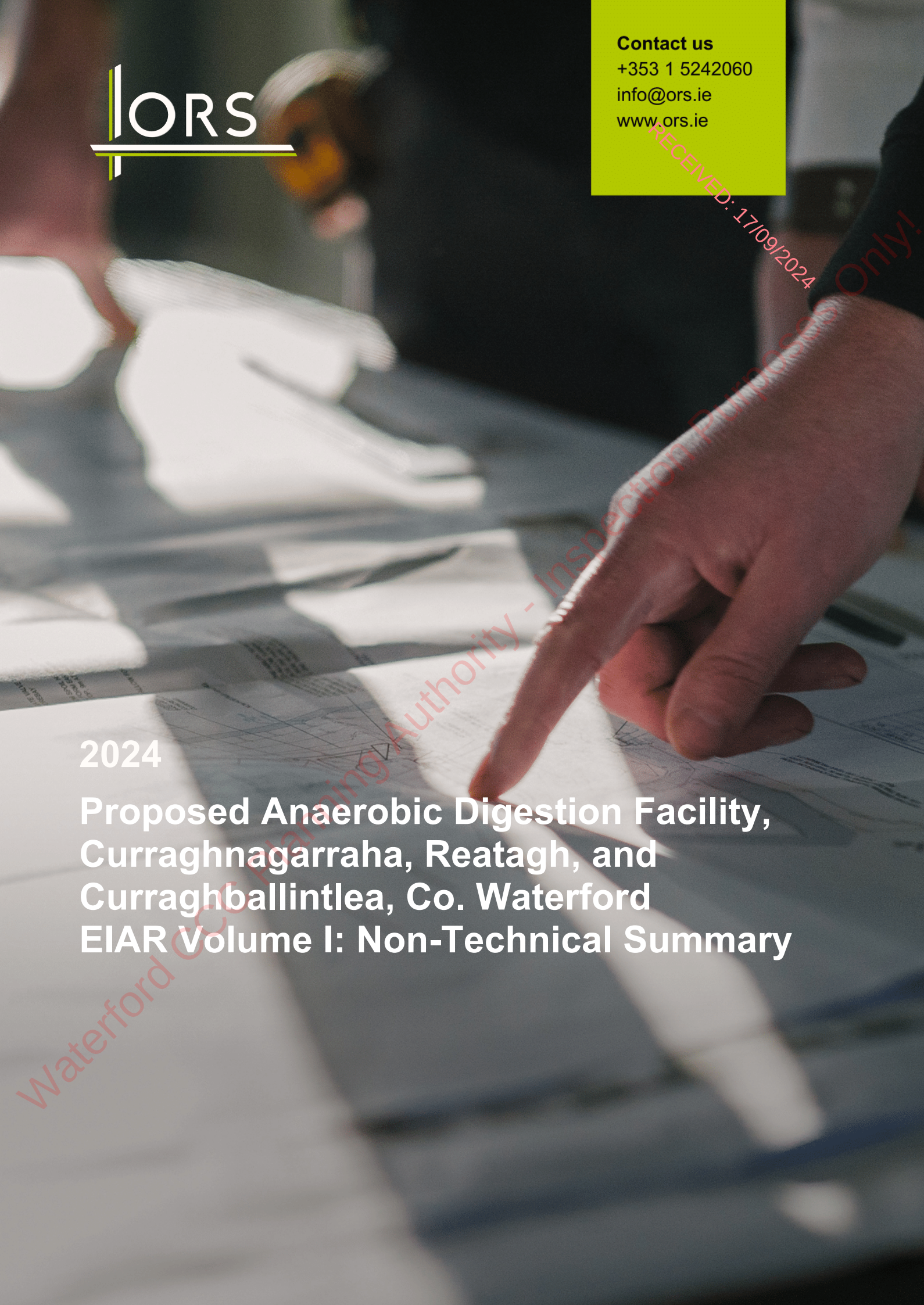

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Proposed Anaerobic Digestion Facility, Curraghnagarraha, Reatagh, and Curraghballintlea, Co. Waterford
EIAR Volume I: Non-Technical Summary

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EIAR Volume I: Non-Technical Summary

Document Control Sheet

Client:	**Mr. James Foran and Nephin Renewable Gas - Reatagh Limited**
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1 Introduction

1.1 Introduction

Mr. James Foran and Nephin Renewable Gas - Reatagh Limited (the Applicant) are pleased to submit this EIAR in support of a planning application for the construction and operation of an Anaerobic Digestion Facility at a site in the townlands Curraghnagarraha, Reatagh, and Curraghballintlea, Co. Waterford.

Occupying an area of circa 7.7 hectares, the development will accept and treat 90,000 tonnes per annum of locally sourced agricultural manures, slurries, food processing residues and crop-based feedstocks to produce grid quality biomethane (renewable natural gas) suitable for direct injection into the Gas Network Ireland (GNI) distribution network. The renewable natural gas (RNG) produced at the facility will be used as a direct replacement for conventional natural gas and in doing so contribute towards the Government's Climate Action Plan to develop 5.7TWh of indigenous biomethane production by 2030. In addition to RNG, the facility will produce a nutrient rich biobased fertiliser which can be used as a direct replacement for fossil fuel derived fertiliser. The facility will also be specified for the recovery of biogenic carbon dioxide (CO_2).

The proposed 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.

The application is accompanied by an Environmental Impact Assessment Report (EIAR) and a Natura Impact Statement (NIS).

A detailed description of the Proposed Development is provided in **Chapter 2 – Project Description** of Volume I: EIAR.

1.2 The Applicant

Mr. James Foran and Nephin Renewable Gas - Reatagh Limited

Mr. James Foran is a local landowner and progressive farmer who owns and manages a pig rearing facility. This facility is located ca. 200m from the Proposed Development.

Nephin Renewable Gas is a newly-established renewable energy company, located in Tipperary Town, Co. Tipperary. Nephin Renewable Gas is part of Nephin Energy, Ireland's largest gas production company. Nephin Energy produces indigenous natural gas and currently provides approximately 25% of the daily gas demand in Ireland. Nephin Renewable Gas is committed to making a meaningful contribution to the decarbonisation of Ireland's gas supply by developing *ca*. 1.2TWh of indigenous Irish biomethane, creating offtake opportunities of significant scale for large energy users.

Nephin Renewable Gas aims to become Ireland's largest producer of indigenous biomethane, building on the Group's existing position as Ireland's largest producer of domestic natural gas

1.3 Site Location

The Proposed Development site (herein referred to as 'the site') is located in the townlands of Curraghnagarraha and Reatagh 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 1**.

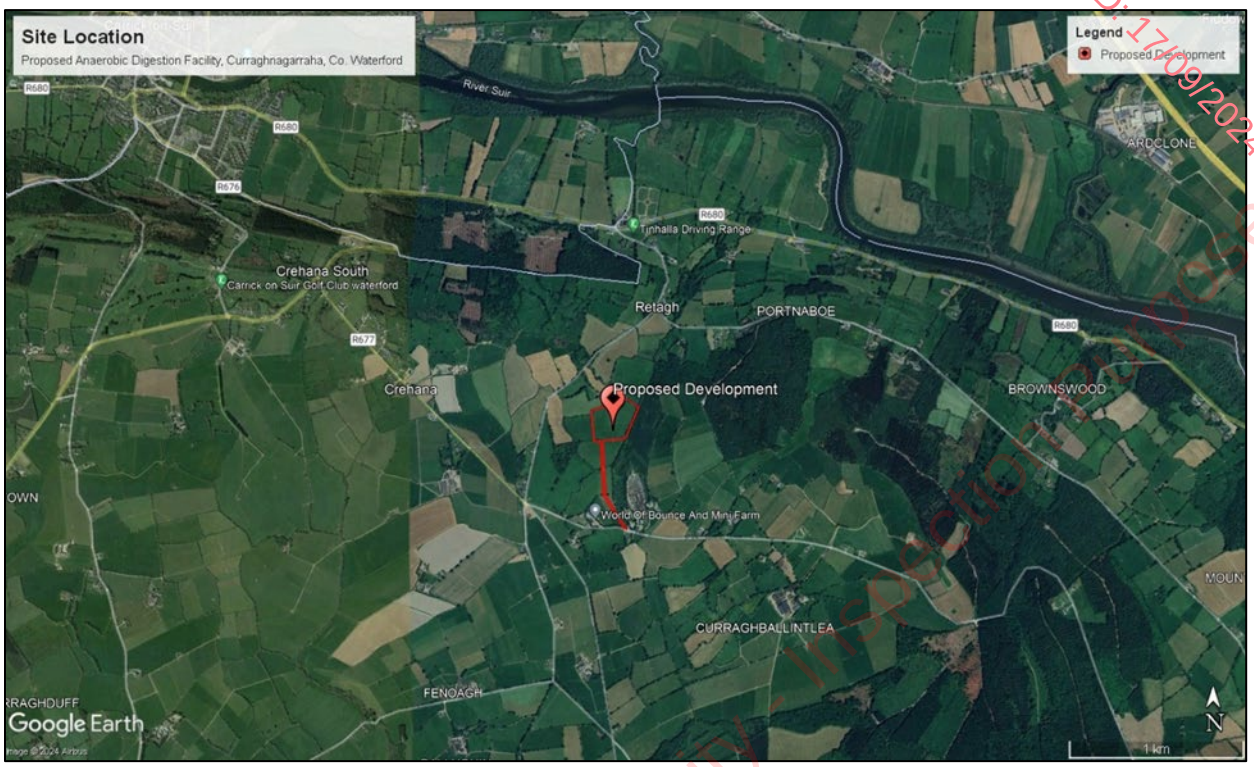


Figure 1: Site Location

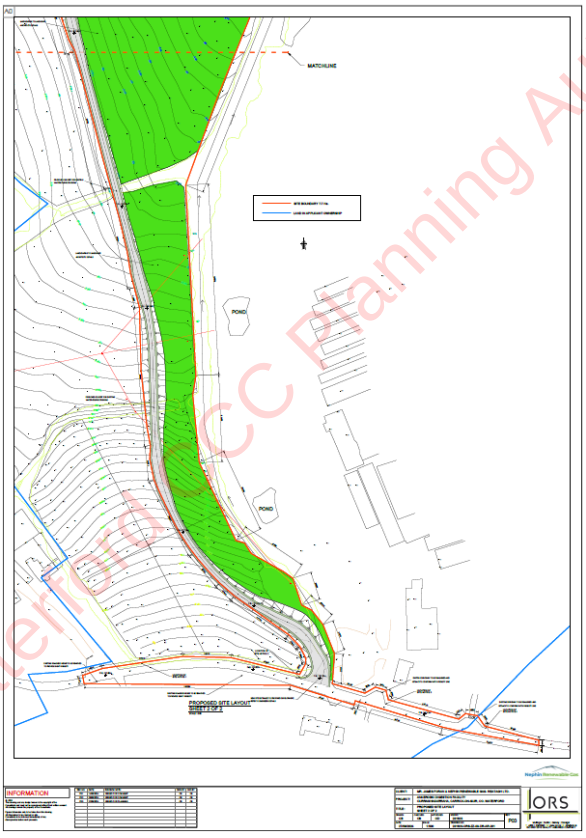
The total site area measures ca. 7.7ha. The site is currently used as agricultural pastureland and bounded to the north, south, east, and west by further agricultural pastureland. An operational piggery is located ca. 200m to the south.

The site is ca. 500m north of the Old Scrouty Road and ca. 500m northeast of the Old 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 Old Scrouty Road and a new access road leading north.

1.4 Site Layout

The site layout is displayed in **Figure 2.** Detailed site layout and structural drawings are included in **Volume IV: Drawings**.

Figure 2: Proposed Site Layout Plan



1.5 3D Image of the Site Layout

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

Figure 3: 3D Image of Site Layout

2 Process and Design Description

2.1 Anaerobic Digestion Process

Anaerobic Digestion (AD) is a natural biological decomposition process which takes place in an oxygen-free environment, where micro-organisms break down organic matter to produce biogas.

2.2 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).

2.3 Feedstock

The Proposed Development has been designed to accept and treat up to 90,000 tonnes per year of predominantly locally sourced agricultural manures, slurries, food processing residues and crop-based feedstocks.

2.4 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, Pasteurisation Tasks are all connected to the Odour Treatment System.

2.5 Primary and Secondary Digestion Tanks

The Anaerobic Digestion process takes place in a series of 2no. Primary and 1no. Secondary Anaerobic Digestion Tanks. The Digestion Tanks are equipped with mechanical mixers featuring a series of paddles with externally mounted drive units and are equipped with a double membrane gas collection system.

2.6 Digestate Treatment

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.

2.7 Biogas Upgrading

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

2.8 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 comprises equipment which will ensure that the biomethane is compliant with all necessary standards and regulations before it enters the local gas network.

2.9 CO2 Liquefaction

By extending the Biogas Upgrading Unit with a CO_2 Liquefaction system, the gaseous CO_2 is processed into a liquid CO2 in a liquefaction system.

2.10 Licensing Requirements

Environmental Protection Agency (EPA)

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.

Department of Agriculture, Food and Marine (DAFM)

The application process for approval and operation of the Proposed Development by the DAFM will commence upon receipt of planning consent.

3 Consideration of Alternatives

A detailed site selection process was undertaken by the Applicant, with reference to the following criteria:

- Transport Network and Access
- Availability and proximity to Feedstock Supply
- Availability and proximity to Digestate Receivers
- Existing Land Use
- Landscape Sensitivity
- Ecological Designations
- Archaeological Designations
- Access to Gas Grid
- Access to Electricity Grid
- Proximity to Sensitive Receptors
- Available Land Size
- Land Availability
- Landscape and Visual Amenity
- Proximity to Suitable Water Course or Sewer
- Proximity to Drinking Water Source/Aquifer
- Topography
- Flood Risk

The applicant devised a scoring matrix based on each of the site-specific criteria outlined above. 4 no. alternative site locations within County Waterford were assessed under the above criteria, with the site at Curraghnagarraha, Reatagh, and Curraghballintlea, Co. Waterford scoring highest overall.

4 Planning and Policy

4.1 Introduction

This chapter of the EIAR examines the relevant waste management, energy, climate change and planning policy, and the legislative context at European, national, regional, and local levels with relevance to the Proposed Development. Further analysis of the consistency of the proposed development with the relevant national, regional, and local planning policy context is provided within the Planning Report prepared by John Spain Associates.

4.2 Application Site: Planning History

The site of the Proposed Development and adjacent lands were subject to previous planning permission under Waterford City and County Council Reg. Ref.: 10/222. The Council granted permission on the 30th of March 2011, subject to 21 no. conditions, for development comprising "*a Biogas Plant consisting of 2 no. digester tanks, geomembrane lined manure storage basin, fibre store, 3 no. feed tanks, reception building, reception bays, plant building, pasteurisation tank, weighbridge, and associated site works"*.

4.3 European Policy and Legislation

The Paris Agreement

Under the Paris Agreement (COP21), the EU has pledged to achieve climate neutrality by 2050. Reaching this objective will require a transformation of Europe's energy supply, society, and economy. The Proposed Development represents renewable energy development which will contribute to achieving this goal.

European Green Deal

The European Green Deal recognises that renewable and low-carbon gases, such as biomethane, will play a central role in achieving climate neutrality. The Green Deal notes that biogas and biomethane, in addition to green hydrogen, have the potential to displace fossil fuel gas.

EU Common Rules on Renewable Gasses

The Common Rules on Renewable Gasses seek to ensure that EU Member States take all necessary steps to assist in the wider use of sustainable biomethane, and to ensure that biomethane can be injected into and transported via the natural gas system.

Renewable Energy Directive

The current directive (2018/2001/EU, amended by Directive EU 2023/2413), or RED III sets a binding renewable energy target of at least 42.5% by 2030. It includes measures to facilitate renewable energy projects and strengthen bioenergy sustainability criteria. Under the amended Directive, member states must identify areas for the acceleration of renewables where projects will undergo a simplified and fast-track procedure.

REPowerEU Energy Plan

Introduced by the European Commission on the 18th May 2022, the Plan aims to accelerate the EU's clean energy transition and reduce dependency on Russian fossil fuels. It includes a Biomethane Action Plan to achieve 35 billion cubic meters of biomethane production by 2030

and recommends measures to facilitate renewable gas injection.

EU Strategy to Reduce Methane Emissions

Published in 2020, this strategy identifies the agricultural sector as a major contributor to methane emissions. It highlights the benefits of biogas from organic agricultural wastes, supports the development of the EU biogas market, and promotes sustainable farming practices.

Waste Management Legislation

The Waste Framework Directive (2008/98/EC, amended by Directive (EU) 2018/851) and the Landfill Directive (1999/31/EC) encourage the use of anaerobic digestion (AD) as a sustainable waste management method. The directives emphasise the diversion of waste from landfills and the separate collection of organic waste for biological treatment

4.4 National Planning, Climate, and Waste Policy and Legislation

Chapter 4 provides an overview and analysis of the following relevant pieces of national policy and legislation, as summarised below.

- **National Biomethane Strategy:** The National Biomethane Strategy was finalised and published in May 2024. The Strategy seeks to promote delivery of a biomethane industry at scale in Ireland, and sets out the significant benefits (both environmental and economic) that developments of this nature can realise. The Strategy also acknowledges the importance of biomthane production to ensure security of energy supply. It notes that without the development of biomethane production, Ireland is unlikely to meet its legally binding climate targets.

- **National Planning Framework:** The NPF supports low-carbon and energy-efficient initiatives in rural areas, aiming to strengthen rural towns through sustainable development and renewable energy projects.

- **The National Development Plan 2021-2030:** The National Development Plan provides further policy support for the transition to a climate neutral and climate reisiliant society, and the strengthening of the rural economy and communities. The proposed development delivers strongly on these objectives.

- **Climate Action Plan 2024:** The 2024 Climate Action Plan is the third annual Climate Action Plan, and provides direct policy support for biomethane development, noting a target of 5.7 terrawatt hours of biomethane by 2030, with one terawatt hour to be delivered by 2025. The proposals will contribute to meeting this ambitious target.

- **Climate Action and Low Carbon Development Act:** Section 15 of this piece of climate legislation requires that Planning Authorities and An Bord Pleanála carry out their functions, in as far as is practicable, with key climate action policies, including the relevant Climate Action Plan. Chapter 4 outlines the compliance of the development with those relevant policies.

- **Sectoral Emissions Ceilings:** The Sectoral Emissions Ceilings represent binding limits on the greenhouse gas emissions for various sectors of the economy, including agriculture and energy. The proposed renewable energy development will assist in reducing greenhouse gas emissions in these sectors.

- **Support Scheme for Renewable Heat:** This Support Scheme seeks to advance the generation of energy from renewable sources in the heat sector, including biomass boilers and anaerobic digestion heating systems.

- **White Paper: Ireland's Transition to a Low Carbon Energy Future 2015–2030:** The White Paper sets out a framework for policy actions of the Government from 2015-2020, it includes support for the further development of bioenergy. It recognises that anaerobic digestion projects can improve air quality and reduce odour emissions in rural areas, by diverting slurry from being spread on the land.

- **Biomethane Energy Report (Gas Networks Ireland):** While not strictly a policy document, this report published by GNI details the significant potential for biomethane development in the State, noting the ability of such development to improve security of supply, boost rural employment, and rapidly reduce climate emissions across hard to abate sectors of the economy.

- **Energy Security in Ireland to 2030:** This policy was published by Government following the invasion of Ukraine by Russia and the resulting energy crisis. The new National Biomethane Strategy is recognised as an important move towards improved energy security within this policy document.

- **National Policy Framework on Alternative Fuels Infrastructure for Transport in Ireland:** The Policy Framework highlights the importance of alternative fuels in decarbonising the transport sector, including via the incorporation of biomethane as a transport fuel.

- **Ag Climatise – National Climate & Air Roadmap for the Agriculture Sector:** This Roadmap includes an action for the promotion of anaerobic digestion for the agriculture sector.

- **National Energy and Climate Plan (NECP) 2021-2030:** This Plan included further policy support for biomethane development, and included a target for 1.6 terawatt hours of biomethane procuction, which has since been revised upward under the 2023 and 2024 Climate Action Plans.

- **The Planning and Development Act 2000 (as amended):** The Planning and Development Act includes legislative recognition of the need to respond to climate change and to promote renewable energy development. It also provides the overall legislative framework for the Irish Planning System and Environmental Impact Assessment.

- **Whole of Government Circular Economy Strategy 2022 – 2023:** This Strategy directly targets the increased recycling of bio-waste and further renewable gas development, to enhance the circularity and sustainanbility of agriculture in the state.

- **A Waste Action Plan for a Circular Economy Strategy 2020-2025:** This Waste Action Plan recognises that anaerobic digestion plays a role in providing opportunities for regional development with benefits for local communities while producing renewable energy domestically.

- **National Policy Statement on the Bioeconomy (2018):** This Policy Statement notes that Ireland has a strong competitive advantage for the development of a more coherent and stronger bioeconomy.

- **Common Agricultural Policy (CAP) Strategic Plan 2023 – 2027:** The Common Agricultural Policy Strategic Plan provides support for farmers and contributes to improved sustainability in agriculture and agricultural practices.

- **European Union (Waste Directive) Regulations 2020:** This legislation regulates how waste compost and digestate are recycled into fertiliser products.

- **Environmental Protection Agency (Industrial Emissions) (Licensing) Regulations, 2013:** These Regulations introduce a class of licence known as an Industrial Emissions Licence. The proposed development will require an Industrial Emissions Licence from the EPA to operate.

- **Animal By-Product Regulations:** These Regulations set out requirements which must be met in order to build and operate a biomethane development, including in relation to design, feedstock, and equipment requirements.

4.5 Regional Planning Policy

The Regional Spatial and Economic Strategy for the Southern Region (RSES) supports renewable energy projects and highlights the importance of regional bio-economy initiatives and proposals to strengthen the rural economy. It encourages the sustainable management of waste and the development of new facilities to generate renewable energy.

4.6 Local Planning Policy

Waterford City and County Development Plan 2022-2028

The relevant policies and objectives of the County Development Plan include the following:

- The Subject Site is not zoned under the City and County Development Plan (CDP) due to its rural locality, or subject to any designations for protected views or routes.
- The Proposed Development is located within the 'Farmed Lowlands' ('Rathgormuck Lowlands') landscape character area. The subject site is located within a 'Low Sensitive' landscape area of primarily pastureland, according to Appendix 8 of the CDP.
- The CDP promotes sustainable rural development, including bio-energy projects.
- Section 6.6 'Renewable Energy' of the CDP states that "*there is a significant potential to use renewable energy (solar, biomass, anaerobic digestion, hydro, wave and on/offshore wind), including through micro-generation (which typically assist in lowering energy demand), to achieve climate change emission reduction targets. Low carbon technologies present economic opportunities for various sectors, and green technology development is emerging as a major field of innovation and growth".*
- The CDP contains policies and objectives which seek to preserve the biodiversity of the county and protect European Sites within the county.

Waterford Renewable Energy Strategy (Development Plan: Volume 3, Appendix 7)

- The Renewable Energy Strategy forms part of the County Development Plan and aims to promote new renewable energy projects in the county.

- Bioenergy and anaerobic digestion are supported by the Renewable Energy Strategy.

Waterford City and Council Climate Action Plan 2024-2029

- The Waterford City and Council Climate Action Plan ('WCCCAP' hereafter) was adopted in March 2024.
- The vision of this plan is *"to be a climate resilient and low carbon organisation that inspires, leads, and facilitates ambitious and just climate across the county and city".*
- Under Strategic Goal 5: Sustainability and Resource Management, it is an objective *"to ensure waste generated is reduced, removed and reused through the implementation of effective waste management policies and procedures and to shift away from a "take-make-waste" model towards a more sustainable and circular economy to create long-term environmental, economic and social benefits".* To support this objective, Action 5.8 states that the Council's green waste will be used in the bioeconomy to produce bioenergy.

5 Biodiversity

This chapter provides an Ecological Impact Assessment (EcIA) which addresses the potential ecological impacts that may occur in the future on the terrestrial, avian and aquatic ecology of a Proposed Development at Curraghnagarraha, Reatagh, and Curraghballintlea, Co. Waterford and its surrounding environs.

5.1 Methodology

The assessment followed CIEEM, EPA, and NRA guidelines, evaluating ecological features and potential impacts, which were classified as positive, negative, or neutral, with mitigation measures proposed.

5.2 Designated Sites

Natura 2000 Sites

The proposed site is not within or immediately adjacent to any designated sites.

Nationally Important Sites

The Proposed Development is not within or immediately adjacent to any nationally designated site, such as a Natural Heritage Area or a proposed Natural Heritage Area. Flora, Fauna, Aquatic Environment

Habitats within the Study Area

- The site does not lie within or adjacent to any designated nature conservation areas and is considered to have low local biodiversity value.
- The main habitat is improved agricultural grassland, dominated by rye and meadow grasses, with no wetland indicators present.
- Perimeter features include low-value hedgerows and stone walls, with species such as hawthorn, ash, elder, bramble, and ivy.

Overall, the biodiversity and ecology of this Proposed Development is of low value.

Flora

- The Proposed Development site consists of primarily low- biodiversity improved grassland, with high-value hedgerows, treelines, and a stream at its perimeter.
- No protected or invasive plant species were identified within the site.

Fauna

Protected Mammals

- Records indicate the presence of various protected mammals in the wider 10km area, including several bat species, Eurasian badger, European otter, Irish hare, and more.
- The otter is protected under Annex II of the European Habitats Directive.
- No evidence of these species was found within the proposed development site itself.

Bats

- The landscape suitability index for bats in the study area is moderately high (39.11).
- No buildings for bat roosts are within the site. However, there are mature trees suitable for bat roosts along the site boundaries.
- The landscape is considered to be of high local importance for bats due to a good network of hedgerows and treelines around the fields in the wider area.

Birds

- Limited bird activity was noted, with common species such as blackbird, robin, starling, and jackdaw observed.
- The site is of low importance for birds due to the lack of mature trees and hedgerows.

Amphibians, Reptiles, and Invertebrates

- No suitable breeding habitats for common frog or smooth newt are within the site.
- The site provides limited value to pollinating insects, though unmanaged verges and hedgerows offer some foraging habitats.

Aquatic Environment

Water Features and Quality

- The Tinhalla Stream flows south to north along the eastern permitter of the Proposed Development until it's confluence with the River Suit *ca.* 1.9k north.
- The EPA have classed the ecological status of the Tinhalla Stream and River Suir as moderate and poor, respectively.
- There will be no process water discharged from the proposed development.
- Groundwater in the area is currently considered good and not at risk.

5.3 Ecological Evaluation

5.3.1 Summary of the Value of the Site

The Proposed Development is within the Zone of Influence of three sites under the Natura 2000 network (SACs / SPAs).

The closet of these is the Lower River Suir SAC, which is 1.3km north-east of the site. The hydrological connectivity between these areas is 1.7km, via the Tinhalla Stream.

The Proposed Development is also within 15km of nine sites designated as Natural Heritage Areas (NHAs and pNHAs). The closest of these is Tibberaghny Marshes pNHA and this is 1.6km north-west of the site, on the northern shores of the River Suir.

Within the Proposed Development site itself the dominant habitats are improved agricultural grasslands, watercourses, hedgerows and treelines. The watercourses, treelines and hedgerows that occur along the perimeters of the site are important ecological features.

According to the NRA guidelines for assessing ecological impacts, the ecological features of the site are evaluated as follows:

- Improved Agricultural Grasslands and Fragmented Hedgerows: Rated as having no to low local importance due to limited biodiversity.
- Well Structured Hedgerows / Treelines: Rated as having local importance (higher value).
- Watercourses (Tinhalla Stream): Rated as having local importance (higher value).
- Lower River Suir (SAC Downstream of Discharge): Rated as international important. 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.

5.4 Impact Assessment

Impacts upon Designated Sites

- The site at Curraghnagarraha, Reatagh, and Curraghballintlea, Co. Waterford is 1.9km upstream of the Lower River Suir SAC and connectivity is provided by the Tinhalla Stream. In the absence of mitigation, it cannot be ruled out with certainty that significant effects upon these Natura 2000 sites will not arise.
- An NIS as required under Article 6 of the EU Habitats Directive has been submitted as part of this application. This NIS will allow the competent authority to undertake its statutory obligations with regards to Appropriate Assessment.
- The Proposed Development will not lead to the loss or fragmentation of protected habitats within any pNHA or NHA. However, three pNHAs occur along the River Suir downstream of its confluence with the Tinalla Stream, i.e., the Tibberaghny Marshes pNHA, Fiddown Island pNHA and Lower River Suir (Coolfin, Portlaw) pNHA. In the absence of mitigation measures, significant effects upon these pNHAs cannot be ruled out due to pollution of the Tinhalla Stream. The impacts are the same as those which were previously described in the preceding section on the Natura 2000 sites.

Impacts within the Site

Construction Phase

- Habitat Loss and Fragmentation: The dominant habitat within the Proposed Development site is Improved Agricultural Grassland. This habitat will be converted to Buildings and Artificial Surfaces. This habitat has limited ecological value and therefore its loss constitutes a negligible ecological impact.
- In order to achieve safe site lines at the entrance, ca. 114m of hedgerow boundary will be removed along the roadside. This is low quality hedgerow, consisting primarily of immature poplar trees. Its removal does not constitute a significant ecological impact. Landscape plans for the site have included for the replacement of this section of hedgerow with native species.
- Plans indicate that the remaining mature vegetation along the boundaries will be retained and this will mitigate against any impacts due to the direct loss of these ecological features. However, damage to these existing hedgerows and mature trees and a subsequent reduction in their lifespan may arise if any root compaction occurs due to works or storage of heavy vehicles or spoil in the root protection zone (RPA) of

these features. Any loss or damage to these features would have a negative impact upon the local biodiversity value.

The biomethane produced will be delivered to the grid via a new pipeline (which will be designed in detail, consented, and delivered by GNI) along Scrouty Road and the R680. This may result in the loss of hedgerows and grassy verges along the roadside.

Disturbance to Wildlife: Construction noise and activity may disturb local wildlife, including nesting birds.

Water Pollution: Construction could lead to sediment and pollutant runoff into the Tinhalla Stream, with potential impacts on Natura 2000 sites.

Operational Phase

Disturbance to Local Wildlife: Increased activity, noise, and lighting could disturb local wildlife. Mitigation will ensure minimal disruption, particularly for bats.

Pollution to Surface and Groundwater: Operational runoff may contain pollutants. Structural weaknesses in tanks could lead to groundwater contamination.

Flood Risk: The site is at low flood risk, but flood events could overwhelm drainage systems, leading to potential off-site contamination.

Cumulative Impacts: Other local developments could reduce habitat availability. However, the creation of new areas of biodiversity within the Proposed Development and the retention and protection of treelines, will provide local ecological corridors and networks that will reduce the overall cumulative impact of this development in the Ballinrobe area.

5.5 Mitigation Measures

In order to avoid any reductions in water quality in the area surrounding the site, a number of mitigation measures must be implemented and followed. These measures will protect the surface and ground water quality locally and will subsequently prevent any significant effects upon the Lower River Suir SAC.

The implementation of these site-specific mitigation measures will ensure the protection of Natura 2000 habitats and species, and the local non-designated ecological receptors. These mitigation measures, outlined in **Table NTS 5.1** below, are also included in the accompanying NIS report.

Table NTS 5.1: Mitigation Measures

Stage	Details
Pre-Construction and General Requirements	Site preparation and construction must be confined to the Proposed Development only and all mitigation measures must be adhered to.
	Contractors must be made aware of the ecological sensitivity and mitigation measures. This will be done prior to the commencement of any site works
Protection of Terrestrial Habitats and Features	Existing green infrastructure must be incorporated into the development. There must be no dumping or storage of construction waste or machinery in this zone during construction
	Removal of trees/shrubs should be outside the bird nesting season (March-Aaugust)
	The unnecessary clearance of vegetation should be avoided and only areas necessary for building works should be cleared.

Protection of Water Quality and Management of Pollutants	It is vital that there is no deterioration in water quality in the Tinhalla Stream, which is upstream of the Lower River Suir SAC. Efficient construction practices to minimise soil erosion and pollution must be implemented.
	Avoid works during heavy rainfall.
	Control of hydrocarbons on site with specific measures. All chemicals must be stored as per manufacturer's instructions.
	Best practice concrete / aggregate management measures must also be employed on site during construction.
	It is recommended that silt fences are installed along the buffer zones of all watercourses within the site. An interceptor trench will be required in front of this silt fence.
	The proposed access road requires crossing a small site drain. To minimize ecological disruption, use pre-cast open box culverts and remove only minimal vegetation. The Clerk of Works should oversee the installation..
Management of Construction Waste and Soil	All construction waste must be removed from site by a registered contractor to a registered site
	All topsoil generated from site works should only be stored within the Proposed Development until it is required for landscaping
Mitigation Measures during Operation	An Environmental Management System (EMS) accredited to ISO14001:2015 will be prepared and implemented by the operating company during the operational phase.
	The Proposed Development will operate under an Industrial Emissions Licence (IEL) issued by the Environmental Protection Agency (EPA).
	The licence will contain several conditions which the operator must remain in compliance with for the entire duration of the Anaerobic Digestion Facility's lifespan
Landscaping and Lighting	The treelines and hedgerows around the site are important ecological corridors. These features should be enhanced and maintained for the benefit of wildlife.
	The existing gappy hedges should be enhanced with some more native shrubs if possible
	The natural verges along the stonewall hedgerows should be managed as old hay meadows, cutting only in late summer.
	It is recommended that further actions that are outlined as part of the National Pollinator Plan should be implemented
	Nesting areas for solitary bees will be included and bee boxes for cavity-nesting bees will be created.
	Bat boxes will be installed around the Proposed Development
	The use of herbicides and rodenticides within the Proposed Development will be minimised and should be in accordance with relevant guidelines.
	There should be no lighting directed from the site towards mature vegetation or the Tinhalla Stream.
	Lighting shall be controlled to avoid light pollution of green areas and shall be targeted to areas of human activity and for priority security areas.
Use of the Biobased Fertilisers by Customer Farmers	In order to avoid any reductions in water quality within the catchment as a whole, all biobased fertilisers must be used in accordance with S.I. 113 of 2022 European Communities
	The spreading of the biobased fertiliser on the customer farms must be done in accordance with the specific Nutrient Management Plan for that farm

5.6 Residual Impacts

Construction Phase

A summary of the predicted effects associated with the construction phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual effects are summarised in **Table 5.7** in Chapter 5 of the EIAR – Main Report.

The overall impact anticipated by the construction phase of the project following the

implementation of suitable mitigation measures is considered to be ***neutral***, ***slight***, and ***temporary.***

Operational Phase

A summary of the predicted effects associated with the operational phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual effects are summarised in **Table 5.8.**

The overall impact anticipated by the operational phase of the project following the implementation of suitable mitigation measures is considered to be ***neutral***, ***slight***, and ***short-term*** to ***long-term.***

6 Population and Human Health

Chapter 6 of Volume 2 of the EIAR assesses the likely significant effects of the proposed development on Population and Human Health. The assessment methodology involves a thorough desktop study and fieldwork, utilizing guidelines from the EPA, European Commission, the Institute of Public Health, and the Institute of Environmental Management and Assessment (IEMA). The primary goal is to ensure that the development's effects on human health and welfare are comprehensively evaluated and mitigated.

6.1 Description of the Receiving Environment

Population & Employment

The health status of the population in the study area, as reported by the Central Statistics Office (CSO) in the 2022 Census, shows that 56.36% of the area self-reports their health as 'very good', which is a higher percentage than county and national trends, and considerably higher than the figure for the nearest town.

The study area has experienced population growth between the 2016 and 2022 censuses, with a growth rate that slightly exceeds the rates seen at county and State levels.

According to the Pobal HP Deprivation Index, the ED within which the Proposed Development is situated is marginally above average, indicating low population sensitivity.

here is a lower than average age dependency ratio, therefore a large proportion of the population is within working age range in the ED, thus considered as largely independent and judged to be not sensitive to change. The data shows that the study area has a lower percentage of persons with a disability than the county and national average indicating that for persons within the area, there are relatively few restrictions on daily activities.

Overall, the population within the study area is not particularly sensitive to change, with an overall ranking of ***low*** to ***moderate sensitivity***.

Community

The two principal aspects of the community surrounding the subject site can be defined as follows:

- The site of the Proposed Development is located approx. 478m north-east of the R677, c. 310m east of a county road and 390m north of a further additional country road. The closest established residential area is located at the built-up area of Carrick-on-Suir (approx. 2.5km north-west of the subject site). There are also residential units located sparsely, in a closer proximity from c. 448m north, 720m east, 415m south and 468m west.
- The working community in the vicinity of the subject site comprise primarily of agricultural and forestry-based employment. Other employment within the wider vicinity includes a driving range (c. 1.05km north) and a national school (approx. 1.93km west).

Human Health (Off-Site)

There is a low age dependency ratio, therefore a large proportion of the population is within working age, thus considered as largely independent and judged to be not sensitive to change. The information presented above for the study area shows, a high proportion describes their health status as 'very good'. The data shows that the study area has a lower percentage of persons with a disability than the national average: indicating that for persons within the area, there are relatively few restrictions on daily activities. The population within the study area is therefore not particularly sensitive to change, with an overall ranking of low to moderate sensitivity.

Human Health (On-Site)

An anaerobic digestion plant is considered to be a biological treatment facility, the operation of which can have the potential for a variety of exposure scenarios involving a range of factors including:

- Pest Control
- Engineering specification
- Abatement technologies
- Hydrogeology
- Topography
- Type and quantity of waste accepted.
- Biogas generation

In the absence of appropriate mitigation, the primary hazards to human health at a biogas facility is mainly associated with uncontrolled air and water discharges

6.2 Likely Significant Effects
Do-Nothing Scenario

Under the 'Do Nothing' scenario, the current land use of the Proposed Development site would remain unchanged, with no additional efects on the following receptors:

Local Population & Employment: The local population and employment levels would remain unaffected, but the opportunity to create additional jobs and contribute to specific objectives in the City and County Development Plan and the 2024 Climate Action Plan would be lost.

Community: Community perceptions would remain unchanged, but the potential economic and social benefits from the development would be foregone.

Land Use: The land would likely continue to be used for agriculture.

Human Health (Off-Site Receptors): There would be no effects on human health, as the site would remain in its existing greenfield state. However, the opportunity to provide renewable energy to the national grid and address rising energy costs would be missed.

Human Health (On-Site Receptors): It is likely that the risks associated with uncontrolled pests and vermin on the surrounding the area, livestock and ecological receptors will be significantly reduced (in the absence of mitigation).

Overall, the 'Do Nothing' scenario is sub-optimal in the context of national and county renewable energy targets and efforts to mitigate climate change. in the context of the national and county targets for the adoption of renewable energy sources, and in the context of anthropogenic climate change. Furthermore, an opportunity to introduce a bio-based fertiliser, with reduced pathogen content into to local bioeconomy will be missed.

Receptor Sensitivity

Sensitivity of the receptors identified are summarised in **Table 6.11** (extracted from Chapter 6)

Table 6.11 – Receptor Sensitivity

Receptor	Receptor Importance	Receptor Sensitivity	Rationale
Local Population & Employment	Low to moderate	High	The Proposed Development provides employment opportunities to the local area and surrounds, also with the potential to provide renewable energy.
Community	Low to moderate	Low	The overall economic and social benefits that the development would bring to the area would not be experienced by the community in the event of the development not occurring.
Human Health (Off-Site)	Low to moderate	Low	If the Proposed Development were not to proceed this greenfield site would remain in its existing form and the unique opportunity of providing renewable energy will be missed.
Human Health (On-Site)	High	High	The development will result in a situation where human health will be put at risk due to typical hazards associated with the construction and operation of the proposed facility.

Sources

Construction Phase

Population

The construction phase is not considered to have any significant effect on the population of the surrounding area, as it is expected that the work force will primarily travel from their existing place of residence to the construction site, As such activities associated with the construction phase are anticipated to have **positive, slight, temporary** effects on the local population.

Employment

The Proposed Development will provide important construction and related employment. The construction phase will also have secondary and indirect 'spin-off' effects on ancillary support services in the area of the Proposed Development, such as retail services, together with wider benefits in the aggregate extraction (quarry) sector, building supply services, professional and technical professions etc. As such, activities associated with the construction phase are anticipated to have **positive, slight, temporary** effects on employment within the area.

Community

It is acknowledged that the construction phase of the project may have some short-term negative effects on local residents. These effects are dealt with separately and assessed other technical

chapters of the EIAR. It is expected that these short term temporary localised effects may be experienced by those residing, working, and visiting the area. Such effects would include an increase in daytime noise levels in the area as a result of the machinery being used for construction purposes Activities associated with the construction phase are anticipated to have **negative, slight, temporary** effects on the local community.

Installation of Gas Pipeline

This Chapter of the EIAR addresses the installation of a gas pipeline to serve the development, which will be designed and delivered by GNI. The impact of the construction phase of the gas pipeline is considered to be ***negative, slight, and temporary*** on local polulation and human health.

Human Health

The Health and Safety policy, procedures and work practices of the Proposed Development will conform to all relevant health and safety legislation both during the construction and operational stages of the Proposed Development. The Proposed Development will be designed and constructed to best industry standards, with an emphasis being placed on the health and safety of employees, visitors, local residents and the community at large. Activities associated with the construction phase are anticipated to have **negative, slight, temporary** effects.

Operational Phase

Potential operational phase effects are considered in detail below and summarised in **Table 6.12** in Chapter 6 of the EIAR – Main Report.

Table 6.12 – Construction Phase Effects Summary

Receptor	Sensitivity Rating	Potential Environmental Effects	Quality	Significance	Duration
Local Population	Low to moderate	Potential minor increase in population during construction.	**Positive**	**Imperceptible**	**Temporary**
Employment	Low to moderate	Will provide jobs during the construction phase. May attract other sources of employment to the area.	**Positive**	**Slight**	**Temporary**
Community	Low to moderate	Wear and tear on the infrastructure. Construction traffic. Risk to air/noise.	**Negative**	**Slight**	**Temporary**
Installation of Gas Pipeline	Low to moderate	materials can pose a risk to Human Health due to the presence of Polycyclic Aromatic Hydrocarbons (PAHs).	**Negative**	**Slight**	**Temporary**
Human Health (Off-Site)	Low to moderate	Risk to health from construction methods. Impact of disturbance, air and noise impacts during construction.	**Negative**	**Slight**	**Temporary**

6.3 Mitigation Measures

Construction Phase

Potential effects during the construction phase will be minimised through the implementation of the Construction Environmental Management Plan which will be submitted to the council prior to construction.

Population

It is considered that the Proposed Development is unlikely to generate any significant adverse effects on the demographics of the area No mitigation measures are required during the construction phase.

Employment

The Proposed Development will have a positive effect on employment levels in the area and as such no mitigation measure are required.

Community

It is considered that the Proposed Development is unlikely to generate any adverse effect on the community of the area either during the construction phase or the operational phase and would actually have positive economic effects. No mitigation measures are required during the operational phase.

Installation of Gas Pipeline

Trenches will be backfilled shortly after installation of each section. Any waste material will be appropriately segregated and disposed of. The pipeline will be designed and implemented by GNI in accordance with *I.S. 328 2021 Gas transmission — Pipelines and pipeline installations.*

Human Health

Adverse health and safety effects during the construction phase will be minimised through the implementation of the Construction Management Plan to be prepared by the main contractor.

Operational Phase

Potential effects to the local population, employment and community are neutral to positive hence no mitigation measures are recommended for these receptors. A robust set of measures are proposed for the following operational aspects relating to Human Health, outlined in detail in section 6.7 of the main EIAR Report and within Chapter 16 - Schedule of Mitigation. Mitigation measures are provided where relevant for the following:

- Pest Control
- Fugitive Emissions
- Hazardous Substance
- Biological Agents
- Electrical Hazards

- Gas Hazards
- Explosion and Fire Hazards
- Malpractice.

6.4 Cumulative Effects

The cumulative effects of the proposed construction and operation of a biogas facility near Carrick-on-Suir with other developments in the area are reviewed in this section with specific regard to the local population.

Construction Phase

The mitigation measures outlined in the CEMP and in Chapter 6 of the EIAR – Main Report, should be applied throughout the construction phase of the Proposed Development. This will ensure any significant cumulative effects on the local population and the greater environment are prevented.

Operational Phase

The cumulative effects on the local population and human health during the operational phase of the Proposed Development are expected to be minor. These effects primarily stem from a slight increase in demand for local services and increased employment, aligning with broader employment trends. Mitigation measures and sustainable use of resources will help manage this increased demand.

6.5 Residual Effects

The mitigation strategy above recommends actions which can be taken to reduce or offset the scale, significance, and duration of the effects on the surrounding population.

Population

The Proposed Development is not expected to have any significant adverse effect on the local population.

Employment

The development will create new employment opportunities, boosting local businesses and services.

Community

The Proposed Development is unlikely to adversely affect the local demography and will have positive economic effects.

Human Health

Provided the actions and procedures outlined in **section 6.7** are rigidly adhered to, the proposed development will have no likely significant adverse effect in relation to pest control, whether direct or indirect on the surrounding areas during the construction or operational phases.

Following implementation of the mitigation measures proposed in **section 6.7**, the residual effects are anticipated to be ***negative, slight and long-term*** effects on the Pest Control.
The various human health parameters discussed in this chapter also interact with many other aspects of the environment. The residual effects in relation to these aspects are detailed in the individual chapters as follows:

- Chapter 9 – Air, Odour and Climate
- Chapter 10 - Noise and Vibration

Following implementation of the mitigation measures proposed in **Section 6.7**, the residual effects are anticipated to be***, neutral, slight, long-term*** effects on the Human Health.

Residual Effects Summary

The overall effect anticipated during the construction phase of the project following the implementation of suitable mitigation measures is considered to be ***neutral to positive, imperceptible to slight,*** and ***long-term***.

6.6 Summary of Significant Effects

The aspects for this assessment are considered to be the Population, Employment, Community, and Human Health. Whilst the development proposals have the potential to cause detriment to the sensitive receptors identified, the recommended mitigation measures will ensure that the risk of potential effects are reduced to levels which are ***not significant***.

Chapter 6 of Volume 2 of the EIAR assesses the likely significant effects of the proposed development on Population and Human Health, with reference to population, human heath, employment, and community. The assessment methodology involves a thorough desktop study and fieldwork, utilizing guidelines from the EPA, European Commission, and the Institute of Environmental Management and Assessment (IEMA). The primary goal is to ensure that the development's effects on human health and welfare are comprehensively evaluated and mitigated.

7 Land, Soils & Geology

ORS conducted an assessment of the likely impact of the Proposed Development on the land, soil and geology within the proposed development site and the wider region.

7.1 Receiving Environment

Topography

The Proposed Development locality is characterised as being rolling to gently undulating glacial sediments, in keeping with the Landscape Character Type description for the area. The River Suir is distinct feature within the landscape. A peak in the Proposed Development site topography, 106.5m OD, is situated slight to the west of the site with a gradient east to towards the centre at 98m OD. The gradient is steeper at the centre of the site and continues to gradually fall east to a low of 91.5m OD along the eastern boundary. The area surrounding the Proposed Development site contains characteristic small undulations in the land.

The proposed development site is located in the Landscape Character Type 5: Foothill Landscapes which is further differentiated into as Unit 5G: Portlaw Foothills. The proposed development is adjacent to Type 2: Farmed Lowland Landscapes, Unit 2A: Rathgormack Lowlands.

Drift Geology

The General Soil Map of Ireland describes the region as comprising of Acid Brown Earths with associated soils including Gleys and Brown Podzolics. The majority of the Proposed Development overlays a till derived from shale. The soils which are likely to be affected by the development are characteristic in the local and regional context and occur in abundance.

Regional Bedrock Geology

The bedrock geology within the wider region is complex and varies greatly from sedimentary, and metamorpic formations. The mountainous regions further to the west are composed of Devonian sedimentary rocks. The Proposed Development is located on a large terrane of Silurian metasediments and volcanics which stretches from Garravone (N), Clongam (E) and Clonea (S) to the Comeragh Mountains (W). Towards the south of the terrane a linear section of Devonian Kiltorcan-type Sandstones occurs running from east to west.

Local Bedrock

The underlying bedrock is known as dark grey slate and greywacke, from the Ballindysert Formation. The formation is characterised by dark grey slates which are massive and frequently contain thin white silty mudstones. The formation has maximum thickness of approximately 1900m. Exposers of the formation can be found to the west of the proposed development site, running from northeast to the southwest towards Rathgormuck. A number of exposers can be observed along the northern and eastern edges of the formation.

The Carrigmaclea Formation lies to the northern border of the Ballindysert Formation. GSI have classified this as red, brown conglomerate & sandstone. The formation comprises quartz cobble conglomerates, pebbly sandstones and cross-stratified sandstones which are all red, brown or pink in colour. Conglomerates are particularly common towards the base of the formation". Beyond the Carrigmaclea Formation are the Kiltorcan, Porter's Gate and Ballysteen Formations respectively.

A number of faults can be observed within the 2km study area. These are observed along the various rock formations which encompass the wider area and surround the Ballindysert Formation. The area is ringed by mountains / hills to form a basin, the centre of which is where

the bedrock terrane underlying the proposed development is situated.

Depth to Bedrock

An assessment of the GSI groundwater vulnerability maps and local groundwater wells data was undertaken. It should be noted that there are 9 recorded groundwater wells within the 2km study area. These groundwater wells are defined as Boreholes. Groundwater wells within the wider area have a varying yield class from poor to moderate. The lands on which the site location has been proposed have been assigned variety of vulnerability ratings ranging from moderate along the western boundary, high along a central strip of the site, Extreme at the eastern boundary and X (Rock near or at surface or karst) along a northeast portion of the site.

The recorded depth to bedrock encountered for the corresponding wells in the wider area are generally between 1.2 to 9.1 metres below ground level (bgl).

Site investigations depict a varying soil depth throughout the site with bedrock encountered at 1.8m below ground level (bgl) in Trial Pit 4 located at the center of the site.

Karst Features

Karstic features are common in the wider area to the west and northwest of the proposed development due to the underlying pure bedded lower carboniferous age limestone bedrock.

There are no known karst features within the 2km study area.

Tracing of underground flows from a cave to springs has been undertaken by GSI and indicates interconnectivity between karst features *ca.* 22km northwest of the study area. Traced groundwater movement through karst features further to the south were found to have western to southwestern flow, away from the development.

Soils & Subsoils

GSI online mapping indicates that the site overlies mineral poorly drained (mainly acidic) (AminPD) derived mainly from non-calcareous parent materials. The soil groups associated with this category are surface water gleys and ground water gleys. A bedrock outcrop is noted at the northern extent of the site. A number of bedrock areas in the surrounding area are also noted and are classified as belonging to soils groups of Lithosols, Regosols, Podzols (Peaty) and Peats.

The Teagasc representative soil profile description for the underlying soil is the ‘Clonroce’ Series. This is described as having a fine loamy texture. The definition is fine loamy drift with siliceous stones over which contains a high proportion of sand (43%) and smaller proportions of silt (34%) sized particles with lower proportions of clay (23%) in the top horizon (0-21cm).

The till is described as diamicton, which relates to its terrigenous sediment that is unsorted to poorly sorted and contains particles ranging in size from clay to boulders, suspended in an unconsolidated matrix of mud or sand. This unsorted matrix is due to glaciation. The subsoil in the areas delineated as alluvium are described as having alluvium subsoils.

Soil Contaminants

No contaminants were observed on site during the site investigations. The site is greenfield with no recorded previous development within the site boundary. A licensed Integrated Pollution Prevention Control (IPPC) facility (license number: P0573-01) is located *ca.* 200m southeast of the Proposed Development. The facility is a piggery which is classed as “6.2.0/ Industry” and is operated by Mr Jimmy Foran. Contamination of the land from the adjacent IPPC site has not been noted.

Historic Land Use

The historic maps indicate no obvious sources of contamination based on previous land use within the Proposed Development. The most notable sources of contamination within the study area can be found on the 25-inch historic maps (1863-1924). Two disused Quarries are located *ca.* 0.5km and *ca.* 0.9km to the north and a corn mill is noted *ca.*0.9k northeast of the Proposed Development. There are no notable remnants of these structures on modern OSI maps or in the Historical Environment Viewer database. Given the distance and nature of the materials involved it is not foreseen that these will have a negative impact on the Proposed Development.

Site Investigation

The results of the trial pits installed as part of the site investigation are shown below in **Table NTS 7.1**.

Table NTS 7.1: Soil Profile of Trial Pits

Location	Depth (m)	Ground Profile	Comments
TP-01	0.0 – 0.25 0.25 – 0.55 0.55 – 2.30	Clay, silt. Brown topsoil Grey clay Cobbles 70mm, round sub-angular occasional shale boulder 200mm	End Trial Pit at 2.3m Water infiltration at 2.1m
TP-02	0.00 – 0.25 0.25 – 0.55 0.55 – 1.00 1.00 – 2.00	Grey-brown topsoil. Gley texture Grey. Clay texture. Small cobble 20-50mm. Grey colour, round to sub-angular shape. Brown clay. Boulders, round some sub-angular.	End Trial Pit at 2.0m Water infiltration at 0.9m Water level at 2m, 1.5hrs after excavation.
TP-03	0.00 – 0.10 0.10 – 0.60 0.60 – 0.70 0.70 – 1.00 1.10 – 1.20 1.10 – 1.90	Brown topsoil. Grey-brown subsoil. High clay content. Gravel, sand-clay layer. Brown hue. Possibly alluvial. Grey-brown colour. Clay with some cobbles. Black band. Brown-grey clay. Oxidised rock noted. Shale boulders, sub-angular 500mm, some cobbles also	End Trial Pit at 1.9m
TP-04	0.00 – 0.25 0.25 – 0.45 0.45 – 1.10 1.10 – 1.80 1.80 – 2.10	Dark brown topsoil. Grey silt. Occasional shale boulder 100mm. Grey-brown clay. Brown-grey clay silt. Angular shale bed.	End Trial Pit at 2.1m Water infiltration at 1.8m

The Proposed Development site is characterised by a poor draining bedrock (slate), low permeability subsoil overlain by a poorly-drained topsoil. There is a slight variation in the soil depth from which is moderately deep (1.9m) to (2.3m). The topsoil throughout the site is characterised as Brown Earth, with a variable texture consisting of clay, silt to gley. The subsoil found throughout the trial pits exhibits a variety of characteristics but typically consists of grey clayey-silt. The underlying bedrock across the site is a Silurian dark grey slate. No bedrock was discovered in the Trial Pits 1 - 3. Bedrock in the form of an angular shale bed was discovered at 1.8m bgl in Trial Pit 4. The bedrock encountered is characterised by dark grey slates. They are massive and frequently contain thin white silty mudstones.

7.2 Assessment of Impacts

Receptor Sensitivity

The sensitivity of the receptors identified during the study of the land, soil & geology features within the vicinity of the site are summarised in **Table NTS 7.2** overleaf.

Table NTS 7.2: Receptor Sensitivity

Receptor	Receptor Importance	Receptor Sensitivity	Rationale
Topsoil	Local Level	Low	The local topsoil is a groundwater gley / surface water gley which is in abundance within the vicinity of the development. The site topsoil contains no known pollutants. The soil is of poor agricultural quality, being a poorly drained 'Gley' and would not be a highly sought-after topsoil for any infill agricultural lands.
Underlying Deposits	Local Level	Moderate	The development has been designed to utilise the existing site topography as far as possible **(31925-ORS-ZZ-00-DR-AR-200),** minimising the disturbance to the subsoil to achieve the desired site levels. Where possible drift deposits will remain on site and be utilised as infill material. The underlying till deposit is a diamicton (poorly sorted containing particles ranging in size from clay to boulder) sandstone parent material which is in abundance within the wider area. The development site is located across a GSI designated foothills with a varying range in soil depth from shallow to deep.
Bed Rock Geology	Regional Level	Moderate	The underlying bedrock is a characterised as dark grey slates which are massive and frequently contain thin white silty mudstones. Karst features have not been recorded within the site vicinity but are found within the wider region to the north of the River Suir. Karst features are not prevalent throughout Waterford as the majority of County Waterford is underlain by Sandstone bedrock. This rock is in abundance with the wider region. It is envisaged that bedrock will be encountered. The underlying aquifer is classified as being locally important.

Construction Phase

The construction phase is likely to yield the most potential impacts on the surrounding land, soil & geology. Potential construction phase impacts are considered in detail in **Section 7.5.3** of the EIAR – Main Report and summarized in **Table NTS 7.3** overleaf.

Table NTS 7.3: Construction Phase Effects (Unmitigated)

Receptor	Potential Environmental Effects	Quality	Significance	Duration
Topsoil	Topsoil Removal	**Negative**	**Slight/ Moderate**	**Reversible**
	Access roads and Gas Pipeline	**Negative**	**Slight**	**Temporary**
Underlying Deposits/ Subsoil	Construction of Built Structures	**Negative**	**Moderate**	**Long-term**
	Excavation/ Subsoil Removal	**Negative**	**Moderate**	**Permanent**
	Wetland	**Negative/ Neutral**	**Moderate**	**Permanent**
	Contaminated Soils	**Negative**	**Not Significant**	**Temporary**
	Access roads and Gas Pipeline	**Negative**	**Slight**	**Permanent**
Bed Rock Geology	Excavation of Bedrock	**Negative**	**Significant**	**Permanent**

Operational Phase

The operational phase effects anticipated and considered throughout the lifetime of the operation of the facility are considered in detail in **Section 7.5.4** of the EIAR – Main Report and summarized in **Table NTS 7.4** below.

Table NTS 7.4: Operational Phase Effects (Unmitigated)

Receptor	Potential Environmental Effects	Quality	Significance	Duration
Topsoil	Nutrient Leaks	**Negative**	**Slight**	**Short-term**
	Land Spreading of Biobased Fertiliser	**Positive**	**Slight**	**Long-term**
	Attenuation Ponds	**Neutral**	**Moderate**	**Permanent**
Bed Rock Geology	Hydrocarbon Contamination	**Negative**	**Moderate/ Significant**	**Long-term**

7.3 Mitigation Measures

Construction Phase

General Mitigation Measures

A summary of all mitigation measures for the construction phase to ensure maximum protection of land, soil & geology receptors are listed below:

- Construction Environmental Management Plan.
- Site preparation and construction will be confined to the Proposed Development only.
- Prior to the commencement of developments on site, the PSCS/ ECoW will ensure that contractors will be made aware of the sensitive receptors identified in the EIAR. A signed statement saying that they have taken on board the mitigation measures contained herein should be presented to the local authority along with the Notice of Commencement.
- A wheel wash/ power wash facility will be established.
- Dirty equipment will be refused entry to site.

Topsoil Removal

- Slight compaction of stockpiles to minimise erosion.
- Running stockpiles in the direction of prevailing wind.
- Construction of silt fences around topsoil stockpiles.
- Minimise the export of topsoil off site by incorporating in the final landscape design.
- Minimise handling and tracking of material to maintain optimum soil structure.
- Landscaping to take place as soon as possible to reduce exposure of subsoil and topsoil stockpiles.
- Works will be avoided during periods of extended rainfall.
- All topsoil generated from site works should be stored within the Proposed Development until it is required for landscaping. It must not be stored outside the Proposed Development boundaries.
- Excess topsoil will be removed from site by a registered contractor.

Excavation

- Stockpiling material in appropriate locations, away from water sources, with a silt fence surrounding it to reduce the rate of run-off from hydraulic conditions.
- Light compaction of stockpiles to minimise erosion.
- Stockpile heights should be kept to a minimum.
- Excavations will be postponed in high rainfall conditions to reduce the risk of excavation collapse.
- Excavations to be backfilled as soon as possible.
- All long-term soil stockpiles are to be planted with a vegetative cover to bind the soil and improve slope stability.
- All temporary excavations will be conducted in a safe manner to ensure sidewall stability and prevent collapse of excavations. Mobile shoring equipment will be utilised to this end where required.
- Engineered retaining walls are to be installed where required to ensure stability of contiguous and Proposed Development topography.
- “Mole Plough” installation method will be utilised to limit trenching requirements and reduce the risk of sediment laden run-off.

Soil Compaction

- Construction of a hardcore gravel access road on and around the site.
- Confine site traffic to designated routes.
- Minimise traffic flows on site and establish a construction stage parking compound.
- Avoid the use of oversized machinery when and where possible.
- Prevent movement of vehicles on site during and after periods of rainfall.
- Driving machinery on topsoil stockpiles will be avoided.
- Works will be avoided during periods of extended rainfall.

Run-Off

- Silt fencing will be erected along the eastern extents of the Proposed Development site. Fencing is to be made of a permeable filter fabric (Hy-Tex Terrastop Premium silt fence, or similar), with the footing of the fencing to be buried into the ground and the visible fencing to be *ca.* 0.5m high.
- An interceptor trench will be installed in front of the silt fence.

- The silt fence will be visually inspected daily. Maintenance of the fences will be carried out regularly.
- Excavated and/or imported material will be stockpiled and silt fencing will be constructed around stockpile locations to contain/ reduce any sediment run-off.
- Slight compacting of stockpiles to reduce erosion.
- Stockpile areas for sands and gravel should be kept to minimum size, well away from storm water drains and gullies leading off-site.
- Silt Fences to be erected where excavation works are required in close proximity to water features and along depressions in land where there's increased surface water flow rates.
- Chemicals to be stored in bunded compounds well away from storm water drains and gullies.
- Refuelling of machinery should be carried out using drip trays.
- A temporary drainage system will be established complete with a settlement pond to remove contaminants from run-off, prior to discharge.
- Temporary staff welfare facilities will be installed on site.

Concrete

- **Concrete Washout Skip**: Chutes of concrete trucks are only to be washed out into an impermeable lined (polythene) skip. The washout water is to be treated prior to discharge.
- The concrete washout skip is to be located to the east of the site, where the overburden is greater.
- Excavations lined with an impermeable liner are not permitted as concrete washout bays.
- Large excess loads of concrete are to be returned to the supplier or poured into concrete block moulds (Betonblock or similar design) in order to minimise waste and reduce the risk of contaminants leaching into the surrounding environment.
- Best practice in bulk-liquid concrete management should be employed on site addressing pouring and handling, secure shuttering, adequate curing times etc.
- Where concrete shuttering is used, measures will be put in place to prevent against shutter failure and control storage, handling and disposal of shutter oils.
- Activities which result in the creation of cement dust will be controlled by dampening down the areas.
- Raw and uncured waste concrete will be disposed of by removal from the site.

Construction Contaminants

- Fuels, oils and other environmental deleterious chemicals are to be stored in a bunded well-ventilated chemical stores.
- Use of such chemicals and fuels is to be contained to bunded areas, where possible.
- Fuel bowsers to be located in bunded areas which can cater for 110% of the primary vessel capacity.
- Any spills or leaks to the soil is to be immediately contained and the soil in question is to be removed by a licensed contractor and disposed of in a registered facility.
- Oil spill containment kits are to be situated near areas of potential spills.
- Regular inspections carried out on plant and machinery for leaks and general condition.
- Use of ready-mixed supply of wet cement products.
- Scheduling cement pours for dry days.
- Maintenance and repair works will be carried out at least 10m from any collection of surface water.
- No refuelling will be undertaken within 50m of the Tinhalla Stream.

- Ancillary machinery equipment such as hoses, pipes and fittings which contain hydrocarbons will be stored within a bund or drip tray.
- Any repair works required on machinery involving fuel and oil control will be carried out off-site where practical, if not possible then repairs will be undertaken on a clean hardcore area of site. Unless unavoidable, repair works carried out in the field where machinery is operational will use spill trays and absorbent materials to prevent release of contaminants to the ground.
- Daily pre-start checks prior to start-up of plant and machinery.

Importation of Contaminated Materials

- Any deliveries found to be contaminated will be refused access to deposit on site.
- Any contaminated materials deposited on site will be removed immediately from site. If this is not possible then it will be stored in a “quarantine zone”.
- The quarantine zone is to be lined with an impermeable liner which the material will be stored on. A cover will be placed over the liner to avoid hydraulic run-off of contaminated materials.
- The quarantine zone is to be fenced off and surrounded by silt fencing, as a secondary containment measure.

Excavation of Contaminated Soils

- All excavated materials will be visually assessed for contamination. Any contaminated material detected will be sent for analysis to a suitable environmental laboratory and subsequently quantified, segregated and transported for disposal by a licenced contractor.

Operational Phase

A summary of all mitigation measures for the operational phase to ensure maximum protection of land, soil & geology receptors are listed below:

General Mitigation Measures

- An Environmental Management System (EMS) will be prepared and implemented
- The proposed facility will operate under an Industrial Emissions Licence (IEL)
- Emissions Limit Values for all emissions including surface water
- Monitoring requirements for surface waters
- Resource use and energy efficiency
- Waste management control and documentation
- Storage and transfer of substances
- Facility management
- Accident prevention and emergency response including fire water retention
- Operational Controls

Uncontrolled Releases and Spillage of Biobased Fertiliser and Feedstocks

- Dedicated hard standing for off-loading areas, with a minimum separation distance from adjacent water courses.
- Use of spill kits, bunded pallets and secondary containment units, as appropriate.
- All bunds sized to contain 110% of the volume of the primary storage vessel.
- Environmental Management Plan (EMP) to include site specific standard operating procedures pertaining to waste management and emergency response.
- There will be no intentional discharge of untreated storm water to surface or ground waters.

- The Digestion Tanks and Digestate Storage tanks will be located within a bunded location to the east of the site, this will act as a secondary containment in the event of loss of tank contents.
- All primary pipelines and bunded structures will be inspected and integrity tested prior to handover from the appointed construction contractor. All works will be installed to Construction Quality Assurance (CQA) plan.

Land Spreading of Biobased Fertiliser

- All biobased fertilisers must be used in accordance with S.I. 113 of 2022 European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2022).
- The spreading of the biobased fertiliser on the customer farms must be done in accordance with the specific Nutrient Management Plan for that farm.
- Application of biobased fertiliser to be conducted in compliance with the Nitrates Action Programme (e.g. prohibited periods and nitrogen application rates).
- All biobased fertiliser is to be pasteurised prior to removal from the Proposed Development to comply with Regulation (EU) 142/2011 on Animal By-Products in Organic Fertilisers.

7.4 Residual Impacts

Construction Phase

A summary of the predicted impacts associated with the construction phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 7.13** in Chapter 7 of the EIAR – Main Report.

The overall impact anticipated by the construction phase of the project following the implementation of suitable mitigation measures is considered to be **neutral to negative**, **slight to moderate** and **temporary to permanent**.

Operational Phase

A summary of the predicted impacts associated with the operational phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 7.14** in Chapter 7 of the EIAR – Main Report.

The overall impact anticipated by the operational phase of the project following the implementation of suitable mitigation measures is considered to be **positive to neutral**, **imperceptible to slight**, and **temporary to permanent**.

8 Hydrology & Hydrogeology

ORS conducted an assessment of the likely impact of the proposed development on the hydrological and hydrogeological environment (collectively known as the water environment) within the proposed development site and the wider region.

The proposed development site is situated in Curraghnagarraha, Reatagh and Curraghballintlea, Co. Waterford.

The objectives of this chapter (Chapter 8 - Hydrology & Hydrogeology) are:

- To provide a baseline assessment of the receiving water environment in terms of surface water (hydrological) and groundwater (hydrogeological) receptors.
- To identify any potential negative effects posed by the construction and operational phases of the Proposed Development.
- To propose suitable mitigation measures to prevent or reduce the significance of the negative effects identified.
- To consider any significant residual effects of cumulative effects posed by the Proposed Development.

8.1 Receiving Environment

The following aspects relating to hydrology & hydrogeology were assessed:

- Topography
- Drift Geology
- Regional Bedrock Geology
- Local Bedrock Geology
- Regional Hydrology
- Local Hydrology
- Protected Areas
- Flood Risk
- Water Quality
- Historic land use
- Regional & Local Hydrogeology

Sensitivity was low in most instances with the exception of: Local Hydrology (The Tinhalla stream and the River Suir) Protected Areas (downstream receptors, Lower River Suir SAC/pNHA and Tibberaghny Marshes pNHA) and Local Hydrogeology (Comeragh Groundwater Body – Locally Important Aquifer).

Local Hydrology

The Proposed Development is situated approximately 3.4km southeast of Carrick-on-Suir located in sub-catchment 16-16, known as the Suir_SC_140 sub-catchment.

The main hydrological feature in the vicinity of the site is the Tinhalla Stream (EPA name: IE_SE_16T310740) which runs directly adjacent to the eastern side of the Proposed Development in a generally northerly direction towards the River Suir/ Upper Suir Estuary (EPA

name: IE_SE_100_0600) located ca. 1.6km from the proposed development.

There are no arterial drainage channels located within the immediate vicinity of the proposed development. The OPW Arterial Drainage Scheme (ADS) Channel labelled C1 is located ca. 2.8km northwest of the proposed site boundary, to the south of Carrick-on-Suir and flows from west to east upstream of the proposed developemnt. The OPW Arterial Drainage Scheme (ADS) Channel labelled C2 is located ca. 3.7km northwest of the proposed site boundary to the west of Carrick-on-Suir, upstream of the proposed development.

Protected Areas

There are eight no. Nature 2000 sites within 15km of this Proposed Development.

There is hydrological connectivity to 1 no. Natura 2000 sites and 2 no. protected site, namely the Lower River Suir SAC Tibberaghny Marshes pNHA and Lower River Suir (Coolfin, Portlaw) pNHA. Hydrological connectivity to the protected sites is via the Tinhalla stream located adjacent to the eastern site boundary, which runs from south to north, eventually discharging into the Lower River Suir SAC ca. 1.6km downstream. The River Suir meanders eastwards towards Waterford City where it encounters Tibberaghny marshes *ca*. 2.4km downstream of the proposed development and Lower River Suir (Coolfin, Portlaw) pNHA *ca.* 10km downstream of the proposed development.

Local Hydrogeology

Mayo has been mapped for Aquifer Classification. The subject site is situated above one no. Groundwater Bodies which is designated by the Geological Survey of Ireland (GSI) National Draft Bedrock Aquifer Map as follows:

- Comeragh Groundwater Body – “LI” Locally Important Aquifer

According to the GSI database, there is a high density of groundwater wells within 2 kilometers of the Proposed Development. The closest being a ‘Borehole’ classified for domestic use, located *ca.* 360m from the proposed development.

A full list of Groundwater Wells located within a 2km radius of the proposed development is outlined in **Table 8.13** (Chapter 8 - EIAR Main Report)

According to the GSI Source Protection Area map, there are no Source Protection Areas in the vicinity of the Proposed Development.

Site-Specific Ground Investigations

Ground investigation works were carried out by a chartered ORS environmental scientist for the Proposed Development at Reatagh on the 13th of December 2023, the main findings are as follows:

- The depths of all trial pits varied slightly from 1.9mbgl to 2.3mbgl.
- Bedrock was encountered at 1 no. Trial Pit (TP-04) at 1.8mbgl – 2.1mbgl.
- Groundwater was also encountered in 1 no. Trial Pit (TP-04) at 1.8mbgl.
- TP-04 is located to the centre of the site.
- The topsoil across all trial pits were all of a brown in colour overlaying a layer of grey soil with a high CLAY content or in the case of Trial Pit 4, a layer of grey silt with an occasional shale boulder.

- The topsoil texture in Trial Pit 1 is referred to a clay-silt and Trial Pit 2 is referred to as gley soil. Trial Pits 3 and 4 demonstrated a larger diversity among subsoil horizons in comparison to Trial Pits 1 and 2.
- The Proposed Development site is characterised by a poor draining bedrock (slate), low permeability subsoil overlain by a poorly-drained topsoil.
- The bedrock encountered are characterised by dark grey slates.
- The findings of the site investigation correlated with the GSI soil & subsoil database mapping.

Site Vulnerability

From desktop and field investigations it can be determined that the Proposed Development is located on a locally important aquifer and has been assigned a vulnerability rating ranging from moderate in the east to extreme in the west. A portion of the northeastern section of the site has a been assigned a vulnerability rating of "X".high/ extreme vulnerability based off GSI mapping.

The response matrix would indicate that the vulnerability rating assigned to the site would be "R1" for the majority of the site from the central portion to the western boundary. Indicating the development location is "*acceptable with respect to groundwater protection*". For the eastern and north eastern portion of the site the response matrix would indicate that the vulnerability rating assigned to the site would be "R31" indicating the development location is "*Not generally acceptable, unless a consistent minimum thickness of 1 m of soil and subsoil can be demonstrated*" to the northeast and east of the site.

Further trial pits are recommended pre-construction to determine soil depth to the east/ northeast within the site and the installation of impermeable liners under the attenuation ponds.

No land spreading will occur on site. The farms of the customer farmers have been identified. All farmers will use the biobased fertiliser on lands that have an agronomic requirement for fertiliser.

8.2 Assessment of Impacts

Receptor Sensitivity

The sensitivity of the receptors identified during the study of hydrological and hydrogeological features within the vicinity of the site are summarised in **Table NTS 8.1**:

Table NTS 8.1: Receptor Sensitivity

Receptor	Receptor Importance	Receptor Sensitivity	Rationale
Groundwater Comeragh Groundwater Body	Local Level	High	The Comeragh Aquifer Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones renders this groundwater body's importance as important on a local context. The groundwater vulnerability ranges in classification from "Moderate" to "High" and "Extreme" from west to east across the site according to the GSI map viewer. However, the trial pit excavations have revealed at least 1m of soil/subsoil cover exists, throughout the entire site,

			and the groundwater table is adjudged to be >1m below ground level. The response matrix (**Table 8.15**) would indicate that vulnerability rating assigned to the site would be "R1 Acceptable, subject to normal good practice", for the western section of the site indicating the development location is acceptable with respect to groundwater protection. The vulnerability rating assigned to the eastern portion of the site would be "R3[2]" not generally acceptable, unless a consistent minimum thickness of 1 m of soil and subsoil can be demonstrated.
Surface Water Tinhalla stream/ River Suir and downstream receptors Lower River Suir SAC/ pNHA and Tibberaghny Marshes pNHA.	EU Level	Extreme	The receiving water body from the local Tinhalla stream that drains the site is the River Suir. This river is protected by EU Legislation and has SAC status. This River is hydrologically connected to downstream receptors Tibberaghny Marshes pNHA Lower River Suir (Coolfin, Portlaw) pNHA (Hydrological separation distance of *ca*. 10km) and

Construction Phase

The construction phase is likely to yield the most potential impacts on the surrounding hydrology and hydrogeology. Potential construction phase impacts are considered in detail in **Section 8.5.3** of EIAR – Main Report and summarised in **Table NTS 8.2** below:

Table NTS 8.2: Construction Phase Effects (Unmitigated)

Receptor	Potential Environmental Effects	Quality	Significance	Duration
Groundwater Comeragh Groundwater Body	Excavations Increasing Groundwater Vulnerability	**Negative**	**Moderate**	**Temporary**
	Accidental Spillages of Harmful Substances	**Negative**	**Moderate**	**Temporary**
	Increased Groundwater Vulnerability	**Negative**	**Significant**	**Long-Term**
	Excavation of Bedrock Aquifer	**Negative**	**Significant**	**Long-Term**
	Excavation of Contaminated Soils	**Unlikely**	**Negligible Impact**	**Unlikely**
Surface Water	Increased Run-off and Sediment Loading	**Negative**	**Moderate**	**Temporary**

Tinhalla stream, the River Suir and further downstream receptors Lower River Suir SAC/ pNHA and Tibberaghny Marshes pNHA.	Accidental Spillages of Harmful Substances	**Negative**	**Moderate**	**Temporary**
	Excavation of Contaminated Soils	**Unlikely**	**Negligible Impact**	**Unlikely**
	Conversion of Permeable Soils to Hard standing	**Negative**	**Moderate**	**Temporary**

Operational Phase

The operational phase effects anticipated and considered throughout the lifetime of the operation of the facility are considered in detail in Section 8.5.4 of EIAR – Main Report and summarised in **Table NTS 8.3** below:

Table NTS 8.3: Operational Phase Effects (Unmitigated)

Receptor	Potential Environmental Effects	Quality	Significance	Duration
Groundwater Comeragh Groundwater Body	Attenuation Ponds	**Negative/ Neutral**	**Moderate**	**Permanent**
Surface Water Tinhalla stream, the River Suir and further downstream receptors Lower River Suir SAC/ pNHA and Tibberaghny Marshes pNHA.	Contaminated runoff	**Negative**	**Moderate/ Significant**	**Temporary**
	Conversion of permeable Soils to Hardstanding	**Negative**	**Moderate/ Significant**	**Temporary**
	Uncontrolled Releases and Spillages	**Negative**	**Slight/ Moderate**	**Temporary**
	Fire and Resultant Firewater	**Negative**	**Significant**	**Temporary**
	Uncontrolled Release of Discharge	**Negative**	**Significant**	**Temporary**
	Contaminated Runoff	**Negative**	**Moderate**	**Temporary**
Both	Foul Water	**Negative**	**Moderate/ Significant**	**Short-term**
	On-site Flooding	**Negligible**	**Not Significant**	**Unlikely**

8.3 Mitigation Measures

Construction Phase

General Mitigation Measures

An Outline Construction Environmental Management Plan has been provided with this planning application. This is a practical document which will include detailed procedures to address the main potential environmental impacts on site, encompassing soil, geology, noise, dust, air quality, surface and ground water, and highlights the proposed construction methods, activities and procedures.

A summary of all mitigation measures for the construction phase to ensure maximum protection of groundwater and surface water receptors is listed below:

Increased Run-off and Sediment Loading

- A temporary drainage system will be established complete with oil interceptors and settlement ponds to remove contaminants from run-off, prior to discharge off-site.
- Stockpile areas for sands and gravel should be kept to minimum size, well away from storm water drains and gullies leading off-site.
- Covers are to be provided over soil stockpiles when high wind and inclement weather are encountered if required.
- Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer.
- Landscaping to take place as soon as possible to reduce weathering.

Accidental Spillages of Harmful Substances

- Establishment of bunded oil and chemical storage areas.
- Refuelling of mobile plant in designated areas provided with spill protection.
- Fuel bowsers to be located in bunded areas which can cater for 110% of the primary vessel capacity or 25% of the total volume of the substance which could be stored withing the bunded area.
- Only appropriately trained site operatives permitted to refuel plant and machinery on-site.
- Regular inspections carried out on plant and machinery for leaks and general condition.
- Emergency response plan.
- Spill kits readily available throughout the site.
- Use of ready-mixed supply of wet cement products.
- Scheduling cement pours for dry days.

Increased Groundwater Vulnerability/ Excavation of Bedrock Aquifer

- Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer.
- Landscaping to take place as soon as possible to reduce weathering.
- Further trial pits are recommended pre-construction to determine soil depth to the east/northeast of the Proposed Development.
- Installation of impermeable liners is recommended under the attenuation ponds.

Excavation of Contaminated Soils

- Procedure in place for incidence of contaminated land within CEMP
- Contaminated soils encountered to be tested, quantified, segregated and transported for disposal by a licenced contractor

Conversion of Permeable Soils to Hard standing

- The rate of discharge to the stream will be restricted to a maximum permissible rate of 17.8 lit/sec. 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

- Floor levels upstream of the storage areas are at least 500mm above the top water level in the detention basins for the 100-year event.
- Overtopping does not occur during rainfall events ranging from 30 minutes to 1440 minutes. No risk of flooding of adjacent areas.
- Attenuation Pond will accommodate the total catchment area capacity and will provide a minimum storage capacity of 1151.8 m3 (designed to accommodate the estimated rainfall events)

In-Stream Works (Culverted Drain)

- 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.
- In stream works should adhere to Inland Fisheries Ireland, Guidance Document entitled: "Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016)" Contact should be made with IFI at the earliest possible stage regarding the installation of the culverts.

Operational Phase

A summary of all mitigation measures for the operational phase to ensure maximum protection of groundwater and surface water receptors is listed below:

General Mitigation Measures

An Environmental Management System (EMS) will be prepared and implemented by the operator during the operational phase.

The Proposed Development will operate under an Industrial Emissions Licence (IEL) issued by the Environmental Protection Agency (EPA). The licence will contain several conditions which the operator must remain in compliance with for the entire duration of the facility's lifespan. Typical conditions relating to the protection of water receptors include:

- Site specific trigger levels will be established and agreed with the EPA.
- Monitoring requirements for surface waters
- Resource use and energy efficiency
- Waste management control and documentation
- Storage and transfer of substances
- Facility management
- Accident prevention and emergency response including fire water retention
- Operational Controls

Contaminated Run-off

- Compared to untreated manures and slurries, biobased fertiliser poses a lower risk of nutrient leaching into watercourses. The balanced nutrient composition and slow-release nature of biobased fertiliser minimise the likelihood of excess nutrients washing away into streams or groundwater. This reduction in nutrient leaching coupled with land spreading best practice helps mitigate water pollution and eutrophication, safeguarding aquatic ecosystems and maintaining water quality.

- Drainage systems will be designed to attenuate excess surface water runoff with suitable storage volumes
- Reduction of outflow rate to below the existing greenfield runoff rate before discharging into the Tinhalla stream from attenuation ponds.
- Sumps in gullies and manholes collect silts in run-off from roads
- Where feasible, run-off will discharge to filter drains. The filter material will treat run-off before its entry to pipes
- Class 1 discharge bypass separator treats surface water for hydrocarbons run-off before its discharge to the attenuation pond
- 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.
- Regular inspection and maintenance of all treatment measures to remove accumulated silts and disposed of to an appropriately licenced landfill
- The digestion process area will be completely bunded and constructed to Eurocode standard (BS EN 1992-3)

Foul Water

- All sewage infrastructure to be installed in accordance with the relevant industry standards and pressure tested/CCTV surveyed prior to commissioning to ensure absence of defects
- Programme of inspection and maintenance to ensure any defects are repaired
- The wastewater treatment system will comprise a EuroTank BAF P6 EN12566/3 SR66 Certified Secondary Wastewater Treatment system with Tertiary Treatment via Eurotank TER3 P6 Packaged Tertiary Treatment unit on infiltration area of min 60m2.The overburden consisting of grey CLAY/ SILT is determined have sufficient absorption capacity to support Groundwater Protection Responses (GWPR). The trenches will be dug 500mm wide and will achieve a minimum separation distance between the trenches of 2m spacing (2.5m centre to centre) and to a depth of 850mm.
- The treatment plant will be specified and installed by an appropriately qualified technician and will be subject to regular desludging and maintenance, subject to manufacturers recommendations.

Increased Groundwater Vulnerability

- The site bunding is designed in accordance with IPC Guidance Note on storage and Transfer of Materials for Scheduled Activities (EPA, 2004)
- The tank farm area will be bunded in its entirety to ensure enough containment is provided in the unlikely event of a leak.
- The bund will be impermeable and provide the required storage volume i.e., a minimum of 110% of the largest single tank volume.
- Dedicated hard standing for off-loading areas, with a minimum separation distance from adjacent water courses.
- Use of spill kits, bunded pallets and secondary containment units, as appropriate.
- All bunds sized to contain 110% of the volume of the primary storage vessel.

- Environmental operating plan to include site specific standard operating procedures pertaining to waste management and emergency response.
- All bunds and pipelines (foul & process) will be subject to integrity assessments every 3 years by a suitably qualified engineer.

On-Site Flooding

- The existing flood risk to the Proposed Development is negligible with the proposed site located in 'Flood Zone C'. No specific mitigation measures to alleviate flood risk to the site are recommended.
- The proposed stormwater management system is designed in accordance with industry standards and is projected to emulate the current greenfield runoff rates calculated at the site.

Increase in Flood Risk to Receiving Catchment

Drainage systems will be designed to attenuate excess surface water runoff with suitable attenuation volumes for the site and reduce the outflow rate to below the estimated greenfield rate before discharging.

- An attenuation pond is provided to facilitate the existing gradients on the site. The attenuation pond is designed for a 1:100-year event and well as to regulate the outflow from the site.
- The attenuation pond will accommodate the total catchment area capacity and will provide a minimum storage capacity of 1,151.8m^3.

The attenuation pond will discharge the storm water and a flow control valve at the outfall from the basin will deliver a max flow less than that of greenfield run off of 17.8l/s.

Uncontrolled Releases & Spillage

- Use of spill kits, bunded pallets and secondary containment units, as appropriate.
- All bunds sized to contain 110% of the volume of the primary storage vessel or 25% of the total volume of the substance which could be stored withing the bunded area (in compliance with Guidance to storage and Transfer of Materials for Scheduled Activities, EPA 2004)
- EMS to include site specific standard operating procedures pertaining to waste management and emergency response.
- Impermeable membrane liner will be installed under the attenuation pond to limit percolation of contents into the underlying regionally important karst aquifer.
- The entire tank farm area of the Proposed Development will be bunded.
- The Reception Hall, Digestate Storage building and Nutrient Recovery Building will each be self-bunded.
- All bunds and underground pipelines (foul and process) will be subject to integrity assessments every 3 years by a suitably qualified engineer.
- Ongoing monitoring of stormwater discharge to the Tinhalla stream.

Fire and Resultant Water

The conclusions and recommendations of the Firewater Risk Assessment Report will ensure

that fire response and firewater retention are adequately scaled for the size of the facility. The operator of the facility will be obliged to ensure:

- Adequate firewater retention capacity is installed and maintained on-site in the event of a worst-case scenario fire event.
- Firewater retention will be the containment bund and underground tank in the reception building.
- All retention infrastructure systems will be automatically activated in the event of a fire alarm being triggered.

Conversion of Permeable Soils to Hard standing

- Sustainable Urban Drainage Systems (SuDS) such as such as sediment chambers, oil traps into drainage ditches and attenuation ponds included.
- Drainage systems will be designed to attenuate excess surface water runoff with suitable storage volumes for the Proposed Development and reduce the outflow rate to below the estimated greenfield rate before discharging.

Land Spreading of biobased fertiliser

- Nutrient management plans to avoid excess fertiliser application
- Farmers to comply with the Nitrates Action Plan
- “Lay-off” period of 21 days for grazing or harvesting following application
- Biobased fertiliser will be pasteurised in accordance with Regulation (EU) 142/2011 on use of animal by products as organic fertiliser.

Attenuation Pond

- The attenuation pond is designed for a 1:100 year event and well as to regulate the outflow from the site.
- Installation of Sustainable Urban Drainage Systems (SuDS) features such as Sumps in gullies and catchpits collect silts in run-off from roads, filter drains, discharge bypass separator and an attenuation pond.

8.4 Residual Impacts

Construction Phase

A summary of the predicted impacts associated with the construction phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 8.18** in Chapter 8 of the EIAR – Main Report.

The overall impact anticipated by the construction phase of the project following the implementation of suitable mitigation measures is considered to be ***neutral to negative***, ***imperceptible to slight***, and ***temporary.***

Operational Phase

A summary of the predicted impacts associated with the operational phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 8.19** in Chapter 8 of the EIAR – Main Report.

The overall impact anticipated by the operational phase of the project following the implementation of suitable mitigation measures is considered to be ***neutral to negative***, ***slight*** and ***short-term*** to ***long-term***.

9 Air, Odour and Climate

ORS conducted an assessment of the likely impact of the proposed development on the air quality, odour and climate within the proposed development site and the wider region.

The proposed development site is situated in Curraghagarraha and Reatagh, Carrick-On-Suir, Co. Waterford.

The objectives of this chapter (Chapter 9 – Air, Odour and Climate) are:

- To provide a baseline assessment of the receiving air environment in terms of air quality receptors.
- To identify any potential negative effects posed by the construction and operational phases of the Proposed Development.
- To propose suitable mitigation measures to prevent or reduce the significance of the negative effects identified.
- To consider any significant residual effects of cumulative effects posed by the Proposed Development.

9.1 Receiving Environment

Site Location and Receptor Identification

A qualitative assessment of construction dust has been undertaken in line with the IAQM 2024 guidance. The study area for this assessment was 250m from the Proposed Development boundary and or within 50m of the roads used by construction vehicles on the public road up to 250m from the site entrance.

The first stage is to assess the requirement for an evaluation. The requirement for an assessment is based on distances of human and/or ecological receptors of the site.

Human receptors are within 250m of the site boundary with two of those also being within 50m of the trackout route; consequently, construction dust does have the potential to cause an effect on these receptors. No designated ecological receptors are within 50m of the trackout route or site boundary; therefore, construction dust will not have the potential to effect adversely on ecological receptors.

T There are approximately 6 sensitive receptors within 250 meters of the site boundary and 13 within 50 metres of the applicable construction routes.

Human receptors are largely residential houses located to the Southeast and Northeast of the site. There are farmyards *ca.* 125m Southwest and 160m East of the site boundary.

he nearest human and residential receptor to the site is a residential house located approximately 50m South of the proposed site boundary. Dust will be created during the construction of the Proposed Development which may have adverse effects on local sensitive receptors e.g., residents living nearby.

The construction dust assessment study area including identified receptors is included as part of **Figure 9.1.**

Figure 9.1: Site construction boundary, buffer zones and receptor locations

Air Quality

Air quality monitoring programs are routinely undertaken by the EPA and Local Authorities. The most recent annual report on air quality "Air Quality in Ireland Report 2023" (EPA 2024), details the range and scope of monitoring undertaken throughout Ireland. As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes.

Onsite monitoring (and subsequent lab analysis as necessary) was carried out for the below parameters to evaluate background levels for the site. To remain as conservative and robust as possible figures obtained from EPA monitoring were utilised, as per AG4, which are greater than results obtained from the onsite monitoring. Onsite results for NH_3 and H_2S were utilised in the absence of data generated from EPA monitoring locations. Data from the Birr monitoring station was utilised for the Carbon Monoxide values and data from the Claremorris monitoring station was utilised for the $PM_{10/2.5}$ values. Fieldwork was completed January 2024 and consisted of the following elements;

- $PM_{2.5}$ and PM_{10} Monitoring (EPA Monitoring Station)
- NO, NO2 and NOx Monitoring
- SO2 Monitoring
- H2S Monitoring
- NH3 Monitoring
- CO Monitoring (EPA Monitoring Station)

Results can be seen below:

Compound	Site specific baseline monitoring 21st Dec 23 to 17th Jan 24
Carbon Monoxide 8-hr (Annual Mean) (1 Location)	< 0.57 (Below LOD of Monitoring Unit) (mg/m³)
Oxides of Nitrogen (Annual Mean) (4 locations)	Avg. 1.63 (Min 1.60 - Max 1.70) (µg/m³)
Sulphur Dioxide (Annual Mean) (4 locations)	Avg. < 1.52 (Min/Max < 1.52 (LOD)) (µg/m³)
Particulate matter as PM_{10} (Annual Mean) (1 Location)	Avg. 18.27 (Min 1.63 - Max 287.51) (µg/m³)
Particulate matter as $PM_{2.5}$ (Annual Mean) (1 Location)	Avg. 14.81 (Min 1.00 - Max 282.44) (µg/m³)
Ammonia (Annual Mean) (4 locations)	Avg 3.71 (Min 2.60 - Max 4.33) (µg/m³)
Hydrogen Sulphide (Annual Mean) (4 locations)	Avg 0.16 (Min <0.10 (LOD) - Max 0.23) (µg/m³)

In summary, existing baseline levels of the pollutants based on extensive long-term data from the EPA and field monitoring locations are below ambient air quality limit values in the vicinity of the proposed development. This indicates there is a relatively good level of air quality in the area of the proposed development.

9.2 Effects of the Proposed Development

Operational Effects

Process Emissions

AERMOD has been utilised to evaluate the air quality impact from the planned odour abatement emission source and also the from the two combustion sources positioned onsite i.e. the CHP and biomethane boiler.

There is also the possibility of emissions to air being generated from the planned gas upgrading plant, planned pressure relief valves, digestor vents at the site however, due to the nature and / or the infrequent use of these emission sources air dispersion modelling was not required to evaluate the possible impact from these sources. Digestor vents contain air only and used to control the pressure within the gas dome. There is no release of biogas through the digestor air vents. Pressure relief valves are not intended for routine use onsite. The PRV are only used in the event of all other gas outlets being simultaneously out of service. The usage of the emergency flares is envisaged to be infrequent and would operate for approximately 6% operating time/annum. The existence a gas flare is for times when the gas injection unit is not in operation, when the storage of gas has reached maximum capacity and that the CNG compression unit requires maintenance. Both Compressor and GIU would need to be down at the same time. The flare will have a capacity of 110% of the estimated maximum hourly biogas produced and will safeguard the secure and complete combustion of biogas where necessary. Flaring of gas is an infrequent occurrence and will only take place as a final option during a period of irregular operation i.e., during maintenance or breakdown.

AERMOD results give rise to the following conclusions:

Table 9.25 below compares the highest annual average predicted levels at the residential receptors where:

- The Process contribution (PC)- the maximum modelled concentration of the substance due to process emissions alone

- Predicted Environmental Concentration (PEC) – that is, the maximum modelled concentration due to process emissions combined with estimated baseline concentrations.
- PC and PEC as a percentage of the objective or guideline.

In relation to the predicted short-term peak 1-hr concentrations, twice the background concentration level was added to the predicted environmental concentration (PEC) (UK Environment Agency).

Table 9.25: Air Quality Summary

Pollutant	Limit Type	Value ($\mu g/m^3$)	Baseline ($\mu g/m^3$)	Max Level ($\mu g/m^3$)	PEC ($\mu g/m^3$)	PC of limit (%)	PEC of Limit (%)
Nitrogen Dioxide (NO_2)	99.8% max 1-hr	200	14.6	19.6	34.2	9.8	17.1
	Annual Avg	40	7.3	0.63	7.9	1.6	19.8
Carbon Monoxide (CO)	8-hr mean	10,000	0.3	101.6	101.9	1.0	1.0
Odour	98th %tile of 1-Hour	3	0	1.19	1.19	39.7	39.7

**The maximum annual average levels for Nitrogen Dioxide and Carbon Monoxide are predicted when the volume flow from the proposed facility is at 75%, rather than a maximum. Full details of the assessment undertaken at 75% volume flow are included in Appendix 9.5.*

It can be seen that the worst case predicted level at any residential locations in the vicinity of the development do not exceed the limit level when considered as a PC or PEC.

It should also be noted that the PC under maximum operations does not exceed 75% of the ambient air quality standards, based on the maximum emission limits of the stacks.

Nitrogen Deposition

A review has been completed with regard to emissions from the proposed development on critical levels and loads for designated sites within 15 km of site. The PC at all locations is less than 0.3kg.N/ha/yr, and as a result would be considered negligible for the purposes of the Nitrogen assessment.

In addition, it can be seen that the maximum predicted Nitrogen deposition is significantly <1% at all of the locations assessed, and the Critical Level of Nitrogen is not exceeded at any location.

Traffic

LA105 DMRB guidance gives details for assessing significance of air quality effects of a development in relation to nitrogen dioxide (NO_2) and particulate matter (PM_{10}). The table below describes the corresponding terms used to describe the level of significance from the DMRB in conjunction with EPA EIAR guidance.

Table 9.10 Traffic air quality effects (Operational Stage)

Magnitude of change in annual mean NO_2 or PM_{10} ($\mu g/m^3$)	Magnitude (DMRB)	Significance (EPA)

>4 (>10%)	Large	Significant, Very Significant, Profound
>2 (>5%)	Medium	Moderate
>0.4 (>1%)	Small	Slight
<0.4 (<1%)	Negligible	Not significant, Imperceptible

Traffic input data is included in **Appendix 9.3**. The DMRB Screening Method spreadsheet was used to forecast pollution concentrations at a receptor position. A robust and conservative approach was utilized when assuming background concentrations (i.e. 1.63 µg/m3 for NO2 and 18.27 µg/m3 for PM10 – average values taken from EPA Monitoring locations). **Table 9.11** (shown below) shows the results of "Do Minimum" (DM) and "Do Something" scenarios for 2025 assuming (as a worst-case scenario), receptors are 3m away from road links.

Table 9.11 Projected NO_2 and PM_{10} traffic concentrations

Receptor	NO_2				PM_{10}			
	DM (µg/m3)	DS (µg/m3)	Change (µg/m3)	Magnitude	DM (µg/m3)	DS (µg/m3)	Change (µg/m3)	Magnitude
R1	2.1	2.2	0.1	Negligible	18.39	18.40	0.01	Negligible

Climate

Due to the production of *ca.* 675 - 800 Nm^3 of biomethane per hour which will be exported and used as an alternative fuel to fossil fuels for regional energy and heat production, the net effect of the Proposed Development during the operational phase will be a slight, positive, long-term impact on climate and regional air quality. The (Gas Network Ireland) GNI predict that by achieving a net zero carbon gas network by 2050, at least 18.7 Mt per annum of CO_2 emissions would be saved which equates to circa 31% of Ireland's current emissions.

Construction Effects

Dust

Construction dust usually deposits within 200m of a construction area; however the bulk of this deposition will occur within the first 50m. There are no sensitive receptors (residential receptors) within 50m of the site. There are receptors within the construction traffic route however bulk deposition will have likely occurred within the first 50m. Therefore, the surrounding area can be classified as low risk with respect to construction dust effect in this regard. Emission effects from planned construction are finite and short-term, mitigation measures (outlined in **Section 9.6**) will also be in place through this stage, leading to air quality effects that will temporary, negligible and short-range.

Traffic / Emissions

Construction traffic and embodied energy of construction materials are likely to be a possible cause of greenhouse gas emissions because of construction related to the Proposed Development. Construction plant and machinery will lead to CO_2 and NO_2 emissions during construction of the planned development. Due to the period, nature and scale of construction,

CO_2 and NO_2 emissions from construction plant, machinery and embodied energy of construction resources will have a short-term and imperceptible impact on climate.

9.3 Mitigation Measures

Construction

Dust

The constant control of fugitive dust will maintain the prevention of significant emissions, instead of an inefficient attempt to manage them once they have been released. The main elements with respect to control of dust will be:

- The design of a site policy on dust and the allocation of the site management responsibilities for dust issues.
- The creation of a documented system for managing site practices regarding dust control.
- The development of a method by which the functionality of the dust minimisation plan can be consistently monitored and assessed; and
- The requirement of effective procedures to handle any complaints.

These procedures will be strictly monitored and assessed continuously throughout the construction stage. In the occurrence of dust nuisance outside the site boundary, activities likely to raise dust would be restricted and adequate procedures applied to resolve the problem before the recommencement of construction operations.

Traffic

Traffic emissions associated with site have been projected as not significant therefore no detailed mitigation/remediation related to air and climate emissions from traffic have been described.

Climate

Various site-specific mitigation methods can be applied throughout the construction stage of the Proposed Development to support emissions reduction. The restriction of on-site or delivery vehicles from leaving engines idling, even over brief periods. Reducing waste of materials due to inadequate timing or over stocking of materials on site will assist to minimise the carbon footprint of the site.

Operational

Odour

The following odour abatement measures have been integrated into the design of the plant:

- The reception hall has been constructed to accommodate multiple trucks to unload at any one time. This will significantly reduce the number of trucks waiting outside of the building and therefore minimising fugitive odour emissions on-site.
- The proposed reception hall will be sealed to prevent fugitive emissions from this building.
- All waste activities at the facility will be carried out within a ventilated building which will be extracted to an odour abatement system using ammonia scrubbing, UV treatment and active carbon filtration to remove odorous compounds. The building will operate under negative pressure with a minimum of 2 air changes per hour. Ventilation pipe work installed

in the headspace of the building will be connected to a high-volume medium-pressure blower that will draw off the warm, buoyant building air that will be generated by a combination of emissions from the feedstock materials in the intake area and from fugitive emissions from the movement of the material to the pre-treatment and digesters.
- The main entrances to the reception building will be fitted with rapid response roller shutter doors. A closed-door management strategy will be enforced.
- Treated emissions from the odour control plant in the reception building will be discharged via a 6.0m stack to enhance dispersion. The proposed location of the odour abatement system emission point within the site footprint was also designed to ensure that the distance between the emission point and the nearest sensitive receptors was maximised, thereby aiding dispersion.

The following additional mitigation measures will be adopted for the management of the Proposed Development:

- Vehicles exiting the reception building will be subjected to cleaning procedures in accordance with the DAFM Conditions Document in a designated cleaning area located outside of this door.
- Where there is a potential for odours from deliveries of feedstock, these will be delivered in covered or sealed containers.
- Feedstock delivery times will be controlled in order to minimise truck weighting times outside of the reception building and therefore minimising fugitive odour emissions on-site.
- Biobased fertiliser will be stabilised before storage and removal from the site in order to minimise odour generation.
- An odour management plan will be prepared for the operational phase of the site to ensure that all odour control methods applied are sufficient and assessed at regular intervals. The plan will also outline a procedure for addressing any odour complaints.

As described previously, the proposed development will be licenced by the EPA under the Industrial Emissions Directive and will therefore need to comply to all associated processes as directed by the IE licence to avoid significant impacts to local odour, climate and air quality.

Process Emissions

The proposed stack height for the CHP has been designed in an adaptive manner to guarantee that an acceptable height has been incorporated into site layout to support effective dispersion of emissions and comply with applicable EU ambient air quality standards at all offsite locations.

As a result of the air dispersion modelling evaluation, mitigation measures designed into site and planned supervision of the proposed AD facility, no supplementary abatement measures are planned for the CHP, flare and biomethane boiler stack during the operational stage of the development.

9.4 Cumulative Effects

Construction Phase

There is potential for cumulative dust effects at adjacent site receptors should the construction stage of the planned development overlap with the construction of any other authorised development within 250m of the site. Dust alleviation measures described in **Section 9.6.1**

shall be employed during the construction stage of the planned development preventing significant cumulative effects on air quality. Due to suitable mitigation measures in position, any cumulative impacts on air quality and climate linked with the construction stage of the planned development are considered ***short-term and not significant.***

Operational Phase

There is a pig farm in the immediate vicinity of the site, however cumulative impacts are unlikely, in terms of odour or air quality. Feedstock from the piggery will be transported directly to the proposed development. Any existing sources of emissions to air have been included by way of background air quality data during the air dispersion modelling phase.

Indirect Impacts

Ammonia emissions to air occurs from slurry and chicken manure spreading with the use of nitrogen fertilisers. Ammonia can create particulate matter in the atmosphere which can have adverse effects on human health.

Ammonia is one of the key air pollutants monitored and reported under National Emissions Ceiling Directive (2016/2284/EU) which was ratified to give effect to the landmark UNECE Gothenburg Protocol under the Convention on Long Range Transboundary Air Pollution in 1999. Under this directive Ireland's ceiling for ammonia is 116 Kt per annum, with an obligation to decrease ammonia emissions to 107.5 Kt by 2030 or by *ca.* 10%. In 2017 Ireland infringed its ammonia ceiling emitting 11 8.4 KT of ammonia.

Using slurry/chicken manure as a feedstock for the AD process instead of land spreading will reduce ammonia emissions to air. Also, the use of digestate as a biobased fertiliser instead of inorganic nitrogen fertiliser will further reduce ammonia emissions.

The digestate produced will meet prescribed standards for digestive quality respiration activity, metals, pathogenic organisms, impurities, organic matter and maturity. Digestate storage tanks will be covered to prevent rainwater ingress and as they will contain spent digestate there will be a lower odour potential from the digested storage tanks. The digestate will be spent by the time it is sent to the digestate storage tanks because of the digestion process; by which time all biomethane will have been extracted. The digestate will also have undergone pasteurisation during the process. Therefore, the potential for odour will have reduced at this stage.

Therefore, the Proposed Development will have a ***long-term slight positive*** indirect effect on air quality.

9.5 Residual Impacts

According to Environmental Protection Agency guidelines, Residual Impact is described as 'the degree of environmental change that will occur after the proposed mitigation measures have taken place.' The mitigation strategy above recommends actions which can be taken to reduce or offset the scale, significance and duration of the impacts on the surrounding odour, air quality or climate.

The purpose of this assessment is to specify mitigation measures where appropriate to minimise the 'risk factor' to all aspects of air quality such as to minimize the potential for odours to be generated, air quality limits to be exceeded etc. This 'risk factor' is reduced or offset by recommending the implementation of a mitigation strategy in each area of the study. On the implementation of this mitigation strategy, the potential for impact will be lessened.

A site-specific Construction Environmental Management Plan (CEMP) will be devised and implemented throughout the duration of the construction phase. This document will contain all the necessary procedures required to prevent and minimise any environmental risks posed by the project on the surrounding environment.

Construction Phase

A summary of the predicted impacts associated with the construction phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 9.29**.

The overall impact anticipated by the construction phase of the project following the implementation of suitable mitigation measures is considered to be ***negative, imperceptible to moderate, and temporary.***

Operational Phase

A summary of the predicted impacts associated with the operational phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 9.30**.

The overall impact anticipated by the operational phase of the project following the implementation of suitable mitigation measures is considered to be ***neutral to negative, imperceptible to slight, and temporary to long term.***

10 Noise and Vibration

Enfonic have been commissioned to conduct a noise impact assessment in relation to the proposed Anaerobic Digestion Facility (the Proposed Development) at Curraghnagarraha Reatagh, and Curraghballintlea Co. Waterford.

The methodology adopted for this noise impact assessment is summarised as follows:

- Review of appropriate guidance to identify appropriate noise and vibration criteria for the construction, operational and decommissioning phases;
- Quantify the receiving environment through baseline noise surveys at representative Noise Sensitive Locations (NSLs) surrounding the Proposed Development;
- Undertake predictive calculations to assess the potential effects associated with the construction phase of the Proposed Development;
- Undertake predictive calculations to assess the potential effects associated with the operational phase of the Proposed Development;
- Evaluate the potential noise and vibration effects;
- Specify mitigation measures to reduce, where necessary, the identified potential outward effects relating to noise and vibration from the Proposed Development; and
- Describe the significance of the residual noise and vibration effects associated with the Proposed Development.
- In addition, the following guidelines were considered and consulted for the purposes of this chapter:
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022); and
- EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), (2003).

10.1 Receiving Environment

Noise Sensitive Locations

A Noise Sensitive Location (NSL) is defied in EPA NG4 as

"any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels."

The study area is defined as any NSL that may be affected by noise from the Proposed Development. A representative sample of the closest NSLs is used in this assessment. Noise levels diminish over distance therefore these locations represent a worse-case evaluation.

Noise levels to the nearest NSLs as a result of operation of the Proposed Development are considered in this assessment with a commensurate reduction in levels at locations further away. The locations assessed are given in **Figure NTS 10.1** below:

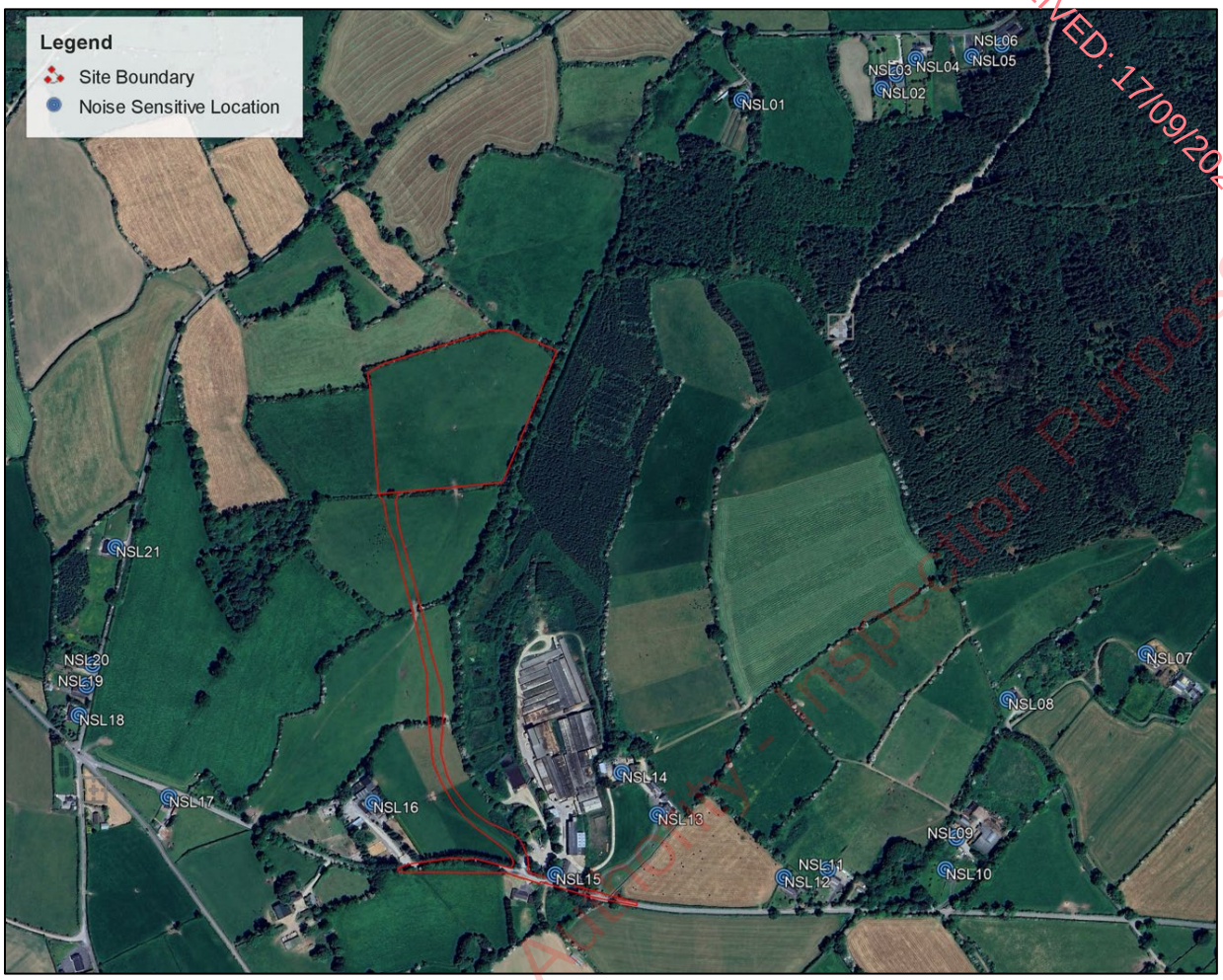


Figure NTS 10.2: Study Area and Noise Sensitive Locations (NSL)

Background Noise Survey

A noise survey has been conducted at the site in order to quantify the baseline noise levels within the study area. The survey was conducted in general accordance with ISO 1996: 2017: Acoustics - Description, Measurement and Assessment of Environmental Noise and followed the methodology contained in EPA NG4. Specific details are set out below.

Noise Monitoring Locations

Three Noise Measurement Locations (NMLs) were selected to represent the ambient noise conditions at the identified Noise Sensitive Locations.

Noise measurements took place between 13:00 – 15:00 on 16-April-2024. Monitoring took place between 16-April-2024 and 19-April-2024.

Attended noise measurement were taken during the daytime period at NML1 and NML2. An unattended noise monitor was installed at NML3 which monitored noise levels for several days and was used to establish night-time noise levels. The locations are as shown in **Figure NTS 10.2** below:

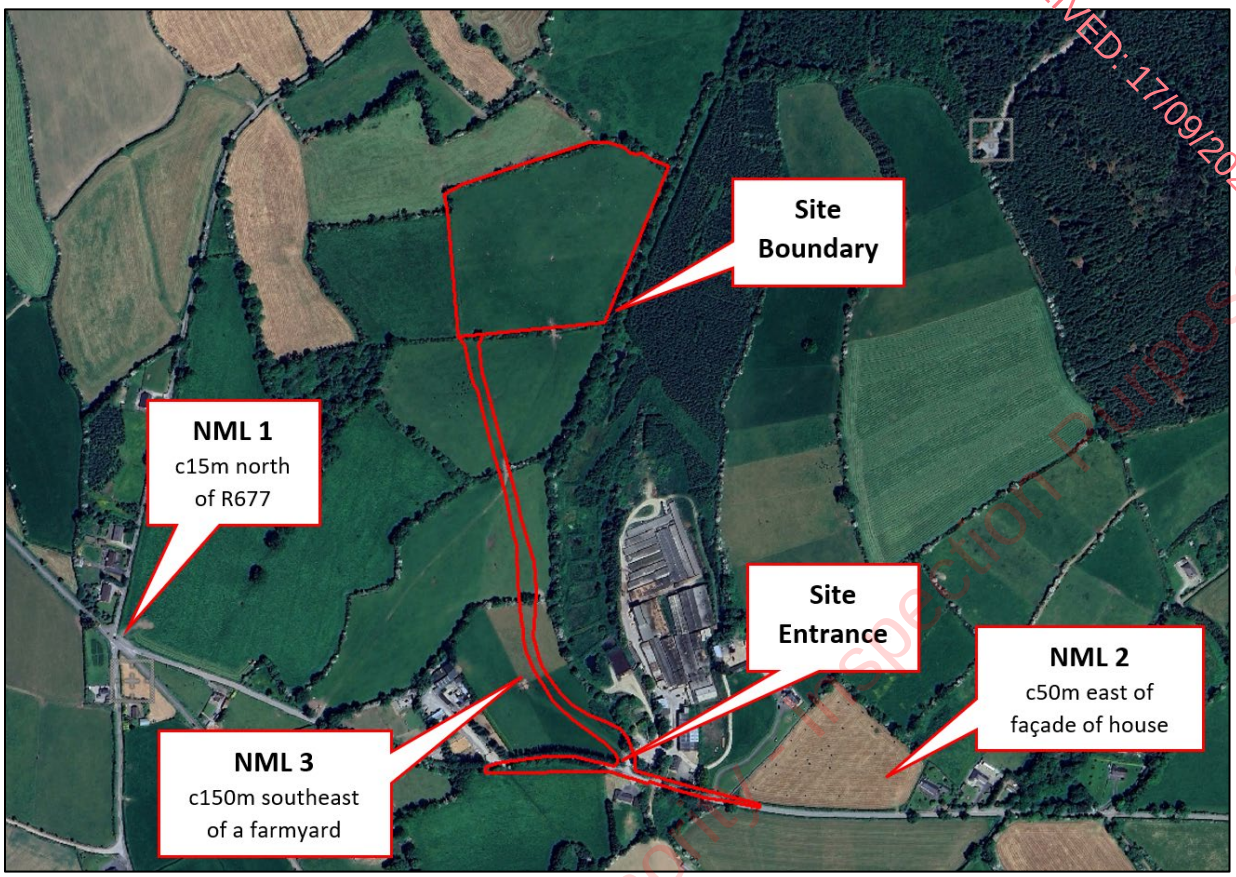


Figure NTS 10.2: Map of noise monitoring locations (NMLs) and site boundary

Survey Results

Day-time Levels

Noise measurements were taken using class 1 Bruel & Kjaer Type 2250 Sound Level Meters (SLMs). Each meter was calibrated prior to measurements and the sensitivity checked afterwards for any significant drift; none was found. Weather conditions were calm and dry throughout the survey.

Two rounds of non-consecutive 15min measurements were taken at the attended locations and the average of the results are used to set the prevailing Background (LA90) Daytime noise levels. The results are presented in Table **10.9**.

A summary of the Baseline Results can be found in **Table 10.9** (*EIAR Chapter 10 – Main report*).

The average typical Daytime Background (L_{A90}) noise level is: 45dB.

Night-time Levels

Night-time noise levels were derived from the unattended noise monitor at the NML3 location shown in **Figure 10.2** – a time-history plot of the average Night-time noise levels from here is given in Appendix B.

The average typical Night-time Background (L_{A90}) noise level is: 40dB.

10.2 Assessment of Impacts

In general, noise impact is a result of the noise levels of the sources, the distance from the source to a receiver, the intervening topography and built environment, the time of day and the existing background noise levels.

The impact assessment considers the construction and operational phases separately.

Do-Nothing Scenario

If the development is not progressed the existing noise environment (as measured in the baseline assessment) in the vicinity of the Proposed Development will remain largely unchanged. Traffic flows on the road network in the area are expected to grow over time with an associated increase in noise level.

Construction Phase

The appropriate methodology for the impact assessment of the construction phase is set out in *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1 Noise*. The standard sets out sound power levels and L_{Aeq} noise levels of plant items normally encountered on construction sites, which in turn enables the prediction of noise levels at selected locations.

An outline CEMP has been submitted in relation to the Proposed Development and will be updated when a definitive construction plan is formalised, to include mitigation outlined in this chapter. As a working initial hypothesis, the impact of assumed typical construction phases of work has been assessed.

Following a review of the baseline noise survey results (*Table 10.5 – EIAR main report*), the appropriate BS5228 construction noise category is A i.e. 65dB L_{Aeq}.

The impact assessment considered the impact of the following potential noise sources from construction phase works at the development:

- Construction Noise
- Construction Traffic
- Construction Vibration
- Extension of the Gas Network Pipeline

Description of Effects

With respect to the EPA's criteria for description of effects, the potential worst-case effects at the nearest NSLs associated with the above aspects of the construction phase are described **Table NTS 10.1** below:

Table NTS 10.1: Summary of Description of Effects (Construction Phase - Unmitigated).

Aspect	Quality	Significance	Duration
Construction Phase	Negative	Slight	Temporary
Construction Traffic	Negative	Not Significant	Temporary
Gas Pipe Extension Works	Negative	Significant	Temporary

Operational Phase

The facility will operate 24 hours per day, 7 days a week, as Anaerobic Digestion is a continuous biological process. However, feedstock deliveries and removal of digestate will only occur between the hours of 0800 and 1830 Monday to Friday, and 0900 to 1300 on Saturday. There will be no deliveries or removal of digestate on Sundays and on Bank Holidays.

The most stringent noise impact assessment is for the Night-time period due to the lower measured Background (L_{A90}) noise levels of 40dB compared with the Daytime level of 45dB.

Each of the potential operational noise sources were identified and reference sound power data assigned. The data has been sourced from manufacturers datasheets, noise source databases, and BS 5228-1:2009+A1:2014 standard.

The associated noise sources with the Proposed Development are described in **Table 10.15** (*EIAR Chapter 10 – main report*).

The location of the noise sources is concentrated in the eastern and western sides of the development.

A computer-based noise propagation model has been prepared to predict the noise levels. **Section 10.6.12** (*EIAR Chapter 10 – main report*) discusses the methodology behind the noise modelling process and presents the results.

The assessment criteria can be summarised as follows:

BS4142 (Daytime)

There is likely to be no adverse impact during the Daytime period as the predicted levels are below the existing Background (L_{A90}) noise levels at all NSLs.

BS4142 (Night-time)

There is likely to be no adverse impact during the Daytime period as the predicted levels are below the existing Background (LA90) noise levels at all NSLs.

EPA IE License

Operation noise emission levels will satisfy the criteria as set out in the Environmental Protection Agency (EPA) (2016) *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities* (NG4) which should be referenced in the site's IE license.

Description of Effects

With respect to the EPA's criteria for description of effects, the potential worst-case effects at the nearest NSLs associated with the proposed development are described in **Table NTS 10.2** below:

Table NTS 10.2: Summary of Description of Effects (Operational Phase - Unmitigated)

Aspect	Quality	Significance	Duration
Daytime Period	Negative	Imperceptible	Long-term
Night-time Period	Negative	Imperceptible	Long-term

10.3 Mitigation Measures

Construction Phase

The Construction Environmental Management Plan (CEMP) will deal specifically with management processes and strategic mitigation measures to remove or reduce significant noise and vibration impacts, and cumulative noise and vibration impacts from the construction works. The Plan will also define noise and vibration monitoring and reporting. The CEMP will also include method statements for each phase of the works, the associated specific measures to minimise noise and vibration in so far as is reasonably practicable for the specific works covered by each plan and a detailed appraisal of the resultant construction noise and vibration generated.

The contract documents shall specify that the Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures when deemed necessary to comply with the recommendations of BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction on open sites – Noise. The following list of measures will be implemented, where necessary, to ensure compliance with the relevant construction noise criteria:

- No plant used on site will be permitted to cause an on-going public nuisance due to noise.
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working for the duration of the contract.
- Compressors will be attenuated models, fitted with properly lines and sealed acoustic convers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.
- Any plant, such as generators or pumps, which is required to operate before 07:00hrs or after 19:00hrs will be surrounded by an acoustic enclosure or portable screen.
- During the construction programme, supervision of the works will be include ensuring compliance with the limits detailed in Section 6.2.1 using methods outlined in BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.
- The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 07:00hrs and 19:00hrs weekdays and between 08:00hrs and 16:00hrs on Saturdays. However, any necessary or emergency out of hours working will be agreed in advance with the local Planning Authority.

Operational Phase

The contribution of the individual noise sources were ranked and the most significant are given in **Table NTS 10.3**:

Table NTS 10.3: Summary of most significant noise sources.

Item
Exhaust Stack (CHP)
Cooling Fan (Biogas Upgrading System)
Biogas Blower (CHP)

The impact assessment adopts a worst-case scenario with all noise sources operating simultaneously and continuously. In reality the noise levels and the impact will be less.

There are no mitigation measures required to minimise the impact of the operational phase with the exception of regular maintenance of the plant and suitable assessment of any replacement plant that may be required in the future.

Decommissioning Phase

It is anticipated that the decommissioning phase will adopt a similar approach to the

construction phase of this assessment including the same noise criteria. To minimise the potential impact on noise sensitive locations, mitigation measures in line with those proposed for the construction phase are proposed.

Monitoring

Noise and vibration emissions may be monitored by the planning and/or licensing authority as required to ensure compliance with conditions and in the event of complaint.

10.4 Residual Impacts

Construction Phase

The assessment identified that there is potential for elevated noise levels during the construction phase and mitigation measures are prescribed as applicable. However, given the nature of the work there may be occasions where there are residual effects. It is therefore considered that the residual impact will be ***slight*** and for a ***brief period***.

Operational Phase

During the operational phase, the Night-time predicted noise levels may be above the existing baseline noise levels at the limited number of Noise Sensitive Locations close to the facility. Mitigation measures are prescribed as applicable. A new noise source will be introduced into the environment however the noise levels for the vast majority of NSLs are ***insignificant***.

11 Landscape and Visual

The landscape and visual impact assessment (LVIA), concerns itself with landscape, landscape values, aesthetic and visual amenity and landscape as a resource which provides society with cultural, economic, and environmental benefits. Landscape has come to be defined according to the European Landscape Convention as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'.

The assessment is informed by EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022 and the methodology prescribed in the Guidelines for Landscape and Visual Impact Assessment, 3rd edition, 2013 (GLVIA) published by the UK Landscape Institute and the Institute for Environmental Management and Assessment.

Although interlinked, the Landscape Impact and the Visual Impacts are assessed separately and with their own sets of criteria.

Landscape

The effects on landscape are studied with Landscape Character Assessment (LCA) as the guiding principle. This is concerned with the identification of and assessment of the importance of landscape characteristics, landscape quality and the condition of the landscape.

The impact of the development itself is studied as the impact of the proposals and development on the landscape, whilst 'effect' describes the changes brought about by these impacts e.g., a change to landscape character.

Visual

Visual assessment is concerned with changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area's visual amenity.

Methodology for Landscape Assessment

The baseline descriptions are required to consider the context of the landscape and views in terms of the proposed location, magnitude and spatial extent of landscape affected as well as current trends in that landscape/view.

The methodology for conducting a Landscape and Visual Impact Assessment (LVIA) is a structured approach designed to evaluate the potential effects of a proposed development on the landscape and visual environment. This comprehensive process involves several key stages, which are outlined below:

- Baseline Information
- Thresholds of Magnitude of Change
- Landscape Quality
- Value
- Landscape Sensitivity
- Geographical Extent
- Loss/No Loss of Landscape Elements
- Magnitude of Landscape Change
- Probability of Effects

- Significance of Effects
- Duration of Effects
- Environmental Protection Agency Guidelines
- Methodology for Visual Effects Assessment:
    - Susceptibility of the Visual Receptor to Change
    - Value attached to the view
    - Categories of Viewpoint Sensitivity
- Magnitude of Change to the View
- Significance of Visual Effects
- Mitigation Measures

11.1 Baseline Conditions

The following headings in relation to Landscape and Visual baseline conditions were assessed:

- Ordnance Survey Ireland Historical Maps
- Landscape Associations
- Waterford City and County Development Plan LCA
- Landscape Character Assessment Policy Objectives
- General Landscape Policies and Objectives MCDP
- Landscape Value
- Geological Heritage
- Landscape Character Type
- Recreation and Tourism

The following baseline conditions are deemed to be of notable value to the assessment:

- The landscape has not generally changed significantly. The development of the local pig unit and housing are apparent but it is the change in field size that has had the most effect on landscape pattern.
- The typological classification (Waterford City and County Council - Landscape Character Assessment) describes the landscape around the site of the Proposed Development as type 2 Farmed Lowlands.
- The landscape sensitivity at the site of the Proposed Development is low. It is close to high sensitivity landscapes and most sensitive landscapes
- The following policies and objectives of the WCDP are relevant for the Proposed Development: **Landscape Policy & Objectives L01, L02, L03** and **L S04** (see Section **11.3.7** EIAR Chapter 11, Main Report for full details)
- There are no scenic routes or protected views affected by the Proposed Development.
- There are no sites of geological importance relating to the site of the Proposed Development.
- Landscapes with designated wetlands will not be affected by the Proposed Development. The closest is south of Killowen on a bend on the River Suir.
- There are no tree preservation orders on or near the site of the Proposed Development. The closest is Curraghmore, south of the site, west of Portlaw town.
- Replacement planting along the proposed sight lines will generate some consolidation of the hedgerow close to the entrance of this facility which, as it matures, will improve the industrialised appearance of the palisade fences, gates and different materials used at the existing entrances.
- Considering highly scenic viewing points, scenic views, and scenic routes it can be

seen there will be no effect on any due to the Proposed Development.

- There are no (SPA,SAC ,NHA or pNHA) within the boundaries or close to the Proposed Development.
- There are no Natura designated areas affected by the Proposed Development
- The archaeological influence is minimal with a crannóg being the closest to the site of the Proposed Development.
- The enclosing topography, screening vegetation and the presence of the existing pig units, offer a high potential to absorb new development. The area also has good capacity to support new vegetation e.g. trees, tall hedges etc.

Landscape Effects

The landscape sensitivity for this landscape character unit (Rathgormuck Lowlands) has been assessed as **low.** The presence of the large pig unit shapes the character of the landscape although it is well set in its current location benefitting from forestry descending to the edge of the farm.

The example of agricultural/renewable energy development represented by the Proposed Development, is likely to be widely conceived as appropriate unless siting and design are poor. Good efforts to design a rurally appropriate facility and integrate it into its landscape context have been made in the landscape proposals with a good response to the topographical levels of the overall facility in the iterative design process.

Although the ranking is low for this landscape's sensitivity, it is partially only fully described according to the definition below and merits as much protection as can be afforded.

Low Areas; Where the landscape has few valued elements, features or characteristics and the character is weak. The character is such that it has capacity for change; where development would make no significant change or would make a positive change. Such landscapes are generally unrecognised in policy and the principle management objective may be to facilitate change through development, repair, restoration or enhancement.

View Effects

Considering highly scenic viewing points, scenic views, and scenic routes it can be seen there will be no effect on any due to the Proposed Development.

11.2 Predicted Impacts

Landscape Construction Phase

The changes to the landscape will occur during the construction stage. There will be a new scale introduced into the landscape. The presence of the existing pig units and associated infrastructure near the site of the Proposed Development reduces the sensitivity of the existing landscape to change. The opportunity to restore elements of the landscape character on the public road will slightly improve the landscape character of the area

Landscape Sensitivity: **Low**

The overall Magnitude of Change will be '**medium**'.

Setting a **low** landscape sensitivity against a **medium** magnitude of change gives a '**slight**'

rating for significance of effects at the construction phase of the Proposed Development.

Landscape Operational Phase

There will be no change to the landscape form or structures placed therein from the construction phase as the facility becomes operational. There is an expected slight increase in traffic at the facility. As part of the landscape proposals it is recommended that there will be a significant mixed native and naturalised tree planting wrapping around the facility.

The sight lines realignment has provided for some new hedgerow to replace the palisade fencing and a brick and concrete road boundary which will mature over the operational phase of the project. The addition of a screening hedgerow softening the appearance of the industrial palisade fencing will contribute positively to landscape character. Maturing trees will make a positive contribution to the landscape also. The replacement hedgerow on the southern sight line although sharp will have matured during the operational phase.

Landscape Sensitivity: **Low**

Magnitude of Change: **Medium**

Setting a low landscape sensitivity against a medium magnitude of change gives a '**slight**' rating for significance of effects at the operational phase of the Proposed Development.

Significance of effects: **Slight**

In the absence of mitigation, the effect will be adverse and long term.

11.3 Visual Assessment

In conducting the visual assessment for the Proposed Development, issues relating to views and viewpoints were considered including the amount of time over which a view would be experienced, the angle of the view and whether views would be full, partial or glimpsed. The distance from the Proposed Development was considered and the extent of the area over which the proposed works would be visible. Again, as for the landscape effect, the duration of the visual impact was considered. The duration of the visual effects is considered as appropriate. As per EPA guidelines, duration of effects is categorised as follows:

Short-term Effects: Effects lasting one to seven years

Medium-term Effects: Effects lasting seven to fifteen years

Long-term Effects: Effects lasting fifteen to sixty years

Permanent Effects: Effects lasting over sixty years

Visual Impact – Construction Phase

The area around Curraghnagarraha, Reatagh and Curraghballintlea was visited on 7th February 2024 and 2nd July 2024 for assessment and viewpoint appraisal and again on 11th July 2024 for photography for verified photomontage production. The visual impact assessment is to be read with the 3Dimensional, verified photomontage booklet which accompanies this report. (Chapter 11 - EIAR Main Report). The site location and its hinterland were examined.

There are specific considerations at each viewpoint which are addressed in **Section 11.5.4** (Chapter 11 - EIAR Main Report)

The selected viewpoints were assessed, and this is summarised as outlined in **Table NTS 11.1** below:

Viewpoint No.	Location	Sensitivity	Magnitude of Change	Significance of Effects	Nature of effects
VP1	Tinahalla	High	Negligible	Slight to Not Significant	Neutral
VP2	Curraghnagarraha	High	Medium	Significant	Negative
VP3	Curraghnagarraha	High	Medium	Significant	Negative
VP4	Curraghnagarraha	High	Medium	Significant	Negative
VP5	Reatagh	High	Negligible	Slight to Not Significant	Neutral
VP6	Portlaw Wood	High	Negligible	Slight to Not Significant	Neutral

Visual Impact – Operational Phase

The operational phase of the Proposed Development will not have any additional large impacts on visual receptors. There will be no change to structures in the views from the construction phase. There will be more vehicular movement into and out of the facility affecting mainly viewpoints 3 and 4. There are specific considerations at each viewpoint which are addressed here below.

There are specific considerations at each viewpoint which are addressed in **Section 11.5.5** (Chapter 11 - EIAR Main Report)

Viewpoint No.	Location	Sensitivity	Magnitude of Change	Significance of Effects	Nature of effects
VP1	Tinahalla	High	Negligible	Slight to Not Significant	Neutral
VP2	Curraghnagarraha	High	Low	Moderate to Slight	Negative
VP3	Curraghnagarraha	High	Low	Moderate to Slight	Negative
VP4	Curraghnagarraha	High	Low	Moderate to Slight	Negative
VP5	Reatagh	High	Negligible	Slight to Not Significant	Neutral
VP6	Portlaw Wood	High	Negligible	Slight to Not Significant	Neutral

'Do Nothing' Scenario

It is likely that the pig unit will continue to expand, with the slurry continuing to be land spread. The pig farm and it structures will have a landscape and visual impact at similar viewpoints as indicated in this report. Trends in the existing environment will indicate that field size may increase over the coming years and this could result in the further loss of hedgerow field boundaries.

There would be no visual or landscape impact experienced at the construction phase due to the construction of the site or its structures.
Cumulative Impact

11.4 Cumulative Impact

The cumulative impact of the Proposed Development with the preexisting pig unit and accompanying infrastructure is already largely considered for both landscape and visual receptors. There are no other known proposals of a similar nature planned for this area. The significance of effects will therefore be no greater on the landscape or visual receptors than as assessed above. The landscape sensitivity is still rated as **low** whilst the magnitude of change will be **medium.** The significance of effects for the cumulative impact of the Proposed Development will be **slight** as assessed according to the matrix as set out in Table 11.1 (Chapter 11 – EIAR Main Report). The duration of the impact will be long term with the mitigating effect of the landscape proposals reducing the effect as time goes by.

11.5 Mitigation Measures

The following landscape protection and landscape impact mitigation measures should be put in place to avoid, eliminate or minimise any potential landscape and visual impact associated with the construction of the Proposed Development.

- Any area of site subject to soil disturbance is to be repaired, the soil reworked into the site, recontoured and modelled. Matching sod/seed sown to blend the topography back into the rural landscape.
- All construction materials, fill, gravel, etc to be removed from the site and surrounding fields once the works are complete.
- An irrigation plan to be put in place to allow for establishment of plantings with irrigation water source to be identified prior to the spring of the first year of planting. A plan to irrigate in hot weather and as required to be put in place especially for the first two years after planting. Recovered process water may be used.

Avoidance Prevention Reduction and Offsetting

Mitigation is discussed below as a measure of avoidance, prevention, reduction and offsetting of impacts and effects. The positioning of the digestion tanks into the topography by retaining the bunds and sloping the access into the site of the Proposed Development has prevented the structures breaking the skyline at specific viewpoints and reduced its impact. Other measures include;

Disease

- The avoidance of *Fraxinus excelsior*, ash, in any infill planting in the hedgerow system will not only protect existing landscape trees from the biologically infectious chalara disease, but it will also protect the local habitats that ash supports for as long as possible, by avoiding this biosecurity risk.

- Any plant materials brought on site to bulk out the plantings during the operational phase of the project to be disease free, to at a minimum hold all relevant plant passports and preferably be sourced field grown and inspected at source prior to planting. This is to avoid spreading potential infections to local populations. All trees and shrubs will conform to the specification for nursery stock as set out in British Standard 3936 Parts 1 (1992) and 4 (1984). Advanced Nursery stock trees if used in tree planting shall conform to BS 5236.

Topsoil

- Avoid bringing any additional topsoil on site. Use local soil to make localised repairs. Where additional topsoil is required use from a matching source as local as possible to the Proposed Development. Do not mix topsoil and sub soil during construction. Identify storage area where soils are to be stored separately until they are reworked into the soil.

Invasive Species

- Avoid spreading or bringing invasive plant species onsite in soil or plant materials. Soil and plant material hygiene to be observed and plant, boots, tools and equipment to be clean before being brought on site. All involved at the construction stage to be made aware of this prior to coming on site.

  Invasive Alien Plant Species include;
  - Japanese knotweed *Fallopia japonica*
  - Giant knotweed *Fallopia sachalinensis*
  - Bohemian knotweed *Fallopia x bohemica*
  - Himalayan knotweed *Persicaria wallichii*
  - Old man's beard *Clematis vitalba*
  - Winter heliotrope *Petasites fragrans*
  - Garden Yellow Archangel *Lamiastrum galeobdolon ssp argentatum*

  Of these, knotweed is most likely to be problematic if introduced onsite.

- Palisade fencing is to be softened by placing new hedgerow and hedgerow trees on the boundary line with the security fencing tucked inside. This reduces the effect of industrial items on landscape character in rural areas.

- All hedgerows and hedgerow trees to be protected during the construction process with a root protection zone established outside the dripline of the trees and hedges whichever is greater, prior to the commencement of construction . No root systems to be trenched severed or cut and there is to be no piling of building materials, soil, plant, containers or any loading material on the protected root zone during construction. All parties involved in the construction process to be made aware of this avoidance measure. No unnecessary damage is to occur to the existing tree and hedgerow complex during construction or afterwards during operations.

- Planting specifications to be overseen by a qualified landscape architect during the

construction and operational period as required

Reinforcing landscape

- Stone walls are in good condition and it is recommended that they receive local repairs with any damage received during construction to be repaired in the traditional manner. Repairs are not to be carried out using heavy machinery but rather in the manner of traditional hand worked stone walls.

- All plantings to be properly executed and irrigated with correct amounts of fertiliser and pruning given to ensure plant health and vigour.

Landscape Maintenance and Management Plan

- A landscape management plan is to be produced and ready post construction so that all new and existing planting, hedgerows, and trees will be immediately cared for and promptly maintained. This plan along with any necessary method statements to be produced during the operational phase of the planting by a qualified landscape architect.

- Landscape maintenance and management plans ought to remain in place until all plantings are fully established and during the life of the Anaerobic Digestion Facility. The aim of the plan is to continue to ensure landscape character is maintained as well as biodiversity and habitat protection.

- A landscape maintenance and management plan will include a small woodland/hedgerow management plan and will address appropriate hedgerow cutting, timing of operations, protection of hedgerow habitats, address irrigation of newly planted trees or infill plants, accessing water, pruning, weeding, fertilising, trimming, management of dead and diseased wood, and general maintenance. Any areas requiring artificial shelterbelt to help them establish are to be identified at the outset after planting is commenced. Plant establishment to be provided for appropriately. All amelioration as required for good plant establishment to be tailored to the plants, trees and hedgerows to satisfy their growing needs.

- The mitigation measures as outlined are conducted throughout the life of the operation.

- Periodically the landscape maintenance and management plans to be reviewed to ensure growth, screen establishment and general appearance of the site is fulfilling its original intent.

- Hedgerow maintenance and laying are to occur outside of the nesting season and where hedgerows are weak and require significant work to rejuvenate the hedgerows.

11.6 Interactions and Cumulative Impact

Other environmental impacts which will interact with landscape and visual impacts in the case of this Proposed Development are Biodiversity and Archaeology under the following headings (see **Section 11.7**, **Chapter 11**, EIAR Main Report for details):

- Biodiversity and Carbon Absorption
- Interaction of the LVIA with Archaeology

11.7 Residual Impacts

Once all mitigation measures have been implemented and there is ongoing care provided to the landscape tree planting and hedgerows over the life of the project, the Proposed Development will not be hidden but it will be effectively screened.

Viewpoints 2, 3 and 4 will experience a view of the proposals diminishing consistently in the medium to long term.

12 Traffic & Transport

ORS conducted an assessment of the likely impact of the proposed development on the traffic flows and transport infrastructure within the site of the Proposed Development and the wider area.

The proposed development site is situated in the townlands of Curraghnagarraha, Reatagh, and Curraghballintlea, Co. Waterford

The objectives of this chapter (Chapter 12 – Traffic & Transport) are to assess:

- The prevailing traffic conditions on the public road network in the vicinity of the Proposed Development that may influence conditions.
- The potential effect on the surrounding road network due to the anticipated traffic generated by the Proposed Development.
- The proposed access arrangements for the Proposed Development.
- Review of committed developments adjacent to the Proposed Development.
- The pedestrian, cyclist and public transport connectivity in the vicinity of the site.
- The parking requirements for the site.

12.1 Receiving Environment

Traffic and transport-related infrastructure considered in relation to the Proposed Development are listed below:

- Site Access
- Car Parking
- Cycle Storage
- Existing Road Network
- Proposed Road Network Improvements
- Existing Traffic Flows
- Committed Developments Traffic Generation
- Future Year Traffic Growth

Site Access

The site takes in an area of the existing public road to the south of the main site area, to provide for access to the development. Vehicular access to the site is through a new proposed priority T-junction off the Old Scrouty Road to the south of the site. 10No. car parking bays are provided to the south of the office area, while the central circulation area close to the CO2 tanks will be used for articulated lorry turning and reversing. An internal asphalt road that will provide access to the Energy Hub to the southeast.

The proposed access was designed to accommodate the expected HGV traffic and was designed in accordance with the Transport Infrastructure Ireland (TII) publication DN-GEO-03060.

The proposed site access road is a single lane carriageway of approximately 4m wide. Due to the limited width, passing bays will be created at three locations from the access junction off the Scrouty Road and northwards up to the site entrance. These bays will facilitate the simultaneous passage of two large vehicles.

Car Parking

The site will have between 3No. to 5No. staff members on site at the same time. The number of parking spaces provided for staff and visitors of the development is 10No. spaces, located adjacent to the office building, with 1No. being an accessible parking space and 3No. being dedicated EV charging points. The parking spaces provided can be considered sufficient for the expected levels of traffic associated with the site.

Cycle Storage

Due to the nature of the development and the reduced number of staff accessing the site, trips by bicycle are not anticipated. There are currently no bicycle lanes on the R677 and no dedicated means of accessing the site by bicycle other than by the proposed access point off the Old Scrouty Road.

Despite this, the Proposed Development includes provision for 10No. bicycle parking spaces, aligning with the guidelines established in the Waterford City and County Development Plan.

Existing Road Network

The Proposed Development plans include providing vehicular access from Scrouty Road to the south of the site. This access will primarily be via the Regional Road R677, located southwest of the site, and will utilise the Scrouty Road/Rath Road/L4031/R677 junction, commonly known as Piquet's Crossroads. Piquet's Crossroads is a 4-arm priority junction combined with a T-junction where Scrouty Road meets the R677. Most of the traffic associated with the site is expected to use this junction for both arrivals and departures.

The R677 is a two-way flow single carriageway approximately 6 metres wide with no hard shoulders available on either side of the carriageway. The R677 has a posted speed limit of 80 km/h. The R677 connects to the R676 to the north, approximately 1.7 km from the assessed junction, and to the R678 to the south, ca. 5 km from the junction.

The Old Scrouty Road is a narrow single-lane carriageway, approximately 5.5 metres wide, that accommodates two-way traffic and provides access to the regional road R677 to the west. The junction with the R677 is currently equipped with readable road markings, which are crucial for effectively guiding drivers. At present, a 'STOP' sign is in place, along with a 'STOP' road marking that is partially worn out.

There are no footpaths or cycle lanes provided along the R677 and the Old Scrouty road, in the vicinity of the site access. With a width of 6 metres, the R677 road does not provide sufficient space for pedestrian or cyclist access to the site without the provision of substantial development of active travel infrastructure in the surrounding area.

Proposed Road Network Improvements

At present, Waterford City and County Council have no improvement schemes on the R677 or the Scrouty Road that would affect the Proposed Development.

Existing Traffic Flows

Manual junction turning counts (JTC) have been undertaken at the junction on Thursday 30th May 2024 by ORS team members. The traffic counts were carried out during a 3-hour period from 08:00-9:30 AM and from 17:00-18:30 PM. The traffic counts have been used to obtain accurate data on the prevailing traffic conditions along the road network in the vicinity of the site and to predict future traffic conditions. The traffic counts encompassed all movements of traffic: pedal cycles, cars, buses, LGVs and HGVs. The final number of traffic is presented in Passenger Car Unit (PCU). PCU is the impact that a mode of transport has on traffic compared to a single car, e.g., a private car represents 1 PCU whereas an HGV represents 2.3 PCUs.

During the morning peak period, a total of 113 PCUs were recorded, with 63 heading towards Carrick-on-Suir town and 13 towards Old Scrouty Road. In the PM peak, the majority of traffic moved again northbound along the R677, totalling 66 PCUs, with 24 headed towards Old Scrouty Road. Overall, the observed traffic along Piquet's junction, in the vicinity of the site during the PM peak was 166 PCUs.

Results are summarised in **Table NTS 12.1** below.

Table NTS 12.1: May 2024 Traffic Counts

Junction	AM Peak (PCU)	PM Peak (PCU)
1 – Piquet's Crossroad Junction	113	166

Committed Developments Traffic Generation

As part of this Traffic Assessment, to assess the existing and expected traffic along the road network in the vicinity of the Proposed Development, the Waterford County Council planning website was consulted to include all committed developments in the area.

As per the records available on the Waterford County Council planning website, there is a single application (PA 21171) that was granted permission on the 1st of June 2021 and can potentially utilise the road network in the vicinity of the Proposed Development. It consists of a single storey residential unit. However, this cumulative effect has not been considered in the junction modelling analysis in **Section 12.5.2** (Chapter 12 - EIAR Main report), due to its anticipated negligible impact.

Future Year Traffic Growth

The Proposed Development is aimed to be fully constructed and operational in 2026. The assessment of future year traffic growth is based upon central growth forecasts extracted from the TII Publication PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, published in October 2021. **Table NTS 12.3** displays predicted traffic flows along the site access for the year of the development conclusion, 5-year, 10-year and 15-year after the development conclusion.

Table NTS 12.3: Traffic Flows in Future Design Years (PCUs)

Design Year		R677 Towards Carrick-on-Suir	L4031 towards Tinhalla	R677 Towards Ballyquin	Rath Road	Old Scrouty road towards the Site	Total Movements
2024	AM	64	6	28	2	13	113
	PM	67	5	37	33	24	166

2026	AM	66	6	29	2	13	117
	PM	69	5	38	34	25	172
2031	AM	71	7	31	2	14	126
	PM	75	6	41	37	27	185
2041	AM	77	7	34	2	16	136
	PM	81	6	45	40	29	200

12.2 Assessment of Impacts

Construction Phase

Construction traffic associated with the Proposed Development will include:

- Construction personnel accessing the site by private vehicles and vans
- Delivery of materials (here include what type of materials) by vans and HGVs
- Earthworks machinery (excavators, rollers and dumper trucks) transported by HGVs
- HGVs for the export surplus excavated material

It is expected a maximum of 8No. to 10No. construction personnel to be at the site at the same time and the deliveries to be arranged during off-peak hours.

Table NTS 12.4 below shows the expected generated traffic during construction phase.

Table NTS 12.4: Expected Traffic During Construction Phase

Time Range	Arrivals	Departures	Total
08:00-09:00	10	0	**10**
17:00-18:00	0	10	**10**

Operational Phase

The operation of an Anaerobic Digestion Facility involves producing renewable biogas through the decomposition of organic feedstock. The site will be operational 24 hours a day for 7 days a week with staff onsite during normal working hours from 6 AM to 8 PM. Outside of these hours, the process is monitored remotely. There are no shifts, and it is expected that between 3 and 5 staff members will be present at the premises during normal working hours. The Proposed Development will receive an intake of approximately 90,000 tonnes of feedstock per annum for anaerobic digestion. The process will produce a methane-rich biogas, which is converted into renewable energy or upgraded to biomethane which is injected to the natural gas grid, and a nutrient-rich fertiliser known as ‘biobased fertiliser’.

The solid materials will arrive at the site by HGV/Walking Floor and the liquid form feedstock will arrive in bulk tankers. The average tonnes per load are assumed to be 30 tonnes. It is expected that traffic will be spread out throughout the day in order to minimise traffic issues in the road network. However, in the event of deliveries arriving at the same time, the site will be able to cater for the traffic flows, as the access road and internal road layout of the site can accommodate the expected traffic without generating congestion on the main road.

Table NTS 12.5 illustrates the expected AM and PM traffic flows associated with the Proposed Development.

Table NTS 12.5: Expected AM and PM Traffic Flows

	Arrivals	Departures	Total
AM	12	7	19
PM	6	11	17
Average movements			**18**

The trip rate profile for the Proposed Development has been interpreted from first principles and has been sufficiently loaded to reflect a 'worst-case scenario'. The trip rates are relevant given the type of development and the type of use. The trips found indicate that the level of traffic activity associated with this type of development is small and will correspond to approximately 4% of the AADT observed along the R677 in the vicinity of the site. The figures derived from the first principles analysis are very robust, as a 'worst case scenario', the total daily trips expected from the development are 48.

Regarding the HGV numbers generated from the site, of the 48No. trips associated with the site, 38No. will be composed of heavy vehicles. Traffic counts reveal that during the morning peak, 5% of the traffic on the R677 consisted of HGVs, with no heavy vehicles turning onto Scrouty Road. In contrast, during the PM peak, 15% of HGV traffic turned from the R677 onto Scrouty Road, while 3.5% of HGVs exited Scrouty Road onto the R677. Consequently, the additional HGV movements from the site are projected to increase HGV volumes on the R677 southbound direction to 23% during the AM peak and to 31% along the Scrouty Road during the PM peak.

Consequently, the traffic generated by the Proposed Development meets the criteria for producing a full Traffic and Transport Assessment, even though it will only add up to 24No. additional trips to the wider road network during the morning peak - a 18% increase, driven primarily by the area's very low existing traffic volumes. Given that the majority of site-related traffic will consist of HGVs, junction modelling has been conducted to assess the impact of the Proposed Development on the existing junction.

The full Traffic and Transport assessment is outlined in **Section 12.5.2** (Chapter 12 -EIAR Main report)

12.3 Mitigation Measures

Construction Phase

A summary of all mitigation measures for the construction phase to ensure minimum impact on traffic and transport infrastructure is listed below:

- A detailed Traffic Management Plan (TMP), produced in accordance with Chapter 8 of the Traffic Signs Manual, will be finalised and agreed upon with the Local Authority prior to construction works commencement. The following mitigation measures are proposed during the construction phase of the development.
- Appointment of a Construction Project Manager to be responsible for the day-to-day implementation of measures outlined in the TMP
- Identify routes to be used in the delivery and export of materials to the site and routes that shall be avoided by HGVs
- Monitor the condition of the roads throughout the construction period and a truck-mounted vacuum mechanical sweeper will be assigned to roads along the haul route as required

- Access to the site to be monitored at all times by a banksman who will direct traffic safely into the construction site and facilitate the safe navigation of larger construction vehicles

Operational Phase

The operational phase of the development will generate a maximum of 48No. vehicle movements day, where 38No. are HGVs and 10No. are private vehicles and vans. The additional vehicles will represent a maximum of 18% increase in traffic but will not generate increased queues and delays along the road network in the vicinity of the site, therefore, no mitigation measure is proposed for the operational phase of the development.

12.4 Residual Impacts

The proposed construction and operational phase of the development will generate a minimal impact on the road network in the vicinity of the site. The proposed mitigation measures proposed in Section 12.6 will also help reduce or eliminate any potential impact associated with the proposal. The proposal, located off the Scrouty Road, is located in an 80km/h speed limit zone and the narrow road width will not give rise to potential hazards, on the other hand, will reduce traffic speeds and increase road safety benefits.

Queuing of vehicles is not anticipated on the Scrouty Road due to the low number of vehicles predicted to enter the site on a daily basis and the incorporation of 3No. passing bays, along the proposed site access road, that will facilitate the safe passage of two vehicles at the same time. The proposal will have no negative impact on the overall road network associated with the proposed construction and operational phase of the site.

Overall, it is assessed that the development will have a **neutral**, **slight** and **long-term** effect.

13 Archaeology & Cultural Heritage

Site Overview and Archaeological Context

The proposed development site is *ca.* 2.9km southeast of the town of Carrick-on-Suir, Co. Tipperary and approximately 19.5km northwest of Waterford City, Co. Waterford. The site comprises improved grassland bordered by mature trees and hedgerow situated in a flat, low-lying pasture landscape. The total area of the site measures *ca.* 7.7 ha. There are no National Monuments within the site boundary. The nearest monuments, two fulachtaí fia (WA003-094-- & 94001--) are located *ca*. 200m to the west of the site. There are no other features of Cultural Heritage significance in the immediate vicinity.

Cultural Heritage Assessment

The assessment aimed to identify potential impacts on archaeological and cultural heritage resources through a desktop study and field survey, following guidelines from the Department of Housing, Local Government and Heritage, the National Monuments Acts (1930-2005), and the Waterford City & County Development Plan 2022 – 2028. Archaeological testing conducted on December 18, 2023, revealed no significant findings.

No significant archaeological or cultural heritage features were found within the proposed development site, and appropriate measures have been taken to ensure minimal impact on the surrounding environment.

13.1 Existing Environment

Archaeological Baseline Data

A comprehensive assessment was conducted to identify potential impacts on archaeological and cultural heritage resources. This included a desktop study, field survey, and archaeological testing, following guidelines from relevant authorities. Archaeological testing on December 18, 2023, revealed no significant findings.

No significant archaeological or cultural heritage features were found within the proposed development site. Appropriate measures were taken to ensure minimal impact on the surrounding environment, complying with relevant guidelines and regulations.

Site Inspection

A field inspection was conducted on December 19, 2023, to assess Proposed Development site and its immediate environs, noting, and recording the terrain type and land usage, the presence of features of archaeological or historical significance and visually investigating any suspect anomalies observed to determine their nature and provenance where possible. Any anomalies observed were investigated to determine their nature and origin. The inspection revealed no features of archaeological significance.

Results of Archaeological Testing

There are no monuments recorded by the National Monuments Service within the site boundary. The are located *ca*. 200m to the west of the site. The nearest site of cultural heritage significance is 1.4 km to the east There are no other features of Cultural Heritage significance in the immediate vicinity

13.2 Potential Effects

Potential Direct Effects

Recorded Archaeological Monuments

The Proposed Development will have no direct physical effect on known archaeological sites and monuments.

Unrecorded Archaeological Monuments or Features

There is a low to moderate potential for unrecorded sub-surface deposits surviving below ground within the project area and the proposed pipeline route.

Architectural Sites

The Proposed Development will have no direct physical effect on known architectural sites.

'Do Nothing Scenario'

If the Proposed Development were not to proceed, there would be no effect upon the archaeological, architectural, or cultural heritage resource.

Potential Effects on the Setting/Operational Effects

Impacts on Setting can be reduced with sensitive site development and screening.

13.3 Cumulative Effects

The permitted and proposed developments within a 500m study area have been considered as part of the cumulative impact assessment. As the Proposed Development will not result in any impacts on the architectural heritage resource, no cumulative impacts have been identified.

13.4 Mitigation Measures and Residual Effects

The mitigation strategies recommend archaeological testing prior to construction, with a qualified archaeologist overseeing the process, to assess and manage any discovered archaeological materials. All findings will be reported to the relevant authorities, and appropriate preservation or excavation measures will be implemented as needed, subject to approval by the National Monuments Service.

14 Material Assets

ORS conducted an assessment of the likely impact of the proposed development on the material assets within the site of the Proposed Development and the wider area.

The proposed development site is situated in the townlands of Curraghnagarraha, Reatagh, and Curraghballintlea, Co. Waterford.

The objectives of this chapter (Chapter 14 – Material Assets) are:

- To provide a baseline assessment of the receiving built services in the vicinity of the Proposed Development.
- To identify any potential negative effects posed by the construction and operational phases of the Proposed Development.
- To propose suitable mitigation measures to prevent or reduce the significance of the negative effects identified.
- To consider any significant residual effects of cumulative effects posed by the Proposed Development.

14.1 Receiving Environment

Material Assets considered in relation to the Proposed Development are listed below:

- Roads Infrastructure
- Foul Water Network
- Surface Water Network
- Public Water Network
- Gas Infrastructure
- Electricity Network
- Telecommunications Network
- Municipal Waste

The following paragraphs provide an overview of the existing receiving environment in relation to Material Assets under the aforementioned headings.

Roads Infrastructure

The Proposed Development plans include providing vehicular access from Scrouty Road to the south of the site. This access will primarily be via the Regional Road R677, located southwest of the site, and will utilize the Scrouty Road/Rath Road/L4031/R677 junction, commonly known as Piquet's Crossroads. Piquet's Crossroads is a 4-arm priority junction combined with a T-junction where Scrouty Road meets the R677. Most of the traffic associated with the site is expected to use this junction for both arrivals and departures

At present, Waterford County Council have no improvement schemes on the R677 or the Scrouty Road that would affect the Proposed Development.

Foul Water Network

In its present state, there exists no established connection to the surrounding foul water network.

The Proposed Development will have 10 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. A domestic scale wastewater treatment plant is proposed, and it has been concluded that the soils at the Proposed Development have sufficient absorption capacity for the installation of a percolation area.

Surface Water Network

At present, the site does not feature dedicated surface water infrastructure. The existing ground level slopes steeply downwards from southwest to northeast. Ground conditions at the site are known to be relatively poor with low sub-soil permeability.

Public Water Network

There is no existing connection to the public water network on site. Potable and welfare water will be provided by the public network during the operational phase of development. Any other water, for example, wash water, will be supplied from rainwater harvesting and treated process water.

The increase in public water demand will be calculated in accordance with Irish Water – Code of Practice for Water Infrastructure.

All public water supply infrastructure shall be designed and constructed in accordance with Irish Water documents “Code of Practice for Water Infrastructure” and “Water Infrastructure Standard Details”.

Gas Infrastructure

Biomethane will be supplied to the existing gas network via the 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 will be owned and operated by Gas Networks Ireland.

GNI has confirmed that the existing grid capacity is adequate to accommodate the production output of the Proposed Development.

All works to the existing and proposed gas pipelines will be carried out by GNI in accordance with *Standard I.S. 328 2021 Gas transmission – Pipelines and pipeline installations*.

Electricity Network

The Proposed Development will be powered by the onsite CHP unit and Solar PV during normal operation, with power supply from the grid provided only as a backup.

Telecommunications Infrastructure

The Proposed Development will feature an office and canteen facility which will require connections to telephone lines and Wi-Fi.

Municipal Waste

Assuming a volume of 50l of waste arising per employee per week, it is estimated that weekly waste arisings will equate to approximately 300l per week. The associated mitigation measures to limit their impact are discussed in more detail in the outline Construction Environmental Management Plan (CEMP) that accompanies this application

14.2 Assessment of Impacts

Construction Phase

The construction phase is likely to yield the most disturbance to existing material assets in the vicinity of the site. Potential construction phase impacts are considered in detail in Section 14.5.1 of the EIAR – Main Report and summarised in **Table NTS 14.1** below:

Table NTS 14.1: Construction Phase Effects (Unmitigated)

Asset	Potential Environmental Effects	Quality	Significance	Duration
Roads Infrastructure	Increased flow of construction-related traffic. Establishing the pipeline connection to the existing gas network will require the implementation of temporary traffic management measures along the Old Scrouthy Road, Rath Road and the R680.	**Negative**	**Slight-Moderate**	**Temporary**
Foul Water Network	During the construction phase, welfare facilities for staff will be supplied via portable toilets and waste collected and tankered offsite. A domestic scale wastewater treatment plant is proposed for installation during construction stage. It has been concluded that the soils at the Proposed Development have sufficient absorption capacity for the installation of a percolation area.	**Negative**	**Slight**	**Temporary**
Surface Water Network	Contaminated runoff reaching surface water receptors. Spillage of contaminants such as fuels, oils, chemicals, and cement material and subsequent migration into surface water receptors.	**Negative**	**Slight**	**Temporary**
Public Water Network	Disruption to existing network while establishing connection.	**Negative**	**Slight**	**Brief**
Gas Infrastructure	Disruption to existing network while establishing connection.	**Negative**	**Slight**	**Temporary**
Electricity Network	Power supply for plant and machinery during the construction phase will be predominantly supplied by generators onsite.	**Negative**	**Slight**	**Temporary**

	There may be partial disruption to the existing electricity network as connection to the grid via the substation is established.			
Telecommunications	Disruption to existing network while establishing connection.	**Negative**	**Slight**	**Brief**
Municipal Waste	The Proposed Development will generate a range of non-hazardous and hazardous waste materials during site excavation and construction. Waste materials will be required to be temporarily stored on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues.	**Negative**	**Slight**	**Temporary**

Operational Phase

The operational phase effects anticipated and considered throughout the lifetime of the operation of the facility are considered in detail in Section 14.5.2 of the EIAR – Main Report and summarised in **Table NTS 14.2** below:

Table NTS 14.2: Operational Phase Effects (Unmitigated)

Asset	Potential Environmental Effects	Quality	Significance	Duration
Roads Infrastructure	A new access road will be constructed and connected to the pre-existing road network.	**Positive**	**Slight**	**Long-Term**
Foul Water Network	Wastewater from welfare facilities and canteen will be treated using a proprietary system as recommended in Site Suitability Assessment.	**Negative**	**Slight**	**Long-Term**
Surface Water Network	Establishment of clearly defined work areas which can be monitored and isolated if required, for example, the bunded area. The Proposed Development includes two attenuation ponds which will be used for attenuation of surface water and to control the rate of the discharge from the Proposed Development. Run-off will be channelled through sediment chambers, oil traps, drainage systems and attenuation ponds. Leakage / spillage of biobased fertiliser or feedstocks via vehicle movements.	**Negative**	**Slight**	**Long-term**

Public Water Network	Potential contamination to the local aquifer Potential risk to human health	**Negligible**	**Slight**	**Long-term**
Gas Infrastructure	Biomethane will be supplied to the existing gas network via the Grid Injection Unit (GIU) and a pipeline connecting the site to the existing medium pressure distribution gas pipeline located to the south of the Proposed Development. The GIU comprises equipment which will ensure that the biomethane is compliant with all necessary standards and regulations before it enters the gas network. It is projected that the Proposed Development will produce 1350-1600 Nm^3 of biomethane per hour, to be supplied to the existing gas network.	**Positive**	**Significant**	**Long-Term**
Electricity Network	An ESB substation will be constructed and will provide connection to the national grid, although this source of power will serve only as a backup.	**Negative**	**Slight**	**Long-Term**
Telecommunications	Increased demand on existing network.	**Negative**	**Slight**	**Long-Term**
Municipal Waste	Increased waste production of ca. 300l per week. Increased demand on waste collection services.	**Negative**	**Slight**	**Long-Term**

14.3 Mitigation Measures

Construction Phase

A summary of all mitigation measures for the construction phase to ensure maximum protection of material assets is listed below:

Roads Infrastructure

- A detailed Traffic Management Plan (TMP), produced in accordance with Chapter 8 of the Traffic Signs Manual, will be finalised and agreed upon with the Local Authority prior to construction works commencement.
- Appointment of a Construction Project Manager to be responsible for the day-to-day implementation of measures outlined in the TMP
- Identify routes to be used in the delivery and export of materials to the site and routes that shall be avoided by HGVs
- Monitor the condition of the roads throughout the construction period and a truck-mounted vacuum mechanical sweeper will be assigned to roads along the haul route as required

- Access to the site to be monitored at all times by a banksman who will direct traffic safely into the construction site and facilitate the safe navigation of larger construction vehicles.
- Traffic management measures will be implemented on a temporary basis while connections underground services (gas, telecommunications, water) are established.

Foul Water Network

- Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer.
- All foul water infrastructure to be installed in accordance with the relevant industry standards.

Surface Water Network

- A temporary drainage system will be established complete with oil interceptors and settlement ponds to remove contaminants from run-off, prior to discharge off-site.
- Stockpile areas for sands and gravel should be kept to minimum size, well away from storm water drains and gullies leading off-site.
- Covers are to be provided over soil stockpiles when high wind and inclement weather are encountered, if required.
- Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer.
- Landscaping to take place as soon as possible to reduce weathering.
- Harmful materials such as fuels, oils, greases, paints and hydraulic fluids must be stored in bunded compounds well away from storm water drains and gullies. Refuelling of machinery should be carried out using drip trays.

Public Water Network

- Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer.
- Consultation with Irish Water be undertaken prior to works on the existing public water network and notification given to local population.

Gas Infrastructure

- All works to the existing and proposed gas pipelines will be carried out by GNI in accordance with Standard I.S. 328 2021 Gas transmission – Pipelines and pipeline installations.

Electricity Network

- Consultation with ESB and Dial-Before-You-Dig platforms prior to works on the existing electricity network.
- Implement best practice measures when working on electricity lines.
- Inform the public of when works are to be carried out to ensure they are aware of any temporary interruptions in power supply that may occur.
-

Telecommunications Network

- Consultation with ESB and Dial-Before-You-Dig platforms prior to works on the existing electricity network.
- Implement best practice measures when working on electricity lines.
- Consultation with Eir and Dial-Before-You-Dig platforms prior to works on the existing telecommunications network.
- Implement best practice measures when working on telecommunications lines.
- Inform the public of when works are to be carried out to ensure they are aware of any temporary interruptions in power temporary telecommunications outages that may occur.

Municipal Waste

- Inform staff through toolbox talks/training etc on the relevance and importance of correct waste segregation and management.
- Ensure waste receptacles available for the different identified waste streams to ensure proper and efficient segregation of waste onsite.
- Install signage to promote and encourage proper waste segregation, recycling etc.
- Ensure bins/skips are not allowed to overflow to prevent litter build-up onsite.
- Ensure all bins have lids and skips are covered when be removed offsite to prevent littering elsewhere.
- Ensure waste is collected by a registered vendor and disposed of at a facility licenced to take said waste.
- Maintain good waste records onsite to ensure all is accounted for.
- Concrete Washout Skip: Chutes of concrete trucks are only to be washed out into an impermeable lined (polythene) skip. The washout water is to be treated prior to discharge.
- The concrete washout skip is to be located to the east of the site, where the overburden is greater.
- Excavations lined with an impermeable liner are not permitted as concrete washout bays.
- Large excess loads of concrete are to be returned to the supplier or poured into concrete block modules (Betonblock or similar design) in order to minimise waste and reduce the risk of concrete being dumped throughout site.

Operational Phase

A summary of all mitigation measures for the operational phase to ensure maximum protection of material assets is listed below:

Roads Infrastructure

- The operational phase of the development will generate a maximum of 36 vehicles a day, where 26 are HGVs and 10 are private vehicles and vans. The additional vehicles will represent a maximum of 4.95% increase in traffic and will not generate increased queues or delays along the road network in the vicinity of the site, therefore, no mitigation measures are proposed for the operational phase of the development.

-

Foul Water Network

- A regular schedule of foul infrastructure inspection and maintenance will be carried out over the lifetime of the Proposed Development.
- The onsite WWTP will be subject to regular desludging and maintenance, subject to manufacturer recommendations.

Surface Water Network

- Dedicated hard standing for off-loading areas will be established, with a minimum separation distance from adjacent water courses.
- Use of spill kits, bunded pallets and secondary containment units, as appropriate.
- All bunds sized to contain 110% of the volume of the primary storage vessel.
- All bunds and pipelines (foul & process) will be subject to integrity assessments every 3 years by a suitably qualified engineer.
- Surface water drainage features onsite will undergo routine inspection and maintenance to ensure absence of blockages or leaks.
- The site will be subject to annual inspections from the EPA which will assess compliance with conditions outlined in the IEL. Surface water outflows from the site will be assessed as part of these inspections to ensure emissions from the site are compliant with the license.

Public Water Network

- Waste water, such as wash water, will be supplied from rainwater harvesting or from treated process water. This water will undergo UV treatment prior to use and storage.

Gas Infrastructure

- An Environmental Management System (EMS) will be prepared and implemented by the facility management company during the operational phase. This is a practical document will include detailed procedures to address the things like water and energy usage, waste management etc.
- The GUI and gas connection pipeline will be installed and maintained by Gas Networks Ireland. All works to the existing and proposed gas pipelines will be carried out by GNI in accordance with Standard I.S. 328 2021 Gas transmission – Pipelines and pipeline installations.

Electricity Network

- Utilisation of power from the public grid will serve only as a backup. Power usage for the Proposed Development under normal operating conditions will be supplied by CHP and solar PV array onsite.

Telecommunications Network

No mitigation measures are proposed for the operational phase of the Proposed Development. The onsite office/canteen/staff welfare facility will require a constant telecommunications connection meaning a slight negative impact to the existing network is unavoidable.

Municipal Waste

- Inform staff through toolbox talks/training etc on the relevance and importance of correct waste segregation and management.
- Ensure waste receptacles available for the different identified waste streams to ensure proper and efficient segregation of waste onsite.
- Install signage to promote and encourage proper waste segregation, recycling etc.
- Ensure bins/skips are not allowed to overflow to prevent litter build-up onsite.
- Ensure all bins have lids and skips are covered when be removed offsite to prevent littering elsewhere.
- Ensure waste is collected by a registered vendor and disposed of at a facility licenced to take said waste.
- Maintain good waste records onsite to ensure all waste is accounted for.

14.4 Residual Impacts

Construction Phase

A summary of the predicted impacts associated with the construction phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 14.3** in Chapter 14 of the EIAR – Main Report.

The overall impact anticipated by the construction phase of the project following the implementation of suitable mitigation measures is considered to be ***negligible to neutral, imperceptible to slight,*** and ***brief to temporary***.

Operational Phase

A summary of the predicted impacts associated with the operational phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 14.4** in Chapter 8 of the EIAR – Main Report.

The overall impact anticipated by the operational phase of the project following the implementation of suitable mitigation measures is considered to be ***negligible to positive***, ***slight to significant***, *and* ***long term***.

15 Interaction Between Effects on Different Factors

15.1 Introduction

In an Environmental Impact Assessment Report (EIAR), the interactions between chapters are crucial for providing a comprehensive understanding of how different environmental factors influence each other.

Each environmental topic chapter of this EIAR includes a dedicated section on interactions with other relevant factors. This approach is considered to meet with the requirements of applicable EU and Irish law. The likely interactions between one topic and another have been discussed under each topic chapter by the relevant specialist consultant. ORS ensured collaboration among specialist consultants to address the likely interactions between effects predicted from the proposed development. This ensured that appropriate mitigation measures were incorporated into the design process.

This section on interactions identifies the potential of unplanned but potential interactions that could occur during construction and operation of the proposed development. **Table 15.1** below identifies where it is predicated, that interactions could occur.

Table 15.1: Matrix summarising potential interactions noted between factors

Interaction	Biodiversity	Pop. & Human Health	Lands, Soils, Geology	Hydrology & Hydrogeology	Air, Odour, Climate	Noise & Vibration	Landscape & Visual	Traffic & Transport	Archaeology & Cultural Heritage	Material Assets
Biodiversity	*N/A*	✓	✓	✓	✓	✓	✓	✗	✗	✗
Population & Human Health	✓	*N/A*	✓	✓	✓	✓	✓	✓	✗	✓
Lands, Soils & Geology	✓	✓	*N/A*	✓	✗	✗	✗	✗	✗	✗
Hydrology & Hydrogeology	✓	✓	✓	*N/A*	✗	✗	✗	✗	✗	✓
Air, Odour & Climate	✓	✓	✗	✗	*N/A*	✗	✗	✓	✗	✗
Noise & Vibration	✓	✓	✗	✗	✗	*N/A*	✗	✓	✗	✗
Landscape & Visual	✓	✓	✗	✗	✗	✗	*N/A*	✗	✗	✗
Traffic & Transport	✗	✓	✗	✗	✓	✓	✗	*N/A*	✗	✓
Archaeology & Cultural Heritage	✗	✗	✗	✗	✗	✗	✗	✗	*N/A*	✗
Material Assets	✗	✓	✓	✗	✗	✗	✗	✓	✗	*N/A*

✓ Interaction ✗ No interaction

16 Schedule of Mitigation

16.1 Introduction

This EIAR has assessed the impacts and resulting effects likely to occur as a result of the Proposed Development on the aspects of the receiving environment, grouped under the following headings:

- Population & Human Health
- Biodiversity
- Lands, Soils & Geology
- Hydrology & Hydrogeology
- Air, Odour & Climate
- Noise & Vibration
- Landscape & Visual
- Traffic & Transportation
- Archaeology & Cultural Heritage
- Material Assets

Annex IV(7) of the EIA Directive, as amended, requires that the EIAR should include '*a description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases"*.

The Proposed Development will be constructed and operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. Where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance.

This Chapter of the EIAR collates and summarises the mitigation and monitoring measures detailed in **Chapter 5.0** to **Chapter 14.0.**

Mitigation and monitoring measures proposed during the construction phase are outlined in **Chapter 16** and the **Construction Environmental Management Plan (CEMP)** which accompanies this planning application**.** The main contractor appointed to construct the development will be obliged to carry out the programme of works in strict accordance with the CEMP, thus minimising the effects of the construction phase on the local environmental receptors. The local authority will be responsible for enforcing the conditions of the CEMP.

Mitigation and monitoring measures proposed during the operational phase are outline in **Chapter 16**. The site will be operated under an Industrial Emissions Licence and will be regulated by the Environmental Protection Agency (EPA), Department of Agriculture, Food and the Marine (DAFM) and the Local Authority (Waterford City and County Council).

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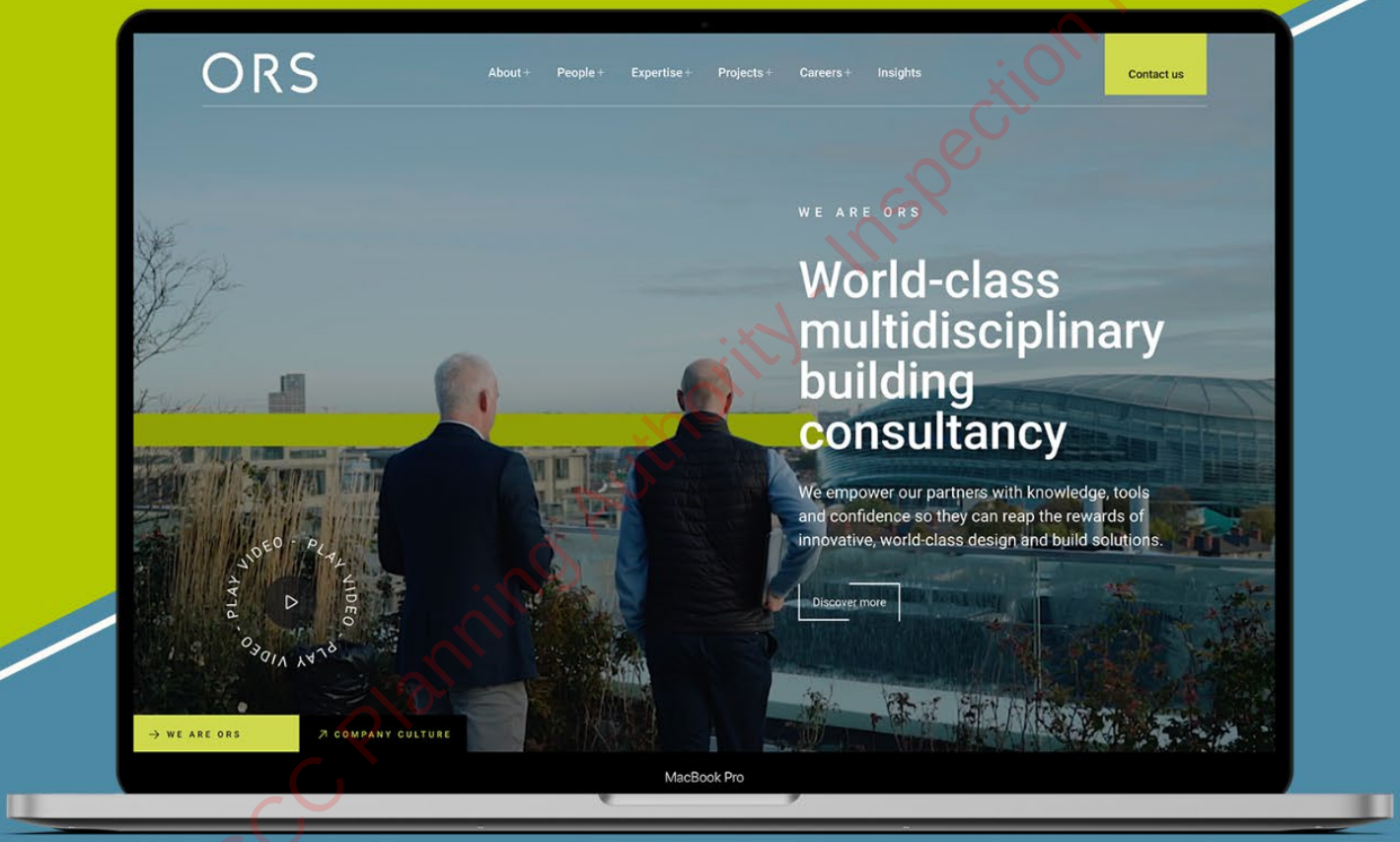

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