

EIAR FOR POWERSTOWN BIOENERGY

Volume 1- Non-Technical Summary

Prepared for:
Greengate Biogas 001 Ltd.



Date: June 2026

Document No:
P24414-FT-EN-XX-RP-EN-0031

Unit 6, Bagenalstown Industrial Park, Royal Oak Road,
Muine Bheag, Co. Carlow, R21 XW81, Ireland

T: +353 59 972 3800 | E: info@ftco.ie

CORK | DUBLIN | CARLOW

www.fehilytimoney.ie

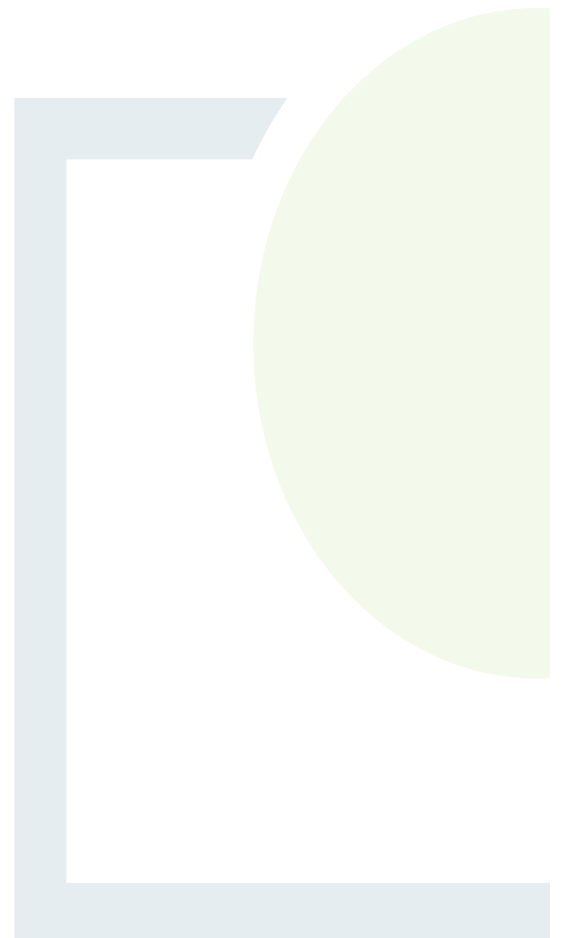


TABLE OF CONTENTS

1.	CHAPTER 1: INTRODUCTION	1
1.1	Overview of the Project.....	1
1.2	The Applicant.....	1
1.3	The Existing Site.....	1
1.3.1	Sensitive Receptors	2
1.4	The Proposed Development	2
1.4.1	Planning History	2
1.5	Application and EIA Process	3
1.5.1	Environmental Impact Assessment (EIA)	3
1.5.2	Appropriate Assessment (AA).....	3
1.5.3	Industrial Emissions Licence.....	4
1.5.4	Animal By Product Approval	4
1.5.5	Seveso (COMAH) Requirements	4
1.6	EIAR Methodology.....	4
1.6.1	EIAR Structure	5
2.	CHAPTER 2: PLANNING, POLICY AND NEED	6
2.1	Introduction.....	6
2.2	Planning and Policy Supports	6
2.2.1	Climate Policy.....	6
2.2.2	Biomethane and Renewable Energy Policy.....	7
2.2.3	Biodiversity Policy	8
2.2.4	Agricultural Emissions Policies	8
2.3	Need for the Proposed Development	9
2.3.1	General Need	9
2.3.2	Energy and Climate	10
2.3.3	Agricultural Emissions	10
2.3.4	Replacement of Chemical Fertilisers.....	10
2.3.5	Bioeconomy and Circular Economy	10
2.3.6	Renewable Heat and Energy Policy.....	10
2.4	Summary.....	10

3.	CHAPTER 3: EXISTING AND PROPOSED DEVELOPMENT DESCRIPTION	12
3.1	Introduction and Purpose	12
3.2	The Existing Site.....	12
3.2.1	Location and Surroundings	12
3.2.2	Current Condition	12
3.3	Existing Agricultural Materials (Feedstocks)	13
3.3.1	Types of Feedstocks	14
3.3.2	Current Management of Manures and Slurries	14
3.4	The Proposed Development.....	14
3.4.1	Overview	14
3.5	Main Structures and Layout	15
3.5.1	Site Access and Traffic.....	15
3.5.2	Material Handling Areas	15
3.5.3	Processing Area.....	16
3.5.4	Storage and Treatment	16
3.5.5	Energy and Gas Systems	16
3.5.6	Production of Fertiliser	16
3.5.7	Working Hours and Staffing	16
3.5.8	Environmental Protection Measures	17
3.6	Gas Pipeline Connection.....	17
3.7	Construction of the Development.....	17
3.7.1	Construction Activities	17
3.7.2	Duration	18
3.7.3	Environmental Controls During Construction.....	18
3.7.4	Materials and Waste	18
3.7.5	Safety and Monitoring	19
3.8	Decommissioning	19
3.9	Overall Summary.....	19
4.	CHAPTER 4: ALTERNATIVES CONSIDERED	20
4.1	Introduction.....	20
4.2	Assessment Methodology	20
4.3	Baseline Environment.....	20
4.4	Do Nothing Impacts.....	20

4.5	Alternative Locations.....	20
4.6	Alternative Site Layouts and Design.....	23
4.7	Alternative Technologies.....	23
4.7.1	Odour Control	23
4.7.2	Gas Upgrading Technology	24
4.7.3	Heat Source for Processing	24
4.7.4	Pretreatment Technology	25
4.7.5	Water Supply.....	25
4.7.6	On-Site Power Generation	25
4.7.7	Carbon Dioxide Capture.....	25
4.8	Conclusion	26
5.	CHAPTER 5: SCOPING AND CONSULTATION	27
5.1	Introduction.....	27
5.2	Scoping and Consultation Purpose.....	27
5.3	Methodology	27
5.4	Consultation Process	28
5.4.1	Consultation with An Coimisiún Pleanála	28
5.4.2	Consultation with SEAI.....	28
5.4.3	Stakeholder Consultation.....	29
5.4.4	Stakeholder Consultation Meetings.....	29
5.4.5	Public Consultation	30
5.5	Conclusion	30
6.	CHAPTER 6: TRAFFIC AND TRANSPORTATION	31
6.1	Introduction.....	31
6.2	Assessment Methodology	31
6.3	Baseline Environment.....	31
6.4	Assessment of Likely Significant Effects	32
6.4.1	‘Do Nothing’ Scenario	32
6.4.2	Construction Phase	32
6.4.3	Operational Phase.....	32
6.4.4	Road Safety	33
6.4.5	Cumulative Impacts	33
6.5	Mitigation Measures	33

6.6	Residual Impacts.....	33
6.7	Overall Conclusion.....	34
7.	CHAPTER 7: POPULATION AND HUMAN HEALTH.....	35
7.1	Introduction.....	35
7.2	Methodology.....	35
7.3	Existing Environment.....	35
7.3.1	Population.....	35
7.3.2	Employment and Economy.....	35
7.3.3	Land Use and Amenity.....	35
7.3.4	Human Health.....	36
7.4	Assessment of Likely Significant Effects.....	36
7.4.1	‘Do Nothing’ Scenario.....	36
7.4.2	Construction Phase Effects.....	36
7.4.3	Operational Phase Effects.....	36
7.4.4	Decommissioning Phase Effects.....	37
7.5	Mitigation.....	37
7.5.1	Construction Phase.....	37
7.5.2	Operational Phase.....	38
7.5.3	Decommissioning Phase.....	38
7.6	Conclusion.....	39
8.	CHAPTER 8: AIR QUALITY.....	41
8.1	Introduction.....	41
8.2	Relevant Legislation and Guidance.....	41
8.3	Assessment Criteria.....	41
8.3.1	Human Health.....	41
8.3.2	Ecology.....	41
8.4	Assessment Methodology.....	42
8.4.1	Construction Phase.....	42
8.4.2	Operational Phase.....	42
8.4.3	Decommissioning Phase.....	43
8.5	Baseline Environment.....	43
8.6	Sensitivity of the Receiving Environment.....	44
8.6.1	Construction Phase.....	44

8.6.2	Operational Phase.....	44
8.7	Assessment of Likely Significant Effects	44
8.7.1	Do Nothing Scenario	44
8.7.2	Construction Phase Impacts.....	45
8.7.3	Operational Phases Impacts	45
8.7.4	Decommissioning Phase Impacts.....	45
8.7.5	Cumulative Impacts	46
8.8	Mitigation Measures	46
8.8.1	Construction Phase	46
8.8.2	Operational Phase.....	46
8.8.3	Decommissioning Phase	47
8.9	Residual Impacts.....	47
8.10	Interactions and Interrelationships	47
8.11	Overall Conclusion.....	47
9.	CHAPTER 9: CLIMATE	48
9.1	Introduction.....	48
9.2	Assessment Methodology	48
9.2.1	Greenhouse Gas Assessment.....	48
9.2.2	Climate Risk Assessment.....	48
9.3	Baseline Climate Environment	49
9.3.1	Greenhouse Gas Emissions (Ireland)	49
9.3.2	Existing Climate Conditions.....	49
9.4	Assessment of Likely Significant Effects	49
9.4.1	‘Do Nothing’ Scenario	49
9.4.2	Construction Phase Impacts.....	49
9.4.3	Operational Phase Impacts	50
9.4.4	Climate Benefits of the Proposed Development	50
9.4.5	Climate Risk (Effects of Climate Change on the proposed Development).....	51
9.4.6	Cumulative Impacts	51
9.5	Mitigation Measures	51
9.6	Residual Impacts.....	52
9.7	Overall Conclusion.....	52
10.	CHAPTER 10: NOISE AND VIBRATION	53

10.1	Introduction.....	53
10.2	Assessment Approach	53
10.3	Baseline Environment.....	53
10.4	Assessment of Likely Significant Effects	53
10.4.1	Construction phase	53
10.4.2	Operational Phase.....	54
10.4.3	Decommissioning Phase	54
10.4.4	Mitigation Measures	54
10.5	Residual Impacts.....	54
10.5.1	Construction Phase Residual Impacts	54
10.5.2	Operational Phase Residual Impacts.....	55
10.5.3	Decommissioning Phase Residual Impacts	55
10.5.4	Summary of Residual Impacts.....	55
11.	CHAPTER 11: BIODIVERSITY.....	56
11.1	Introduction.....	56
11.2	Assessment Methodology	56
11.2.1	Legislative Policy Context.....	56
11.2.2	Consultation	56
11.3	Baseline Environment.....	57
11.4	Assessment of Likely Significant Effects	58
11.4.1	Construction Phase	58
11.4.2	Operational Phase.....	58
11.4.3	Decommissioning Phase	58
11.4.4	Cumulative Impacts	58
11.5	Mitigation Measures	59
11.6	Residual Impacts.....	59
11.7	Enhanced Monitoring.....	59
11.8	Overall Conclusion.....	59
12.	CHAPTER 12: SOILS, GEOLOGY, AND HYDROGEOLOGY	60
12.1	Introduction.....	60
12.2	Assessment Methodology	60
12.3	Baseline Environment.....	60
12.3.1	Site Context.....	60

12.3.2	Soils and Geology	60
12.3.3	Hydrogeology	61
12.3.4	Land Use and Contamination	61
12.3.5	Sensitivity of the Environment	61
12.4	Assessment of Likely Significant Effects	61
12.4.1	‘Do Nothing’ Scenario	61
12.4.2	Construction Phase	61
12.4.3	Operational Phase	62
12.4.4	Decommissioning Phase Impacts	62
12.4.5	Major Accidents and Natural Disasters	63
12.4.6	Cumulative Impacts	63
12.5	Mitigation Measures	63
12.5.1	Design and Prevention	63
12.5.2	Construction and Operational Phase Mitigation	63
12.5.3	Decommissioning Phase Mitigation	63
12.6	Water Framework Directive	63
12.7	Indirect Impacts	64
12.8	Residual Impacts	64
12.9	Overall Conclusion	64
13.	CHAPTER 13: SURFACE WATER AND HYDROLOGY	65
13.1	Introduction	65
13.2	Assessment Methodology	65
13.3	Baseline Environment	65
13.3.1	Catchment and Hydrology	65
13.3.2	Surface Water Quality	66
13.3.3	Flood Risk	66
13.4	Assessment of Likely Significant Impacts	66
13.4.1	‘Do Nothing’ Scenario	66
13.4.2	Construction Phase	66
13.4.3	Operational Phase	66
13.4.4	Major Accidents and Natural Disasters	67
13.4.5	Decommissioning Phase	67
13.4.6	Cumulative Impacts	67

13.5	Mitigation Measures	67
13.5.1	Design and Embedded Mitigation.....	67
13.5.2	Construction Phase Mitigation	67
13.5.3	Operational Phase Mitigation	68
13.5.4	Decommissioning Phase Mitigation.....	68
13.6	Residual Impacts.....	68
13.7	Monitoring.....	69
13.8	Overall Conclusion.....	69
14.	CHAPTER 14: MATERIAL ASSETS.....	70
14.1	Introduction.....	70
14.2	Assessment Methodology	70
14.3	Baseline Environment.....	70
14.3.1	Infrastructure	70
14.3.2	Utilities	70
14.3.3	Materials	71
14.4	Assessment of Likely Significant Effects	71
14.4.1	‘Do Nothing’ Scenario	71
14.4.2	Construction Phase	71
14.4.3	Operational Phase.....	72
14.4.4	Decommissioning Phase	72
14.4.5	Cumulative Impacts	72
14.5	Mitigation Measures	72
14.6	Residual Impacts.....	73
14.7	Overall Conclusion.....	73
15.	CHAPTER 15: ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE.....	74
15.1	Introduction.....	74
15.2	Assessment Methodology	74
15.3	Baseline Environment.....	74
15.3.1	Site Context.....	74
15.3.2	Surrounding Area	75
15.3.3	Historical Land Use.....	75
15.3.4	Gas Pipeline Route	75
15.3.5	Assessment of Likely Significant Effects	75

15.3.6	'Do Nothing' Scenario	75
15.3.7	Construction Phase	75
15.3.8	Operational Phase.....	76
15.3.9	Major Accidents and Natural Disasters.....	76
15.3.10	Decommissioning Phase	76
15.3.11	Cumulative Impacts	76
15.4	Mitigation Measures	76
15.5	Residual Impacts.....	77
15.6	Overall Conclusion.....	77
16.	CHAPTER 16: LANDSCAPE AND VISUAL IMPACT	78
16.1	Introduction.....	78
16.2	Assessment Methodology	78
16.3	Baseline Environment.....	78
16.3.1	Landscape.....	78
16.3.2	Visual	79
16.4	Assessment of Likely Significant Effects	79
16.4.1	'Do Nothing' Scenario	79
16.4.2	Construction Phase	79
16.4.3	Operational Phase.....	80
16.4.4	Decommissioning Phase	80
16.4.5	Cumulative impacts.....	80
16.5	Mitigation Measures	80
16.6	Residual Impacts.....	81
16.7	Overall Conclusion.....	81
17.	CHAPTER 17: INTER-RELATIONSHIPS AND INTERACTIONS.....	82
18.	CHAPTER 18: SCHEDULE OF COMMITMENTS	83

LIST OF FIGURES

	<u>Page</u>
Figure 3-1: View from south shows ongoing restoration of former quarry.....	13
Figure 3-2: View from southwest (restored area in fore and mid ground).....	13
Figure 4-1: Powerstown Site	21
Figure 4-2: Clonmelsh Site.....	21
Figure 4-3: Jamestown Site.....	22



1. CHAPTER 1: INTRODUCTION

1.1 Overview of the Project

The document is an Environmental Impact Assessment Report (EIAR) prepared by Fehily Timoney & Company for Greengate Biogas 001 Ltd. It accompanies an application for statutory consent for a major renewable energy project called Powerstown Bioenergy, located in Powerstown, Milford, Co. Carlow.

The project involves building a large anaerobic digestion (AD) plant that will turn agricultural residues—such as cattle slurry, pig slurry, poultry manure, and straw-based manures—into renewable biomethane, biogenic CO₂, and digestate (a nutrient-rich fertiliser product). The plant is designed to process up to 663,000 tonnes per year of these materials.

A new gas pipeline will connect the proposed development to the Gas Networks Ireland grid in Clogrennan, Co. Carlow. Gas Networks Ireland as a Statutory Undertaker will apply separately for consent for the pipeline. A statutory undertaker is any public utility body who performs obligations under statutory powers.

The project is considered Strategic Infrastructure Development (SID) under the Planning and Development Acts 2000–2025, meaning it must be assessed by An Coimisiún Pleanála.

1.2 The Applicant

Greengate Biogas 001 Ltd. was established in 2024 and is backed by:

- Copenhagen Infrastructure Partners (CI Advanced Bioenergy Fund)
- Atlas Renewables Ltd.
- Energex Partners Ltd.

Ireland's National Biomethane Strategy (2024) sets a legally binding target for the generation of 5.7 TWh of biomethane by 2030. This project will supply 250 GWh, or about 4% of the national target.

The plant will also capture 30,000 tonnes of biogenic CO₂ per year, reducing emissions from agriculture.

1.3 The Existing Site

The site, known as Mary Kelly's Pit, is a partially restored quarry. It lies:

- 2.5 km north of Leighlinbridge
- 6 km north of Bagenalstown
- 8.6 km south of Carlow town

The site is currently operated by Kilcarrig Quarries Ltd. for sand and gravel extraction and soil/stone import.

Existing Environment



The site is in a mixed-use rural landscape with agriculture, quarrying, and waste facilities. Key nearby features include:

- Powerstown Landfill (closed) – directly north
- Powerstown Recycling Centre (operational)– immediately east
- M9 Dublin Waterford Motorway junction 9 – 420 m north
- R448 Regional Road Carlow Kilkenny – immediately west
- L3045 local road - immediately south
- River Barrow and River Nore SAC – 20 m west
- Railway line (Dublin–Waterford) – 420 m east

The quarry's slopes and vegetation provide substantial visual screening.

1.3.1 Sensitive Receptors

Nearby sensitive locations include:

- residential properties along the L3045 and R448
- the River Barrow and River Nore SAC (Site Code 2162)

These are assessed in detail in later EIAR chapters.

1.4 The Proposed Development

Powerstown Bioenergy is an anaerobic digestion facility that will convert agricultural residues into:

- Renewable Natural Gas (RNG)
- Biogenic CO₂
- Solid and liquid digestate (fertiliser)

The full technical description is in Chapter 3 of the EIAR.

1.4.1 Planning History

The planning history of the existing site is quarrying and soil recovery. The planning consents issued include:

2001 – P01/300 (ABP PL01.129838)

Permission granted for sand and gravel extraction over 9. ha, with conditions on restoration and no import of fill.

2011 – P11/105

Application refused because the development was considered unauthorised and contrary to proper planning.



2012 – P11/206

Permission granted for retention of part of the quarry development and further extraction. Traffic assessments found the road network acceptable.

2014 – P13/187 (Current Planning Permission)

Permission granted for internal haul roads, extraction, and restoration works (under waste facility permit) at 5,000 tonnes per annum soil and stone. Extraction volumes were estimated at 80,000 tonnes per year over 15 years.

2024–2025 – PL01.320180

Permission granted for change of use from quarry to a soil recovery facility (4.84 ha). This includes importing up to 199,500 tonnes of inert soil and stone over 8 years. This consent has not been invoked by the operator.

Waste Facility Permit (2022)

Permit WFP CW 22 001 01 allows import of up to 52,000 tonnes of inert material over 5 years for site restoration. This waste facility permit is in respect of planning consent P13/187.

The Applicant is seeking permission for a change of use, to cease quarrying and restoration works and to develop Powerstown Biogas on the site.

1.5 Application and EIA Process

This EIAR was prepared to accompany a development consent application to An Coimisiún Pleanála under Section 37E of the Planning and Development Acts 2000 to 2025.

1.5.1 Environmental Impact Assessment (EIA)

Under Directive 2011/92/EU as amended by 2014/52/EU, certain projects must undergo EIA. Powerstown Bioenergy is a development specified in the 7th Schedule of the Planning and Development Acts 2000 to 2025 and which satisfies conditions (a) and (b) of Section 37(A)2 of the same Acts, that is Strategic Infrastructure Development (SID). Under the Acts an EIAR must accompany the application.

The EPA is also a competent authority for EIA. For Industrial Emissions (IE) applications, where the activity is also a project which requires EIA, the Agency must conduct an assessment of the application for the purposes of EIA as respects the matters that come within the functions of the Agency. For this reason, this EIAR accompanies the IE licence application for the proposed development.

The EIAR provides all information required under Article 5(1) and Annex IV of the Directive.

1.5.2 Appropriate Assessment (AA)

Under Article 6 of the Habitats Directive (92/43/EEC), a project must undergo AA if it is likely to have a significant effect on a European site.

Screening concluded that the project could affect the River Barrow and River Nore SAC in the absence of mitigation, so a Natura Impact Statement (NIS) has been prepared.



1.5.3 Industrial Emissions Licence

The project requires an IE licence under:

- Industrial Emissions Directive (2010/75/EU)
- Activity Class 11.4(b)(i) of First Schedule of the Environmental Protection Act 1992, as amended

A licence application will be submitted to the EPA for the proposed development following development consent.

1.5.4 Animal By Product Approval

Required under the European Union (Animal By Products) Regulations 2014. An application for Stage 1 approval was submitted to the Department of Agriculture, Food and the Marine in March 2026. Stage 2 approval will be required at commissioning stage.

1.5.5 Seveso (COMAH) Requirements

Because the site will store ≥ 50 tonnes of natural gas, it will be a Seveso Lower Tier site under the Chemicals Act (Control of Major Accidents Involving Dangerous Substances) Regulations 2015. A land use planning assessment is being submitted to the HSA concurrent with the SID application to An Coimisiún Pleanála.

1.6 EIAR Methodology

The Environmental Impact Assessment (EIA) process will be undertaken by the relevant Competent Authority, in this case An Coimisiún Pleanála (ACP). An EIAR presents relevant information such that an environmental impact assessment (EIA) can be undertaken to assess the potential effects of certain development projects on the environment.

The EIAR has been prepared in accordance with guidelines listed hereunder except where specific sectoral guidance was used:

- Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU) (European Commission, 2017)
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022)

Article 3 of the 2014 EIA Directive states that an “*environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:*

- a) population and human health;*
- b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;*
- c) land, soil, water, air and climate;*
- d) material assets, cultural heritage and the landscape;*
- e) the interaction between the factors referred to in points (a) to (d)”*



The primary objective of an EIA is to ensure that projects which are likely to have significant effects on the environment are assessed and impacts avoided, where possible. This assessment process aims to achieve the most sustainable and environmentally friendly integration of a development with the local environment.

Firstly, the planning and policy context, the background to the project including the need for the development, consultation, the alternatives assessed, and the existing and proposed development is described. This sets the reader in context as to the practical and dynamic process undertaken, to arrive at the layout and design of the proposed development that will cause least impact on the environment.

Subsequent sections deal with specific environmental topics, for example, human health and population, air and climate, hydrology and surface water, noise, etc. These sections may involve specialist studies and evaluations. The methodology applied during these specific environmental assessments is a systematic analysis of the proposed development in relation to the existing environment. The broad methodology framework for these assessments is outlined below and is designed to be clear and concise and allow the reader to logically follow the assessment process through each environmental topic. In some instances, more specific topic related methodologies are outlined in the relevant sections of the EIAR.

Each environmental topic is assessed using a consistent structure:

- Introduction
- Methodology
- Existing Environment
- Potential Effects
- Mitigation
- Residual Effects
- Interactions
- References

1.6.1 EIAR Structure

The EIAR has been structured in accordance with the European Commission's Guidance (European Commission, 2017).

Accordingly, the EIAR comprises four volumes:

- Volume 1: Non-Technical Summary
- Volume 2: Main Report
- Volume 3: Appendices
- Volume 4: Drawings



2. CHAPTER 2: PLANNING, POLICY AND NEED

2.1 Introduction

This chapter explains the policy and legislative context supporting Powerstown Bioenergy and the need for the proposed development.

The proposed development consists of a commercial anaerobic digestion (AD) facility at Powerstown, County Carlow. The proposed development will process agricultural residues, such as cattle and pig slurry, poultry slurry and manure and farmyard manures, to produce renewable biomethane. This gas will be injected into the national gas network and used as a low-carbon alternative to fossil fuels.

The development will process up to approximately 663,000 tonnes of material per year and will generate up to 250 GWh of biomethane annually. This will result in an estimated reduction of approximately 181,000 t CO₂ each year. In addition to renewable gas, the process will produce biogenic carbon dioxide and digestate, a nutrient-rich fertiliser.

Overall, the project is designed to contribute to Ireland's transition to a low-carbon economy while supporting more sustainable agricultural practices.

2.2 Planning and Policy Supports

The proposed development is supported by a wide range of policy objectives that seek to address climate change, improve energy security, and promote renewable energy. These policies also recognise the importance of sustainable agriculture and the transition to a circular economy.

At an international level, Ireland has committed to the United Nations Sustainable Development Goals, which aim to provide affordable and clean energy and to take urgent action on climate change. Similarly, global agreements such as the Paris Agreement require countries to reduce greenhouse gas emissions and increase the use of renewable energy.

These international commitments are implemented through European and national policy frameworks. Together, they establish a clear direction towards reducing reliance on fossil fuels and increasing the production of renewable energy, including biomethane.

The proposed development aligns directly with these objectives by producing renewable gas from agricultural materials and reducing emissions associated with both energy production and farming activities.

2.2.1 Climate Policy

European climate policy sets legally binding targets to reduce emissions and increase the use of renewable energy. The European Union aims to significantly reduce greenhouse gas emissions by 2030 and to achieve climate neutrality by 2050.

The European Green Deal sets out a roadmap to achieve these goals and highlights the role of renewable gases, such as biomethane, in replacing fossil fuels. This is particularly important for sectors that are difficult to decarbonise, including heating, transport and industry.

The proposed development will contribute to European climate objectives by generating renewable biomethane, which will replace fossil natural gas in the energy system



Ireland has introduced a range of legislation and policy measures to address climate change. The Climate Action and Low Carbon Development (Amendment) Act 2021 commits the country to reducing greenhouse gas emissions by 51% by 2030 and achieving climate neutrality by 2050.

National policy documents, including the Climate Action Plan and the National Planning Framework, emphasise the importance of renewable energy, energy security and sustainable development. They also recognise the potential of biomethane to contribute to emissions reductions and to support the transition to a low-carbon energy system.

The proposed development directly supports these national objectives. It will provide a source of indigenous renewable energy, reduce dependence on imported fossil fuels and contribute to national emissions reduction targets.

At a regional level, the Southern Regional Spatial and Economic Strategy promotes sustainable development, climate action and renewable energy. It supports diversification within the rural economy and encourages the development of low-carbon energy solutions.

At a local level, the Carlow County Development Plan 2022–2028 provides clear policy support for bioenergy developments, including anaerobic digestion. The plan supports such developments, particularly on suitable sites such as brownfield lands, and encourages the use of renewable energy technologies.

The proposed development is located on a former quarry site and is consistent with regional and local climate policies. It will also support the rural economy by providing opportunities for farmers and contributing to local economic activity.

2.2.2 Biomethane and Renewable Energy Policy

The Fit for 55 Package (European Commission, 2021) is a set of laws aiming to reduce EU greenhouse gas emissions by at least 55% by 2030 and achieving climate neutrality by 2050. It includes a gas market package to decarbonise the sector by shifting from fossil fuel derived gas to renewable and low carbon gases including biomethane from organic sources. The third EU Renewable Energy Directive known as RED III came into force in November 2023. RED III reflects the EU's commitment to achieving higher renewable energy targets and facilitating clean energy. Powerstown Biogas will be RED III compliant, accepting only feedstocks listed in Annex IX and will contribute to the European target under RED III to increase renewable energy share to at least 42.5% by 2030. The EU Hydrogen and Gas Decarbonisation package or the Fourth Package was adopted in 2024. It is aimed at cutting greenhouse gas emissions and ensuring security of supply and is intended to allow renewable gas entry into networks. The proposed development will replace fossil fuel generated gas in the network and will be generated in Ireland. Under this Gas Package, Member States have an obligation to facilitate this Directive in order to decarbonise energy supply and improve energy security. Ireland currently imports c 75% of its gas needs.

The REPowerEU Plan (2022) identifies sustainable biomethane as essential to replacing Russian fossil fuels, while the EU Methane Strategy (COM/2020/663) highlights biogas from manures as a highly sustainable energy source and stresses the importance of agricultural residues rather than food crops. Other relevant EU frameworks include the Energy System Integration Strategy (2020), Clean Energy for All Europeans Package (2019), Energy Roadmap 2050 (2011), and the Roadmap for a Competitive Low Carbon Economy in 2050 (2011), all of which support renewable gas, circular systems, and long-term decarbonisation.



Ireland's Renewable Heat Obligation Bill 2025 will require fossil fuel suppliers to source renewable heat, including biomethane, though enactment may be delayed by European Commission concerns. The European Union (Planning and Development) (Renewable Energy) Regulations 2025 (S.I. 274/2025 and S.I. 426/2025) transpose RED III into Irish law, introduce shorter permitting timelines, and define biogas as renewable energy for planning purposes.

Biomethane is increasingly recognised as an important component of Ireland's future energy system. National policy identifies a target of producing up to 5.7 TWh of biomethane annually by 2030. At present, production levels are very low, which highlights the need for significant new infrastructure.

Powerstown Bioenergy will generate approximately 250 GWh or 0.25 TWh of biomethane each year using 663,000 t/year of manure. This represents a meaningful contribution to national targets and demonstrates the type of large-scale project required to develop the biomethane sector.

Biomethane offers several advantages. It can be transported using the existing gas network, it provides a reliable and flexible energy source, and it can be produced from locally available agricultural materials. In this way, it supports both climate objectives and energy security.

The Biomethane Environmental Sustainability Charter (2025) requires RED-compliant feedstocks, high environmental standards, and sustainable digestate management. Powerstown Biogas will return digestate to farmers, will operate under an IE licence from the EPA and will install solar PV.

Other supporting national frameworks include the Programme for Government, White Paper on Ireland's Transition to a Low Carbon Energy Future 2015–2030, Energy Security Package (2023), National Policy Statement on the Bioeconomy (2018), and Bioeconomy Action Plan 2023–2025.

2.2.3 Biodiversity Policy

Biodiversity protection is governed by European legislation, including the Habitats and Birds Directives. These require that developments avoid significant impacts on protected habitats and species.

The potential effects of the proposed development on biodiversity are assessed in detail in other chapters of the EIAR. However, the project will be required to comply with all relevant environmental legislation and to implement mitigation measures where necessary.

2.2.4 Agricultural Emissions Policies

Agricultural emissions are regulated at both European and national levels through a combination of legislation, policy frameworks, and funding supports aimed at improving environmental performance while maintaining agricultural productivity.

At European level, the Common Agricultural Policy (CAP) Strategic Plan (European Commission, 2022) provides funding and direction to help farmers move towards more sustainable practices. The EU Climate Law (European Union, 2021) sets a legally binding target for the EU to become climate neutral by 2050, including emissions from agriculture.

The Nitrates Directive (91/676/EEC) (European Economic Communities, 1991) focuses on protecting water quality from agricultural pollution. It requires all Member States to prepare National Nitrates Action Programmes (NAPs), which set rules on how fertilisers and manures are managed and applied.



At national level, Ireland implements these requirements through its own policies and regulations. Ireland's 6th Nitrates Action Programme 2026–2028 (Government of Ireland, 2026) sets out updated measures to reduce nutrient losses to water. It includes stricter rules on manure management and requires that movements of organic manures be recorded. These rules are legally enforced through the European Union (Good Agricultural Practice for Protection of Waters) (Amendment) Regulations 2026 (S.I. No. 119 of 2026) also known as the Nitrates Regulations. The Programme is relevant to the project because it sets out rules for the management of manures which are enforced by the Nitrates Regulations.

Under these regulations, farmers must prepare Nutrient Management Plans (NMPs) to ensure fertilisers and manures are used efficiently and do not harm water quality. Digestate (a by-product of anaerobic digestion) must be tested for nutrient content and used in line with soil and crop needs. All movements of organic fertilisers must also be reported to the Department of Agriculture, Food and the Marine (DAFM).

Ireland's wider climate policy also places strong emphasis on reducing agricultural emissions. The Climate Action and Low Carbon Development (Amendment) Act 2021 sets a national target of climate neutrality by 2050. The Climate Action Plan 2025 establishes emission reduction targets for agriculture, including a goal to reduce emissions by 25% by 2030 (relative to 2018 levels). Measures include reducing chemical fertiliser use and supporting alternatives such as organic fertilisers and anaerobic digestion.

The Ireland CAP Strategic Plan 2023–2027 (Government of Ireland, 2022) provides financial support to farmers for improving environmental performance, including better manure management and reduced emissions. The Programme for Government and the National Biomethane Strategy further support the development of renewable energy from agricultural sources.

Air quality is addressed through the Clean Air Strategy for Ireland (Government of Ireland, 2023), which highlights that agriculture is the main source of ammonia emissions. Measures such as improved manure management and reduced fertiliser use are promoted to address this.

Finally, Food Vision 2030 (Government of Ireland, 2022) and Ag Climatise set out a long-term vision for a climate-neutral agricultural sector. These policies promote a circular bioeconomy, where materials such as slurry and manure are converted into valuable products like biomethane and digestate. They also emphasise the role of anaerobic digestion in reducing emissions and supporting renewable energy production.

Agriculture is one of the largest sources of greenhouse gas emissions in Ireland. Emissions mainly arise from livestock, manure management and the use of chemical fertilisers.

The proposed development will contribute to these objectives by processing manure in a controlled environment. This reduces methane emissions from storage and produces renewable energy. The resulting digestate can be used as a fertiliser, reducing the need for synthetic alternatives.

2.3 Need for the Proposed Development

2.3.1 General Need

There is a clear need for developments such as Powerstown Bioenergy to support Ireland's climate, energy and agricultural policies. The country faces significant challenges in reducing emissions and increasing renewable energy production.

The proposed development will make a direct contribution to these objectives while also supporting the rural economy and improving the sustainability of agricultural practices.



2.3.2 Energy and Climate

Ireland must significantly increase its production of renewable energy in order to meet national and European targets. At the same time, there is a need to reduce dependence on imported fossil fuels and to ensure a secure and reliable energy supply.

The proposed development will generate renewable biomethane for injection into the national grid. This will displace fossil natural gas and contribute to a substantial reduction in greenhouse gas emissions.

2.3.3 Agricultural Emissions

Reducing emissions from agriculture is a key challenge. The management of manure is a significant source of methane emissions, which are particularly harmful in terms of climate change.

The proposed development will treat manure through anaerobic digestion, capturing methane and converting it into usable energy. This improves overall emissions performance and supports national climate targets.

2.3.4 Replacement of Chemical Fertilisers

Chemical fertilisers are a significant source of emissions and can also impact water quality. The digestate produced by the proposed development provides a sustainable alternative.

By returning nutrients to the soil in a more stable form, digestate can reduce the need for synthetic fertilisers and improve nutrient efficiency. This contributes to both environmental protection and agricultural sustainability.

2.3.5 Bioeconomy and Circular Economy

The project is consistent with the principles of the circular economy. It converts agricultural residues into valuable products, including renewable energy and fertiliser.

This approach maximises the value of existing resources and reduces waste. It also supports the development of a bioeconomy, where biological materials are used in a sustainable and efficient manner.

2.3.6 Renewable Heat and Energy Policy

Future policy measures, such as the Renewable Heat Obligation, will require increased use of renewable energy in heating. Biomethane will play an important role in meeting these requirements.

The proposed development will contribute to this transition by providing a reliable supply of renewable gas that can be used across multiple sectors.

2.4 **Summary**

This chapter demonstrates that the proposed development is strongly supported by policy at all levels, from international agreements to local planning frameworks. These policies consistently emphasise the need to reduce greenhouse gas emissions, increase renewable energy production and support sustainable agriculture.

Ireland faces legally binding targets to reduce emissions and transition to a low-carbon economy. Current projections indicate that meeting these targets will be challenging without significant additional action.



The proposed development will make a meaningful contribution to addressing these challenges. It will produce renewable biomethane, reduce emissions from agriculture, and support the transition to a more sustainable and circular economy.

In conclusion, Powerstown Bioenergy represents a necessary and policy-aligned development that will contribute positively to climate action, energy security and rural development in Ireland.



3. CHAPTER 3: EXISTING AND PROPOSED DEVELOPMENT DESCRIPTION

3.1 Introduction and Purpose

This document describes the existing site for the proposed development in Powerstown, County Carlow, and explains how it will be changed to create a new bioenergy facility. It outlines:

- the current condition and use of the site
- the details of the new development
- how the facility will operate
- how it will be built
- the main features and infrastructure involved

The aim is to clearly explain what exists today and what is being proposed for the future.

3.2 The Existing Site

3.2.1 Location and Surroundings

The site is a sand and gravel quarry known as Mary Kelly's Pit. It is 9 ha and is located in a rural area with a mix of nearby features, including:

- A closed landfill and an operational recycling centre beside the site
- other quarries nearby
- a motorway, a railway line, and local roads
- the River Barrow which is part of a protected natural area close to the site, the River Barrow SAC

The site is enclosed by fencing, hedge lines and adjacent site fencing and has two access points from the local road L3045. The existing site is shown in Figure 3. 1 and Figure 3. 2. The site is just south of Junction 9 on the M9 motorway Dublin to Waterford, visible in the figures. Regional road R448 connects the M9 junction to the local road L3045.

3.2.2 Current Condition

The quarry has been partly filled in (restored) after years of operation. Some parts are still being worked, while others have been backfilled with soil and stone. The ground is uneven, with slopes and low-lying areas typical of a former quarry. There is very little infrastructure on site. It includes:

- a small disused electricity sub-station building
- a few monitoring wells
- a group of buildings near one entrance (not included in the proposed development)



3.2.2.1 Current Use

The site is still used at a low level as a quarry. It supplies sand and gravel and accepts small amounts of soil for restoration. Activity levels are low, with around 1,000 tonnes of soil brought in each year. It is operated under its planning consent (planning reference PL13/187) and a waste facility permit, both from Carlow County Council which permits the export of 80,000 tonnes of sand and gravel and import of 5,000 tonnes per annum of soil and stone over the lifetime of the permission.



Figure 3-1: View from south shows ongoing restoration of former quarry



Figure 3-2: View from southwest (restored area in fore and mid ground)

3.3 Existing Agricultural Materials (Feedstocks)

The proposed facility will use agricultural residues, i.e. animal manures. In the EIAR, these are referred to as feedstocks. These are widely available in the surrounding area, with large volumes produced by farms within 35 kilometres of the site.



3.3.1 Types of Feedstocks

The main types include:

- liquid manures (such as cattle and pig slurry)
- solid manures (such as farmyard and poultry manure)
- horse manure and straw-based materials

3.3.2 Current Management of Manures and Slurries

At present, farmers:

- store these materials during certain times of the year
- spread them on land as fertiliser when conditions allow

This is regulated by the Nitrates Regulations to protect water quality and ensure proper use.

3.4 The Proposed Development

3.4.1 Overview

The proposed development is a large bioenergy facility. This facility will process agricultural residues in an anaerobic digester to produce:

- renewable gas (used in the national gas network as a replacement for natural gas)
- liquid carbon dioxide (captured and reused)
- digestate (a fertiliser returned to farms)

The plant is designed to process about 663,000 tonnes of manures and slurries per year and will generate 250 GWh of renewable energy per year. This is equivalent to the amount of natural gas currently used for home heating and cooking in County Carlow. As outlined in Section 2 of this report, it is government policy to generate 7.5 TWh of biogas energy by 2030.

The plant will borrow manures and slurries from farmers, extract the methane and carbon dioxide which are greenhouse gases that drive climate change and return the manures to farmers as digestate. The methane produced is a renewable indigenous fuel replacing fossil fuel derived natural gas and imported gas. Over 70% of Ireland's natural gas is imported.

Gas Networks Ireland (GNI) will be responsible for building a new gas pipeline to connect the facility to the national gas grid in Clogrennan, Co. Carlow.



3.5 Main Structures and Layout

The proposed development will include a wide range of buildings and equipment. These are grouped into key areas:

3.5.1 Site Access and Traffic

There will be:

- a main entrance for large trucks at western end of site (at existing access)
- a separate access for cars and smaller vehicles at eastern end of site (at existing access)
- a weighbridge to check vehicle loads at main entrance

Greengate Biogas 001 Ltd. will control a fleet of 12 tankers and covered haulage vehicles to collect slurries and manures and deliver digestate. The tankers are similar to milk tankers. Only these vehicles and vehicles with a contract to supply feedstock or collect digestate will be allowed into the facility. Farmers will not be allowed to deliver or collect. This system allows the operator to manage traffic and time deliveries.

3.5.2 Material Handling Areas

All material handling will take place indoors in:

- buildings for receiving solid materials
- buildings for receiving liquid materials

The solids building is for handling of solid manures, covered haulage trucks will reverse into the building, doors close and the truck tips the manure into a lower area called a bunker. From there the manure is moved by overhead crane. The truck is reloaded with solid digestate before exiting the building. The liquids building is a drive through, tankers pull into a bay, the doors close, the driver connects the tanker and the tanker pumps liquid manure to the feedstock pipe. Once empty, the drive connects the tanker to the digestate pipe and sucks digestate into the tanker, ready to return to farm.

The buildings contain equipment for handling and preparing materials and an odour control system. This operates like a vacuum pulling air out of the buildings all of the time. The doors to the buildings open and close quickly to maintain the vacuum in the buildings. The air sucked out of the buildings is cleaned before being emitted via a chimney stack. There is also:

- an administration building with offices and canteen
- a heating centre containing boilers to generate heat for the process
- a weighbridge building
- a tank farm building

There will be solar panels on the roofs of the buildings to generate energy for use at the plant.



3.5.3 Processing Area

As previously this is an anaerobic digestion plant, meaning the organic manures and slurries are broken down in the absence of oxygen and generating biogas (methane and carbon dioxide). This process occurs in large tanks. Pipework moves materials between the tanks and pipework collects gas from the tanks. The tanks have equipment to stir and heat the material. There is also an odour control system.

3.5.4 Storage and Treatment

The anaerobic digestion process takes place in a series of tanks. The tanks are all located within a bund which is a structure required by the operational licence and is designed to contain spills from tanks or connecting pipework. The manures and slurries are digested which generated biogas which is a mixture of mainly methane and carbon dioxide and some trace gases which make up less than 1% of the biogas. The process runs continuously and is carefully controlled.

3.5.5 Energy and Gas Systems

The plant will have equipment and process to clean the raw biogas and to separate it into methane and carbon dioxide and to remove any impurities. This includes:

- a desulphurisation plant
- a gas upgrade plant
- a carbon dioxide liquefaction plant and
- a facility to connect to the gas network

The methane is the renewable gas, which is sent into the national gas network. Carbon dioxide is liquefied, collected and transported off site for reuse.

3.5.6 Production of Fertiliser

After processing, a material called digestate remains. This is separated into:

- a liquid form
- a solid form

Both are used as fertiliser and returned to farms.

3.5.7 Working Hours and Staffing

The plant operates all the time (day and night). Deliveries and collections are during daytime hours. Staff will manage operations, monitoring, and maintenance. There will be 40 staff, 14 administrative staff, 12 divers and 14 operational staff working in two shifts.



3.5.8 Environmental Protection Measures

3.5.8.1 *Odour Control*

All handling of materials takes place inside buildings. Air from these buildings is treated before being released to prevent smells. The discharge of exhaust air will be in compliance with an EPA Industrial Emissions licence. Post grant of planning, the Applicant will apply to the EPA for this licence.

3.5.8.2 *Water Management*

Different types of water are kept separate and managed safely:

- rainwater falling on roof area, paved areas, unpaved areas and in the tank farm bund
- process water used in the plant
- wastewater from staff facilities

Rain water is collected for reuse in the process, and stored safely. Wastewater is collected in tanks and transported off site to a private wastewater treatment plant.

A large sealed and covered stormwater lagoon stores rainwater. There are systems to control water flow and prevent pollution.

Emergency arrangements are in place for unusual events.

3.5.8.3 *Fire Safety*

Water storage is provided for firefighting. Systems are designed to capture water used during emergencies and prevent it from causing pollution.

3.6 **Gas Pipeline Connection**

The project includes a connection to the national gas network.

- A pipeline approximately 9.6 km long will connect the facility to an existing gas installation.
- The pipeline will mainly follow existing roads.
- It will be developed separately by Gas Networks Ireland (GNI).

3.7 **Construction of the Development**

3.7.1 Construction Activities

The development will be built in stages, including:

- building the stormwater lagoon
- preparing the ground, i.e. moving soil to create the required profile
- building structures and tanks
- installing equipment



3.7.2 Duration

Construction will follow a planned programme and will take place over 24 months.

3.7.3 Environmental Controls During Construction

Measures will be used to manage:

- Dust
- Noise
- Traffic
- Stormwater runoff

A construction management plan will guide how work is carried out.

3.7.4 Materials and Waste

3.7.4.1 *Materials Used*

Construction will require materials such as:

- Concrete
- Steel
- Aggregates

During operation, the facility will also use:

- Fuel
- Biomass (wood materials for heat)
- Water

3.7.4.2 *Waste Generation*

Small amounts of waste will be produced, including:

- ash from heating systems
- used filter materials
- general waste from staff areas

All wastes will be managed and removed by authorised contractors.



3.7.5 Safety and Monitoring

The facility will include systems to ensure safe operation:

- continuous monitoring of processes and emissions
- alarm systems for faults or emergencies
- automated controls for key systems

Security measures include fencing, lighting, and surveillance.

3.8 Decommissioning

When the facility reaches the end of its life (around 30 years), it will be carefully closed down:

- materials will be removed
- equipment will be dismantled or reused
- the site will be cleaned and restored
- final checks will be carried out to ensure it is safe

3.9 Overall Summary

The proposed development will transform a former quarry into a modern facility that produces renewable energy and fertiliser products from agricultural materials.

The project makes use of materials that are already widely available and currently spread on land. Instead, it will process them in a controlled way to capture methane and carbon dioxide.

The development includes strong environmental safeguards, careful planning for construction and operation, and clear arrangements for eventual closure.



4. CHAPTER 4: ALTERNATIVES CONSIDERED

4.1 Introduction

This chapter outlines the reasonable alternatives considered during the design and planning of the proposed development at Powerstown, County Carlow. The purpose is to explain how environmental considerations influenced the selection of the preferred option.

European legislation requires developers to examine reasonable alternatives relating to location, design, scale, and technology and to explain the reasons for selecting the preferred option, including environmental considerations.

4.2 Assessment Methodology

A comparative assessment approach was used to evaluate alternatives. Site-specific assessments were supported by desk studies and site visits, allowing consistent comparison across all options. A structured and proportionate approach was used to assess alternatives. This involved:

- Identifying feasible options at an early stage
- Assessing each option using environmental, technical and economic criteria
- Applying a weighted scoring system to compare site options
- Using both desk-based studies and site visits to inform the evaluation

4.3 Baseline Environment

The baseline conditions for the assessment reflect the current use of the proposed site and its surroundings. The Powerstown site is an existing quarry that has been partially restored and continues to operate under planning permissions for extraction and infilling activities. The surrounding area is predominantly rural in character, with agricultural land uses and a relatively dispersed population. The site benefits from existing transport infrastructure and is located close to regional road networks.

4.4 Do Nothing Impacts

The 'Do Nothing' scenario assumes that the proposed development does not proceed and the site continues as a quarry.

4.5 Alternative Locations

Three sites were assessed. These were Powerstown (Co. Carlow), Clonmelsh (Co. Carlow), and Jamestown (Co. Tipperary), presented in Figure 4-1 to Figure 4-3.

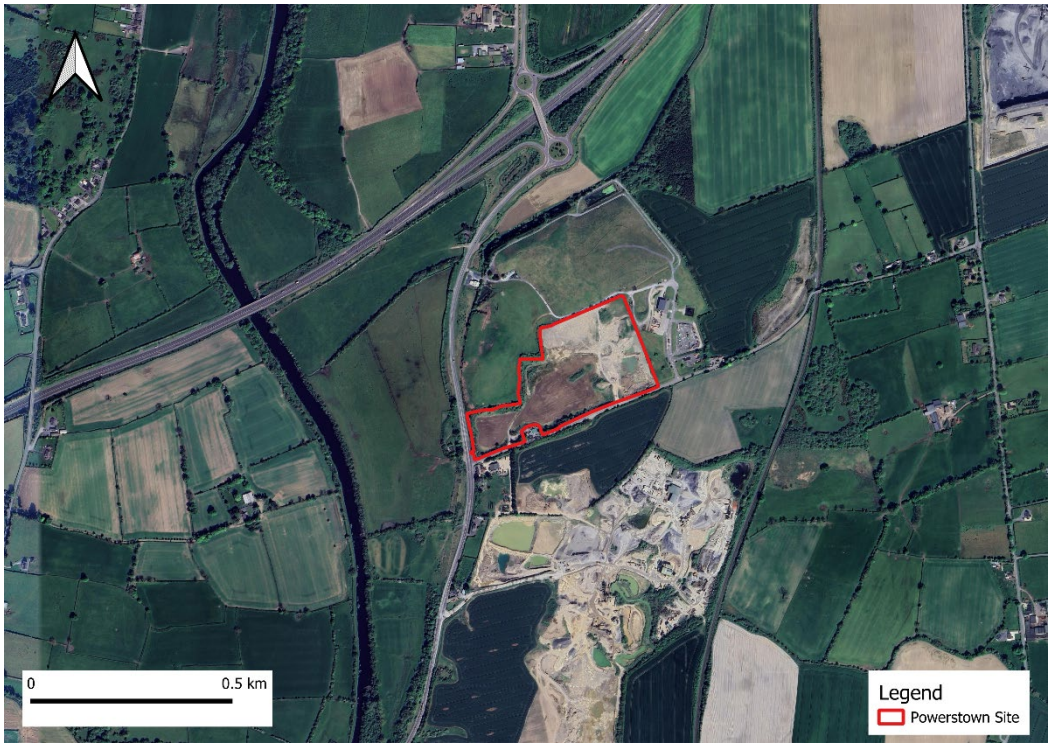


Figure 4-1: Powerstown Site

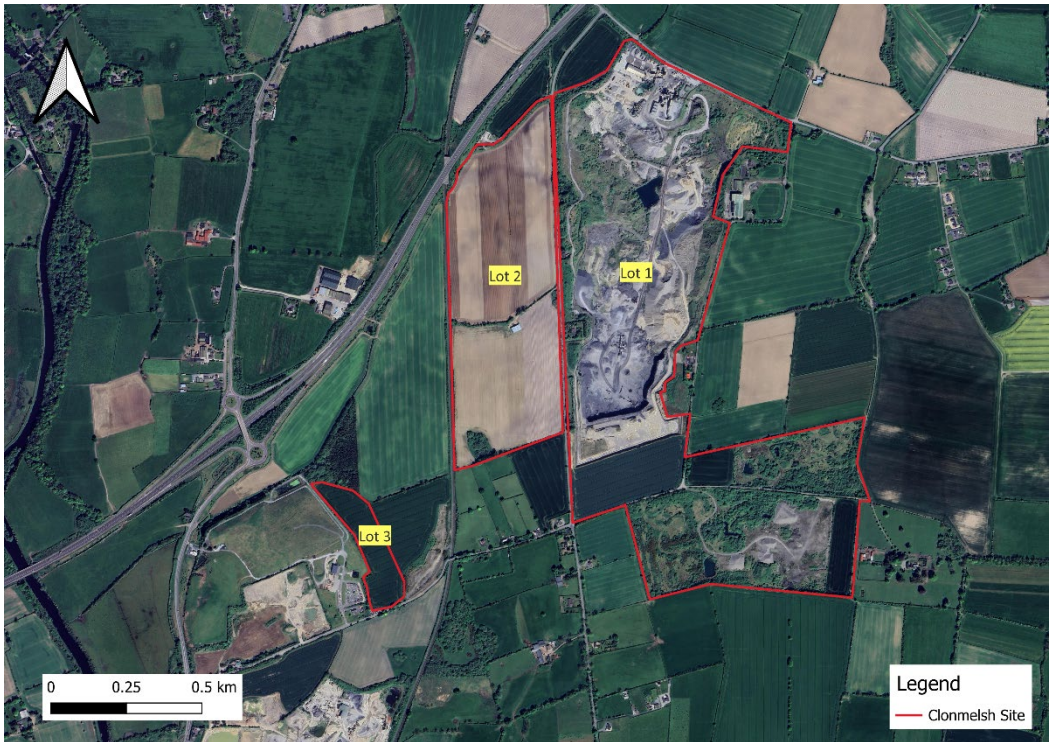


Figure 4-2: Clonmelsh Site



Figure 4-3: Jamestown Site

Sites were evaluated based on a scoring system using the following criteria:

- Existing land use (brownfield vs greenfield)
- Landscape and visual impact
- Proximity to gas and electricity networks
- Access to road infrastructure
- Availability of feedstock
- Population and human health considerations
- Environmental constraints (air, biodiversity, water, noise)
- Site acquisition feasibility

Powerstown achieved the highest overall score (106) compared with Clonmelsh and Jamestown. A key factor in this outcome was that Powerstown is a brownfield site, having previously been used as a quarry. The reuse of previously developed land is generally preferable from an environmental perspective, as it avoids the need to develop greenfield agricultural land and reduces the extent of land disturbance. The existing excavation at the quarry also provides natural screening, reducing visual impacts and limiting the need for extensive earthworks.

In addition, the site benefits from good access to high-quality road infrastructure, including proximity to the R448 and the M9 motorway. This facilitates the efficient movement of materials and reduces potential impacts on local roads and communities. The site is also located close to feedstock sources, which reduces transport distances and associated emissions.



While the alternative sites at Clonmelsh and Jamestown offer certain advantages, such as proximity to infrastructure or greater separation from ecological receptors, they are less favourable overall due to factors including their greenfield status, increased construction requirements and less favourable transport connections.

4.6 Alternative Site Layouts and Design

The site layout evolved through an iterative design process, with several configurations tested to identify the most efficient and practical arrangement for the available footprint. Due to the size and shape of the Powerstown site, there was limited flexibility in layout, so alternatives mainly focused on optimising how infrastructure was arranged within the site.

Three design options were considered, all broadly similar but progressively refined to improve constructability, operational efficiency and overall site functionality.

The key difference between the options relates to how efficiently the site uses space and supports operations. The earlier layouts (Options 1 and 2) had a more spread-out arrangement of tanks and buildings, which increased earthworks, infrastructure requirements, and operational complexity. The final layout (Option 3) adopts a more compact configuration that makes better use of the existing quarry topography and reduces unnecessary ground disturbance.

Key improvements in the preferred layout include:

- More efficient use of space, reducing land take and earthworks
- Fewer storage tanks, achieved by increasing tank heights and optimising capacity
- Improved internal access, enabling safer and more efficient vehicle movement
- Centralised control and processing areas, reducing pipework, cabling and operational complexity

This evolution results in a layout that is easier to construct, more efficient to operate, and better suited to the site constraints, while also reducing environmental disturbance.

Environmental considerations were integrated throughout the design process. For example, building placement and orientation were selected to minimise noise, visual impact, and potential effects on nearby receptors, while drainage and containment systems were incorporated to protect soil and water resources.

Overall, the preferred layout represents the best balance between technical performance, environmental protection, and long-term operation.

4.7 Alternative Technologies

A range of technologies was considered for key elements of the proposed development. The selected technologies reflect Best Available Techniques (BAT) and were chosen based on efficiency, environmental performance, operational reliability, and suitability for Irish conditions.

4.7.1 Odour Control

Two main approaches were considered: traditional biofilters and modern photo-oxidation systems.



Biofilters are simple and widely used but require large land areas and can be affected by weather and operating conditions. In contrast, photo-oxidation systems use UV light and controlled oxidation to break down odorous compounds more efficiently.

The preferred solution is a compact, combined odour control system based on photo-oxidation because it:

- Requires less space
- Maintains consistent performance under varying conditions
- Responds quickly to changes in odour levels
- Requires less maintenance

This makes it more suitable for the site, particularly given its need for flexibility and reliability.

4.7.2 Gas Upgrading Technology

Two technologies were assessed to upgrade biogas to biomethane:

- membrane separation
- amine-based separation

Membrane systems are effective but require high electricity use. Amine systems, by contrast, use a chemical absorption process and are more energy efficient.

The amine system was selected because it:

- Achieves higher methane recovery (over 99%)
- Uses less electricity, which is important given grid constraints
- Has lower overall energy costs
- Provides more stable and reliable operation

This makes it more suitable for the proposed development from both an economic and environmental perspective.

4.7.3 Heat Source for Processing

Several energy sources were considered for generating process heat, including electricity, gas, diesel and biomass.

Biomass was selected as the preferred option because it is a renewable and low-carbon fuel. It also avoids using biogas that could otherwise be exported and is more efficient than electricity or fossil fuels for this purpose.



4.7.4 Pretreatment Technology

Two options were considered for processing solid feedstock:

- hammermill systems
- shredders

Hammermills are widely used but are more suited to pre-processed materials. Irish agricultural feedstocks tend to be coarser and less processed, requiring more robust handling.

The shredder was selected because it:

- Better handles coarse materials such as straw and manure
- Improves digestion performance
- Removes contaminants that could damage equipment

4.7.5 Water Supply

Two water supply options were assessed:

- mains water
- on-site groundwater

The preferred option is on-site groundwater abstraction, which avoids the energy and environmental impacts associated with treating and transporting mains water. This is considered a more sustainable and lower-impact solution.

4.7.6 On-Site Power Generation

The option of installing solar panels was considered alongside reliance on grid electricity. The inclusion of solar photovoltaic panels was selected as it:

- Reduces reliance on grid electricity
- Lowers operational emissions
- Improves overall energy efficiency

4.7.7 Carbon Dioxide Capture

An important design decision was to capture and liquefy CO₂ produced during the process, rather than releasing it. This approach:

- Reduces greenhouse gas emissions
- Creates a usable product
- Contributes to a circular economy

The scale of capture could also support wider industrial uses and improve national supply of biogenic CO₂.



4.8 Conclusion

The alternatives assessment demonstrates that the chosen site, layout and technologies represent the most appropriate solution for the proposed development. The Powerstown site offers clear advantages as a brownfield location with good infrastructure access and reduced environmental constraints.

The iterative design process has resulted in a layout that minimises impacts and supports efficient operation, while the selected technologies ensure high environmental performance.

The final layout minimises land take, improves efficiency, and reduces environmental disturbance. The selected technologies prioritise energy efficiency, reliability, and reduced emissions. Environmental considerations were embedded throughout, ensuring impacts are avoided or minimised.

Overall, the preferred option provides a balanced and sustainable solution that contributes to national energy and climate objectives while protecting the local environment.



5. CHAPTER 5: SCOPING AND CONSULTATION

5.1 Introduction

This chapter describes the consultation and scoping process undertaken for the proposed development. Scoping is an important step in the Environmental Impact Assessment (EIA) process, as it identifies the key environmental issues that need to be assessed in the Environmental Impact Assessment Report (EIAR).

The chapter explains how consultation was carried out with statutory bodies, stakeholders and the public, and summarises the main issues raised. It also outlines how these issues were considered and addressed in the design of the project and in the EIAR.

Overall, the consultation process ensured that the assessment focuses on the most relevant environmental topics and reflects the concerns of regulators and the local community.

5.2 Scoping and Consultation Purpose

The purpose of scoping is to identify the potential environmental effects of the proposed development and to determine the level of detail required in the assessment. It considers:

- The likely sources of environmental effects
- The pathways through which impacts may occur
- The sensitive receptors that could be affected

Scoping also helps to ensure that unnecessary detail is avoided and that the EIAR focuses on the most significant issues.

5.3 Methodology

An informal, voluntary scoping exercise was carried out which established the terms of reference for the EIAR and identified the concerns and issues that warranted attention during the assessment phases. This followed recognised European guidance and included a structured four-step process:

1. Initiation of the assessment
2. Identification of information required
3. Consultation with relevant bodies
4. Preparation of scoping outputs

The following tasks were undertaken during the scoping exercise:

- Review of planning and environmental considerations relevant to the proposed development, including:
 - a review of relevant EIARs
 - walkover surveys
 - evaluation of reasonable alternatives



- examination of historic planning application
- review of historic environmental monitoring data
- Issue of stakeholder consultation documents to relevant consultees
- Public consultation
- Issue of revised stakeholder consultation document
- Pre-application consultation meetings with Carlow County Council, NPWS and An Coimisiún Pleanála (ACP).

Feedback received was used to inform both the design of the project and the scope of the EIAR.

Scoping was treated as an ongoing and flexible process, allowing new information and feedback to be incorporated as the project developed.

5.4 Consultation Process

5.4.1 Consultation with An Coimisiún Pleanála

Two pre-application consultations were carried out with ACP to establish the planning approach for the project. These meetings were held in October 2025 and February 2026.

ACP confirmed that the proposed development constitutes Strategic Infrastructure Development (SID) and that the application should be made directly to the Board.

During this process, several key issues were identified, including, amongst others, the following:

- The need to clearly justify the scale and location of the proposed development.
- Consideration of cumulative environmental effects.
- Assessment of potential impacts on water quality, particularly the River Barrow which is a Special Area of Conservation (SAC).
- Consideration of residential amenity and landscape impacts.
- The need to consult with relevant stakeholders.

These matters were incorporated into the EIAR and informed the scope of the environmental assessments.

5.4.2 Consultation with SEAI

Consultation was also undertaken with the Sustainable Energy Authority of Ireland (SEAI) to confirm the status of the proposed development as a renewable energy project.

The outcome of this consultation supported the classification of the project as a renewable energy development, which is reflected in the EIAR.



5.4.3 Stakeholder Consultation

A scoping consultation letter was sent out to stakeholders on 02 April 2025. A wide range of stakeholders were consulted as part of the scoping process. These included:

- Government departments
- Local authorities and regional bodies
- Environmental organisations
- Infrastructure providers
- Industry groups

A second, updated scoping consultation letter was sent to original list of stakeholders, as well as additional consultees on 18 November 2025.

Overall, 10 consultation responses were received, identifying issues that required assessment in the EIAR.

Key themes raised by stakeholders included:

- Environmental protection, including air, water and biodiversity
- Traffic and transport impacts
- Safety considerations, including fire safety and major accident risk
- Infrastructure interactions, such as roads and utilities

Each of these topics has been addressed in the relevant chapters of the EIAR.

5.4.4 Stakeholder Consultation Meetings

Direct engagement was undertaken with key stakeholders, including Carlow County Council and the National Parks and Wildlife Service (NPWS).

Meetings with Carlow County Council focused on local environmental and infrastructure issues, including:

- Protection of the River Barrow
- Traffic management
- Impact on nearby residential areas

Meetings with NPWS focused on ecological matters. These included:

- Survey requirements for habitats and species
- Potential impacts on designated sites
- Opportunities for biodiversity protection and enhancement

These discussions helped to refine the design of the project and ensure that appropriate mitigation measures were included in the EIAR.



5.4.5 Public Consultation

A public consultation event was held in April 2025. The purpose of this event was to inform the local community about the proposed development and to gather feedback.

A total of 74 people attended the event. Attendees were provided with information about the project and were given the opportunity to raise concerns and ask questions.

The main issues raised by members of the public included:

- Concerns about odour, noise and air quality
- Traffic impacts and road safety
- Potential effects on property values
- Risks associated with fire or explosion
- Impacts on biodiversity and human health

These concerns were carefully considered and have been addressed in the relevant technical chapters of the EIAR. In general, the assessments concluded that, with appropriate mitigation measures in place, no significant adverse effects are expected.

The consultation process also identified interest in local economic benefits, including employment opportunities and potential collaboration with local businesses.

5.5 Conclusion

The observations and issues raised during the scoping and consultation process have directly informed the final project design, environmental assessments, and proposed mitigation measures.

Engagement with An Coimisiún Pleanála clarified the planning approach and confirmed the strategic nature of the project. Consultation with Carlow County Council ensured that local issues, such as traffic, water protection and residential amenity, were fully considered. Engagement with NPWS ensured that ecological impacts were properly assessed.

Stakeholder and public consultation provided valuable feedback on potential environmental and community concerns. These inputs informed the preparation of the EIAR and ensured that the assessment addresses all relevant issues.

The process also led to specific design and assessment measures. For example, construction methods such as horizontal directional drilling were considered to reduce impacts on sensitive features such as watercourses and infrastructure.

Overall, the consultation process ensured that the proposed development has been designed and assessed in accordance with best practice, with full consideration of environmental, regulatory and community concerns.



6. CHAPTER 6: TRAFFIC AND TRANSPORTATION

6.1 Introduction

This chapter assesses how the proposed development will affect traffic and transport in the surrounding area. It considers the existing road network and traffic conditions, the additional traffic that will be generated, and whether this could lead to congestion, safety issues, or other impacts.

The assessment covers both the construction and operational phases of the proposed development. Measures to minimise any impacts are also outlined where required.

6.2 Assessment Methodology

The assessment was carried out using a combination of field surveys, traffic data collection, and modelling. Existing traffic conditions were analysed, and future traffic levels were predicted based on the expected number of vehicle movements associated with the proposed development.

The approach involved:

- Establishing baseline traffic conditions
- Estimating construction and operational traffic
- Assessing impacts on road capacity and safety
- Identifying mitigation measures where necessary

The significance of impacts was determined by considering changes in traffic volumes, road conditions, and the sensitivity of the receiving environment.

6.3 Baseline Environment

The site is accessed via local roads connecting to the R448, which is a regional route linking to the M9 motorway. This provides good connectivity to the wider road network.

The surrounding road network includes:

- Local rural roads with relatively low traffic volumes
- The R448, which carries higher traffic volumes and provides access to strategic routes
- The M9 motorway, which accommodates regional and national traffic

Traffic surveys show that existing roads operate efficiently, with no significant congestion or capacity issues at key junctions. Road safety performance is generally good, with no evidence of unusual accident patterns.



6.4 Assessment of Likely Significant Effects

6.4.1 'Do Nothing' Scenario

If the proposed development does not proceed, traffic levels in the area are expected to increase gradually over time in line with normal background growth. However, no step change in traffic or significant impacts would occur.

6.4.2 Construction Phase

During construction, there will be an increase in traffic associated with the delivery of materials, removal of excavated material, and the movement of workers and equipment.

This will result in:

- Temporary increases in heavy goods vehicle (HGV) traffic
- Increased traffic on local roads leading to the site
- Short-term impacts at site access points

Although noticeable locally, these effects are temporary and will vary throughout the construction period rather than occurring continuously.

Potential impacts include:

- Minor delays on local roads
- Increased wear on road surfaces
- Short-term disruption during peak construction periods

Overall, construction impacts are assessed as short-term and not significant, particularly given the capacity of the surrounding road network.

6.4.3 Operational Phase

Once operational, the proposed development will generate regular traffic associated with staff, deliveries, and transport of materials.

Although this represents a permanent increase in traffic, the number of vehicle movements is relatively low compared to the overall capacity of the surrounding road network.

The assessment shows that:

- The R448 and nearby junctions can accommodate additional traffic
- There will be no significant change in travel times or delays
- The overall level of service on the road network will remain acceptable

Traffic associated with the proposed development is spread throughout the day, which reduces the risk of peak-time congestion.



As a result, operational impacts are considered minor and not significant.

6.4.4 Road Safety

The assessment considered whether additional traffic could increase the risk of accidents. Based on the nature of the road network and existing safety record, no significant increase in collision risk is expected.

The site access will be designed to meet current standards, ensuring safe entry and exit for vehicles.

6.4.5 Cumulative Impacts

Other developments in the area were considered as part of the assessment. When combined with background traffic growth and other projects, the overall increase in traffic remains within the capacity of the road network.

Therefore, cumulative impacts are not significant.

6.5 Mitigation Measures

While impacts are generally low, a number of measures will be implemented to ensure that traffic effects are minimised.

During construction:

- Traffic will be managed to avoid peak periods where possible
- Designated routes will be used for construction vehicles
- Deliveries will be scheduled and coordinated
- Road safety signage and traffic management measures will be put in place

During operation:

- Site access will be designed for safe vehicle movements
- Traffic will be managed to ensure efficient flow
- Staff travel arrangements may be organised to reduce vehicle numbers

These measures ensure that the proposed development integrates safely with the existing road network.

6.6 Residual Impacts

After mitigation measures are applied, the remaining impacts are expected to be negligible to minor.

- Construction-related effects remain temporary and controlled
- Operational traffic is well within the capacity of the road network
- No significant impacts on road safety or congestion are expected



6.7 Overall Conclusion

The assessment concludes that the proposed development will not result in significant impacts on traffic or transport.

While there will be temporary increases in traffic during construction and modest increases during operation, the surrounding road network has sufficient capacity to accommodate these changes.

With appropriate design and traffic management measures in place, the proposed development is considered acceptable from a traffic and transport perspective.



7. CHAPTER 7: POPULATION AND HUMAN HEALTH

7.1 Introduction

This chapter assesses the potential effects of the proposed development on population and human health. It considers how people living and working in the surrounding area may be affected during the construction, operation and decommissioning of the proposed development.

The assessment also considers related factors such as employment, land use, amenity, tourism, and overall wellbeing. The aim is to ensure that the proposed development does not reduce quality of life and, where possible, provides positive benefits.

7.2 Methodology

The study area focuses on the local community surrounding the site at Powerstown, including the Electoral Division (ED) of Nurney and wider County Carlow.

The assessment is based on established guidance and uses available data from sources such as the Central Statistics Office, Pobal and Fáilte Ireland. It also draws on findings from other environmental topics assessed in the EIAR, including air quality, noise, traffic and water.

Human health is considered in a broad sense. This includes both direct effects, such as exposure to noise or air emissions, and indirect effects, such as changes to employment or local amenities.

7.3 Existing Environment

7.3.1 Population

The proposed development is located in the rural area of Powerstown, County Carlow. It is in the ED of Nurney, County Carlow. Approximately 193 residential and commercial properties are located within 2 km of the site.

Population growth in the area has been modest, with local growth below the national and county averages. The area has a relatively low population density and a slightly older age profile compared to national trends.

Overall, the population is considered relatively resilient, with a higher proportion of working-age residents and a lower dependency rate than the national average.

7.3.2 Employment and Economy

Employment levels in County Carlow are broadly in line with national trends. Most people are in employment, and unemployment levels have stabilised in recent years following fluctuations.

7.3.3 Land Use and Amenity

The site itself is an existing quarry, with surrounding land mainly used for agriculture. The wider area includes agriculture, rural housing and small settlements.



The gas pipeline is proposed to be installed within the verge of the public road. The local road network includes typical linear infrastructure within roadside verges, such as underground utilities.

There are a range of recreational and tourism amenities within 15 km of the proposed development, including the River Barrow, walking routes, heritage sites and local attractions. These contribute to the quality of life in the area.

7.3.4 Human Health

Available data indicates that the general health of the local population is good and higher than the state and county average. The majority of people self-report their health as “good” or “very good,” with lower levels of reported poor health than national averages.

Taking all factors into account, the local population is considered to have a low sensitivity to change in terms of health impacts in the context of the proposed development.

7.4 **Assessment of Likely Significant Effects**

7.4.1 ‘Do Nothing’ Scenario

Under the ‘Do Nothing’ scenario, no commercial-scale anaerobic digestion (AD) facility is developed. The existing use of land as a quarry and the surrounding lands for agriculture will remain unchanged. It is likely that the landowner would commence the latest planning consent for the existing site.

Factors considered within this EIAR of relevance to this chapter include air quality, climate, noise and vibration, surface water and hydrology, archaeology, and landscape and visual impact. In summary, these chapters state that under the ‘Do Nothing’ scenario, the site would continue as a quarry and surrounding land uses would remain unchanged, meaning no additional traffic, emissions, noise, or environmental effects from the proposed development would occur, and all environmental conditions would remain broadly consistent with the current baseline. However, this also means that the potential positive benefits of the proposed development (such as renewable energy generation and related environmental improvements) would not be realised, and the site would instead be restored to agricultural use over time.

7.4.2 Construction Phase Effects

During construction of the proposed development and proposed gas pipeline, there will be a temporary increase in activity, including construction traffic, noise and dust. These may cause short-term disturbance to nearby residents.

However, these effects are expected to be localised and temporary. The construction phase will also provide positive economic benefits, including employment for up to approximately 500 workers and increased demand for local services.

Overall, in the absence of mitigation, the construction phase is expected to have slight, temporary negative effects on amenity and human health, moderate temporary positive effects on employment, and slight, positive, short-term effects on population.

7.4.3 Operational Phase Effects

During operation, the proposed development will function as an AD facility and associated gas pipeline.



There will be ongoing employment opportunities and indirect economic benefits, including support for the agricultural sector through feedstock supply and the use of digestate as fertiliser.

Air quality and noise impacts are expected to be low and not significant. Some minor increases in noise and traffic may occur, but these are generally limited and controlled.

Overall, in the absence of mitigation, the operational phase is expected to have slight, long-term positive effects on employment and slight, non-significant negative effects on human health.

No effects on population, amenity, or land-use are anticipated from the operation of the proposed development and proposed gas pipeline.

Importantly, the proposed development will also contribute positively to climate action by replacing fossil fuels with renewable biomethane.

7.4.4 Decommissioning Phase Effects

At the end of the project's lifespan, the proposed development will be decommissioned and the proposed gas pipeline will remain in-situ.

This phase may result in short-term, localised disturbance similar to construction, including noise and dust. It may also lead to the loss of operational employment.

However, these effects will be temporary or limited in scale. Overall, no significant impacts on population or human health are expected.

7.5 Mitigation

A range of standard mitigation measures will be implemented to minimise potential effects.

7.5.1 Construction Phase

During construction, mitigation measures focus on good practice construction management and environmental controls to minimise short-term disturbance.

For most topics (population, employment and land use), no specific mitigation is required as impacts are either positive or negligible. The key controls relate to managing temporary effects on local amenities and human health.

These include:

- Traffic management planning, including designated haul routes and coordination of deliveries
- Control of noise, dust and vibration, through working hours restrictions, plant management and dust suppression measures
- Community communication, including use of a Community Liaison Officer
- Implementation of the Construction Environmental Management Plan (CEMP)



Human health is protected through compliance with best practice standards and EU limits, with measures focusing on:

- reducing emissions at source
- controlling noise and dust
- ensuring safe working practices and site management

Overall, these measures ensure that construction impacts are short-term, controlled and not significant.

7.5.2 Operational Phase

During operation, mitigation is largely embedded within the design and management of the proposed development, meaning additional measures are limited.

For population, employment and land use, no mitigation is required as effects are neutral or positive.

Mitigation for environmental and human health protection focuses on:

- Built-in design measures, such as enclosed processes, odour control systems, and efficient equipment
- Noise control through site layout and building design, including insulation and screening
- Traffic and operational management, to ensure minimal disturbance
- Ongoing environmental compliance and monitoring

Health and safety measures are a key component, including:

- staff training and safety procedures
- gas detection and confined space controls
- fire prevention and emergency response systems
- compliance with COMAH / Seveso regulations

Air quality and noise impacts are already predicted to be low, and no additional mitigation beyond design measures is required.

Overall, operational impacts are low, well-managed, and not significant, with mitigation largely achieved through design and standard operational controls.

7.5.3 Decommissioning Phase

During decommissioning, mitigation focuses on applying standard best-practice controls to ensure any impacts remain minimal, temporary and well managed.

Overall, no specific or additional mitigation is required for population, land use or employment, as effects are neutral or negligible. The approach relies on good management rather than new measures.



For environmental and community protection, the key measures include:

- Use of best-practice working methods, including controlled working hours, dust suppression and noise management
- Traffic and site management, ensuring access to local services and amenities is maintained
- Implementation of the approved Closure Plan, which ensures all works are carried out safely and in compliance with regulatory requirements
- Application of the same controls used during construction, particularly for dust and air quality

Human health impacts are managed through standard controls (e.g. emissions management, safe work practices and regulatory compliance), ensuring that any effects remain temporary, localised and not significant

The proposed development will also comply with regulations relating to major accident hazards, ensuring that risks to human health are minimised.

7.6 Conclusion

Following the implementation of mitigation measures, the proposed development and proposed gas pipeline is not expected to result in any significant adverse effects on population or human health.

During the construction phase, residual impacts are generally slight and temporary. There will be short-term disturbance from noise, traffic and construction activity, but these effects will be localised and well managed. Positive effects will arise from employment generation and increased economic activity in the area. Overall, residual impacts on human health and amenity are not significant.

During the operational phase, the proposed development will provide ongoing employment and indirect economic benefits, including support for the agricultural sector. Environmental effects such as air emissions and noise will be controlled through design and operational measures. These effects are predicted to be slight and not significant, while wider benefits will arise from renewable energy generation and reduced reliance on fossil fuels.

During the decommissioning phase, residual impacts will again be temporary and comparable to construction. Short-term disturbance from noise, traffic and dust may occur, but these effects will be limited in scale and duration. Loss of operational employment will occur, but overall socio-economic effects are expected to be negligible.

In summary, residual impacts across all phases of the proposed development are generally neutral, slight, or positive. No significant long-term adverse effects on the local population, human health, or amenity are anticipated.

The assessment shows that the proposed development and proposed gas pipeline will not result in significant adverse effects on population or human health.

Temporary disturbances during construction will be limited and well managed. During operation, environmental effects such as noise and air emissions will be controlled and are not expected to be significant.

The proposed development will provide economic benefits through employment and support for agriculture, as well as contributing to renewable energy production and climate action.



Overall, the local population is considered resilient, and the proposed development is compatible with the existing environment and community.



8. CHAPTER 8: AIR QUALITY

8.1 Introduction

This section describes the air quality assessment carried out for the proposed development. It considers how the project may affect air quality during construction, operation and decommissioning, and whether any significant impacts could occur. Where potential impacts are identified, mitigation measures are outlined.

8.2 Relevant Legislation and Guidance

The assessment is based on European and Irish air quality standards, including:

- EU Ambient Air Quality Directive (2024/2881)
- Air Quality Standards Regulations 2022 (S.I. No. 180/2011)
- Guidance from the EPA (IN2, AG4, AG9), Transport Infrastructure Ireland (TII) (PE-ENV-01106) and Institute of Air Quality Management (IAQM)

The key principles of the legislation and guidance are:

- To protect human health by limiting exposure to harmful pollutants
- To protect ecosystems from damage caused by air pollution
- To ensure that developments comply with recognised standards

8.3 Assessment Criteria

8.3.1 Human Health

Impacts on human health are assessed by comparing predicted pollutant concentrations with established air quality standards. These standards define acceptable limits for pollutants based on scientific evidence.

Air quality impacts are assessed by comparing predicted concentrations with established limits for:

- Nitrogen dioxide (NO₂)
- Particulate matter (as PM₁₀ i.e. airborne particles less than 10 micrometers in diameter)
- Particulate matter (as PM_{2.5} i.e. airborne particles less than 2.5 micrometers in diameter)
- Ammonia (NH₃)
- Odour

8.3.2 Ecology

The assessment of ecological impacts focuses on the potential for air pollutants to affect sensitive habitats and species. This is particularly important for European designated sites such as Special Areas of Conservation (SACs) and Special Areas of Protection (SPAs), and nationally designated sites such as Natural Heritage Areas (NHAs).



Assessment considers effects of air pollutants on sensitive habitats.

Key concepts:

- Critical Levels: thresholds above which damage may occur from nitrogen oxides (NO_x) and NH_3
- Critical Loads: atmospheric pollutant (nitrogen) deposition limits for ecosystems

As per EPA IN2 guidance, if emissions are:

- < 1% of the lowest limits critical levels of loads, they are considered not significant
- > 1% of the lowest critical levels of loads, further assessment may be required

8.4 Assessment Methodology

8.4.1 Construction Phase

The construction phase assessment focuses mainly on dust generation and its potential effects on nearby receptors. A recognised methodology (TII and IAQM guidance) is applied to determine the likelihood and significance of dust impacts. This methodology considers both the scale of construction activities and the sensitivity of the surrounding area.

The assessment evaluates:

- The type and extent of construction activities, including earthworks and vehicle movements
- The distance to nearby residential properties and ecological receptors
- The local baseline air quality conditions
- The potential for dust to be generated and transported

Dust impacts are assessed by categorising:

- The magnitude of dust emissions (small, medium or large)
- The sensitivity of receptors (low, medium or high)

These factors are then combined to determine the overall level of risk, which is then used to identify appropriate dust mitigation measures. This structured approach ensures that potential impacts are assessed in a consistent and transparent manner.

8.4.2 Operational Phase

The operational phase assessment uses air dispersion modelling to predict how pollutants released from the proposed development will disperse in the atmosphere. This modelling provides an estimate of pollutant concentrations at locations surrounding the site.



The modelling takes account of:

- Pollutant (NOX, NH3, PM10/PM2.5, odour) emission rates from all sources at the site
- Meteorological data over a five-year period
- Terrain and surrounding landform
- The influence of buildings on airflow (building downwash)

Predicted concentrations are calculated at a network of receptor locations, including:

- Residential properties
- Site boundary locations
- 10 km² receptor grid (to determine plume direction)
- Ecological receptor areas

The results are then compared against:

- Air quality standards for human health
- Critical levels and loads for ecological receptors

8.4.3 Decommissioning Phase

The decommissioning phase is expected to generate impacts that are similar in nature to those during construction, but generally of shorter duration.

Potential impacts include:

- Dust emissions from demolition and site clearance
- Traffic emissions from removal activities

The same assessment approach used for construction phase dust has been applied. Overall, impacts are expected to be temporary, localised and manageable through standard mitigation measures.

8.5 Baseline Environment

The existing air quality in the area is generally good and well within regulatory limits. The site is located in a rural air quality zone, where pollutant levels are typically low. The assessment has used monitoring data from representative locations in the EPA's national air quality monitoring network to establish background concentrations representative of the proposed development's site.



8.6 Sensitivity of the Receiving Environment

8.6.1 Construction Phase

The sensitivity of the surrounding environment has been evaluated based on the presence of nearby receptors. These include residential properties and designated ecological sites.

The area surrounding the site contains:

- Residential properties in close proximity (within 250 m of the boundary)
- Designated ecological sites of high importance (within 50 m of the boundary)

Based on this, the sensitivity is summarised as follows:

- Dust soiling: High sensitivity, due to nearby homes
- Human health: Low sensitivity, given low background PM₁₀ levels
- Ecology: High sensitivity, due to nearby designated sites

8.6.2 Operational Phase

During operation, receptors include both human and ecological receptors. These receptors are used within the modelling assessment to evaluate pollutant exposure.

Human receptors include:

- Residential dwellings
- The study area was reviewed for other sensitive receptors such as schools and hospitals, and none were identified

Ecological receptors include:

- Designated conservation sites (SACs, SPAs, NHAs)
- Sensitive habitats for which the above sites are designated

8.7 Assessment of Likely Significant Effects

8.7.1 Do Nothing Scenario

If the proposed development does not proceed, no additional air emissions will occur. Air quality would remain as it is currently, influenced only by existing activities in the area. Over time, air quality may change due to broader regional trends, but not as a result of the project.



8.7.2 Construction Phase Impacts

The main potential impact during construction is dust generation. This has been assessed using a structured approach that considers both the scale of works and the sensitivity of nearby receptors.

The assessment indicates that:

- The potential for dust generation is moderate in magnitude
- The surrounding area includes sensitive receptors
- Overall risk is at most medium in terms of dust soiling and ecology effects, and low for human health effects

8.7.3 Operational Phases Impacts

Human Health

Air dispersion modelling shows that pollutant concentrations remain within all applicable air quality standards. This means that the proposed development will not result in unacceptable exposure to pollutants.

The predicted impacts are:

- Long-term in duration
- Very small in magnitude
- Within safe limits

Ecology

The ecological assessment shows that emissions will not exceed critical levels or loads for sensitive habitats. Screening thresholds are generally not exceeded, meaning that further detailed assessment is not required in most cases.

Where further assessment was carried out, specifically for the River Barrow and River Nore SAC, results confirm:

- No exceedance of ecological thresholds
- No significant negative effects on sensitive habitats

8.7.4 Decommissioning Phase Impacts

The impacts during decommissioning are similar to those of the construction phase. However, since the activities are shorter in duration, the overall impact is expected to be lower.

Impacts are:

- Temporary
- Localised
- Not significant



8.7.5 Cumulative Impacts

The assessment also considers the combined effects of the proposed development with other nearby emission sources. This ensures that all potential overlapping impacts are addressed.

The results show that:

- Combined emissions remain within limits
- Existing background levels already account for other sources
- There are no significant cumulative impacts

8.8 Mitigation Measures

8.8.1 Construction Phase

A range of standard mitigation measures will be implemented to control dust emissions. These measures are commonly used and proven to be effective.

Key measures include:

- Regular dampening of surfaces to suppress dust
- Covering of materials during transport
- Use of wheel-washing facilities
- Management of vehicle speeds on-site

These measures will ensure that dust impacts are minimised.

8.8.2 Operational Phase

Operational mitigation is largely built into the design of the proposed development. The plant includes multiple systems to control emissions effectively.

These include:

- Odour Control System (OCS)
- Enclosed processing systems
- Stack heights which ensure adequate atmospheric dispersion of pollutants from all major emission sources
- Continuous monitoring and compliance with future Industrial Emissions licence conditions (regulated by the EPA)

These features ensure that emissions are monitored and controlled at all times.



8.8.3 Decommissioning Phase

Mitigation measures during decommissioning will mirror those during construction. This ensures that dust and emissions are effectively managed during removal activities.

8.9 Residual Impacts

Residual impacts are those that remain after mitigation has been applied. The assessment shows that:

- Construction impacts are low and not significant
- Operational impacts remain very low
- Cumulative impacts are not significant

Overall, no significant adverse effects are expected.

8.10 Interactions and Interrelationships

Air quality can interact with other environmental factors such as human health, biodiversity and climate. The assessment has considered these interactions.

The findings indicate that:

- There are no significant combined effects
- Air quality impacts do not exacerbate impacts in other areas

8.11 Overall Conclusion

The assessment concludes that the proposed development will not result in significant effects on air quality. Although some temporary and not significant effects may occur during construction, these will be short-lived and effectively managed with appropriate mitigation measures.

During operation, emissions will be monitored and controlled under an Industrial Emissions licence regulated by the EPA and will be within all applicable standards. As a result, the proposed development is considered acceptable in terms of air quality.



9. CHAPTER 9: CLIMATE

9.1 Introduction

This section summarises the assessment of climate impacts associated with the proposed development. The assessment considers both the effects of the proposed development on climate (through greenhouse gas emissions) and the potential effects of climate change on the proposed development (climate risks).

The assessment has been carried out in line with recognised Irish and European guidance. It ensures that the proposed development:

- Contributes to climate goals where possible
- Does not significantly increase greenhouse gas emissions
- Is resilient to future climate conditions

9.2 Assessment Methodology

9.2.1 Greenhouse Gas Assessment

The greenhouse gas assessment calculates emissions associated with the full lifecycle of the proposed development. This includes construction activities, operational energy use and transport.

A 30-year operational lifespan has been assumed. This is considered appropriate for infrastructure of this type and allows emissions to be compared fairly with national carbon budgets.

Emissions have been grouped into several key categories, including:

- Construction materials and activities
- Energy consumption during operation
- Transport of materials, feedstock and products

9.2.2 Climate Risk Assessment

A separate climate risk assessment has been carried out to determine whether the proposed development could be affected by future climate change. This assessment considers how the site and infrastructure may respond to different climate hazards.

The assessment examines:

- The types of hazards likely to occur
- How sensitive the proposed development is to those hazards
- How likely those hazards are in the future

A simple risk-based approach is used, where risk is determined by combining sensitivity and exposure. Only hazards considered relevant to the site are assessed further.



9.3 Baseline Climate Environment

9.3.1 Greenhouse Gas Emissions (Ireland)

Ireland's greenhouse gas emissions remain relatively high compared to its climate targets, although reductions are ongoing. The agriculture and transport sectors are the largest contributors, and significant reductions are still required to meet national targets.

Overall, the baseline context highlights that Ireland is:

- Currently above desired emission reduction pathways
- Required to make substantial reductions by 2030
- Moving towards a net-zero target by 2050

9.3.2 Existing Climate Conditions

The site experiences a typical Irish climate, with mild winters and cool summers. Rainfall occurs throughout the year, with slightly wetter conditions during winter months.

Average conditions include:

- Warmest month: July, with averages around 15°C
- Coolest period: winter months, with low temperatures near freezing
- Frequent rainfall, particularly in winter

Storm events occur periodically, although extreme weather is relatively infrequent.

9.4 Assessment of Likely Significant Effects

9.4.1 'Do Nothing' Scenario

If the proposed development does not proceed, there will be no additional greenhouse gas emissions from construction or operation. However, there would also be no renewable energy generation, and methane emissions from organic waste would continue unmanaged.

As a result, the do-nothing scenario represents a missed opportunity to reduce emissions at a wider level.

9.4.2 Construction Phase Impacts

The construction phase will generate greenhouse gas emissions primarily from the manufacture of materials and the use of construction equipment. These emissions are temporary and occur over the duration of the construction period.



Most emissions arise from:

- Production of construction materials
- Energy used by machinery and equipment
- Transport of materials to the site

Overall, construction impacts are:

- Short-term in duration
- Direct in nature
- Negative in effect

Without mitigation, these impacts are considered **moderate and significant**, mainly due to the scale of material use.

9.4.3 Operational Phase Impacts

During operation, emissions arise mainly from energy consumption and transport activities. These emissions occur continuously over the life of the proposed development.

The assessment shows that:

- Energy use is the dominant source of emissions
- Transport contributes a smaller but notable amount

Operational impacts are:

- Long-term
- Continuous
- Negative

Without mitigation, these impacts are assessed as moderate and significant.

9.4.4 Climate Benefits of the Proposed Development

While the proposed development generates emissions, it also provides significant climate benefits. The production of biomethane replaces fossil fuels and reduces methane emissions that would otherwise occur from waste.

In particular, the proposed development:

- Captures methane from organic materials
- Produces renewable gas for energy use
- Reduces reliance on fossil fuels



These benefits result in a substantial overall reduction in emissions at a national level, which outweighs the direct emissions from the proposed development itself.

9.4.5 Climate Risk (Effects of Climate Change on the proposed Development)

The climate risk assessment considered a range of possible hazards, including extreme temperatures, heavy rainfall, wildfire and lightning. Other hazards, such as coastal flooding, were not considered relevant due to the location of the site.

Overall, the assessment found that the proposed development is not highly sensitive to these hazards. In addition, the likelihood of extreme impacts is relatively low.

The results show that the proposed development has low vulnerability to climate change, and no significant risks are expected.

9.4.6 Cumulative Impacts

Climate change is inherently cumulative, as greenhouse gas emissions contribute to global atmospheric concentrations. The assessment therefore considers the proposed development in the context of national emissions.

The findings indicate that:

- The project contributes only a small proportion of national emissions
- It does not significantly affect Ireland's carbon budgets
- It supports climate objectives through renewable energy generation

9.5 Mitigation Measures

Mitigation measures have been incorporated into both the design and operation of the proposed development to reduce emissions.

During construction, mitigation focuses on reducing embodied carbon by:

- Using lower-carbon materials
- Increasing the use of recycled materials
- Improving construction efficiency

During operation, mitigation measures include:

- Use of renewable energy sources such as biomass and solar
- Efficient plant design to minimise energy consumption
- Optimised transport logistics

These measures significantly reduce the overall carbon footprint of the proposed development.



9.6 Residual Impacts

After mitigation is applied, the level of impact is reduced.

- Construction phase impacts are reduced to **minor adverse and not significant**
- Operational impacts are also reduced to **minor adverse and not significant**
- Climate risks remain low and not significant

Although some emissions remain, they are considered acceptable within the context of national climate targets as the mitigation measures proposed are considered to go above and beyond the expected minimum.

9.7 Overall Conclusion

The assessment concludes that the proposed development will not result in significant adverse climate impacts once mitigation measures are applied. The mitigation measures proposed are considered to go above and beyond the expected minimum. While greenhouse gas emissions will occur, they are relatively small in comparison to national totals and are effectively managed through design and operational controls.

Importantly, the proposed development provides substantial climate benefits through renewable energy generation and methane capture. These benefits contribute positively to Ireland's transition to a low-carbon economy.

Overall, the proposed development is considered acceptable in climate terms and supportive of national climate objectives.



10. CHAPTER 10: NOISE AND VIBRATION

10.1 Introduction

This section summarises the likely noise and vibration effects associated with the proposed development during the construction, operational and decommissioning phases. The assessment considers nearby noise-sensitive locations, including residential dwellings and commercial properties.

10.2 Assessment Approach

A baseline noise survey was undertaken to establish existing conditions. Noise and vibration impacts were then predicted for each phase of the proposed development and assessed using recognised standards and guidance. Impacts are described using standard terminology such as imperceptible, slight, moderate or significant, and whether they are positive or negative, as well as short-term or long-term.

10.3 Baseline Environment

The existing noise environment is dominated by road traffic, with additional contributions from nearby quarry activities, landfill operations and rail traffic. Noise levels are generally higher close to the main road network and lower in more rural areas.

No significant vibration was identified in the baseline environment.

10.4 Assessment of Likely Significant Effects

10.4.1 Construction phase

During construction, noise will arise from machinery, site activities and construction traffic.

- General construction works will result in negative, slight and short-term impacts at nearby receptors.
- Noise levels are predicted to remain below applicable limits for most activities.
- Localised works associated with the gas connection may temporarily exceed limits at nearby properties. These effects are negative, moderate to significant, but short-term and temporary, typically lasting 1–2 days at any location.
- Construction traffic will result in a negative, not significant and short-term impact, with increases generally imperceptible to slight.

Vibration from construction activities will:

- Not result in building damage.
- Be negative, slight and short-term, and only just perceptible at the nearest properties.



10.4.2 Operational Phase

During operation, noise will arise from plant, equipment and site traffic.

- Operational noise levels will comply with the relevant EPA noise limits at all noise-sensitive locations during daytime, evening and night-time periods.
- The resulting effects will be imperceptible to slight and long-term .
- Traffic noise increases during operation will be negative, moderate and long-term.

No significant vibration sources are associated with operation. Any vibration will be imperceptible and not significant.

10.4.3 Decommissioning Phase

Decommissioning impacts will be similar to construction but of shorter duration.

- Noise impacts will be negative, slight and short-term.
- Traffic-related impacts will be negative, not significant and short-term.
- Vibration will be imperceptible to slight and short-term.

10.4.4 Mitigation Measures

Standard best practice mitigation measures will be implemented, including:

- Restriction of working hours
- Use of appropriate and well-maintained plant
- Traffic management measures
- Good site management practices

These measures ensure that impacts are minimised and controlled.

10.5 **Residual Impacts**

10.5.1 Construction Phase Residual Impacts

Following mitigation:

- General construction noise will be negative, slight and short-term.
- Gas connection works will result in negative, slight to moderate and temporary impacts, due to short duration at each location.
- Traffic noise will be negative, not significant and short-term, and generally imperceptible.
- Vibration effects will be negative, not significant to slight and short-term.



10.5.2 Operational Phase Residual Impacts

Following mitigation:

- Operational noise will be neutral to slight, long-term and not significant.
- Traffic noise will be negative, moderate and long-term.
- Vibration will be imperceptible and not significant.

10.5.3 Decommissioning Phase Residual Impacts

Following mitigation:

- Noise impacts will be negative, slight and short-term.
- Traffic impacts will be negative, not significant and short-term.
- Vibration impacts will be imperceptible to slight and short-term.

10.5.4 Summary of Residual Impacts

Overall, the residual effects of the proposed development on noise and vibration are:

- Construction Phase: Predominantly negative, slight and short-term, with some temporary moderate effects associated with localised gas connection works.
- Operational Phase: Neutral to slight, long-term and not significant, with moderate traffic impacts and no significant vibration.
- Decommissioning Phase: Negative, slight and short-term, similar to construction but of shorter duration.

In summary, no significant long-term adverse noise or vibration impacts are predicted, and all effects will be either imperceptible, slight to moderate, or temporary in nature.



11. CHAPTER 11: BIODIVERSITY

11.1 Introduction

This chapter explains the existing plants, animals and habitats at the proposed development site and along the gas pipeline route. It assesses how the project could affect biodiversity during construction, operation and decommissioning. Measures are included to avoid or reduce impacts, with the overall aim of achieving no significant net loss of biodiversity.

Supporting technical material is provided in Appendix 11 in Volume 3 of this EIAR, including species records, bird data, and the Biodiversity Enhancement Management Plan (BEMP).

11.2 Assessment Methodology

11.2.1 Legislative Policy Context

The project has been assessed in line with national and European laws protecting wildlife and habitats.

Key frameworks include:

- EU Habitats and Birds Directives
- Irish Wildlife Acts and Flora Protection Orders
- Water Framework Directive (for water quality protection)
- National Biodiversity Action Plan (including the goal of no net loss of biodiversity)
- Local planning policies in County Carlow

These ensure protected species, designated sites and water environments are properly considered.

11.2.2 Consultation

Relevant organisations were consulted, including:

- National Parks and Wildlife Service (NPWS)
- Inland Fisheries Ireland
- Environmental and conservation groups

Feedback from NPWS led to additional refined surveys. Overall, consultation helped ensure that key ecological issues were discussed and appropriately addressed.



11.3 Baseline Environment

The site is a former quarry that is partially restored and gradually being recolonised by vegetation. It is located in a rural setting surrounded by agriculture, a landfill, a recycling facility and the nearby River Barrow floodplain. The gas pipeline follows existing roads and crosses several rivers and drains, meaning most works occur within the built and modified road servitudes.

The surrounding environment supports a mix of modified and semi-natural habitats, providing foraging areas, movement routes and shelter for wildlife. The River Barrow is the most important ecological feature in the area, acting as a key corridor for aquatic species, mammals and birds, and forming part of the protected River Barrow and River Nore SAC.

Key Features include:

1. Designated sites

- River Barrow and River Nore SAC (international importance)
- Cloghristick Wood pNHA north of the proposed development (national importance)
- Wildfowl sanctuary downstream of the proposed development (national importance)

2. Habitats:

- No habitats of European conservation importance overlap the project
- Bare ground and recolonising vegetation (local importance, lower value)
- Grasslands, scrub, hedgerows and treelines (local importance, higher value)
- Small temporary pools and nearby watercourses (local importance, higher value)

3. Water environment:

- Powerstown Stream (local importance, higher value & low quality)
- River Barrow (International importance, moderate quality)
- Supports fish species and aquatic macroinvertebrates and forms an important ecological corridor

4. Species:

- Otter (international importance)
- Other mammals such as badger and hedgehog (local importance, higher value)
- Several bat species using boundaries for feeding and commuting (local importance, higher value)
- A range of farmland, water and woodland birds (local importance, higher value)
- Notable plants including orchids (local importance, higher value) and greater knapweed (national importance)
- Presence of Schedule III and non-native invasive plant species



11.4 Assessment of Likely Significant Effects

11.4.1 Construction Phase

The main impacts arise during construction and are generally temporary.

These include:

- Removal of small areas of habitat
- Disturbance to wildlife from noise and activity
- Risk of spreading invasive species
- Potential pollution of nearby watercourses during pipeline works
- Loss of small numbers of sensitive plants (e.g. orchids)

Most impacts are localised and short-term, but some (such as plant loss) could be more significant without mitigation.

11.4.2 Operational Phase

During operation, impacts are expected to be limited.

Potential effects are limited to the biogas plant only and include:

- Noise and lighting disturbance to animals
- Very occasional discharge of clean stormwater to a nearby stream (only in rare extreme rainfall events)

These effects are predicted to be minor due to design controls.

11.4.3 Decommissioning Phase

Impacts would be similar to construction but smaller in scale and shorter in duration. The gas pipeline would remain in place and will have no further impact during decommissioning phase.

11.4.4 Cumulative Impacts

When considered alongside other nearby activities, no significant combined impacts are expected due to:

- Limited overlap in impact zones with other developments at the same time
- Existing strong mitigation and regulatory controls in place



11.5 Mitigation Measures

A range of measures are built into the project to avoid or reduce impacts.

Key measures include:

- Retaining hedgerows, treelines and important habitats
- Translocating rare and locally restricted plant species
- Controlling invasive species
- Timing works to avoid sensitive periods for wildlife (e.g. bird breeding season)
- Using trenchless methods (HDD) to avoid disturbance to rivers and structural bat roosts
- Managing runoff through drainage systems, sediment controls and oil separators to maintain water quality in the area
- Limiting light spill to protect bats and other nocturnal species
- Ecological supervision during construction

11.6 Residual Impacts

After mitigation, impacts will be **minor or negligible**

No significant long-term negative effects are expected on biodiversity.

11.7 Enhanced Monitoring

The project includes measures to improve biodiversity, such as:

- Habitat management and landscaping
- Ongoing monitoring and control of invasive species
- Monitoring location sites of orchids

An Ecological Clerk of Works will oversee implementation and ensure compliance.

11.8 Overall Conclusion

The site and surrounding area support a range of habitats and species, mostly of local importance, with the River Barrow being the key ecological feature of high importance.

With the proposed mitigation and enhancement measures in place, the project is not expected to result in significant negative effects on biodiversity biodiversity or designated sites and is consistent with the objective of no net loss of biodiversity.



12. CHAPTER 12: SOILS, GEOLOGY, AND HYDROGEOLOGY

12.1 Introduction

This chapter assesses how the proposed bioenergy development and associated gas pipeline could affect soils, geology and groundwater in the surrounding area. It considers impacts during construction, operation and decommissioning, as well as cumulative effects with other developments.

The aim is to identify any potential impacts and outline measures to avoid, reduce or manage them so that no significant environmental effects occur.

12.2 Assessment Methodology

The assessment follows EPA (2022) guidance and relevant European directives, including the Water Framework Directive.

The approach includes:

- Review of environmental data and guidance
- Site investigations and ground testing
- Identification of potential pollutant pathways
- Assessment of impacts based on sensitivity, magnitude and duration
- Identification of mitigation and residual effects

A study area of 2km around the site was used to identify potential receptors such as groundwater bodies and wells.

12.3 Baseline Environment

12.3.1 Site Context

The site is located in a rural area near an existing closed landfill and recycling facility. It is currently a sand and gravel quarry and that has been partly filled and restored.

Surrounding land uses are mainly agricultural, with some residential properties nearby.

12.3.2 Soils and Geology

The site is underlain by:

- Gravel deposits derived from limestone
- Glacial sands and gravels
- Limestone bedrock at depths of approximately 14–20 m



Due to quarrying, soils are already disturbed (made ground) and have lower sensitivity than undisturbed soils.

12.3.3 Hydrogeology

The site is located within the Athy-Bagenalstown Gravels groundwater body, classified as having good status.

Key characteristics include:

- A regionally important gravel aquifer with a regionally important aquifer (karstified – diffuse) in the underlying bedrock. Athy-Bagenalstown gravels groundwater body is refers to the overburden. The reference to regionally important karstified aquifer relates to the bedrock underlying the site
- Groundwater flow generally towards the River Barrow
- High groundwater vulnerability at the site
- Approximately 27 groundwater wells within 2 km

The site is not within a source protection area, and no major water supplies are directly affected.

12.3.4 Land Use and Contamination

- The site has a history of quarrying and infilling
- Soil and groundwater testing found no significant contamination
- Adjacent landfill monitoring shows no evidence of off-site groundwater impact

Overall, soil and groundwater conditions are considered suitable for development.

12.3.5 Sensitivity of the Environment

- Soils and geology: Medium sensitivity (due to previous disturbance)
- Groundwater: High importance (regionally important aquifer with good status)

12.4 **Assessment of Likely Significant Effects**

12.4.1 'Do Nothing' Scenario

If the development does not proceed:

- Quarrying and restoration activities would continue.
- There would be no change to existing soil or groundwater conditions.
- The overall impact would be negligible.

12.4.2 Construction Phase

Construction activities include excavation; foundation works and pipeline installation.



Potential impacts:

- disturbance and removal of soils
- risk of contamination from fuels or materials
- localised reduction in groundwater recharge due to hardstanding
- temporary exposure of groundwater during excavations

However:

- most of the excavated soils will be reused onsite
- groundwater is below excavation depth
- no significant pathways for pollution are identified

Overall, impacts are temporary, localised and not significant.

12.4.3 Operational Phase

During operation:

- the main risk is accidental leakage or spills
- reduced infiltration due to paved areas is expected

However:

- The facility includes bunding, containment and drainage controls.
- No discharges to groundwater will occur.
- Groundwater abstraction for operations is small and localised.

Overall impacts on soils and groundwater are very low and unlikely.

12.4.4 Decommissioning Phase Impacts

Decommissioning impacts are similar to construction but lower in scale.

- Limited disturbance due to retention of the hardstanding area.
- Short-term risks from dismantling activities can be managed with a decommissioning plan.



These impacts are temporary and manageable.

12.4.5 Major Accidents and Natural Disasters

Potential risks such as flooding or fire have been assessed:

- The site is outside major flood zones.
- Firewater containment is provided.

Any impacts would be minor and well controlled.

12.4.6 Cumulative Impacts

No significant cumulative impacts with other developments are expected, particularly given the controlled nature of the works and mitigation measures.

12.5 Mitigation Measures

12.5.1 Design and Prevention

Many mitigation measures are built into the design to prevent impacts from occurring. These include:

- impermeable bunded tank areas
- stormwater management system and lined lagoon
- reuse of excavated materials to minimise waste
- use of trenchless methods (HDD) for sensitive crossings

12.5.2 Construction and Operational Phase Mitigation

There are no specific mitigation measures for soils, geology and hydrogeology as there is no potential for significant impacts due to the design and the proposed construction and operational controls.

12.5.3 Decommissioning Phase Mitigation

Decommissioning will follow a managed closure plan, including, managed removal of infrastructure, spill prevention during dismantling and restoration of the site.

12.6 Water Framework Directive

The assessment confirms that:

- The development will not cause deterioration in groundwater or surface water status.
- There will be no impact on the River Barrow or associated water bodies.
- The project complies with the Water Framework Directive.



12.7 Indirect Impacts

No significant indirect impacts on nearby water bodies or groundwater systems are predicted.

12.8 Residual Impacts

After mitigation:

- Impacts are imperceptible to slight.
- Effects are localised and controlled.
- No significant long-term impacts are expected.

No significant residual impacts are predicted, and no lasting damage to soil or groundwater conditions is expected.

12.9 Overall Conclusion

The site is already disturbed due to historic quarrying, reducing its sensitivity. Although the underlying groundwater resource is important, it can be effectively protected through design and management.

Overall:

- Potential impacts are well understood and low in magnitude.
- Robust design and operational measures are proposed.
- The development will not adversely affect soils, geology or groundwater.

The proposed development is therefore considered environmentally acceptable in terms of soils, geology and hydrogeology.



13. CHAPTER 13: SURFACE WATER AND HYDROLOGY

13.1 Introduction

This chapter assesses how the proposed development and associated gas pipeline could affect surface water, hydrology and water quality in the surrounding area. It examines conditions at the site and nearby watercourses, including the River Barrow and its tributaries, and considers potential effects during construction, operation and decommissioning.

The assessment is supported by three appendices in Volume 3 of the EIAR: a site-specific flood risk assessment, a hydraulic capacity assessment, and a Water Framework Directive (WFD) assessment.

The proposed development has been designed to protect the surface water environment. The storm or rain water falling on site will be collected in a series of system with multi-stage controls and actively controlled design measures to provide a robust, fail-safe approach to surface water management and to prevent the likelihood of adverse impacts on surface water quality, hydrological regimes, and downstream receptors.

13.2 Assessment Methodology

The assessment follows EPA guidance and incorporates:

- A desk study of mapping, hydrology and water quality data
- Site walkover surveys and inspection of watercourses and crossings
- Review of legislation and policy, including the Water Framework Directive
- Identification of potential impact pathways and sensitive receptors

The study considers all phases of the proposed development and includes consultation with stakeholders.

Relevant Irish and EU policies were taken into account. These policies require that developments do not harm water quality, do not increase flood risk and, where possible, support improvements in the water environment.

13.3 Baseline Environment

13.3.1 Catchment and Hydrology

The site is located within the River Barrow catchment, approximately 300 m from the river and close to several tributary streams. The River Barrow and River Nore SAC lies nearby, making the receiving environment sensitive to changes in water quality.

The site of the proposed development is a former quarry, forming a naturally enclosed basin where water tends to collect rather than flow off site.

The proposed gas pipeline route crosses a number of streams and drainage features, mainly via existing roads and structures.



13.3.2 Surface Water Quality

Water quality in the area is generally moderate, with some evidence of nutrient enrichment:

- River Barrow: Moderate status (Q3-4)
- Powerstown Stream: Poor to moderate status (Q3–Q3-4)
- Elevated nutrients (e.g. phosphorus) recorded locally

These conditions reflect existing pressures such as agriculture and historical land use.

13.3.3 Flood Risk

The site is not located within mapped flood zones and is considered at low risk of flooding from rivers or the sea.

- no recorded flooding at the site
- one historical event recorded on a nearby stream

The drainage system, including a stormwater lagoon, will manage runoff and prevent flooding impacts.

13.4 **Assessment of Likely Significant Impacts**

13.4.1 'Do Nothing' Scenario

If the proposed development does not proceed, the site would remain largely unchanged as a quarry undergoing restoration. In this case, there would be no new impacts on water systems, and conditions would continue as they are at present.

13.4.2 Construction Phase

Overall, construction impacts are expected to be temporary, localised, unlikely and not significant.

13.4.3 Operational Phase

During operation, the main potential risks relate to:

- Reduced drainage performance due to sediment build-up in the storm water lagoon.

The facility includes a fully segregated drainage system, reuse of water, and no routine discharge to surface waters.

Impacts are therefore very low and unlikely.



13.4.4 Major Accidents and Natural Disasters

Potential scenarios include flooding, fire or tank failure. These could result in contaminated water entering the drainage system if uncontrolled.

However, the design includes:

- bunded storage and containment systems
- firewater management
- drainage isolation and monitoring

As a result, risks are well controlled and not significant.

13.4.5 Decommissioning Phase

Impacts during decommissioning are similar to construction but smaller in scale. As much of the hardstanding will remain in place, ground disturbance is limited. This significantly reduces the risk of exposing underlying soils, thereby lowering the potential for sediment mobilisation, erosion, or contaminated runoff compared with the construction phase. Any impacts are temporary and manageable.

13.4.6 Cumulative Impacts

The surrounding area includes agriculture, quarrying and a closed landfill. However, due to the contained drainage design and controlled discharge, the development will not significantly add to existing pressures.

13.5 Mitigation Measures

13.5.1 Design and Embedded Mitigation

Most mitigation is incorporated directly into the design. The surface water system is designed to:

- prevent pollution pathways
- control runoff rates
- provide multiple treatment stages

Key design features include:

- a sealed stormwater lagoon with settlement and storage capacity
- fully separated drainage systems for different water types
- hydrocarbon interceptors and containment systems
- continuous water quality monitoring and automatic controls

13.5.2 Construction Phase Mitigation

Construction mitigation focuses on standard good construction practice.



These ensure impacts remain short-term and controlled.

13.5.3 Operational Phase Mitigation

Operational mitigation is largely embedded in the design.

The main ongoing measure is:

- Routine inspection and maintenance of the drainage system and lagoon

This ensures continued performance and protection of water quality.

13.5.4 Decommissioning Phase Mitigation

Decommissioning will be managed through standard environmental controls, including:

- removal of fuels and materials
- controlled dismantling
- continued use of drainage systems during works

Impacts remain temporary and minimal.

13.6 Residual Impacts

After mitigation, residual impacts are:

- not significant
- localised and controlled
- consistent with environmental standards

The development will not:

- deteriorate water quality
- increase flood risk
- cause uncontrolled discharges



13.7 Monitoring

A monitoring programme in compliance with the Industrial Emissions licence from the EPA will ensure ongoing protection of water quality.

This includes:

- Continuous water quality monitoring (e.g. pH, turbidity, nutrients)
- Inspection of drainage systems, lagoon and containment measures
- Automated controls to stop discharge if contamination is detected
- Reporting under EPA licence requirements

13.8 Overall Conclusion

The site is located in a sensitive river catchment, but existing water quality pressures are unrelated to the proposed development.

The project incorporates a robust, multi-layered drainage and containment system, designed to prevent pollution and control runoff.

Overall:

- Impacts are low and well managed
- no deterioration of water quality is expected
- the development complies with the Water Framework Directive

The proposed development is therefore acceptable in terms of surface water and hydrology.



14. CHAPTER 14: MATERIAL ASSETS

14.1 Introduction

This chapter considers how the proposed development may affect material assets in the area. Material assets include infrastructure (such as roads and structures), utilities (such as electricity, gas, water and telecommunications), and materials (both those used and those generated).

The assessment examines potential effects during construction, operation and decommissioning. It also identifies measures to avoid, reduce or manage any impacts and considers how the proposed development aligns with broader goals such as efficient use of resources and circular economy principles.

14.2 Assessment Methodology

The assessment followed established environmental assessment guidance and involved a structured approach. This included reviewing the proposed development, examining available data on the local environment and utilities, and assessing how the project may interact with existing infrastructure and material resources.

Relevant legislation and policy relating to waste management and the circular economy were considered. While there is no single law specifically covering “material assets” as a topic, existing legislation governing waste and resource use has informed the approach.

The assessment considers:

- Existing infrastructure and utilities in the area
- The demand the proposed development will place on these systems
- The types and quantities of materials used and generated

Impacts are evaluated based on their scale, duration and importance, and then classified in terms of their overall significance.

14.3 Baseline Environment

14.3.1 Infrastructure

The site currently contains very limited infrastructure, as it is an active and partially restored quarry. Existing features include a small unused building, site entrances, fencing and a groundwater well. There is no formal drainage system, with rainwater currently soaking into the ground.

Along the proposed gas pipeline route, infrastructure includes the road network, culverts and bridges. These are standard features and are already in use.

14.3.2 Utilities

The site is not currently connected to key utilities such as electricity, water supply, wastewater or gas. However, connections are available nearby and could be extended to serve the proposed development.



There is an existing gas network in the wider area, and electricity infrastructure is present in the vicinity. A groundwater well provides a source of water on site.

Along the proposed pipeline route, typical utilities (such as electricity cables and telecoms) are assumed to be present within road corridors.

14.3.3 Materials

The site is already used for quarrying and restoration, involving the movement and placement of soil and stone. As part of ongoing restoration, materials are imported and redistributed across the site.

The proposed development will involve the use of construction materials such as concrete, steel and piping. During operation, it will process large volumes of agricultural materials to produce renewable energy and related outputs.

Materials generated during the project will include both useful outputs (such as biomethane and digestate) and wastes (such as surplus construction materials and small quantities of operational waste).

14.4 Assessment of Likely Significant Effects

14.4.1 'Do Nothing' Scenario

If the proposed development does not proceed, the site would continue as a quarry and would eventually be restored. Material use would remain low, and there would be no additional demand on infrastructure or utilities.

However, the opportunity to generate renewable energy and reuse organic materials would also be lost. The current reliance on existing waste management practices would continue.

14.4.2 Construction Phase

During construction, there will be some temporary interaction with infrastructure, utilities and materials.

Existing on-site infrastructure will be removed or modified to allow construction to proceed, but this will not result in significant impacts given its limited extent. Temporary structures and services will be required during construction but will be removed when works are complete.

Impacts on utilities are expected to be minor and short-term. There may be brief interruptions during connection works, but these will be managed and communicated by the relevant service providers.

Material use will increase during construction, particularly for building works and pipeline installation. Waste materials such as packaging and surplus construction materials will also be generated. These will be managed in line with waste management best practice, with a focus on reuse and recycling.

Along the pipeline route, construction could temporarily affect underground utilities during excavation. Without mitigation, this could result in short-term disruption, but such impacts are manageable and common in infrastructure works.

Overall, construction impacts are short-term, localised and not significant.



14.4.3 Operational Phase

During operation, the proposed development will introduce permanent infrastructure and ongoing use of utilities and materials.

The demand for electricity will increase, but this is relatively small when considered at a national or regional scale and can be supported by existing infrastructure. Some electricity will also be generated on site, helping to reduce reliance on external supply.

Water demand will be met on site through rainwater and groundwater sources, meaning there will be no reliance on public water supply. Foul water will be collected and removed for treatment off-site, ensuring no impact on local wastewater systems.

A key feature of the proposed development is the production of biomethane, which will be injected into the gas network. This represents a significant positive impact by contributing renewable energy and reducing reliance on fossil fuels.

From a materials perspective, the operational phase has notable benefits. Large quantities of agricultural residues will be processed, producing useful outputs such as renewable gas and digestate, which can be reused in agriculture. This supports circular economy principles by turning waste materials into resources.

Some waste materials will still arise, including contaminants in feedstock and process residues. These will be managed through established waste collection and treatment systems. Due to the relatively small quantities and controlled handling, these impacts are not significant.

14.4.4 Decommissioning Phase

At the end of the project life, the site will be decommissioned in accordance with a formal plan. Equipment and structures will be dismantled and removed or reused where possible.

This phase will generate demolition materials, but a high proportion is expected to be recyclable. Temporary impacts on infrastructure and utilities may occur during dismantling works, but these will be short-term and localised.

A reduction in renewable gas production will occur after closure, which represents a loss of a positive contribution to the energy system. However, overall environmental impacts of decommissioning are limited and manageable.

14.4.5 Cumulative Impacts

When considered alongside other developments in the area, the project is not expected to place significant additional pressure on infrastructure or utilities. The proposed development is largely self-sufficient in water and wastewater, and its energy demands can be accommodated within existing systems.

In terms of materials, the project contributes positively by increasing resource recovery and reducing waste through circular economy practices.

14.5 Mitigation Measures

Mitigation measures are largely built into the design of the proposed development and focus on efficient use of resources and protection of existing assets.



The use of a previously developed quarry site avoids impacts on undeveloped land and minimises the need for new materials. Most excavated materials will be reused on site, reducing waste and transport requirements.

During construction, standard procedures will be followed to protect utilities, manage materials and avoid disruption. A Construction Environmental Management Plan will guide these activities.

During operation, the site is designed to minimise reliance on external utilities, particularly water and wastewater systems. Materials will be carefully managed to maximise reuse and recycling, while any waste will be handled through licensed facilities.

A closure plan will guide the decommissioning phase, ensuring that materials are recovered where possible and impacts are minimised.

14.6 Residual Impacts

After mitigation, impacts on infrastructure and utilities are expected to be not significant. The proposed development will operate largely independently of public systems and will not cause long-term disruption or capacity issues.

Residual impacts on materials are generally positive, due to the reuse of materials during construction and the transformation of agricultural inputs into useful outputs during operation.

14.7 Overall Conclusion

Overall, the proposed development is not expected to negatively affect material assets in any significant way. Temporary impacts during construction and decommissioning are manageable and short-lived.

Importantly, the proposed development provides clear benefits in terms of resource efficiency and renewable energy production. By converting agricultural materials into biomethane and other useful products, it supports circular economy objectives and contributes positively to national energy infrastructure.



15. CHAPTER 15: ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE

15.1 Introduction

This chapter considers how the proposed development could affect cultural heritage in the area. Cultural heritage includes tangible constraints such as archaeological remains and landscapes, and architectural heritage structures, and also includes intangible aspects such as place names, folklore and historical associations.

The assessment examines potential impacts during construction, operation and decommissioning, and identifies measures to protect cultural heritage features where required.

15.2 Assessment Methodology

The study involved a detailed review of available information combined with a site visit. Data sources included national records of archaeological sites, protected structures, the National Inventory of Architectural Heritage (NIAH), historic maps, aerial imagery and excavation records.

Two separate study areas were defined:

- The main site and surrounding area within 1 km, to assess potential direct and indirect impacts
- The gas pipeline corridor and land within 100 m on either side, focusing on potential construction impacts

This approach allowed both known cultural heritage features and the potential for previously undiscovered remains to be considered.

Impacts were assessed by appraising the value/sensitivity of cultural heritage features in combination with potential magnitudes of effects on their locations and settings. Effects can range from negligible to significant depending on the scale of change and the sensitivity of the cultural heritage feature.

15.3 Baseline Environment

15.3.1 Site Context

The site is a former quarry that has been extensively excavated and partially restored. Previous works included archaeological monitoring of topsoil stripping within the quarry, during which any identified remains were preserved by record. As a result, there is no reasonable potential for unrecorded archaeological features to remain within the site.

No recorded archaeological sites or protected structures are located within the site itself or in its immediate vicinity.



15.3.2 Surrounding Area

There are 13 no. recorded archaeological sites dispersed across the lands in the surrounding 1 km study area and none of these are located within 200m of the site. Five of these archaeological sites are located within undeveloped greenfield lands, three have been classified as 'redundant records' by the Archaeological Survey of Ireland (ASI) and five were excavated during archaeological investigations carried out in advance of the construction of the N9/N10 Kilcullen-Waterford Road scheme in the north end of the study area. The ASI inventory descriptions of the archaeological sites within the 1 km study area indicate that only one example (ring barrow CW012-043----) retains visible surface remains.

There are no protected structures or buildings listed in the NIAH located within the 1 km study area.

15.3.3 Historical Land Use

Historic mapping shows the site was agricultural land in the 19th and early 20th centuries, with no significant buildings or features present. Modern aerial imagery confirms that quarrying removed original ground levels across the entire site.

15.3.4 Gas Pipeline Route

A number of archaeological sites and protected structures are located within the study area extending for 100m from either side of the route.

These include:

- Archaeological features such as a ringfort, a large enclosure, ring-ditches and a church site
- A fragment of a high cross which has been relocated near the roadside
- Several protected structures, including a church, houses and a historic canal lock

All of the protected structures within the study area are located within private properties outside the direct construction footprint. The known extent of the recorded archaeological sites within the study area are also outside the direct construction footprint, although the potential exists that associated unrecorded, sub-surface features may extend beneath the road corridor.

15.3.5 **Assessment of Likely Significant Effects**

15.3.6 'Do Nothing' Scenario

If the proposed development does not proceed, there would be no change to the cultural heritage environment. All known and unknown heritage features would remain unaffected.

15.3.7 Construction Phase

For the main site, no impacts are expected. The site has already been heavily disturbed by quarrying, and any archaeological features previously present were recorded during archaeological monitoring of topsoil stripping in advance of quarrying works.



For the pipeline route, there is potential for localised impacts during excavation works. These are limited to areas where unrecorded, sub-surface archaeological remains may extend beneath roads or verges. This includes the potential for sub-surface archaeological remains associated with the following sites:

- A previously recorded but unlocated holy well (CW012-044003-)
- A large enclosure (CW012-213----) identified from aerial imagery, which may contain potential surviving associated sub-surface features that extend beneath the road corridor

At these locations, impacts could occur if potential sub-surface archaeological remains are disturbed during trenching. For other cultural heritage sites within the pipeline study area, including protected structures and archaeological sites situated within the wider environs of the route, effects will be indirect and temporary, such as minor disturbance to their setting.

Overall, construction impacts are limited in extent and primarily relate to the pipeline works.

15.3.8 Operational Phase

During operation, the proposed development will not directly affect any cultural heritage features.

At the main site, the proposed development will operate within a previously disturbed quarry and will not alter the surrounding cultural heritage landscape in any meaningful way.

The pipeline will be buried underground and will not be visible, meaning no long-term impact on the setting of nearby cultural heritage features.

Overall, operational impacts are negligible.

15.3.9 Major Accidents and Natural Disasters

Given the absence of sensitive cultural heritage features within the site itself, and the limited interaction with cultural heritage features along the pipeline, no likely impacts from accidents or extreme events are identified.

15.3.10 Decommissioning Phase

Decommissioning works will take place within the existing developed site, which does not contain cultural heritage features. As a result, no impacts on cultural heritage are expected.

15.3.11 Cumulative Impacts

When considered alongside other developments, the proposed project is not expected to contribute to cumulative impacts on cultural heritage.

The site is already altered by quarrying, and the pipeline works are localised and temporary. No combined impacts on cultural heritage features are anticipated.

15.4 Mitigation Measures

Mitigation is focused mainly on the pipeline route, as no measures are required for the main site.



A programme of archaeological monitoring will be carried out during pipeline construction. This involves a qualified archaeologist supervising groundworks and inspecting soil as it is excavated.

Where there is greater potential for buried remains, continuous monitoring will be implemented. If any archaeological material is discovered, works will stop in that area and appropriate actions will be agreed with the relevant authorities.

Protected structures and other known cultural heritage features within the environs of the pipeline route will be clearly identified and avoided during construction. No works will take place within their boundaries.

15.5 Residual Impacts

After mitigation, no significant impacts on cultural heritage are expected.

If previously unknown archaeological remains are identified, they will either be preserved in place or recorded in full by systematic archaeological excavation. This ensures that their information value is retained.

Overall, residual effects are expected to be negligible to slight.

15.6 Overall Conclusion

The site itself has already been heavily disturbed and does not contain surviving cultural heritage features. As a result, no impacts are expected from the proposed development at this location.

Potential impacts are limited to the pipeline route and are primarily focused on a small number of locations where potential unrecorded, sub-surface features associated with recorded archaeological sites in adjoining lands may extend beneath the road corridor. These potential impacts can be effectively managed through standard archaeological monitoring.

With mitigation in place, the proposed development will not result in significant effects on the archaeological, architectural or cultural heritage resource.



16. CHAPTER 16: LANDSCAPE AND VISUAL IMPACT

16.1 Introduction

This Landscape and Visual Impact Assessment (LVIA) accompanies the planning application for the proposed anaerobic digestion (AD) facility at Powerstown, Co. Carlow, including the associated gas pipeline connection. The assessment examines how the proposed development will affect the physical features and fabric of the landscape, the established landscape character, visual amenity, and views within the landscape.

Landscape and visual effects are considered separately but are closely related. Landscape Impact Assessment (LIA) relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. Visual Impact Assessment (VIA) relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from visual obstruction (blocking of a view, be it full, partial or intermittent) or visual intrusion (interruption of a view without blocking).

The assessment adopts an approach that is founded on established best practice, including GLVIA3 and relevant EPA guidance, and draws on site surveys and desk-based analysis.

16.2 Assessment Methodology

The assessment uses methodology as prescribed in GLVIA3, which follows the European Landscape Convention (ELC) definition of landscape, recognising landscape as an “area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.”

The assessment process involved:

- baseline analysis of the landscape and visual environment
- identification of receptors and viewpoints
- evaluation of sensitivity and magnitude of change
- assessment of significance of effects
- consideration of mitigation and residual impacts

A 5 km study area was adopted, with a more detailed focus within approximately 2 km where effects are most likely to be more notable. This reflects typical industry practice and ensures a proportionate assessment.

16.3 Baseline Environment

16.3.1 Landscape

The landscape of the site and surrounds is characterised by a broad river valley associated with the River Barrow, surrounded by gently rising terrain. The site itself is located within a modified landscape that includes a working quarry, landfill, civic amenity site, and major transport infrastructure.



Land use is predominantly agricultural, consisting of medium to large fields bounded by hedgerows and mature trees. Woodland blocks and riparian vegetation provide local enclosure, while elevated areas afford wider views across the region.

Several small settlements—including Leighlinbridge, Nurney, and Ballinabrannagh—are distributed within the study area. Infrastructure such as the M9 motorway and railway line contributes to a landscape that is already influenced by human activity.

Overall, the landscape is considered typical of rural Carlow, with a mix of natural and anthropogenic characteristics. Landscape sensitivity is considered to be Medium-Low, with an underlying Medium sensitivity associated with locations along the River Barrow and elevated locations.

16.3.2 Visual

The visual baseline was informed by Zone of Theoretical Visibility (ZTV) modelling and field verification. The ZTV indicates that much of the study area has theoretical visibility of the site due to the open valley setting, although actual visibility is substantially reduced by intervening vegetation, structures, and local topography.

A series of representative viewpoints were selected to capture a range of receptor types, including:

- local residents
- road users
- walkers and recreational users
- users of scenic routes

Visual receptor sensitivity is generally assessed as Medium to Medium-Low, reflecting a working rural landscape with some scenic elements, particularly in elevated or river corridor locations.

16.4 Assessment of Likely Significant Effects

16.4.1 'Do Nothing' Scenario

In the absence of the proposed development, the site would likely continue as a quarry and be restored to agricultural use. The wider landscape would evolve gradually through agricultural practices, vegetation growth, and incremental development.

16.4.2 Construction Phase

During construction, there will be increased activity, including heavy vehicle movements, machinery operation, soil stripping, and temporary structures. These activities will introduce short-term disturbance and visible change, particularly within close proximity to the site.

Landscape effects during this phase are assessed as Moderate to Slight in the immediate vicinity, reducing rapidly with distance. Visual effects follow a similar pattern: noticeable near the site but limited and often screened elsewhere.

For the gas pipeline, impacts are more localised and temporary, primarily affecting roadside corridors. These effects are generally Slight or Imperceptible.



Overall, construction impacts are adverse but temporary and Not Significant.

16.4.3 Operational Phase

Once operational, the proposed development will introduce new built structures into the landscape. While these structures are larger than typical rural buildings, they are set within an already modified landscape that includes industrial and infrastructure elements.

At close range, the development will be noticeable and will alter local landscape character. However, its effects diminish rapidly with distance due to screening, scale, and context.

Across the study area:

- Landscape effects are Moderate-Slight in the immediate vicinity of the site, reducing to Slight or Imperceptible further away.
- Visual effects are generally considered Slight to Imperceptible, with limited Moderate effects within the immediate vicinity of the site.
- The gas pipeline will have Negligible operational effects, as the affected land will be largely reinstated and the pipeline would not be visible.

Overall operational impacts are Not Significant.

16.4.4 Decommissioning Phase

Decommissioning effects will broadly mirror construction impacts but in reverse, involving dismantling and removal of structures. These effects will also be temporary and Not Significant.

16.4.5 Cumulative impacts

Other developments in the area, including permitted solar farms, were considered. While these contribute to a general increase in built development within their landscape, their land-hugging form and distance from the proposed development would likely result in limited combined visibility.

Cumulative effects on both landscape and visual receptors are therefore considered Not Significant.

16.5 Mitigation Measures

Mitigation is embedded primarily through site design and landscape integration, including the retention and bolstering of existing vegetation. Additional planting will help assimilate the development over time and reduce visibility of the proposed development.



16.6 Residual Impacts

Following mitigation and establishment of planting:

- Landscape effects are likely to remain Moderate-Slight to Slight locally, reducing with distance.
- Visual effects are likely to be further reduced, to at most Moderate-Slight within the immediate vicinity of the site.

All residual impacts are considered Not Significant.

16.7 Overall Conclusion

The assessment concludes that the proposed development will introduce localised changes to landscape character and visual amenity, particularly within close proximity to the site. However, these changes occur within an already modified rural landscape with existing infrastructure and industrial influences.

Effects are generally limited in extent, reduce rapidly with distance, and are mitigated by existing and proposed vegetation. Both during construction and operation, impacts on the landscape and visual environment would likely not exceed Moderate significance, and are therefore considered Not Significant.



17. CHAPTER 17: INTER-RELATIONSHIPS AND INTERACTIONS

	Population and Human Health	Biodiversity	Soils, Geology and Hydrogeology	Surface Water and Hydrology	Air Quality	Climate	Noise and Vibration	Traffic and Transportation	Archaeological, Architectural and Cultural Heritage	Landscape and Visual Impact	Material Assets - Utilities and Waste
Population and Human Health		✓		✓	✓	✓	✓	✓	✓	✓	✓
Biodiversity	✓		✓	✓	✓		✓		✓		
Soils, Geology and Hydrogeology		✓		✓	✓				✓		
Surface Water and Hydrology	✓	✓	✓			✓					
Air Quality	✓	✓	✓			✓		✓			
Climate	✓			✓	✓						
Noise and Vibration	✓	✓						✓			
Traffic and Transportation	✓				✓		✓				✓
Archaeological, Architectural and Cultural Heritage	✓	✓	✓								
Landscape and Visual	✓										
Material Assets - Utilities and Waste	✓							✓			



18. CHAPTER 18: SCHEDULE OF COMMITMENTS

There is a list of mitigation measures that the Applicant shall be required to implement during construction, operation and decommissioning of the proposed development and that GNI will be required to implement during the construction and operation of the proposed gas pipeline. These are listed in Chapter 18 of Volume 2 of the EIAR. They will be a condition of planning if granted.



**DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE**

www.fehilytimoney.ie

 **Cork**

 **Dublin**

 **Carlow**

