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Introduction

4.1 This Chapter of the Environmental Impact Assessment Report (EIAR), prepared by SLR Consulting Ireland Ltd, addresses the potential effects of a bio-renewables production facility (incorporating anaerobic digestion) on population and human health.

4.2 The proposed development is located within an application area of c. 6.3 hectares within the southwest corner of the existing permitted Killough hard rock quarry, which has been in operation since the 1950's. To date, material extracted from the quarry area has been processed within the quarry void using mobile processing plant, then stockpiled, prior to further processing at other value added facilities in the wider quarry landholding (such as the concrete manufacturing facility, asphalt plant, limestone production facility and agricultural lime facility) or transported off-site to market.

4.3 The application site is located in Gaile townland, Holycross, Co. Tipperary, approximately 3.5km and 6.5km south of Holycross and Thurles respectively.

4.4 The area is currently occupied by processed aggregate stockpiles which will be relocated elsewhere within the quarry site prior to any development works associated with the proposed bio-renewables facility being carried out.

4.5 The proposed bio-renewables production facility (incorporating anaerobic digestion) compound will cover an area of c. 4 hectares with c. 16,821.5m² of new buildings consisting of an administration building; a dry matter reception building; a workshop; a bio-conversion building; a pre-treatment, equalisation and gas upgrading building; a digestate handling building; a warehouse storage building; a bio-filling station building; an odour abatement and pumping station building; a linear generator building; and an ESB sub-station building.

4.6 Ancillary facilities to be provided will include, a wheelwash; a weighbridge; surface water and fire water storage ponds; storage tanks for water, silage feed, cattle manure, pot ale and spent grain, maize, chicken litter and gas; effluent collection and storage tanks; staff and visitor car parking and bicycle storage; HGV parking; roof mounted solar panels; hydrocarbon interceptors; wastewater treatment equipment; bunding and surface treatments; boundary treatments and fencing; lighting; services; drainage; landscaping; and all associated ancillary works.

4.7 The proposed facility will operate 24 hours a day / 7 days a week, with delivery of feedstock restricted to between the hours of 8am to 6pm Monday - Saturday / no deliveries Sundays or bank holidays.

4.8 Feedstock importation will be c. 105,000 tonnes per annum consisting of:

- Chicken Waste c. 15,000 tpa
- Cattle Slurry c. 20,000 tpa
- Grass Silage c. 60,000 tpa
- Maize Silage c. 5,000 tpa
- Pot ale and Spent Grain c. 5,000 tpa

4.9 Outputs will consist of:

- bio-methane (gas);
- compressed bio-methane (bio-CNG);
- carbon dioxide (CO_2);

- electricity (green);
- organic fertilisers (pelleted); and
- water.

4.10 The adjacent Roadstone Killough Quarry plant will utilise the electricity, bio-methane and water generated by the proposed development. Pelletised fertiliser will be available for supply to local agriculture and traders off-site. CNG and CO_2 will be pressurised and stored for ongoing draw-off by tankers to points of re-use off-site.

4.11 Further information on the proposed development, site activities, environmental management systems and controls at the application site are provided in Chapter 2 of this EIAR.

4.12 The application site is situated within the townland of Gaile, and within the Electoral Division of Gaile Co. Tipperary, see **Figure 4-2**.

Scope of Work

4.13 The EPA guidelines in relation to the preparation of EIAR[1] note the following in respect of population and human health:

- assessment of land-use planning and demographic issues or detailed socio-economic analysis is not generally required;
- economic development or settlement patterns are only relevant if they give rise to new development and associated effects;
- human health should be considered in the context of the relevant environmental topics addressed by the EIAR;
- the effects on human health via relevant pathways (such as air and water) should be considered in the context of accepted standards for exposure, dose or risk; and
- other health and safety issues are addressed under other EU directives.

4.14 This chapter of the EIAR has considered all of the above items in relation to population, employment, amenity and human health.

4.15 The Institute of Environmental Management and Assessment (IEMA) issued two guidance documents in 2022 on the assessment of human health within EIA as follows:

- Effective Scoping of Human Health in EIA; and
- Determining Significance for Human Health in EIA.

4.16 Section 1.11 of the IEMA Guidance on the Effective Scoping of Human Health in EIA recommends that if there is not potential for likely significant population effect, human health should be scoped out of the EIA. The guidance makes clear that the topics of population and human health are separate technical topics. The assessment of socio-economic conditions addressed through the topic of 'Population' provides baseline information on which an assessment of sensitivity of human health can be made, therefore it is considered appropriate that both topics are covered within this chapter.

4.17 **Table 4-1** of this chapter sets out an initial review of the wider determinants of health identified within the guidance on scoping of human health and how these have the potential

[1] Environmental Protection Agency (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.* Environmental Protection Agency, Johnstown Castle Estate, Co. Wexford.

to be impacted by the proposed development. The initial assessment within **Table 4-1** provides a framework in order to focus the assessment of human health impacts on areas of most relevance.

4.18 This Chapter of the EIAR presents baseline information on population (including employment, amenity and community resources) and assesses likely impacts as a result of the proposed development. This facilitates an assessment of the potential impacts on human health where there is a potential for this to be impacted as identified within **Table 4-1.**

Table 4-1: Wider Determinants of Health and Proposed Development

Categories	Wider Determinants of Health	Commentary
Health related behaviours	Physical activity	No changes likely as a result of proposed development
	Risk taking behaviour	No changes likely as a result of proposed development
	Diet and nutrition	No changes likely as a result of proposed development
Social environment	Housing	No changes likely as a result of proposed development
	Relocation	Not relevant, no relocation proposed
	Open space, leisure and play	No changes likely as a result of proposed development
	Transport modes, access and connections	No changes likely as a result of proposed development, using existing accesses/routes
	Community Safety	No changes likely, boundaries of application site will continue to be kept secure
	Community identity, culture, resilience and influence	No changes likely, proposed development is activity that is in keeping with existing activity at site
	Social participation, interaction and support	Not relevant to application site/proposed development
Economic environment	Education and training	Not relevant to application site/proposed development
	Employment and income	Proposed development will be a source of small-scale and long-term employment within the local area
Bio-physical environment	Climate change mitigation and adaptation	Supports transition to renewable energy
	Air quality	Potential for air quality impacts from HGV use and dust/odour from activities on site
	Water quality or availability	Potential for contaminants in, run-off to, impact on surface water and/or groundwater
	Land quality	No changes likely as a result of proposed development
	Noise and vibration	Potential for impacts from site activities
	Radiation	Potential exposure to radon gas

Categories	Wider Determinants of Health	Commentary
Institutional and built environment	Health and social care services	No changes likely as a result of proposed development
	Built environment	No changes likely as a result of proposed development
	Wider societal infrastructure and resources	New technology development to tackle the requirements of a switch to carbon neutral

Consultations

4.19 An initial pre-planning consultation meeting was held between officials of Tipperary County Council, the Applicant and their representatives on 20 November 2023.

4.20 In addition, an exercise was undertaken to identify potentially interested stakeholder organisations and a pre-planning consultation document was issued for their feedback in October 2024. Details of those consulted and feedback obtained is contained in Chapter 1 of this EIAR.

4.21 Feedback of most relevance to the assessment of population and human health was received from the following:

- Health and Safety Authority (HSA), which highlighted the need to consider whether the project would come within the scope of the Control of Major Accident Hazard Regulations 2015.

4.22 A public consultation exercise was undertaken in June 2024. Letters were sent to a total of 89 local residents (dated 10 June 2024), advising of the upcoming planning application and notice of an information drop-in session to be held between 4pm and 8pm at the Horse and Jockey Hotel on 25 June 2024. The letter drop covered all residences within 1500m along with additional residences between 1500m and 2km to the northwest, southwest and east.

4.23 The event was advertised in the local newspaper, the Tipperary Star, on two consecutive weeks (13 June 2024 and 20 June 2024) in advance of the event.

4.24 Details of the proposed development were available to view at the public event, and Roadstone personnel and their planning advisors were present to address any questions. Anybody with any observations or feedback were invited to submit same either in person at the public information session or via email to info@roadstone.ie up until 26 July 2024.

4.25 Below is an outline of some of the key issues and concerns raised in respect of the proposed development in the course of the public consultation event.

Table 4-2: Concerns raised during Public Consultation

Issue Arising	Detail of Concern
Traffic & Road Infrastructure	• Number of HGV's the new development would generate, and existing HGV numbers associated with the quarry • Local roads being too narrow, and which already accommodate quarry traffic and difficulty to pass HGVs. Some existing HGV traffic using areas outside dwelling entrances as passing bays • Operating times of HGV accessing the site. Reports that some HGVs arrive at the gate outside of permitted hours • Safety concerns about walking, cycling on the local roads and existing HGV drivers giving very little respect to residents • Clarification requested re traffic routes for the extra HGVs

Issue Arising	Detail of Concern
Potential Odour	• What feedstock materials are being transported to the site • How will the smells / odours be controlled during feedstock transport and on site during the plant operation • How will the odours be monitored and by whom • Concerns that there will be methane odours • All buildings to be enclosed • Concerns that Roadstone won't control the plant and therefore have no accountability if there is an issue/complaint - who is accountable?
Water Management	• Most people on local wells and will they be affected • Concerns that Roadstone won't control the plant and therefore have no accountability if there is an issue/complaint - who will be accountable? • Concern raised by one individual 400m from the quarry for his well, which was contaminated with diesel some years back
Feedstock	• Queries raised on the types of feedstock - would any animal waste / human sewerage be used in the facility • Would the supply of agricultural feedstock - silage / maize impact on land values and compete with existing agricultural enterprises • How would feedstock be delivered to the plant - from individual farms or hubs
Visual Impact	• Concerns raised over the visual impact of the existing concrete plant and the proposed new plant • Height of the plant compared to the existing concrete plant
Safety	• Potential risk of gas explosions arising from gas storage at the plant • Potential impact of blasting operations in the quarry on the plant operation
Plant Operation	• Concern raised that Roadstone won't operate the plant / no accountability if problems arise • First plant of this type in Ireland - a number of attendees requested examples of similar plants that are currently in operation in Ireland or elsewhere • Will the proposed plant capacity be extended further at any future date (with further increase in traffic)? • A number of attendees requested written commitment from Roadstone regarding the operation of the plant (no odour etc.)
Public Consultation	• A number of attendees requested advance notice of when the planning application is going to be submitted. • Interest in the proposed timeline for the planning application and plant construction / operation • The question of further public consultation was raised by a number of attendees • A number of attendees complained the event wasn't properly advertised and they received no notification

4.26 The issues raised above have been addressed within the relevant chapters of the EIAR (and their technical appendices, as appropriate). Their relationship with the local population and human health is cross referenced in the relevant sections of this chapter.

Contributors / Authors

4.27 This chapter of the EIAR was prepared by Lynn Hassett who is an EIA co-ordinator with a BSc in Applied Ecology (2000) and a MSc in Environmental Impact Assessment (2001). She has over 16 years of experience of EIA across the not-for-profit, public and private sectors in the UK and Ireland. She has worked on both the review of EIA on behalf of planning authorities assessing applications and in the production of them to support planning applications being lodged. She is a Practitioner member of the Institute of Environmental Management and Assessment, which she is a member of since 2001. She is also a Full Member of the Institution of Environmental Sciences, which she joined in 2023.

4.28 She has worked on numerous urban development, extractive industry and renewable energy planning applications and EIARs. She has experience in both the project management of EIA as well as preparation of generalist assessments such as Population and Human Health, Material Assets and Major Accidents and Natural Disasters.

Limitations / Difficulties Encountered

4.29 No limitations or difficulties were encountered in the preparation of this chapter of the EIAR.

Regulatory Background

Legislation

4.30 There is no specific legislation relevant to this chapter of the EIAR. Legislation that is relevant to each pathway (noise, air, water, etc.) is addressed elsewhere in this EIAR. However, the framework of information provided within this chapter is informed by:

- Section 37D and 171A of the Planning and Development Act, 2000 (as amended);
- Section 94 and Schedule 6 of the Planning and Development Regulations, 2001 (as amended); and
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

Guidance and Technical Standards

4.31 This chapter of the EIAR has been prepared on the basis of the Guidelines on the Information to be contained in Environmental Impact Assessment Reports by the EPA (2022) and the two Institute of Environmental Management and Assessment (IEMA) 2022 guidance documents on the assessment of human health within EIA. The IEMA guidance emphasises that assessment should consider complete physical, mental, and social well-being and not focus only on health in terms of the absence of disease.

4.32 There are no technical standards relevant to this chapter of the EIAR. Technical standards, if any, that are relevant to each pathway (noise, air, water, etc.) are addressed elsewhere in this EIAR.

4.33 The framework for human health protection is predominantly set out within World Health Organisation (WHO) Guidelines and Limits.

4.34 The WHO works worldwide to promote health, keep the world safe, and serve the vulnerable. Their goal is to ensure that a billion more people have universal health coverage, to protect a billion more people from health emergencies, and provide a further billion people with better health and well-being. It has a wide remit, from setting limits to

prevent danger to human health, to providing responses to health emergencies, and promoting health and wellbeing.

4.35 The Institute of Public Health (IPH) is an organisation that informs public policy to promote health and wellbeing and reduce health inequalities in Ireland and Northern Ireland. It has previously provided comments on draft legislation on EIA and has been represented on the working group for the IEMA guidance on human health in EIA. It has its own guidance on stand-alone Health Impact Assessments[2] (HIAs), however, the guidance is clear that EIA does not have to adopt all the HIA methods and tools. The IPH set its Strategic Objectives 2020-2025 in order to be able to fulfil its role to its best potential in informing public health policy. The Institute supports the national implementation of the UN Sustainable Development Goals, including SDG3, which focuses on good health and wellbeing. Taking opportunities to enhance wellbeing is a common thread in the IPH and IEMA guidance on human health assessment.

4.36 There is no policy or validation requirement to undertake HIA for the proposed development, therefore this chapter of the EIA aligns to HIA principles, as identified in the IPH Guidelines, including considering wider determinants of health, considering existing inequalities of health and encouraging stakeholder engagement.

4.37 The Healthy Ireland Framework was launched by the Irish Government in 2013, with a focus to deliver a vision where 'everyone can enjoy physical and mental health and wellbeing to their full potential, where wellbeing is valued and supported at every level of society and is everyone's responsibility'. The Healthy Ireland Strategic Action Plan 2021-2025 identifies 6 themes to deliver the vision and identifies relevant government departments as well as specific implementation actions. A network of Healthy Cities and Counties (including one for Tipperary) is intended to be developed to deliver the Framework at a local level. One of the commitments within the Strategic Action Plan is to publish a Healthy Cities and Counties Strategic Development Plan.

4.38 The Healthy Ireland Framework is delivered within each local authority area through the Local Community Development Committee (LCDC), which also has the responsibility for creating a Local Economic and Community Plan every six years. In Tipperary, the Healthy Tipperary Strategy 2018-2020 is supported by a dedicated Healthy Tipperary Co-ordinator and is overseen by the Healthy Tipperary Steering Group which consists of partner organisations across the county and chaired by the HSE. Various health and wellbeing programmes and events are organised across the county under the framework, which is also supported by Tipperary Libraries. Details of events are posted on the council website and various social media platforms.

Tipperary County Council Planning Policy

4.39 The development of a sustainable rural economy based on agriculture, the bioeconomy and renewable energy production is highlighted at the beginning of the Tipperary County Council (TCC) County Development Plan (CDP) 2022-2028 (abbreviated in this EIAR to TCDP) as uniquely important to Tipperary.

4.40 Chapter 10 (Section 10.6) recognises the potential of the county to support the bioeconomy and produce bioenergy through its agriculture section, including anaerobic digestion technologies. Planning Objective 10-E specifically aims to:

"*Support the diversification of the agriculture sector as part of decarbonisation, and its role in energy production, including anaerobic digestion and green gas production*".

[2] https://www.publichealth.ie/reports/health-impact-assessment-guidance-manual

The potential of the bio-economy sector to foster local employment is also acknowledged, as it is explained that many of the inputs for the bioeconomy are sourced nationally, hence it has a greater impact compared to other areas of the economy that are more reliant on imports.

4.41 Section 3.4.2 acknowledges the importance of agriculture as part of the rural economy, and its importance in carbon capture, and states that national programmes for sustainable agriculture will be supported as a key component in a sustainable and low-carbon economy.

4.42 Planning Objective 3-E aims to:

"*Support, in collaboration with stakeholders, research and innovation in smart renewable energy technologies and initiatives to accelerate diversification away from fossil fuels*".

4.43 Section 2.5.6 of the TCDP 2022-2028 acknowledges the inter-reliance between communities and the benefits provided by the County's natural environment assets, such as flood and climate regulation, recreation, culture, quality of life as well as the tourism economy.

4.44 It is stated in Planning Objective 6-B that the TCDP 2022-2028 is intended to implement the Healthy Tipperary Strategy 2018-2020, the goals of which include:

- Increase the proportion of people who are healthy at all stages of life;
- Reduce health inequalities;
- Protect the public from threats to health and wellbeing; and
- Create an environment where every individual and sector of society can play their part in achieving a healthy Ireland.

4.45 Planning Policy 11-1 specifically states:

"*In assessing proposals for new development to balance the need for new development with the protection and enhancement of the natural environment and human health. In line with the provisions of Article 6(3) and Article 6 (4) of the Habitats Directive, no plans, programmes, etc. or projects giving rise to significant cumulative, direct, indirect or secondary impacts on European sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects)*[3]".

4.46 The purpose of this EIAR assessment is to ensure this balance between the natural environment and human health is achieved.

4.47 Appendix 2 of the TCDP 2022-2028 is the Renewable Energy Strategy for the County. Section 4.2.1 identifies anaerobic digestion as a type of renewable bio-energy technology that is commercially available in the County, with one commercial scale facility already in existence at the Moyne Energy Park. There has been little investment in such facilities at a farm level in Tipperary.

4.48 Section 6.4 of the Renewable Energy Strategy identifies the potential for community benefits from renewable energy development. Policy RE3 states that:

"*It is the policy of the Council to support and facilitate renewable energy proposals that bring about a direct socio-economic benefit to the local community. The Council will engage with local communities and stakeholders in energy and encourage developers to work with local*

[3] Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be: a) no alternative solution available, b) imperative reasons of overriding public interest for the project to proceed; and c) Adequate compensatory measures in place

communities to identify how they can invest in/gain from significant renewable energy development".

4.49 Section 6.6 sets out the policies and objectives for bioenergy in the County. TCC encourages the sustainable development of the bio-energy sector in the county due to the positive contribution it can make to the economy and to the achievement of renewable energy targets. The multiple contributors to the industry are acknowledged, such as forestry, agriculture, waste recovery, research funding and business development, as is its contribution to the circular economy.

Methodology

Desk Based Research

4.50 The baseline study comprises a desk-top review of online and published resources, information provided by the applicant and information contained in the other chapters of this EIAR. A review of existing residential housing and sensitive receptors in the vicinity of the application site was undertaken. Ordnance Survey maps and aerial photography were also examined.

Sources of Information

4.51 Baseline information was obtained from the following sources:

- Myplan.ie (http://myplan.ie/index.html);
- Historic Environment Viewer (http://webgis.archaeology.ie/historicenvironment/);
- Tipperary County Development Plan 2022-2028;
- The environmental topic chapters of this EIAR;
- Tailte Éireann Maps;
- Aerial Photographs;
- Live Register statistics; and
- CSO SAP map data.

Study Area

4.52 The study area relates to the vicinity of the application site and to those dwellings in the vicinity of the application site and has been defined generally as a c. 1 km buffer radius from the application site boundary. Although population and human health effects would not expect to be experienced at a 1 km distance from the development, the radius has been selected to facilitate a conservative assessment and to ensure that a range of community services and facilities representative of the local area were included.

4.53 Local residences and other potentially sensitive receptors within and slightly beyond the 1km Study Area are indicated on **Figure 4-1**. Residential development within the general area consists of isolated private residential property and agriculture farms located throughout the surrounding rural landscape, predominantly along the local road network. There are c. 22 residences located within c. 1km of the red line application boundary, of which c. 12 residences are located within 500m. Gaile national school is located c. 1.4km west of the site. The designated national monument of Ballytarsna Castle is situated c. 1.3km east of the site. It is a 15th century fortified tower house, which was restored for residential use at the beginning of this century.

4.54 Demographic data has been sourced from the Central Statistics Office (CSO)'s Census of Ireland publicly available records[4]. The demographic data for the Study Area is taken as the Gaile ED, within which the majority of the Study Area is situated, as shown on **Figure 4-2** of this chapter.

Assessment of Significance of Impacts

4.55 The EPA (2022) EIAR Guidelines provide advice to EIA practitioners on undertaking clear and proportional assessments to ensure that concentration is focused on the likely significant effects. They state that significance of effects is usually understood to mean the importance of the outcome of the effects (the consequences of the change). Significance is determined by a combination of (objective) scientific and subjective (social) concerns.

4.56 It is also acknowledged that while guidelines and standards help ensure consistency, the professional judgement of competent experts can play an important role in the determination of significance. In order to assist EIA practitioners in attributing levels of significance where there is an absence of topic specific guidance, the Guidelines suggest the definitions set out in **Table 4-3**.

Table 4-3 Definitions of Significance suggested by EPA (2022) EIAR Guidelines

Level of Significance	Suggested Definition
Imperceptible	An effect capable of measurement but without significant consequences
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant Effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment
Profound	An effect which obliterates sensitive characteristics

4.57 As stated in the IEMA (2022) 'Determining Significance for Human Health in EIA' guidance, the assessment of significance relies on informed experts' judgements about what is important, desirable or acceptable with regards to changes triggered by the project in question. These judgements are relative and must always be understood in their context.

4.58 EIA commonly uses a significance matrix framework, which is based on assigned sensitivity to receptors assessed against a predicted magnitude of change in order to determine if an effect is significant. The definitions for 'Sensitivity' and 'Magnitude' for this assessment are based on these IEMA Guidelines and are identified in **Table 4-4** and **Table 4-5** below.

[4] https://visual.cso.ie/?body=entity/ima/cop/2022

Table 4-4 Population and Health Sensitivity Criteria (IEMA, 2022)

Category / Level	Indicative criteria
High	High levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the project); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependants; people with very poor health status; and/or people with a very low capacity to adapt
Medium	Moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt
Low	Low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt
Very Low	Very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependant); people with good health status; and/or people with a very high capacity to adapt

4.59 The baseline assessment of population and human health is used to assess a level of sensitivity of the receptors identified.

Table 4-5 Population and Health Magnitude Criteria (IEMA 2022)

Category / Level	Indicative criteria
High	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/ injury outcomes; majority of population affected; permanent change; substantial service quality implications
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications
Low	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications
Negligible	Negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication

4.60 Based on the above indicative criteria for assessing the sensitivity and magnitude of population and human health impacts, the IEMA (2022) Guidelines propose a generic indicative EIA significance matrix as set out in **Table 4-6** below.

Table 4-6 Generic indicative EIA significance matrix (IEMA 2022)

		Sensitivity			
		High	**Medium**	**Low**	**Very Low**
Magnitude	**High**	Major	Major/moderate	Moderate/minor	Minor/negligible
	Medium	Major/moderate	Moderate	Minor	Minor/negligible
	Low	Moderate/minor	Minor	Minor	Negligible
	Negligible	Minor/negligible	Minor/negligible	Negligible	Negligible

4.61 A combination of the above sources of guidance, along with the acknowledged requirement for professional judgement, is applied to the information set out within this chapter to enable an assessment of potential significant effects to arise from the proposed development.

Receiving Environment

Site Location

4.62 The application site is approximately 3.5km and 6.5km south of Holycross and Thurles respectively. It is located wholly within the townland of Gaile, Holycross, Co. Tipperary, and within the existing footprint of the Killough quarry development, owned and operated by Roadstone Limited, refer to EIAR **Figure 2-1**. The quarry has been in operation since the 1950's.

4.63 The proposed bio-renewables production facility compound will cover an area of c. 4 hectares at the southwest corner of the existing quarry.

Site and Surroundings

4.64 Beyond the application site, the overall Roadstone landholding (c. 108.3 hectares) encompasses a large portion of Killough Hill, a limestone escarpment which lies within the otherwise flat plain stretching several kilometres to the east and west of the River Suir. The north slope of the hill is steep whilst the southern side, and application area is a gentle slope.

4.65 The land immediately surrounding Killough Hill lies at levels of between 110 and 120m AOD. Over a distance of 3.5km to the west of the hill the land falls very gently towards the River Suir to levels just under 80m AOD. Killough Hill which reaches a maximum height of approximately 215m is the only noticeable highpoint within the general area.

4.66 The existing main extraction void of the quarry at Killough Hill covers approximately the southern three quarters of the hill. To the immediate northwest, north and east of the void, the land slopes fairly steeply towards the surrounding plain, covering a height difference of between 50-80m over a distance of less than 200m. These steep slopes are covered by conifer and mixed woodland. To the immediate southeast and south of the void the land slopes slightly less steeply and is made up from pasture as well as some woodland scrub areas. To the immediate southwest of the void the quarry processing facilities are located at levels between 140m AOD and 170m AOD.

4.67 The flat landscape surrounding Killough Hill is almost exclusively made up from agricultural land (mostly pasture interspersed with some arable fields). The fields, which are usually enclosed by hedgerows, are also variable in size.

4.68 The main transport route within the area is the M8 motorway, approximately 2.5km to the southeast of the site. There are also a number regional routes in the area, the R659 and R660, east and south of Holycross respectively; and the R639, the former N8, just east of the

M8). Access from the site to the primary road network is via c. 2.5 km of local road onto the M8 Motorway between Urlingford and Cashel.

Population and Age Profile

4.69 The change in population from 2016 to 2022, as per Census 2022[5] for the Gaile ED, the County and the State are outlined in **Table 4-7**.

Table 4-7: Population Trends 2016 – 2022 (CSO, 2016 and 2022)

	2016	2022	% Change
Study Area (Gaile ED)	746	768	2.9%
County Tipperary	159,553	167,895	5.2%
Ireland	4,757,976	5,149,139	8.2%

4.70 The census results indicate that the population has increased in the Gaile Electoral Division, area, albeit at a lower rate than that observed at the county and (in particular) the national level.

4.71 **Table 4-8** shows the age profile across Gaile ED, the County and the State, which suggests that there is a higher proportion of individuals over the age of 65 residing in Gaile ED (20.3% of residents) compared to the proportion at County (17.5%) and State (15.1%) level.

4.72 There is a slightly higher proportion of individuals under the age of 15 residing in Gaile ED (20.6%) compared to the proportion at County (19.8%) and State (19.7%) level.

4.73 Converse to this, there is a lower proportion of residents between the ages of 15 and 64 potentially available for work in the Gaile ED (59.1%) than in the County (62.7%) and the State (65.3%).

Table 4-8: Age Profile within Gaile ED, County Tipperary and the State (CSO, 2022)

	Gaile ED		Co. Tipperary		Ireland	
	No.	%	No.	%	No.	%
Age 0-4	59	7.7%	9,696	5.8%	295,415	5.7%
Age 5-9	47	6.1%	11,089	6.6%	342,670	6.7%
Age 10-14	52	6.8%	12,501	7.4%	374,202	7.3%
Age 15-19	39	5.1%	11,107	6.6%	337,628	6.6%
Age 20-24	30	3.9%	8,765	5.2%	307,143	6.0%
Age 25-29	46	6.0%	7,895	4.7%	295,808	5.7%
Age 30-34	45	5.9%	9,125	5.4%	332,223	6.5%
Age 35-39	45	5.9%	11,216	6.7%	382,869	7.4%
Age 40-44	55	7.2%	12,551	7.5%	411,524	8.0%
Age 45-49	48	6.3%	12,186	7.3%	373,504	7.3%
Age 50-54	43	5.6%	11,386	6.8%	340,003	6.6%
Age 55-59	57	7.4%	11,057	6.6%	307,165	6.0%

[5] http://census.cso.ie/sapmap/

	Gaile ED		Co. Tipperary		Ireland	
	No.	%	No.	%	No.	%
Age 60-64	46	6.0%	9,965	5.9%	272,670	5.3%
Age 65-69	41	5.3%	8,974	5.3%	238,144	4.6%
Age 70-74	33	4.3%	7,636	4.5%	202,884	3.9%
Age 75-79	26	3.4%	5,862	3.5%	154,260	3.0%
Age 80-84	19	2.5%	3,617	2.2%	96,586	1.9%
Age 85+	37	4.8%	3,267	1.9%	84,441	1.6%
Total	768	100.0%	167,895	100.0%	5,149,139	100.0%

Employment

4.74 **Table 4-9** below provides a breakdown of employment status in the latest Census period of 2022 within the ED, County and State.

4.75 The proportion of residents at work in the ED was higher than the proportion at County level and equivalent to that at State level. Gaile ED and County Tipperary both had lower unemployment rates overall than that recorded across Ireland as a whole. Proportions of residents with disabilities were in line with County and State figures. Of most note is the higher proportion of the population recorded as 'retired' in comparison to the County and State, but a lower level of students and those looking for their first job.

4.76 The CSO's Quarterly Labour Force Survey for Q3 2024[6] reflects a positive situation in relation to the national economy, with a 1% increase in employment rates and a 0.2% drop in unemployment rates from the previous 12 months. Over half of youths (15-24 yrs) were recorded as in employment for first time since Q4 2008. The positive situation is reflected in the figures for the Southern region, which showed a 2.5% overall increase in employment and an 8.6% decrease in unemployment figures between Q2 and Q3 2024.

4.77 The ESRI Quarterly Economic Commentary for Autumn 2024[7] is also very positive about the economic outlook, predicting a robust pace of growth this year and next.

4.78 The drop in the unemployment rate is described as remarkable given the significant increase in population which is currently being experienced in the country.

4.79 The closest Social Welfare Offices to the application site are in Thurles and Cashel towns. Live register data[8] for those offices indicate the general trend for decreasing unemployment since recessionary lows of 2011/2012 (for example in Thurles, a total of 1,237 in October 2024 compared to 3,427 in August 2011 and in Cashel a total of 381 in October 2024, compared with 1,252 in August 2011).

Table 4-9: Employment Status in ED, County and State according to 2022 Census

Status	Gaile ED		Co. Tipperary		Ireland	
	No.	**%**	**No.**	**%**	**No.**	**%**
At work	342	56.1%	73,207	54.4%	2,320,297	56.1%
Looking for first regular job	2	0.3%	927	0.7%	34,526	0.8%

[6] https://www.cso.ie/en/releasesandpublications/ep/p-lfs/labourforcesurveyquarter32024/
[7] https://www.esri.ie/publications/quarterly-economic-commentary-autumn-2024
[8] https://data.cso.ie/

Status	Gaile ED		Co. Tipperary		Ireland	
Short-term unemployed	9	1.5%	1,926	1.4%	70,217	1.7%
Long-term unemployed	14	2.3%	3,265	2.4%	106,059	2.6%
Student	43	7.0%	13,631	10.1%	459,275	11.1%
Looking after home/family	43	7.0%	9,368	7.0%	272,318	6.6%
Retired	131	21.5%	24,015	17.8%	657,790	15.9%
Unable to work due to permanent sickness or disability	20	3.3%	7,572	5.6%	189,308	4.6%
Other	6	1.0%	698	0.5%	27,062	0.7%
Total	610	100.0%	134,609	100.0%	4,136,852	100.0%

4.80 The population of Gaile ED compared with that within Tipperary County and the State is categorised by occupation as per **Table 4-10**.

4.81 The table shows that the population within the ED has a higher proportion of professional occupations, skilled trade occupations and process, plant and machine operatives than at the County and State level. There appears to be less reliance on associate professionals / technical operations and sales / customer service employment in the local area compared to the County and State.

Table 4-10: Population of ED, County and State by Occupation (2022)

Occupation	Gaile ED		Co. Tipperary		State	
	No.	**%**	**No.**	**%**	**No.**	**%**
Managers, Directors and Senior Officials	21	5.8%	5,216	6.7%	192,679	7.7%
Professional Occupations	84	23.0%	12,728	16.2%	507,044	20.3%
Associate Professional and Technical Occupations	29	7.9%	7,157	9.1%	292,273	11.7%
Administrative and Secretarial Occupations	32	8.8%	6,731	8.6%	229,737	9.2%
Skilled Trades Occupations	69	18.9%	13,897	17.7%	313,921	12.6%
Caring, Leisure and Other Service Occupations	28	7.7%	6,780	8.6%	183,584	7.4%
Sales and Customer Service Occupations	12	3.3%	4,692	6.0%	154,238	6.2%
Process, Plant and Machine Operatives	38	10.4%	7,462	9.5%	172,521	6.9%
Elementary Occupations	32	8.8%	6,802	8.7%	203,532	8.2%
Not stated	20	5.5%	6,933	8.8%	247,044	9.9%

Occupation	Gaile ED		Co. Tipperary		State	
Total	365	100.0%	78,398	100.0%	2,496,573	100.0%

4.82 The population of Gaile ED compared with that within Tipperary County and the State is categorised by industry sector employment as per **Table 4-11**. The table supports the status of Tipperary County as an area with a heavy reliance on agriculture as described in the TCDP. Similarly, the Gaile ED has a much higher proportion of residents reliant on agriculture, forestry and fishing in comparison with the State situation. **Table 4-11** also indicates a heavy reliance on the building and construction industry for residents of the ED, with less of a reliance on manufacturing industries. There is also a higher proportion of residents than that within the County and State recorded as working in the public administration and professional services industries.

Table 4-11: Persons at work in ED, County and the State by Industry (2022)

Industry	Gaile ED		Co. Tipperary		State	
	No.	**%**	**No.**	**%**	**No.**	**%**
Agriculture, forestry and fishing	29	8.5%	6,454	8.8%	82,228	3.5%
Building and construction	32	9.4%	4,540	6.2%	134,482	5.8%
Manufacturing industries	33	9.6%	11,472	15.7%	273,102	11.8%
Commerce and trade	68	19.9%	14,720	20.1%	552,642	23.8%
Transport and communications	15	4.4%	3,804	5.2%	212,383	9.2%
Public administration	31	9.1%	4,425	6.0%	131,639	5.7%
Professional services	94	27.5%	17,638	24.1%	568,105	24.5%
Other	40	11.7%	10,154	13.9%	365,716	15.8%
Total	342	100.0%	39,934	100.0%	2,320,297	100.0%

Economic Activities including Agriculture and Tourism

4.83 Tipperary is one of the most central and accessible counties in Ireland, with strategic transport links to Limerick, Waterford, Cork and Dublin, international airports, ports, academic and employment opportunities.

4.84 County Tipperary is also home to a number of nationally renowned visitor attractions including cultural resources such as the Rock of Cashel and the Brú Boru Cultural Centre, and natural resources such as the county mountains and uplands, Mitchelstown Caves, Lough Derg, and the river Suir. Fáilte Ireland has recognised Lough Derg and the Munster Vales (the Galtee, Knockmealdown and Comeragh Mountain Ranges) as unique and distinctive experiences. Tipperary is also included in 'Ireland's Ancient East'; part of a wider destination brand to promote tourism opportunities across the east coast and parts of the midlands and south coasts, based on ancient and cultural heritage features.

4.85 According to the 'Strategic Tourism Marketing, Experience and Destination Development Plan 2016 - 2021'[9], Tipperary attracts over 300,000 visitors annually, with slightly more overseas visitors than domestic.

4.86 The Tipperary County Development Plan 2022-2028 highlights that Tipperary is located within two Fáilte Ireland destination proposition brands, 'Irelands Ancient East' and 'Irelands Hidden Heartlands'. It is stated that Fáilte Ireland has already invested significantly in key towns such as Cashel and Clonmel, and in initiatives and amenities in the County such as the Cashel Town Plan, Tipperary Museum of Hidden History, and various Destination Development Plans (DEDPs). The tourism economy of the county is significantly supported by exciting and multi-faceted tourism destination propositions, including the 'Shannon Tourism Masterplan', 'Discover Lough Derg', and 'Munster Vales', and unique flagship products including the Suir Blueway Tipperary, the Beara Breifne Way, and the Butler Trail. It is further stated that the tourism experience that Tipperary offers is built on its natural, social, and cultural assets. It is a key function of the Plan to protect, support and grow these assets in a plan-led manner in collaboration with stakeholders with incorporation of the principles of 'Responsible Tourism' as part of the county's overall strategy for tourism. A 'Destination Recovery Taskforce' has been established to co-ordinate the recovery of the sector within the area following the disruption of Covid-19.

4.87 With respect to the Tipperary Tourism Strategy the Plan references the 'Tipperary Transforming - Tourism Product Development Plan 2020 - 2030', a 10-year vision statement for tourism development which aims to support the 'Strategic Tourism Marketing, Experience and Destination Development Plan 2016-2021'. 19 concepts are listed in 'Tipperary Transforming'; these concepts are to be further developed, subject to feasibility, to transform Tipperary as a tourism destination.

4.88 One of the closest visitor attractions to the application site is Holycross Abbey, a restored 12th century Cistercian abbey which is located c. 3.5 km northwest and is open to guided tours. EIAR Chapter 12 provides further details on culturally significant features surrounding the application site, and Chapter 13 provides further details on local hiking / cycling trails through natural landscape attractions.

4.89 The Equine industry has also been identified as a unique selling point and economic speciality for Tipperary. Fáilte Ireland recently developed a 'Thoroughbred Country Destination Development Plan', which is supported by Tipperary and Kildare County Councils, and the racing industry. Plans are currently in development to develop a 'Thoroughbred Trail' of experiences across the county leveraging significant development planned at Tipperary Racecourse, Limerick Junction. Tipperary Racecourse, in conjunction with Horse Racing Ireland, has begun the process of developing the racecourse at Limerick Junction into an equine centre of excellence, providing community amenities and developing the facility as a tourism resource.

4.90 As mentioned previously, the TCDP heavily references the strong role of agriculture in the economic fabric of the County in general. The County is located within an area known as Ireland's 'Golden Vale'; an area considered the best in the country for dairy farming. Section 8.4 of the Plan states that Tipperary is internationally renowned for its agriculture, horticulture and bloodstock industry. In relation to equine in particular, Section 8.4.2 of the Plan states that "*the Council will seek to ensure that the vitality and viability of the equine industry is maintained through the appropriate management of the rural environment on which the equine industry is reliant*".

4.91 This reliance on the agricultural and equine sectors of the economy is very evident in the local surrounds of the application site, comprising numerous agricultural holdings of varying

[9] Prepared for Tipperary County Council in 2016

scales. The historical Killough Castle dating from the 1400s is an example of a large arable and pasture farm holding directly to the north of Killough Quarry. There is also a substantial equine farm directly to the southeast of the Roadstone Limited landholding at the quarry.

4.92 Killough Quarry, within which the application site itself is located, is an important economic asset in the County and has been in operation since the 1950's. Material extracted from the quarry area is used to produce value added asphalt, concrete, limestone and agricultural lime which are commercially desirable products. It currently provides employment for c. 54 people (directly and indirectly).

Community Infrastructure

4.93 The application site is located in a remote area, with the closest village being Holycross, c. 3.5 km to the northwest. Holycross is the closest social and cultural hub for those living in the area surrounding the application site. It is set on the River Suir hosts basic services including a primary school, grocery store, post office, mass at the abbey, community centre, garda station, craft store and a small number of bar / restaurants. The grounds of the local GAA club (Holycross/Ballycahill) are located to the north of the village.

4.94 A further range of services is provided in the surrounding towns of Thurles (6.5 km to the north) and Cashel (c. 9.5 km south) with facilities including pharmacies, HSE health centres, fire stations, secondary schools, etc. The nearest hospital with an A&E department in the county is at Clonmel, c. 28 km to the south. As is typical in rural areas, there are various enterprises, smaller community HSE and private healthcare services interspersed in the region.

Indices of Deprivation

4.95 Pobal is an organisation that works on behalf of Government to support communities and local agencies toward achieving social inclusion and development. The organisation produces mapping information[10] including on deprivation indices in order to identify areas in need of social/community investment. The overall levels of deprivation have been based on census data in relation to demographic profile, social class composition and labour market situation. According to the deprivation indices based on 2022 census data, Gaile ED is categorised as marginally below average (i.e. slightly disadvantaged).

General Health

4.96 **Table 4-12** presents the results of the 2022 census in relation to the self-reported health status of Gaile ED, County Tipperary and State residents.

Table 4-12: Self-reported Health Status at ED, County and State level (2022)

Area	Very Good	Good	Fair	Bad	Very Bad	Not Stated
Gaile ED	47.7%	35.8%	11.8%	0.7%	0.3%	3.8%
Co. Tipperary	52.2%	31.0%	9.6%	1.6%	0.4%	5.2%
State	53.2%	29.7%	8.6%	1.4%	0.3%	6.7%

4.97 The information presented in **Table 4-12** suggests that there is no particular vulnerability in health terms in the local area with 83.5% of respondents classifying their health as either very good or good, which is higher than the 83.2% at County and 82.9% at State level.

[10] https://data.pobal.ie/portal/apps/experiencebuilder/experience/?id=3b0acba7eb694ffa85340a60f81d516c

0.9% of Gaile ED residents reported their health status as bad or very bad, compared with 1.9% in County Tipperary and 1.7% in Ireland.

Radon

4.98 The application site is in an area mapped by the EPA[11] as being within the '1 in 5 homes likely to have high radon levels' risk category, and within an area where legal requirements for radon testing of workplaces are in place.

Sensitive Receptors

4.99 The above analysis of publicly accessible data in relation to the local environment and demographics is used to establish an overall summary of the sensitivity of the local community.

4.100 The area is sparsely populated, with c. 22 residences located within c. 1km of the red line application boundary, of which 12 residences are located within 500m. From a review of the live register data at the closest social welfare offices it can be inferred that unemployment rates have been steadily declining in line with wider county and national trends.

4.101 Analysis of the age profile in the Study Area would suggest that there is a lower proportion of those residents available for work but a higher proportion of under 15s and over 65s, therefore more likely to be based at home during the day. The Pobal deprivation description for the Study Area is 'marginally below average'. It would appear that the employment opportunities offered by the proposed development are in line with the requirements of the local workforce and their current industry experience. Community services appear to be in line with typical rural areas. Self-reported health status for the Study Area is positive.

4.102 Based on the above and on professional experience, it is assessed that the overall sensitivity of the local population is low in accordance with the definitions set out in **Table 4-4**.

4.103 A further review of **Table 4-1** in the context of the baseline population confirms that the main potential for the proposed development to cause negative impacts to human health is through the potential for noise emissions and emissions to air, land and water. These issues have been addressed in detail in their respective chapters of the EIAR and conclusions in relation to their resulting impact to human health are set out below. The proposed development has potential for a substantial positive influence on the local economy through the enabling of the application site to provide a source of direct and indirect employment and contribution to a green energy transition. This has potential knock-on effects in terms of contributing to the overall wellbeing of the local population.

Impact Assessment

Evaluation Methodology

4.104 The evaluation of effects on employment, human health and amenity comprises a qualitative assessment based on the analysis of potential effects on the environment undertaken in other chapters of this EIAR. The assessment also takes into account a review of relevant literature and professional judgement in relation to impact on population and human health and an ultimate assessment of significance of impacts is made based on the methodology described previously in this chapter.

[11] https://gis.epa.ie/EPAMaps/Radon?&lid=EPA:RadonRiskMapofIreland

4.105 The location and intensity of associated environmental impacts at receptors may vary somewhat with the type of activities carried out within the proposed development over specific times. The localised effects predicted are worst-case (i.e. assuming the most disruptive activities for the entire operation period), even though they will generally be short-term.

Population

4.106 Given the nature of the proposals which do not introduce any new communities or housing to the area, and the relatively low level of workers that will be introduced to the application site at all stages of the proposed development, it is considered that there will be negligible impacts to the population make-up.

Employment

Construction Stage Impacts

4.107 It is expected that c. 20 direct jobs (and a larger number of indirect jobs) will be generated during the 18 month construction phase.

4.108 This could reasonably be expected to result in a beneficial impact of low magnitude in accordance with the definitions set out in **Table 4-5** (short-term duration, moderate change in quality-of-life, small minority of population affected, rapid reversal, slight service quality implications). Therefore, in accordance with **Table 4-6** a potential effect of beneficial minor significance is predicted, or a slight significance of effect in line with **Table 4-3**.

Operational Stage Impacts

4.109 The proposed development will provide long-term employment for 15 to 20 direct employees plus a number of indirect sub-contractors, hauliers and service providers for the lifetime of the facility. The operation of the facility will also contribute to the knowledge economy, research and development and the growth of the circular economy on a wider basis.

4.110 This could reasonably be expected to result in a beneficial impact of medium magnitude in accordance with the definitions set out in **Table 4-5** (medium-term duration, gradual reversal, small service quality implication). Therefore, in accordance with **Table 4-6** a potential effect of beneficial minor significance is predicted, or a slight significance of effect in line with **Table 4-3**.

Economic Activities including Agriculture and Tourism

Construction Stage Impacts

4.111 In general, disturbance arising from construction works may result from various activities including preparatory works, diversion of services, noise and vibration, excavation operations, earthworks, construction traffic and delivery of materials during the 18 month anticipated construction phase.

4.112 Potential effects on economically important tourism and agricultural features could arise from general disturbance to amenity or from potential environmental emissions from site activities during this phase. Potential emissions arising as a result of the proposed development relate mainly to potential nuisance from noise, dust, traffic, and visual effects. The technical assessments within the relevant chapters of the EIAR provide detail on the likely scale, duration and implications of emissions and recommend mitigation measures where these will be required to keep these within acceptable limits.

4.113 The application site is remotely located and contained at the edge of the existing quarry void. It is well screened from its nearest neighbours and has a well-established industrial nature with the quarry having been in operation since the 1950s.

4.114 Periodic disruptive construction activities have the potential to result in an adverse impact of low magnitude in accordance with the definitions set out in **Table 4-5** (very low exposure or small scale, short-term duration, occasional events, severity predominantly related to minor change in morbidity or moderate change in quality-of-life, small minority of population affected, rapid reversal, slight service quality). Therefore, in accordance with **Table 4-6** a potential effect of beneficial minor significance is predicted, or a slight significance of effect in line with **Table 4-3**.

Operational Stage Impacts

4.115 The technical assessments within the relevant chapters of the EIAR have been undertaken in line with industry specific guidance issued by organisations such as Cré (Composting and Anaerobic Digestion Association of Ireland) and with the scoping recommendations of the wide range of bodies that were consulted in the pre planning stage.

4.116 Given the nature of the proposed facility, industry specific issues such as the potential for malodour and the safe handling of gas are included within the scope of respective topic assessment and mitigation measures are identified where required. Therefore, it is anticipated that the potential emissions / disturbance to amenity will be managed and minimised so as not to conflict with tourism, agriculture or any other economic assets in the surrounding area.

4.117 The proposed development is directly supportive of the TCDP objectives of sustaining the importance of the agricultural economy and supporting the diversification of it, while at the same time developing renewable energy capacity. The proposed development will foster local employment and boost the national bio-energy sector experience and growth in general.

4.118 This could reasonably be expected to result in a beneficial impact of high magnitude in accordance with the definitions set out in **Table 4-5** (High exposure or scale, long-term duration, continuous frequency, majority of population affected, permanent change, substantial service quality implications). Therefore, in accordance with **Table 4-6** a potential effect of beneficial moderate/minor significance is predicted, or a slight significance of effect in line with **Table 4-3**.

Community Infrastructure

4.119 Given the size and nature of the proposals, it is not considered likely that any additional pressure will be placed on community services such as schools and health facilities. It is considered likely that the potential diversification that the proposed development can provide for local agricultural enterprises will assist in supporting the viability of existing community services.

4.120 The local school is considered to be sufficiently distant from the proposed development so as to not be impacted.

Human Health and Health and Safety

4.121 Ultimately, all of the effects of a development on the environment impinge upon human beings. Direct effects relate to matters such as land, water and air quality, noise, and changes to landscape character. Indirect effects relate to such matters as flora and fauna.

4.122 The potential for impacts on human health has been assessed based on the technical assessments of the EIAR, which identify potential pathways for respective impacts to human receptors.

Construction Stage

4.123 In general, disturbance arising from construction works may result from various activities including preparatory works, diversion of services, noise and vibration, excavation operations, earthworks, construction traffic and delivery of materials during the 18 month anticipated construction phase.

4.124 Potential effects on human health and safety could arise from general disturbance to amenity or from potential environmental emissions from site activities during this phase. Potential emissions arising as a result of the proposed development relate mainly to potential nuisance from noise, dust, traffic, and visual effects. The technical assessments within the relevant chapters of the EIAR provide detail on the likely scale, duration and implications of emissions and recommend mitigation measures where these will be required to keep these within acceptable limits. Best practice construction techniques will be ensured through adherence to industry standards and control mechanisms such as a Construction Environmental Management Plan (CEMP) and Construction Traffic Plan (CTP).

4.125 The application site is remotely located and contained at the edge of the existing quarry void. It is well screened from its nearest neighbours and has a well-established industrial nature with the quarry having been in operation since the 1950s.

4.126 Periodic disruptive construction activities have the potential to result in an adverse impact of low magnitude in accordance with the definitions set out in **Table 4-5** (very low exposure or small scale, short-term duration, occasional events, severity predominantly related to minor change in morbidity or moderate change in quality-of-life, small minority of population affected, rapid reversal, slight service quality). Therefore, in accordance with **Table 4-6** a potential effect of beneficial minor significance is predicted, or a slight significance of effect in line with **Table 4-3**.

4.127 There is high radon potential within the central part of the application site. Radon gas is not considered harmful in the open air and workplace testing is required in indoor or underground locations where workers spend more than 100 hours per year[12]. The EPA (2019) Protocol for the Measurement of Radon in Homes and Workplaces focusses solely on the measurement of indoor radon concentrations and that "it should be noted that outdoor workplaces would not be expected to have elevated radon concentrations and therefore no radon measurements are required".

4.128 The main work at the site takes place outdoors, hence so the risk of radon in general is extremely low. However, if planning permission is granted radon testing can be organised for on-site structures, and corrective measures implemented if required.

4.129 Potable water will be brought to site via a bottled water supplier, hence there is no potential risk to human health from water consumption at the site.

4.130 As outlined in each of Chapters 6, 7, 8 and 10 of this EIAR, a number of mitigation measures are proposed to control and minimise emissions and to ensure that the residual potential impacts of the proposed development (following implementation of mitigation measures) on human health during the construction phase are acceptable and not significant. The landscape and visual assessment has concluded that the proposed development will not result in significant changes to landscape or views.

[12] https://www.epa.ie/environment-and-you/radon/radon-testing/#d.en.82887

4.131 The technical assessments within the chapters above have concluded that the predicted changes in pollutants are well within statutory standards and WHO guidelines. The potential for non-threshold effects is noted and is considered to be of a very low level over the period of the proposed development, therefore the magnitude is also predicted to be low in accordance with **Table 4-5**. In accordance with the significance matrix proposed by the IEMA Guide to Determining Significance for Human Health in EIA, therefore, the potential for effects on human health is considered to be therefore, in accordance with **Table 4-6** a potential effect of adverse minor significance is predicted, or a slight significance of effect in line with **Table 4-3**.

Operational Stage

4.132 The technical assessments within the relevant chapters of the EIAR have been undertaken in line with industry specific guidance issued by organisations such as Cré (Composting and Anaerobic Digestion Association of Ireland) and with the scoping recommendations of the wide range of bodies that were consulted in the pre planning stage.

4.133 Given the nature of the development as a biological treatment facility, industry specific issues such as the potential for malodour and the safe handling of gas are included within the scope of respective topic assessment and mitigation measures are identified where required. The following are industry specific issues that have been considered in further depth than is typical in the EIA process.

Pest Control

4.134 Anaerobic digestion (AD) is a natural process involving the conversion of feedstock (any organic non-woody material) by micro-organisms in the absence of oxygen into biogas and digestate. Given the nature of organic material being used as feedstock, there is potential for the site to be attractive to flies, birds, vermin and other feral animals.

4.135 If these potential pests were not controlled there could be a potential risk to public health and surrounding agriculture because of the potential for spread of disease they can represent.

4.136 However, effective pest control procedures are a mandatory requirement for all waste management facilities and a specialist pest control agency will be engaged for monitoring and management (where required) during all stages of the proposed development.

4.137 This, in addition to the fact that the biodegradable waste will be handled and processed in a controlled environment leads to an assessment of a potential adverse impact of negligible magnitude in accordance with **Table 4-5** (negligible exposure or scale, very short-term duration, very few people affected, immediate reversal once activity complete). Therefore, in accordance with **Table 4-6** the potential for adverse effects from pests is assessed to be of negligible significance, or an imperceptible significance of effect in line with **Table 4-3**.

Odour

4.138 Similar to the above, given the nature of organic material being used as feedstock, there is potential for the site to be a source of malodour. The proposed development has been designed with this in mind, with inbuilt odour abatement technology and containment of potential odorous activities.

4.139 Chapter 8 of this EIA describes the detailed odour impact assessment which is based on a modelling exercise, and which considers the neighbouring dwellings as highly sensitive receptors. The assessment has not identified potential for any significant effects.

Health and Safety

4.140 The facility will convert organic feedstock into carbon dioxide and methane, with further processing to produce synthetic biofuel, which will be stored and exported at high pressure.

4.141 Carbon dioxide is an asphyxiant, whilst methane is a highly flammable gas. Concerns were raised regarding the latter during the public consultation process described in Chapter 1 of this EIAR.

4.142 SLR Consulting Limited Safety Advisory team conducted a semi-quantitative risk assessment (sQRA) in line with Health and Safety Authority (HSA) guidance on land-use planning decisions[13].

4.143 The initial findings were that none of the modelled scenarios result in hazardous thermal radiation or overpressure levels being reached at the nearest residential properties. An adverse impact on land use planning decisions for residential properties in the vicinity of the facility is therefore predicted as unlikely.

4.144 The proposed facility will be regulated under EU Council Directive 2012/18/EU on the Control of Major Accident Hazards Involving Dangerous Substances (COMAH Directive/ Seveso III Directive) and the European Communities Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations").

4.145 The legislation aims to prevent major accidents involving dangerous substances, and the proposed development falls under the remit of both because of the proposed storage of biogas and biomethane at the facility.

4.146 Given the quantities involved, the facility will be categorised as a 'Lower Tier Seveso' site, being an establishment that holds a quantity of dangerous substance, above the lower threshold contained in the Seveso Directive. It is not an 'Upper Tier Seveso' site, which holds dangerous substances above the upper threshold contained in the Seveso Directive (but below the upper threshold).

4.147 Given its status as a Lower Tier Seveso site, the facility will need to comply with the lower tier requirements including to notify the competent authority of their existence, provide specified details in relation to the operations, substances, inventories, and immediate environment of the establishment. It will also need to establish a safety management system (detailed in a Major Accident Prevention Policy).

4.148 The applicability of the above regulations will have implications for the consideration of the planning application and the extent of consultation with the HSA to ensure the safe handling of dangerous substances. A Land Use Planning Risk Assessment is submitted as part of the planning application documentation.

4.149 The facility will be strictly regulated under the COMAH regulations, as well as the 2005 Safety, Health & Welfare at Work Act. There will also be strict reporting and regulation requirements associated with the EPA Licence which will require to be sought following grant of planning permission.

4.150 For this reason, it is concluded that the potential impact magnitude for health and safety is low in accordance with **Table 4-4** (very low exposure or small scale, short-term duration, occasional events, severity predominantly related to minor change in morbidity or moderate change in quality-of-life, small minority of population affected, rapid reversal, slight service quality implications). Therefore, in accordance with **Table 4-6** the potential for adverse

[13] Health and Safety Authority (2023) Guidance on technical land-use planning advice for planning authorities and COMAH establishment operators. Version 2, February 2023.

effects is assessed to be of minor significance, or a slight significance of effect in line with **Table 4-3**.

Unplanned Events

4.151 Chapter 15 of this EIAR provides an assessment of the potential for Major Accidents and Natural Disasters that the proposed development could either be vulnerable to, or could cause.

Cumulative Impacts

4.152 A search of the Tipperary County Council and An Bord Pleanála's online planning search facilities was undertaken to identify any potential cumulative projects that have been or may be granted within the last five years in the vicinity of the proposed development.

4.153 The majority of planning permissions granted within that search time /radius relate to small-scale agricultural and domestic projects.

4.154 There are a number of existing / proposed renewable energy projects in the County. Uisce Éireann, working in partnership with Tipperary County Council, completed 230 solar panels to power a new water treatment plant in Thurles in December 2020.

4.155 The County is also host to the National Bioeconomy Campus at the former site of Lisheen Mines. Recently a plan has been announced for a 40 GWh anaerobic digestion plant that would be supplied by 250-300 farmers.

4.156 Killough Solar is a proposed solar farm which is currently at consultation stage directly north of Killough Quarry. It has an estimated capacity to deliver approximately 100MW of solar power comprised of low-density PV panels covering 100 hectares, c. 40% of the Killough Castle 247 hectare land holding.

4.157 The development of the renewable energy in the County at scale is considered to be a positive in terms of advancing the knowledge economy and viability of projects.

4.158 It is not considered that there is a conflict between the proposed development and any of the proposed other projects, given that the proposed facility at Killough Quarry is predominantly to power the existing quarry, with any excess biogas to be tankered off site for sale on a small scale. There is no requirement to connect with the national grid that could conflict with the other projects in the area.

4.159 The construction traffic and general construction management of the proposed development will be managed to limit the impacts of it to minimum. The Construction Traffic Plan for the facility will take into account other foreseen projects in consultation with the advice of Tipperary County Council. As planning applications are progressed for future projects it is expected that these will also allow for underway and known foreseeable projects at that time.

Transboundary Impacts

4.160 By virtue of its location the application site is a significant distance from any international boundaries. It is not anticipated that the impacts of the proposed development would have any transboundary effects on population and human health.

Interaction with Other Impacts

4.161 The effects of the proposed development on population and human health and the interaction with other environmental topics is covered in the relevant EIAR chapters i.e. Chapter 7 – Water; Chapter 8 (Air Quality), Chapter 10 (Noise), Chapter 11 (Material Assets), Chapter 13 (Landscape) and Chapter 15 (Major Accidents and Disasters), and a

stand-alone 'Interactions' assessment is presented in Chapter 16 to provide a check that all potential interrelationships have been identified.

'Do-nothing Scenario'

4.162 If planning permission is not approved for the proposed development, the existing land use would continue, the application site would continue to be used for storage of aggregates and Killough Quarry would remain reliant on the national grid for its energy use. The Applicant would have no control over the source of energy for its site (i.e. whether from renewable sources or fossil fuels).

4.163 An opportunity would be lost for the generation of renewable energy in line with a global, national and regionally recognised need. Opportunities would also be lost for the local agricultural landowners to diversify their businesses in line with the green transition and to generate new streams of income while sustainably handling their waste. There would also be a lost opportunity to build the knowledge economy for the bioenergy sector in Tipperary, which in itself could have potential to attract investment and Research and Development opportunities.

4.164 The technical assessments of the EIAR have predicted the potential for environmental emissions associated with the proposed development. With the implementation of mitigation measures, none of the emissions or their health impacts are considered capable of causing significant effects, however there would be no such emissions if the proposals did not proceed. However, the increasing frequency of devastating climate change events associated with fossil fuel reliance and CO_2 generation could reasonably be regarded as representing more of a risk to population and human health even at a local scale.

Mitigation Measures

4.165 A number of inherent and 'designed-in' mitigation measures have been incorporated into the design of the proposals, such as odour abatement technology, screening vegetation and management procedures (e.g. pest control).

4.166 Further mitigation measures to be adopted during the construction and operation activities will aim to minimise any impacts of the project on surrounding sensitive receptors (primarily those associated with noise, air quality and traffic). These measures are discussed in the following chapters of this EIAR:

- Chapter 6 - Land, Soil and Geology
- Chapter 7 - Water (Hydrology and Hydrogeology)
- Chapter 8 - Air Quality
- Chapter 10 - Noise
- Chapter 11 - Material Assets
- Chapter 13 - Landscape
- Chapter 14 – Traffic
- Chapter 15 – Major Accidents and Natural Disasters

4.167 Best practice management of all stages of the proposed development will be facilitated through the implementation of a CEMP during construction and a site EMS during operation.

4.168 Radon testing can be undertaken at on-site structures and, should elevated radon gas levels be detected, remedial measures such as enhanced ventilation or installation of a radon sump can be implemented in agreement with an EPA registered radon tester.

4.169 In addition, to the proposed mitigation measures, it is anticipated that impacts associated with the proposed works could be controlled by further conditions attached to any planning permission granted by the Planning Authority, and a licence issued by the EPA in due course.

Residual Impact Assessment

4.170 With implementation of the management & mitigation measures detailed above there will be no residual impacts on population and human health at any stage of the development.

Monitoring

4.171 As outlined in Chapters 7, 8 and 10 of this EIAR, monitoring in relation to the proposed development will be undertaken in respect of groundwater/ surface water, air, and noise. Refer to the relevant Chapters of this EIAR for full details of the monitoring programmes that will be implemented at the application site for the duration of the works.

4.172 Environmental monitoring locations shall be reviewed and revised where and as/when necessary. All environmental monitoring results will be submitted to Tipperary County Council and/or the EPA in accordance with their requirements, for review and record purposes.

References

Central Statistics Office (2022) Census Data 2016 and 2022.

Cré (Composting and Anaerobic Digestion Association of Ireland) (2018) Guidelines for Anaerobic Digestion in Ireland.

Environmental Protection Agency (EPA) (2022) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports'.

Institute of Environmental Management and Assessment (IEMA) (2022) Effective Scoping of Human Health in EIA.

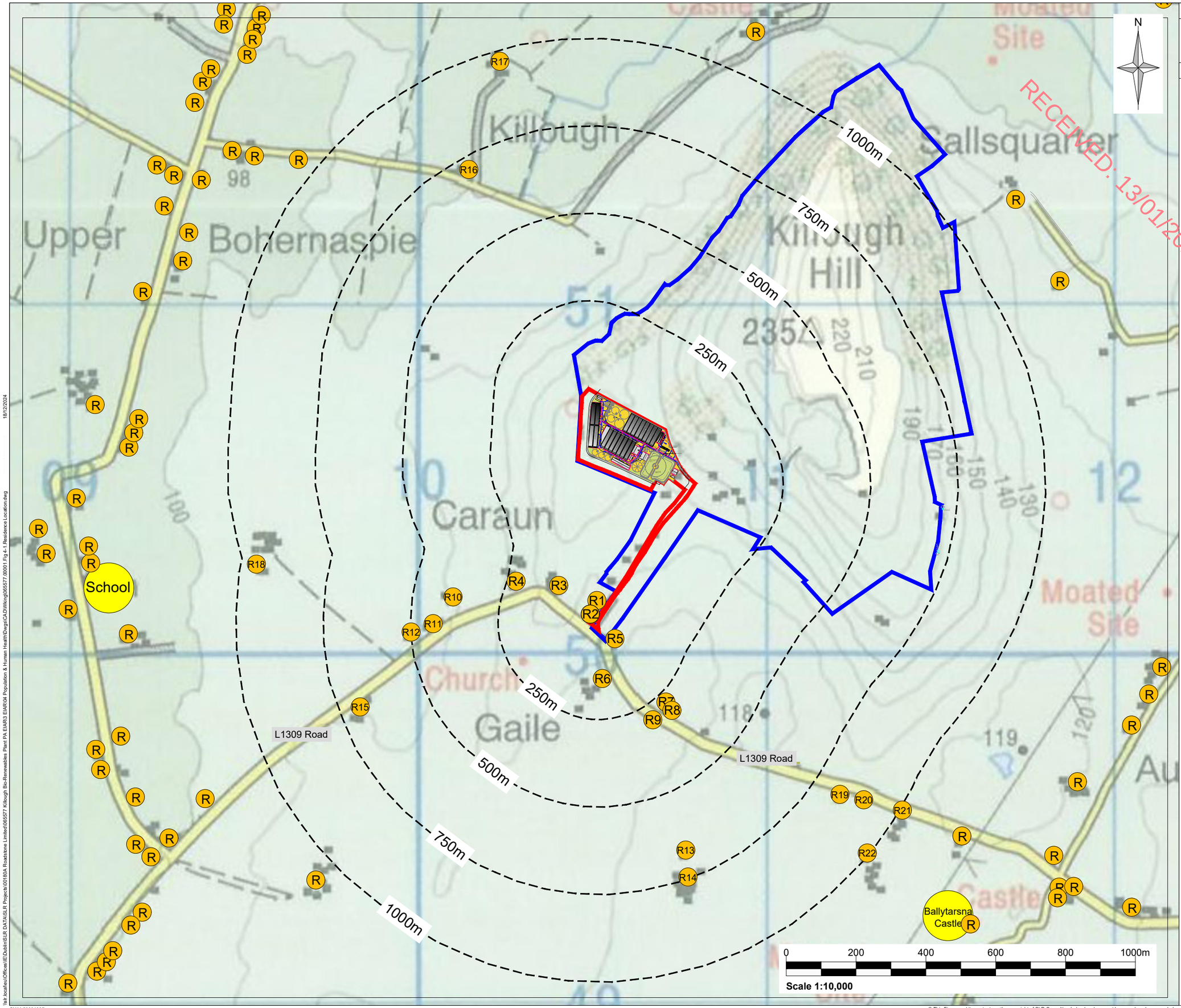
Institute of Environmental Management and Assessment (IEMA) (2022) Determining Significance for Human Health in EIA.

Planning and Development Act, 2000 (as amended).

Planning and Development Regulations, 2001 (as amended).

Tipperary County Council (2022) Tipperary County Development Plan 2022-2028.

Figures



RECEIVED: 13/01/2025

Notes:

1. Extract from Ordnance Survey Map No. 66

Legend:

- Applicants Land Interest Area (c.108.3 hectares)
- Planning Application Area (c. 6.3 hectares)
- Offset distances to application boundary (red line)
- R1 Receptor (Residence) Locations
- Receptor (Other) Locations

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Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Client: Roadstone Ltd.

Project: Bio-Renewables Production Facility at Killough Quarry, Holycross, Co. Tipperary

Figure Title: Residence Location Plan

Scale	SLR Project No.
1:10,000 @ A3	501.065577.00001

Designed	Drawn	Checked	Authorised
pmc	pmc	smcd	smcd
Date: 09/24	Date: 09/24	Date: 12/24	Date: 12/24

Figure Number: **Figure 4-1** Rev.: **0**

\\slr.local\eu\Offices\IE\Dublin\SLR DATA\SLR Projects\501065577 Killough Bio-Renewables Plant PA EIAR3 EIAR\04 Population & Human Health\Dwgs\CAD\Working\065577 00001 Fig 4-1 Residence Location.dwg 18/12/2024

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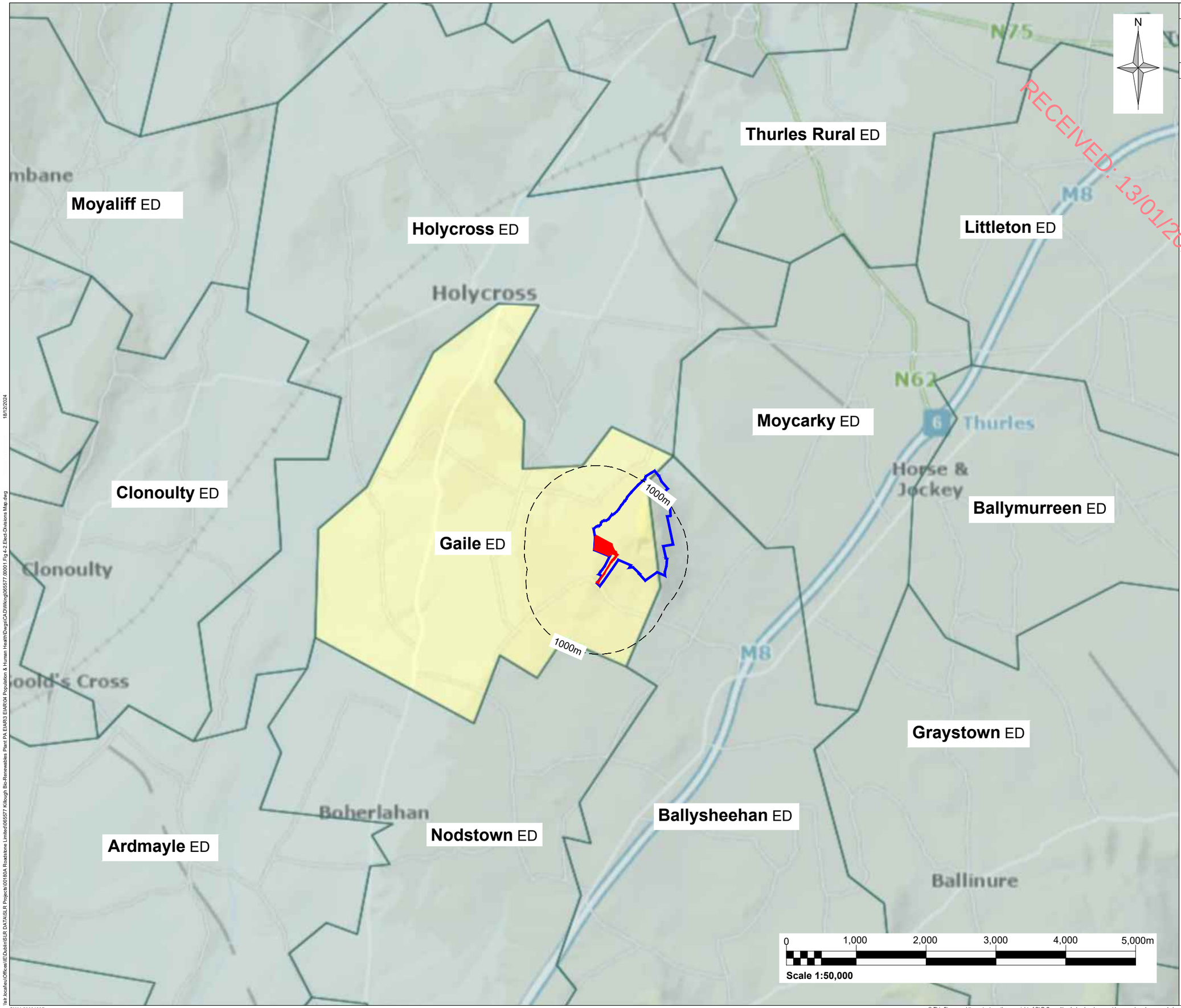

Notes:

1. Extract from Ordnance Survey Map No. 66

Legend:

- Applicants Land Interest Area (c.108.3 hectares)
- Planning Application Area (c. 6.3 hectares)
- Electoral Division Boundaries
- 1km offset from redline site boundary

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Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Client: Roadstone Ltd.

Project: Bio-Renewables Production Facility at Killough Quarry, Holycross, Co. Tipperary

Figure Title: Electoral Divisions Map

Scale	SLR Project No.
1:50,000 @ A3	501.065577.00001

Designed	Drawn	Checked	Authorised
smcd	smcd	smcd	smcd
Date: 12/24	Date: 1224	Date: 12/24	Date: 12/24

Figure Number: **Figure 4-2** Rev.: **0**

CYAL50381397

18/12/2024

\\slr.local\ie\Offices\IE\Dublin\SLR DATA\SLR Projects\00180A Roadstone Limited\065577 Killough Bio-Renewables Plant PA EIAR\3 EIAR\04 Population & Human Health\Dwgs\CAD\Working\065577.00001 Fig 4-2 Elect-Divisions Map.dwg