PURSER

Environmental Impact Assessment Report

Nua Bioenergy, Lisheen

Volume 1: Non-Technical Summary

Prepared for: Nua Bioenergy Limited

October 2024

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Contents

1.0 Introduction

1.1 Introduction

An Environmental Impact Assessment Report (EIAR) has been prepared in respect of the proposed anaerobic digestion facility at Former Lisheen Mine Site, Killoran, Moyne, Co. Tipperary (the 'proposed development' hereafter), in accordance with the relevant directive, legislative, policy and guidance requirements.

This document is a Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR). This NTS, which forms Volume 1 of the EIAR summarises, in non-technical language, the EIAR, including the key sensitive receptors (i.e., the aspects of the environment which could be affected by the proposed development), the assessment of likely significant effects on these receptors, the mitigation and monitoring measures proposed to avoid or reduce these effects, and any likely significant residual effects arising from the proposed development.

Occupying an area of approximately 5.5 hectares, the development will accept and treat 98,000 tonnes per annum of agricultural manures,food processing sludges and crop based feedstocks sourced from the region to produce grid quality biomethane (renewable natural gas) suitable for direct injection into the Gas Network Ireland (GNI) distribution network. The renewable natural gas (RNG) produced at the facility will be used as a direct replacement for conventional natural gas and in doing so contribute towards the Government's Climate Action Plan to develop 5.7TWh of indigenous biomethane production by 2030. In addition to RNG, the facility will produce a nutrient rich biobased fertiliser which can be used as a direct replacement for fossil fuel derived fertiliser.

1.2 Overview of the Proposed development

Nua Bioenergy Limited intends to apply for permission to develop a biomethane and bio-based fertiliser production facility, designed to process up to 98,000 tonnes of feedstock annually, on a 5.5-hectare site at the former Lisheen Mine, Thurles, Co. Tipperary. The site is bordered primarily by former mine lands on three sides and agricultural lands to the west.

The facility will feature a robust anaerobic digestion plant, including four primary and three secondary digester tanks, a set of feed hoppers, technical rooms, biogas conditioning units, and various process, storage, and buffer tanks. Feedstock storage will be provided through three storage clamps and two storage sheds, while biomethane will be upgraded and compressed onsite for distribution. The project will include a biomass boiler with a pellet storage silo, a Combined Heat and Power (CHP) plant with an associated heat exchanger, and a dedicated single-storey fertiliser processing and storage unit.

Supporting infrastructure includes a single-storey office building housing administration and welfare facilities, nine car parking spaces, EV charging infrastructure, bicycle parking, two weighbridges, a vehicle wash area, a fuel storage tank, an emergency flare, and site drainage with sustainable urban drainage systems (SUDS). Additional site elements include a process area runoff lagoon, attenuation pond, boundary fencing, site lighting, hard and soft landscaping, and associated utility connections and site development works.

An Industrial Emissions (IE) licence for operation will be sought from the Environmental Protection Agency (EPA).

The proposed development will be classified as a Lower Tier COMAH establishment and therefore, falls under the requirements of the Control of Major Accident Hazards Regulations, 2015 (COMAH Regulations 2015).

A more detailed description of the proposed development is provided by the Statutory Notices and in **Volume 2: Chapter 6** (Description of the Proposed Development) of this EIAR.

1.3 The Applicant

At the forefront of the country's transition to sustainable energy, Nua Bioenergy specialises in producing carbon-negative biofuels and renewable energy from agricultural feedstocks. Through advanced anaerobic digestion and upgrading technologies, the company delivers high-efficiency, carbon-neutral solutions on a national scale.

With over a century of combined expertise in the agriculture, food, and bioenergy sectors, Nua Bioenergy's team provides a solid foundation for impactful, sustainable projects. The proposed development as the potential to be one of Ireland's largest biomethane production sites, exemplifies Nua Bioenergy's commitment to expanding renewable energy infrastructure and achieving national climate goals by decarbonising agriculture and advancing the circular economy.

Through these initiatives, Nua Bioenergy not only seeks to meet Ireland's energy targets but also aims to position the country as a leader in renewable bioenergy technology. By seamlessly integrating pioneering and established technologies, Nua Bioenergy delivers efficient, reliable, and scalable infrastructure to support Ireland's journey towards a sustainable and decarbonised future.

The Applicant has been granted permission by the Freehold Owner to make this application.

In this regard, the following Letter of Consent is submitted in support of this application:

- Letter of Consent from Landowner – dated 29th July 2024

1.4 Site Location

The application site for the purposes of this EIAR is a c. 5.5 ha brownfield site located in Lisheen Mine Site, Killoran, Moyne, Thurles, Co. Tipperary. An extract from the Site Location Plan, prepared by Donnachadh O'Brien and Associates, is provided below to illustrate the location and the extent of the application site. A detailed description of the application site and its immediate context is provided in **Volume 2: Chapter 3**.

An overview of the site location is provided in **Figure 1.1**.

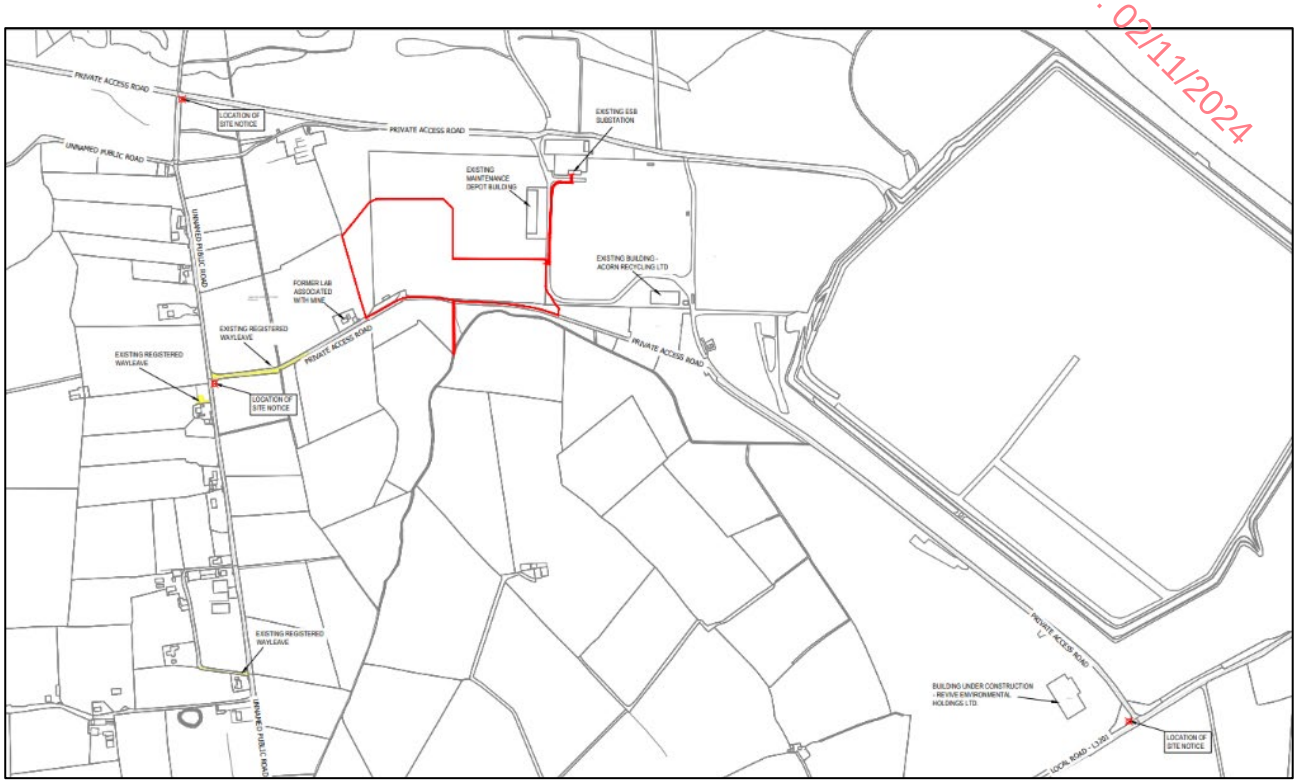

Fig. 1.1: Site Location. (Source: Donnachadh O'Brien & Associates)

1.5 Format and Structure of the Environmental Impact Assessment Report

Table 1.1 below sets out the format and structure Volume 2 – Main body – of the EIAR.

No.	Chapter	Author
1	Introduction	Purser
2	EIA Process and Methodology	Purser
3	Site Location and Context	Purser
4	Legal and Policy Framework	Purser
5	Consideration of Reasonable Alternatives	Purser
6	Description of the Proposed Development	Purser
7	Population and Human Health	Purser
8	Biodiversity	Veon Ecology
9	Land, Soils and Geology	Enviroguide
10	Hydrology and Hydrogeology	Enviroguide
11	Air Quality (including Odour)	AWN
12	Climate	AWN

13	Noise and Vibration	Wave Dynamics
14	Traffic and Transportation	Systra
15	Material Assets: Waste	Enviroguide
16	Material Assets: Utilities	DOBA
17	Archaeology and Cultural Heritage	IAC
18	Landscape and Visual	Purser
19	Risk Management / Major Accidents and Disasters	AWN
20	Inter-Related Effects	Purser
21	Cumulative Impacts	Purser
22	Schedule of Mitigation and Monitoring Proposals	Purser

Table 1.1: EIAR Structure and Consultant. (Source: Purser)

1.6 The Environmental Impact Assessment Team

Table 1.2 provides the names of the professionals who have prepared each element of the EIAR.

Name	Company	Qualifications
Seamus Donohoe	Managing Director, Purser	MRUP BAgrSc (Hons) Landscape Architecture MRTPI MIPI MILI
Elizabeth Shannon	Senior Planner, Purser	MRUP BA(mod) Geography MRTPI
Glen Moon	Principal Engineer, Systra	MA(Hons) CTPP
Steven Livingston	Associate Director, Systra	BEng MCILT
James Cousins	Managing Director, Wave Dynamics Acoustic Consultants	BSc (Hons) Pg Cert (Const Law) IOA Diploma (Acoustics & Noise Control) MIEI MIOA
Cathal Reck	Acoustic Consultant, Wave Dynamics Acoustic Consultants	BSc (Hons) Music Technology & Production IOA Certificate of Competence in Environmental Acoustics TechIOA
Faith Bailey	Associate Director, IAC Archaeology	MA BA (Hons)

		MIAI MCIfA
Jacqui Anderson	Archaeological Consultant, IAC Archaeology	BA MA MIAI
Dr. Jovanna Arndt	Senior Environmental Consultant, AWN Consulting	Ph.D. Atmospheric Chemistry BSc. (Hons) Environmental Science AMIAQM AMIES
Dr. Fergal Callaghan	Director, AWN Consulting	
Matthew Michie	Senior Environmental Consultant, AWN Consulting	MChem(Hons) MSc.
Donnachadh Powell	Lead Ecologist, Veon Ecology	BSc (Hons) Ecology and Environmental Biology QCIEEM
Dr. Amy Haigh	Biodiversity & Mammals Lead Ecologist, Veon Ecology	B.Sc. (Hons) in Zoology NUIG PhD in Mammal Ecology QCIEEM
Patrick Higgins	Technical Director, Enviroguide Consulting	BSc MSc MIEnvSc CEnv
Gareth Carroll	Principal Consultant, Enviroguide Consulting	BA BEng MIEnvSc CEnv
Warren Vokes	Senior Consultant, Enviroguide Consulting	BA MSc MCIWEM C.WEM
Nuria Manzanas	Principal Consultant, Enviroguide Consulting	BSc MSc PGeo
Rachel Redmond	Environmental Consultant, Enviroguide Consulting	BSc. (Hons)
Alan O'Neill	Managing Director, G-Net 3D	Computer Network Engineer Centre of Advanced Technology Training (CATT)
Indre Kuzminiene	Senior Project Manager, G-Net 3D	
Robert Jones	Project Manager , G-Net 3D	MA BA Digital Marketing, MTU Graphic Design QQI

Denis Danylko	Senior 3D Visualisation, G-Net 3D	MA (Architecture)
Donnachadh O'Brien	Managing Director, Donnachadh O'Brien & Associates Consulting Engineers	BSc.Eng Dip.Eng Dip.Envir.Eng CEng MIEI FConEI
Richard Kiernan	Associate, Donnachadh O'Brien & Associates Consulting Engineers	BA Hons CEng MIEI RConsEI
Andy Kotze	Civil Engineer, Donnachadh O'Brien & Associates Consulting Engineers	BEng (Civil) CEng MIEI

2.0 EIA Process and Methodology

2.1 EIA legislation and guidance

The EIAR has been prepared in compliance with Council Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU (the Environmental Impact Assessment (EIA) Directive). The amendment aimed to address certain problems of implementation, reduce unnecessary administrative burdens, simplify the assessment procedure, and reinforce certain levels of environmental protection taking into account emerging challenges such as resource efficiency, climate change, biodiversity and disaster prevention.

The EIA Directive requires that public and private projects that are likely to have significant effects on the environment are subject to an environmental impact assessment (EIA) prior to development consent being given.

Article 5 and Annex IV of the EIA Directive and Schedule 6 of the Planning and Development Regulations 2001, as amended (the "Planning Regulations"), specify the information to be contained in an EIAR in relation to this proposed development.

The prescribed classes of development and thresholds that trigger a mandatory EIA and the provision of an EIAR by the Developer are set out in Schedule 5 of the Planning Regulations.

This assessment of environmental impacts has been completed in accordance with the aforementioned prevailing EIA legislation and in accordance with the relevant guidelines which are outlined in **Chapter 2** of Volume 2 of the EIAR.

In addition to these guidance documents, all EU Directives and national legislation relating to the specialist areas have been considered under each relevant environmental aspect and addressed in the relevant EIAR chapters .

2.2 Structure of EIAR

The EIAR has 3 volumes as follows:

Volume 1 Non-Technical Summary (this document).

Volume 2 contains the main body of the report (Chapters 1-22) which include the EIAR methodology, policy context, need for the development, a description of the reasonable alternatives and technical chapters prepared by competent consultants.

Volume 3 contain all technical appendices for introductory chapters, technical chapters and summary chapters, respectively. This includes modelling outputs, background reports and / or supporting documents.

2.3 EIA Process, Assessment of Effects and Mitigation and Monitoring Measures

EIA is a process of systematically identifying the potential impacts and resultant effects (both beneficial and adverse) of a proposed development throughout all phases, including construction, operation and decommissioning. The potential impacts identified for each phase of a development are assessed for the development in isolation and cumulatively with other nearby developments.

The methodology adopted and applied within the EIAR has been developed based upon the experience of technical experts with reference to the EIA Directive and industry good practice guidance and principles.

The assessments undertaken in preparing the EIAR evaluate the construction, operation, and decommissioning phases of the proposed development, with the likelihood, extent, magnitude, duration and significance of potential likely significant effects described. The interactions of effects between different environmental aspects and the potential for cumulative impacts to arise were also considered.

The EIAR focuses on likely significant effects, i.e. those that are probable or likely to occur.

Each of the assessment chapters (Chapters 7-19) sets out how significance is determined for that particular environmental topic and highlights where varying degrees of significance have been assigned for different factors. The assessment chapters also highlight where alternative guidance to the EPA guidance, or professional judgement has been used.

The magnitude of impact and significance of the likely environmental effects are evaluated, and where required, appropriate measures to mitigate potential adverse effects are proposed. This involves an iterative approach in which a feedback loop is used to initially assess a significant adverse effect, followed by incorporation of mitigation measures to avoid impacts or to reduce impacts to acceptable levels in order to reduce the magnitude of the impact. Where feasible, this process is repeated until the effect is no longer significant.

2.4 Cumulative and Inter-related Effects

Although the proposed development may not result in significant residual effects in isolation, when the proposed development is considered cumulatively with other developments in the vicinity, significant residual effects may occur. A long list of “other existing and/or approved projects” which were deemed to be potentially relevant to be included in the cumulative impact assessment was compiled.

A screening exercise of the “long list” was carried out in order to determine whether each of those other projects have the potential to give rise to likely significant cumulative effects for each of the environmental topics in combination with the proposed development. The results of the cumulative effects assessment for each environmental topic are summarised below in Chapters 7 to 19 of this NTS.

The inter-related (or interactions) between different environmental effects, for example impacts to the road network caused by the proposed development, have been considered throughout the individual environmental topic chapters in the EIAR

3.0 Site Location and Context

3.1 Introduction

This chapter has been prepared in accordance with Annex IV(1) of the amended EIA Directive (2014/52/EU), which mandates the inclusion of *"a description of the project, including in particular a description of the location of the project."* This chapter is also aligned with the EPA's 2022 *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*, which emphasise the importance of accurately presenting the baseline environmental setting of a project.

The application site covers an area of approximately 5.5015 hectares and is located at the Former Lisheen Mine Site, Killoran, Moyne Co. Tipperary.

3.2 Site Description

The application site comprises part of the former Lisheen Mine complex, located in Killoran, Moyne, Thurles, Co. Tipperary. It is primarily bordered by other lands associated with the former mine to the north, south, and east, and by agricultural lands to the west. (See Figure 3.2 below.)

Spanning approximately 5.5 hectares[1], the application site is classified as 'brownfield', having previously operated as a lead-zinc-silver mine until mining ceased in 2015. Since rehabilitation and levelling, which occurred between 2016 and 2018, the application site has remained largely vacant and is characterised by recolonised scrub and ground vegetation, along with a mature hedgerow along the western boundary. The terrain is generally flat, reflecting the site's history as a reclaimed industrial area. The sealed historic mine entrance is located on the western portion of the site, and the Cooleeny Stream flows c. 200 metres to the south.

Notable nearby structures include the former Lisheen Mine maintenance depot, which is permitted (TCC Reg. Ref. 211171) for redevelopment as the Irish Bioeconomy Foundation's Research and Development Unit. A former office and laboratory building from the mine's operational period stands vacant near the site's western edge, while Acorn Recycling / AQS Environmental Solutions operates to the southeast.

Additional remnants from previous mining operations are found throughout the wider site, such as a tailings pond and internal access roads, which still serve as access routes within the complex. Centrally located within the larger Lisheen property, an ESB substation lies approximately 200 metres northeast of the application site.

The wider Lisheen complex includes additional industrial and renewable energy activities, such as the Lisheen Wind Farm, which comprises 18 turbines on the former mine site and additional turbines nearby, connecting to the existing substation. Revive Environmental is constructing a facility (permitted under TCC Reg. Ref. 21709) near the main site entrance, approximately 800 meters to the southeast.

3.3 Wider Area

The wider area surrounding the former Lisheen Mine complex is predominantly rural, characterised by agricultural land, peatlands historically managed by Bord na Móna, and forestry. Land use in the area mainly includes agriculture, forestry, and renewable energy production, with the Lisheen complex and nearby lands hosting multiple wind turbines as part of the Lisheen and Bruckana Wind Farms. These renewable energy projects, along with emerging bio-based industries, are gradually shifting local employment from traditional agriculture to sustainable energy and bioeconomy sectors.

The application site is located at a considerable distance from settlements and populated areas. The closest settlements include the villages of Urlingford - 6.3 kilometres to the southeast - and Templemore, approximately 12.6 kilometres to the northwest. Housing in the area is low-density and predominantly rural, consisting mainly of farmhouses and individual dwellings along country roads. The nearest residence situated approximately 750 metres to the west.

4.0 Legal and Policy Framework

4.1 Introduction

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

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 Gases

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. Under the amended Directive, member states must identify areas for the acceleration of renewables where projects will undergo a simplified and fast-track procedure.

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 Methan 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 2024**: The 2024 Climate Action Plan is the third annual Climate Action Plan, and provides direct policy support for biomethane development, noting a target of 5.7 terrawatt hours of

biomethane by 2030, with one terawatt hour to be delivered by 2025. The proposals will contribute to meeting this ambitious target.

- **Climate Action Plan 2023**: Similarly to the current 2024 Climate Action Plan, the 2023 Climate Action Plan also strongly supported biomethane development in the State.
- **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.
- **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.

4.4 Regional Planning Policy

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

A key objective of the RSES is to support Tipperary Council in expanding the bioeconomy sector in Ireland. Tipperary has been recognised as being a location which can lead in this sector which will be centred on the National Bioeconomy campus in Lisheen.

The RSES sets out a vision for the Southern Region which promotes all areas covered under the plan to realise their full potential; protect and enhance the environment; and to successfully combat climate change alongside achieving economic growth and improving life for the region.

4.5 Local Planning Policy

4.5.1 Tipperary County Development Plan 2022-2028

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

- The County Development Plan support collaborating with stakeholders, research and innovation in smart renewable energy technologies and initiatives to accelerate diversification away from fossil fuels (Objective 3-E).
- The County Development Plan supports a culture of sustainability as part of a move towards a low-carbon society and economy through training programmes, demonstration sites and other activities (Objective 3-K).

- Tipperary Council is highlighted as an early leader in climate action and the green economy through the designation of the bioeconomy site at Lisheen.
- The County Development Plan supports and facilitates the development of a sustainable and economically efficient agricultural and food sector and bioeconomy, balanced with the importance of maintaining and protecting the natural services of the environment, including landscape, water quality and biodiversity (Policy 10-3).
- The County Development Plan supports the co-location of renewable energy development and technologies to ensure the most efficient use of land identified as suitable for renewable energy generation (Policy 10-5).
- A minimum target of 750MW of renewable energy to be produced in County Tipperary through wind and solar energy over the lifetime of the Development Plan.

4.5.2 Tipperary Climate Action Plan (2024)

Adopted in February 2024, Climate Action Plan sets goals to translate national climate policy to local contexts, aiming to achieve climate neutrality and establish decarbonization zones. It supports renewable energy projects and community engagement in climate action. The Climate Action Plan highlights the high degree of support for renewable energy in the county, and notes that the agricultural sector currently contributes 49.9% of the total emissions for the county.

In accordance with the Local Authority Climate Action Plan Guidelines a Decarbonising Zone has been identified in Tipperary centred around the National Bioeconomy Campus at Lisheen, Thurles. The Mid-Tipperary Decarbonisation Zone is the only inland and rural decarbonising zone in the country, and opportunities and actions are therefore focused on the bioeconomy, rural and agricultural diversification, land use change and biodiversity, as well as co-benefits such as building retrofitting, renewable energy, rural transport, forestry, and tourism.

4.5.3 Tipperary Renewable Energy Strategy (Development Plan: Volume 3)

The Renewable Energy Strategy recognises that Ireland (and Tipperary) is a long way off meeting its own energy demands from renewable resources, and it is recognised that significant and immediate commitment to energy (and better energy efficiency) is now required. This Renewable Energy Strategy is set in a hierarchy of international and national legislation which provides the statutory basis for planning policy for the development and use of renewable energy resources and for the protection of the environment.

The Strategy aligns with the White Paper for Energy 2015, aiming to create a low-carbon future by fostering renewable energy technologies, energy efficiency, and local job creation. These goals ensure Tipperary contributes to national climate objectives.

Since the Renewable Energy Strategy was produced by Tipperary Council targets have become more ambitious in order to meet the carbon neutral status by 2050 as agreed by the Irish government. However, the underlying principles of increasing the amount of energy sourced from renewable sources still stands today.

5.0 Consideration of Alternatives

5.1 Introduction

This chapter outlines the reasonable alternatives considered by Nua Bioenergy during the design and pre-application phases of the proposed development. It presents the primary rationale for the selected option in terms of design, technology, location, size, and scale, taking into account the environmental impacts of each alternative and aligning with the project objectives.

As per the EPA's Guidelines on the 'Information to be Contained in Environmental Impact Assessment Reports', dated May 2022, the key alternatives considered are discussed under the following headings:

- 'Do-Nothing Alternative
- Alternative Locations
- Alternative Layouts
- Alternative Designs
- Alternative Technical Configuration

5.2 'Do-Nothing' Alternative

The "Do-Nothing" alternative takes into account the anticipated outcome that would occur if the proposed development were to stagnate, or if nothing were done. It should be noted that this chapter analyses the "Do Nothing" scenario, or the extent to which development could happen if the proposed development were not made.

It was found that not developing the site would leave critical policies unfulfilled, missing key contributions to Ireland's bioeconomy and renewable energy targets. The existing land use would remain in place and would perpetuate the limited environmental and community value currently offered by the site. Direction and indirect job opportunities would be lost in the local and wider communities.

In the 'Do-Nothing' scenario, the contribution of the site to a reduction in emissions from agriculture would not be achieved and the agricultural sector would continue to be the highest contributor to carbon emissions. The current practice of spreading agricultural manures and slurries on the ground would persist and the opportunity to capture CH_4 emissions would be lost.

5.3 Alternative Locations

Taking into consideration the Local Authority development and climate objectives, it is considered that the site is suitable for the proposed development.

Ireland's commitment to renewable energy development, as outlined in national and EU policies like the Climate Action Plan, the National Biomethane Strategy, and the EU Renewable Energy Directive (RED III), makes it a prime location for bio-based energy projects such as anaerobic digestion (AD).

A thorough review was carried out of various locations across the counties of Tipperary, Kildare, Kilkenny and Limerick. These counties are known to have high levels of agricultural activity which would provide a dependable source of products for the AD facility and were also considered to have access to a good road network which would facilitate efficient transport of feedstock and distribution of bio-based fertiliser and biomethane.

The site selection process involved a comprehensive review of each site against a defined set of criteria, set out below:

- Land availability
- Site size
- Existing land use
- Availability and proximity to Feedstock Supply and Digestate Receivers
- Transport Network and Access
- Proximity to Sensitive Receptors
- Access to Gas Grid
- Access to Electricity Grid
- Topography
- Flood Risk
- Landscape Sensitivity
- Proximity to Suitable Watercourse or Sewer
- Proximity to Drinking Water Source

5.4 Alternative Design and Site Layout

An extensive design process was undertaken to establish the optimal redevelopment for the lands. The supporting Planning Report, enclosed with this planning application outlines how the design process has considered feedback at key stages from consultation and engagement to balance the issues and opportunities in order to establish design principles that ensure that the potential for the redevelopment of the lands is optimised.

At key stages, the design was adjusted based on expert feedback, consultation insights, and findings from site investigations and baseline assessments, enabling a balanced response to site-specific issues and opportunities and ensuring the proposed development meets high design standards.

5.5 Alternative Technical Configurations

Alternative Technical Configurations were considered as part of the design process of the proposed development. to ensure that the proposed development would achieve high environmental performance and operational efficiency.

The chosen technologies are well-established in the industry, proven for emission control, and aligned with environmental objectives.

6.0 Description of Proposed Development

6.1. Introduction

This chapter of the EIAR provides an overview of the proposed project including information on the design, construction and operational stages.

Figure 6.1 below is an extract of the proposed site layout plan and identifies the overall extent and layout of the proposed development (please refer to the detailed drawing package which accompanies the planning application for the larger/scaled version).

Figure: 6.1: Overview of the Proposed Site Layout. Source: Extract of Drawing No. 2429-DOB-XX-SI-DR-C-0500 P01, annotated by Purser to show key zones within the proposed site layout.

6.2 Description of the Proposed Development

Nua Bioenergy Limited intends to apply for permission to construct a biomethane and bio-based fertiliser production facility, with an annual intake of up to 98,000 tonnes of feedstock per annum, at this site of c. 5.5 hectares at lands located at the former Lisheen Mine Site, Killoran, Moyne, Thurles, Co. Tipperary.

The development will consist of the construction of an anaerobic digestion plant comprising:

a. 4 No. primary digester tanks (each measuring c. 7.6 m in height);
b. 3 No. secondary digester tanks (each measuring c. 14.5 m in height);
c. 4 No. feed hoppers;
d. 4 No. technical rooms (ranging in size from c. 35 sq m to c. 95 sq m GFA);
e. 2 No. biogas conditioning units;
f. process, storage and buffer tanks (comprising: 1 No. buffer digestate storage tank (c. 7.5 m in height), 1 No. suspension buffer tank (c. 8 m in height), 1 No. process area runoff storage tank (c. 4.5 m in height); 1 No. buffer digestate process tank (c. 4.5 m in height), 1 No. treated digestate liquids recycle storage tank (c. 4.5 m in height); 1 No. roofed liquids feed-mix tank (c. 3 m in height));
g. these components will be located within a containment bund constructed c. 3 m meters below ground level.

The proposed development will also consist of:

h. feedstock storage (comprising 3 No. storage clamps (c. 1,050 sq m in area each) and 2 No. storage sheds (c. 500 sq m GFA each));
i. a biomethane upgrading plant (including natural gas compression unit);
j. a biomethane loading facility (comprising a 4 No. loading bays with associated gates and safety features measuring c. 490 sq m in area);
k. a biomass boiler with its associated pellet storage silo (c. 12.5 m in height);
l. Combined Heat and Power (CHP) plant and associated heat exchanger;
m. a single storey bio-based fertiliser processing and storage unit (c. 3,890 sq m GFA) (including digestate dewatering plant, fertiliser pasteurisation plant and bio-based fertiliser loading facilities);
n. a single storey office building (c. 105 sq m GFA) (including offices, meeting room, control room, laboratory, welfare facilities, storeroom and a first-aid facility);
o. bin storage;
p. 9 No. car parking spaces (including 5 No. standard parking spaces, 2 No. electric vehicle (EV) spaces and 1 No. accessible car parking space);
q. electric vehicle (EV) charging infrastructure;
r. 10 No. bicycle parking spaces;
s. vehicular, cyclist and pedestrian access / egress and associated circulation routes;
t. 2 No. weighbridges;
u. a vehicle steam wash area; fuel storage tank and associated bund;
v. an emergency flare (c. 7.6 m in height);

w. a process area runoff lagoon;
x. an attenuation pond;
y. an ESB sub-station;
z. boundary treatments [including gates, piers and fencing];
aa. site lighting;
bb. all hard and soft landscaping;
cc. provision of sustainable urban drainage systems (SUDS); and
dd. all other associated site excavation, infrastructural and site development works above and below ground, including changes in level and associated retaining features, and associated site servicing [water and electricity supply].

6.3 Site and Plant Components

Figure 6.2 below provides an annotated version of the Proposed Site Layout Plan, numbered to identify the key site and plant components proposed as part of the biomethane and bio-based fertiliser production facility. Detailed drawings showing design, layout and dimensions of components referenced are presented in the Planning Drawings that accompany this EIAR.

Figure 6.2: Overview of the Site and Plant Components. Source: Extract of Drawing No. 2429-DOB-XX-SI-DR-C-0500 P01, annotated by Purser to show key zones within the proposed site layout.

6.4 Key Components of the Proposed Development

The facility will consist of several primary structures and functional areas:

Anaerobic Digestion (AD) Plant: This is the core of the operation, with four primary digester tanks (7.6 m high) for initial processing and three secondary digester tanks (14.5 m high) for further treatment. These tanks break down organic matter to produce biogas.

Feedstock Storage: The site will have three large concrete-walled clamps and two enclosed sheds for storing solid agricultural feedstock prior to processing.

Biogas Conditioning and Upgrading Units: These units refine the raw biogas produced by the AD process into high-purity biomethane, which is either injected into the national gas grid or compressed for use as a transport fuel.

Bio-Based Fertiliser Processing Unit: This component dewaters and pasteurises the digestate (the by-product of AD), converting it into high-quality fertiliser suitable for agricultural use.

Combined Heat and Power (CHP) Plant and Biomass Boiler: These facilities will provide renewable energy to power the AD process, increasing the overall energy efficiency of the development.

Ancillary Facilities: Additional infrastructure includes an office building, staff parking with EV charging points, weighbridges for vehicle loading checks, and a vehicle wash area to maintain hygiene and safety standards.

6.4 Design and Site Layout

The design of the site prioritises operational efficiency, safety, and minimal environmental impact. The AD plant is centrally located to streamline internal processes, while a one-way vehicle circulation system ensures safe and smooth traffic flow. The feedstock storage area is positioned to the south for easy access. To the north, the gas processing and loading facilities are placed to facilitate quick distribution.

Water management is a key consideration, with an attenuation pond and a dedicated process area runoff lagoon designed to prevent uncontrolled water discharge. The landscaping plan includes native plant species to enhance local biodiversity, blending the facility with its surroundings.

Construction Phase

The construction phase will span approximately 20 months, involving site preparation, foundation work, and the assembly of plant structures and infrastructure. Measures will be in place to mitigate environmental impacts, including dust and noise control, traffic management, and careful scheduling to reduce disruption to nearby residents.

Operational Phase

Once operational, the facility will process up to 98,000 tonnes of agricultural feedstock annually, sourced from farms within a one-hour drive. This supports local agricultural sectors by providing a sustainable outlet for organic materials. The biogas production capacity is projected to reach 1,120 cubic metres per hour. The biomethane produced will be injected into the local and national gas networks or compressed for distribution as CNG.

Wastewater from the AD process will be recycled within the facility to minimise water use and eliminate the need for external discharge, contributing to the development's sustainability goals.

6.5 Licencing Requirements and Other Controls

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

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

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

The Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S. L No. 209 of 2015) transposes Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC ("the SEVESO III Directive").

According to the Land Use Planning Assessment by AWN Consulting, the proposed development is classified as a "lower tier" COMAH establishment under the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, S.I. No. 209 of 2015. This classification means that the facility must comply with specific safety and reporting requirements to manage and mitigate risks associated with hazardous substances.

7.0 Population and Human Health

7.1 Introduction

This chapter evaluates the potential impacts of the proposed biomethane and bio-based fertiliser production facility at Lisheen on the population and human health during its construction and operational phases. The assessment follows the requirements outlined in the amended EIA Directive (2014/52/EU) and related guidance, focusing on direct and indirect significant effects.

7.2 Methodology

The assessment methodology draws from guidelines by the Environmental Protection Agency (EPA) and the Institute of Public Health (IPH). It incorporates baseline data from the Central Statistics Office (CSO) Census 2022, Pobal HP Deprivation Index, and local studies. The study area includes the townlands of Killoran and Moyne and extends to communities potentially affected by traffic, noise, and other environmental impacts.

7.3 Description of the Receiving Environment

Population and Employment

The health status of the population in the study area, as reported by the Central Statistics Office (CSO) in the 2022 Census, shows that over half of the residents describe their health as 'very good,' which aligns with national and county trends. Specifically, 59.54% of residents in the small area and 61.79% in the Electoral Division (ED) report 'very good' health, comparable to the state and county averages.

The study area has experienced a slight population decline between the 2016 and 2022 censuses however the adjacent electoral areas have experienced a population growth in line with the county and state. According to the Pobal HP Deprivation Index, the area is marginally above average, indicating low population sensitivity. The low age dependency ratio suggests that most of the population is of working age and largely independent, indicating low sensitivity to change. Additionally, the percentage of persons with a disability is lower than the national average, implying few restrictions on daily activities for residents. Overall, the population within the study area is not particularly sensitive to change, with an overall ranking of **low to moderate sensitivity**.

Community

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

- The residential community: The closest established residential area along the R331 is approx. 4km to the southwest of the proposed development is Moyne . There are also residential units sparsely located to the south, east and west. Templemore which is located approximately 15km to the north contains a range of employment types, including retail, services, healthcare, and educational.
- The working community: The working community in the vicinity of the proposed development comprise primarily agricultural-based employment. Other employment within the wider vicinity includes the

Lisheen windfarm, Bruckana windfarm (to the north and northeast of the site) and a farm machinery supplier based in the townland of Templetouhy approximately 3.8km from the site.

Human Health (Off-Site)

There is a low age dependency ratio, therefore a large proportion of the population is within working age, thus considered as largely independent and judged to be not sensitive to change. The information presented above for the study area shows, a high proportion (59.54% in the small area and 61.79% in the ED) describes their health status as 'very good'. The data shows that the study area has a lower percentage of persons with a disability than the national average: indicating that for persons within the area, there are relatively few restrictions on daily activities. The population within the study area is therefore not particularly sensitive to change, with an overall ranking of **low to moderate sensitivity**.

Human Health (On-Site)

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

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

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

7.4 Likely Significant Effects

Do-Nothing Scenario

Under the 'Do Nothing' scenario, the current land use of the proposed development site would remain unchanged, with no additional effects on the following receptors:

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

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

Land Use: The land would likely continue to remain vacant as a brownfield site.

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

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

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

Receptor Sensitivity

Sensitivity of the receptors identified are summarised in **Table 7.9** extracted from Chapter 7.

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

Sources

Construction Phase

<u>Population</u>

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

<u>Employment</u>

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

Community

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

Human Health

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

Operational Phase

Potential operational phase effects are considered in detail below and summarised in Table 7.11 below (extracted from Chapter 7)

Receptor	Sensitivity Rating	Potential Environmental Effects	Quality	Significance	Duration
Local Population	Low to moderate	No material effect on the existing local population. Likely to have a positive effect 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. Further indirect employment will be created as a result of the induced benefits of the development	Positive	Significant	Long-term
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)	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

7.5 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.

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.

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 7.6.3** of the main EIAR Report and within **Chapter 22 - Schedule of Mitigation**.

- Pest Control
- Fugitive Emissions
- Hazardous Substance
- Biological Agents
- Electrical Hazards
- Gas Hazards
- Explosion and Fire Hazards
- Malpractice.

7.6 Cumulative Effects

The cumulative effects of the proposed construction and operation of a biogas facility at Lisheen 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 7 of the EIAR – Main Report, should be applied throughout the construction phase of the proposed development. This will ensure any significant cumulative effects on the local population and the greater environment are prevented.

Operational Phase

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

7.7 Residual Effects

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

Population

The proposed development is not expected to have any significant adverse effect on the local population.

Employment

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

Community
The proposed development is unlikely to adversely affect the local demography and will have positive economic effects.

Human Health
Provided the actions and procedures outlined in **section 7.6** 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 7.6**, 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.

Following implementation of the mitigation measures proposed in **Section 7.6**, the residual effects are anticipated to be, neutral, slight, long-term effects on the Human Health.

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**.

8.0 Biodiversity

An assessment of the potential impacts on the existing biodiversity and ecology was carried out by Veon Ecology.

The assessment was carried out taking consideration of appropriate national guidelines and standard for the Environmental Impact Assessment using data collected from detailed desk study. Site visits were carried out on 4th, 9th and 13th of September, which included a range of ecological surveys to classify local flora and fauna present on site and within the surrounding environs. Desktop research and a review of all relevant documents pertaining to the Proposed Development were also undertaken to supplement the surveys and provide baseline data, further informing the assessment of the potential impacts of the Proposed Development on the biodiversity on site. Baseline data was obtained from these results, allowing for a robust assessment of the potential impacts of the Proposed Development, and appropriate mitigation measures were identified to minimise any potential impacts.

The Site is characterised by low value habitats, with recolonising bare ground (Fossit code ED3) being the dominant habitat in mosaic with scrub (WS1). Some hedgerows (WL1) are present outside the site boundaries, and these will be retained. Other habitats recorded outside the site boundary (but within the surrounding environs) during the site visits include buildings and artificial surfaces (BL3) and depositing lowland rivers (FW2). The Cooleeny Stream is situated approximately 20 meters south of the southern boundary of the Proposed Development and is separated from the site by a roadway.

There are no protected sites, including Natura 2000 sites or Natural Heritage Areas within the site of the Proposed Development. The closest Natura 2000 site is the Galmoy Fen SAC, which is situated approximately 9.5km north of the site, with no source receptor pathways that connect this SAC to the Proposed Development. No source receptor pathways are present that connect the site of the Proposed Development to any protected sites. The Cooleeny Stream was identified as a potential source receptor pathway to the Lower River Suir SAC, which is located downstream of the Cooleeny Stream. An appropriate assessment was carried out and a Natura Impact Statement was prepared to address any potential impacts to the Lower River Suir SAC, and appropriate mitigation measures will be adopted to protect the stream from any potential impacts during the construction phase of the Proposed Development.

No nesting birds or roosting bats were recorded during the ecological surveys. The site offers low value opportunities for nesting/roosting and foraging. If any vegetation is designated for removal, this will be done outside of the breeding bird season. Birds recorded during surveys were typically associated with rural agricultural settings. Bat activity levels were low on site during all surveys, with bats only being recorded outside the site boundaries, near the hedgerows located northwest of the Proposed Development. Species diversity was also low, with 2 common and widespread species recorded during the surveys: Common Pipistrelle and Leisler's Bat.

No mammal dwellings were recorded on site. The most common signs of mammals recorded were associated with Rabbit and Fox. Other mammal species may use the site for commuting. The habitats surrounding the site are similar to those recorded within the site, and therefore any mammal species present will not be impacted significantly from the land take of the Proposed Development.

As per the Chapter 10 of this EIAR, surface water at the Proposed Development will be managed in accordance with the principals of Sustainable Drainage Systems (SuDS), the Greater Dublin Drainage Strategic Study (GDSDS) and the requirements of Tipperary County Council to treat/attenuate before discharging to the Cooleeny Stream. Foul water generated by the office and administrative building of the Proposed Development will be used in the biomethane process as part of a circular usage procedure, eliminating the need for any wastewater outfall.

The Construction Phase of this project will be carried out in accordance with the Construction Management Plan (CMP) (DOBA, 2024). The CMP will be adhered to for the duration of works, and will implement mitigation measures to reduce any potential impacts on the local biodiversity. The mitigation measures outlined in the CMP will be strictly adhered to for the duration of the Construction Phase. Mitigations measures will ensure the protection of key ecological receptors such as the Cooleeny Stream. Silt traps and bunding will ensure any pollutants which have the potential to enter the stream will be mitigated against.

The Operational Phase of the Proposed Development will comprise an anaerobic digestion facility to produce renewable biomethane and bio-based fertiliser, with an annual intake of up to 98,000 tonnes of liquid feedstock. During the Operational Phase, the Proposed Development will function as a closed system operating under principles of a circular economy. Waste generated from the digestion process will be recycled back into the system and will not be introduced into the local environment.

There will be no significant adverse impacts on the local biodiversity associated with the Proposed Development. There will be no impact to the existing WFD Status of water bodies associated with the Proposed Development including the Cooleeny stream or other downstream waterbodies.

9.0 Land, Soils and Geology

An assessment of the potential impact on the existing land, soil and geological environment was carried out by Enviroguide Consulting.

The assessment was carried out taking cognisance of the appropriate national guidelines and standards for Environmental Impact Assessment using data collected from a detailed desk study, the Site walkover undertaken on the 25th of June 2024 and the IGSL Ltd. G ground investigation undertaken between July 2024 and August 2024 and review of all relevant drawings and documents pertaining to the site and the Proposed Development. A detailed assessment of the potential impacts was undertaken, and appropriate avoidance and mitigation measures were identified to reduce any identified potential impact associated with the Proposed Development.

The Proposed Development will involve the excavation of approximately 26,800 m^3 of soil and subsoil. Excavation depths will extend to 3.1 mbGL for the construction of the anaerobic digestion plant. Additionally, excavation depths will range between 1.2 mbGL and 4.0 mbGL for the construction of drainage systems, utilities, and roads. It is anticipated that there will be no requirement for the excavation of bedrock during the construction phase of the Proposed Development.

It is intended to retain all excavated soil onsite and incorporate it into the landscape design for the Proposed Development. This will be subject to an assessment of its suitability for use, in accordance with engineering and environmental specifications that will be determined during the detailed design phase. However, where required, surplus materials will require removal offsite in accordance with all statutory legislation.

The importation of 11,000 m3 of aggregate fill materials will be required for the construction of the Proposed Development (e.g., granular material beneath road pavement, construction of building and tank foundations and for drainage and utility bedding / surrounds etc.

The Operational Phase of the Proposed Development will comprise an anaerobic digestion facility to produce renewable biomethane and bio-based fertilizer, with an annual intake of up to 98,000 tonnes of feedstock per annum.

There will be no excavation of soil or bedrock or infilling of waste during the Operational Phase of the Proposed Development.

It is estimated that approximately 98,000 m^3 of digestate liquid concentrate will be produced annually after separation and treatment. The digestate produced will meet the quality and end-of-waste requirements of an agreed quality standard, such as Article 28 End of Waste, PAS110, or a standard agreed with the regulator. It will comply with DAFM transformation parameters and testing requirements as per CN 11: Approval and Operation of Biogas Plants Transforming Animal By-Products and Derived Products in Ireland (DAFM, 2014). Digestate liquid and fibre will be classified as bio-based fertilisers for use on agricultural lands, serving as direct replacements for chemical/mineral fertilisers. These digestates will primarily be returned to lands associated with feedstock supplies of crops and/or slurry, thereby promoting a local circular bioeconomy. Digestate receivers will manage

the storage and application of bio-based fertilisers on their lands, subject to controls set out in S.I. No. 113 of the 2022 European Union (Good Agricultural Practice for Protection of Waters) Regulations 2022.

The construction phase of the Proposed Development will require the excavation of 51366m3 of soil (17,189m^3 topsoil and 34,177m3 subsoil). It is intended to reuse approximately 15,869m^3 of suitable excavated subsoil for landscaping and engineering use. However, it is estimated that approximately 35,497m3 of excavated soil (17,189m3 topsoil and 18,308m3 subsoil) will require removal offsite in accordance with all statutory legislation. The construction of the Proposed Development will also require the importation of aggregate fill materials for use as granular material beneath road pavement, under floor slabs and for drainage and utility bedding / surrounds. During the Construction Phase, all works will be undertaken in accordance with the Construction Environmental Management Plan (CEMP) (Enviroguide Consulting, 2024a) and a preliminary Resource Waste Management Plan (RWMP) (Enviroguide Consulting, 2024b). Following appointment, the contractor will be required to implement the measures set out CEMP and RWMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground with regard to the relevant industry standards.

During the Construction Phase, all works will be undertaken in accordance with the Construction Management Plan (CMP) (DOBA, 2024). Following appointment, the contractor will be required to further develop the CMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water with regard to the relevant industry standards (e.g., C532 Control of Water Pollution from Construction Sites, C692 Environmental Good Practice on Site, ICE Earthworks and TII Specification for Road Works Series 600 - Earthworks). The CMP identifies the minimum requirements with regard to the appropriate mitigation, monitoring, inspection and reporting mechanisms that need to be implemented throughout construction. Compliance with the CMP does not absolve the appointed contractor or its sub-contractors from compliance with all legislation and bylaws relating to their construction activities. The CMP will be implemented for the duration of the construction phase, covering construction and waste management activities that will take place during the construction phase of the Proposed Development.

During the Operational Phase the Proposed Development will be subject to an Industrial Emissions (IE) Licence from the Environmental Protection Agency (EPA). The operator will comply with the environmental control and mitigation requirements as per the conditions of the EPA IE Licence to ensure there will be no impact on the receiving land, soil and geological environment.

An Environmental Management System (EMS) will be developed for the Operational Phase of the Proposed Development in accordance with ISO14001:2015. The procedures set out in the EMS and conditions of the IE Licence will be strictly adhered to for the duration of the Operational Phase.

Overall, there is no significant residual impacts on land, soils and geology anticipated regarding this Proposed Development. It is considered that the use of digestate will have a positive impact on the receiving lands given the improved recycling of nutrients and reduction of organic pollution / microbial contamination associated with untreated organic waste sources.

10.0 Hydrology and Hydrogeology

An assessment of the potential impacts on the existing hydrological and hydrological environmental was carried out by Enviroguide Consulting.

The assessment was carried out taking consideration of appropriate national guidelines and standard for the Environmental Impact Assessment using data collected from detailed desk study, the Site walkover undertaken on the 25th of June 2024 and the IGSL Ltd. G ground investigation undertaken between July 2024 and August 2024 and review of all relevant drawings and documents pertaining to the Proposed Development and site. The results of the assessment provided information on the baseline conditions at the site. A detailed assessment of the potential impacts was undertaken, and appropriate avoidance and mitigation measures were identified to reduce any identified potential impact associated with the Proposed Development.

The Site is mapped by the EPA (EPA, 2024) as within the Suir Water Framework Directive (WFD) Catchment (Catchment I.D.: 16), the Suir_SC_040 WFD Sub-Catchment (Sub-Catchment ID: 16_21) and the Drish_040 WFD Sub-basin (EU Code: IE_SE_16D020100). The closest EPA mapped (EPA, 2024) surface waterbody to the site is the as the Cooleeny Stream (River Waterbody Code: IE_SE_16D020100; WFD Name: Drish_40) located approximately 0.02km south of the site.

The EPA (EPA, 2024) maps the groundwater body (GWB) beneath the site as the Thurles GWB (EU Code: IE_EA_G_158). The Thurles GWB covers approximately 90 km^2 and spans areas across Co. Dublin, Co. Kildare, and Co. Meath (GSI, 2024). Groundwater flow beneath the site is expected to be to the south / southwest, discharging to the Cooleeny Stream, the Drish River and/or the Rossestown River.

The site-specific flood risk assessment (SSFRA) developed for the site and proposed development (DOBA, 2024) submitted with the planning application) identifies that the site and proposed development is located in Flood Zone C, an area with a low risk of flooding (less than 0.1% Annual Exceedance Probability - AEP).

The Operational Phase of the Proposed Development will comprise an anaerobic digestion facility to produce renewable biomethane and bio-based fertiliser, with an annual intake of up to 98,000 tonnes of feedstock.

Surface water at the Proposed Development will be managed in accordance with the principals and objectives of Sustainable Drainage Systems (SuDS), the policies and guidelines outlined in the Greater Dublin Drainage Strategic Study (GDSDS) and the requirements of Tipperary County Council to treat and attenuate water prior to discharging to the Cooleeny Stream located approximately 0.02km south of the site.

Foul water generated by the office and administrative building of the Proposed Development will be utilised in the biomethane process as part of a circular usage procedure, eliminating the need for any wastewater outfall.

Water supply to the Proposed Development will be from the Group Water Scheme's 75mm main located to the south of the site. A letter of consent has been received from the Moyne Group Water Scheme dated 6th August 2024.

During the Construction Phase, all works will be undertaken in accordance with the Construction Management Plan (CMP) (DOBA, 2024). Following appointment, the contractor will be required to further develop the CMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water with regard to the relevant industry standards (e.g., C532 Control of Water Pollution from Construction Sites, C692 Environmental Good Practice on Site, ICE Earthworks and TII Specification for Road Works Series 600 - Earthworks). The CMP will be implemented for the duration of the Construction Phase, covering construction and waste management activities that will take place during the Construction Phase of the Proposed Development.

Mitigation works will be adopted as part of the construction works for the Proposed Development. These measures will address the main activities of potential impact which include:

- Control and Management of surface water runoff.
- Control and management of shallow groundwater during excavation and dewatering.
- Management and control of soil and materials.
- Appropriate fuel and chemical handling, transport and storage.
- Management of accidental release of contaminants at the site.
- Control and handling of cementitious materials

During the Operational Phase the Proposed Development will be subject to an Industrial Emissions (IE) Licence from the Environmental Protection Agency (EPA). The operator will comply with the environmental control and mitigation requirements as per the conditions of the EPA IE Licence to ensure there will be no impact on the receiving hydrological and hydrogeological environment.

An Environmental Management System (EMS) will be developed for the Operational Phase of the Proposed Development in accordance with ISO14001:2015. The procedures set out in the EMS and conditions of the IE Licence will be strictly adhered to for the duration of the Operational Phase.

Overall, there will be no significant adverse residual impacts on the receiving hydrological and hydrogeological environment associated with the Proposed Development. There will be no impact to the existing WFD Status of water bodies associated with the Proposed Development including the Cooleeny stream, River Drish, River Suir, other downstream waterbodies and the Thurles GWB as a result of the Proposed Development taking account of design avoidance and mitigation measures where required.

11.0 Air Quality

11.1 Introduction

The assessment of air quality is contained within Chapter 11 of the EIAR and was prepared by AWN Consulting Limited.

11.2 Baseline Environment

Baseline data and data available from similar environments indicates that levels of nitrogen dioxide (NO_2), particulate matter less than 10 microns (PM_{10}) and particulate matter less than 2.5 microns ($PM_{2.5}$) and carbon monoxide (CO) are generally well below the National and European Union (EU) ambient air quality standards.

11.2.1 Potential Impacts

Construction Phase

An assessment of the potential dust impacts as a result of the construction phase of the proposed development was carried out based on the UK Institute for Air Quality Management 2024 guidance *'Guidance on the assessment of Dust from Demolition and Construction'*. This established the sensitivity of the area to impacts from construction dust in terms of dust soiling of property and human health effects. The surrounding area was assessed as being of medium sensitivity to dust soiling and of low sensitivity to dust-related human health effects.

The sensitivity of the area was combined with the dust emission magnitude for the site under three distinct categories: earthworks, construction and trackout (movement of vehicles) in order to determine the mitigation measures necessary to avoid significant dust impacts. It was determined that there is at most a high risk of dust related impacts associated with the proposed development. In the absence of mitigation there is the potential for ***direct***, ***short-term, negative*** and ***slight*** effects on air quality.

In addition, construction phase traffic emissions have the potential to impact air quality, particularly due to the increase in the number of heavy goods vehicles accessing the site. Construction stage traffic did not meet the scoping criteria for a detailed modelling assessment outlined in Transport Infrastructure Ireland's 2022 guidance document '*Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106'* As a result a detailed air assessment of construction stage traffic emissions has been scoped out from any further assessment and the construction stage traffic emissions will have a ***direct***, ***short-term, negative*** and ***imperceptible*** effect on air quality.

Operational Phase

Operational phase traffic has the potential to impact air quality due to vehicle exhaust emissions as a result of the increased number of vehicles accessing the site. Operational stage traffic did not meet the scoping criteria for a detailed modelling assessment outlined in Transport Infrastructure Ireland's 2022 guidance document *'Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106'* As a result a detailed air assessment of operational stage traffic emissions has been scoped out from any further assessment and the operational stage traffic emissions will have a ***direct***, ***long-term, negative*** and ***imperceptible*** impact on air quality.

The operational phase assessment also involved air dispersion modelling of emissions through the release of nitrogen dioxide (NO_2) and carbon monoxide (CO) from a Combined Heat and Power (CHP) generator and emergency flare fuelled by biogas produced on site, as well as odour emissions from the feedstock storage areas as part of the proposed development. The assessment evaluated the impacts of emissions at off-site locations including nearby residential properties and sensitive ecological sites. The dispersion modelling has determined that concentrations of all pollutants are in compliance with the relevant ambient air quality standards. The effect on air quality will be ***direct, long-term, negative*** and ***not significant***.

11.4 Mitigation and Residual Effects (Post-Mitigation)

11.4.1 Construction Phase

Detailed dust mitigation measures are outlined within Section 11.6.1 of Chapter 11 and are incorporated into the Construction Environmental Management Plan for the site to ensure that no significant nuisance as a result of construction dust emissions occurs at nearby sensitive receptors.

Once these best practice mitigation measures, derived from the Institute for Air Quality Management 2024 guidance *'Guidance on the assessment of Dust from Demolition and Construction'* as well as other relevant dust management guidance, are implemented the residual effect on air quality during the construction of the proposed development is considered ***direct, short-term, localised, negative*** and ***not significant***, posing no nuisance at nearby sensitive receptors (such as local residences).

11.4.2 Operational Phase

As the effect of the predicted concentrations of pollutants due to road traffic will be imperceptible, and not significant due to operational emissions, no mitigation is required.

The residual effect of operational traffic on air quality has been assessed as ***direct***, ***long-term, negative*** and ***imperceptible***. The residual effect of operational emissions on air quality has been assessed as ***direct, long-term, negative*** and ***not significant***.

11.5 Cumulative Impact of the Proposed Development

11.5.1 Construction Phase

There is the potential for cumulative impacts to air quality should the construction phase of the proposed development coincide with that of other developments within 500 m of the site. A review of proposed/permitted developments in the vicinity of the site was undertaken and relevant developments with the potential for cumulative impacts were identified.

There is at most a low risk of dust impacts associated with the proposed development. The dust mitigation measures outlined in Section 11.6.1 of Chapter 11 will be applied during the construction phase which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development and the permitted cumulative developments are deemed ***direct, short-term, negative*** and ***not significant***.

11.5.2 Operational Phase

The operational phase effect on air quality from road traffic associated with the proposed development are predicted to be imperceptible. The traffic data provided for the operational stage air quality assessment included

cumulative traffic associated with other developments in the area. The cumulative effect on air quality are considered ***direct***, ***long-term, negative*** and ***imperceptible***.

The cumulative assessment involved modelling the proposed development NO_2 emissions, as well as a nearby EPA licensed site. The cumulative effect on air quality is considered ***direct, short-term, negative*** and ***not significant***.

Overall no significant impacts to air quality are predicted during the construction or operational phases of the proposed development.

12.0 Climate

12.1 Introduction

The assessment of climate is contained within Chapter 12 of the EIAR and was prepared by AWN Consulting Limited.

12.2 Baseline Environment

The existing climate baseline can be determined by reference to data from the EPA on Ireland's total greenhouse gas (GHG) emissions and compliance with European Union's Effort Sharing Decision "EU 2020 Strategy" (Decision 406/2009/EC). The EPA estimate that Ireland had total GHG emissions of 60.72 Mt CO2e in 2023. The provisional EPA 2023 figures indicate that Ireland has used 63.9% of the 295 Mt CO2e Carbon Budget for the five-year period 2021-2025. EPA projections indicate that assuming full implementation of the Climate Action Plan and the use of the flexibilities available Ireland can achieve an emissions reduction of 30% by 2030.

12.3 Potential Impacts

Greenhouse Gas Assessment

Calculation of the GHG emissions associated with the construction of the proposed development was calculated using the online Transport Infrastructure Ireland Carbon Assessment Tool. GHG emissions associated with the proposed development are predicted to be a small fraction of Ireland's Electricity, Industry and Transport sector 2030 emissions ceilings. The proposed development will incorporate some mitigation measures which will aim to reduce climate impacts during construction and once the development is operational.

The proposed development will result in GHG emissions offsets through using feedstock to produce biogas, thereby avoiding methane emissions, and displacement of fossil methane by biogas, thereby avoiding use of a more carbon intensive fuel. This is a positive impact on Ireland's greenhouse gas emissions, in line with the 2024 Climate Action Plan and Ireland's obligatory EU GHG net zero by 2050 trajectory.

As per the TII 2022 PE-ENV-01104 guidance, the significance of the effect of GHG emissions on climate is assessed for the total GHG emissions across all proposed development stages, and is determined by two main factors - the extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050, and the level of mitigation taking place. In accordance with the TII guidance and the EPA guidelines (EPA, 2022), the significance of effect of GHG emissions during the construction and operational phase is ***direct, long-term, positive*** and ***slight***, which is overall ***not significant*** in EIA terms.

Climate Change Risk Assessment

A CCRA was conducted to consider the vulnerability of the proposed development to climate change, as per the TII 2022 PE-ENV-01104 guidance. This involves an analysis of the sensitivity and exposure of the development to future climate hazards which together provide a measure of vulnerability. The hazards assessed included flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; drought; extreme wind; lightning, hail, fog, wildfire and landslides. The proposed development is predicted to have at most low vulnerabilities to the various climate

hazards and therefore the effect of climate change on the proposed development is considered ***direct, long-term, negative*** and ***imperceptible,*** which is considered overall ***not significant*** in EIA terms with regard to the construction and operational phase.

Overall, no significant impacts to climate are predicted during the construction or operational phases of the proposed development.

12.4 Mitigation and Residual Effects (Post-Mitigation)

A number of best practice mitigation measures are proposed for the construction phase of the proposed development to ensure that impacts to climate are minimised. Excavated material will be reused on site and will not require waste disposal and lower embodied carbon concrete will be utilised. During operation, bio-based fertiliser will be distributed back to the feedstock (crop) suppliers, completing the proposed development's circular economy process. This bio-based fertiliser is the remaining by-product from the anaerobic digestion process and in this state is a product instead of a waste. Additionally the same truck which delivers the feedstock will also collect a load of bio-based fertiliser, reducing the number of truck movements.

The proposed development has been designed to reduce the impact on climate through its function of biogas production. Once mitigation measures are put in place, the effect of the proposed development in relation to GHG emissions is considered ***direct, long-term, positive*** and ***slight,*** which is overall ***not significant*** in EIA terms.

Design mitigation has been considered when assessing the vulnerability of the development to future climate change.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the proposed development as a result of climate change. The residual effect of climate change on the proposed development is considered ***direct, long-term, negative*** and ***imperceptible***, which is overall ***not significant*** in EIA terms.

12.5 Cumulative Impact of the Proposed Development

With respect to the requirement for a cumulative assessment PE-ENV-01104 states that *"for GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable."*

However, by presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. Therefore, the assessment approach is considered to be inherently cumulative.

The cumulative impact of the proposed development in relation to GHG emissions is considered ***direct, long-term, positive*** and ***slight,*** which is overall ***not significant*** in EIA terms.

13.0 Noise and Vibration

13.1 Introduction

This Noise and Vibration chapter of the EIAR has was prepared by Wave Dynamics Limited an Acoustic Consultancy specialising in noise and vibration. Chapter 13 of the EIAR addresses the potential noise and vibration impact of the proposed development located at the former Lisheen Mine Site, Killoran, Moyne, Thurles, Co. Tipperary. The assessment methodology includes a baseline noise survey to characterise the existing acoustic environment, a review of relevant industry standards and guidelines including EPA guidance, Tipperary County Council's Noise Action Plan, and British Standards, predictive modelling and calculations using SoundPlan 9.0 software, and the proposal of mitigation measures to minimise impacts. The chapter considers various noise sources such as construction activities, operational plant and equipment, traffic generated by the development, and the potential cumulative impacts from other developments in the area. While some construction noise impact is expected, operational noise is not anticipate to significantly affect the surrounding environment due to predicted operational noise levels falling significantly below EPA NG4 criteria.

13.2 Receiving Environment

A baseline noise survey was conducted to characterise the existing acoustic environment surrounding the proposed development lands at the former Lisheen Mine site in Killoran, Moyne, Thurles, Co. Tipperary. The baseline survey included attended and unattended noise measurements in various locations on the site and in the surrounding area. The site is located south of the existing Lisheen Mine wind farm. Measurements were conducted using ISO Class 1 sound analysers, the unattended noise survey was conducted over six consecutive days, capturing data on noise levels throughout the day and night periods. Attended measurements were taken at specific locations in the area around the site location. The prevailing noise source in the area was road traffic noise from the various roadways in the area, the site was screened based on criteria set out in EPA NG4 for areas of low background noise or quiet areas, the site does not meet the EPA definition of a quiet area.

13.3 Potential Impacts and Mitigation Measures

The construction phase of the anaerobic digestion facility is anticipated to generate noise from various activities and equipment usage, including diggers, concrete breakers, saws, and dumpers. Predictions using BS5228 methodology indicate potential exceedances of noise limits at nearby noise sensitive locations (NSL's) during the construction phase, which necessitates mitigation measures. Recommended mitigation includes the selection of quieter equipment, noise control at the source i.e switching off idling equipment and using white noise reverse alarms, screening with site hoarding and temporary barriers, and public engagement through a liaison officer. While construction vibration is not expected to significant due to distances to receptors, vibration limits are provided based on BS5228 and BS7385 for monitoring purposes.

The operational phase is predicted to have a minimal noise impact. Soundplan 9.0 modelling, incorporating noise sources typically found in the operation of digester facilities, shows noise levels falling below EPA NG4 criteria at

all NSL's. The model considers factors like distance, barriers, topography, ground absorption and noise source characteristics. Following a review of the operations based on the information provided, there are no relevant sources of vibration associated with the operational phase of the development, therefore, there will likely be no vibration impact on the sensitive locations. Mitigation during the operational phase focuses on managing noise from truck movements, loading activities, and worker practices. The assessment concludes that operational noise will not have a significant impact, and construction noise will be mitigated to minimise effects on NSL's.

13.4 Residual Impacts

The assessment predicts that the proposed anaerobic digestion facility will have minimal long-term residual noise impacts. While construction activities are expected to produce some short-term noise impacts, the implementation of mitigation measures, such as site hoarding, quieter equipment selection, and noise control at source, will reduce these effects. Construction vibration is not anticipated to have a negative impact on nearby sensitive locations due to the distances between the site and the receptor. Once operational, the facility's noise levels are predicted to remain below EPA NG4 criteria at all nearby noise sensitive locations, resulting in a neutral impact over the long-term. This conclusion suggests that the proposed development, with its planned mitigation strategies, will not significantly alter the existing noise environment in the area.

14.0 Traffic and Transport

14.1 Introduction

This chapter of the EIAR has been prepared to assess the effects of the proposed development in terms of traffic and transport.

The assessment has been prepared in line with EPA Guidance, and the scope of assessment has been agreed with TCC's Roads Team.

14.2 Study Area

The study area has been defined by SYSTRA, and agreed with TCC through scoping. It comprises the roads that would be used by development traffic travelling between the M8 and the site. These are:

- The R639 between M8 J4 and M8 J6;
- The L4115 between the R639 and the L3201; and
- The L3201 between the L4115 and the Site Access junction.

The L3201 and L4115 were previously used as the HGV route between the Lisheen Mine and the R639. As such, all of the roads in the study area are two-way, of a good standard, and capable of accommodating two-way HGV trips.

14.3 Existing traffic flows

Traffic surveys undertaken in 2024 show that existing traffic flows on the L3201 and L4115 are very low, with around 500 vehicles per day travelling on the L3201, and around 1,000 per day on the L4115. Traffic flows on the R639 were slightly higher, with around 3,500 daily vehicles. None of the road links is currently congested.

14.4 Effects during Construction Phase

The construction stage of the development is expected to last for 18 months. Over this period, there are expected to be around 1,000 HGV trips to the site. No material will be exported from the site. In addition, around 20 construction staff will be based on site for the duration of the build.

In total, during the peak period of construction, there are expected to be 20 two-way HGV trips to the site each day, along with 20 two-way car / van trips associated with construction workers.

This will lead to very modest increases in traffic on roads in the study area. The overall Significance of Effect on these roads is assessed as Likely, Negative, **Slight,** and Short-term (lasting just over a year). These construction effects are considered to be **not significant** in EIAR terms.

Nevertheless, if not properly managed then construction traffic does have the potential to impact negatively on local communities and other road users. This will be ensured through the implementation of a Construction Traffic Management Plan (CTMP), which will set out how construction traffic will be safely and efficiently managed.

14.5 Effects during Operational Phase

During the busiest months of operation, July and November, the development will generate a total of 54 two-way HGV movements per day, plus a small number of vehicle trips related to the three on-site staff members (estimated as 6 two-way movements per day).

Many vehicles that will deliver material to the site will also pick up bio-fertilizer for their return journey, a business efficiency that also helps to reduce the number of vehicle trips that are generated on a daily basis.

This will lead to very modest increases in traffic on roads in the study area. The overall Significance of Effect on the L3201, L4115 and R639 is Likely, Negative, **Slight,** and Long-term (lasting for the duration of development). All of these operational effects are considered to be **not significant** in EIAR terms.

14.6 Cumulative Effects

Following a screening process, six developments were identified as having the potential to generate traffic which could create cumulative effects with the proposed development. A detailed assessment of the L3201 and L4115 was carried out to assess the cumulative traffic effects relating to:

- Driver Delay
- Accidents and Safety
- Severance
- Pedestrian Delay and Amenity
- 'Wear and Tear' on roads

The L3210 and L4115 pass through lightly populated, semi-rural areas, and therefore there are no particularly sensitive receptors such as urban areas, schools or congested locations that could be significantly affected by increases in traffic.

The overall Significance of Cumulative Effects has been assessed as Likely, Negative, **Slight,** and Long-term (lasting for the duration of development). This is considered to be **not significant** in EIAR terms.

14.7 Conclusion

The assessment has concluded that there will be **no significant effects** in terms of Traffic and Transportation as a result of the proposed development, either during the construction or operational stages, or as a result of cumulative effects with other developments.

15.0 Material Assets – Waste

This chapter of the EIAR provides an assessment of the potential impacts of the Proposed Development on Material Assets: Waste.

The methodology adopted for the assessment will take cognisance of relevant guidelines, in particular the following:

- Environmental Protection Agency (EPA) (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)
- EPA (2021) Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects
- Waste Framework Directive (Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste) as amended by Directive (EU) 2018/851
- European Union (Waste Directive) Regulations 2020, S.I. No. 323 of 202
- Waste Management Acts 1996 (as amended)
- National Waste Management Plan for a Circular Economy 2024 – 2030
- Article 27 of the European Communities (Waste Directive) Regulations 2011
- Draft First revision to the National Planning Framework (NPF)
- National Biomethane Strategy
- European Green Deal (2019)
- Regional Spatial and Economic Strategy for the Southern Region
- Tipperary County Development Plan 2022 – 2028.

Construction Phase

The construction phase will give rise to the requirement to remove and bring quantities of various materials to and from the site. Construction and excavation related wastes will be created during the construction phase. This has the potential to impact on the local waste management network.

Waste will be produced from surplus building materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, plastic, cables etc. Packaging waste including plastic wrap and cardboard is also expected to be produced. Wherever possible waste will be segregated onsite into skips or other appropriate receptacles. All waste will be stored in a Waste Storage Area (WSA). Suitably qualified and permitted nominated waste management contractors will collect specific waste streams as receptacles are filled. The following waste materials will be source separated in suitably sized receptacles, stored in the WSA and transferred off site for appropriate processing, recycling and recovery:

- Concrete, bricks, tiles and ceramics,
- Timber;
- Metal;
- Glass;

- Plasterboard;
- Plastic and cardboard packaging;
- Green waste; and
- Soils, stone and bedrock.

A skip will be provided for non-hazardous construction and demolition waste not suitable for reuse or recovery. Prior to removal, the skip will be examined by the waste manager or delegate to confirm that the skip does not contain recyclable materials that have been incorrectly disposed of. Hazardous wastes require specialist handling and removal. On-site storage of hazardous wastes will be minimised, with specialist removal off-site organised on a regular basis.

All waste generated during construction will only be recovered or disposed of as an authorized site which has a current waste license or waste permit in accordance with the Waste Management Acts, 1996 (as amended). This will not apply to the reuse of excavated uncontaminated soil or other naturally occurring material within the site boundary. If surplus, reusable excavation material arises onsite which must be taken offsite, the offsite re-use of material will be prioritised to minimise the potential loss of valuable good quality soil and subsoil to landfill as a waste.

The Proposed Development will result in various classifications of waste arising throughout the construction phase. If not managed and stored properly, the waste could give rise to contamination of land, water or air due to uncontrolled release to the receiving environment. If litter and food waste is not managed correctly onsite, it is likely to attract vermin within the Site of the Proposed Development and the surrounding areas. Unmitigated, the likely effect of construction waste generated from the Proposed Development is significant, with short-term, negative effects.

Operational Phase

Anaerobic Digestion can make a significant contribution to the management of organic wastes in Ireland. Anaerobic Digestion will reduce reliance on landfill capacity which will become an increasingly scarce outlet in the coming years.

Anaerobic Digestion not only recovers energy from feedstocks and farm wastes, but it also produces a nutrient rich digestate which is suitable for use as a bio-based fertiliser. This reduces reliance on artificial fertilisers that are becoming increasingly expensive to manufacture. The nutrients in digestate, particularly nitrogen, are more freely available for plant uptake than in untreated organic waste sources leading to improved recycling of nutrients. Thus, the use of digestate has water and air quality environmental benefits as it decreases organic pollution potential. It would also reduce the risk of spreading microbial contamination thus creating greater biodiversity in the countryside. Anaerobic Digestion can also reduce odours from slurry spreading as the concentration of odour in the air is significantly lower when digestate, instead of untreated slurry, is applied on the fields.

The bio-based fertiliser will be returned to farms and facilities which provide the crop-based feedstock, resulting in a circular process which reduces the use of artificial fertilisers on the supply farms.

There will be some plastic and cardboard from the employee's food waste de-packing. This will have to be sent off site for recycling. General waste including day-to-day office waste and municipal waste from staff areas will be segregated and collected by a suitably licenced contractor.

Mitigation and Monitoring

Construction Phase

The following mitigation measures are recommended for the construction phase of the Proposed Development regarding Waste Management:

- Waste materials will be separated at source and will follow the CEMP.
- Prior to the commencement of the construction phase detailed calculations of the quantities of topsoil, subsoil and green waste will be prepared, and soils will be tested to confirm they are clean, inert or non-hazardous;
- Beneficial use must be identified for the entirety of the excavated soil from the Proposed Development prior to its production for the excavated soil and stone to be considered as a by-product under Article 27 of the European Communities (Waste Directive) Regulations, 2011;
- A suitably competent and fully authorised waste management company will be employed to manage waste arising for the construction phase. The appointed waste contractor must have the relevant authorisations for the collection and transport of waste materials, issued by the National Waste Collection Permit Office (NWCPO);
- All waste materials will be transported to an appropriately authorised facility, which must have the relevant authorisations for the acceptance and treatment of the specific waste streams, i.e., a Certificate of Registration (COR) or a Waste Facility Permit (WFP) as granted by a Local Authority, or a Waste/Industrial Emission Licence as granted by the Environmental Protection Agency; and
- All waste quantities and types will be recorded and quantified, and records will be retained onsite for the duration of the construction phase.

These mitigation measures will ensure that the waste arising from the construction phase of the Proposed Development is dealt with in compliance with provisions of the Waste Management Act 1996, as amended, associated Regulations and Litter Pollution Act 1997, and The National Waste Management Plan for a Circular Economy 2024-2030. The mitigation measures will also ensure optimum levels of waste reduction, reuse, recycling and recover are achieved and will promote more sustainable consumption of resources.

The Construction Management Plan details further measures for the construction phase as follows:

Source Segregation:

> *Metal, timber, glass and other recyclable material will be segregated and removed off site to a permitted/licensed facility for recycling. Waste stream colour coding and photographs will be used to facilitate segregation. Office and food Waste arising on site will be source separated at least into dry*

mixed recyclables, biodegradable residual Wastes. Paints, sealants and hazardous chemicals etc. will be stored in secure, bunded locations. All hazardous Waste will be separately stored in appropriate lockable containers prior to removal from site by an appropriate Waste collection holder. Waste bins, containers, skip containers and storage areas will be clearly labelled with Waste types which they should contain, including photographs as appropriate. The site will be maintained to prevent litter and regular litter picking will take place throughout the site.

Material Management

"Just in time" delivery will be used so far as is reasonably practicable to minimise material wastage. Waste generated on site will be removed as soon as practicable following generation for delivery to an authorised Waste facility. The Contractor will ensure that any off-site interim storage facilities for excavated material have the appropriate Waste licences or Waste facility permits in place.

Operational Phase

The following mitigation measures are recommended for the operational phase of the Proposed Development regarding Waste Management:

- All incoming feedstock quantities and types will be recorded and quantified, and records will be retained onsite;
- All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in The National Waste Management Plan for a Circular Economy 2024-2030; and
- General waste including day-to-day office waste and municipal waste from staff areas will be segregated and collected by a suitably licenced contractors.

Residual effects

Construction Phase

The residual effects on waste management are considered to be minor, negative and short-term largely due to the small volume of waste materials expected.

The Construction Management Plan (DOBA, 2024) outlines construction resource and waste management mitigations which largely reduces the predicted effect of the Proposed Development on the waste infrastructure. It is expected that the effects are minimised due to:

- The prevention and mitigation measures proposed within this and other chapters of the EIAR;
- Compliance with national legislation and the allocation of adequate time and resources dedicated to efficient waste management practices; and,

- Continued use of permitted/licensed waste hauliers and facilities. Waste removed from the facility will be managed appropriately and will avoid environmental impacts or pollution. In addition, the correct management and storage of waste will avoid litter or pollution issues at the siteThe Proposed
- Designs which set out that the cut and fill volumes on the site during site preparation works will be approximately the same. This will reduce the volume of excess material during the excavation process. It is proposed that all materials will be reused onsite in landscaping and berms.

Operational Phase

The Proposed Development will utilise feedstocks and farm wastes to create useful biogas and bio-based fertiliser. The biogas will be used as a renewable energy source and the bio-based fertiliser will be returned to the supply farms, fully encapsulating circular economy. There is no waste associated with the process, and the only waste expected from the site is that from employees and office supplies.

Following the implementation of mitigation measures, including segregation of waste and the employment of a suitably licenced waste contractor the residual effects of the Proposed Development on waste management in the area is considered to be long term, neutral and not significant in nature.

16.0 Material Assets – Utilities

The assessment of material assets has considered the potential impacts of the Proposed Development on physical resources in the environment near the Application Site. These material assets include utilities and infrastructure such as surface water drainage, wastewater drainage, electricity, and water supply infrastructure.

16.1 Impact Assessment and Mitigation Measures

16.1.1 Surface Water Drainage

There are currently no public surface water sewers in close vicinity to the subject site. There is a field boundary drain to the south of the subject site. During the construction phase, surface water from the existing development will continue to discharge to the field boundary drain south of the site. Potential impacts during this phase include the settlement of sediments, accidental spills of harmful substances, and the washing of building materials or silts into the field boundary drain, causing pollution. During the operational phase, the implementation of SuDS and rainwater harvesting will ensure that the outfall is of a better standard than the pre-development scenario. There is no discharge of waste or process water for this subject site as it is recirculated within the plant. With the appropriate design mitigation, the potential effects on the surrounding surface water infrastructure will not be significant.

16.1.2 Wastewater Drainage

There is currently no wastewater infrastructure in close vicinity to the subject site. During the construction phase of the subject project, portable welfare facilities will be utilised and waste is proposed to be carted off-site. In the operational phase, the staff welfare facilities will be pumped in an enclosed system to enter the digesters and will be used as part of the Biomethane process. No outfall is required in this instance and the effects on the surrounding infrastructure are negligible.

16.1.3 Water Supply

The potable water is proposed to be supplied from the existing Moyne Group Water Scheme main, south of the subject site. The Biomethane Process will utilise harvested rainwater stored in above-ground lagoons. With the appropriate design mitigation, the potential effects on the surrounding surface water infrastructure will not be significant.

16.1.4 ESB Utility Services

All work on electrical infrastructure during the construction phase will be carried out in accordance with the Main Contractors' final Construction Management Plan. Tie-in location and requirements will be agreed upon in consultation with ESB. The operational feed is proposed to be a 10kV underground cable to the ESB substation to the northeast of the subject site. There will be an increased demand for electricity supply required during the operational phase of the proposed development. The exact demands will be agreed upon with ESB prior to connection.

17.0 Archaeology and Cultural Heritage

IAC Archaeology has prepared Chapter 17 of this EIAR to study the impact, if any, on the archaeological, architectural and cultural heritage resource of a proposed biomethane and bio-based fertilizer production facility within the townland of Killoran, County Tipperary. The assessment has been undertaken by Faith Bailey and Jacqui Anderson of IAC Archaeology.

There are 20 recorded monuments within the 500m study area, with the majority prehistoric is date. A large number of these monuments have previously been excavated as part of the previous mining activities within the area and therefore the records are 'record only'. There are no recorded sites of architectural heritage significance within the 500m study area. In terms of cultural heritage sites, no specific sites have been identified within the study area.

Between 1997–1998 Margaret Gowen and Co. monitored the construction of the existing mining facility at Lisheen. The development covered a 250ha area over four townlands: Barnalisheen, Cooleeny, Derryfadda and Killoran, including the proposed development area. Numerous archaeological sites were uncovered during monitoring and site types discovered included prehistoric complexes, fulachtaí fia, two cremation cemeteries, isolated cremations, burnt pits, a substantial Bronze Age settlement, Iron Age occupation sites and a variety of timber trackways and platforms. The sites were located across an undulating terrain of low eskers, peat-filled hollows and flat reclaimed marshland and adjacent to the raised bog of Derryville.

The analysis of desktop resources and a field inspection has shown that a large majority of the development area previously contained industrial structures, which have since been demolished. The site was previously stripped of topsoil and developed, with the exception of a small portion of the southwest corner, which covers c. 0.5ha. This area remains undisturbed and retains some archaeological potential. Here there is potential for direct negative (permanent) effects on previously unrecorded archaeological remains, which may be present. Effects may range from moderate to very significant, dependant on the nature, extent and significance of any remains that may be identified.

All topsoil stripping in the south-western corner of the development area will be subject to archaeological monitoring. If any features of archaeological potential are identified, further mitigation will be required such as preservation in-situ or by record. Any further mitigation will require agreement from the National Monuments Service of the Department of Housing, Local Government and Heritage.

No effects during construction or operation are predicted upon the architectural heritage or cultural heritage resource. No operational effects are predicted upon the archaeological resource.

Following the completion of all mitigation measures, there will be no significant residual impacts upon the archaeological, architectural or cultural heritage resource.

18.0 Landscape and Visual

18.1 Introduction

This chapter assesses the likely significant landscape and visual effects of the proposed biomethane and bio-based fertiliser production facility at Lisheen during its construction and operational phases. The analysis covers changes to landscape character and impacts on visual receptors (residents and visitors). Mitigation and monitoring measures embedded in the project design and potential cumulative impacts are also discussed.

18.2 Methodology

The methodology for the Landscape and Visual Impact Assessment (LVIA) aligns with the Environmental Protection Agency (EPA) guidelines and the "Guidelines for Landscape and Visual Impact Assessment, Third Edition" (GLVIA3). The assessment involved:

- Desktop reviews of landscape character, visual sensitivity, and designated scenic routes.
- Fieldwork to verify baseline conditions and capture visual perspectives.
- Use of photomontages to evaluate visual impacts from selected viewpoints.

18.3 Baseline Environment

The site is part of the former Lisheen Mine complex, a brownfield area that has transitioned towards renewable energy and bio-based industry uses. The surrounding landscape includes agricultural lands, forestry, and historic peatlands, contributing to its classification as a low-sensitivity landscape. The nearest notable population centre, Urlingford, lies over 6 km from the site.

18.4 Characteristics of the Proposed Development

The facility will feature:

- **Anaerobic Digestion Tanks**: Four primary tanks (7.6 m high) and three secondary tanks (14.5 m high).
- **Ancillary Structures**: A biomass boiler (12.5 m high), bio-based fertiliser processing units, and an emergency flare (7.6 m high).
- **Landscaping and Screening**: Native vegetation planting for visual integration and biodiversity support.

18.5 Potential Effects

- **Construction Phase**: Visual impacts during construction are expected to be minimal due to existing vegetation that screens most of the site. Temporary visual elements like cranes and machinery will be present but limited in visibility.

- **Operational Phase**: The facility's design, with structures built 3 m below ground level and in recessive colours, will reduce visual prominence. The project is expected to blend with the surrounding industrial landscape, leading to low to imperceptible visual impacts from most viewpoints.

18.6 Mitigation and Monitoring Measures

- **Construction Phase**: Visual screening through site hoarding and limited construction visibility.
- **Operational Phase**: Use of a subdued colour scheme and strategic landscaping to minimise visual impact.

18.7 Residual Effects

No significant residual effects are expected during either the construction or operational phases due to the embedded design measures and the site's low landscape sensitivity.

18.8 Cumulative Effects

Assessments considered other nearby developments within a 2.5 km radius, such as renewable energy projects. No significant cumulative landscape or visual impacts were identified.

18.9 Conclusion

The proposed development at Lisheen is anticipated to have minimal landscape and visual impacts, integrating effectively with the existing industrial character of the area. The project supports regional sustainability goals and contributes positively to the evolving landscape.

19.0 Risk Management – Major Accidents and Disasters

An assessment of the potential impact on Major Accidents and Disasters was carried out by AWN Consulting Limited.

Alongside the legislation, policy, and guidance outlined in Chapter 1, the following relevant legislation, policy, and guidance has informed the preparation of this chapter:

- EPA 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2022),
- EPA 'Advice Notes on Current Practice in the Preparation of Environmental Impact Statements' (2018),
- Health and Safety Authority Guidance on Technical Land-Use Planning Advice, for planning authorities and COMAH establishment operators (2023)
- Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015
- HSA Guide to the COMAH Regulations 2015 (S.I. No. 209 of 2015)
- Building Regulations (Part A Amendment) Regulations 2012 (as amended) (SI No. 138 of 2012)
- Safety, Health and Welfare at Work (Construction) Regulations 2013 (as amended) (hereafter referred to as the Safety, Health and Welfare (Construction) Regulations) (S.I. No. 291 of 2013)
- A Framework for Major Emergency Management. Guidance Document 10 (DECLG 2015)

The subject site is ca 5.5 ha at lands located at the former Lisheen Mine Site, Killoran, Moyne, Thurles, Co. Tipperary. The existing facility is a non-COMAH site and the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, 2015 (COMAH Regulations 2015) does not apply.

There are no Seveso Establishments within a 10km radius of the proposed development and the proposed development is not within the consultation distance of a Seveso Establishment. Therefore, there are no constraints to the proposed development at this location from nearby Seveso establishments.

The Land Use Planning assessment (AWN, 2024) concluded that the level of risk to persons off-site is acceptable and there is no risk of a major accident to the environment. Therefore, it is concluded that the risk from a major accident, at the proposed development, to human health and environment in the surrounding area, will be not significant.

19.1 Construction Phase

General construction activities will include ground preparation, excavation, construction of structures. These activities will require the use of vehicles and tools. The hazards associated with activities include the potential for vehicle impact, particularly during reversing and vehicle overturning. The controls around this work will be managed by appropriate risk assessments to control the risks to people, the environment and also to the existing operational areas.

A site-specific Construction Environmental Management Plan (CEMP) and a Health and Safety Plan produced by the Engineering and Construction Contractor, covering the construction and commissioning of the Proposed Development, will be prepared to ensure compliance with relevant health and safety legislation including the Safety, Health and Welfare at Work Act.

The following scenarios have been identified that could impact the construction phase of the project:

- Extreme heat or cold weather resulting in result structural damage and/or pollution to soils, groundwater, or surface waters.
- Compressed Gas Cylinder release
- Storm events resulting in structural damage and/or pollution to groundwater and surface waters.
- Flooding

There are no likely impacts on the project or to off-site receptors during the construction phase in relation to major accidents and disasters.

19.2 Operational Phase

The following scenarios have been identified that could impact the operational phase of the project:

- Release of Biogas at Bay Trailer
- Release of Biogas at the Anaerobic Digesters, Biogas Compressors and Energy Centre
- Extreme heat or cold weather resulting in result structural damage and/or pollution to soils, groundwater, or surface waters.
- Storm events resulting in structural damage and/or pollution to groundwater and surface waters.
- Flooding

There are no likely impacts to off-site receptors, as a result of the proposed development, during the operational phase in relation to major accidents and disasters.

The Proposed Development and Overall Project will comply with the requirements of all relevant health, safety and environmental legislation including COMAH, which requires operators to take all measures necessary to prevent major accidents.

19.3 Mitigation Measures and Proposed Response to such Emergencies

A site Major Accident Prevention Policy, including an Emergency Response Plan, will be developed prior to the commencement of operations and will include detailed procedures in the event of a major accident. This plan will follow the framework detailed in Guidance Document 10 of A Framework for Major Emergency Management (DECLG 2015) and will comply with the requirements of the COMAH Regulations.

This plan will contain detailed plans for the response to emergencies such as loss of containment from an Anaerobic Digester, release cylinders of compressed natural gas and severe weather events.

The proposed development has been designed in line with good industry practice, and, as such, mitigation against the risk of major accidents and/or disasters is embedded through the design and in accordance with planning and legislative requirements. As no likely significant effects were identified, no additional mitigation measures are proposed.

19.4 Residual Impacts

The residual effects are the final predicted or intended effects which occur after the proposed mitigation measures have been implemented. As no likely significant effects were identified, no additional mitigation measures are proposed. Therefore, residual effects are not relevant for this assessment.

19.5 Cumulative Impacts

Cumulative effects relate to the potential effects of the proposed development in combination of the potential effects of other developments (referred to as 'cumulative developments') within the surrounding area. A review of the planned and permitted projects within the vicinity of the site was undertaken and is described in Chapter 21 Cumulative Impacts, which presents the planned and permitted projects within 500 m of the proposed development. All other developments are outside the 500 m cumulative zone of influence and have been scoped out of cumulative assessment as there no direct or indirect significant negative cumulative effects predicted between these projects and the proposed development on major accidents and disasters.

There are no expected impacts from these projects from a major accidents and disasters perspective, as such, there are no significant cumulative effects with the proposed development from a major accidents and disasters perspective.

20.0 Inter-Related Effects

20.1 Introduction

Chapter 20 examines the inter-related effects of the proposed biomethane and bio-based fertiliser production facility at Lisheen. Interactions between environmental factors are crucial to provide a holistic understanding of potential cumulative impacts on the environment and community. This chapter highlights how various environmental aspects assessed in the EIAR interact during the construction and operational phases.

Methodology The methodology for assessing inter-related effects aligns with the Environmental Protection Agency (EPA) guidelines and the EIA Directive (2014/52/EU). The assessment involved:

- Identifying direct and indirect significant effects across various chapters.
- Creating an interaction matrix to visualise potential overlaps between environmental topics.
- Summarising collaborative findings from specialist consultants.

Key Interactions Identified

1. **Population and Human Health**:
    - Interactions with hydrology, air quality, noise, traffic, waste, utilities, landscape, and risk management.
    - Measures such as dust suppression, noise control, traffic management, and stringent safety protocols mitigate potential negative effects on human health.

2. **Biodiversity**:
    - Interacts with population health, land and soils, hydrology, and landscape.
    - Overlaps with mitigation measures in hydrology and air quality sections, including water quality protection and dust control to safeguard sensitive habitats.

3. **Land, Soils, and Geology**:
    - Interactions with human health, biodiversity, hydrology, air quality, and traffic.
    - Soil management plans and pollution prevention strategies help minimise potential contamination and maintain land integrity.

4. **Hydrology and Hydrogeology**:
    - Connects with human health, biodiversity, and waste.
    - Implementation of water management systems and spill prevention measures reduces risks to water quality and aquatic ecosystems.

5. **Air Quality (including Odour)**:
    - Relates to human health, biodiversity, traffic, and climate.

- Air quality modelling indicates compliance with ambient standards, ensuring negligible impacts when mitigation measures are applied.

6. **Climate**:
   - Interacts with hydrology, air quality, traffic, and waste management.
   - Incorporating sustainable practices and emissions control contributes to climate resilience.

7. **Noise and Vibration**:
   - Affects human health, biodiversity, and traffic.
   - Mitigation includes use of quieter machinery and limiting work hours to reduce disturbances.

8. **Traffic and Transportation**:
   - Overlaps with human health, air quality, noise, and climate.
   - Traffic management strategies and designated haul routes help limit congestion and emissions.

9. **Material Assets (Waste and Utilities)**:
   - Interacts with human health, biodiversity, and land.
   - Proper waste handling and utility management plans mitigate risks of pollution and resource disruption.

10. **Landscape and Visual**:
    - Affects human perception and wellbeing.
    - Landscape design, including native vegetation planting, integrates the facility into its environment.

11. **Risk Management (Major Accidents and Disasters)**:
    - Relates to human health, land, and soil.
    - Safety measures ensure minimal risk of significant accidents.

Interactions Matrix The matrix (see below) identifies interrelationships between factors, illustrating potential overlapping impacts during construction and operation phases.

Conclusion The assessment of inter-related effects confirms that comprehensive mitigation strategies embedded in the project design effectively address potential cumulative impacts. The proactive approach ensures minimal adverse interactions, supporting the sustainable development of the Lisheen facility.

Source: Interaction	Receptor: Pop & Human Health		Biodiversity		Land and Soils		Hydrology and Hydrogeology		Air Quality		Climate		Noise and Vibration		Traffic and Transportation		Material Assets: Waste		Material Assets: Utilities		Archaeology and Cultural Heritage		Landscape and Visual		Risk Management	
	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op
Population & Human Health			✓	✓	✓		✓	✓	✓	✓			✓	✓	✓	✓	✓	✓						✓		✓
Biodiversity	✓	✓			✓	✓	✓	✓															✓	✓		
Land, Soils & Geology	✓	✓	✓	✓			✓		✓						✓								✓			
Hydrology & Hydrogeology	✓	✓	✓		✓	✓											✓	✓								
Air Quality	✓	✓	✓	✓	✓	✓					✓	✓			✓	✓										
Climate							✓	✓	✓	✓					✓	✓	✓	✓								
Noise and Vibration															✓	✓										
Traffic and Transportation									✓	✓			✓	✓												
Material Assets: Waste	✓	✓	✓	✓	✓	✓	✓	✓							✓	✓										
Material Assets: Utilities					✓		✓	✓		✓		✓			✓	✓										
Archaeology & Cultural Heritage																										
Landscape and Visual		✓															✓	✓			✓					
Risk Management	✓	✓			✓																					

Table 20.1 : Interactions Matrix. (Source : Purser)

21.0 Cumulative Impacts

21.1 Introduction

Chapter 21 of the EIAR assesses the cumulative effects of the proposed biomethane and bio-based fertiliser production facility at Lisheen. Cumulative effects arise when the proposed development's impacts combine with those of other existing or approved projects, potentially creating more significant environmental effects. This chapter evaluates these combined impacts during the construction and operational phases.

Relevant Guidance and Policy The assessment follows key guidance documents:

- **EPA Guidelines (2022)**: Guidance on information to be contained in EIARs.
- **European Commission (2017)**: Guidance on EIA report preparation.
- **Guidelines for the Assessment of Indirect and Cumulative Impacts (1999)**.
- **Department of Housing (2018)**: EIA guidelines for planning authorities and An Bord Pleanála.

Methodology The Cumulative Effects Assessment (CEA) process involves:

1. Establishing a long list of relevant existing and approved projects within a specified radius.
2. Screening projects to determine their potential for interaction with the proposed development.
3. Assessing the combined impacts where interactions are likely.

The assessment covers interactions between the proposed facility and other projects during construction and operation phases, focusing on population and human health, biodiversity, hydrology, air quality, noise, traffic, and material assets.

Screening of Projects Projects were screened based on their proximity to the proposed development and potential to interact with it. These were categorised into four tiers:

- **Tier 1**: On-site projects.
- **Tier 2**: Projects within 2.5 km.
- **Tier 3**: Projects within 2.5-7.5 km.
- **Tier 4**: Projects beyond 7.5 km.

Projects screened in for further assessment included renewable energy facilities, industrial units, and infrastructural developments that could overlap in impacts such as traffic, noise, and air quality.

Key Findings

- **Population and Human Health**: Minor temporary impacts due to increased traffic and noise during construction. No significant long-term effects were identified.
- **Biodiversity**: Potential cumulative effects on hydrologically connected waterbodies during construction. Mitigation measures like sediment control and water quality monitoring will minimise impacts.

- **Hydrology and Water Quality**: Cumulative effects on water bodies such as the Cooleeny Stream were considered. The facility's design to reuse water internally and treat surface water before discharge helps avoid significant impacts.
- **Air Quality**: Construction activities from concurrent projects may result in temporary increases in dust levels. Mitigation measures, such as dust suppression, will be applied to control these effects.
- **Noise and Vibration**: No significant cumulative noise impacts are expected due to the distance between developments and adherence to EPA noise guidelines.
- **Traffic and Transportation**: Minor cumulative impacts from construction traffic are anticipated. A traffic management plan will be implemented to mitigate congestion.
- **Material Assets**: Increased demand on waste management services during construction, but regional facilities have capacity to handle additional waste.

Mitigation Measures Mitigation measures outlined in individual EIAR chapters will ensure that cumulative impacts are managed effectively. These include noise reduction practices, dust control strategies, water quality monitoring, and traffic management plans.

Conclusion The cumulative assessment found no significant negative impacts during construction or operation, provided that proposed mitigation measures are implemented. The facility, in combination with other projects, is expected to support sustainable development without significant adverse cumulative effects on the environment or local community.

22.0 Schedule of Mitigation and Monitoring Proposals

22.1 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 Quality (including Odour)
- Climate
- Noise & Vibration
- Landscape & Visual
- Traffic & Transportation
- Archaeology & Cultural Heritage
- Material Assets: Waste
- Material Assets: Utilities
- Risk Management

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 EPA's 2022 Guidelines recommend the below strategy for identifying appropriate mitigating measures for a proposed project (see **Figure 22.1** below).

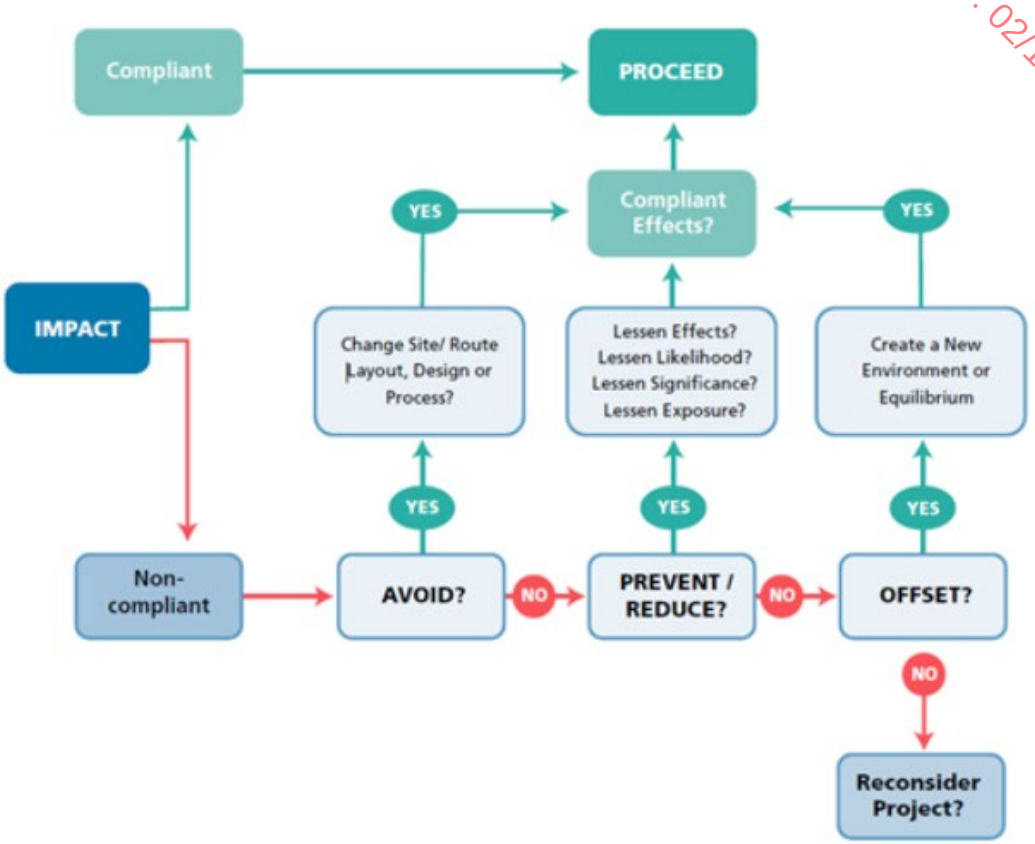

Figure 22.1: Strategies for identification of Appropriate Mitigation or Offsetting Measures. (Source: EPAs 2022 Guidelines).

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 7** to **Chapter 19**.

Mitigation and monitoring measures proposed during the construction phase are outlined in **Chapter 22** 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 22**. The site will be operated under an Industrial Emissions Licence and will be regulated by the Environmental Protection

Agency (EPA), Department of Agriculture, Food and the Marine (DAFM) and the Local Authority (Tipperary County Council).

Importantly, this Chapter does not seek to elaborate on the reasoning or expected effectiveness of those measures, as this is provided within the main body of each specialist Chapter. Please refer to '**Chapter 22 – Mitigation & Monitoring Measures**' of Volume 2 of the EIAR for further details.

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