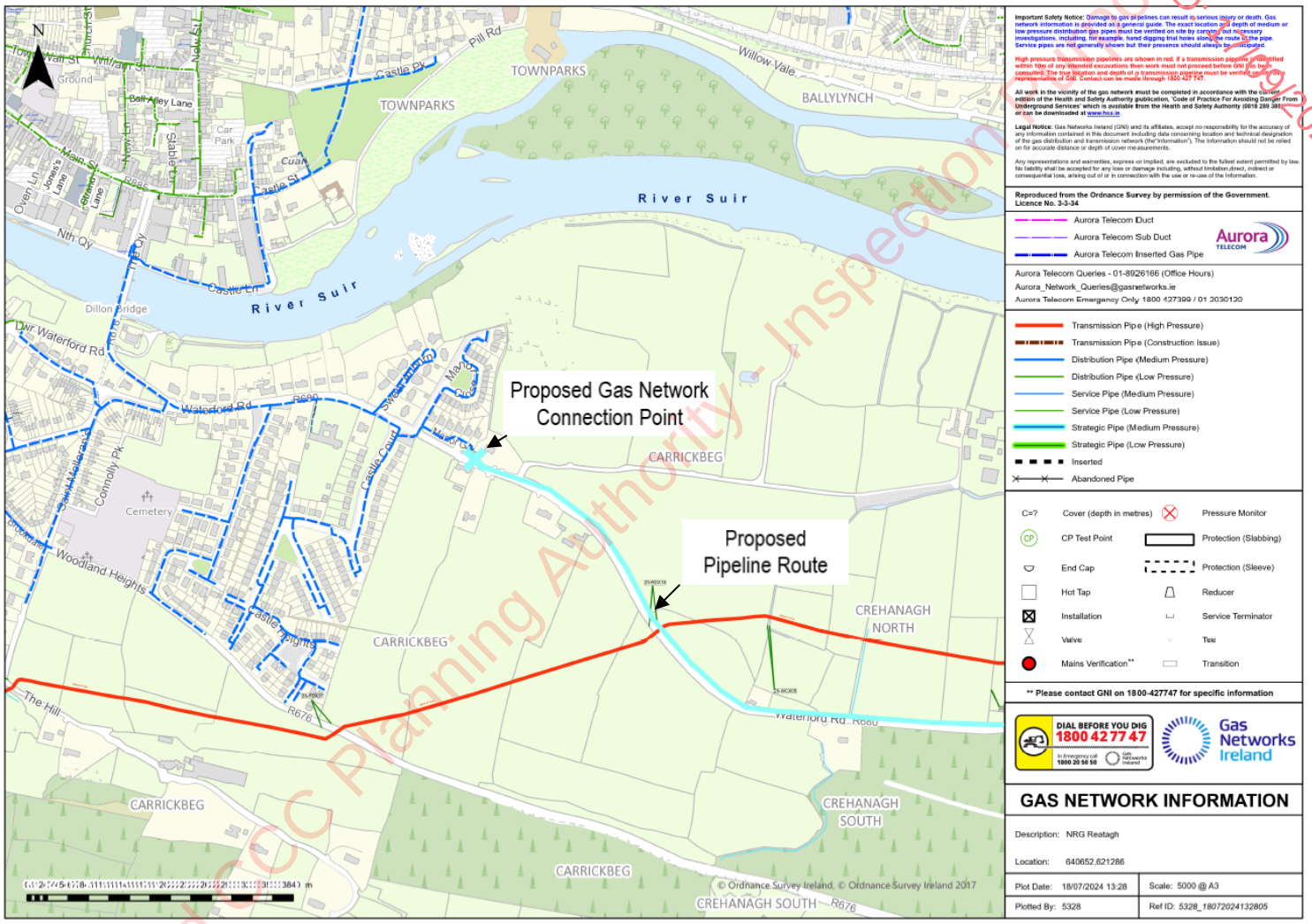


Figure 2.3: Existing gas network and proposed pipeline connection at Carrickbeg, Carrick-on-Suir, Co. Tipperary

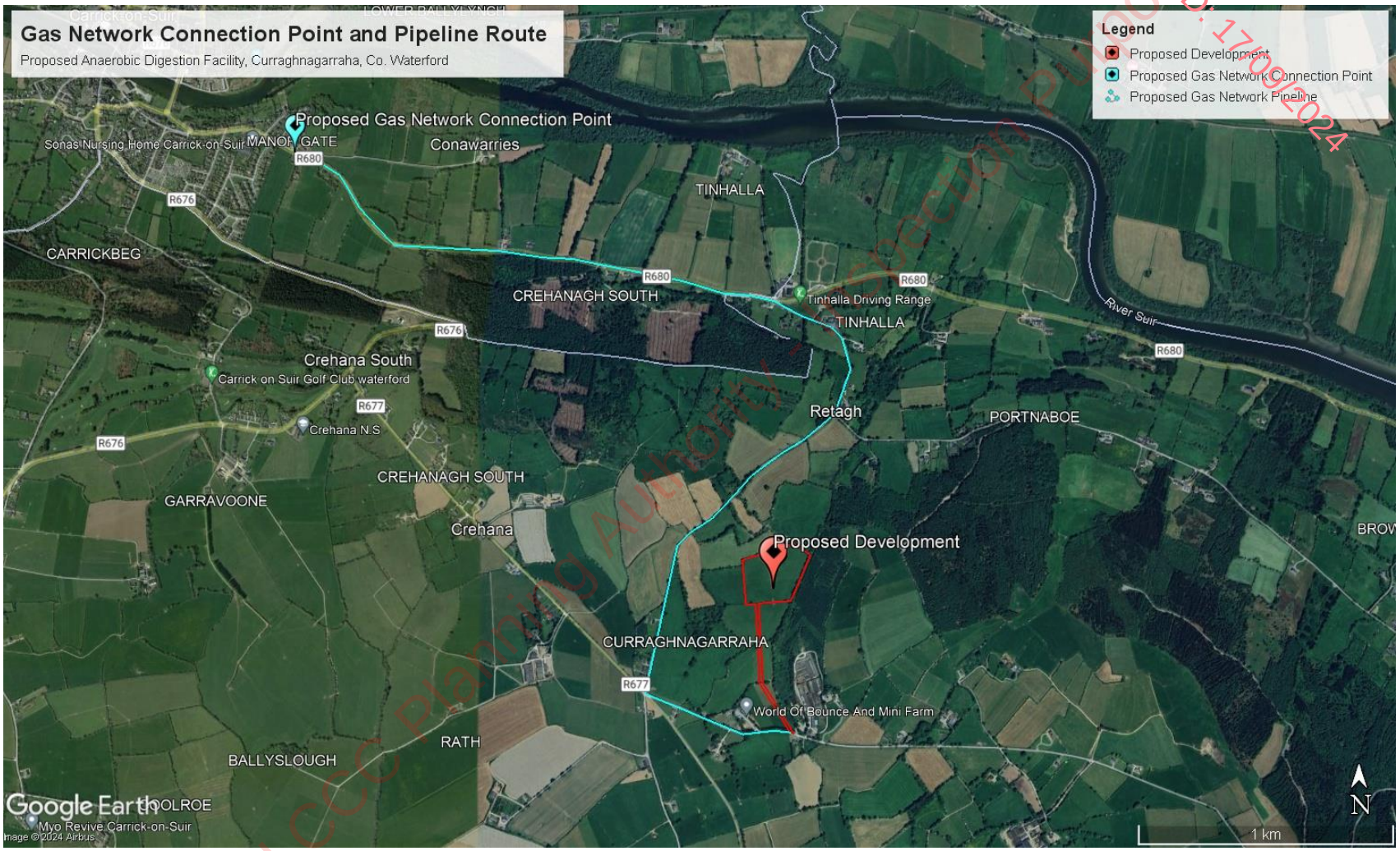


Figure 2.4: Proposed gas network connection point and pipeline route from Proposed Development.

2.1.3 Site Layout

The site layout is displayed in **Figures 2.5a and 2.5b.** Detailed site layout and structural drawings are included in **Volume IV: Drawings**.

Figure 2.5a: Proposed Site Layout - Main Site

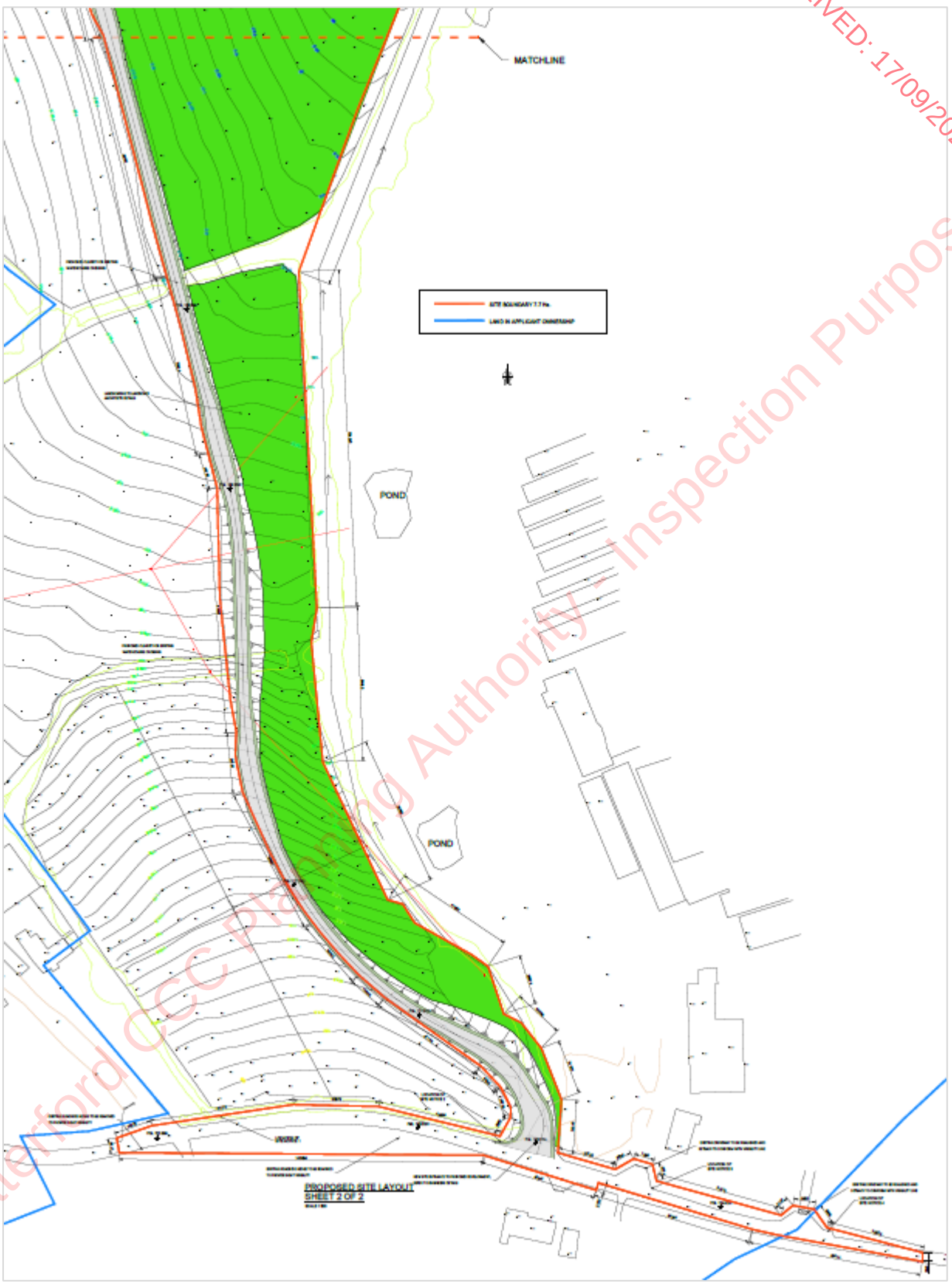


Figure 2.5b: Proposed Site Layout Plan – Access Road

2.1.4 3D Image of the Site Layout

A 3D model image of the site layout is included in **Figure 2.6**.

Figure 2.6: 3D Image of Site Layout

2.2 Process and Design Description

The key processes and design details illustrated in **Figures 2.5a, 2.5b** and **2.6** above are described in detail in the following sections.

2.2.1 Summary Process Flow Diagram

A summary process flow diagram is presented in **Figure 2.7**.

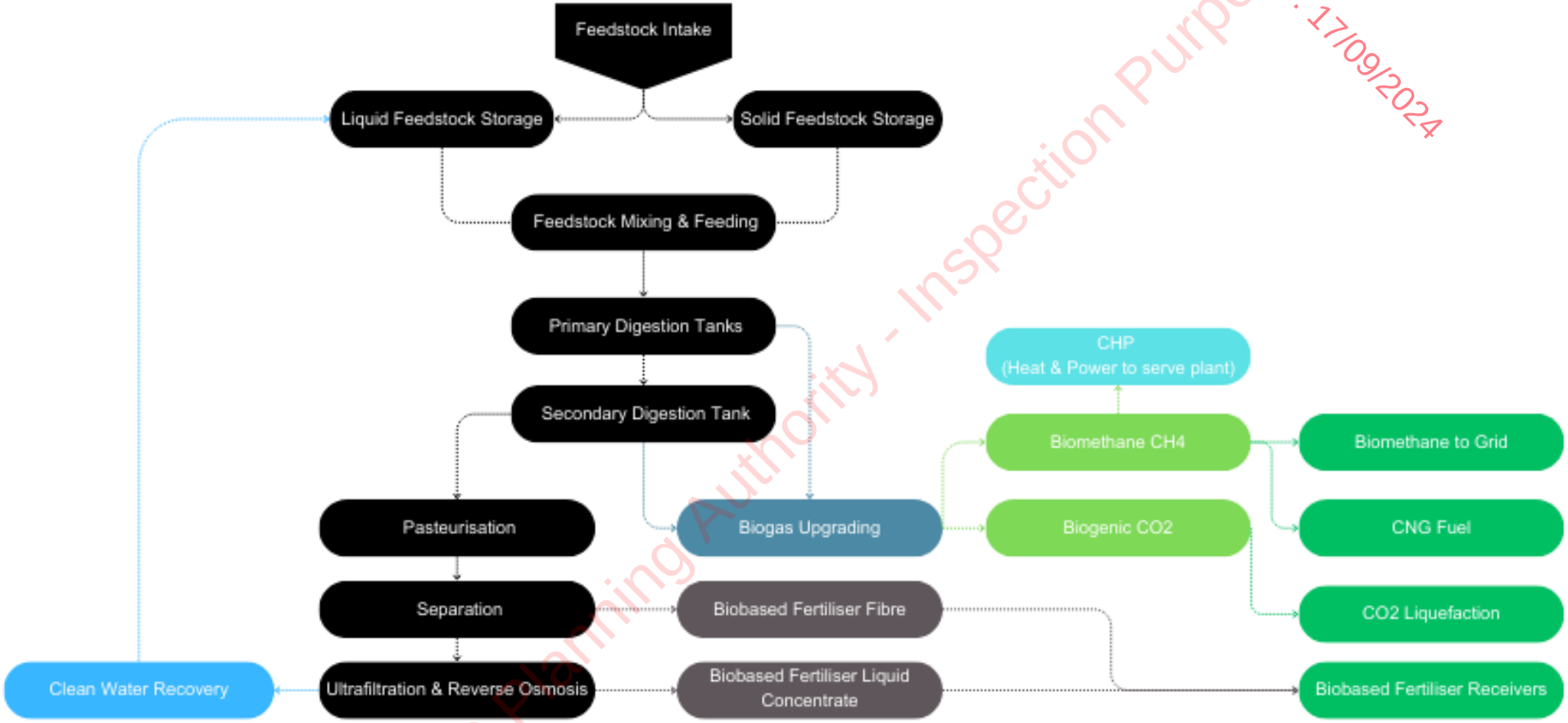


Figure 2.7: Process Flow

2.2.2 Plant Components

The plant components are listed in **Table 2.3** below. Detailed drawings showing design, layout and dimensions of components referenced are presented in the Planning Drawings that accompany this EIAR.

Table 2.3: Key Plant Components and Process

Drawing Ref.	Item	Details
01	Entrance Gate	Site entrance with 1.8 metre high security gate.
02	Car Park	Staff and visitor parking, providing 10no. vehicle parking spaces. Including 3no. EV charging points parking spaces, 1no. disabled access parking space and bicycle storage.
03	Weighbridge and Office	Weighbridge facility to record incoming feedstock delivery tonnages and outgoing biobased fertiliser tonnages. Site Office including Entrance Area, Canteen, Accessible Shower Room , WC, Welfare Facilities and Control Room on the Ground Floor. Office and Meeting Room on the First Floor.
04	Concrete Apron	Concrete apron to the front of Reception Hall providing vehicle access route and turning areas.
05	ESB Substation	Substation to allow for import of back-up electricity when required. Including transformers used to transform incoming electricity from high to low voltage.
06	Canteen and Toilet Wastewater Treatment	Wastewater treatment and percolation area for wastewater from canteen and toilet facilities.
07	Perimeter Fencing	1.8 metre high palisade fencing surrounding the site.
08	Bund Floor and Ramps	The bund will be impermeable and provide the required storage volume i.e., a minimum of 110% of the largest single tank volume.
09	Bund Walls	
10	Landscaping	Native flora and tree planting.
11	Attenuation Pond	Attenuation pond providing attenuation of stormwater only.
12	Asphalt Access Road	Access road providing access to the Energy Hub.
50	Odour Treatment	An Odour Treatment System to collect and treat all odours arising from potentially odorous activities occurring on site.
51	Reception Hall	Reception Hall accommodating solid waste reception, storage area and quarantine area. Maintained under negative pressure with adjoining Odour Treatment System.
52	Liquid Feed Tank	Liquid feedstock intake and storage, prior to feeding.
53	Digesters	Digesters are constructed using pour in-situ concrete, featuring walls measuring 8m in height and 32m in diameter. Each primary digester has a
54	Digesters	

55	Digesters	volume capacity of 6,032 m^3. Each Digester is equipped with a double membrane gas collection dome with a biogas storage capacity of 2,460 Nm^3.
56	Digestate Storage Tank	Storage tank providing a storage capacity of 6,032m^3 for treated Liquid Digestate Concentrate. The site possesses a total storage capacity of 7,832m^3 (2no. Digestate Storage Tanks of 6,032m^3 and 1,800m^3 volume capacity) – Items 56 and 63.
57	Pasteurisation Tank	Insulated pasteurisation tanks will provide treatment of the digestate material to ABP standard.
58	Pasteurisation Tank	
59	Pasteurisation Tank	
60	Pasteurisation Tank	
61	Post Pasteurisation Cooling	Post pasteurisation storage to allow recovery of heat from pasteurised digestate prior to further treatment.
62	Pre-Biobased Fertiliser Manufacturing Tank	Liquid digestate buffer tank used to ensure constant digestate supply to the nutrient recovery unit.
63	Digestate Storage	Storage tank providing a storage capacity of 1,800m^3 for treated Liquid Digestate Concentrate.
64	Nutrient Recovery	Nutrient recovery unit will remove and clean the water from the digestate. It will concentrate the nutrients into a reduced volume of digestate concentrate.
65	Solid Digestate Storage	The Solid Digestate Storage will provide enclosed storage of pasteurised and treated solid digestate fibre, recovered during digestate treatment.
66	Digestate Offtake	Tanker connection for liquid digestate offtake.
67	Pump House	Accommodation for pumping equipment and pipework for the transfer of liquid feedstock and digestate materials.
68	Pump House	
69	Pump House	
70	Pump House	
71	Workshop	Dedicated area for undertaking mechanical repairs.
72	Tool Store	Storage of maintenance equipment and parts.
73	Panel Room	Electrical panel room.
74	Laboratory	On site laboratory providing a space for process monitoring and analysis.
75	Liquid Feed Intake	Liquid feedstock intake point
101	CO_2 Tanks	Insulated storage tanks for the temporary storage of liquefied CO_2.
102	CO_2 Loading Pump	Pump for the loading of liquefied CO_2 to specialist tanker for export.

103	CO_2 Auxiliaries	Auxiliary equipment to CO_2 liquefaction process.
104	CO_2 Liquefaction	CO2 liquefaction system to recover CO_2 from the biogas upgrading process.
105	CO_2 Compressor	
106	CO_2 Pre-Treatment Skid	
107	H_2S Washing Tower	H_2S scrubber system providing removal of H_2S from biogas prior to treatment.
108	Biogas Treatment Skid	Containerised biogas upgrading system to upgrade biogas to biomethane.
109	CHP + Panel Room	1.2MWe capacity containerised CHP unit and panel room.
110	Biogas Compression System	Biogas upgrading removes trace impurities in the biogas stream. The primary goal is to separate carbon dioxide (CO_2) from methane (CH_4) to produce renewable biomethane and CO2.
111	Biogas Upgrading Module	
112	Biogas Flare	1no. enclosed gas flare serving as additional safety measure. Flare only operates under distinct scenarios to ensure safety and compliance.
114	Grid Injection Unit	The Grid Injection Unit (GIU) comprises equipment which will ensure that the biomethane is compliant with all necessary standards and regulations before it enters the local gas network.
115	Propane Tanks	Supply of propane to enhance CV of biomethane when necessary.
116	Fuel Tank	1,000 litre capacity self-bunded fuel storage for refuelling of site plant and machinery.
117	CNG Compression Unit	Compressed Natural Gas compression unit
118	Biomethane Boiler	1No. 500kW containerised biomethane boiler, which will provide emergency backup heat utilising biomethane generated on site to produce heat for the digestion process.

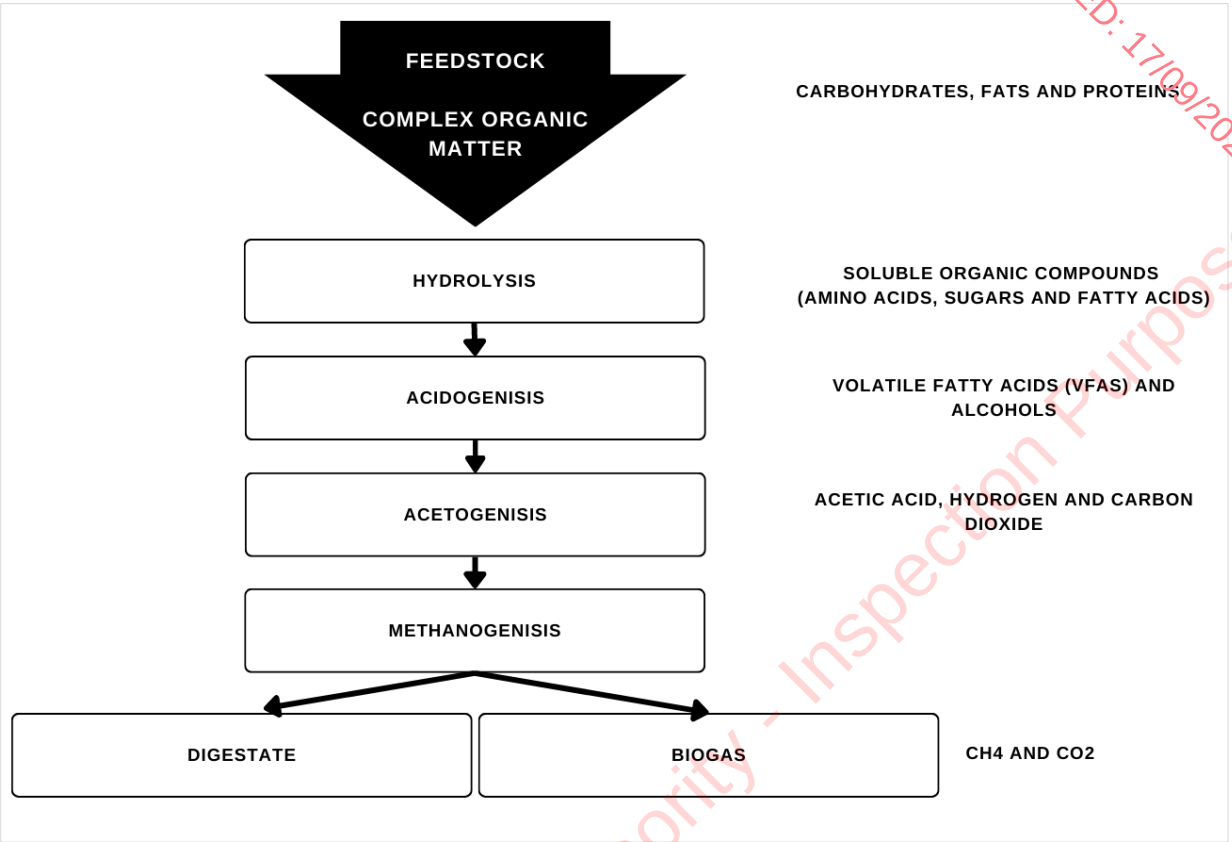
2.2.3 Anaerobic Digestion Process

Anaerobic Digestion (AD) is a natural biological decomposition process which takes place in an oxygen-free environment, where micro-organisms (bacteria and archaea) break down organic matter. There are four main stages to this process:

- Hydrolysis - large, complex polymers like carbohydrates, cellulose, proteins, and fats are broken down by hydrolytic enzymes into soluble monomers i.e., amino acids from proteins, long chain fatty acids from lipids, and simple sugars from complex carbohydrates.
- Acidogenesis – these soluble monomers are further broken down into short chain volatile fatty acids (VFAs), alcohols, carbon dioxide and hydrogen.
- Acetogenesis - the products of acidogenesis are broken down into acetate, releasing hydrogen and carbon dioxide.
- Methanogenesis – In this final stage of AD, various groups of methanogenic bacteria consume acetate, hydrogen and carbon dioxide and convert these intermediate products into CH4.

The biological decomposition stages are illustrated in **Figure 2.8**.

Figure 2.8: Biological decomposition process in AD



2.2.4 Biogas

Biogas is the product of this complex biological decomposition of organic materials, mainly consisting of 55-70% by volume methane (CH_4), 30-45% carbon dioxide (CO_2), together with traces of other gases, i.e., nitrogen (N_2), hydrogen (H_2), hydrogen sulphide (H_2S), ammonia (NH_3), as well as water vapour. The exact composition of biogas is dependent on the type of feedstock being digested.

Biogas can be 'upgraded' to pure methane, often called biomethane, by removing CO_2, H_2S, moisture and other trace gases. The biogas upgrading process produces a purified stream of biomethane, which can then be injected into the main gas grid. The upgrading process also produces a CO_2 rich gas stream which can be recovered for treatment within a CO_2 liquefaction system to produce renewable liquefied CO_2.

Based on the feedstock composition and design operating capacity, it is projected that the facility will be capable of producing 810-960 Nm^3 of biomethane per hour.

2.2.5 Feedstock

The Proposed Development has been designed to accept and treat up to 90,000 tonnes per annum of predominantly locally sourced agricultural manures, slurries, food processing residues and crop-based feedstocks. The estimated feedstock composition and annual tonnages accepted are outlined in **Table 2.4** below. These tonnages are indicative and subject to change based on market and season conditions and availability and quality of feedstocks. Overall tonnages will not exceed 90,000 tonnes.

Table 2.4: Estimated Annual Feedstock Composition and Intake

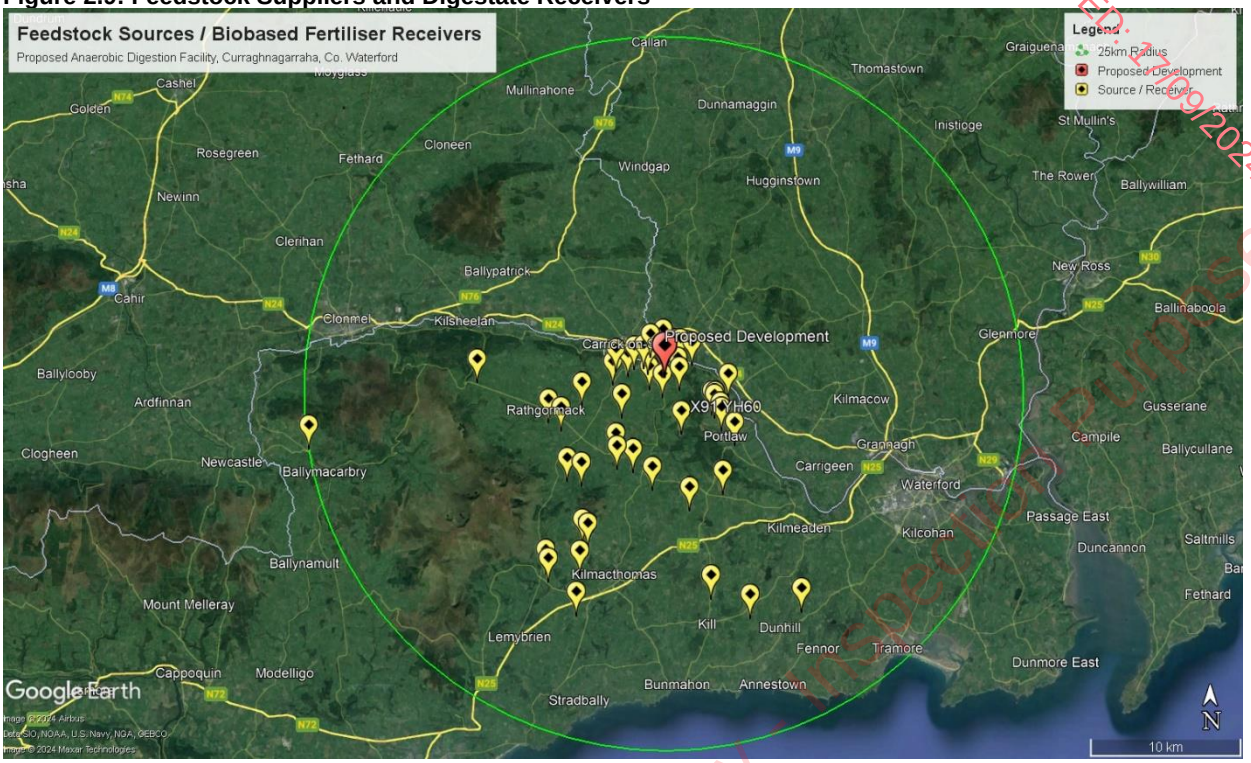
Feedstock	Tonnes/Annum
Cattle Slurry	7,700
Cattle Manure	1,400
Pig Slurry	26,200
Poultry Litter	12,200
Vegetable Residues	1,000
Food Production Residues	3,100
Drinks Production Residues	7,700
Dairy Production Residues	7,000
Grass Silage	9,000
Whole Crop Silage	14,100
Total	**90,000**

The agricultural manures, slurries and crop-based feedstocks will be sourced from agricultural operators in the vicinity of the site. Pig Slurry will be supplied to the Proposed Development by tanker from the neighbouring Piggery (IPPC Licence Ref: P0573) located 200m to the south of the site.

To date the applicant has engaged with a large number of local farmers, of which 61 have confirmed their agreement to supply feedstock to the Proposed Development and receive biobased fertiliser in return. Letters of support from these feedstock suppliers and biobased fertiliser receivers have been compiled and submitted alongside the Planning Statement accompanying the application.

The geographical distribution of these feedstock suppliers and digestate receivers is represented in **Figure 2.9**. 59% (36) of these sources are located within a 10km radius of the site and 100% (61) within a 25km radius of the site.

Figure 2.9: Feedstock Suppliers and Digestate Receivers



2.2.6 Feedstock Acceptance and Storage Procedure

Feedstocks will be transported to the Proposed Development using heavy goods vehicles (HGVs), enclosed trailers, and sealed vacuum tankers.

Only feedstocks meeting strict feedstock acceptance procedures and complying with Environmental Protection Agency (EPA) and Department of Agriculture, Food & Marine (DAFM) license conditions will be accepted. All suppliers must complete a Feedstock Acceptance Agreement (FAA). Suppliers are also required to notify the weighbridge operator 24 hours in advance of delivery.

Upon arrival at the site, incoming feedstock deliveries will be weighed and logged at the weighbridge located at the site entrance and office, in accordance with regulatory requirements set by the EPA and DAFM. All hauler drivers will proceed to the office for review and submission of commercial documentation related to feedstock transport. Visual inspection of feedstocks will ensure conformity with the FAA.

Once delivery and documentation are confirmed, delivery vehicles will be directed to the Reception Hall for further processing.

2.2.7 Weighbridge

All vehicles entering the facility to deliver feedstock or export digestate will enter and depart via a weighbridge located at the site entrance and adjacent to the site office. Weighbridge information will be recorded automatically by a weighbridge data management system. The weighbridge will be of steel construction, mounted on load cells within a reinforced concrete pit chamber.

The weighbridge is shown as **item 03** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200**.

2.2.8 Reception Hall

The Reception Hall will be constructed utilising a steel frame, composite PVC coated cladding, concrete flooring, and retaining walls equipped with rapid closing doors. The building will feature ventilation and odour abatement system, designed to maintain negative air pressure within the building, thereby minimising the release of fugitive odours. This integrated system of high-speed roller shutter doors, building ventilation, and odour abatement will effectively prevent fugitive emissions. Pedestrian doors are included for safe ingress and egress of personnel. All liquids and washings will be contained within the Reception Hall building and returned to process.

Upon arrival to the Reception Hall, drivers will reverse their vehicles into the building. Prior to entry, high-speed roller shutter doors will open to allow access, and upon entering, the doors will promptly close prior to the discharge of the material.

Liquid feedstock will be discharged into either the reception pit with a capacity of 70m^3 or directly transferred via pump to the liquid feedstock tank, which has a capacity of 196m^3. The reception pit will be constructed using concrete, while the liquid feedstock tanks will also be made of concrete and located within a bunded area.

Solid materials will be unloaded into designated feedstock bays, with a total storage capacity of 745 tonnes of solid feedstock material, the equivalent of 5 days storage.

All vehicles will undergo external cleaning via a power hose prior to exiting the building. Rapid closing doors will open to facilitate the vehicle's departure, after which it will return to the office and weighbridge for re-weighing before exiting the site.

The Reception Hall is shown as **item 51** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200.**

2.2.9 Liquid Feed Tank

The Liquid Feed Tank will provide intake storage of liquid feedstocks prior to processing.

Liquid Feed Tank is shown as **items 52** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200.**

2.2.10 Odour Treatment System

An Odour Treatment System will recover and treat all odours arising from potentially odorous activities occurring on site. All major odour sources, inclusive of the Reception Hall, Digestate Storage Tanks, Liquid Feed Tanks and Pasteurisation Tanks are all connected to the Odour Treatment System. The odour treatment is a proprietary system designed and supplied by a specialist contractor with extensive experience of treating odour from biogas and other organic waste facilities. Odour emission rates will be agreed as part of the EPA licence.

The Reception Hall has a volume of *ca*. 19,000m^3 and the Digestate Storage building discussed below has a volume of *ca* 8,000 m^3. The ventilation and odour abatement system will be designed to achieve a minimum of two (2) air changes per hour which corresponds to a

flowrate of 54,000 m^3/hour, providing adequate air changes in accordance with BAT. The odour abatement system will be designed to treat 60,000 – 70,000 m^3/hour providing an overcapacity of 10-23% and an odour destruction efficiency of 95-99.5%.

Following a comprehensive review of BAT and odour abatement technologies on the market, the applicant has adopted multi-stage treatment technology. This technology uses a combination of Ammonia (NH_3) Scrubbing, High Intensity Ultraviolet (UV), Photo Chemical Oxidation, and Activated Carbon Filtration to achieve high levels of odour removal.

Ammonia (NH_3) Scrubbing

An NH_3 Scrubber is used for efficient NH_3 removal consisting of a reaction vessel with packing and liquid distributor and spray system. The exit route from the packed column includes a demister for removing entrained liquid droplets. Water conditioned with weak sulphuric acid is used as the scrubbing liquid, reacting with the ammonia to form ammonium sulphate. Once treated by the NH_3 Scrubber the treated air is combined with the larger low concentration air flow for polishing treatment via ColdOx.

DEO 500

Sources such as the Liquid Feed Tank and Pasteurisation Tanks will be treated via DEO™ technology. DEO™ is designed to eliminate reduced sulphur compounds, aromatics, and other VOCs. DEO™ allows for VOC and odour reduction of > 95% (typical values are in between 98-99,5%). Once treated by the DEO system the treated air is combined with the larger low concentration air flow for polishing treatment in the Coldox® System.

ColdOx

ColdOx® oxidises volatile organic compounds (VOCs) and eliminates odour through the use of high intensity ultraviolet (UV), excess ozone, and photo chemical oxidation supported by special purpose catalysts. The UV reactor achieves odour reduction efficiency of up to 90% on its own.

Activated Carbon Filtration

Activated Carbon Filters act as a polishing step in the odour treatment process prior to discharge to the atmosphere via the stack.

The Odour Treatment System process flow is depicted in **Figure 2.10**.

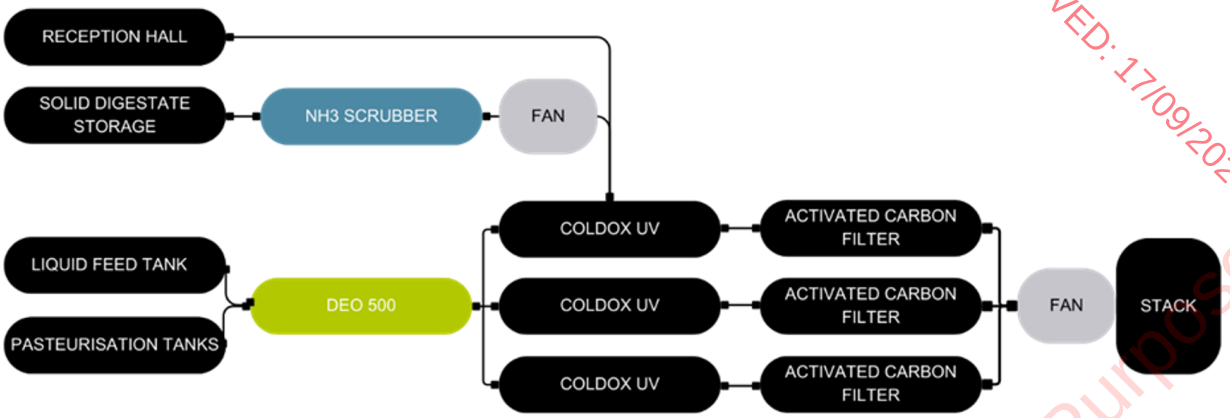


Figure 2.10: Odour Treatment Process Flow

The Odour Treatment System is shown as **item 50** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200**

2.2.11 Primary and Secondary Digester

In two-stage AD, the digestion process takes place in a series of primary and secondary anaerobic digesters. The primary and secondary digestion process will take place within 3 no. Continuously Stirred Tank Reactor (CSTR) tanks:

- 2no. Primary Digestion Tanks
- 1no. Secondary Digestion Tank

Primary Digestion Tank

The Primary Digestion Tanks are constructed using pour in-situ concrete. The walls of the digestion tanks will be constructed from pour-in-situ reinforced concrete and constructed on a reinforced concrete base sloping to a central point to facilitate optimum mixing. Each primary digestion tank has a volume capacity of 6,032 m^3.

The tanks will be designed and constructed in accordance with Eurocode 2 Part 2 Liquid retaining structures and a Construction Quality Assurance (CQA) plan will validate their proper design and construction.

The Primary Digestion Tanks are each equipped with a double membrane gas collection system. The flexible, sealed twin membrane gasholder will act as low-pressure gas capture and temporary storage which will accommodate any fluctuation in gas generation from the process. The inner membrane temporarily stores the biogas while the outer membrane contains low-pressure air which is maintained at a slightly higher pressure to ensure biogas within the inner membrane flows to its destination i.e., Biogas Upgrade Unit. The double membrane gas collection systems of the primary digestion tanks each have a biogas storage capacity of 2,460 Nm^3.

Primary Digestion Tanks are shown as **items 53 and 54** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200.**

Secondary Digestion Tank

The Secondary Digestion Tank is constructed using pour in-situ reinforced concrete and constructed on a reinforced concrete base sloping to a central point to facilitate optimum mixing. The Secondary Digestion Tank is also equipped with a double membrane gas collection system with a biogas storage capacity of 2,460 Nm^3. The Secondary Digestion Tank has a volume capacity of 6,032 m^3.

The Secondary Digestion Tank is shown as **item 55** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200**

Digestion Mixing

The Digestion Tanks are equipped with mechanical mixers featuring a series of paddles with externally mounted drive units. This configuration is designed to facilitate thorough mixing and homogenisation of the tank contents. The sizing of these mixers is determined based on the characteristics of the substrate, specifically considering factors such as dry matter content and viscosity. This ensures optimal mixing efficiency tailored to the specific requirements of the digestion process.

Digestion Temperature

The temperature in both primary and secondary digestion tanks is maintained within the temperature range of 37-42ºC. Each digester tank is heated using integrated water heating pipework in the walls of the digester. The Supervisory Control and Data Acquisition (SCADA) system ensures the digesters operate in the mesophilic range at 37-42ºC.

2.2.12 Pasteurisation System

The Pasteurisation System is designed to minimise the risks from microbiological hazards. The EU pasteurisation standard uses indicator organisms to;

- verify that pasteurisation achieves the required reductive effect on pathogens and,
- verify that no cross contamination between untreated ABP feedstock and digestate product occurs.

The EU pasteurisation standard requires that all the digestate material is simultaneously held at 70°C or above for a minimum of 60 continuous minutes. The use of this pasteurisation standard reduces pathogens to levels at which they do not pose a risk, ensuring that all digestate end products (Digestate Liquid and Fibre) are safe to handle and use.

In accordance with Animal By-product (ABP) Regulations all organic material must also be mechanically treated to ensure all particles are less than 12mm in size. This will be achieved through a screening and maceration pump prior to pasteurisation.

The Pasteurisation System will comprise the following items:

- 4 no. enclosed pasteurisation tanks (each of 25m^3 capacity)
- Heat exchanger (with heat provided by the CHP/Biomethane Boiler)
- 1 no. maceration and screening pump (12mm)
- Post-Pasteurisation Cooling Tank (200m^3 volume capacity)

Digestate from the Secondary Digestion Tank will be fed using enclosed pipework via the macerator and pump system to the 4 no. pasteurisation tanks. Pasteurisation will take place independent of the digestion system, in a batch process. By utilising 4 no. pasteurisation tanks in parallel it is possible to operate the pasteurisation system on a sequential batch basis with one tank filling, one processing and one emptying.

The digestate will be circulated by a pump system through a heat exchanger which will raise the temperature to greater than 70°C. The heating process will cease once the desired process temperature is achieved but material will continue to be maintained at temperature and agitated within the pasteurisation tank for a minimum of 60 minutes.

The pasteurisation tanks will each be equipped with 3no. temperature probes and ultrasonic level indicators to provide evidence to regulatory authorities that all material is kept above the minimum temperature (70°C) for the required minimum period of 60 minutes, therefore meeting the legal time and temperature standards.

The Pasteurisation System will be equipped with a datalogging system that will allow real-time thermographs to be produced via a SCADA system. The datalogging system and thermographs produced will be tamperproof.

The Pasteurisation Tanks (**items 57, 58, 59** and **60)** and Post-Pasteurisation Cooling Tank (**item 61**) are shown on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200**.

2.2.13 Digestate Treatment

Following pasteurisation, the digestate passes to the Digestate Treatment System which through a combination of separation, ultrafiltration and reverse osmosis generates three outputs namely solid digestate, concentrated liquid digestate and recovered clean water.

The Digestate Treatment System has a design capacity to treat a minimum of 78,000 tonnes of whole digestate per annum. Following treatment of the whole digestate, *ca*. 8,000 tonnes of digestate fibre, and *ca*. 17,000 tonnes of liquid digestate concentrate will be produced. The treatment process will recover *ca*. 53,000 tonnes of clean water which will be reused on site for cleaning, with the remaining volume returned to the process as a feeding liquid.

The digestate treatment process involves the following stages:

- Screwpress Separation
- Ultrafiltration
- Reverse Osmosis

Screwpress Separation

The screwpress, comprising a rotating screw and mechanical screen, separates the digestate into a solid and liquid fraction. The solid fraction (solid digestate) is passed through the separator and is collected in the enclosed storage bay below. The liquid fraction (permeate) is pumped to the nutrient recovery unit for further treatment by ultrafiltration and reverse osmosis.

Ultrafiltration

The liquid fraction of the digestate is then concentrated to reduce the water content and increase the nutrient concentration in the remaining concentrated digestate. The liquid

digestate is first passed through a vibrating screen ultra filtration module to further remove suspended solids from the liquid. The concentrate material obtained from the ultra filtration module is stored in one of the digestate storage tanks.

The thin fraction permeate which passes through the ultra filtration module contains dissolved solids with the suspended solids being removed during the ultrafiltration process.

Reverse Osmosis

In order to remove dissolved solids, Reverse Osmosis is required. Spiral wound reverse osmosis membranes are installed on a 3-stage treatment system; this ensures that there can be no breakthrough of nutrients, bacteria or ions as the material undergoes reverse osmosis. The membranes within the reverse osmosis module are 0.2 micron ensuring any dissolved solid material containing nutrients is recovered from the liquid.

Due to the small pore size only water molecules can pass through. The water permeate produced from the reverse osmosis unit is pure water free from bacteria, salts, and nutrients. The filtrate collected during the process contains high concentrations of nutrients. The nutrient rich digestate concentrate is pumped to the digestate storage tank and mixed with the concentrate obtained from the ultrafiltration unit. This mixing of concentrate ensures a pumpable, homogenous, nutrient rich, high quality biobased fertiliser is produced.

Recovery of Clean Water

The Reverse Osmosis (RO) system will maintain a steady maximum outflow volume of 10m^3 per hour. Following the RO stage, the purified water generated by the process will be stored in a balance tank before being reused onsite for cleaning activities and returned to the process as a feeding liquid.

Please refer to **Figure 2.11** for Digestate treatment process flow.

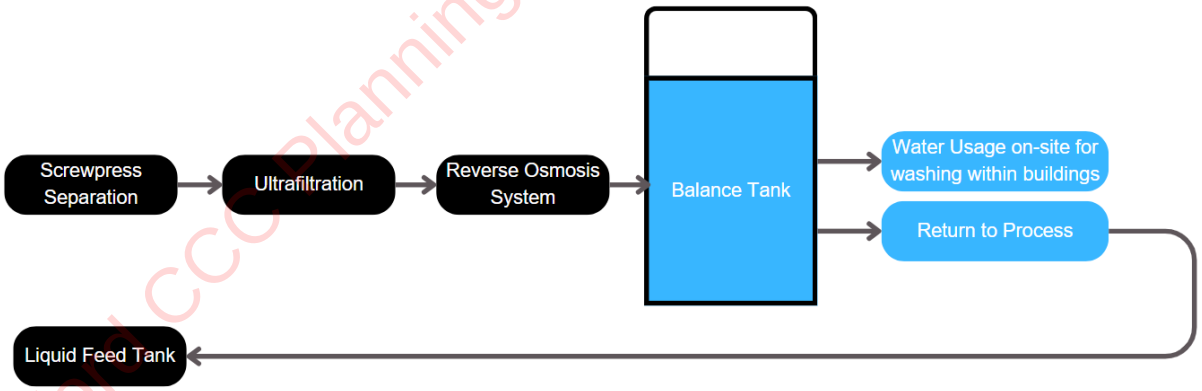


Figure 2.11:Digestate Treatment Process

The Digestate Treatment process includes **items 62, 63, 64** as shown on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200.**

2.2.14 Digestate Storage

Digestate Liquid Concentrate Storage

The site possesses a total storage capacity of 7,832m^3 (2no. Digestate Storage Tanks of 6,032m^3 and 1,800m^3 volume capacity) for digestate liquid concentrate. It is projected that *ca*. 17,000m^3 of digestate liquid concentrate will be produced annually after complete digestate separation and treatment.

With onsite storage capacity amounting to 7,832m^3, there is sufficient storage to accommodate volume for up to 24 weeks, surpassing the maximum requirement of 16 weeks set down by the Department of Agriculture, Food & Marine (DAFM).

Digestate Fibre Storage

Solid digestate fibre will be housed in the dedicated Digestate Storage Building. The building is vented to the Odour Treatment System which will recover and treat all odours arising from within. With no land spreading permitted during the closed period, the storage building possesses adequate capacity to store solid digestate for over 16 weeks.

The Digestate Storage is shown as **item 63** and **65** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200**.

2.2.15 Digestate Quality and Volume

Digestate produced will meet the quality and end-of-waste requirements of an agreed quality standard, such as Article 28 End of Waste, PAS110 or standard agreed with the regulator and will comply with DAFM transformation parameters and testing requirements as per the CN 11: Approval and Operation of Biogas Plants Transforming Animal By-Products and Derived Products in Ireland (DAFM, 2014).

Digestate Liquid and Digestate Fibre will be classified as a bio-based fertiliser for use on agricultural lands as a direct replacement for chemical/mineral fertilisers. Digestate liquid and fibre will, on the whole, be returned to lands associated with feedstock supplies of crop and/or slurry, thereby promoting a local circular bioeconomy. Digestate receivers will manage the storage and application of bio-based fertiliser on their lands and will be subject to controls set out in S.I. No. 113 of 2022 European Union (Good Agricultural Practice for Protection of Waters) Regulations 2022.

The treatment process recovers 75% of the liquid digestate concentrate volume as clean water with the remaining concentrate being stored in the Digestate Storage tank.

With an annual processing capacity of 90,000 tonnes of feedstock, approximately 78,000 tonnes of whole digestate are expected to be generated following the anaerobic breakdown for energy recovery. Approximately 17,000 tonnes of liquid digestate concentrate (biobased fertiliser) is projected to be produced annually after separation and treatment.

At full capacity the process is projected to produce a total of *ca*. 78,000 tonnes per annum of pasteurised whole digestate of *ca*. 10-12% Dry Matter (DM) content. Following the screw press separation process *ca*. 8,000 tonnes of solid Digestate Fibre of typically 29% DM content will be recovered. The remaining liquid digestate will be treated within the Digestate Treatment Unit, producing 53,000 tonnes of recovered clean water and 17,000 tonnes of nutrient rich

liquid digestate concentrate to be stored in the Digestate Storage Tank prior to offtake and delivery to DAFM registered end users.

At full capacity the total digestate (fibre and liquid) tonnages for transportation off-site as biobased fertiliser to local receivers are summarised below:

- Digestate Fibre - 8,000 tonnes
- Digestate Liquid Concentrate - 17,000 tonnes

Post-pasteurisation the digestate will meet the standard of an EU fertilising product under Regulation (EC) No 2019/1009 under the criteria outlined for Product Function Category (PFC) 3 B: Inorganic Soil Improver. The operator will complete the application process for End of Waste status upon grant of permission and commencement of operations.

2.2.16 Biomethane Boiler

The proposal includes 1No. 500kW containerised biomethane boiler, which will provide emergency backup heat utilising biomethane generated on site to produce heat for the digestion process.

The 1No. Biomethane Boiler is shown as **item 118** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200.**

2.2.17 Fuel Storage

1 no. 1,000 litre above ground fuel tank will be located within a bunded area on site and used for refueling on site plant and equipment.

This Fuel Storage is shown as **item 116** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200**.

2.2.18 CHP Unit

The Proposed Development includes a 1.2MWe capacity containerised CHP unit. Biomethane or imported natural gas will be utilised to generate electricity to power the site parasitic load, and to supply heat for the primary and secondary digester tanks, pasteurisation, biogas upgrading and CO_2 liquefaction processes.

The CHP unit is shown as **item 109** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200**.

2.2.19 Biogas Upgrading

Biogas upgrading removes trace impurities in the biogas stream. The primary goal is to separate carbon dioxide (CO_2) from methane (CH_4) to produce renewable biomethane and CO_2. The proposed Biogas Upgrading Unit will recover over 99.9% of the biomethane present in untreated biogas by separating CO_2 from the biogas through the following process.

Initially, biogas is directed through a biological desulphurisation unit where specialised bacteria work to reduce the concentration of hydrogen sulphide present within the biogas. Following this step, the biogas is filtered through a series of activated carbon filters. This filtration process aims to eliminate any remaining hydrogen sulphide or trace volatile organic compounds (VOCs)

generated during the breakdown of organic material in the anaerobic digestion process. Subsequently, the biogas proceeds through a biogas upgrading module, featuring a selective permeable membrane. Here, carbon dioxide passes through the membrane while methane gas is retained, resulting in an upgraded biogas known as biomethane. Notably, the biomethane attains a molecular composition equivalent to natural gas.

The Biogas Upgrading process includes Hydrogen Sulphide (H_2S) Washing Tower (**item 107**) Biogas Treatment Skid (**item 108)** Biogas Compression Module **(item 110)** and Biogas Upgrading Module **(item 111)** as shown on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200**.

Post treatment, the biomethane is injected into the local natural gas grid via the onsite Grid Injection Unit (GIU).

2.2.20 Grid Injection Unit (GIU)

Biomethane will be supplied to the existing gas network via the on-site Grid Injection Unit (GIU) and a pipeline connecting the site to the existing medium pressure distribution gas pipeline located ca. 2.5km north from the site at Carrickbeg, Carrick-on-Suir, Co. Tipperary. The GIU and pipeline will be owned and operated by Gas Networks Ireland.

The GIU comprises equipment which will ensure that the biomethane is compliant with all necessary standards and regulations before it enters the local gas network. The unit performs the following key tasks:

- Gas pressure reduction and control: so that the gas pressure is always correct to match the medium pressure gas network.
- Gas analysis for compliance monitoring: the gas is tested for contaminants
- Metering: the volume of gas needs to be measured and recorded
- Flow Weighted Average Calorific Value: the energy content of the gas being injected into the grid needs to be measured and recorded. The calorific value must match the value stipulated by the local gas distributor.
- Propanation: Where there are any shortfalls in the calorific value of biomethane, propane can be added from the on-site propane storage to match the calorific value required.

The Grid Injection Unit (GIU) is shown as **item 114** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200**.

2.2.21 CO_2 Liquefaction

By extending the Biogas Upgrading Unit with a CO_2 Liquefaction system, the gaseous CO_2 that is produced during the biogas upgrading process can be captured and liquefied.

The CO_2 which passes through the membranes in the biogas upgrading unit is further treated using activated carbon filters. Residual compounds which may have passed through the membrane of the biogas upgrading unit are removed. The clean carbon dioxide is then cooled, compressed, and dried into liquid form. The liquid is then stored in the carbon dioxide storage tanks prior to being transported offsite.

By utilising this process, the biogenic CO_2 from biomethane production which would have been emitted to the atmosphere is now captured, purified, and reused, thereby creating a circular economy.

The CO_2 Liquefaction process incorporates CO_2 Tanks (**item 101**), CO_2 Loading Pumps (**item 102**), CO_2 Auxiliary equipment (**item 103**), Discovery & CO_2 Liquefaction (**item 104**), CO_2 Compressor (**item 105**) and CO_2 Pre-Treatment Skid (**item 106**) and are shown on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200.**

2.2.22 Biogas Flare

An enclosed biogas flare is proposed for installation on the site, serving as an additional safety measure. The flare will only operate under distinct scenarios to ensure safety and compliance.

The biogas flare serves as a safety device in case the biomethane upgrading unit requires unscheduled maintenance. This flare is activated only in the unlikely event of when there is no outlet (i.e. the biogas upgrading unit and CHP) available for the produced biogas.

The flare is controlled and operated by the Supervisory Control and Data Acquisition (SCADA) system. An enclosed flare, characterised by the concealed flame and quiet operation below 65dB, ensure discreet and efficient operation during use.

The Biogas Flare is shown as **item 112** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200.**

2.2.23 Supervisory Control and Data Acquisition system

A supervisory control and data acquisition (SCADA) system will be installed for ease of operation and monitoring of plant processes. This system comprises hardware and software components to monitor and control industrial processes within the site. SCADA will be used to monitor and control the anaerobic digestion process, biogas upgrade, grid injection and associated plant and emissions control devices.

2.2.24 Office

The Site includes a two-storey Office Building incorporating an office area, meeting room welfare facilities, storeroom, first aid facility, communications, and control room.

The Office is shown as **item 3** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200**.

2.2.25 Water Supply

The water supply for the Proposed Development is organised into three categories: Fire Water, Grey Water, and Potable Water.

- Fire Water: This supply is sourced from roof drain runoff, which is conveyed through underground piping and stored in an underground tank.
- Grey Water: This is produced from rainwater harvesting and the reverse osmosis process within the facility and will be used for toilet flushing.
- Potable Water: Clean water for drinking and cleaning will be delivered to the site.

During construction, the existing piped water source for the livestock will be utilised, and potable water will be supplied for drinking and cleaning purposes.

2.2.26 Surface Water Management

The Proposed Development will comprise three separate drainage networks:

- Run-off from the buildings and yards in the facility will be collected in a sealed pipe network which will discharge to the stream;
- Rain falling on the bunded area will be collected in a sperate sealed drainage network and discharged to a sump, from which it will be pumped to the surface water drainage system for the remaining areas of the facility.
- Run-off from the access road and from lands uphill of the road will be collected in filter drains; these will allow run-off to discharge to ground insofar as the permeability of the subsoils allows. Not all run-off will infiltrate to ground during intense rainfall events and so this network will also discharge to the surface water drainage system for the remaining areas of the facility.

There are two existing small watercourses that require culverts under the access road to allow surface water to maintain its natural drainage course. Please refer to Drawing Ref: 24052-DR-0502 for the locations of the culverts. Culverts are to be sized and designed with final construction documents.

A model for the surface water drainage system was designed using AutoDesk Infodrainage. Details of this model are provided in **Technical Note Ref: 24052-TN-SUDS - Appendix B**. The results of design calculations for the critical 1% AEP rainfall events are provided in **Technical Note Ref: 24052-TN-SUDS - Appendix C**.

SUDs Regime - Quantity

Discharge Rate

Subsoils are unsuited to infiltration of all surface water run-off and so it will be necessary to discharge surface water run-off to an outfall.

The rate of discharge to the stream will be restricted to a maximum permissible rate of 17.8 lit/sec. This rate shall be achieved through attenuation in the Attenuation Pond and a variable head orifice in the outlet structure/manhole of the pond. This rate is calculated in accordance with criteria defined in the Greater Dublin Strategic Drainage Study ['GDSDS'] to ensure the Proposed Development will not affect the flow / flood regimes in the receiving environment.

Storage of Attenuated Surface Water

The restriction on discharge will attenuate surface water run-off within the Site when the run-off from the Proposed Development exceeds the discharge rate.

This attenuated water will be stored temporarily in an Attenuation Pond located in a grassed landscaped area close to the receiving stream. Details of this Attenuation Pond are provided on the reference drawings.

The Attenuation Pond is shown as **item 11** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200.**

The Surface Water Management strategy and civil design measures are detailed in **Technical Note Ref: 24052-TN-SUDS** and Drawings which accompany the application.

SUDS Regime – Quality

Surface water run-off will be treated by the various measures described in Table 2.5.

Table 2.5: Surface Water Treatment Measures

Stage	Treatment Measure
1	Sumps in gullies and catchpits collect silts in run-off from roads
2	Where feasible, run-off will discharge to filter drains. The filter material will treat run-off before its entry to pipes
3	Class 1 discharge bypass separator treats surface water for hydrocarbons run-off before its discharge to the attenuation pond
4	All surface water run-off will discharge to the attenuation pond. The floor of the basin will be shaped to allow for the retention of silts in the pond
5	Regular inspection and maintenance of all treatment measures to remove accumulated silts and disposed of to an appropriately licensed landfill

2.2.27 Foul Water Management

The Proposed Development will have 5 workers on site each day with normal loadings of 30l/day and BOD of 20g/day. The wastewater from the toilet and canteen will be treated using a proprietary system as recommended in the Site Suitability Assessment. The proposed system is a tertiary treatment system and percolation area as shown on **Drawing Ref: 24052-DR-0501**.

Testing and assessment have been carried in accordance with the requirements of EPA Code of Practice Wastewater Treatment Manuals Treatment Systems for Single Houses (p.e.< 10).

2.2.28 Bunding

The bund is designed in accordance with IPC Guidance on Storage and Transfer of Materials for Scheduled Activities (EPA, 2004). The digestion tank area will be bunded in its entirety to provide sufficient containment volume in the unlikely event of a leak at the facility.

The bund will be impermeable and provide the required storage volume i.e., a minimum of 110% of the largest single tank volume (110% of 6,032 m^3 = 6,636m^3). The bund has been designed to accommodate >6,636m^3 in the unlikely event of a failure of the storage tanks.

Maintenance vehicle access to the bund will be provided via 2no. ramps.

The Bunding is shown as **items 08** and **09** on Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200**.

2.2.29 Access Road

The Proposed Development will be accessed via Scrouty Road and a new access. The access road will be a single lane carriageway of 4.0m width, increasing to 6.0m to provide 3no. passing bays.

The Access Road is shown on Drawing **Ref. 24052-DR-0102**.

2.2.30 Boundary Treatment

The site boundary will be enclosed by a mesh panel perimeter fencing system *ca*. 1.8m high with secured mesh panel entrance and exit. The Perimeter Fencing as **item 07** on Drawing **Ref. 231926-ORS-ZZ-00-DR-AR-200**.

Please refer to Landscape Plan (**Ref: 24/NRG/ORS/Rt/M/001**) which accompanies the application. The landscape strategy offers short to long term buffering, sustainability and biodiversity at its core and is specifically adapted to assist in integrating the Proposed Development into its surrounds. The buffer planting aims to increase value for wildlife and is pollinator friendly. The primary objective being to buffer visual receptors of the Proposed Development.

Sightline requirements necessitate removal of a section of existing hedgerow along a section of Scrouty Road (**Drawing Ref: 24052-DR-0103**). Landscaping proposals include replacement and enhancement of the native hedgerow and tree line. The outer edge of the planting adjacent to roadway will consist of a gentle undulation of 500mm maximum height planted with a low growing wildflower species mix in order to echo curve of previous hedge line.

2.2.31 Electricity Substation

The Proposed Development will include an ESB Networks substation. The substation will be designed and constructed in accordance with published ESB standard details and subject to ESB certification. A transformer is incorporated in the substation area to convert imported high voltage electricity to low voltage for use on site.

Under normal operation the Proposed Development will be powered by the on-site CHP unit and Solar PV, with power supply from the grid provided only as a backup.

The Electricity Substation is shown as **item 05** on Site Layout Drawing Ref. **231926-ORS-ZZ-00-DR-AR-200**.

2.2.32 Solar PV

Solar photovoltaic (PV) modules are included upon the roof structures of the Reception Hall and Solid Digestate Storage buildings.

2.2.33 Lightning Protection System

An independent lightning consultant was engaged by the applicant to design a level 2 Lightning Protection System for the site. The Lightning Protection System is designed in accordance with BSEN60079 & BSEN 1127. The system is designed to provide a protective virtual dome over the site. The purpose of the protective dome is to ensure no structures or tanks are within any potential lightning strike path. Lightning finials are strategically positioned around the site to ensure all areas of the site are protected from a potential lightning strike. The finial positioning

is determined by detailed 3D site modelling which was undertaken as part of the lightning protection design.

2.2.34 Site Security

Entrance to the site will include a locked gate, controlled entrance barrier and CCTV monitoring system.

2.2.35 Operating Hours

The facility will operate 24 hours per day, 7 days a week, as Anaerobic Digestion is a continuous biological process. However, feedstock will only be accepted between the hours of 0700 and 1900 Monday to Friday, and 0700 to 1600 on Saturday. There will be no deliveries on Sunday and on Bank Holidays.

2.3 Licensing Requirements

2.3.1 Environmental Protection Agency (EPA)

The EPA were consulted during the design phase of the Proposed Development, to verify waste authorisation requirements as defined by the classes of waste activity listed in the Third Schedule of the Waste Management (Facility Permit and Registration) Regulations, 2007 (S.I. No. 821 of 2007), as amended.

Having regard to current law and practice, the Proposed Development will require an application for an Industrial Emissions (IE) licence to the EPA in accordance with Class 11.4 (b) of the First Schedule of the EPA Act 1992 as amended, outlined in **Table 2.5** below:

Table 2.5: Class 11.4 of First Schedule to the EPA Act 1992 as amended

11.4 (a) Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day involving one or more of the following activities (other than activities to which the Urban Wastewater Treatment Regulations 2001 (S.I. 254 of 2001) apply):

1. *biological treatment;*
2. *physico-chemical treatment;*
3. *pre-treatment of waste for incineration or co-incineration;*
4. *treatment of slags and ashes;*
5. *treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components.*

(b) Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities, (other than activities to which the Urban Wastewater Treatment Regulations 2001 (S.I. No. 254 of 2001) apply):

1. *biological treatment;*
2. *pre-treatment of waste for incineration or co-incineration;*
3. *treatment of slags and ashes;*
4. *treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components.*

(c) Notwithstanding clause (b), when the only waste treatment activity carried out is anaerobic digestion, the capacity threshold for that activity shall be 100 tonnes per day.

The IE licence will set conditions under which the following will be controlled:

- Emission Limit Values for emissions to air and stormwater;
- Monitoring requirements for emissions;

- Resource use and energy efficiency;
- Waste management control documentation;
- Waste acceptance procedures and records;
- Storage and transfer of substances;
- Changes to operations and the physical fabric of the facility;
- Facility management including the requirement for an environmental management system (EMS);
- Accident prevention and emergency response including fire water retention; and,
- Operational controls.

An Environmental Management System (EMS) will be put in place for the facility, as will be required by the IE Licence. The operator shall develop the EMS in accordance with ISO14001:2015, applying for accreditation when operational. This EMS will include but not be limited to the following:

- Measures to comply with the IE licence and other relevant environmental legislation;
- Waste Acceptance Procedures;
- Standard Operating Procedures;
- Measures to comply with the corporate sustainability goals (e.g., reducing water and energy consumption); and
- Accident prevention and emergency response procedures

2.3.2 Department of Agriculture, Food and Marine (DAFM)

The Anaerobic Digestion Facility will be a 'Type 1' plant under the European Union (Animal By-Products (ABP)) Regulations (S.I. No. 187 of 2014).

The facility will process Category 2 animal by-products, specifically farmyard manures i.e., cattle slurry, pig slurry and poultry manure. Approval will be required from the Department of Agriculture, Food, and the Marine (DAFM) in accordance with Article 24(a) of Regulation (EC) No. 1069/2010, for the acceptance and/or treatment of animal by-products.

DAFM were consulted during the design phase and the Proposed Development has been designed in accordance with DAFM guidance *CN11: Conditions for approval and operation of biogas plants transforming animal by-products and derived products in Ireland*. The application process for approval and operation of the proposed facility by the DAFM occurs in three stages as follows;

1. Application for approval in principle.
2. Application for conditional approval to operate which allows an operating period of three months to test and demonstrate ABP compliance. This stage commences following the construction and handover of the facility.
3. Full approval.

This application process will commence upon receipt of planning consent.

2.3.3 SEVESO III Directive / Control of Major Accident Hazards (COMAH) Regulations

The Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S. L No. 209 of 2015) transposes Directive 2012/18/EU of the European

ORS

Parliament and of the Council of 4 July 2012 on the control of major accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC ("the SEVESO III Directive").

The purpose of the COMAH Regulations is to lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents when they occur, with the overall objective of providing a high level of protection in a consistent and effective manner.

The COMAH Regulations place an obligation on operators of establishments that store, handle, or process dangerous substances above certain thresholds to take all necessary measures to prevent major accidents and to limit the consequences for human health and the environment. Under the Regulations, an establishment may qualify as upper tier or lower tier, depending on the inventory of dangerous substances; sites that store, handle or process dangerous substances below a certain threshold do not qualify as establishments under the Regulations.

SEVESO/COMAH Assessment of the Proposed Development

Methane, the combustible component of biogas is classified as a P2 flammable gas in accordance with Regulation (EC) No. 1272/2008 on the classification, labelling and packaging of substances and mixtures.

Under COMAH, P2 Flammable gases are subject to a threshold quantity of 10 tonnes meaning that any biogas facility storing less than 10 tonnes of methane will fall outside of the COMAH Regulations. At full operation, the proposed facility will store less than 3.72 tonnes of flammable gas, and is, therefore not a COMAH regulated site.