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Proposed Anaerobic Digestion Facility, Ballyvass, Co. Kildare
EIAR Volume I: Non-Technical Summary

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1 Introduction

1.1 Introduction

Cycle0(IE) Limited (the Applicant) are pleased to submit this EIAR in support of a planning application for the construction and operation of a Renewable Biogas Facility at a site in Ballyvass, Co. Kildare.

The Proposed Development, spanning approximately 5.12 hectares, is designed to process up to 90,000 tonnes annually of locally sourced agricultural manures, slurries, dairy processing residues, and crop-based feedstocks. Its primary objective is to produce grid-quality biomethane (renewable natural gas), which will compressed onsite and injected into the Gas Networks Ireland (GNI) distribution system via a Grid Injection Unit (GIU) that will be constructed onsite. This renewable natural gas (RNG) will directly replace conventional natural gas, contributing to the Government's target of generating 5.7 TWh of domestic biomethane annually.

The facility will also produce a nutrient-rich, biobased fertiliser, offering a sustainable alternative to conventional, fossil fuel-derived fertilisers. Additionally, the facility is designed to capture and recover biogenic carbon dioxide (CO_2).

The proposed development will consist of the following:

- Construction of 2 no. primary digesters (with an overall height of c. 9.1m), a digestate storage tank (with a height of c. 11.3m), a pump house (with a gross floor area (GFA) of c. 362 sq.m), 2 no. post digester tanks (with an overall height of c. 9.1m), and a safety flare (c. 11.3m in height), located in the southeastern section of the site.
- Construction of 2 no. prepits (c. 4.3m in height), a pasteurisation buffer tank (c. 4.3m in height), and a pasteurisation unit (with a maximum height of c. 4.2m), located to the west of the primary digesters, within the southern section of the site.
- Construction of digestate treatment and feedstock reception building and odour abatement system (with a GFA of c. 2,797 sq.m and a height of c. 12.1m and c. 16.2m to top of odour abatement stack) located within the southwestern section of the site.
- Construction of roofed silage clamps (with a GFA of 2,424 sq.m and a height of c. 8.7m) and a fuel storage tank (c. 2m in height), located within the western section of the site.
- Construction of a combined heat and power (CHP) unit (with a GFA of c. 39 sq.m and a height of c. 2.6m and c. 5.6m to top of flue), a biogas boiler (c. 2.6m in height and c. 5.6m in height to top of flue), a backup boiler (c. 2.6m in height), located within the northern section of the site.
- Construction of a gas treatment unit (c. 4.2m in height), a grid injection unit (with a GFA of c. 22 sq.m and a height of c. 2.8m), and a CO2 liquefactor (with an overall height of c. 10.7m to top of storage vessels) a propane tank compound accommodating 2 no. propane tanks (c. 1.6m in height), and an ESB substation (with a GFA of c. 24 sq.m and a height of c. 3.4m), located within the northern section of the site.
- Construction of a two storey ancillary administration building (with a GFA of c. 327 sq.m and a height of c. 11m) within the northern section of the site, adjacent to the site entrance.

- Alterations to the adjacent local road and site access road, including junction improvement and widening and site entrance and access arrangements.
- Associated and ancillary works including parking (9 no. standard, 2 no. EV and 1 no. accessible parking spaces, and bike storage for 10 no. bikes), site entrance and gate, a weighbridge, solar PV arrays at roof level, wastewater treatment equipment, bunding and surface treatments, boundary treatments, lighting, services, lightning protection masts, drainage, landscaping and tree planting, 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

CycleØ (IE) Limited is an end-to-end biomethane provider delivering innovative solutions to slow the pace of global warming. CycleØ focus on capturing methane from the agri-food, industrial and municipal sectors and upgrading it to biomethane for vehicle use or grid injection. As experts in biomethane, CycleØ develop, build, own and operate plants to the benefit of farmers, the local communities and in support of local decarbonisation targets.

CycleØ are fully committed to developing four projects in Ireland to help achieve the 5.7TWh biomethane target set out in the government climate action plan 2030 and the biomethane strategy, published in 2024.

1.3 Site Location

The Proposed Development site (herein referred to as 'the site') is located in the townlands of Ballyvass, Co. Kildare, approximately 3.3km northwest of the town of Castledermot, Co. Kildare and approximately 11.3km northeast of Carlow town, Co. Carlow. The approximate grid reference location for the centre of the site is N 75040 41931, ITM: 674984, 741954.

An overview of the site location is provided in **Figure 1**.

Figure 1: Site Location

The total site area measures *ca*. 5.12ha. The site is currently used as an agricultural pastureland and bounded to the north, south, east, and west by further agricultural pastureland.

The site's northern and eastern boundary is flanked by an unnamed local road which gives access to farmland and a quarry to the south of the site. The local road (L8050) is ca. 30m north of the site and ca. 30m west of the M9 Motorway. An unmarked local road runs along the proposed site boundary to the north and east. The Proposed Development will be accessed via this road and entrance will be established to the north of the site along this road.

1.4 Site Layout

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

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Figure 2: Proposed Site Layout Plan

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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

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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, including the Feedstock Reception Building, Digestate Treatment Building, Pre-Pit 01, Pre-Pit 02 and Pasteurisation Tanks are connected to the Odour Treatment System. The odour treatment system is a proprietary system designed and supplied by a specialist contractor with extensive experience of treating odour from biogas and other organic waste facilities. In the event of a grant of licence by the EPA to carry out activities that require such a licence, it is expected that odour emission rates will be agreed as part of such a licence.

2.5 Primary and Post Digestion

In a two-stage anaerobic digestion (AD) process, digestion occurs sequentially in primary digestion and post digestion tanks. This process will be facilitated by four Continuously Stirred Tank Reactor (CSTR) tanks:

- 2 Primary Digestion Tanks
- 2 Post Digestion Tanks

2.6 Digestate Treatment

The Digestate Separation System is designed to treat a minimum of 78,000 tonnes of whole digestate per annum. Following treatment, approximately 24,500 tonnes of digestate fibre and 53,500 tonnes of liquid digestate will be produced.

2.7 Biogas Upgrading

The primary goal is to separate carbon dioxide (CO_2) from methane (CH_4) to produce renewable biomethane and CO2. The proposed Biogas Upgrading Unit will recover over 99.9% of the biomethane present in untreated biogas by separating CO2 from the biogas through the

following process.

2.8 Grid Injection Unit (GIU)

Biomethane will be supplied to the existing gas network via the on-site Grid Injection Unit (GIU). An existing medium pressure distribution gas pipeline traverses the site. 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 CO2 Liquefaction system, the gaseous CO2 that is produced during the biogas upgrading process can be captured and liquefied.

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.

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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

4 no. alternative site locations within County Kildare and County Kilkenny were assessed under the above criteria, with the site at Ballyvass scoring highest overall.

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4 Planning and Policy

This chapter of the Environmental Impact Assessment Report (EIAR) examines 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 at Ballyvass, Castledermot, Co. Kildare.

4.1 Application Site: Planning History

The following planning history is based on a review of the subject site and surrounding area using the Planning Authority online planning search tool.

Reg. Ref.: 02/345 – Refusal – C. 200m South of Site

KCC refused permission on the 23rd October 2002 on a site located c. 115m south of the current application Site, to retain a mobile concrete batching plant.

The Applicant appealed KCC's decision to refuse and the final decision was brought to An Bord Pleanála ('the Board' hereafter), under ABP Ref.: PL09.130889. The Board refused permission on the 13th May 2003.

Reg. Ref.: 05/2340 / ABP Ref.: PL 09.218352 – Grant C. 115m South of Site

KCC granted permission on the 5th June 2006, subject to 38 no. conditions, for a site comprising c. 3.46 ha, located c. 115m south of the current application Site. The proposal was outlined as follows within the public notices:

"Extension and retention of sand and gravel extraction. The development consists of the extension of sand and gravel extraction over an area of 3.46 hectares and an attenuation pond on an area of 0.7ha, the retention of sand and gravel extraction etc."

The decision to grant permission was appealed and the final decision was brought to the Board under ABP Ref.: PL 09.218352. The Board issued a final grant subject to 19 no. conditions (summarised in Section 4.2 – EIAR Main report)

Reg. Ref.: 15/125 – Grant of EOD – C. 115m South of Site

KCC issued a decision to grant Extension of Duration ('EoD' hereafter) of permission on the 5th June 2015, for a site comprising c. 3.46 ha, located c. 115m to the south of the current application Site. The grant was for EoD of permission granted under Reg. Ref.: 05/2340, consisting of the following development (as described within the public notices):

"Extension of Duration of Planning Ref. 05/2340 - extension and retention of sand and gravel extraction. The development consists of the extension of sand and gravel extraction over an area of 3.46 hectares and an attenuation pond on an area of 0.7ha, the retention of sand and gravel extraction etc."

Reg. Ref.: 23/60256 – Sand and Gravel Pit – C. 115m South of the Site

KCC issued a final grant of permission on the 28th November 2024, subject to 36 no. conditions, for the following development (as described within the public notices):

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"(i) Extension to the existing sand and gravel pit with an extraction area of 4.890 hectares; (ii) Use of the existing sand and gravel pit for processing, storage of processed and unprocessed aggregates over an area of 4.681 hectares; (iii) Provision of mobile screening plant (no washing of aggregates will take place on site) and installation of a wheelwash within the existing sand and gravel pit; (iv) Restoration of the existing sand and gravel pit and proposed extension area to agricultural use with a combined total area of 9.571 hectares; (v) and all other ancillary site development works and activities associated with the proposed development. The duration for which the planning permission is sought is ten (10) years. Planning permission was previously granted for the existing sand and gravel pit and proposed extension area under Reg. Ref. 05/2340 as approved by An Bord Pleanála PL09.218352 and an extension of duration was also approved by Kildare County Council under Reg. Ref. 15/125 – Planning permission for both the existing sand and gravel pit and proposed extension have expired as has the extension of duration. No works have taken place since planning permission expired. An Environmental Impact Assessment Report (EIAR) will be submitted to the planning authority with the application. Revised by Significant Further Information which consists of the submission of a Site Restoration Plan."

Reg. Ref.: 23/60263 – Refused – New Dwelling – C. 855m Northwest of the Site

KCC refused permission on the 16th November 2023 for the following development, as described within the public notices:

"For a new single story dwelling; new domestic vehicular entrance, domestic garage, wastewater treatment system with polishing filter and all associated site works."

This application site is located c. 855m northwest of the current application Site.

Reg. Ref.: 24/61010 – Refused – New Dwelling – On the Same Site as 23/60263

KCC refused permission on the 28th November 2024, for a site located c. 855m northwest of the current application Site, for the following development (as described within the public notices):

"to construct a storey and a half style dwelling house, domestic garage, proprietary treatment system and associated percolation area, bored well, new site entrance, all ancillary site works and services."

Reg. Ref.: 23/60101 – Grant – Alterations to Dwelling – Northeast of the Site

KCC issued a final grant of permission on the 25th October 2023, subject to 18 no. conditions, for the following development (as described in the public notices):

"The alterations and refurbishment of an existing single storey vernacular dwelling including demolition of existing extension; a new single storey extension to the rear and side; alterations and setback of vehicular entrance and the provision of all other associated site excavation, infrastructural and site development works above and below ground, including a new wastewater treatment system and percolation area."

This application site is located c. 855m northwest of the current application Site.

Reg. Ref.: 22/1403 – Dwelling Granted – Northwest of the Site

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KCC issued a final grant of permission on the 15th May 2023, subject to 22 no. conditions, for the following development (as described in the public notices):

"Permission for the construction of a storey & half type dwelling, domestic garage, new entrance, bored well, Secondary Treatment System & soil polishing filter and all associated works."

Reg. Ref.: 19/201 – Refused – Bungalow – Northwest of the Site

KCC refused permission on the 13th December 2019 for the following development (as described in the public notices):

"A bungalow, domestic garage/store, Aswaflow SBR wastewater treatment system and soil polishing filter and all ancillary site development works."

This application site is located c. 900m northwest of the current application Site.

Reg. Ref.: 17/885 – Refused – Northwest of the Site – On the Same Site as 22/1403 and 19/201

KCC refused permission on the 28th September 2017 for the following development (as described in the public notices):

"A bungalow, domestic garage/store, Aswaflow SBR wastewater treatment system and soil polishing filter and all ancillary site development works."

This application site is located c. 900m northwest of the current application Site, on the same site as Reg. Ref.: 19/201 and 22/1403.

Reg. Ref.: 18/1575 – Grant Northwest of the Site

KCC issued a final grant of permission on the 10th April 2019, subject to 3 no. conditions, for the following development (as described in the public notices):

"A new septic tank and percolation area to existing dwelling and all ancillary development works."

This application site is located c. 1.16km to the northwest of the current application Site.

Reg. Ref.: 16/346 – Extension of Duration – Grant – Northwest of the Site

KCC granted an extension of duration permission on the 31st May 2016, subject to 1 no. conditions, for the following development:

"Extension of Duration of Planning Ref. 10/915 - for the erection of a new storey and a half dwelling, connection to a new effluent treatment system and percolation area and the erection of a separate garage."

The application site is located c. 1.04km to the northwest of the current application Site.

Reg. Ref.: 06/1464 – C. 246m Southeast of the Site

KCC issued a final grant of permission on the 6th October 2006, for a site located c. 246m southeast of the current application Site, for the *"construction of an agricultural building included slatted unit".*

4.2 European Policy and Legislation

4.2.1 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.

4.2.2 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.

4.2.3 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.

4.2.4 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.

4.2.5 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.

4.2.6 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.

4.2.7 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

4.3 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 biomethane 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 resilient society, and the strengthening of the rural economy and communities. The proposed development delivers strongly on these objectives.
- **Climate Action Plan 2025:** The 2025 Climate Action Plan ('CAP25' hereafter) was published on the 15th of April 2025 and is the third statutory annual update to Ireland's Climate Action Plan under the Climate Action and Low Carbon Development (Amendment) Act 2021. CAP25 builds upon last year's Plan (CAP24) by refining and updating the measures and actions required to deliver the carbon budgets and sectoral emissions ceilings. The Plan provides a roadmap for taking decisive action to halve Ireland's emissions by 2030 and reach net zero by no later than 2050, as committed to in the Climate Action and Low Carbon Development (Amendment) Act 2021.
- **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 terawatt 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 production, 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 sustainability 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.

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4.4 Regional Planning Policy

The RSES acknowledges that the effects of climate change will be felt in the environment, society and economy of the Eastern and Midland Region. A key principle of the RSES is "*the need to enhance climate resilience and to accelerate a transition to a low carbon society recognising the role of natural capital and ecosystem services in achieving this*". Renewable energy is a primary area of transition for the region and is a at the core of the plan's strategy.

4.5 Local Planning Policy

4.5.1 Kildare County Development Plan 2023-2029

The Kildare County Development Plan 2023-2029 ('CDP' hereafter) recognises the central role of land use planning in promoting a low carbon society, mitigating the impact of climate change, and progressing towards a sustainable energy future for County Kildare. The CDP aligns with the NPF, by recognising the role that rural areas play in driving the economy, for example by attracting entrepreneurship and innovation development, particularly where low carbon outputs can be achieved. The 'Strategic Vision' for the CDP is:

"To build on the strengths of the county in order to improve the quality of life of all residents, through the creation of **high-quality job opportunities**, by the provision of high-quality residential development supported by high quality community and social infrastructure, through the provision of a high-quality sustainable transport network, by healthy placemaking and transformational regeneration. The vision for County Kildare also **supports the transition to a low carbon climate resilient environment**, by embracing inclusiveness, enhancing our built environment and enshrining the importance of conserving, restoring and protecting Kildare's biodiversity for future generations." [**Emphasis added**].

The 'Overarching Guiding Principles' to achieve this vision are expressed in section 1.8.1 of the CDP. The guiding principles of relevance to the Proposed Development are outlined below:

- *"To develop a county that is **resilient to climate change**, plans for and adapts to climate change and flood risk, **facilitates a low carbon future, supports energy efficiency** and conservation, and enables the decarbonisation of our lifestyles and economy;*
- *To recognise the role of the rural countryside in supporting the rural economy and its role as a key resource for agriculture, equine, bloodstock, forestry, energy production, tourism, recreation, mineral extraction, and rural based enterprises;*
- *To support, facilitate and promote the **sustainable development of renewable energy sources** in the county; and*
- *To protect local assets by preserving the quality of the landscape, open space, recreational resources, natural, architectural, archaeological, and cultural heritage and the material assets of the county."* [**Emphasis added**].

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4.5.2 Local Authority Climate Action Plan 2024-2029

The vision for the Local Authority Climate Action Plan ('KCAP' hereafter) states, "Kildare County Council will deliver climate action across all council functions and will lead the community of County Kildare in the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral local economy".

We take note of the KCAP mission, which states, "The Council is committed to lead in translating National Climate Policy into local actions in Kildare by how we do our business and by supporting and enabling our citizens, communities and stakeholders to increase their capacity to achieve climate resilience and increase climate awareness towards a low carbon society".

Goal 3, Goal 2 (Objective 1), Goal 5 (Objective 1 & 2), Goal 5, Objective 3 of the KCAP are noted (Full description in Section 4.6.2 – EIAR Main Report).

4.5.3 Climate Resilient Kildare: Climate Change Adaptation Strategy 2019-2024 (KCCAS)1

According to Section 7.1 of the CDP, the Kildare Climate Change Adaptation Strategy ('KCCAS' hereafter) was adopted in 2019. It *"takes on the primary role as the primary instrument at local level: to ensure a proper comprehension of they key risks and vulnerabilities of climate change; bring forward the implementation of climate resilient actions in a planed and proactive manner; and ensure that climate adaptation considerations are mainstreamed into all plans and policies and integrated into all operations and functions of Kildare County Council."*

Within the KCCAS, ***Goal 1 ('Local Adaptation Governance and Business Operations'), Objective 5*** *is to "identify and support opportunities that may arise from pursuing adaptation efforts through the function of Kildare County Council". An action outlined to achieve this is to "encourage and promote projects that will contribute positively and grow the Circular and Bio-economy to promote sustainable rural and urban economic development as part of the overall aim of transiting to a low carbon economy".*

4.5.4 County Kildare Local Economic and Community Plan (LECP) 2024-2026[2]

Section 1.1 of the LECP states, *"The purpose of the LECP is to set out the objectives and actions to promote Kildare's economic and local/community development for a six-year period."*

Objectives from the following Goals are noted with relevance to the proposed development (Full description in Section 4.6.4 – EIAR Main Report)

- **High Level Goal 3**: County Kildare Promotes and Prioritises Climate Action, Climate Justice and Sustainability.
- **High Level Goal 4**: County Kildare Attracts the Resources and Investment to Be a Sustainable, Inclusive, Economically Vibrant Community, For All.

[1] KCC (2019) Climate Resilient Kildare: KCC Climate Adaptation Strategy: https://www.kildareppn.ie/wp-content/uploads/2020/05/Kildare-Climate-Change-Adaptation-Strategy.pdf
[2] KCC (2024) *County Kildare LECP 2024-2029*: https://kildarecoco.ie/media/County%20Kildare%20LECP%2020242029.pdf

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4.6 Summary Statement

This chapter examined and summarised the relevant planning, climate, and waste management policy, and the legislative context at European, and national levels with relevance to the Proposed Development at Ballyvass, Castledermot, Co. Kildare.

The Proposed Development aims to lessen the dependence on imported fossil fuels, provide greater security in energy supply, and increase the provision of renewable energy in line with government and planning policy at the national, regional, and local level.

It is considered that the Proposed Development is supported by the Kildare County Development Plan 2023-2029 and the local, regional and national policy discuss within this chapter.

The Proposed Development has been carefully designed so it will integrate into the local landscape, will not be prejudicial to public health, and would be acceptable in terms of traffic safety. The Proposed Development would therefore be in accordance with the proper planning and sustainable development of the area and will deliver local renewable energy generation and employment to support the economic development and prosperity of the area.

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5 Biodiversity

This chapter provides an Ecological Impact Assessment (EclA) which addresses the potential ecological impacts that may occur in the future on the terrestrial, avian and aquatic ecology of a Proposed Development at Ballyvass, Co. Kildare 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.
- Perimeter features include treelines, Dry Meadows and Grassy Verges and a drainage ditch.

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

Flora

- The Proposed Development site consists of primarily low- biodiversity improved grassland, with high-value treelines, and a drainage ditch 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, Pine Marten, 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.

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Bats

- The landscape suitability index for bats in the study area is moderate (25.11).
- No buildings for bat roosts are within the site. The trees within the treeline are overgrown with ivy which isn't suitable for bat roosts along the site boundaries.
- The landscape is considered to be of moderate local importance for bats due to a good network of hedgerows and treelines around the fields in the wider area.

Birds

- The site is of moderate local importance for birds due to the mature trees along the site boundary.

Amphibians, Reptiles, and Invertebrates

- The drainage ditch on site is likely to provide some limited value for invertebrates and amphibians.
- The unmanaged verges also offer limited value for pollinating invertebrates.

Aquatic Environment

Water Features and Quality

- A drainage ditch flows northeast along the northwestern boundary of the site.
- The closest waterbody to the site consists of the Ballynamony stream located 646 m to the east of the site. This stream runs northwest for approximately 2 kilometres until it joins the Greese River a tributary of the Barrow River and River Barrow and Nore SAC which are protected by national legislation.
- 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 closest of these is the River Barrow and River Nore SAC, which is 2 km South of the site. The hydrological connectivity between these areas is 6 km, via the Ballynamony stream.

The Proposed Development is also within 15km of nine sites designated as Natural Heritage Areas (NHAs and pNHAs). The closest of these is Corballis Hill pNHA and this is 5 km east of the site.

Within the Proposed Development site itself the dominant habitats are improved agricultural grasslands, dry meadows and grassy verges, drainage ditch and treelines. The treelines, drainage ditches and dry meadows and grassy verges 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.
- Treelines: Rated as having local importance (higher value).
- Drainage ditches: Rated as having local importance (higher value).

5.4 Impact Assessment

Impacts upon Designated Sites

- The site at Ballyvass, Co. Kildare is 6 km upstream of the River Barrow and River Nore SAC and connectivity is provided by the Ballynamony 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.

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.
- Plans indicate that the 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 mature trees and hedgerows 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

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 drainage ditch and subsequently the Ballynamony 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.

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 Ballyvass 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 River Barrow and River Nore 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-August)
Protection of Water Quality and Management of Pollutants	The unnecessary clearance of vegetation should be avoided and only areas necessary for building works should be cleared.
	It is vital that there is no deterioration in water quality in the Ballynamony Stream, which is upstream of the River Barrow and River Nore 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.
	Ongoing stormwater discharge monitoring will be carried out, and site specific trigger levels will be established to detect early signs of pollution and ensure no deterioration in downstream water quality.
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) 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 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 drainage ditch
	A bat sensitive lighting strategy will be implemented using warm white (,2700K), no- UV LED luminaires, with downward- only lighting to maintain dark corridors. Tree crowns and treelines will not be illuminated.
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
	All biobased fertilisers will be pasteurised in accordance with EU Regulation 142/2011 prior to land spreading.
Firewater Retention System	Firewater containment systems including bunded tanks and automatic isolation valve will be installed to prevent contaminated runoff entering surface waters during emergencies.

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 5.8** 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 5.9.**

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.***

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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, 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.

6.1 Description of the Receiving Environment

6.1.1 Population & Settlement Patterns

The Site is located in a sparsely settled rural area known as Ballyvass, in the Electoral Division of Belan ('ED' hereafter), approximately 3.3km northwest of the town of Castledermot, Co. Kildare.

In the years between the 2016 and 2022 census, the population of Ireland ('Country' hereafter) has increased by 387,274 people (8.13%) and the population of the County increased by 25,270 people (11.36%).

The population of the ED increased by 20.68% between 2016 and 2022. This is notably higher than the growth experienced at a national (+8.12%), County (+11.36%) and town level (Castledermot: +14.24%). a rural area on the outskirts of Castledermot.

Within the ED, the most dominant age grouping is 0-14, whereas for Castledermot and County the most dominant is 25-44. Nonetheless, the percentage of persons aged 0-14 is relatively consistent with Castledermot and the County. The ED has a higher percentage (17.76%) of persons aged 65+ in comparison with Castledermot (12.52%) and the County (11.99%). The ED has a notably lower percentage of persons aged 25-44 (21.81%) when compared to Castledermot and the County.

The ED is less dependent than the Country as a whole. Indicating a relatively 'independent' population within the study area as compared to the Country which can be defined as per the conceptual model as 'providing some care' to 'providing a lot of care'. We note that the age dependency ratio for the ED has increased since 2016, but still remains relatively independent. The age dependency ratio of the ED is notably higher than the County level.

6.1.2 Socioeconomics

The ED has a lower percentage of the population (1.02%) with 'no formal education' in comparison to Castledermot (3.37%) and the County (2.06%). The ED and County have greater proportion of the population with a 'Honours Bachelor's Degree, Professional Qualification or both' and 'Postgraduate Diploma or Degree' (ED: 13.20% and 9.64%. County: 14.58% and 12.17% respectively) in comparison to Castledermot (8.32% and 6.07%).

6.1.3 Deprivation

The Health Impact Assessment Guidance referred to previously in this chapter (IPH, 2021) outlines that impact assessments should consider whether the population is already stressed by limited resources or unusually significant burdens as well as whether groups could be affected that have reduced access to financial, social, and political resources.

The Pobal HP Deprivation Index Relevant Index Scores for the Study Area based on the 2022 Census. These figures show for the year of 2022 that the ED is 'marginally below average' which is relatively consistent with that of the County. This indicates a moderate population sensitivity (deprivation) within the study area. Pobal have not released deprivation scores for the State for 2022, so comparison to the national average is not possible, however it is noted that, for comparison purposes, the area of Dublin County displays a deprivation level of 2.69 (marginally above average).

6.1.4 Employment

The CSO's Quarterly Labour Force Survey[3] (which has now replaced the Quarterly Household Survey) for Q1 2025, indicated that there was an annual increase in employment within the State by 89,900 or 3.3% to 2,794,100 people from Q1 2024. There were 124,200 unemployed people (aged 15-74 years) in Q1 2025 using the International Labour Organisation (ILO) criteria, with an associated unemployed rate for those aged 15-74 years of 4.3%, up from 4.1% in Q1 2024.

According to the 2022 census there was a 15.69% unemployment rate (8 as a % of 151 - 'short/long term unemployed' as a % of 'at work' and 'short/long term unemployed') within the Belan ED. This is compared with the national average unemployment rate of 8% and a County unemployment rate of 6.07% in 2022.

6.1.5 Community

The pattern of residential development in the vicinity of the Site is dispersed, comprising rural one-off housing. The closest residential dwelling to the north is c. 310m (located along the L8050), and to the west is c. 985m (located off the L8049). Kilkea Castel Hotel and Golf Resort is located c. 1.75km to the west.

The closest established residential area is located at Castledermot town (c. 3.3km to the southeast) and at Kilkea (c. 2.3km to the west).

The working community in the vicinity of the Site comprise primarily agricultural-based employment. Other employment within the wider vicinity includes a solid fuel company (c. 1.3km east), a tour operator (c. 1.5km southeast), a flooring contractor (c. 1.7km southeast), a bed and breakfast (c. 1.4km west), a hotel and golf course (c. 1.7km northwest), a stone supplier (c. 2.2km northwest), an animal feed store (c. 1.5km northeast), a bar (c. 1.75km northeast), and an oil refinery (c. 2.37km east). The adjacent quarry also represents an employment use in direct proximity to the site.

[3] CSO (2025) *Labour Force Survey Q1 2025*: Employment Labour Force Survey Quarter 1 2025 - Central Statistics Office

6.1.6 Human Health (Off-Site)

The information presented in Section 6.4.6 (EIAR Main Report) for the ED shows that a high proportion (85.36%) described their health status as 'very good' or 'good' and a very low proportion (0.31%) describes their health status as 'very bad' or 'bad'. The data shows that the ED has a consistent percentage of the population with a disability than that of the County and 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 a ranking of ***medium*** to ***low*** sensitivity.

6.1.7 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:

- 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

Under the 'Do Nothing' scenario there would be no change to the current land use of the Site. If the Proposed Development does not proceed as planned there would be no additional impact on the following receptors:

- **Local Population & Employment** - The failure of the Proposed Development to proceed will not lead to any profound or irreversible consequences. However, the opportunity to deliver additional employment opportunities into the rural economy will be lost as will the opportunity to contribute to specific objectives in the Kildare County Development Plan and the 2025 Climate Action Plan, which promotes renewable energy generation.
- **Community** - It is likely that the perceptions of the community would remain unchanged. However, the immediate economic and social benefits that would be forthcoming and experienced if the development were to progress would be foregone.
- **Land Use** - The failure of the Proposed Development to proceed will most likely see the land remaining as agricultural land adjacent to an existing quarry undertaking.
- **Human Health (Off-Site)** - If the Proposed Development were not to proceed this greenfield site would remain in its existing form and there would be no impact on Human Health. However, the opportunity of providing renewable energy to the national grid will be missed, given the current economic climate and rising energy costs this Proposed Development provides a safeguard for the area and the country's energy needs.

- **Human Health (On-Site)** – Under the do-nothing scenario, 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 the Proposed Development, particularly in uncontrolled conditions (i.e. in the absence of mitigation), however, the production of a biobased fertiliser presents an opportunity to introduce a high-quality fertiliser with reduced pathogens compared to slurries and manures.

The Do-Nothing scenario would also be considered sub-optimal 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 the local bioeconomy would be missed.

6.2.1 Receptor Sensitivity

The sensitivity of the receptors identified are summarised in **Table 6.11**.

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 to Moderate	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, in the absence of mitigation, 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 impact on the population of the surrounding area, as it is expected that the workforce will primarily travel from their existing place of residence to the construction site, rather than reside in the area during the construction phase of the development, as such activities associated with the construction phase are anticipated to have ***positive, slight, temporary*** effects on the local population.

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Employment

The Proposed Development will provide important construction / engineering 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. These beneficial effects on economic activity will be largely temporary but will contribute to the overall future viability of the construction sector and related services and professions over the construction period. 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.

Human Health (On & Off site)

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 6.13 – Operation Phase Effects Summary

Receptor	Sensitivity Rating	Potential Environmental Effects	Quality	Significance	Duration
Local Population	Low to moderate	No material impact on the existing local population. Likely to have a positive impact on the population in terms of employment and economic benefit in the long term.	**Positive**	**Moderate**	**Long-term**
Employment	Low to moderate	Creation of significant employment benefit for the local study area.	**Positive**	**Significant**	**Long-term**

		Further indirect employment will be created as a result of the induced benefits of the development.			
Community	Low to moderate	The community may experience a slight change in mobility as a result of increased traffic on the road network.	**Neutral**	**Slight**	**Long-term**
Human Health (Off-Site)	Low to moderate	Air emissions from CHP, Biomethane Boiler and Odour Treatment System. Projected ambient concentrations including background levels fall within all National and EU ambient air quality limit values and, thus, will not cause any effect on human health.	**Neutral**	**Imperceptible**	**Long-term**
Human Health (On-Site)	Moderate	**Pests** The presence of vermin and insect pests in or around any waste management facility is a health hazard. Management must have a pest and vermin control standard operating procedure in place, which effectively controls any such presence and prevents possible contamination risk.	**Negative**	**Moderate**	**Long-term**
Human Health (On-Site)	High	Fugitive Emissions Hazardous Substances Biological Agents Electrical Hazards Mechanical Hazards Gas Hazards Explosion and Fire Hazards Malpractice - Operative Health and Safety Major Accidents	**Negative**	**Moderate to significant**	**Long-term**

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 operational phase.

ORS

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.

Grid Injection Unit

Biomethane will be supplied to the existing gas network via the onsite Grid Injection Unit (GIU) connecting the Site to the existing medium pressure distribution gas pipeline located within the site boundary of the Proposed Development, at Ballyvass, Co. Kildare. The GIU will be owned and operated by Gas Networks Ireland.
The GIU comprises equipment which will ensure that the biomethane is compliant with all necessary standards and regulations before it enters the local gas network. The unit performs the following key tasks: 6-33

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

The Grid Injection Unit (GIU) is shown as **item 25** on Site Layout Drawing Ref. **231239-ORS-Z0-00-DR-B-200**.

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 6.7.2.1 of the main EIAR Report and within Chapter 16 - Schedule of Mitigation.

- 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 Castledermot 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 on Human Health for the operational phase of the Proposed Development arise primarily from a slight increase in demand for services in the area, and due to increased employment in the area in combination with wider trends of increasing employment. By taking the mitigation factors into account and promoting sustainable use of all material assets this will help with the anticipated increase in the demand for local services and resources. Given the nature and scale of this development any potential cumulative effects of this Proposed Development will be minor.

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.

ORS

Human Health

Provided the actions and procedures outlined in **Section 6.7** (EIAR Main Report) 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 and positive, imperceptible to slight,*** and ***long-term***.

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 ***negligible***.

ORS

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.

The Proposed Development is located in the townlands of Ballyvass, County Kildare.

7.1 Receiving Environment

The following aspects relating to land, soils and geology were addressed;

- Topography
- Drift Geology
- Local Bedrock Geology
- Regional Bedrock Geology

Topography

The Proposed Development locality is characterised as being hummocky sediments, in keeping with the Landscape Character Type description for the area. The proposed site is located between two rivers, the Greese (*ca.* 1.6km north) and the Graney (*ca.* 3.5km south) which are distinct features within the landscape of southern Kildare. The topography of the site exhibits a gradual slope from the north to the south. A peak in the site topography, 89m OD, is situated along the southwestern boundary of the site with a gradual gradient northward. This gradient is gradual, continuing towards the centre of the site at 85m OD and continues to gradually fall northward to a low of 81m OD along the northeastern site boundary. A drainage ditch occurs along the northwestern boundary of the site.

The area surrounding the Proposed Development site contains characteristic minor undulations in the land. The proposed development site is located in the Landscape Character Area: Eastern Transition Lowlands which is classified as being of medium sensitivity.

Drift Geology

The Second Edition General Soil Map of Ireland describes this region as belonging to the "*flat to undulating lowland*" group of the broad physiographic divisions. The site resides at the soil association no. 35 comprising grey brown podzolics (80%) with associated soils including Gleys (10%) and Brown Earths (10%). Parent material is proposed to consist of stony-limestone-glacial till. The majority of the proposed site overlays gravels derived from limestones. 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 predominant rock types in Kildare are sedimentary rocks, limestone of Carboniferous age in particular. The Proposed Development is located on a large terrane of Silurian metasediments and volcanics which terminates *ca.* 300m south of the Proposed Development and stretches from Belan Lower (N) to Kilkea (W) and Castleroe West (SW). The terrane expands and extends far to the northeast to Glencanon (E) and beyond towards Rathcoole and Naas East (NE).

Local Bedrock

The underlying bedrock for the Proposed Development consists of greywacke and shale, from the Tipperkevin Formation. The formation is characterised by medium to fine grained

greywacke sandstones or shales. Exposers of the formation can be found *ca.* 750m to the southwest of the proposed development site, towards Mullaghreelan Wood.

A number of faults can be observed within the 2km study area. The closest unconformity, a fault, is located *ca.* 250m east of the site and runs from northeast to southwest.

Depth to Bedrock

According to GSI groundwater vulnerability maps and local groundwater wells data there are 63 recorded groundwater wells within the 2km study area. These groundwater wells comprise a mix of Dug Wells and Boreholes and have a varying yield class from moderate to poor. The lands on which the site location has been proposed have been assigned a high groundwater vulnerability rating.

The recorded depth to bedrock encountered for the corresponding wells in the wider area is generally between 1.8 to 13.1 metres below ground level (bgl).

The western portion of the subject site is situated above a poor aquifer of bedrock which is generally unproductive except for local zones (Pl). The eastern boundary of the Proposed Development is situated above the Coolane Sand and Gravel aquifer which is designated by the Geological Survey of Ireland (GSI) National Draft Bedrock Aquifer Map as a locally important gravel aquifer which is generally unproductive expective expect for local zones (Pg). The entirety of the site is located within the New Ross Groundwater body classified under the WFD. This ground waterbody extends throughout county Kildare towards New Ross, county Wexford to the south.

Karst Features

Examples of karst landforms are scarce throughout county Kildare. Karstic features are not common in this region due to the underlying igneous rocks, sandstones, greywacke and shale which underlie much of the county. A number of karstic features occur *ca.* 13km to the west.

Soils & Subsoils

GSI online mapping indicates that the majority of the site overlies shallow well drained mineral (mainly basic) (BminSW) soil derived mainly from calcareous parent materials. The soil groups associated with this category are renzinas and lithosols. A portion of the development located along the western and northern boundary is underlain by deep well drained mineral (mainly basic) (BminDW) soils derived from mainly calcareous parent materials. The soil groups associated with this category are grey brown podzolics, brown earths (medium-high base status).

A bedrock outcrop is noted *ca.* 750m southwest of the Proposed Development which occurs in close proximity to a number of other bedrock outcrops. These outcrops occur in an area classified as belonging to the lithosols and regosols soil groups. A bedrock outcrop is also noted *ca.* 900m northeast of the Proposed Development in an area classified as belonging to the surface water gleys and ground water gleys soil association.

The Teagasc representative soil profile description for the underlying soil is the “Elton (1000c)” Series is described as having a fine loamy texture. The modern definition is fine loamy drift with limestones.

The EPA databases indicate that the majority of the site overlies subsoils with parent material consisting of till derived chiefly of gravels derived from limestones (GLs). 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. A portion of the west and north of the site is underlain by subsoils with parent material consisting of till derived chiefly from limestone (TLs).

Soil Contaminants

No contaminants were observed on site during the site investigations. The site is greenfield with no previous development recorded within the site boundary.

There are no active IPPC licensed sites located within a 2km radius of the Proposed Development. To the southeast ca. 2.9 km is Kerry Coachbuilders Ltd. that is licensed under major class of activity 3.9: Metals. This license status is currently surrendered. Another facility is located ca. 8km to the southeast beyond Castledermot and a composting facility classified under the activity 11.4(b)(i): Waste. It is not foreseen that any these licensed facilities will have an effect on the Proposed Development.

Historic Land Use

The historic maps indicate no obvious sources of contamination based on previous land use within the proposed site. The 25-inch historic maps (1863-1924) indicate that the area in the immediate vicinity of the Proposed Development site consists of agricultural lands. In subsequent maps of the area, the character of the area has been changed due to the establishment of the M9 motorway located along the eastern boundary of the site. The site location and the surrounding environs have historically been greenfield

Site Investigation

The site is predominantly Dark Brown Earth with loose sandy topsoil. Subsoil characteristics differ between the majority of the site and a small portion along the western and northern site boundary. The majority of subsoils are classed as renzinas and lithosols, with subsoil of permeability. Subsoils at the west and north of the development are classed as grey brown podzolics and brown earths with moderate permeability. Groundwater was observed in two instances (TP01 and TP06) at moderate depths (1.5mbgl and 1.1mbgl respectively). Investigations on site followed a period of heavy rainfall, which may have influenced groundwater levels. The findings of site investigations are presented in **Table NTS 7.1.**

Table NTS 7.1: Soil Profile of Trial Pits

Location	Depth (m)	Ground Profile	Comments
TP-01	0.0 – 0.2 0.2 – 1.3 1.3 – 2.1 2.1	Topsoil – Dark Brown Earths. LOAMY/CLAY, gravel abundant, lighter brown colouring. – Site was likely infilled during construction of adjacent motorway. Dark LOAM mottling evident throughout layer, abundance of rounded large cobbles. GW observed @ 1.5mbgl, high recharge Unstable, collapsible soils. End of TP @ 2.1mbgl.	 Trial Pit located at proposed entrance of the site, near to the suggested location for the WWTP. No Bedrock encountered. Groundwater encountered at 1.5mbgl.
TP-02	0.0 – 0.2 0.2 – 0.9	Topsoil – Dark brown, slightly aggregated silty SAND with some organic content. Dry, with no significant cohesion. Very thin transition layer of light brown to yellow/orange material, possibly iron oxidised.	No Bedrock encountered. No GW encountered. Highly permeable soil, consistent with desk study indicating a gravel aquifer above a poor bedrock aquifer. Wet conditions likely

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	0.9 – 1.9 1.9	Light Grey Gravelly Silt. Light grey to darker grey SILTY GRAVEL with high gravel content and some small to medium cobbles. Slightly wet, with excavation walls collapsing due to low cohesion. End of TP @ 1.9mbgl.	due to recent rainfall infiltration.
TP-03	0.0 – 0.4 0.4 – 0.1 1.0 – 2.65 2.65	Topsoil - Dark Brown Earths, dry and loose silty SAND with some organic material. Light brown to grey compacted CLAY with sparse orange mottling, indicating some oxidation. Moist to wet conditions suggest reduced drainage and possible seasonal water table presence. Dark brown, moderately compacted silty GRAVEL with high gravel content and occasional cobbles. End of TP @ 2.6mbgl.	Trial Pit located at the bunded area. No Bedrock encountered. No GW encountered.
TP-04	0.0 – 0.3 0.3 – 0.55 0.55 – 1.55 1.55 – 2.8 2.8	Topsoil – Dark brown, dry and loose silty SAND with some organic matter. Transition layer – Light brown to grey, compacted GRAVEL with clayey matrix. Presence of fines suggests poor sorting. Light brown CLAY with high orange mottling throughout. Compacted and dry with collapsing walls, indicating low cohesion and possible evidence of seasonal wetting and drying. Dark brown, compacted and wet GRAVELLY material with fine content. Impermeable sticky Groundwater Gley (characterised by grey colour and upper layers are oxidised & typical brown) End of TP	No Bedrock encountered. High gravel presence and occasional small cobbles noted throughout all horizons. One side of the pit was noticeably drier than the other, suggesting variable drainage.
TP-05	0.0 – 0.2 0.2 – 1.0 1.0 – 2.4 2.4	Topsoil – Dark Brown Earths. Dry and loose silty SAND with some organic matter. Light brown, moderately compacted, wet GRAVEL with a mixed sand and clay matrix. Some orange mottling present, indicating minor oxidation and variable drainage. Dark brown to grey, compacted and wet GRAVELLY material with small to medium cobbles. End of TP.	No Bedrock encountered. No GW encountered.
TP-06	0.0 – 0.2 0.2 – 1.2	Topsoil – Dark brown, moderately dry and loose silty SAND with some organic matter. Unstable, collapsible gravelly lighter silty SAND, small signs of mottling. The sand matrix is poorly cohesive and saturated at depth, indicating groundwater influence. Groundwater strike @ 1.1mbgl.	No Bedrock Encountered. GW encountered at 1.1mbgl Water accumulation observed at the base of the pit confirms high permeability and shallow groundwater conditions.

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	1.2 – 2.0 2.0	Unstable, collapsible darker brown soil, cobbles/ small boulders present. End of TP.	

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**.

Table NTS 7.2: Receptor Sensitivity

Receptor	Receptor Importance	Receptor Sensitivity	Rationale
Topsoil	Local Level	Low	The local topsoil is a dark brown earth which is in abundance within development site. The site topsoil contains no known pollutants. The soil is of poor agricultural quality, being a poorly-drained mineral soil and would not be a highly sought-after topsoil for any infill agricultural lands.
Underlying Deposits	Local Level	Low	The development has been designed to utilise the existing site topography as far as possible (231239-ORS-ZZ-00-DR-CE-490), minimising the disturbance to the subsoil to achieve the desired site levels. Where possible to minimise quantities of excavated materials being removed from site, excavated materials will remain on site and be utilised for the provision of an earthen berm, for landscaping and as infill material. The deposits underlying the majority of the site are described as gravels. The portion to the west and north of the site is described as till. Both deposits are derived from limestone parent material which is in abundance within the wider area. The proposed development site is located across a GSI designated lowlands with a varying range in soil depth from shallow to deep. Site investigations revealed underlying deposits to consist of gley soils with a high-water table and the presence of some cobbles.
Bedrock Geology	Regional Level	Moderate	The underlying bedrock is a characterised as medium and fine-grained greywackes and shales. Karst features have not been recorded within the site vicinity and are scarce throughout county Kildare. Bedrock was not encountered during trial pit investigations, up to depths of 2.8m bgl. The underlying aquifer is classified as being a locally important gravel aquifer.

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** below.

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Table NTS 7.3: Construction Phase Effects (Unmitigated)

Receptor	Potential Environmental Effects	Quality	Significance	Duration
Topsoil	Topsoil Removal	**Negative**	**Slight/ Moderate**	**Reversible**
	Site Entrance and Gas Injection Point	**Negative**	**Slight**	**Temporary**
Underlying Deposits/ Subsoil	Construction of Built Structures	**Negative**	**Moderate**	**Long-term**
	Excavation/ Subsoil Removal	**Negative**	**Moderate**	**Permanent**
	Geological Sensitivities and Harmful Substances	**Not Significant**		
	Attenuation Tanks	**Neutral**	**Moderate**	**Long-Term**
	Attenuation Pond	**Negative**	**Neutral**	**Permanent**
	Contaminated Soils	**Negative**	**Not Significant**	**Temporary**
	Site Entrance and Gas Injection Point	**Negative**	**Slight**	**Permanent**
Bed Rock Geology	Excavation of Bedrock	**Negative**	**Significant**	**Permanent**

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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**
Bed Rock Geology	Hydrocarbon Contamination	**Negative**	**Moderate/ Significant**	**Long-term**

7.3 Mitigation Measures

7.3.1 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.

Geological Sensitivities and Harmful Substances

- Mitigation measures include pre-construction trial pit investigations to ascertain soil depth throughout the site, a desktop study to determine environmental sensitivities in the vicinity of the site as well as backfilling and landscaping of any temporary excavation works as soon as possible

Soil Compaction

- Construction of a hardcore gravel access road on and around the site.
- Confine site traffic to designated routes.

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- 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

Sediment laden run-off from exposed soil and stockpiles poses a risk to waterways and aquatic life. The main pollutants of site water are silt, fuel/oil, concrete and chemicals. There are a number of steps outlined below to eliminate contamination of site surface water runoff.

- As a standard best practice measure silt fencing will be erected along the ~~eastern~~ western extents of the Proposed Development site to limit accidental discharge of sediments into the adjacent ~~stream/~~ drainage ditch located to the west and southwest. The 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 to ensure that they remain functional throughout the construction of the Proposed Development. Maintenance of the fences will be carried out regularly. Fences will be inspected thoroughly after periods of heavy rainfall.
- Excavated and/or imported material will be stockpiled and silt fencing will be constructed around stockpile locations to contain/ reduce any sediment run-off during times of inclement weather.
- Compacting of stockpiles will reduce the rate of airborne and hydraulic 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.
- 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.
- 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 at the pre-commencement stage. These will include toilet facilities. All foul discharges from welfare facilities will be collected in a septic storage tank. This tank will be regularly emptied, and the contents disposed of at a registered facility.

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 drainage channel adjacent to the west of the site.
- 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 Materials, including if found to be contaminated

The Proposed Development will involve the importation of gravel and concrete.

- All material will be sourced and transported by registered suppliers.
- All materials will be inspected prior to acceptance on site.
- Any deliveries found to be contaminated will be refused access to deposit on site. Any contaminated materials accidentally 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.

7.3.2 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

Geological Sensitivities and Harmful Substances

During the operational phase, the site will be bunded, with hardstanding established for offloading areas. No process water will be discharged off-site and storm water will be monitored. Thus, the risk of pathways which could exacerbate or contribute to increased levels of the aforementioned minerals and heavy metals in groundwater sources are minimised.

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Attenuation Pond

Mitigation of relevance to the management of the Attenuation Pond will include:

- No soils will be imported to site.
- Any contaminated materials will be refused entry to site
- Quarantine zone will be available to isolate any contaminated soils identified. The area will have an impermeable linear, cover and surrounded by silt fencing.
- The pond will be lined with an impermeable geotextile liner to limit percolation of the contents into the underlying groundwater

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 positive***, ***slight to long-term*** and ***reversible 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 ***neutral to positive***, ***imperceptible to slight***, and ***temporary to long-term***.

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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 Ballyvass, Co. Kildare.

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 classed as moderate to high. Key receptors include: Local Hydrology (The Ballynamony stream and the River Greese) Protected Areas (downstream receptors, River Barrow and River Nore SAC) and Local Hydrogeology (New Ross Groundwater Body – Poor Aquifer & Coolane Groundwater Body – Locally important Gravel Aquifer).

Local Hydrology

The proposed development site, located in the townland of Ballyvass, Co. Kildare, falls within sub-catchment 14_9 of the Barrow Catchment, also known as the Greese_SC_010 sub-catchment.

The Ballynamony Stream flows north for approximately 2.3 km before joining the River Greese, which moves west-southward and meets the River Barrow ca. 5 km upstream of Carlow. From there, the Barrow continues south for around 85 km before reaching the Suir Estuary at Cheekpoint. The total hydrological distance from the site to the confluence of the River Barrow and River Greese is *ca.* 14 km.

The site is bordered to the north by an existing watercourse that flows from west to east, this is not identified on EPA mapping but was noted during site visits and topographical surveying. The watercourse is likely a small tributary to the Greese River.

According to the Arterial Drainage Scheme (ADS) and Drainage District (DD) maps, the proposed site is not located in close proximity to any drainage schemes or their benefitted lands. The nearest Drainage District channels, associated with the River Lerr, lie beyond a 3 km radius from the site and the site is not hydrologically connected to it. There is no Arterial Drainage Schemes in close proximity to the site.

Protected Areas

The closest designated sites to the Proposed Development include the River Barrow and River Nore SAC (Site Code: 002162) located ca. 1.9km southeast of the site. There are no additional designated sites within 2km of the site.

Taking into consideration the 'Source-Pathway-Receptor' model, the closest waterbody is the Ballynamoney stream located ca. 600m northeast of the Proposed Development. The stream runs from south to north, eventually crossing the M9 motorway and adjoining the River Greese ca. 2.3km downstream. The river Greese continues flowing to the west, eventually turning southwest and adjoins the River Barrow and River Nore SAC ca. 10.8km downstream. Thus, there is no direct hydrologic connectivity between the proposed development site and any European Designated sites.

Local Hydrogeology

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

- New Ross Groundwater Body – "Pl" (Poor Aquifer)
- Coolane Sand and Gravel Aquifer – "Lg" (Locally Important Gravel 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.* 390m from the proposed development.

A full list of Groundwater Wells located within a 2km radius of the proposed development is outlined in **Table 8.11** (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 an ORS environmental scientist for the Proposed Development at Ballyvass on the 31st of January 2025, the main findings are as follows:

- The depths of the trial pits ranged from 1.9m to 2.8m below ground level (bgl)
- no bedrock was encountered in any of the six trial pits.
- Groundwater was encountered at 1.1 mbgl in TP-06 and at 1.5 mbgl in TP-01.
- The topsoil across all trial pits comprised a dark brown layer extending to depths between 0.2m and 0.4 mbgl, overlying horizons that varied between trial pits.
- The topsoil in TP04 consisted of dark brown gravelly earths, with extensive gley soils beneath, a profile also observed in TP05. In contrast, TP06 exhibited gravelly, silty loamy soils, which showed signs of mottling and an extremely fragile structure.
- The water table was observed to be high, with visible drainage towards the drainage ditch to the northwest of the site. High rainfall levels preceding the site investigations, combined with variations in soil permeability—from highly permeable in the southeast to less permeable in the northwest—likely contributed to high water table and consequently ponding along the northwestern boundary. Additionally, the eastern part of the site was observed to be boggy. The saturation of soils was evident from mottling and gleying across all trial pits.
- The findings of the site investigation correlated with the GSI soil & subsoil database mapping.

Site Vulnerability

Desktop and field investigations indicate that the site overlies two distinct aquifers: a Locally Important Gravel Aquifer in the southeastern portion and a Poor Aquifer - Bedrock, Generally Unproductive Except for Local Zones, in the northwestern portion. The Groundwater Vulnerability of the site is classified as ‘high’ based off GSI mapping.

The groundwater protection response matrix (**Rg/M**) assigns the site a vulnerability rating of "**R1**," indicating that the development location is *acceptable with respect to groundwater protection*.

Desktop study suggests a subsoil depth of 5-10m throughout the area, considering the type of aquifers present in the area. Geotechnical investigations conducted on-site support this, as no bedrock was encountered during the excavation of trial pits. However, as water was observed at 0.9 and 1.5mbgl at TP-06 and TP-01, respectively, the possibility of encountering groundwater during the works exists. An excavation depth of 3.0m bgl could increase the vulnerability in these areas from ‘high’ to ‘extreme’.

Further trial pits pre-construction are recommended to determine soil depth, especially along the northwestern boundary and where the bunded area is to be located.

No land spreading will occur on site, the Proposed Development will not have any detrimental impact on the underlying aquifer or more importantly any wells in the area. The farms of the customer farmers have been identified. All farmers will use the biobased fertiliser on lands that have an agronomic requirement for fertilizer.

8.2 Assessment of Impacts

8.2.1 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**:

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Table NTS 8.1: Receptor Sensitivity

Receptor	Receptor Importance	Receptor Sensitivity	Rationale
Groundwater New Ross Groundwater Body & Coolane Sand and Gravel Aquifer	Locally Important & Poor Aquifers	Medium & Low	The northwestern portion of the site is underlain by the New Ross Groundwater Body, classified as a Poor Aquifer—Bedrock that is Generally Unproductive except for Local Zones. The southeastern portion is underlain by the Coolane Sand and Gravel Aquifer, which is a Locally Important Gravel Aquifer. This classification reflects local hydrogeological importance. According to the GSI map viewer, groundwater vulnerability across the site is rated as "High." Trial pits excavated to a depth of 2.8 mbgl did not encounter bedrock. The presence of ponding on-site suggests that the water table is highly responsive to rainfall and may exhibit seasonal fluctuations, particularly within the gravel aquifer. Groundwater was encountered at depths of 1.1 mbgl in TP-06 and 1.5 mbgl in TP-01, both located along the northwestern boundary. These groundwater levels, along with observed flow at the northwest drainage ditch, indicate a connection between groundwater and surface drainage. Based on the response matrix (Error! Reference source not found.), the site is classified as "R1 Acceptable, subject to normal good practice," confirming that the proposed development is considered suitable in terms of groundwater protection.
Surface Water Ballynamony Stream and downstream receptor, River Greese.	Local Level	High	The Ballynamony Stream, along with downstream receptors—the River Greese (designated as GREESE_050 by the EPA) currently hold a “Moderate” status under the Water Framework Directive (WFD) 2016–2021 assessment and are considered to be at risk. Waterbodies near the site have exhibited considerable fluctuations in quality across multiple monitoring cycles, ranging from *Good* to *Poor* status, though predominantly maintaining a *Moderate* status over the past decade. The last monitoring cycle though have highlighted a decline in water quality, resulting in the waterbody being classified as "at risk." Although a hydrological pathway exists to the River Barrow and River Nore SAC, an area protected under EU legislation, significant effects from the Proposed Development are not anticipated. The considerable downstream distance (approximately 10 km) is expected to allow for dispersion and dilution of any potential pollutants, minimising the impact on this protected area.

8.2.2 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

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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 New Ross Groundwater Body & Coolane Sand and Gravel Aquifer	Increased Run-off and Sediment Loading	**Negative**	**Moderate**	**Short-term**
	Accidental Spillages of Harmful Substances	**Negative**	**Moderate**	**Short-Term**
	Increased Groundwater Vulnerability	**Negative**	**Significant**	**Long-Term**
	Excavation of Bedrock Aquifer	**Negative**	**Significant**	**Long-Term**
	Excavation of Contaminated Soils	**Unlikely**	**Negligible**	**Unlikely**
Surface Water Ballynamony Stream and downstream receptor, River Greese	Increased Run-off and Sediment Loading	**Negative**	**Moderate**	**Temporary**
	Accidental Spillages of Harmful Substances	**Negative**	**Moderate to Significant**	**Temporary**
	Excavation of Contaminated Soils	**Unlikely**	**Negligible**	**Unlikely**
	Increase in Flood Risk to Receiving Catchment	**Negative**	**Moderate**	**Long-Term**

8.2.3 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 New Ross Groundwater Body & Coolane Sand and Gravel Aquifer	Contaminated Run-off	**Negative**	**Moderate**	**Short-Term**
	Foul Water	**Negative**	**Moderate to Significant**	**Temporary**
	Increased Groundwater Vulnerability	**Negative**	**Significant**	**Temporary**
	Uncontrolled Releases & Spillage of Digestate and Feedstocks	**Negative**	**Slight to Moderate**	**Temporary**
	Fire and Resultant Firewater	**Negative**	**Moderate**	**Short-Term**
	Landspreading of Biobased Fertiliser	**Negative**	**Slight**	**Short-Term**
	Attenuation Tanks	**Negative**	**Moderate**	**Long-Term**
	Attenuation Pond	**Negative**	**Moderate**	**Long-term**
Surface Water Ballynamony Stream and downstream	Contaminated Run-off	**Negative**	**Moderate to Significant**	**Temporary**
	Foul Water	**Negative**	**Moderate to Significant**	**Temporary**

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Receptor	Potential Environmental Effects	Quality	Significance	Duration
receptor, River Greese	On-Site Flooding	**Negative**	**Slight**	**Temporary**
	Increase in Flood Risk to Receiving Catchment	**Negative**	**Moderate**	**Long-Term**
	Uncontrolled Releases & Spillage of Digestate and Feedstocks	**Negative**	**Slight to Moderate**	**Temporary**
	Fire and Resultant Firewater	**Negative**	**Slight to Moderate**	**Temporary**
	Landspreading of Biobased Fertiliser	**Negative**	**Slight**	**Temporary**
	Attenuation Tanks	**Neutral**	**Moderate**	**Long-Term**
	Attenuation Pond	**Negative**	**Moderate,**	**Long-term**

8.3 Mitigation Measures

8.3.1 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.

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- 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.
- To better understand the hydrogeological conditions and inform construction planning, a detailed ground investigation should be undertaken prior to commencement of works. This should include:
    - Drilling of cable percussion and/or rotary boreholes with the installation of standpipes to obtain geological and hydrogeological data.
    - Pumping tests to determine baseline groundwater levels and assess aquifer hydraulic properties.
    - Assessment of hydraulic connectivity between the sand and gravel aquifer and nearby surface water features such as drainage ditches, ponded areas, and rivers.
    - Evaluation of surface water infiltration pathways and the potential for groundwater ingress during excavation activities.
    - Identification of any long-term risks to groundwater quality or quantity.
- The results of this investigation will be compiled into a technical report and submitted to the relevant local authorities. These findings will be used to develop a hydrogeological conceptual model for the site to determine whether dewatering is necessary. If dewatering cannot be avoided, the following aspects will be assessed:
    - Estimated volume and duration of dewatering required to facilitate the deepest excavations, always accounting for worst-case scenarios.
    - Potential temporary impacts on local groundwater resources and groundwater-dependent receptors.
    - Anticipated aquifer drawdown, including potential effects on existing wells and nearby surface water features.
    - Evaluation of construction methods that may minimise dewatering requirements and reduce associated impacts.
    - Discharge strategy based on predicted flow rates, identifying best discharge location (surface water or groundwater), and incorporating temporary settlement tanks or treatment units where necessary.
    - Licensing requirements for discharge to surface water or groundwater, including the need to obtain a Discharge Licence from Kildare County Council.
    - Based on the outcomes of the assessment, relevant mitigation measures and any residual impacts will be identified. The potential impacts of discharging abstracted groundwater to surface water or groundwater will also be assessed, and mitigation measures developed accordingly.
- During construction, the following measures will be implemented to protect groundwater and nearby surface water bodies:

  - Excavations will be backfilled as soon as practicable to minimise the risk of contaminant infiltration into the subsurface and underlying aquifer.
  - Landscaping works will be carried out promptly to reduce surface erosion and weathering.
  - Baseline groundwater quality monitoring will be conducted prior to the commencement of works.
  - Foundation and service designs will account for groundwater pressures and will include attenuation systems where appropriate, ensuring alignment with greenfield runoff rates (Qbar).
  - Surface water will be managed using Sustainable Drainage Systems (SuDS) to reduce runoff and support on-site infiltration.
  - Pollution prevention measures will be enforced throughout all construction phases to prevent untreated runoff, spills, or other pollutants from entering groundwater or surface waters.

- Where dewatering systems are necessary, they will be designed in accordance with recognised best practice (i.e. CIRIA C750). Monitoring of groundwater levels and discharge quality will be undertaken in accordance with the requirements of the relevant local authorities. Dewatering plans will be subject to revision as site conditions evolve.

- Following the completion of construction, any dewatering systems will be decommissioned gradually to allow for the natural recovery of groundwater levels. Post-construction monitoring will be carried out as required to verify restoration of pre-development conditions and to ensure there are no residual impacts on groundwater or associated receptors.

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.

Increase in Flood Risk to Receiving Catchment

- A temporary drainage system will be implemented during the construction phase, incorporating oil interceptors and settlement ponds to treat surface water runoff and remove potential contaminants prior to controlled discharge off-site.
- Bunds and diversion channels will be installed to divert surface water away from sensitive areas, including open excavations and adjacent drainage ditches leading off-site.
- All temporary drainage features will be subject to regular inspection and maintenance to ensure effective operation and to prevent blockages or failures.
- The drainage strategy will be reviewed and adapted throughout the construction period to reflect evolving site conditions.
- A flood risk response plan will be developed to set out actions and procedures in the event of extreme weather during construction.
- If dewatering systems are required, they will be designed in accordance with recognised best practice guidance, such as CIRIA C750. A discharge strategy will be developed based on predicted flow rates, identifying the most suitable discharge location and incorporating temporary settlement tanks or treatment units where necessary. Discharge to surface water will be controlled to ensure it does not exceed greenfield runoff rates.

- Where discharge to surface water is proposed, the relevant licensing requirements will be addressed, and a Discharge Licence will be obtained from Kildare County Council, as required

8.3.2 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

- Outflow from the sub catchments will be restricted to a maximum permissible discharge rate of 5.8 l/s (Western service yard) 3.1l/sec, (Office and eastern service yard) and 4.3l/sec (Sump/Lower Level).
- Overflow from the rainwater harvesting tanks on the higher, western side of the site, will be collected in an attenuation facility below ground, considering the rainwater harvesting tank may be full at the time of a 1:100year +30% climate change rainfall event.
- The bunded area drainage system (lower level) will be isolated from the other systems in order to guarantee no accidental discharge of contaminated runoff in case of failure of the digester or digestate tanks.
- The office and eastern service yard catchment attenuation is provided by a proposed open surface pond. The banks have been proposed at 1:4 to allow for maintenance requirements and grade back to proposed ground levels in the surroundings.
- The full 1:100 year + 30% climate change volume will be contained below ground in the proposed pluvial cube system.
- Surface water runoff will be discharged at the greenfield runoff rate calculated for each catchment via means of a Hydrobrake or similar approved flow control device.
- Attenuation and rainwater harvesting volumes have been sized based on a 95% runoff rate from all impermeable surfaces throughout the site.
- Pipes are designed for small catchment areas as defined in GDSDS, based on the modified rational method and a rainfall intensity of 50mm/ hour onto impermeable surfaces.

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- All surface water pipes have been designed to achieve a minimum self-cleansing velocity of 0.75m/s.
- Surface water pipework will be laid to a gradient no flatter than 1:500.
- Backdrop heights will be greater than 0.6m where practicable.
- The GDSD requirements with respect to interception volume, long-term storage volume and treatment volume have been considered.
- Minimum surface water pipe size of 225mm.
- Minimum depth of cover to pipework of 1.2m below trafficked area, or where this cannot be achieved, adequate protection will be provided.
- Maximum depth of pipework of 5m.
- Roughness value for surface water pipework, ks, 0.6mm.
- A class 1 petrol interceptor (Kingspan Klargester or similar approved) will be installed prior to the main rainwater harvesting facility and the attenuation facility on the western service yard, the sump level and the office and eastern service yard.
- Runoff from internal building washdowns and wheel washes will be collected for reuse in the industrial process. Silage runoff will be captured via linear drains within buildings and at thresholds, with surface water excluded except for rainwater used in washdowns. The runoff will flow through a piped network set at a 1:60 gradient to reduce blockages and silt build-up. A precast concrete sump chamber (e.g. Molloy P6 or equivalent) will be installed in the odour abatement building to collect silage runoff before it is pumped to Prepit 01.

Foul Water

- A domestic scale wastewater treatment plant is proposed to cater for the foul water arising from staff facilities on-site only.
- The wastewater treatment plant will comprise a tertiary treatment system, followed by a 6PE EuroTank TER3 Percolation Unit.
- The system is proposed with discharge to a Ter3 packaged tertiary unit with a minimum 60m2 attenuation layer.
- The treatment plant will be specified and installed by an appropriately qualified technician and in accordance with EPA COP 2021. It also will be subject to regular desludging and maintenance, as per manufacturers recommendations. Pressure tests and CCTV surveys will be carried out prior to commissioning to ensure absence of defects.
- Programme of inspection and maintenance to ensure any defects are repaired.

Increased Groundwater Vulnerability

Engineering and Structural Controls

- Site bunding will be designed in accordance with the EPA IPC Guidance Note on the Storage and Transfer of Materials for Scheduled Activities (EPA, 2004), ensuring high standards of containment and impermeability.
- The entire tank farm will be bunded to contain potential leaks. All bunds will be:
  - Impermeable, constructed of concrete or suitable material with chemical resistance.
  - Sized to hold a minimum of 110% of the volume of the largest single tank within the

bunded area.
    - Fitted with sealed sumps to allow for safe inspection and removal of stormwater or spill residues.
- Dedicated hardstanding areas will be provided for vehicle off-loading and chemical handling, with appropriate drainage controls and a minimum setback distance from any nearby surface watercourses.
- Spill prevention and containment measures will include the use of:
    - Bunded pallets and secondary containment units for smaller storage vessels.
    - Mobile spill kits strategically located throughout the site.
    - Clearly marked and regularly inspected emergency shut-off systems.
- Runoff from substantial areas of impermeable surfaces, including roofs and service yards, will be directed to a rainwater harvesting system. These tanks will:
    - Store rainwater for reuse (e.g., for washdown or non-potable applications).
    - Include overflow mechanisms to regulate discharge during heavy rainfall and avoid overloading the system.
    - Connect to a properly designed outfall system incorporating flow control structures and filtration, where necessary.
- All proposed below-ground structures will be constructed to be fully impermeable. The rainwater harvesting tanks will comprise reinforced concrete construction. The smaller circular tanks are pre-cast concrete units supplied by Molloy Precast and are designed to be watertight. The larger rainwater harvesting tank will also be constructed from reinforced concrete, likely cast in-situ, and will achieve full impermeability. Both tank types are to be installed on a compacted bed of single-sized granular material, in accordance with standard detailing for below-ground concrete structures.
- Attenuation storage for the western portion of the site will be provided using proprietary modular geocellular units (e.g. Pluvial Cube or similar) and an attenuation pond located to the northeast of the site. As these systems are not inherently impermeable, they will be encapsulated in a welded or taped impermeable geomembrane or geotextile liner to ensure full watertightness. The attenuation systems will also be laid on, and surrounded by, compacted single-sized granular fill to facilitate structural stability and membrane protection.

Operational Environmental Management

- An Environmental Operating Plan will outline site-specific procedures for material handling, waste management, and emergency spill response.
- Staff training and regular updates will ensure effective implementation.

Groundwater Monitoring Programme

- A long-term monitoring programme will be established, including permanent Bs placed upgradient and downgradient of risk areas, based on site hydrogeology.
- Baseline groundwater sampling will be completed before operations begin.
- Ongoing sampling will follow EPA guidance, with frequency set by the relevant authority (e.g., quarterly or biannual).
- Threshold values will be set in consultation with the authority, based on legislation, baseline data, and site-specific conditions.

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- If thresholds are exceeded, investigations will be launched, corrective measures taken, and findings reported to the regulator.

On-Site Flooding

- The proposed Finished Floor Levels are above the estimated 1 in 1000-year return period fluvial flood event placing the units within Flood Zone C.
- 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

- Discharge from site sub-catchments will be restricted to greenfield runoff rates: 5.8 l/s (western yard), 3.1 l/s (office/eastern yard), and 4.3 l/s (sump/lower level), based on IH124 methodology to protect downstream flood regimes.
- Finished floor levels (FFLs) are designed to minimise excavation: sump level at 81.50 mAOD, with surrounding wall and ramp at 83.00 mAOD. The western yard is set at 82.50 mAOD; the eastern yard and office/ancillaries at 81.60–81.65 mAOD.
- Overflow from rainwater harvesting tanks (western side) will be captured in underground attenuation sized using Causeway Flow software for a 1-in-100-year storm event plus 30% climate change allowance.
- Surface water runoff will be controlled using Hydrobrake or similar devices to maintain natural drainage routes to the drainage ditch at the northern site boundary.
- Attenuation and harvesting systems account for 95% runoff from impermeable areas.
- Pipework is sized using GDSDS small catchment guidance and designed for a rainfall intensity of 50 mm/hr, ensuring a minimum self-cleansing velocity of 0.75 m/s.
- GDSDS criteria for interception, long-term storage, and treatment volumes have been addressed.
- Rainwater harvesting tanks will provide water for sanitary use and, post-filtration, potable supply via UV and reverse osmosis treatment. Quality will be verified pre-commissioning and maintained by qualified personnel.
- A 7,000-litre tank with level monitoring is proposed; bottled water may supplement supply during dry periods.

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.
- The entire tank farm area of the Proposed Development will be bunded.
- The Reception Hall, Digestate Treatment building a 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 local hydrologic system.

Fire and Resultant Water

- A Firewater Risk Assessment will be commissioned within the first six months of operation and will determine the volume of firewater retention storage require on site.
- 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 large rainwater harvesting tank.
- All retention infrastructure systems will be automatically activated in the event of a fire alarm being triggered.
- All retention tanks, etc., shall be maintained empty, or at least to a point where the required retention capacity is available.
- Bunds and tanks will be constructed to Eurocode standard (BS EN 1992-3:2006).
- All proposed below-ground structures will be constructed to be fully impermeable. The rainwater harvesting tanks will comprise reinforced concrete construction. The smaller circular tanks are pre-cast concrete units supplied by Molloy Precast and are designed to be watertight. The larger rainwater harvesting tank will also be constructed from reinforced concrete, likely cast in-situ, and will achieve full impermeability. Both tank types are to be installed on a compacted bed of single-sized granular material, in accordance with standard detailing for below-ground concrete structures.

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 Tanks

The Proposed Development includes two no. attenuation tanks designed to manage surface water runoff from roads, yards, roofs, and the impermeable bunded area. The tanks are located centrally within the site, within the bunded area and near the silage clamps. The following mitigation measures are proposed in order to ensure maximum protection of the surface and groundwater systems:

- The attenuation tanks have been sized using Causeway Flow drainage software and considers that the rainwater harvesting tank may be full at the time of a 1:100year +30% climate change rainfall event.
- The lower-level sub catchment will discharge to an isolated drainage system in order to contain any potential contaminated water should there be a failure in the digestate tanks. This limits the potential for SuDS based attenuation features and as such the full 1:100 year + 30% climate change volume will be contained below ground in the proposed pluvial

cube system. An automated penstock will be provided within the final manhole prior to discharge from the sump level that will be activated in the unlikely event that there is a failure of the digester or digestate tanks.
- Post-attenuation, surface water runoff will be discharged at the greenfield runoff rate calculated for each catchment via means of a Hydrobrake or similar approved flow control device.
- Attenuation and rainwater harvesting volumes have been sized based on a 95% runoff rate from all impermeable surfaces throughout the site.
- Attenuation storage will be provided using proprietary modular geocellular units (e.g. Pluvial Cube or similar). As these systems are not inherently impermeable, they will be encapsulated in a welded or taped impermeable geomembrane or geotextile liner to ensure full watertightness. The attenuation systems will also be laid on, and surrounded by, compacted single-sized granular fill to facilitate structural stability and membrane protection.

Attenuation Pond

The proposed attenuation feature for the office and eastern service yard level is an open attenuation pond with a permanent water level. Retention ponds can provide both stormwater attenuation and treatment. They are designed to support emergent and submerged aquatic vegetation along their shoreline. The following mitigation measures are proposed in order to ensure maximum protection of the surface and groundwater systems:

- Runoff from each rain event is detained and treated in the pool. The retention time promotes pollutant removal through sedimentation and the opportunity for biological uptake mechanisms to reduce nutrient concentrations.
- Ponds can be designed to control flow rates by storing floodwater and releasing it slowly once the risk of flooding has passed (also known as a balancing pond). The stored water will change the water level, and ponds should be designed to function in both dry and wet weather. Quantity can also be influenced by the amount of water that can be allowed to infiltrate into the ground if there is no risk to groundwater quality.
- A flow control device will be fitted to the outlet manhole from the attenuation tanks and attenuation pond. This will control outflow from the features internally and offset discharge downstream within the network. The cumulative flow to discharge into the adjacent watercourse, will be discharged at greenfield runoff rates. All flow control manholes will be fitted with a pen stock on the inlet to the flow control manhole to facilitate any future maintenance work. All flow control chambers are also to have slit traps installed.

8.4 Residual Effects

8.4.1 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 8.19** 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.***

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8.4.2 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 8.20** 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***.

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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 Ballyvass, Co. Kildare.

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.

There is 1 no. sensitive receptor within 250m of the site boundary with 2 no. sensitive receptors being within 50m of the applicable construction routes; consequently, construction dust does have the potential to cause an effect on this receptor. 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.

There are 19 sensitive receptors within 1 kilometre of the site which outlines the sparsely populated nature of the area surrounding the proposed project.

Human receptors are largely residential houses. Receptors are located to the Southeast and Northwest of the site.

The nearest human and residential receptor to the site is a residential house located approximately 190m North 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.**

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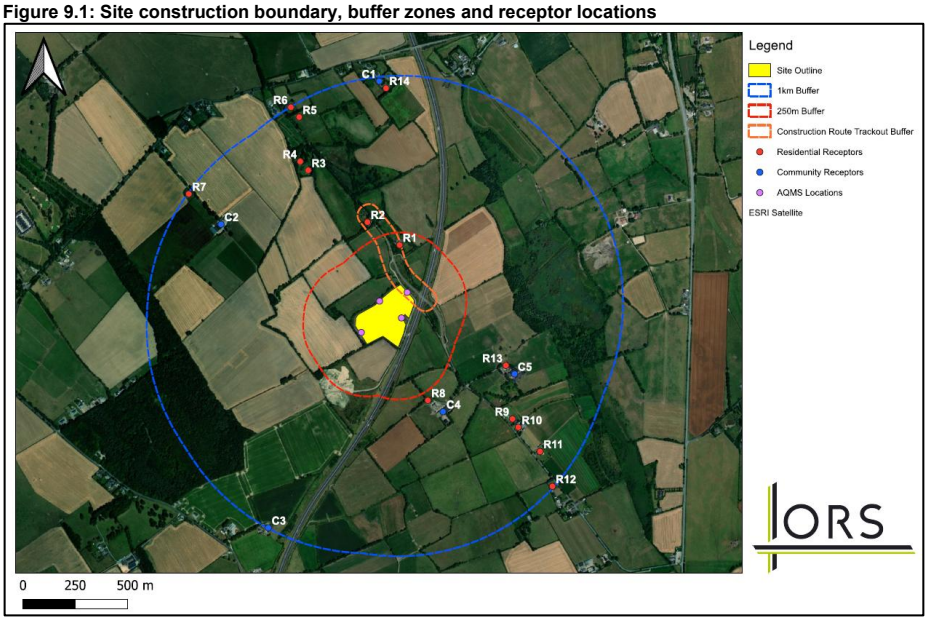
Figure 9.1: Site construction boundary, buffer zones and receptor locations



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 Edenderry monitoring station was utilised for the $PM_{10/2.5}$ values. Fieldwork was completed 31st October and 6th December 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 in **Table NTS 9.1** below.

Table NTS 9.1: Baseline Air Quality Monitoring Data in the Vicinity of Proposed Plant

Compound	Site specific baseline monitoring 31st Oct to 06th Dec 24
Carbon Monoxide 8-hr (Annual Mean) (1 Location)	0.30 (Below LOD of Monitoring Unit) (mg/m³)
Oxides of Nitrogen (Annual Mean) (4 locations)	Avg. 5.50 (Min 4.40 - Max 6.30) (µg/m³)
Sulphur Dioxide (Annual Mean) (4 locations)	Avg. < 1.23 (Min/Max < 1.23 (LOD)) (µg/m³)
Particulate matter as PM_{10} (Annual Mean) (1 Location)	Avg. 21.57 (Min 1.29 - Max 170.30) (µg/m³)
Particulate matter as $PM_{2.5}$ (Annual Mean) (1 Location)	Avg. 19.64 (Min 1.29 - Max 138.91) (µg/m³)
Ammonia (Annual Mean) (4 locations)	Avg 3.70 (Min 2.39 - Max 5.27) (µg/m³)
Hydrogen Sulphide (Annual Mean) (4 locations)	Avg 0.10 (Min 0.08 (LOD) - Max 0.11) (µg/m³)

* Average, minimum and maximum values from 4 individual monitoring locations are shown. Monitoring was performed for the month of January 2024. All analysis was performed in a UKAS certified laboratory for such analytes.

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 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 NTS 9.2: Air Quality Summary

Pollutant	Limit Type	Value (µg/m^3)	Baseline (µg/m^3)	Max Level (µg/m^3)	PEC (µg/m^3)	PC of limit (%)	PEC of Limit (%)
Nitrogen Dioxide (NO_2)	99.8% max 1-hr	200	14.6	22.9	37.5	11.5	18.8
	Annual Avg	40	7.3	1.31	8.6	3.3	21.5
Carbon Monoxide (CO)	8-hr mean	10,000	0.3	145.9	146.2	1.5	1.5
Odour	98th %tile of 1-Hour	1.5	0	1.45	1.45	96.1	96.1
Ammonia	Max 1-Hour	2,500	5.52	0.89	6.41	0.04	0.3
	Annual Average	180	2.76	0.045	2.80	0.02	1.6

**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 NTS 9.3 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 NTS 9.4** (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 NTS 9.4 Projected NO_2 and PM_{10} traffic concentrations for "Do-minimum (DM)" and "Do-something (DS)" scenarios

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	5.5	5.6	0.1	Negligible	21.6	21.6	0.00	Negligible

Climate

Due to the production of *ca.* 510 - 580 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.

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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 11.0m 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

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** (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 ***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** (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, imperceptible to slight, and temporary to long term.***

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10 Noise and Vibration

Enfonic Ltd. have been commissioned by ORS Consulting Engineers to conduct a noise impact assessment in relation to the proposed Anaerobic Digester Facility at Ballyvass, Co. Kildare (the Proposed Development).

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:

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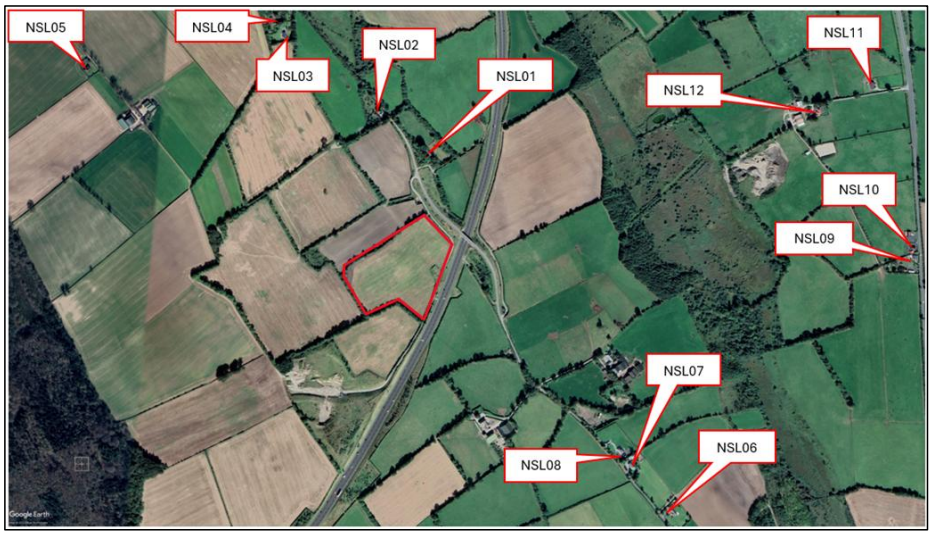

Figure NTS 10.2: Study Area and Noise Sensitive Locations (NSL)

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

One Noise Monitoring Location (NML) and two Attended Survey (ASLs) at the positions shown below were selected to represent the ambient noise conditions.

Monitoring was conducted between 10-01-2025 and 18-01-2025 and measurements on 10-1-2025.

Measurements from ASL1 and ALS2 were used to quantify the daytime noise levels. Monitoring noise levels from NML were used to establish the 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: **50dB**.

Night-time Levels

Night-time noise levels were derived from the unattended noise monitor.

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.

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	Not Significant	Temporary
Construction Traffic	Negative	Not Significant	Temporary

Operational Phase

Anaerobic digestion is a continuous process and therefore the digestion and gas upgrade and injection processes will operate continuously.

Feedstock deliveries and the removal of digestate will only occur from 08:00 to 18:30 hrs Monday to Friday and from 09:00 to 13:00 hrs on Saturday.

The most stringent noise impact assessment is for the Night-time period due to the lower measured Background (LA90) noise levels compared with the Daytime period.

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*).

Several noise sources will be installed inside enclosures and estimates of the acoustic

performance of these structures to attenuate the noise within, based on manufacturers datasheets and published data, have been included for.

Noise sources that are contained within buildings are estimated to have negligible significance due to the attenuation of the building fabric. The Flare Stack and associated Biogas Blower operate only in an emergency or for testing purposes. Their operation is expected to be no more than 2% annually as a worst-case scenario and it is therefore appropriate not to include these sources in the noise impact assessment.

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/Not Significant	Long-term
Night-time Period	Negative	Imperceptible/ Not Significant	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 include ensuring compliance with the limits detailed in Section Error! Reference source not found. 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 impact assessment herein adopts a worst-case with all noise sources associated with the site operating simultaneously and continuously. In reality, the noise levels and the impact will be less.

Noise emissions associated with deliveries will be subject to operational restrictions including timings to minimise any adverse impacts.

There is no further 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.

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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***.

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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
- Kildare 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 site of the proposed development sits lower in the topography from other local icons. The motorway, its bridges and overpasses further seclude the site in the contemporary landscape.
- There are no listed buildings affected by or in view of the proposed development. Given the location of the M9 motorway and the sand and gravel quarry in relation to the site of the proposed development and the absence of listed elements at the site, incongruity is not an issue in the case of landscape associations.
- There are no recorded monuments or protected structures on the site of the proposed development that have any landscape implications. A previous excavation revealed a Fulacht Fia during nearby work for Gas Networks Ireland.
- The typological classification of the county's' landscapes into categories has placed the site of the Proposed Development into the Eastern Transition landscape character area.
- The landscape character area 'Eastern Transition' zone has been assigned a 'medium' sensitivity rating in the landscape character assessment for County Kildare. This is described as; "Class 2 Medium Sensitivity Eastern Transition Lands South- Eastern Uplands Areas with the capacity to accommodate a range of uses without significant adverse effects on the appearance or character of the landscape having regards to localised sensitivity factors
- These areas of high amenity in proximity to the proposed development include; Dun Ailinne, The Curragh and Environs, Pollardstown Fen, The River Liffey and the River Barrow Valleys, Rye Water Valley at Carton SAC, The Grand and Royal Canal Corridors, Ballynafagh Lake SAC, Poulaphuca, Mouds Bog SAC, Ballynafagh Bog SAC, Red Bog SAC, East Kildare Uplands.

- There is no strong landscape value attributed to the character area in the current KCDP. The hedgerow system is a most valued element in its ability to define the landscape spatial pattern and locally its position on the edge of an interesting historical area lend these elements most value in the landscape setting.
- The designated amenity views and prospects in County Kildare will /not be affected by the proposed development. The closest hilltop view is Corballis Hill at over 5km from the proposed development.
- Examining the Kildare County Development plan and Geological Survey Ireland, there are no listed areas of geological heritage interest affected by the proposed development from a landscape or intervisibility perspective.
- The following policies and objectives of the KCDP are relevant for the Proposed Development: **Landscape Policy & Objectives LR O42, BI P6, BI O26, BI O27, BI O28, BI O29, BI O30** and **BIO31,** (see Section **11.4** EIAR Chapter 11, Main Report for full details)

Landscape Effects

Landscape character as discussed above is a significant aspect of the landscape receptors susceptibility to change. The effect on landscape character and its ability to accommodate the proposed development, maintain the baseline and achieve landscape planning policies is considered. The elements which contribute to positive landscape character at or near the site of the proposed development is the topographical differentiation and contrast, the woodland outcrop, and the field pattern. The hedgerows are a valuable landscape element contributing to spatial integrity and landscape quality at the site of the proposed development.

The findings of the field study (**Appendix 11.2 – Chapter 11 – EIAR Main Report**) concur with the description. The '**medium'** sensitivity as ascribed in the landscape character assessment and the findings which considers the proximity of the motorway and other large units in the landscape character area is an appropriate rating.

Therefore, considering the nature of the proposed development, the intrinsic and inherent values attributed to the landscape character area and assessing the landscape at and near the site of the proposed development the rating '**medium'** is appropriate for landscape sensitivity.

View Effects

The scenic prospects as listed in the KCDP were examined in relation to the Proposed Development. There are no listed prospects in the proximity of or focused on the proposed development site. The Corballis scenic drive is the closest prospect to the site of the proposed development and is approximately 2km- 6 km on the nearest side to the proposed development.

The views listed by Coillte in Mullaghreelan Wood were examined. They focus north towards Kilkea Castle and west over the plain of Kildare towards Laois. These are not in the direction of the proposed development. The visual section of **Chapter 11** (EIAR Main Report) examines this further.

11.2 Predicted Impacts

Landscape Construction Phase

The changes to the landscape will occur during the construction stage. The proposals will require access which will widen the entrance.

Apart from this there will be no loss of landscape elements that would alter the landscape character at a local level.

However, there will be a new scale introduced into the landscape. The landscape exhibits a reasonable capacity for change when accompanied with tree planting. Woodland and trees are an addition to the existing landscape which add to the overall landscape pattern and will effectively blend with the eastern woodland and field mosaic of the area.

The soils will contribute to excellent tree growth. The proposed topographical adjustment will work with the existing topography in the area. Any soil disturbance or overload is to be utilised onsite as far as practicable. The proposals are accompanied by a landscape masterplan indicating how the development is to be integrated into the surrounding landscape. This will achieve in protecting the existing landscape character and reinforce it somewhat. The soils will support the tall vegetation once contoured and selected carefully. The trees specified in the landscape masterplan which will screen the development in time.

The overall magnitude of change will be 'medium.' This is in line with the description of medium landscape change which is moderate in extent with the introduction of elements that may be prominent but "not necessarily substantially uncharacteristic in the context. Such development results in change to the character of the landscape but not necessarily reduction in landscape quality and perceived value."

Landscape Sensitivity: **Medium**

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

Setting a **medium** landscape sensitivity against a **medium** magnitude of change gives a '**Moderate**' 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. As part of the landscape proposals, it is recommended that there will be a significant mixed screen planting wrapped around the proposed facility. This will largely include native and naturalised trees and plant material.

This will effectively envelope the proposed development in the landscape.

It will also screen the scale and form of the structures and add additional deciduous trees and Scots Pine to the overall landscape which blends with the landscape character area. Trees will add another favourable element to the landscape in the long term.

During the operational phase of the development, maturing trees present an opportunity to make

a positive contribution to the overall landscape. The landscape sensitivity is not likely to change from the construction phase, but the magnitude of change will be lower as the landscape proposals start to establish and grow. In the medium term, the positive landscape impact of the trees and understory development will reduce the magnitude of change experienced at landscape level from medium to low.

Landscape Sensitivity: **Medium**

Magnitude of Change: **Low**

Setting a **medium** landscape sensitivity against a **low** magnitude of change gives a significance of effects rating as **'slight'** as indicated in Table 11.1 above**.** Given the scale of the development and using professional judgement, a rating of **'moderate to slight'** is more likely to be appropriate for the significance of effects in the medium term. This will decrease in adversity with the passage of time as the trees develop into a woodland copse and the landscape significance of effects reduces to slight.

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. Initially a zone of theoretical visibility (Appendix 11.1) or viewshed influenced the areas being considered for intervisibility. A ZTV is computer generated and presents the worst-case scenario and examines intervisibility without the effect of natural land cover, forests, woodlands, trees, buildings, and vegetation. The area was visited and the most likely visual receptors affected identified. 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 Ballyvass was visited on 4, 10 and 24 February 2025 and on the 5 March 2025.The viewpoints selected were also photographed on March 7 and 10, 2025, for verified photomontage production. The visual impact assessment is to be read with the 3Dimensional, verified photomontage booklet which accompanies this report. The site location and its hinterland were examined referencing the viewshed analysis. Taking topography and vegetative cover into consideration, an inventory of viewpoints was selected. Upon establishing the location of likely viewpoint receptors each was visited and an assessment with respect to viewpoint sensitivity and the likely magnitude of change to this view due to the Proposed Development was made. The verified photomontages of these views examine the extent of any visual impact or loss of visual amenity at these viewpoints.

There are specific considerations at each viewpoint which are addressed in **Section 11.7.4** (**Chapter 11 - EIAR Main Repor**t)

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	Mullaghreelan	High	Negligible	Slight to Not Significant	Adverse
VP2	Ballyvass	High	Medium	Significant	Adverse
VP3	Ballyvass M9 Bridge	Low	High	Moderate to Slight	Adverse
VP4	Coolane	High	Negligible	Slight to Not Significant	Adverse
VP5	Mullaghreelan	High	Medium	Significant	Adverse
VP6	Coolane M9 Bridge	Low	Negligible	Imperceptible	Neutral

Visual Impact – Operational Phase

The operational phase of the project 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 than is currently the case but likely less than at the construction phase. There are specific considerations at each viewpoint which are addressed here below.

There are specific considerations at each viewpoint which are addressed in **Section 11.7.5** (Chapter 11 - EIAR Main Report)

Viewpoint No.	Location	Sensitivity	Magnitude of Change	Significance of Effects	Nature of effects
VP1	Mullaghreelan	High	Negligible	Slight to Not Significant	Neutral
VP2	Ballyvass	High	Low	Moderate to Slight	Adverse
VP3	Ballyvass M9 Bridge	Low	Medium	Slight	Adverse
VP4	Coolane	High	Negligible	Slight to Not Significant	Neutral
VP5	Mullaghreelan	High	Medium to low	Moderate	Adverse
VP6	Coolane M9 Bridge	Low	Negligible	Imperceptible	Neutral

'Do Nothing' Scenario

There will be no difference to the views or the landscape for a 'Do Nothing' scenario. It is likely the site will remain as agricultural land.

11.4 Cumulative Impact

There are no other known biogas proposals within the landscape character area. Other biogas facilities in the county at Lackaghmore, Monasterevin, Gorteen Nurney, and Littleconnell and Great Connell Newbridge will not have a cumulative effect with this proposal given the distance between the developments. There will be no instance of intervisibility between these facilities and the Proposed Development.

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.

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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.

- *Thaumetopoea processionea*, commonly known as the Oak Processionary Moth (OPM) is not to be brought onsite and reported immediately to the Department of Agriculture, Food, and the Marine (DAFM), if identified on or near to the site.

- *Xylella fastidiosa* also presents a threat to new and existing planting and is to be avoided and reported to DAFM if detected on or near the site.
- All hedgerows and hedgerow trees which are being retained are to be protected during the construction process with a root protection zone established, 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. At the detailed design stage tunnelling is to be preferred over trenching where pipework interacts with existing hedgerow systems in selected areas. This to minimise the impact of pipe works on adjacent hedgerow structures. The root protection zone is to at a minimum be positioned outside the drip line of the hedgerow system.

- Palisade fencing is to be screened with hedging and trees.
- Planting specifications to be overseen by a qualified landscape architect during the construction and operational period as required.

Reinforcing landscape

Any damage to field boundaries received during construction to be repaired in the traditional manner. Low banks for planting trees and hedgerows are to be reinforced where possible. The screening planting and new tree planting will reinforce much of the landscape pattern.
Following correct landscape construction and planting, all plant material is to be properly and satisfactorily, irrigated, pruned and given correct amounts of appropriate fertiliser 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. 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 continued growing needs.

- Cutting and timing of operations in the landscape management plans to facilitate for full benefit of pollinators

- Hedera colchica as identified in the flora survey not to be allowed to establish itself in the

hedgerows.

- 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. Stake belts are to be loosened as required and stakes cut down and or removed as appropriate.
- 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, this to be completed on each side, on alternate years.
- Appropriate native infill materials to be used in the rejuvenation of the hedgerows e.g. Crataegus monogyna, Ilex aquifolium etc,
- Flowering hedgerow plants and other pollinators are to be factored into the hedgerow cutting regime with respect to timing of operations and infill planting opportunities.
- The colour of the buildings as selected will blend into the landscape similarly to agricultural buildings. Wall colours are to be lighter than roof colour. A suitable dark green specification is to be applied on all metal cladding. The least reflective colours to be chosen to avoid light reflection and to reduce the apparent size of the buildings in the landscape. Standards as expected for large agricultural buildings to be applied to prevent incongruent colour choices on the buildings and structures.

Buildings and Structures

The colour of the buildings as selected will blend into the landscape similarly to agricultural buildings. Wall colours are to be lighter than roof colour. A suitable dark green specification is to be applied on all metal cladding. The least reflective colours to be chosen to avoid light reflection and to reduce the apparent size of the buildings in the landscape. Standards as expected for large agricultural buildings to be applied to prevent incongruent colour choices on the buildings and structures.

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 related and are generally positive and beneficial. Mitigation measures which avoid damage to the landscape and views will also help mitigate biodiversity loss. The archaeology and cultural heritage can interact with landscape and visual impact in certain areas. (see **Section 11.9**, **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 be effectively screened, and a plantation of trees will be an addition to the

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landscape. Year on year the development of taller trees will continue to absorb the Proposed Development. Apart from the impacts as outlined in the assessment above no further residual impacts are expected.

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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 Ballyvass, Co. Kildare.

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 is located approximately 3.3km northwest of the town of Castledermot, Co. Kildare and approximately 11.3km northeast of Carlow town. The site access is located around 165m off the L8050 Local Road and vehicles travelling between the proposed site access and the R448 to the east will make use of this local road. The L8050 is situated in a rural environment. There is no designated footpath, cycle path and hard shoulder along its length. As the site is located in the vicinity of the R448, it offers connectivity to various locations across the county.

Vehicular access to the site is via an existing access on the L8050 local road and through a new proposed priority T-junction off the existing access road which intersects the L8050 Local Road to the northwest of the site. 12No. car parking bays are provided to the northeast of the office area, while the central circulation area (concrete apron) to the south of the office building

will be used for articulated lorry turning and reversing.

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 Development plans include providing vehicular access from the L8050 to the northwest of the site. Arrivals and departures will be via the Regional Road R448, located southeast of the site, and all traffic will utilise the L8050/R448 priority T- junction to/from the proposed site.

The R448 is a two-way flow single carriageway road running in a north–south direction, providing connectivity between Naas to the north and Carlow Town to the south. The carriageway width varies along its length, measuring approximately 8m at its junction with the L8050. At this location, the R448 features continuous solid white double centreline, indicating no overtaking along this road section, and intermittent yellow edge road markings. The posted speed limit along this section of the R448 is 100 kph.

Car Parking

The site will have ca. 3-5No. staff members on site at the same time. The number of parking spaces provided for staff and visitors of the development is 12No. spaces, located adjacent to the office building, with 1No. being an accessible parking space and 2No. 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 R448 and the local roads in the vicinity, and no dedicated means of accessing the site by bicycle.

Despite this, the Proposed Development includes provision for 10No. bicycle parking spaces, in accordance with the standards outlined in the in the Kildare County Development Plan.

Existing Road Network

The Proposed Development plans include providing vehicular access from the L8050 to the northwest of the site. Arrivals and departures will be via the Regional Road R448, located southeast of the site, and all traffic will utilise the L8050/R448 priority T- junction to/from the proposed site.

The R448 is a two-way flow single carriageway road running in a north–south direction, providing connectivity between Naas to the north and Carlow Town to the south. The carriageway width varies along its length, measuring approximately 8m at its junction with the L8050. At this location, the R448 features continuous solid white double centreline, indicating no overtaking along this road section, and intermittent yellow edge road markings. The posted speed limit along this section of the R448 is 100 kph.

The L8050 is a single-lane carriageway, approximately 5-6 metres wide, that accommodates two-way traffic that gains access to the Regional Road R448 to the northwest, with an increasing width towards the mouth of the priority junction formed by the L8050 and the R448. At this junction, the road is equipped with road markings, which are essential for guiding vehicle

drivers effectively, while a 'STOP' sign is in place.

The junction with the L8050 is a simple priority T-junction, with the minor road intersecting from the left (west) of the R488. Street lighting infrastructure is not available in the immediate vicinity.

At the junction with the R448, there are no dedicated right-turn lanes provided for vehicles turning onto the L8050. The surrounding environment consists of residential properties with front boundary walls, hedgerows, and green fields. Directional signage is located on the eastern side of the junction, providing wayfinding information for drivers. Additionally, the road is bordered by hedgerows on the southern side, restricting visibility at certain points. Street lighting infrastructure is not available in the immediate vicinity.

Furthermore, the L8050 is generally a narrow local road along the majority of its length, with some localised widening at the overbridge crossing the M9 motorway. In several sections, the road width is constrained, providing limited opportunity for two vehicles to pass safely. However, formal passing bays are to be provided at suitable locations along the L8050 where sufficient forward visibility exists. These works form part of the adjacent planning application for the extension of the existing sand and gravel pit (Planning Application Ref. 23/60256). As a condition of that planning permission - imposed in the interest of road safety - the developer is required to deliver seven passing bays between the development site and the R448. These bays must be generally in accordance with the standards set out in NRA TA 85/11, spaced no more than 250 metres apart, and inter-visible with adjacent bays.

There are no footpaths or cycle lanes provided along the R448 and the L8050, in the vicinity of the site access. Additionally, the R448 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, Kildare County Council have no improvement schemes on the R448 or the L8050 that would affect the Proposed Development.

Existing Traffic Flows

Automatic Junction Turning Counts (JTC) have been undertaken at the junction on Thursday 13th February 2025 by a third-party company called IDASO. The traffic counts were carried out during a 12-hour period from 07:00 AM to 07:00 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 371 PCUs were recorded, with 175 heading southbound, towards the Castledermot, and 164 towards the North, while only 12 headed westbound onto the L8050. In the PM peak, the majority of traffic moved southbound along the R448, totalling 252 PCUs, with 15 vehicles travelling westbound towards the L8050. Overall, the observed traffic along the assessed junction in the vicinity of the site, during the PM peak,

was 429 PCUs.

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

Table NTS 12.1: February 2025 Traffic Counts

Junction	AM Peak (PCU)	PM Peak (PCU)
1 – T- Junction L8050/ R448	371	429

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 Kildare County Council and the National Planning Application websites were consulted to include all committed developments in the area.

As per the records available on the Kildare County Council planning website, there is a single application (Ref. No 23/60256) to the southwest of the proposed site for the extension to the existing sand and gravel pit with an extraction area of 4.890 hectares that was granted permission on the 28th of November 2024. The entrance to the sand and gravel pit will be via the existing access road which intersects the L8050 Local Road, from which the proposed development will also be accessed. This cumulative effect has been considered in the junction modelling analysis in **Section 12.5.2** (Chapter 12 - EIAR Main report).

Future Year Traffic Growth

The Proposed Development is aimed to be fully constructed and operational in 2027. 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		R448 Towards Castledermot	L8050	R448 Hobartstown	Total Movements
2027	AM	212	55	196	463
	PM	301	51	172	524
2032	AM	227	56	208	491
	PM	321	52	184	557
2042	AM	240	57	219	516
	PM	339	53	195	587

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 20No. to 30No. 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	25	0	**25**
17:00-18:00	0	25	**25**

Operational Phase

The operation of a Renewable Biogas Facility involves producing renewable biogas through the decomposition of organic feedstock. The site will be functional 24 hours a day for 7 days a week with staff onsite during normal working hours from 07:00 and 19:00 Monday to Friday, and 07:00 to 16:00 on Saturday. Outside of these hours, the process is monitored remotely. There are no shifts, and it is expected that ca. 3-5 staff members will be present at the premises during normal working hours. The 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'.

Feedstock will be transported to the Proposed Development using heavy goods vehicles (HGVs), enclosed trailers, and sealed vacuum tankers. The average tonnes per load are assumed to be 28-30 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	18	12	30
PM	12	18	30
Average movements			**60**

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 2.3% of the AADT observed along the R448 and the junction with the L8050 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 60.

Regarding the HGV numbers generated from the site, of the 60No. trips associated with the site, 50No. will be composed of heavy vehicles. Traffic counts reveal that during the morning peak, approximately 8% of the traffic on the R448 consisted of HGVs, with no heavy vehicles turning onto the L8050. The same pattern was observed during the PM peak, with 8% of the traffic composing HGVs, and no HGVs along the L8050 local road.

Consequently, the traffic generated by the Proposed Development meets the criteria for producing a full Traffic and Transport Assessment, with a higher than 10% increase in traffic, and 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, in order to reinforce the point that the traffic from the Proposed Development will not adversely affect the functionality of the neighbouring 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 60No. vehicle movements day, where 50No. are HGVs and 10No. are private vehicles and vans. The additional vehicles will represent a maximum of 13.5% increase in traffic under a very conservative scenario and will not generate 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.

ORS

12.4 Residual Impacts

As mentioned in previous sections, 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 L8050 Local Road, is located in an 60km/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 L8050 due to the low number of vehicles predicted to enter the site on a daily basis. 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.

ORS

13 Archaeology & Cultural Heritage

Site Overview and Archaeological Context

The proposed biogas facility development ais located in Ballyvass, Co. Kildare. This subject site is in low lying arable agricultural land currently under crop, the boundaries of the subject site are demarcated by semi-mature trees and hedgerows. The subject site is bounded by greenfield to the north and west, by the M9 to the south.

Recorded monument KD038-076----, a Fulacht fiadh excavated (and is therefore no longer extant) in advance of a Bord Gáis pipeline development (Gregory, 1999). The excavation revealed three shallow pits and two complete troughs. This site was located in the southern end of the subject site (within the PDA). Roughly 275m from the southern boundary of the PDA another excavation related to the gas pipeline (KD038-062----) revealed a pit with a fill of ash and humus soil, and associated finds of pig teeth (Cleary et al. 1987, 5).

A ringfort (KD038-036----) and moated site (KD038-034---) are located to the west in Mullaghreelan townland (both roughly 45m distant). 261m to the east there is an extant mound (KD038-031----). There are no NIAH or RPS structures or demesne lands in the vicinity.

Cultural Heritage Assessment

This study aims to assess, as far as reasonably possible from existing records, the archaeological and cultural heritage environment (hereafter referred to as cultural heritage environment or cultural heritage resource), to evaluate the potential or likely impacts that the proposed development will have on this environment and, where appropriate, to suggest mitigation measures to ameliorate potential impacts, in accordance with the policies of:

- Department of Housing, Local Government and Heritage.
- The National Monuments Acts (1930-2005).
- The Kildare County Development Plan 2023 - 2029.
- Best practice guidelines.

Following on from this, the residual impact that the proposed scheme will have on the baseline environment is identified and evaluated.

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.

Several monuments are located within a 1km radius of the site. A miscellaneous site (KD038-062) is approximately 200m to the south. A possible ringfort, rath or cashel (KD038-036) approximately 450m to the southwest and a rectangular enclosure (KD038-034) approximately 550 m to the west.

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Architectural Heritage Baseline Data

A review of the National Inventory of Architectural Heritage was undertaken.

A review of the National Inventory of Architectural Heritage (NIAH) identified several recorded structures within approximately 2.5 km of the proposed development site.

The closest structure is a disused freestanding cast-iron "cow tail" water pump (Reg. No. 11903808), extant by 1962, located approximately 1.4 km to the south.

Woodlands House (Reg. No. 11903807), a detached three-bay two-storey house extant in 1908, is situated approximately 2.0 km south of the site.

Kilkea Demesne and Castle is located approximately 1.5 km to the west. Nearby, Kilkea House (Reg. No. 11903718), a detached three-bay (two-bay deep) two-storey over basement farmhouse built in 1837, lies around 2.1 km west of the site.

Several other heritage structures are located approximately 2.4 km to the northwest, including Kilkea Castle Gate Lodge (Reg. No. 11903719), a detached two-bay single-storey rubble stone lodge with a half-dormer attic dating to c.1870; Kilkea Lodge Farm (Reg. No. 11903723), a detached three-bay single-storey rubble stone former estate worker's cottage with dormer attic dating to c.1820; Kilkea National School (Reg. No. 11903722), a detached four-bay single-storey former school with dormer attic dated 1863; and Kilkea Church (Reg. No. 11903721), a detached four-bay double-height rubble stone Gothic-style Church of Ireland church dating to c.1850.

These recorded structures provide important context to the architectural and historical setting of the surrounding area.

The proposed development will not impact the visual amenity of the built or architectural heritage resource, curtilage or setting. Please refer to EIAR Chapter 11: Landscape and Visual Impact for a further assessment of landscape visual impacts.

Site Inspection

A field inspection was carried out on the 18th of March 2025 which entailed walking the PDA 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. The site could be fully accessed and was inspected throughout. The site is low lying and comprises arable agricultural land which is currently under crop. The boundaries of the subject site are demarcated by semi-mature trees and hedgerows. The subject site is bounded by greenfield to the north and west, by the M9 to the south.

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

The is a moderate to high potential to impact on previously unknown archaeological sites given the known presence of sites in the immediate vicinity.

Architectural Sites

The proposed development will have no direct physical or visual effect on the surrounding built heritage.

'Do Nothing Scenario'

If the proposed works 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. The impact of the development is usually proportional to the extent to which that development is visible to and from the extant recorded monuments and features.

13.3 Cumulative Effects

No cumulative impacts have been identified upon the archaeological and architectural resource and as such there will be no residual cumulative effects.

13.4 Mitigation Measures and Residual Effects

The mitigation strategies outlined in this section detail the measures to be adopted to ameliorate the effects that the proposed works may have on features of archaeological, architectural, or Cultural Heritage within the study area during both the construction and operational phases of the scheme. The residual effects that will remain once these mitigation measures have been implemented are also identified.

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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 Ballyvass, Co. Kildare.

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 the unnamed local road to the north of the site. The access to this road will be via the (L8050) local road located north of the site and traffic will utilize the junction when visiting the site.

At present, Kildare County Council have no improvement schemes on the R448 or the L8050 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 3-5 workers on site each day. The wastewater from the toilet and canteen will be treated using a proprietary system as recommended in the Site Suitability Assessment.

ORS

Surface Water Network

At present, the site does not feature dedicated surface water infrastructure. The site is comprised of two relatively flat areas falling towards a moderate valley at the centre of the site. The slope is generally from the northeast corner of the site to the north and from the southwest corner of the site to the north. The proposed site will require the collection, attenuation and disposal of surface water accumulated during rainfall events.

Public Water Network

The Proposed Development will not be connected to the public water network. The water supply for the Proposed Development is organised into three categories: Fire Water, Grey Water, and Potable Water.

Any other water, for example, wash water, will be supplied from rainwater harvesting and treated process water.

Gas Infrastructure

Biomethane will be supplied to the existing gas network via the Grid Injection Unit (GIU) at the site, connecting to the existing medium pressure distribution gas pipeline located onsite. 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. There are no power lines or poles within the site boundary. No ESB network infrastructure will have to be moved or relocated, there will be no requirement for relocation of utility poles or lines.

Telecomm 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 250l 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 entrance to the site will require the implementation of temporary traffic management measures along the local access road to the north of the site.	**Neutral to Negative**	**Slight**	**Brief to 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.	**Neutral**	**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	The Proposed Development will not be connected to the public water network.	**Neutral**	**Slight**	**Brief**
Gas Infrastructure	Disruption to existing network while establishing connection. All works involved in establishing the pipeline connection to the existing gas network will all be contained within the site boundary and will not require the implementation of temporary traffic management measures along local roads.	**Negative**	**Slight**	**Brief**
Electricity Network	Power supply for plant and machinery during the construction phase will be predominantly supplied by generators onsite.	**Negative**	**Slight**	**Brief**

	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 entrance will be constructed and connected to the pre-existing road network.	**Neutral**	**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.	**Neutral**	**Imperceptible**	**Long-Term**
Surface Water Network	Establishment of clearly defined work areas which can be monitored and isolated if required, for example, the bunded area. Run-off from the buildings and yards collected in a sealed pipe network which will discharge to the stream. Rain falling on the bunded area will be collected in a separate sealed drainage network and discharged to a sump, from which it will be pumped to the surface water drainage system for the remaining areas of the Proposed Development.	**Negative**	**Slight**	**Long-term**

	Leakage / spillage of biobased fertiliser or feedstocks via vehicle movements.			
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) onsite, connecting the site to the existing medium pressure distribution gas pipeline which traverses the site. 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 510-580 $Nm^3$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. 250l 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.

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- 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 to 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.

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- 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 60No. vehicle movements day, where 50No. are HGVs and 10No. are private vehicles and vans. The

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additional vehicles will represent a maximum of 13.5% increase in traffic under a very conservative scenario and will not generate 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.

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

- Wastewater, 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.

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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.

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 14.5** 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 14.6** 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**.

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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.

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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

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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 outlined 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).

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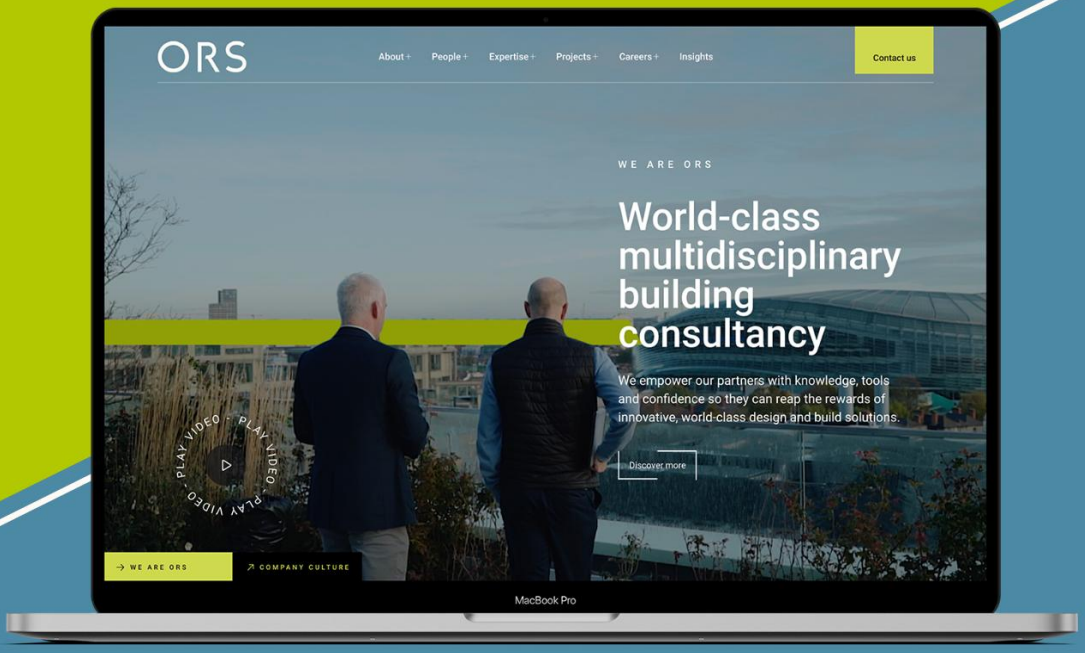

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