February 2026

Environmental Report – Volume 1

Proposed 110kV Substation and Underground Grid Connection at Killoran, Co. Tipperary

On behalf of

Soleirtricity Lisheen Ltd

MALONE O'REGAN ENVIRONMENTAL

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MALONE O'REGAN ENVIRONMENTAL

Ground Floor – Unit 3
Bracken Business Park
Bracken Road, Sandyford
Dublin 18, D18 V32Y
Tel: +353- 1- 567 76 55
Email: enviro@mores.ie

Title: Environmental Report – Volume 1, Proposed 110kV Substation and Underground Grid Connection at Killoran, Co. Tipperary, Soleirtricity Lisheen Ltd

Job Number: E2319

Prepared By: Kathryn Broderick **Signed:** K. Broderick.

Checked By: Gus Egan **Signed:** _____

Approved By: Kevin O'Regan **Signed:** _____

Revision Record

Issue No.	Date	Description	Remark	Prepared	Checked	Approved
01	26/02/2026	ER Report	Final	KB	GE	KOR

Environmental Report – Volume 1

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Soleirtricity Lisheen Ltd

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EXECUTIVE SUMMARY

Malone O'Regan Environmental ('MOR Environmental') were commissioned by Soleirtricity Lisheen Ltd ('the Applicant') to prepare an Environmental Report ('ER') in respect of both the Construction and Operational Phases of a proposed 110kV substation and associated 110kV underground cable ('UGC') connecting the proposed substation ('110kV Substation') to the existing Lisheen 110kV ESB Substation and all associated works ('Proposed Development'). The Proposed Development will be located on a Site that is circa ('ca.') 2 hectares ('ha') in size and located in the townland of Killoran, Thurles, Co. Tipperary (OS ITM Reference 621463 666719) as outlined in Figure 1-1 ('the Site').

The Proposed Development will transmit power from the permitted Lisheen Solar PV Farm (Planning Ref: 211128) (henceforth referred to as the 'Permitted Solar Development') via the UGC, which will connect into the existing Lisheen 110kV ESB substation located circa ('ca.') 700m west of the Permitted Solar Development. Please note that this Permitted Solar Development has received a 76MEC AC Eirgrid Grid Connection Offer to export to the national electricity transmission system.

The Applicant entered into pre-application consultation with An Coimisiún Pleanála ('ACP') on 17th September 2024, as provided for in Section 182E of the Planning and Development Act, 2000, as amended. ACP formally determined on 28th October 2025 that the Proposed Development was 'strategic infrastructure' in accordance with Section 182A of the Planning and Development Act, 2000, as amended. See Appendix 1-1 for the letter of determination.

An Environmental Impact Assessment ('EIA') Screening was undertaken, which concluded that the Proposed Development does not warrant an EIAR. Regardless, robust environmental assessments have been undertaken in support of this SID application, the findings of which are presented in this ER. For the purpose of this report, the 110kV substation, proposed UGC and Permitted Solar Development and all associated infrastructure works will be evaluated to assess the potential cumulative impacts of the overall development.

The key conclusions of the ER are that the Proposed Development will not result in any likely or significant environmental impacts based on the following:

- The design has taken full cognisance of all requirements of all relevant development plans;
- The Site is located within the National Bioeconomy Campus that will be developed on the former Lisheen Mine Site. The permitted solar farm will be integral to the development of the overall campus.
- The Permitted Solar Development will not be able to function as a standalone development, as it will be reliant on connections to the Proposed Development in order to connect to the grid. In addition, the design of the Proposed Development will allow for ready expansion to serve other renewable developments;
- The AA undertaken concluded that activities associated with the Proposed Development, either alone or in-combination with other projects or land uses, will not have any direct or indirect adverse impacts on the conservation objectives of any Natura 2000 Sites;
- The Ecological Assessment concluded that the lands within the Site are currently of low ecological value, and that the Proposed Development will not have any direct or indirect adverse impacts on the conservation objectives of any Natura 2000 sites or on any notable / protected flora and fauna;

- The landscaping proposed as part of the Permitted Development will ensure that the Proposed Development will not result in any significant residual impacts on receptors in regard to direct visual impacts;
- A Preliminary Site-Specific Flood Risk assessment confirmed that the Proposed Development will not result in any increased flood risk;
- The Proposed Development will not require any alterations to the existing drainage network, and no specific drainage infrastructure will be required;
- The Site levels will be increased by ca. 1m with imported engineering fill materials, to raise future site levels above the high winter water table;
- The Site is located in an area classed as having 'Low' landscape sensitivity. It is not considered that at a local level, this landscape is highly sensitive or highly susceptible to change. There will be no impacts, direct, indirect or residual on receptors in regard to visual amenity of the area;
- During the construction period, the potential exists for temporary noise nuisance. However, due to the distance of the proposed construction works from the NSR's identified and the general methods that will be involved in constructing the Proposed Development, these will not exceed standard construction noise limits at nearby NSR's;
- Detailed noise modelling concluded that there will be no cumulative noise impacts arising from the Permitted Solar Development and Proposed Development at any nearby receptors either during day or night-time periods;
- A Preliminary Construction Environmental Management ('pCEMP') has been submitted in support of the planning application. This pCEMP will be used by the appointed contractor to prepare an updated and comprehensive CEMP prior to the commencement of any on-site works. It is proposed that this plan will be agreed with the Council in advance and will be fully implemented during the construction of the Proposed Development;
- The CTMP outlines strategies to mitigate transport-related impacts during the Proposed Development's Construction Phase. The plan focuses on minimising congestion and disruption to the local road network, as well as reducing environmental impacts and safety risks associated with the permitted development. It includes details on working hours, temporary compounds, parking arrangements, traffic routing, deliveries, enforcement, complaint management, staff movements and travel, as well as controls for noise, mud and debris;
- The CTMP is a working document and will be fully implemented during the construction of the Overall Development, to minimise any impacts on the existing road network during this temporary period;
- No protected archaeological sites will be impacted either directly or indirectly as a result of the Proposed Development;
- The applicant will fully implement all of the environmental commitments outlined in Section 13; and,
- The Proposed Development will have a design life of approximately 40 years at which time it will be fully decommissioned, and lands reinstated.

1 INTRODUCTION

Malone O'Regan Environmental ('MOR Environmental') has been commissioned by Soleirtricity Lisheen Ltd ('the Applicant') to prepare an Environmental Report ('ER') in respect of both the Construction and Operational Phases of a proposed 110kV substation (henceforth referred to as the '110kV Substation') and associated 110kV underground cable (henceforth referred to as 'the UGC') connecting the proposed 110kV substation to the existing Lisheen 110kV ESB substation and all associated works.

The 110kV Substation and UGC (henceforth collectively referred to as 'the Proposed Development') will be located at Killoran, Thurles, Co. Tipperary (ITM OS Reference 621463 666719). A detailed description of the Proposed Development is provided in Chapter 5 of this ER.

The Proposed Development will transmit power from the permitted Lisheen Solar Photovoltaic ('PV') Farm (Planning Ref: 21/1128) (henceforth referred to as the 'Permitted Solar Development') via the UGC, which will connect into the existing Lisheen 110kV ESB substation located circa ('ca.') 750m west of the Permitted Solar Development. Please note that this Permitted Solar Development has received a 76MEC AC Eirgrid Grid Connection Offer to export to the national electricity transmission system.

The Applicant entered into pre-application consultation with An Coimisiún Pleanála ('ACP') on 17th September 2024, as provided for in Section 182E of the Planning and Development Act, 2000, as amended. ACP formally determined on 28th October 2025 that the Proposed Development was 'strategic infrastructure' in accordance with Section 182A of the Planning and Development Act, 2000, as amended. See Appendix 1-1 for the letter of determination.

This report comprises two volumes, with the main report presented in Volume 1 and supporting appendices presented in Volume 2. The Strategic Infrastructure Development ('SID') application for the Proposed Development will also be supported by:

- Stage 1 – Appropriate Assessment;
- Preliminary Construction Environmental Management Plan ('pCEMP');
- Decommissioning Plan; and,
- Engineering Report.

These reports should be read in conjunction with this report. This ER collates the key findings from each individual environmental report to develop an assessment of likely significant effects arising from the Proposed Development and the mitigation strategies to be implemented where relevant.

1.1 Site Location

The Proposed Development will be located on a site that is ca. 2 hectares ('ha') and is situated in the townland of Killoran, North Tipperary, ca. 6.3km northwest of Urlingford and ca. 12.6km southeast of Templemore (henceforth referred to as the 'Site'). The Site is shown in Figure 1-1.

The Permitted Solar Development will be located on the former Tailings Management Facility ('TMF') on lands that Vedanta Lisheen Mining Limited currently manages under an Integrated Pollution Control ('IPC') License P0088-04 that the Environmental Protection Agency ('EPA') regulates.

Figure 1-1: Site Location

1.2 The Applicant

Soleirtricity Lisheen Ltd. is an Irish firm that develops solar PV farms in Ireland. Their principal activity is the design, build, finance and operation of solar PV farms in Ireland, supplying green electricity via private wires directly to businesses across the country and to the public grid.

1.3 Planning Background

The Proposed Development will be critical infrastructure, intrinsically linked to permitted and planned renewable energy projects, that will initially comprise a large-scale consented solar development.

The Proposed 110kV Substation will be required to facilitate a step-up of the medium voltage supply (33kV) from the Permitted Solar Development to the existing Lisheen 110kV ESB Substation. The design of the Proposed Development will mean that it could be readily expanded in the future to accommodate other renewable energy projects and, as such, it will be a key node on the grid.

It is proposed that, subject to obtaining consent for the Proposed Development, the proposed 110kV substation will be developed in place of a previously permitted 38kV substation granted by Tipperary County Council (Planning Ref: 211128).

It is predicted that the Proposed Development will be constructed in conjunction with the Permitted Solar Development as part of one development (henceforth known as the 'Overall Development'). Please refer to Appendix 1-2.

Tipperary County Council Planning Ref: 211128 – Granted

> *The construction of a Solar PV development with a maximum export capacity ('MEC') of up to 122MW, comprising ca. 214,800 no. photovoltaic panels laid out in arrays, the construction of a 38kV Substation (ca.57.31m2 x 4.45m tall), along with associated*

ancillary development, including 30 no. Transformer Stations (ca. 7.27m2 x 2.6m) with an integrated bund, 716 string Inverters, 1 no. DNO Substation Building (16.28m2 x 5.42m), 1 No. Storage and maintenance building (ca. 57.31m2 x 4.45m tall), 38 no. CCTV cameras mounted on ca. 3.8m high poles, perimeter security fencing and all ancillary works. The total development area will be ca. 77ha.

Tipperary County Council granted the Permitted Solar Development on 23rd February 2022. Figure 1-2 illustrates the Permitted Solar Development and the Proposed Development.

Figure 1-2: Site Context

1.4 Background

1.4.1 Former Lisheen Mine

The Site comprises a section of the former Lisheen Mine. 1Chevron Limited discovered the Lisheen deposit of lead and zinc in 1990. Minorco Lisheen Limited began developing the mine in 1997 by constructing the main mine decline and facilities. From the outset, the Lisheen Mine operated under an IPC licence, issued by the EPA. Ivernia West and Anglo-American initially carried out mining.

Lead and zinc production commenced in 1998, with the first production ore brought to the surface in 1999. Mining activity continued for 17 years. At its peak, the mine employed 400 staff and was the 12th largest zinc mine in the world. The mine produced an average of 6,000 tonnes of lead and zinc ore per day, around 300,000 tonnes of ore per year and a total of 22.4 million tonnes overall.

The total landholding of the former Lisheen Mine was 445ha. The ore deposits were extracted from depths of up to 200m below the surface from four distinct ore bodies:

- Main Zone;
- Derryville Zone;

- Bog Zone; and,
- Derryville Island Zone.

The Lisheen Mine was operated under an IPC licence issued by the EPA on 27th June 1997 to Minorco Lisheen Limited. Production at the mine ceased in 2015. All closure works have been completed at the site, and following two years of Active Closure and three years of Passive Closure, the mine transitioned to Aftercare in June 2021. There have been several amendments to the licence since 1997 via the Technical Amendment ('TA') process. The extent of the land currently under IPC licence (P0088-04 [1]) are shown in Figure 1-3. The Site is outside the Vedanta IPC Licence boundary as defined in Technical Amendment A to the IPC Licence P0088-04 dated 2nd April 2020 [2].

The EPA has independently signed off on the condition of the Site. The Agency are legally bound under Section 95(7) of the Environmental Protection Agency Act 1992, as amended, to ensure that they are:

> *'…satisfied that the condition of the relevant installation is not causing or likely to cause environmental pollution and the site of the activity is in a satisfactory state, it shall accept the surrender of the licence or revised licence, but otherwise shall refuse to accept the surrender of the licence or revised licence.'*

As part of the process to remove the Site from the Vedanta Licence, the EPA undertook an exit audit of the Vedanta lands. The overall audit finding was as follows.

> *"The condition of those surface areas of the site proposed to be excluded from the licence (identified as 'Stage 2' areas) were assessed and it was the opinion of the inspector that those areas were in a satisfactory state on the day of the visit. Based on this and on the information supplied by the licensee (in particular - the final 'Validation Report in Respect of Lisheen Mine' updated and submitted under licensee return LR036661 on 11/09/2018), those 'Stage 2' areas were considered unlikely to cause environmental pollution or to contain any potentially polluting residues."* [6].

Figure 1-3: IPC Licence Boundary

Obtaining formal sign-off on the Site by an independent third party, such as the EPA, is very important, as it provides reassurance in relation to the condition of the Site. The EPA legally could not have removed the Site from the Vedanta licence unless they were satisfied that the lands were in a satisfactory condition.

1.4.2 National Bioeconomy Campus

The Site forms part of the National Bioeconomy campus. A key objective of the Tipperary County Development Plan 2022-2028 ('TCDP') is to facilitate and support the development of the National Bioeconomy Campus at Lisheen, Co. Tipperary. The development of the bioeconomy campus at Lisheen will be plan-led with a masterplan to be put in place. Synergies between the proposed campus and Thurles town will be identified at the Local Area Plan ('LAP') stage [3].

The TCDP provides the Irish Bioeconomy Foundation ('IBF') with a range of stakeholders, including universities and private enterprises and is supported through Enterprise Ireland. The campus will have a range of facilities that will enable industry entrepreneurs and researchers to scale technologies that convert Ireland's natural resources (including residues) to products of high value for use in a wide variety of sectors, including food ingredients, feed ingredients, pharmaceuticals, natural chemicals, biodegradable plastics and more.

The IBF is set to expand its operations due to a grant award from the European Union's Just Transition Fund. The new funding will help facilitate the scale-up and demonstration of novel biotechnological approaches for biomanufacturing at the site.

While the previous activity at the mine resulted in high energy usage, the transformed bioeconomy campus is all about circularity and sustainability. The National Bioeconomy Campus currently consists of the following enterprises:

- Revive Environmental;

- Naring-Tech Limited;
- Lisheen Wind Farms;
- Acorn Recycling;
- Soleirtricity Lisheen; and,
- Tipperary County Council.

It is an objective of the LAP to promote and support the growth and development of the National Bioeconomy Campus as an important employment location with strong ties, maximising its residential and employment potential.

The bioeconomy is the part of the economy that uses renewable resources while reducing waste, supporting the achievement of a sustainable and climate-neutral society.

In developing the design and this planning application, the Applicant has engaged extensively with the IBF to ensure the Proposed Development meets the criteria for the National Bioeconomy Campus. Through collaborative engagement and ongoing communication, Soleirtricity will seek to build positive relationships in the community and secure strong support for this transformative project for the regions. These relationships will also benefit and support the economy and locality near Lisheen by creating attractive job opportunities.

1.4.3 The Lisheen Wind Farm

The Lisheen Wind Farm became operational in August 2009, with eighteen wind turbines erected across the former Lisheen Mine complex, with another 24 wind turbines neighbouring the Site, all of which connect to the Lisheen 110kV ESB substation.

These turbines are currently maintained and operated by Brookfield Renewable. The lands are leased from Lisheen Mine, on which the turbines and other infrastructure necessary for the operation of the Wind Farm are located. The current owners of these wind farms have access rights to all these turbines. However, this access requirement is not considered to be a constraint on the Proposed Development.

The presence of these wind turbines will help to reinforce the Site's position as a green campus, promoting the use of sustainable energy sources.

1.4.4 Site Context and Description

The Site is ca. 2ha in size and situated in the townland of Killoran, North Tipperary, ca. 6.3km northwest of Urlingford and ca. 12.6km southeast of Templemore. The Site is accessed from the existing Lisheen Mine entrance via the L3201 road. The Site is in proximity to Junction 4 on the M8 (north of Urlingford) motorway and the R502 and R639 regional roads.

The Site is currently vacant and comprises predominantly of recolonising bare ground and areas of artificial surfaces. The existing Lisheen 110kV ESB substation is located immediately to the north of the Site. To the east, the Site is bounded by the former Tailing Management Facility and the Permitted Solar Development. To the west of the Site is a building currently occupied by Irish Bioeconomy Foundation personnel, recently acquired by Tipperary County Council. To the south of the Site are two buildings occupied by AQS Environmental Solutions personnel, along with associated carparking.

The surrounding wider area is a mix of the Lisheen Mine Windfarm and associated infrastructure, agricultural farmland and bogland currently harvested by Bord Na Móna.

1.5 Watercourses within the Vicinity of the Site

The Site is located within the Suir Catchment (Catchment ID:16) and the Suir_SC_040 Sub Catchment (Subcatchment ID: 16_21) [4].

As per EPA maps, there is one hydrological feature of note within close proximity of the Site: the Cooleeny stream.

1. Cooleeny stream

The Cooleeny stream (IE_SE_16D020100) is located ca. 40m to the south of the Site, at its closest point. The stream flows in a southerly direction and is a tributary of the Cooleeny River, which it joins ca.1.6km downstream of the Site. The Cooleeny River continues in a southerly direction before joining the Drish 16 ca. 4km downstream of the Site. The Drish 16 continues to flow in a southwesterly direction before discharging into the River Suir, ca. 14km downstream of the Site. The River Suir forms part of the Lower River Suir Special Area of Conservation ('SAC').

Water Quality Status and Risk

Under the Water Framework Directive ('WFD') 2000/60/EC, the EPA classifies the status and the risk of not achieving good water quality status for all waterbodies in Ireland [4]. According to the river waterbody WFD 2019-2024, the most recent data available at the time of writing these reports, the status of the Cooleeny Stream is *'moderate'* [4]. In addition, this waterbody is considered to be *'at risk'* of not achieving a good water quality status [4]. The location of the key surface water features in the vicinity of the Site are illustrated in Figure 1-4 below.

Figure 1-4: Watercourses in the Vicinity of the Proposed Development

1.5.1 OPW Flood Maps

The Office of Public Works ('OPW') Flood Maps identifies Drainage Districts, Arterial Drainage Schemes and Benefited Areas. Arterial Drainage Schemes were works that were carried out under the Arterial Drainage Act, 1945, to improve land for agriculture and to mitigate flooding. The Benefited land identifies land that was drained as part of the Drainage District with the aim of improving land for agriculture and mitigating flooding.

The OPW did not identify any arterial drainage schemes or drainage districts on-site and the Site does not form part of the Benefitted Lands Scheme [5].

1.5.2 Drainage Ditch Network

During the Site visits, no drainage ditches were noted traversing the Site.

1.6 National Barriers Programme

Irish rivers are heavily fragmented by weirs, dams, sluices, culverts, bridges and other artificial barriers. The National Barrier Programme ('NBP') has created a national database of potential barriers to fish passage (over 70,000) encompassing assessed structures which can impact on both fish passage and hydromorphology. For primary assessment, Inland Fisheries Ireland ('IFI') has developed the IFI Barrier Assessment and Screening Tool ('I-BAST') application as an initial screening and barriers assessment tool.

As per the National Barriers Programme Dataset, no barriers were identified within the watercourse outlined in Section 1.4 above [6].

1.7 Consultation

1.7.1 An Coimisiún Pleanála

The Applicant entered into a pre-application consultation with ACP, as provided for in Section 182E of the Act.

On 28th October 2025, ACP served notice that it is of the opinion that the Proposed Development falls within the scope of Section 182A of the Planning and Development Act 2000, as amended, and has decided that the Proposed Development would be strategic infrastructure (ABP Ref: ABP-320834-24). Please refer to Appendix A-1 for the ACP determination letter.

2 ENVIRONMENTAL IMPACT ASSESSMENT ('EIA') SCREENING CONSIDERATIONS

2.1 Introduction

An EIA screening assessment has been undertaken in accordance with Schedule 5 and Schedule 7 of the Planning and Development Regulations 2001 (as amended) and takes cognisance of Directive 2014/52/EU, as it is currently interpreted, utilising the following guidance:

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

EIA stands for the process of Environmental Impact Assessment, which anticipates and predicts the effects on the environment caused by a project. It is integrated into consent processes and helps to ensure that the environmental consequences of a project are understood before a consent decision is reached.

EIA screening involves deciding whether an EIA is required under legislative requirements.

This section of the report examines the legislative context relating to EIA and EIA Screening and its applicability to the Proposed Development.

2.2 Methodology

2.2.1 Desk-Based Studies

In undertaking this EIA Screening Assessment, a detailed desk-based study was completed that included a review of the following information:

- Relevant legislation and guidance; and,
- Relevant published information pertaining to the Site and the surrounding area in regard to all of the stipulated EIA Report ('EIAR') topics.

2.2.2 Field-Based Studies

Site surveys were undertaken on 1st May 2024 and 19th September 2024. An updated survey was conducted on 19th December 2025 by suitably qualified and experienced MOR Environmental Ecologists to gain a better understanding of the receiving environment and to identify any sensitive environmental receptors. It should be noted that the MOR Environmental team have worked on a number of projects in Lisheen and as such would be very familiar with the Site and the surrounding lands.

2.3 Legislative and Regulatory Context

The requirement for EIA has its origins in Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment. This Directive has been amended three times and was codified by Directive 2011/92/EU in 2011. Directive 2011/92/EU was then subsequently amended by Directive 2014/52/EU in 2014.

Projects requiring EIA are defined in Article 4 and set out in Annexes I and II of Directive 2014/52/EU. These provisions are, in turn, transposed into domestic Irish legislation through Schedule 5 of the Planning and Development Regulations 2001, as amended.

In determining the requirement for EIA, Schedule 5 differentiates between different types of projects in the context of 'project types':

- Schedule 5 'Part 1' identifies project types that are anticipated to have significant effects on the environment, and which require mandatory EIA; and,

- Schedule 5 'Part 2' identifies projects that do not necessarily have significant effects, but for which different thresholds or other criteria are applied, and if these are met, then EIA is required. Projects that are identified in Part 2, but which fall below those thresholds and other criteria, may also require EIA. This is determined by the outcome of a sub-threshold EIA Screening, which is undertaken in accordance with Schedule 7.

If a project is not of a type identified in Schedule 5, there is no statutory requirement for it to be subject to EIA or EIA Screening. This is clearly established in Irish planning legislation and its interpretive case law.

2.3.1 Environmental Impact Assessment Screening - Legislative and Regulatory Context

In order to determine whether it is required to undertake an EIA for the Proposed Development, the following legislation was consulted:

- The Planning and Development Regulations, 2001 (as amended) [7]; and,
- EU Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment ('2014 EIA Directive') [8].

In addition, the following guidance documents were reviewed:

- Interpretation of Definitions of project Categories of Annex I and II of the EIA Directive (European Commission, 2015);
- European Commission (June 2017), Environmental Impact Assessment of Projects. Guidance on Screening [9];
- Department of the Environment, Heritage, and Local Government (August 2003), Environmental Impact Assessment ('EIA') Guidelines for Consent Authorities regarding Sub-threshold Development [10];
- Guidelines on the information to be contained in Environmental Impact Assessment Reports [11];
- Department of Housing, Planning, Community and Local Government Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive) - Circular 1/2017', 15th May 2017 [12]; and,
- Department of Housing, Planning and Local Government ('DHPLG') Transposing Regulations (S.I. No. 296 of 2018) Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment [13].

2.4 Consideration of Substation and Grid Connection Development

Section 5 of the Planning and Development Regulations 2001 (as amended) sets out the criteria for assessing whether or not a mandatory EIAR is required for a development. It transposes Annex I and Annex II of the EU EIA directive (85/337/ECC as amended) into Irish law under Parts 1 and 2 of the schedules.

2.4.1 Schedule 5 'Part 1' Projects

There are no activities listed within Schedule 5 'Part 1' of the Planning and Development Regulations 2001 (as amended) that relate to substations or underground grid connections.

The most relevant energy-related project types are set out below with corresponding commentary:

2(a) A thermal power station or other combustion installation with a heat output of 300 megawatts or more.

- 110kV substations or underground cable grid connections do not meet the definition of a thermal power station or combustion installation. Therefore, this project type is not applicable.

2(b) A nuclear power station or other nuclear reactor including the dismantling or decommissioning of such a power station or reactor1 (except a research installation for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load).

- 110kV substations or underground cable grid connections do not meet the definition of a nuclear power station. Therefore, this project type is not applicable.

(20) Construction of overhead electrical power lines with a voltage of 220 kilovolts or more and a length of more than 15 kilometres.

- The Proposed Development does not include overhead power lines with a voltage of 220kV. Therefore, this project type is not applicable.

There are no other project types identified in Schedule 5 'Part 1' that relate either directly or indirectly to 110kV substation or underground electrical cables. It is clear, therefore, that 110kV substation or underground electrical cables are not a project type with regard to 'Part 1' and do not, therefore, require a mandatory EIA. This has been subject to legal confirmation in Kavanagh V An Bord Pleanála [2020] IEHC 259 and Sweetman V An Bord Pleanála [2020] IEHC 39.

2.4.2 Schedule 5 'Part 2' Projects

Under Schedule 5 - Part 2, the following project types have been considered to determine applicability to the Proposed Development:

1(a) Projects for the restructuring of rural land holdings, undertaken as part of a wider proposed development, and not as an agricultural activity that must comply with the European Communities (Environmental Impact Assessment) (Agriculture) Regulations 2011, where the length of field boundary to be removed is above 4 kilometres, or where re-contouring is above 5 hectares, or where the area of lands to be restructured by removal of field boundaries is above 50 hectares.

- No hedge / treeline will be removed as part of the Proposed Development. The land will not be re-contoured as part of any aspect of the Proposed Development. Therefore, the Proposed Development does not meet the definition of restructuring for rural land holdings as per the paragraph, as amended.

3(a) Industrial installations for the production of electricity, steam and hot water not included in Part 1 of this Schedule with a heat output of 300 megawatts or more.

- 110kV substation or underground cable grid connections do not meet the definition of an industrial installation as per the meaning of 3(a).

3(b) Industrial installations for carrying gas, steam, and hot water with a potential heat output of 300 megawatts or more, or transmission of electrical energy by overhead cables not included in Part 1 of this Schedule, where the voltage would be 200 kilovolts or more.

- 110kV substations or underground cable grid connections do not meet the definition of an industrial installation as per the meaning of 3(b).

3(i) Installations for the harnessing of wind power for energy production (wind farms) with more than 5 turbines or having a total output greater than 5 megawatts.

- 110kV substations or underground cable grid connections do not meet the definition of a wind farm.

10(a) Industrial estate development projects, where the area would exceed 15 hectares.

- 110kV substation or underground cable grid connections do not meet the definition of an industrial estate.

10(b)(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.

- 110kV substations or underground cable grid connections do not meet the definition of an urban development as per the meaning of 10(b)(iv).

10(b)(dd) All private roads which would exceed 2000 metres in length.

- The Proposed Development will include access tracks comprising permeable hardcore, which will not fall within a road definition as per the Roads Acts 1993, as amended.

There are no other project types identified in Schedule 5 'Part 2' that relate, either directly or indirectly, to 110kV substations or underground cable grid connections. It is clear, therefore, that the Proposed Development is not a project type with regard to 'Part 2' and does not, therefore, require EIA.

2.5 Conclusions on Schedule 5 Analysis

If a project is not of a type identified in Schedule 5, then there is no statutory requirement for it to be subject to EIA or EIA Screening. Based on the findings of this EIA screening assessment, the Proposed Development does not fall under the remit of Schedule 5, and accordingly, neither a mandatory nor a sub-threshold EIA is warranted.

Therefore, there is no legal requirement to subject the Proposed Development to a sub-threshold EIA Screening. The legislative basis for this is well established in planning legislation and interpretive case law, including (in the specific case of solar farm development) Kavanagh V An Bord Pleanála [2020] IEHC 259 and Sweetman V An Bord Pleanála [2020] IEHC 39. It is also a well-established precedent with planning authorities and An Bord Pleanála.

Regardless, a precautionary approach was adopted to assess the Proposed Development for potential environmental impacts. Although Section 7 is not applicable to the Proposed Development, it has been utilised in order to undertake this assessment comprehensively.

2.5.1 Assessment under Schedule 7 (Significance)

Schedule 7 of the Planning and Development Regulations 2001 (as amended 2018) sets out the criteria for assessing whether or not a project will have 'likely' and 'significant' effects on the environment. These criteria include the following:

- 'Characteristics of Proposed Development';
- 'Location of Proposed Development'; and,
- 'Characteristics of Potential Impacts'.

Taking a very precautionary approach, these criteria were considered for the Proposed Development under the topics recommended in EIA guidance documents. A summary of this assessment is set out in Table 2-1. Section 7 of the Planning and Development Regulation

2001 (as amended, 2015) has been utilised in order to undertake a comprehensive assessment.

Table 2-1: EIA Screening Assessment

Topic	Likely & Significant Effects	Comment
Human Beings	None	The Proposed Development will have no significant effects on the local population. It is considered that the Proposed Development will have a temporary positive impact due to the provision of ca. 30 jobs during the Construction Phase of the Proposed Development. Any other potential effects on humans through visual impact, noise impact and traffic are discussed and assessed in the relevant sections of this report.
Biodiversity / Flora & Fauna	None	An ecological assessment has been undertaken, as presented in Chapter 6. The assessment concluded that the Proposed Development will not result in any significant impact on any protected or notable species and that it is considered that an overall positive impact will occur. A Stage 2 Natura Impact Assessment has been completed for the Proposed Development.
Soils & Geology	None	Localised levelling works will be required for the development of the Site. The detailed design of the substation will determine the extent of the earthworks. It is estimated that the majority of the excavated materials will be reused within the Site or alternatively within the adjoining permitted solar farm for the purpose of constructing screening berms, given the overall development will be constructed as a single construction project. Details of soil recovery are provided in Chapter 5.3, Construction Procedures. There will be no significant effects on soils and geology at or in the general area of the Site.
Water	None	A hydrological and hydrogeological assessment, which included a desk-based flood risk screening assessment, was undertaken and is presented in Chapter 7. The assessment concluded that there is no flood risk at the Site and that the Proposed Development is not expected to result in any adverse impacts to the hydrological or hydrogeological regime of the receiving environment.
Noise	None	A comprehensive Noise Assessment was undertaken for the Site and is presented in Chapter 8. The assessment concluded that there are no significant noise sources associated with the Proposed Development. The Applicant is committed to ensuring that any noise is maintained below the typical Local Authority, day and night-time noise nuisance level of a site-specific $L_{Aeq,T}$ of 55dB and 45dB, respectively, during operation nuisance limits at sensitive receptors.
Air Quality	None	No significant emissions to air will occur due to the Proposed Development.

Topic	Likely & Significant Effects	Comment
Climate	None	It is considered that the Proposed Development will have an overall slightly positive impact, as it will improve the efficiency of energy production by providing storage capacity for surplus energy, as discussed in Chapter 4.3 Need for the Development.
Landscape & Visual	None	The Proposed Development will not present significant landscape or visual impacts. Refer to Chapter 9 of this report. This conclusion is based on the localised nature of the Proposed Development, the absence of visual receptors within the vicinity of the Site and the screening provided by the surrounding landscape
Cultural Heritage	None	An archaeological assessment has been undertaken, as presented in Chapter 10. This assessment concluded that the Proposed Development will not result in any significant impact on any protected monuments or features in the wider area.
Material Assets - Traffic	None	Given the temporary nature of the construction period, the existing road infrastructure, and the limited number of vehicle movements during the operational lifetime of the Proposed Development, it was concluded that the potential impact on the local road network will be insignificant. A Construction Traffic Management Plan was prepared and is presented in Chapter 11.
Material Assets - Water	None	Water for on-site welfare facilities will be provided by a 1,500 litre rainwater harvesting tank, which will be filled from roof runoff. Working with the projected usage of the sanitary facilities of 1,950 litres every 13 weeks, the rainwater storage tank will provide for up to 10 weeks without receiving any rainfall. The Proposed Development will not present significant material assets - water.
Material Assets - Wastewater	None	There will be no foul drainage required. During the Construction Phase, portable toilets will be provided at the temporary Contractors' Compound for the duration of the Construction Phase only. All waste from the portable toilets will be removed and disposed of off-site by an approved contractor. During the Operational Phase, the substation building will contain a sink and toilet. As the on-site welfare facilities will be infrequently used, it is proposed that foul water will be diverted into a below-ground holding tank. All wastes collected in this holding tank will be removed by a suitably licensed waste contractor as required. No specific drainage infrastructure will be required for the Proposed Development.
Material Assets - Waste	None	There will be no significant waste produced during the Operational Phase and minimal waste during the Construction Phase. Waste generated during the Construction and Operational Phase will be collected, accommodated and segregated on site before being removed off-site and recycled or disposed of at a suitably licensed waste or treatment facility as discussed in Chapter 5.

2.6 Screening Conclusion and Scope of this Environmental Report

Based on the findings of this EIA screening assessment, it was concluded that the Proposed Development will not result in any likely and significant effects on the environment; therefore, an EIAR would not be warranted.

2.6.1 Cumulative Screening Assessment

Despite the fact that a mandatory EIAR was deemed not to be warranted, this ER has considered, as far as practicable, the cumulative environmental aspects of the Proposed Development alongside the Permitted Development and other developments in the area to ensure both applications are supported by a robust environmental assessment.

2.7 Environmental Report

In the absence of the requirement for an EIAR, the Applicant is still committed to ensuring that a comprehensive and robust environmental assessment of the Proposed Development is undertaken. This Environmental Report has been prepared having regard to some of the same guidelines applicable to EIA projects described in Section 2.4, in terms of the general format and specialist assessment methodologies, including:

- Advice Notes for preparing Environmental Impact Statements - Draft [14];
- Environmental Protection Agency ('EPA'), Guidelines on the Information to be contained in Environmental Impact Assessment Reports ('EIAR') 2022 [15];
- European Commission, Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions,1999 [16]; and,
- Circular letter PL 1/2017 - Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive) - Advice on Administrative Provisions in Advance of Transposition [12].

Additional relevant specialist guidance documents were also used in the preparation of the individual assessments. These are detailed in the relevant chapters and associated appendices.

2.7.1 Scope of this ER

The following topics are presented in this ER.

- Proposed Development and Construction Stage Management;
- Biodiversity (Flora and Fauna);
- Water;
- Noise;
- Landscape and Visual;
- Cultural Heritage; and,
- Traffic.

3 METHODOLOGY

3.1 Assessment of the Effects – Evaluation Criteria

The assessment of effects has been undertaken in accordance with best practice. The approach is set out below. The evaluation of significance considers the magnitude of the change and the sensitivity of the resource or receptor. Unless otherwise stated, this approach has been adopted throughout the ER.

The criteria for determining the significance of impacts and the effects are set out in Figure 3-1 and Table 3-1, as abstracted from the EPA's Guidelines on the information to be contained in Environmental Impact Assessment Reports [15]. Definitions of impact, as outlined by the EPA, are included below; unless otherwise stated within a specific ER topic, these definitions will apply within this ER.

Table 3-1: Quality of Effects

Type of Effect	Quality of Effect
Positive Effects	A change which improves the quality of the environment.
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative / Adverse Effects	A change which reduces the quality of the environment.

Table 3-2 outlines the definitions for the significance of an effect, which range from imperceptible to profound.

Table 3-2: Describing the Significance of Effects

Classification	Criteria
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	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging trends.
Significant	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 the majority of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

Table 3-3 describes the terminology used to discuss the Extent and Context of Effects.

Table 3-3: Describing the Extent and Context of Effects

Magnitude	Description
Extent	Describes the size of the area, the number of sites, and the proportion of a population affected by an effect.

Magnitude	Description
Context	Describes whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Table 3-4 details the descriptions of probability of effects, i.e., how likely an impact is to occur.

Table 3-4: Describing the Probability of Effects

Magnitude	Description
Likely	Effects that can reasonably be expected to occur as a result of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

Table 3-5 outlines the duration of effects. Momentary effects lasting from seconds to minutes will often be less concerning than long-term and permanent effects, depending on their severity.

Table 3-5: Describing the Duration and Frequency of Effects

Magnitude	Description
Momentary Effects	Effects lasting from seconds to minutes.
Brief Effects	Effects lasting less than a day.
Temporary Effects	Effects lasting less than a year.
Short-term Effects	Effects lasting one to seven years.
Medium-term Effects	Effects lasting seven to fifteen years.
Long-term Effects	Effects lasting fifteen to sixty years.
Permanent Effects	Effects lasting over sixty years.
Reversible Effects	Effects that can be undone, for example through remediation or restoration
Frequency of Effects	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).

Table 3-6 defines the types of effects that can potentially occur.

Table 3-6: Describing the Types of Effects

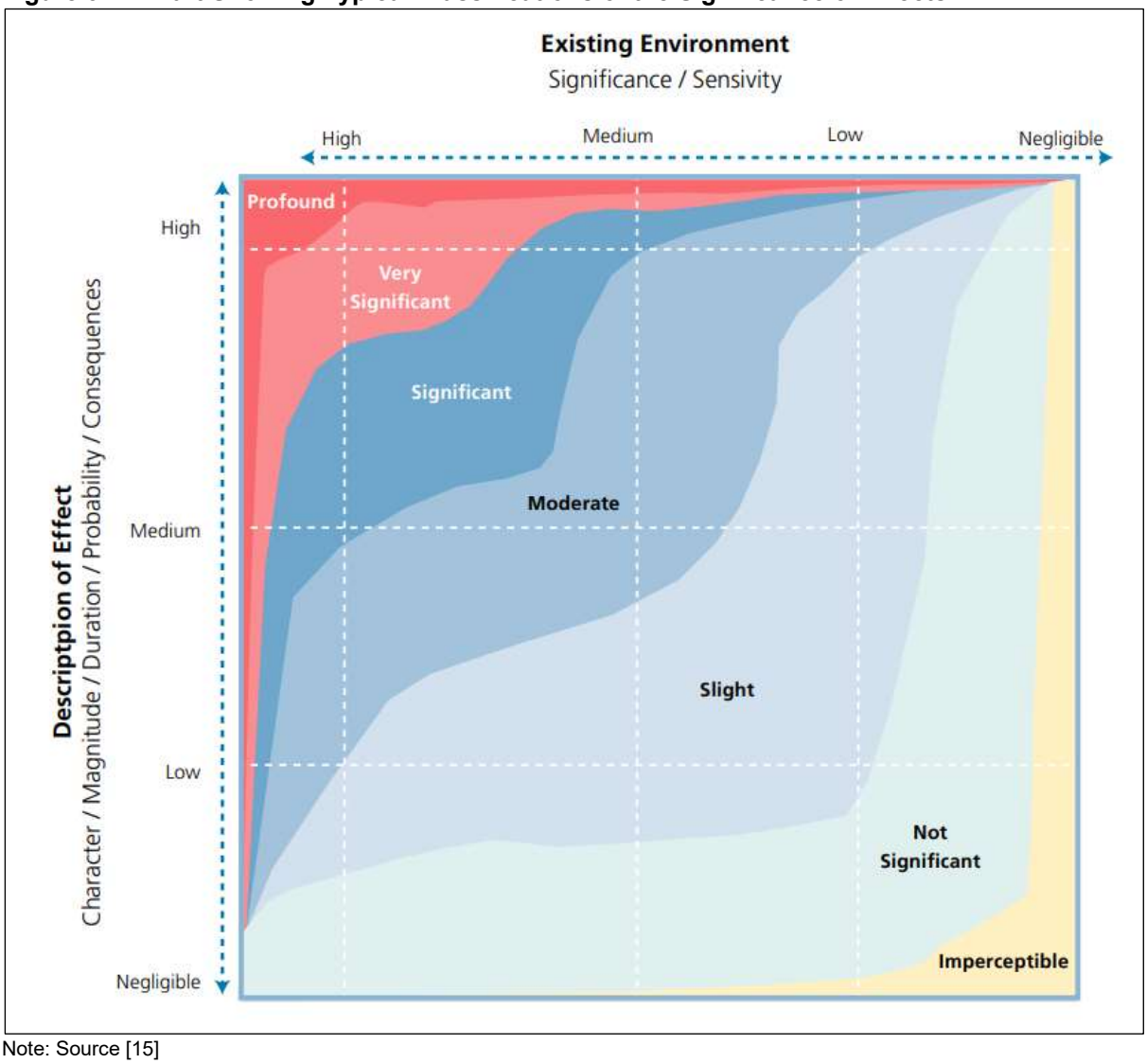
Magnitude	Description
Indirect Effects (a.k.a. Secondary or Off-site Effects)	Effects on the environment, which are not a direct result of the project, often produced away from the project Site or because of a complex pathway.
Cumulative Effects	The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
Do Nothing Effects	The environment as it would be in the future should the subject project not be carried out.
'Worst-case' Effects	The effects arising from a project in the case where mitigation measures substantially fail

Magnitude	Description
Indeterminable Effects	When the full consequences of a change in the environment cannot be described.
Irreversible Effects	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost.
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect
Synergistic Effects	Where the resultant effects are of greater significance than the sum of its constituents.

3.1.1 Determining Significance

Figure 3-1 shows how comparing the character of the predicted effect to the sensitivity of the receiving environment can determine the significance of the effect.

Figure 3-1: Chart Showing Typical Classifications of the Significance of Effects



Note: Source [15]

The above terminology will be used throughout this report unless superseded by an environmental topic best practice in assessing ER. Where specialist topics differ from these terms, a topic-specific methodology will be provided within the relevant chapter.

3.2 Assessment of Cumulative Impacts

Cumulative impacts refer to impacts that result from incremental changes caused by other past, present and approved developments, and as far as practicable from reasonably foreseeable development(s), together with the Proposed Development.

4 POLICY, PLANNING AND DEVELOPMENT

4.1 Introduction

This chapter provides a detailed description of the plans and policies that support the Proposed Development.

4.2 Planning History

According to the TCC Planning Portal, there have been no previous planning applications within the Site. However, there are a number of planning applications that have been granted over the past 15 years directly adjacent and within the immediate vicinity of the Site, as outlined in Table 4-1.

4.2.1 Surrounding Area

The planning history of the surrounding area and adjacent lands are outlined in Table 4-1 below.

Table 4-1: Tipperary County Council – Planning Permission within the adjacent lands of the Proposed Site

Planning Ref.	Applicant	Year	Description	Planning Status
2460978	Tatver Properties Ltd	2025	A state-of-the-art healthcare waste treatment and recycling facility and a waste transfer station. The development will include the construction of 3 no. buildings; Building 1 (total gross floor area of circa (ca.) 2,242m2 and ca. 9m tall), Building 2 (total gross floor area of ca. 229m2 and ca. 6m tall) and Building 3 (total gross floor area of ca. 68m2 and ca. 4m tall) along with associated ancillary development including rooftop solar photovoltaic panels, 1no. battery energy storage system (total gross floor area of ca. 34m2 x 2m tall) and inverter, onsite tank with bunding, vehicle parking, rainwater harvesting tank, surface water retention ponds, firewater retention pond, firewater storage pillow tank, an onsite wastewater treatment system and associated polishing filter bed percolation area, dedicated container storage yard for the temporary storage of container units, signage, landscaping, perimeter security fencing and all ancillary works. The total development area will be ca. 3.75 hectares(ha). The development will intake ca. 10,000 tonnes per annum of healthcare waste for treatment and recycling and an additional ca. 15,000 tonnes per annum of hazardous waste will be accepted, temporarily stored, handled and consolidated onsite for onward transfer - an EIAR has been submitted with the application	Granted 27/05/2025
2460936 ACP - 322641	Nua Bioenergy Limited	2024	Construction of an anaerobic digestion plant and all other associated site excavation, infrastructural and site development works and associated site servicing. An Environmental Impact Assessment Report (EIAR) and a Natura Impact Statement (NIS) will be submitted with the application.	Granted 5/12/2025
2360281	Acorn Recycling Ltd.	2023	Development consisting of Workshop Building (1242m^2), Truck Washout Building (64m^2), commercial yard area, new boundary fence and entrance gates, an onsite Wastewater Treatment System and associated polishing filter bed percolation area, attenuation tank, bored well & water storage	Granted 05/12/2023

Planning Ref.	Applicant	Year	Description	Planning Status
			tank, rainwater harvesting tank, emergency storage tank, solar panels to roof of existing building and all associated siteworks.	
2260395	Naring Tech	2022	A 10-year planning permission for the development of a BioProducts Campus. The Bioproducts Campus development consists of an integrated Compost / Growing Media Facility and Anaerobic Digestion Facility, as well as a Biorefinery. The Compost / Growing Media Facility comprises 1 No. composting building (incorporating feedstock intake area, storage area, in-vessel tunnels, workshop), solar panels at roof level, associated biofilter and liquid storage tanks, 1 No. maturation building and 1 No. office building. The Anaerobic Digestion Facility comprises 3 No. digester tanks, 2 No. digestate storage tanks, 2 No. biogas fuelled electricity generating gas engines, 3 No. biogas processing units, associated storage tanks, bunding, plant and 1 No. gas flare. The BioRefinery includes 1 No. building (incorporating a goods inward area, processing area, drying room, process control rooms, a laboratory and offices), associated feedstock storage tanks; a BioEnergy Facility comprising 1 No. biomass boiler building, associated water storage tank, 1 No. materials storage building. The integrated Compost / Growing Media Facility and Anaerobic Digestion Facility will accept up to 80,000 tonnes of waste materials per annum. Provision of new site access from the R502, internal access roads and hardstanding, car parking, fire water tank and retention pond, ESB substation and pump house, 4 No. weighbridges, entrance gate and security fence. The proposed development includes all ancillary site development, landscaping and boundary treatment works above and below ground. The application relates to development which comprises or is for the purposes of an activity requiring an Industrial Emissions Licence. An Environment Impact Assessment Report will be submitted with this application.	Granted 03/01/2023
211171	Irish Bioeconomy Foundation CLG	2021	1) Demolition of the existing loading bay canopy 2) Change of use from maintenance depot to an agri-food sector Research and Development Unit for light industrial use with ancillary office space 3) Extension of the existing first floor accommodation by 169 sqm. 4) Construction of an external stair to the rear, additional windows to the front and rear elevations with an external perforated printed mesh screen fixed to the front and south gable elevation, canopy over the front entrance door and an array of PV Panels fixed to the roof 5) Landscape works including a wastewater treatment plant and car parking with 4 no. electric vehicle chargers.	Granted 18/11/2021
21709	Revive Environmental Holdings Ltd.	2021	Building (3657 sqm) with a car park and access road, commercial yard area and access road, truck prep building (110 sqm), 2 m high boundary architectural fence, signage, public lighting, solar panels to the building roof, an onsite waste water treatment system and associated polishing filter bed percolation area, rainwater harvesting tank, emergency storage tank,	Granted 13/08/2021

Planning Ref.	Applicant	Year	Description	Planning Status
			attenuation tank, bored well and all associated site works - application is accompanied by a Natura Impact Statement (NIS).	
21855	Lisheen III Wind Farm Ltd.	2021	Alterations to a previously permitted wind farm development (planning register refs 14/510138 and 15/600924 (Tipperary), 14/202, 15/629, 19/787 and 20/459 (Laois)) where the permitted development also extends into the townland of Bruckana, Baunmore and Rathpatrick in Co. Kilkenny and Graigueadrisly in Co. Laoise – the proposed alterations will consist of realignment of underground electrical and communications cabling previously consented in the aforementioned permissions (omission of ca.. 743m of the permitted route and replacement with ca. 572m of underground electrical communications cabling) and all associated works and services.	Granted 24/08/2021
20825	Lisheen III Wind Farm Ltd.	2020	Works within the boundary of the existing Lisheen 110 kV ESB Substation, the proposed works will comprise: replacement and improvement works to an existing electrical transformer bund; construction of two new concrete plinths for associated electrical infrastructure; installation of electrical infrastructure; and underground cable connection from the electrical infrastructure to the existing substation control building.	Granted 14/01/2021
20129	Glanbia Ireland DAC	2020	A 10-year planning permission for modifications to Condition No. 1 of previously granted planning permission Ref. No. 18/601296. The modifications comprise an outfall drain and associated pumping station and monitoring chambers to discharge surface water and treated wastewater from the Biorefinery Site through the townlands of Cooleeny and Derryfadda to the Drish River; a water supply pumphouse and associated site works including access road and security fencing in the townland of Derryville and a water supply pipeline from the pumphouse to the Biorefinery facility site. A Natura Impact Statement (NIS) will accompany the application. This application relates to development which comprises or is for the purpose of an activity requiring an Industrial Emissions Licence.	Granted 27/06/2020
18601296	Glanbia Ireland DAC	2018	A biorefinery facility comprising of a process building with processing areas, plant rooms, stores, personnel & administrative areas; external bunded process & storage areas; vessels and tanks; CHP plant; an effluent & water treatment plant which includes bunded tanks & a building; sewage treatment plant; water storage tanks & site development works including demolition of an existing electrical building, roads, paved areas, parking areas, drains and services, bore well, lighting, fire water retention tank, attenuation pond, site fencing, alterations to the discharge pipeline from the sewage treatment plant, weighbridges & weighbridge office, connection to an existing outfall pipeline and landscaping works. The application is accompanied by an Environmental	Granted 13/05/2019

Planning Ref.	Applicant	Year	Description	Planning Status
			Impact Assessment Report. This application relates to development which comprises or is for the purpose of an activity requiring an Integrated Pollution Prevention and Control Licence.	
17600440	Commercial Mushroom Producers Co-Operative Society	2017	The development will consist of a Phase III mushroom substrate (compost) production facility and will involve the construction of an administration building (296.16 sq. m), storage building (8444.04 sq. m), bunker building (9967.59 sq. m), tunnel building (10628.75 sq. m), woodchip bio-filter, wheel wash, weighbridge, 6 no. water storage tanks, 2 no. fuel storage tanks, well, wastewater treatment system, hardstanding areas, internal access roads, parking facilities, boundary fencing, landscaping, and all ancillary works. An Environmental Impact Statement (EIS) will be submitted with the planning application. The application relates to development which comprises or is for the purposes of an activity requiring an Integrated Pollution Prevention and Control Licence or a Waste Licence	Granted 23/01/2018
15600924	Brookfield Renewable Ireland Ltd.	2015	The development will consist of alterations to a previously permitted wind farm development (Planning Register References 14/510138 (Tipperary), 14/202 (Kilkenny) and 14/109 (Laois)) where the permitted development also extends into the townland of Bruckana, Baunmore and Rathpatrick near Johnstown, County Kilkenny and Graigueadrisly, County Laois. The proposed alterations will consist of: Amended cable route for underground electrical and communication cables; the omission of 1.3 km of previously permitted access track in Tipperary; and all associated works and services. A ten-year permission is sought. The application is accompanied by a Natura Impact Statement. This current application is part of an application for development which extends into the townlands of Bruckana and Baunmore near Johnstown, County Kilkenny The proposed amendments will consist of: relocated vehicular entrance on R502 through widening existing agricultural entrance; alterations to internal access tracks including construction of approximately 572m of new access track with associated drainage and watercourse crossing; the omission of 1.775 km of previously permitted access tracks; Clearfelling of approximately 0.5 Hectares of forestry associated with the new section of internal access track within the Baunmore forestry plantation, County Kilkenny; Amended cable route for underground electrical and communication cables; and all associated works and services. A ten-year permission is sought. The application is accompanied by a Natura Impact Statement	Granted 04/08/2016
14510138	SWS Energy Limited	2014	Underground electrical and communication cables, linking the 8 no. proposed turbines, within Counties Laois and Kilkenny and described hereunder, to the substation and control building at the existing Lisheen 110kV ESB Substation and construction of approximately 1.3km of new internal site access tracks. A ten-year permission is sought. The	Granted 28/07/2014

Planning Ref.	Applicant	Year	Description	Planning Status
			application is accompanied by an Environmental Impact Statement and Natura Impact Statement. The development is part of a larger development and the Site also extends into the townlands of Baunmore, Bruckana and Rathpatrick near Johnstown, Co. Kilkenny and Graigueadrisly, Co. Laois	
14600396	Lisheen Milling Limited	2014	An increase in height of the existing Tailings Management Facility (TMF), previously permitted under Reg. No. 13/510275, granted in 2013 (small adjoining cell to the main TMF). The raise in height of this adjoining cell, from c. 131.5 mod up to aa maximum of c. 136.5 mod, will provide additional storage for the management of mine tailings for the purposes of extending the life of the mine, abd will result in an increase in the footprint of the TMF of c 2.25 hectares. The development also includes all related ancillary development works. This application is accompanied by an Environmental Impact Statement(EIS) & Natura Impact Statement(NIS) and relates to an activity requiring an Integrated Pollution Control Licence	Granted 03/02/2015
12510275	Bord Na Mona Energy Ltd.	2012	Extension to the existing Lisheen 110kV ESB substation including the construction of a new control building, transformer bay, transformer / transformer bund, 38kV cubicle and the extension of the existing busbar. Ancillary works to include the realignment of the internal mine access track to facilitate the proposed extension and the erection of a new compound palisade fence to secure the extension.	Granted 12/12/2012
06510773	Anglo American Lisheen Mining Ltd.	2006	Wind turbine farm consisting of 22 No. wind turbine generators, access roads, craneage pads and associated infrastructure. An Environmental Impact Statement will be submitted to the Planning Authority with this Application	Granted 05/02/2007

4.3 Need for the Development

4.3.1 Global Policy Context

Globally, there is clear recognition that action to mitigate climate change is necessary. This initially resulted in the Paris Agreement 2015 [17] – an international effort to halt the global increase in temperature to below 2°C above pre-industrial levels, with efforts to keep it below 1.5°C. According to the Sixth Assessment Report ('AR6') of the United Nations Intergovernmental Panel on Climate Change ('IPCC'), it states that to meet the 1.5°C target, global GHG emissions must peak before 2025, fall by 43% by 2030 and reach net-zero by the early 2050s [18]. To achieve the 2°C target, emissions must drop by 25% by 2030 and reach net-zero by the early 2070s.

At the 2024 United Nations Climate Change Conference ('COP29'), the participating countries reaffirmed their earlier commitments under the Paris Agreement (2016) to keep the global temperature rise well below 2°C above pre-industrial levels and to pursue efforts to limit the increase to 1.5°C. There was also a recognition that limiting global warming to 1.5°C requires rapid, deep and sustained reductions in global greenhouse gas ('GHG') emissions, including reducing global carbon dioxide emissions by 55% by 2030 relative to the 1990 levels.

Renewable energy technologies play a vital role in the reduction of GHG emissions. In Ireland, wind energy generated 28% of all electricity consumption in 2018, which is second only to natural gas [19]. However, 7% of electricity in Ireland is still generated by coal, the fuel with the highest GHG emissions, as well as emissions of other pollutants [20]. It is paramount to transition to non-fossil fuel sources of electricity as fast as possible in order to achieve national (and international) GHG emissions reduction goals.

Ireland had an overall target of 16% of gross final energy consumption to come from renewable energy sources by 2020 [21]. This was to be achieved by 40% from renewable electricity, 12% from renewable heat and 10% from renewable transport.

Ireland did not meet the 2020 overall renewable energy target. The overall share of renewable energy was 13.5% compared to the target of 16%. Ireland achieved its EU 2020 renewable energy target for transport (10.2% vs. 10%) and just missed its renewable energy target for electricity (39.1% vs. 40%). Ireland achieved just half its 2020 renewable energy target for heating and cooling (6.3% vs. 12%). Energy from renewable sources grew by 8.9% in 2020 [19].

The EPA also recently reported that Ireland is not on track towards decarbonising the economy in the long term [22]. As it stands, Ireland is not on course to achieve its short- or long-term climate goals, and steep challenges will have to be faced toward 2050 [21]. Ireland now has some of the most demanding decarbonisation targets globally, with the necessity to halve emissions by 2030 and reach net-zero by 2050 now enshrined in Irish law [19].

Developments such as the Proposed Development are not only essential to achieving renewable energy goals, but also to achieving the wider goal of decarbonising the economy in Ireland.

4.4 European Policy Context

4.4.1 European Green Deal

Climate change and environmental degradation are an existential threat to Europe and the world. To overcome these challenges, the European Green Deal will transform the EU into a modern, resource-efficient and competitive economy, ensuring [23]:

- *No net emissions of greenhouse gases by 2050;*
- *Economic growth decoupled from resource use; and,*
- *No person and no place left behind.*

4.4.2 EU Renewable Targets

The EU wants to accelerate the take-up of renewables to contribute to and reach the goal of reducing net greenhouse gas emissions by at least 55% by 2030.

Increasing the share of renewable energy across the different sectors of the economy is therefore a key building block to reach the EU's energy and climate objectives by cutting greenhouse gas emissions by at least 55% (compared to 1990) by 2030 and becoming a climate-neutral continent by 2050.

4.4.3 Renewable Energy Directive 2023/2413/EU

In October 2022, the recast Renewable Energy Directive 2023/2413/EU entered into force, as part of the clean energy for all Europeans package, aimed at keeping the EU a global leader in renewables and, more broadly, helping the EU meet its emissions-reduction commitments under the Paris Agreement. Building on the 20% target for 2020, the recast Renewable Energy Directive 2023/2413/EU established a new binding renewable energy target for the EU for 2030 of at least 42.5%.

The Commission proposed a revision of the Renewable Energy Directive in July 2021, as part of the package to deliver on the European Green Deal, as detailed above. The proposal raises the ambition of the existing legislation to align it with the EU's increased climate ambition. It seeks to increase the current target to at least 40% renewable energy sources in the EU's overall energy mix by 2030. In May 2022, this target was subsequently increased to 45% as part of the European Commission's REPowerEU Plan, as detailed below. The amending Directive EU/2023/2413 entered into force on 20 November 2023.

4.4.4 REPowerEU Plan

On 18th May 2022, the Commission published the REPowerEU plan, which sets out a series of measures to rapidly reduce the EU's dependence on Russian fossil fuels well before 2030 by accelerating the clean energy transition. The REPowerEU plan is based on three pillars: saving energy, producing clean energy, and diversifying the EU's energy supplies. As part of its scaling up of renewable energy in power generation, industry, buildings and transport, the Commission proposes to increase the target in the directive to 45% by 2030, thereby increasing the targets set out in the current Renewable Energy Directive.

This would bring the total renewable energy generation capacities to 1236 GW by 2030, in comparison to 1067 GW by 2030 envisaged under the 2021 proposal.

4.4.5 Commission Recommendation

Alongside the REPowerEU plan, the Commission also presented a Recommendation on fast permitting for renewable energy projects and a legislative proposal on permitting that will contribute to the further acceleration [24].

It acknowledged that "*slow and complex permitting processes are a key obstacle to unleashing the renewables revolution and for the competitiveness of the renewable energy industry. Obtaining a permit can take up to 9 years for wind projects and up to 4.5 years for ground-mounted solar projects. Varying permitting times between Member States demonstrate that national rules and administrative capacities complicate and slow down permitting."*

For the purposes of the recommendations below and the accompanying guidance, renewable energy projects are understood to encompass "*production plants for the generation of renewable energy as defined in the Renewable Energy Directive (including in the form of renewable hydrogen), as well as the assets needed for their* ***grid connection*** *and for the storage of the energy produced."*

The recommendation includes:

- Faster and Shorter Procedures;
- Facilitating Citizen and Community Participation;
- Improving Internal Coordination;
- Clear and Digitalised Procedures;
- Sufficient Human Resources and Skills;
- Better Identification and Planning of Locations for Projects;
- Easier Grid Connection;
- Innovative Projects;
- Facilitating Power Purchase Agreements; and,
- Monitoring, Reporting and Review.

4.4.6 The Climate and Energy Policy Framework 2030

The Climate and Energy Policy Framework 2030 [25] includes EU-wide targets and policy objectives for the period between 2021-2030. It seeks to drive continued progress towards a low-carbon economy, to build a competitive and secure energy system that ensures affordable energy for all consumers and increase the security of the EU's energy supply. It sets targets of at least a 40% reduction (set to rise to at least 55%) in greenhouse gas emissions and at least a 32% share of renewable energy from all energy consumed in the EU by 2030.

4.5 National Policy Context

4.5.1 The National Planning Framework - Project Ireland 2040 (Ireland 2018)

The National Planning Framework ('NPF') is a high-level strategic plan to shape the future growth and development of the country to 2040. It is focused on delivering 10 National Strategic Outcomes ('NSOs').

NSO 8 focuses on the '*Transition to a Low Carbon and Climate Resilient Society'* and recognises the need to harness both onshore and offshore potential from energy sources, including solar, to deliver 40% of our electricity needs from renewable sources.

Transitioning to a low-carbon and climate-resilient society and achieving sustainable mobility are vital strategic outcomes identified in the NPF. This reflects the Government's 2014 National Policy Position on Climate Action and Low-Carbon Development, which establishes the fundamental national objective of achieving the transition to a competitive, low-carbon, climate-resilient and environmentally sustainable economy by 2050 [26].

The NPF states the objectives regarding renewable energy, including:

- New Renewable Electricity Support Scheme ('RESS') to support up to 4,500 megawatts of additional renewable electricity by 2030;
- Energy research funding to accelerate diversification away from fossil fuels to green energy, including wind, wave, solar, biomass, biofuels, biogas and hydrogen; and,
- Full roll-out of the new Support Scheme for Renewable Heat.

Section 5.4 of the NPF, 'Planning and Investment to Support Rural Job Creation', notes that in meeting the challenge of transitioning to a low-carbon economy, the location of future national renewable energy generation will, for the most part, need to be accommodated on large tracts of land that are located in a rural setting, while also continuing to protect the integrity of the environment and respecting the needs of people who live in rural areas.

It is a National Policy Objective (NPO 55) to '*promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a low carbon economy by 2050'*.

4.5.2 Planning and Development Act 2024

The Planning and Development Act 2024 ('the Act') was signed into law on 17th October 2024.

The Act places increased emphasis on a plan-led system based on an integrated hierarchy of plan-making comprising a National Planning Framework, regional spatial and economic strategies and council development plans. Thus, the Act provides a decision-making framework fit for the purpose of delivering on key infrastructure, including renewable energy projects.

It provides the potential to accelerate the delivery of renewable energy projects and cut carbon emissions by advocating for the acceleration of the timeframes for making planning decisions.

4.5.3 Climate Action Plan 2025

In 2025, the Government of Ireland released the Climate Action Plan 2025 – the third statutory annual update to Ireland's Climate Action Plan under the Climate Action and Low Carbon Development (Amendment) Act 2021. It outlines the current state of play across key sectors, including Electricity, Industry, Built Environment, Transport, Agriculture, Forestry and the Marine Environment and charts a course to achieve an ambitious net-zero emissions target by 2050 [27]. The plan commits to evaluating in detail the changes required to adopt such a goal in Ireland.

Decarbonising electricity is at the centre of the Climate Action Plan strategy, as this will also aid in the decarbonisation of other sectors such as transport, heating and industry. The share of electricity from renewable energy increased from 7.2% to 40.7% between 2005 and 2023 [27]. The demand for electricity is forecast to increase by between 19% and 50% above existing capacity in the next decade, in line with economic forecasts. Ensuring we build renewable, rather than fossil fuel, generation capacity to help meet this demand is essential. It makes economic sense and also facilitates decarbonising our heating and transport through electrification. It is planned to increase the proportion of renewable electricity to up to 80% by 2030, and a target of 8 GW from solar by 2030 [27].

The renewables sector is very dynamic in nature, with technologies still rapidly evolving. Ensuring increased levels of renewable generation will require substantial new infrastructure, including wind and solar farms, grid reinforcement, storage developments and interconnection:

> *'Increasing the share of electricity demand generated from renewable sources to up to 80% where achievable and cost effective, without compromising security of electricity supply'.*

As renewable generation is intermittent and often unpredictable, this creates new challenges for utilities, market participants and policymakers. Intermittency also establishes the need for a range of technology solutions, which include large-scale interconnection, storage and dispatchable capacity [27]. Up until recently, intermittency was a key obstacle to the expansion of renewable electricity, especially wind, and therefore, fossil fuels continue to be the dominant electricity-generating technology.

Specific actions for the electricity sector, with the aim of keeping Ireland on target for our 2030 decarbonisation ambitions, are set out in the Climate Action Plan 2025. Specifically, the following actions:

Table 4-2: CAP 25 Actions

Action No.	Description
Action EL/25/1	*'Manage the Renewable Electricity Support Scheme.'*
Action EL/25/1	*'Publish Long Duration Energy Storage Procurement recommendations paper.'*
Action EL/25/3	*'Develop a data sharing framework regarding Low Carbon Technologies connected to the electricity grid.'*
Action EL/25/4	*'Develop Smart-flex standards roadmap.'*
Action EL/25/5	*'Develop consumer-led flexible demand processes.'*
Action EL/25/6	*'Establish an electricity decarbonisation pathway through the Decarbonised Electricity System Study.'*
Action EL/25/7	*'Deliver a holistic onshore and offshore network plan blueprint (Net Zero Network Plan).'*

Action No.	Description
Action EL/25/8	*'Assessment of potential actions to encourage and incentivise the uptake of domestic and commercial flexible demand technology.'*
Action EL/25/9	*'Accelerate Renewable Electricity Taskforce to oversee delivery of actions contained in Implementation Plan.'*
Action EL/25/10	*'Offshore Wind Delivery Taskforce to continue to implement the system-wide plan for the delivery of ORE.'*
Action EL/25/11	*'Develop a framework of supporting policies for the repowering and extension of life of existing renewable electricity generation capacity.'*
Action EL/25/12	*'Introduce the Scheduling and Dispatch Programme Go Live.'*
Action EL/25/13	*'Increase the System Non-Synchronous Penetration limit to 80%.'*
Action EL/25/14	*'Launch Low Carbon Inertia Services Phase 2 procurement.'*
Action EL/25/15	*'Begin Future Arrangements for System Services Development.'*

4.5.4 The White Paper 'Ireland's Transition to a Low Carbon Energy Future 2015-2030'

The White Paper sets out a vision and a framework to guide Irish energy policy between 2015 and 2030. It is a complete energy policy update, and its actions have been informed by the vision to transform Ireland into a low-carbon society and economy by 2050, with 2030 representing a significant milestone. This includes the reduction of GHG emissions from the energy sector by between 80% and 95% (compared to 1990 levels) by 2050 while ensuring that secure supplies of competitive and affordable energy remain available to our citizens and businesses.

Chapter 5 of the White Paper 'Delivering Sustainable Energy: Efficiency, Renewables, Technology' sets out an overview of current and planned policies to progressively reduce Ireland's dependence on fossil fuels and support sustainability through energy efficiency, renewable energy and related technologies [28].

Section 142 of Chapter 5 states:

> *'Grid energy storage involves the storage of electrical energy on a large scale, transformed into other forms of energy, for optimum utilisation by the grid. A variety of technologies can be used, including pumped-storage hydroelectricity, compressed air storage, battery storage and thermal storage devices. Electrical energy is stored during times when production exceeds consumption, and this is returned to the grid when production falls below consumption. Grid energy storage can mitigate some of the grid-connection challenges posed by intermittent power plants, such as renewable electricity plants powered by wind, solar or tidal power, and can help to better manage the electricity system.'*

In terms of Electricity Storage, section 161 of Chapter 5 states:

> *'Electricity storage is expected to play an important role in facilitating the deployment of intermittent renewable energy technologies like wind, solar PV and ocean energy. The EU's Energy Roadmap 2050 confirms that storage technologies remain critical and that future integration of RES-E will depend on increased storage capacity. Electricity storage can be deployed in a number of circumstances in Ireland, including at grid-scale and at consumer level.'*

4.5.5 Le Chéile 28 – Statement of Strategy 2025-2028

Le Chéile 28 is the Statement of Strategy for the Department of Climate, Energy and the Environment ('DCEE') between 2025 and 2028. The purpose of Le Chéile 28 is to create a climate-neutral Ireland through collaborative climate action, addressing the transition to low-carbon energy systems, environmental protection and a resource-efficient economy.

Le Chéile 28 incorporates the following key provisions:

- Accelerate climate action and prepare Ireland for the impacts of a changing climate;
- Transform Ireland's energy systems to be sustainable, affordable and secure;
- Protect and enhance our environment and improve the circular and resource-efficient economy;
- Advance our climate, energy and environment objectives through effective EU and international leadership, engagement and collaboration; and,
- Sustain a high-performing, innovative and inclusive organisation focused on collaboratively delivering our vision and mission.

4.5.6 DCEE's Sectoral Capital Plan 2026-2030

The Department of Climate, Energy and the Environment's Sectoral Capital Plan for 2026-2030 under the National Development Plan is strongly aligned with the goals, objectives and actions of the DCEE's new Statement of Strategy, Le Chéile 28 (published in September).

The Sectoral Capital Plan provides for a total capital funding envelope under the National Development Plan of up to €5.640 billion. It outlines priority investments in the energy, climate and circular economy sectors over the next five years, along with planned electricity grid investments that will be leveraged by a separate equity investment of €3.5 billion in EirGrid and ESB.

Key priorities of the plan include:

- The continuation of sustained action to tackle the climate crisis and to decarbonise the economy, including by accelerating delivery of actions to achieve national and EU targets in emissions reductions to 2030 and 2040 and setting a pathway to net-zero emissions no later than 2050;
- Delivering the energy infrastructure required to sustain a growing economy; and,
- Leading a revolution in renewable electricity with a commitment to achieving 80% of Ireland's electricity generation from renewable sources by 2030.

4.5.7 National Energy & Climate Plan ('NECP') 2021-2030

This 2019 National Energy and Climate Plan ('NECP') was prepared in accordance with Regulation ('EU') 2018/1999 on the Governance of the Energy Union and Climate Action to incorporate all planned policies and measures that were identified up to the end of 2019, and which collectively deliver a 30% reduction by 2030 in non-ETS greenhouse gas emissions (from 2005 levels).

It is an integrated document mandated by the European Union to each of its member states in order for the EU to meet its overall GHG emissions targets. The Energy and Climate Plan addresses all five dimensions of the EU Energy Union: decarbonisation, energy efficiency, energy security, internal energy markets and research, innovation and competitiveness.

The plan establishes key measures to address the five dimensions of the EU Energy Union, including: By 2030, the Irish Government has now committed to:

- A 34.1% renewable energy target by 2030 under the NECP;

- Reduction of CO2 emissions by 4.8% per annum from 2021-2025 under the first carbon budget;
- Additional resources for 5,500MW of solar generation to support Ireland's need for greater renewable electricity capacity and to accelerate the reduction of emissions;
- To achieve a 34% share of renewable energy in energy consumption by 2030; and,
- To increase electricity generated from renewable sources to 70%, indicative of up to 1.5GW of grid-scale solar energy.

In addition to reaching renewable energy and decarbonisation targets, Ireland is obligated to monitor the security of electricity supply within its territory over the medium to long term. It is entitled to set and monitor the level of Security of Supply deemed appropriate for its own needs. Ireland also has the responsibility to comply with the requirements of the EU Target Model. In Ireland, the transmission system operator ('TSO') is EirGrid, and EirGrid is charged with reporting and advising on security of supply in electricity through adequate planning and operation of transmission capacity.

The Generation Capacity Statement 2023-2032, prepared by EirGrid, identified potential capacity deficits between 2023 to 2032. The deficits are expected to be the result of the deteriorating availability of power plants in the short term; however, in the long term, deficits are expected to reduce as new capacity comes forward through Single Electricity Market ('SEM') capacity auctions. In addition, new electricity generation will be required to secure the transition to high levels of renewable electricity over the coming decades.

Therefore, the Proposed Development will be fully in line with these National Policies and commitments and is essential for achieving Ireland's National Renewable and Decarbonisation targets.

4.5.8 EirGrid Generation Capacity Statement 2023-2032

The Generation Adequacy Statement ('GCS') is a way for EirGrid to signal future needs and requirements to the all-island energy market, as well as to policymakers and regulators who may have to react.

The GCS is published annually and allows the document to identify changing scenarios and allows time for developers, policy makers and regulators to respond. The ten-year outlook reflects the time required for the wider energy ecosystem to build the necessary infrastructure to address the identified problems.

The GCS is a significant source of information for the SEM Capacity Auctions, which are run annually to meet electricity capacity needs for a specified year, typically four years later. These are known as 'T-4' auctions, and the most recent one was run in 2024 to source capacity for September 2028 to September 2029.

For Ireland, since 2016, EirGrid has warned via the GCS of an increasing tightness between supply and demand. There is no question that the current outlook, based on the best information available, is serious. It is likely that in the coming years, we will experience system alerts and will need to work proactively to mitigate the risk of more serious impacts.

The GCS published in 2024 predicts a challenging outlook for Ireland, with capacity deficits identified during the 10 years to 2032. The deficits were identified to increase up to 2025 due to the deteriorating availability of power plants, resulting in their unavailability ahead of intended retirement dates, as well as increasing electricity demand. In later years, the deficits are expected to reduce as new capacity comes forward through the SEM capacity auctions.

EirGrid's analysis for Ireland shows that further new electricity generation will be required to secure the transition to high levels of renewable electricity over the coming decades. A balanced portfolio of new capacity is required, including new cleaner gas-fired generation

plants that are renewable gas-ready, especially when wind and solar generation are low. This balanced portfolio is also crucial to ensuring Ireland meets its carbon budgets for the electricity sector between now and 2030, positioning the electricity sector to achieve the zero net carbon target by 2050. Furthermore, by 2030, there will be significant new additional load from the heat and transport sectors as they are electrified, in line with government targets set out in the Climate Action Plan.

Policy and regulation actions are required to manage the shortfalls highlighted by the GCS through a combination of short-term measures and longer-term market-based enduring solutions. To address the challenge, in 2021, the Commission for the Regulation of Utilities ('CRU'), incorporating some of the recommendations of EirGrid and in conjunction with the Department of Environment, Climate and Communications ('DECC'), developed a programme of work and actions. This programme continues to progress actions that will be delivered over the coming years. These include:

- The delivery, through the all-island capacity auctions, of over 2,000 MW of enduring flexible gas-fired generation capacity, which is renewable gas-ready, by 2030;
- Procurement of 650 MW of temporary emergency generation capacity to remain available until the necessary replacement capacity has been secured. This capacity can only be called upon in the event of a shortfall in capacity and where alerts on the system are likely;
- Extending the operation, on a temporary basis, of older generators to delay the loss of up to 1,200MW of capacity to allow time for the enduring measures to be implemented; and,
- Actions to enhance the responsiveness of Demand Side Units and develop additional demand side capacity.

These temporary measures, if they are all fully implemented in time, will help bring the adequacy position back to the standard set by the CRU. There are many risks associated with the deliverability of these measures, and the CRU, DECC and EirGrid are all working closely to manage them.

The adequacy assessment of Ireland's system shows an initial deficit position across all core scenarios and remains in deficit over the study horizon. The median demand scenario is a central scenario in which EirGrid observes a significant capacity deficit in 2025 and 2026. These shortfalls are driven by a number of existing generation plants leaving the system and strong demand growth.

From 2026 to 2028, EirGrid forecasts a decrease in the deficit as new capacity units are expected to connect to the system, but the deficit remains significant. The benefit of this new capacity is somewhat tempered by the increasing demand (average of 130 MW/year in the median scenario between 2026-2032). It should be noted that a future T-4 capacity auction ran in September 2023 and will aim to procure generation capacity for October 2027. Further new capacity will be procured as part of this auction, which would further reduce the deficit. In 2027, the Celtic Interconnector's energisation will further reduce the deficit. However, beyond 2028, the deficits increase yearly to 2031 due to the increasing demand.

4.5.9 Delivering a Secure, Sustainable Electricity System ('DS3').

In response to binding National and European targets, EirGrid Group began a multi-year programme, "*Delivering a Secure, Sustainable Electricity System*" ('DS3'). The DS3 Programme aims to meet the challenges of operating the electricity system in a secure manner while achieving the 2030 renewable electricity targets.

EirGrid introduced a suite of 14 grid ancillary services under its DS3 Programme, setting a fixed tariff for each. These are known as DS3 System Services, and this market has been up

and running since May 2018 in Ireland. Battery technology is an excellent source of capability for a number of these services, particularly the faster-acting frequency and reserve products.

4.6 Regional Policy

In the regional context, the key documents considered for the Proposed Development are the Southern Regional Assembly Regional Spatial and Economic Strategy and the Regional Enterprise Plan to 2024 –Mid-West, which are presented in detail below.

4.6.1 Regional Planning Guidelines for the Mid-West 2010-2022

The Site falls within the administrative area of the Southern Regional Assembly and is covered by the Mid-West Regional Planning Guidelines ('MWPG'). This authority has released the Regional Planning Guidelines (2010-2022) [29].

4.6.2 Southern Regional Assembly ('SRA'), Regional Spatial and Economic Strategy ('RSES')

The Strategic Vision for the Southern Regional Assembly is set out in Section 2.1, which states as follows:

> *"The RSES vision for the Southern Region is led by the need for transformative change. By 2040, the population of the Region will most likely grow by 380,000 people to reach almost two million. This growth will require new homes and new jobs. It also raises questions as to where our future population will live and work, what kind of quality of life will we enjoy and how we can adapt to the challenges we face such as climate change, regional disparity and global uncertainty. An unchecked "business as usual" scenario will diminish our quality of life, our environment, erode our competitiveness and compound regional disparity. There is a need for a different approach to planning for the future."*

In addition, the RSES states that the vision is to:

- Nurture all our places to realise their full potential;
- Protect and enhance our environment;
- Successfully combat climate change;
- Achieve economic prosperity and improved quality of life for all our citizens;
- Accommodate expanded growth and development in suitable locations; and,
- Make the Southern Region one of Europe's most creative, innovative, greenest and liveable regions.

•Section 3.5 of the RSES defines Thurles as a Key Town and one of the most well-connected towns in the region, with road infrastructure and railway connections. The Lisheen site and National Bioeconomy Campus, Thurles, will be a significant national economic and employment driver following its designation as one of six sites within the EU for piloting the next generation of the bio-economy, including bio-energy and bio-technology. Thurles will be the focus of associated residential growth and growth in its service and enterprise base. There is also scope for creating greater synergies between Thurles and other Key Towns.

In relation to Lisheen and Thurles, it is a Regional Policy Objective of the RSES to;

> *"support and promote the role of Thurles as a strategically located urban centre of significant influence in a sub-regional context and driver of county and regional prosperity by harnessing the employment and economic potential of the town together with Lisheen, Thurles National Bio Economy Hub and the emergence of a new economic model focused on two principal pillars: low carbon growth and*

> *resource efficiency, while leveraging its strategic location and accessibility on inter-regional road and rail networks."*
>
> *"to support the sustainable development of the Lisheen Bio-economy Hub site into a significant economic and employment driver with the potential to significantly contribute towards meeting Ireland's climate change targets as a strategic site of European significance. Such initiatives as the Lisheen site shall be subject to robust environmental assessment including Flood Risk Assessment (if required) and satisfy AA requirements so as to avoid adverse effects on the integrity of European Sites."*

The RSES also states that developments at the National Bioeconomy Campus in Lisheen, Co. Tipperary, could enable the region to become a European Model Demonstrator Region of Bioeconomy. The campus is supported by the EU bio-economy strategy and Horizon 2020 for the sustainable use of our natural resources from traditional and non-traditional sectors.

The SRA RSES makes provision for the implementation strategy for the NPF for the southern region. It envisages a population growth of 380,000 to a total regional population of almost 2 million by 2040, an increase of 225,000 persons in jobs, with 888,000 in total employment in the region.

4.6.3 Regional Enterprise Plan to 2024 – Mid West

The Regional Enterprise Plan to 2024 is set out to create resilience in the regional economy in the mid-west, by addressing identified gaps and maximising opportunities while focusing on developing a sustainable future. The plan identifies five strategic objectives, which include:

1. Enable innovation to make the Mid-West a leading digital region;
2. Make the Mid-West Ireland's leading sustainability / low carbon region;
3. Enable Enterprise growth in regional towns and rural areas;
4. Initiatives to support SME, Start-ups and Microbusiness; and,
5. Develop Social Enterprises and Job Creation Initiatives for areas of high unemployment.

4.6.3.1 Renewable energy

The regional planning guide, section 2.2.3 Energy and Government Policy, states that renewable and sustainable energy lies at the heart of the Government's environmental and economic policies. Accordingly, the Vision stated in the Guidelines proposes that, "the high potential of the Region for the provision of renewable energy, including bio-energy and other green technologies, including bio-technologies, *"would be harnessed to the benefit of the economy and the environment alike".*

It is also stated that the County's rural areas have great potential for newer enterprise opportunities. These include those associated with renewable energy production and sustainable energy in which the County has developed a significant reputation through the work of the Local Authority, the Eco-Village in Cloughjordan and Tipperary Institute.

4.6.4 Tipperary Local Economic and Community Plan 2024-2029

The aim of the Local Economic and Community Plan 2024 – 2029 is to ensure that Tipperary remains a vibrant place where people can live, visit and work in a competitive and resilient economy, a sustainable environment and an inclusive, healthy and active community.

4.6.5 Tipperary County Development Plan 2022-2028

The ('TCDP') [30] came into effect on 11th July 2022.

The Site is located ca. 12km northeast of Thurles within County Tipperary and ca. 348m west of the northwestern border of County Kilkenny. As part of the National Bioeconomy Campus operated by the Irish Bioeconomy Foundation [31], the Site is in an area of national significance with assets such as good roads and nearby rail links. The Site has a significant industrial and environmental hinterland, including neighbouring solar farms and wind farms.

It is TCC's policy to:

- "*Promote and facilitate renewable energy development, in accordance with the policies and objectives of the Tipperary Renewable Energy Strategy 2016 (and any review thereof), and the Tipperary Climate Adaptation Strategy 2019."*

It is also an objective of TCC to:

- *"Support and facilitate the implementation of European and National objectives for climate adaptation and mitigation and to prepare a Climate Action Plan for Tipperary in compliance with the Climate Action and Low Carbon Development (Amendment) Bill (DECC, 2020) and any review thereof."*
- *"Support the National Policy Statement on the Bioeconomy (Government of Ireland, 2018) and any review thereof, having consideration to the strategic importance of the bioeconomy to rural Tipperary and support the preparation of a Bioenergy Implementation Plan for the Southern Region in conjunction with the Local Authorities and the Southern Regional Waste Management office."*

Chapter 2 of the TCDP sets out a Core Strategy, as required, which includes the following Strategic Objectives:

- SO-1 '*To support the just transition to a climate-resilient, biodiversity-rich, environmentally sustainable, and climate-neutral economy.'*
- SO-2 *'To facilitate and promote the development of Clonmel, Nenagh and Thurles as Key Towns, economic drivers and significant population and service centres for the Southern Region.'*
- SO-5 *'To promote, support and enable sustainable and diverse economic development and foster new and innovative opportunities, harnessing the taken of our workforce and communities.'*
- SO-6 *'To support a sustainable, diverse and resilient rural economy, whilst integrating the sustainable management of land and natural resources.'*
- *'The Core Strategy provides an overarching framework for the Plan, establishing a vision for the county with key ambitions building on Tipperary's unique strengths and assets. The Planning Act also require the Core Strategy to set out a medium to long-term spatial growth strategy, to provide land for residential development, and to ensure that the Plan can support the development of homes in urban and rural areas in accordance with national and regional development objectives set out in the NFP and RSES.'*

Among the new economic opportunities in Tipperary, the Plan recognises the county's ability to deliver the green transition through a focus on the bioeconomy, sustainable energy and research and development in green technologies. The Plan acknowledges that the employment-generating uses at the bioeconomy campus in Lisheen are unique and of a strategic scale and that the specific land-use requirements require it to be located away from the town.

The Renewable Energy and Bioeconomy planning objectives of the Plan include:

- Supporting the National Policy Statement on the Bioeconomy and any review thereof, having consideration to the strategic importance of the bioeconomy to rural Tipperary and supporting the preparation of the Bioenergy Implementation Plan for the Southern Region in conjunction with Local Authorities and the Southern Regional Waste Management office; and,
- Supporting the emerging bioeconomy sector, including support for the National Bioeconomy Campus in Lisheen.

The Plan provides for the development of the bioeconomy campus at Lisheen to be plan-led, with a masterplan to be put in place and for synergies between the proposed campus and Thurles to be identified at the LAP stage.

We consider that the Proposed Development aligns with the strategic vision for the National Bioeconomy Campus at Lisheen, as detailed below.

The vision for the Mid-Tipperary Decarbonising Zone is:

- "*A unique, thriving low carbon rural community in a biodiversity rich landscape. Built on a foundation of sustainable bioeconomy, land use diversification, energy efficient and biodiverse agriculture, renewable energy, eco-tourism and connected, equal and vibrant communities. Where communities and businesses will be empowered to adapt to the impacts of climate change and embrace methods and technologies to reduce Green House Gas emissions."*

4.6.5.1 Economic Development

County Tipperary has seen a significant decline in manufacturing employment in recent years. The closure of the Lisheen Mine and other high-profile industrial facilities has generated an urgent need to identify sustainable employment in the area. Since the economic crisis and given the differential impact on rural areas, there has been a growing interest in the spatial impact of policy, and the bioeconomy is considered to have the potential to generate significant direct and indirect employment in rural areas such as Tipperary.

The Site is zoned for industrial land-use. It is a stated policy objective of the Tipperary County Council to promote the development of the Lisheen lands for industrial development, and it is identified as a strategic employment area.

The strategic objective of the Economic Development section within the TCDP is:

> ***"****To promote, support and enable sustainable and diverse economic development, and foster new and innovative opportunities, harnessing the talent of our workforce and communities."*

According to the TCDP, the NPF highlights the potential of the bioeconomy in supporting rural economic development and employment. The continued development of the Lisheen National Bioeconomy Campus will support the southern region to become a 'European Model Demonstrator Region' for the bioeconomy. The TCDP objective relating to this is as follows;

> *"SO – 5 To promote, support and enable sustainable and diverse economic development, and foster new and innovative opportunities, harnessing the talent of our workforce and communities."*

Policy ED1 (b): Masterplan for Lisheen Mine Site, Moyne Templetuohy, Thurles

It is a policy of the Council to co-operate with the owners / operators of the Lisheen Mine Site in the promotion and the development of lands situated at Moyne Templetuohy to provide for proper planning and sustainable development of the area. The Council will promote development which will provide for the following:

- *Promote the use / development / production of renewable technologies or their by-product*
- *Use of suitable lands to provide for industries / employment / clean technology based industries not currently provided for within the county*
- *A high quality sustainable development*
- *Provide significant amenities, including a design based parkland*
- *Reuse of existing infrastructure within the mine complex, wherever."*

The Proposed Development is considered to be consistent with these objectives.

4.6.6 Tipperary County Council Local Authority Climate Action Plan

A key function of Tipperary County Council is the preparation of the Local Authority Climate Action Plan ('LACAP') [32]. The LACAP for the period of 2024-2029 was made at a TCC plenary meeting on 12th February 2024. The function of the LACAP is to set out how the Council will deliver on climate action (Climate Mitigation and Climate Adaptation) and how the Council aim to influence, facilitate and advocate for climate action across other sectors and communities within the county.

TCC collaborate with stakeholders and communities in the Decarbonising Zone ('DZ') and Lisheen area. The DZ is defined in the National Guidance on the Development as:

- "…*a spatial area, in which a range of potential climate change mitigation, adaptation and biodiversity measures are identified."*

The DZ acts as a demonstration area for positive climate action at a local and community level. It is the purpose of the TCC as the local authority to:

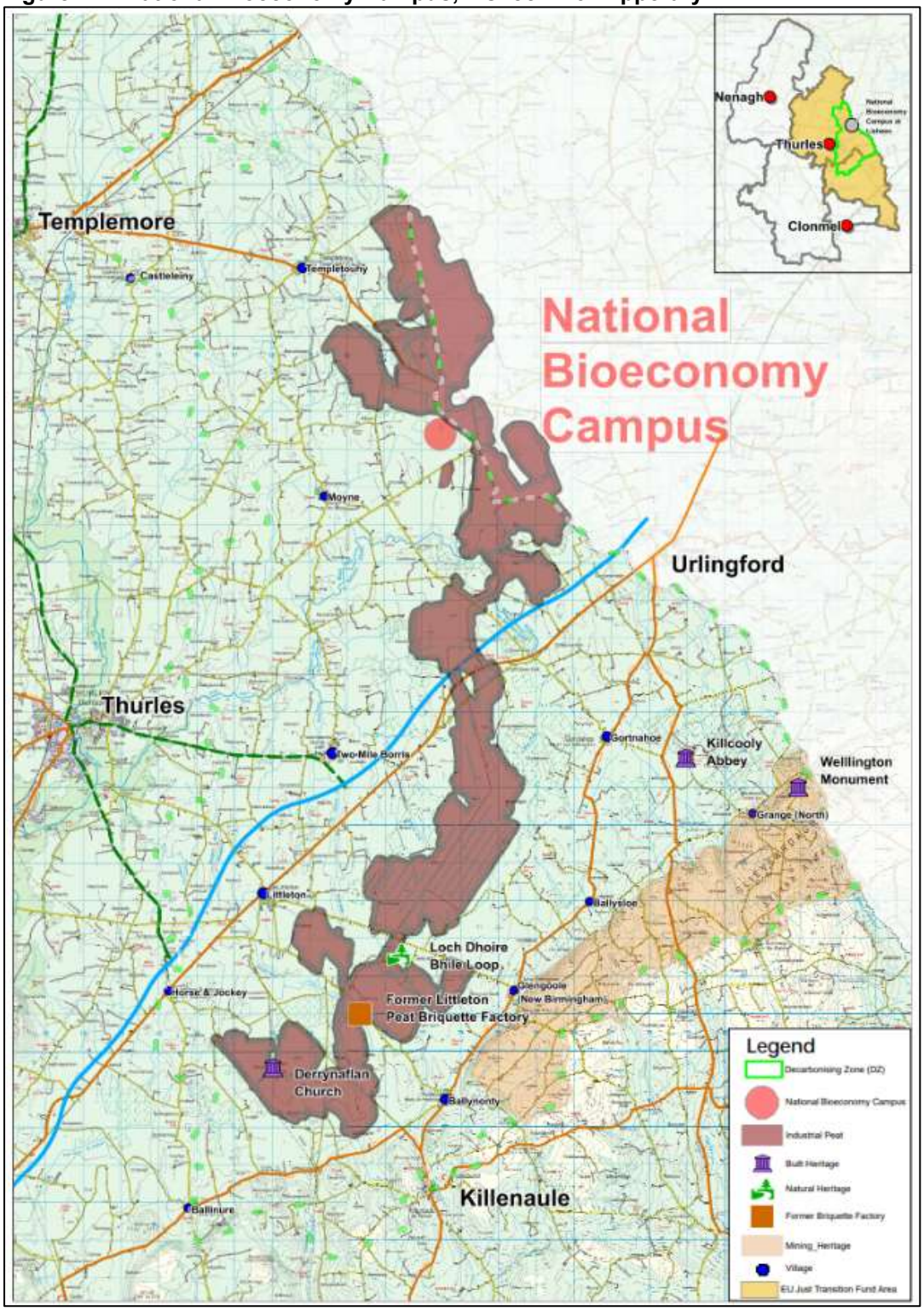
- "*Promote exploration, co-creativity, innovation and new learnings in delivering climate action, as well as the economic and social benefits of decarbonising, such as just transition and health."*

The Mid-Tipperary DZ is centred around the National Bioeconomy Campus at Lisheen and the wider hinterland encompassing parts of both the Thurles and Carrick on Suir Municipal Districts. It is the only inland and rural DZ in Ireland. This National Campus, being led by the Irish Bioeconomy Foundation and TCC with the support of Enterprise Ireland, has commenced the process of identifying groups and stakeholders capable and willing to support and contribute to the delivery of opportunities and actions set out in the DZ. This process will continue to evolve and develop over the lifetime of the LACAP. Some examples of such groups and stakeholders are: Teagasc, Energy Authority of Ireland, Bord na Mona and the Department of Agriculture, Food and the Marine. The support of such groups and stakeholders adds to the attractiveness and success of The National Bioeconomy Campus at Lisheen.

It is an objective of TCC to:

- "*Promote and support the growth and development of Lisheen Bioeconomy Campus as an important employment location with strong ties to Thurles, maximising its residential and employee potential."*

Figure 4-1: National Bioeconomy Campus, Lisheen Co. Tipperary



4.6.7 Local Planning Context

Locally relevant plans include the Thurles and Environs Local Area Plan 2024 – 2030 ('LAP') and the Lisheen National Bioeconomy Campus Masterplan. Relevant objectives from both of these are discussed below.

4.6.8 Thurles and Environs Local Area Plan 2024-2030 ('LAP')

The LAP [33] recognises Thurles and lands at Lisheen in particular as a significant national economic and employment driver following its designation as one of six sites within the EU for piloting the next generation of the bioeconomy, including bioenergy and biotechnology. According to the LAP, Thurles will be the focus of associated residential growth, along with growth in its service and enterprise base, to enhance the Lisheen Bioeconomy Campus. The Lisheen Bioeconomy Campus is not within the LAP boundary but falls within the TCDP.

4.6.8.1 Zoning

The Proposed Development is zoned according to TCC as a Decarbonising Zone ('DZ'). TCC has identified the Lisheen Mine and Lisheen Bog area, centred on the National Bioeconomy Campus, as the first DZ in Tipperary. This DZ designation recognises the importance of the bioeconomy in Tipperary. TCC will support the development of more DZs in the future for Tipperary.

4.6.8.2 Economic Policy

Thurles is located at the centre of the Southern Region and will be a strategic national economic and employment driver as one of six designated sites within the EU for piloting the next generation of the bioeconomy.

Section 4 of the LAP elaborates on the support of developments in areas such as Lisheen Bioeconomy Campus, which is being built in purposeful and existing high-quality areas. This section states that:

> *"New office, research and development and high technology/ high technology manufacturing type employment, shall be located in an existing high quality built and landscaped environment, unless it is demonstrated that there is no availability of such sites."*

4.6.9 The National Bioeconomy Campus Masterplan (DRAFT)

The TCDP provides that the bioeconomy campus at Lisheen will be plan-led, with a masterplan put in place and for synergies between the proposed campus and Thurles to be identified in the LAP. Lisheen was selected as the optimum location for the Proposed Development for multiple reasons, including its excellent road access, infrastructure and distance to sensitive receptors.

The Masterplan layout provides a series of development areas, the development of which seeks to achieve the overall range of facilities proposed within the campus. The Proposed Development is located within Area 1. Within this area, the Masterplan provides for enterprises that support or are complementary to the bioeconomy, that support the designation of the area within a decarbonisation zone and that have high energy demand and can benefit from the direct supply of surplus power generated on the Site and uses that come within the concept of the circular economy.

The Masterplan also provides that new development shall incorporate renewable energy for self or shared consumption on the site, development shall include biodiversity enhancement and planting and nature-based arrangements for surface water disposal. The design of the Proposed Development will meet all of these criteria.

It is considered that this location readily meets the requirements of the draft masterplan and is the optimal location for a development that is complementary to bioeconomy enterprises. It will seek to benefit from the on-campus supply of renewable energy, the facility comes within the concept of the circular economy, and it will provide R&D that will be beneficial to the other businesses located on campus. It will also create local employment.

A summary of the reasons why the Proposed Development will meet the objectives of the Draft Masterplan for Area 1 is as follows:

Renewable Energy and Decarbonisation

- The Proposed Development will be connected to the existing 110kV Lisheen substation located immediately adjacent to the Site, enabling direct import and export of electricity to the national grid;
- This connection will facilitate the efficient integration of renewable electricity generated by the Permitted Solar Development, thereby supporting the transition to a low-carbon energy system, supporting national and regional renewable energy and decarbonisation objectives; and,
- The grid connection also provides flexibility to respond to variations in electricity demand and supply over time.

Sustainability

- The Proposed Development will incorporate nature-based drainage solutions, including sustainable surface water management measures, to reduce runoff

Biodiversity Enhancement

- All existing natural hedgerows and trees within Area 1 will be retained. The Proposed Development will further enhance biodiversity within the National Bioeconomy Campus through targeted planting and the integration of nature-based solutions for surface water and wastewater management.

Consultation with the IBF and Partners

- Soleirtricity Ltd have had very constructive engagement with the IIBF team, who are very supportive of this Proposed Development.

4.6.10 Local and Regional Economic Strategies Support Scheme

The Local and Regional Economic Strategies Support Scheme ('LRESSS'), under the EU Just Transition Fund Programme 2021 - 2027, aims to provide targeted support to projects that will boost communities and the economic fabric of the wider Midlands.

Under this scheme, Tipperary County Council has been awarded funding of €1,000,000 for a project at Lisheen, granted under Category 1 of the EU Just Transition Fund: Local and Regional Economic Strategies Support Scheme (EU JTF LECP-REP scheme). The Lisheen project comprises a Masterplan Development of a 10-acre site at Lisheen, Co. Tipperary, and Part 8 Planning for an Industrial Core building, including:

- A defined Masterplan for a 10-acre site owned by TCC;
- A Part 8 planning application for a circa. 300m^2 industrial core building;
- Confirmation of Feasibility and Connection agreements, with Utility Providers to service the 10-acre site and the ancillary building, e.g. ESB, Uisce Éireann, Bord Gáis, Broadband, etc.; and,
- Detailed design of wastewater treatment system.

5 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The Proposed Development will comprise:

- One 110kV tail-fed transmission substation; and,
- 110kV underground cable connecting the substation to the existing Lisheen 110kV ESB Substation.

5.1 110kV Substation

The Proposed Development will consist of a 10 year permission for a 110kV electrical substation and associated 110kV underground grid connection, cabling and associated works. The Proposed Development will transmit power from a solar farm (permitted under Tipperary County Council Reg. Ref: 21/1128), which will connect into the existing Lisheen 110kV ESB substation.

The proposed 110kV electrical substation in Killoran, on a site of 2ha will consist of:

a) 1 no. electrical substation compound and access road, palisade fencing and gates;

b) 1 no. electrical substation compound / IPP control building measuring 10.74m x 20.15m and 6.920m in height;

c) Station compound extension required at Lisheen 110kV station to facilitate the new Cooleeny 110kV cable bay;

d) 1 no. Eirgrid switch room building measuring 18m x 25m and 8.55m in height;

e) 1 no. lightning protection monopoles measuring up to 22m in height;

f) A main step-up transformer;

g) Associated ancillary equipment such as electrical apparatus, plant and equipment;

h) Overhead and underground electrical and communications cabling and ancillary works; and,

i) All associated ancillary works above and below ground including raising a portion of the site by ca.1m using imported engineering fill.

This switchyard will be enclosed in a palisade-type security fence. The proposed 110kV substation will also have its own control building to house the indoor switchgear and control and protection equipment.

The Proposed 110kV Substation is required to coincide with the 76 MEC AC EirGrid Offer for the Permitted Development. This switchyard will be enclosed in a palisade-type security fence. The proposed 110kV substation will also have its own control building to house the indoor switchgear and control, and protection equipment.

The Proposed 110kV Substation is required to coincide with the 76 MEC AC EirGrid Offer for the Permitted Development.

CCTV

The on-site CCTV would be remotely monitored via a 24/7 operational team who would alert all relevant personnel in the event of a break-in or vandalism at the Site. The cameras will only be focused along the fence line and will not be focused on any residential properties.

Fencing

The switchyard will be enclosed in a palisade-type security fence. A perimeter fence will be installed to provide security and restrict access by wildlife.

Lighting

Emergency lighting will only occur as part of the Proposed Development.

5.1.1 110kV Underground Grid Connection

The 110kV underground cabling is proposed from the proposed 110kV substation to the existing Lisheen 110kV ESB substation, will consist of:

a) Ca. 225m of underground 110kV electrical cables and associated communications cables;

b) Three 125mm diameter HDPE power cable ducts;

c) One 100mm diameter HDPE communications ducts;

d) One 125mm diameter earth continuity duct to be installed in an excavated trench, typically 825mm wide by 1,315mm deep;

e) 1600sq mm Al cable;

f) 240sq mm copper earth continuity cable;

g) One fibre cable; and,

h) All associated ancillary works above and below ground.

The UGC will be installed in a cable trench as per industry standards, including ducting, fibre optic conductor, insulated earthing conductor where required, as well as link boxes at some jointing locations. The Energy Supply Board ('ESB') will ultimately be responsible for ensuring that the most appropriate connection option is selected. This asset, together with the substation, will be owned and operated by the Independent Power Producer ('IPP').

The Proposed Development layout is shown in Appendix 5-1.

5.1.2 Drainage

Surface Water Drainage

The Proposed Development will comprise limited hardstanding, confined to the substation building footprint and access tracks required to EirGrid specification. These elements will represent a small proportion of the overall Site area.

The majority of the surfaces onsite will remain permeable surfaces, allowing rainwater to percolate directly to the ground. As a result, surface water runoff will be minimal and comparable to existing baseline conditions.

Given the limited extent of impermeable surfaces, no specific surface water drainage infrastructure will be required for the Proposed Development. The development will not require any alteration to the existing on-site drainage regime, and surface water will continue to be managed through natural infiltration.

Foul Water

There will be no foul drainage connections required. During the Construction Phase, portable toilets will be provided at the temporary Contractors' Compound. All waste from the portable toilets will be removed and disposed of off-site by an approved contractor.

During the Operation Phase, the facility will be unoccupied for the majority of their service life. However, for design purposes, it was assumed that a maximum projected attendance at the Site and in these buildings will be 2 to 3 people for one day every month.

The predicted irregular foul loading due to the sporadic occupancy of the buildings creates unsuitable conditions for a wastewater treatment system. It is proposed, therefore, to pipe the foul water to a 5,000L tank for temporary holding storage. A maintenance agreement will be

entered with a suitably licensed waste contractor for periodic (3 months) emptying of this tank. The maximum predicted flow into the tank every 3 months is:

- 3 people x 100 l/person/day = 300 l/day.
- 300 (1 day every 4 weeks) x 12 weeks = 900 litres.

Therefore, a 5,000-litre tank that will be emptied every 3 months will provide ample capacity to store the foul water. There will be no foul water discharges arising from the Proposed Development.

5.1.3 Earthworks

The proposed 110kV substation will be developed on ca. 1ha within the overall ca. 2ha Site. These works will require the importation of engineering fill materials to raise site levels by ca. 1m over a total area of ca.17,668m^2 as follows:

- Proposed 110kV substation area measuring 10,191m^2; and,
- The extension over the fence area measuring 7,477m^2.

The detailed design will determine the extent of the earthworks required; however, it is known that the proposed 110kV substation will comprise a concrete foundation for the transformers and electrical equipment, with the rest of the area filled with crushed rock.

Any earthworks required for the Proposed UGC will be backfilled using suitable excavated material, with surface levels reinstated to match the surrounding ground profile.

The remainder of the Site is reserved for future expansion works, as specified by EirGrid. This identified expansion area is currently subject to seasonal groundwater emergence, which can result in localised flooding during periods of a high-water table. The required ground levelling works would not result in any adverse effects on surrounding land, drainage patterns and groundwater conditions, and would be fully integrated with the overall surface water management approach for the Site.

5.1.4 Site Access

The Site is well placed for national distribution and export. It is strategically located adjacent to the M8 motorway. A purpose-built 8km primary road connects the Site directly to the former N8 national road (now R639), which connects to the M8 motorway at Junction 4 (Urlingford) and Junction 6 (Horse and Jockey), midway between Dublin and Cork.

Construction Phase Access and Egress

The Site is accessed from the existing commercial Lisheen Mine entrance along the L5612 local road via the R502 regional road, which currently provides access for Lisheen Mine Complex. All Construction and Operational Phase access and egress will be via the existing access.

The existing entrance is wide and well-serviced and is capable of taking all the vehicle movements during the Construction Phase of the Proposed Development.

Internal Access

The construction of the Proposed Development will utilise the network of pre-existing hardcore tracks, which extend to all areas of the Site.

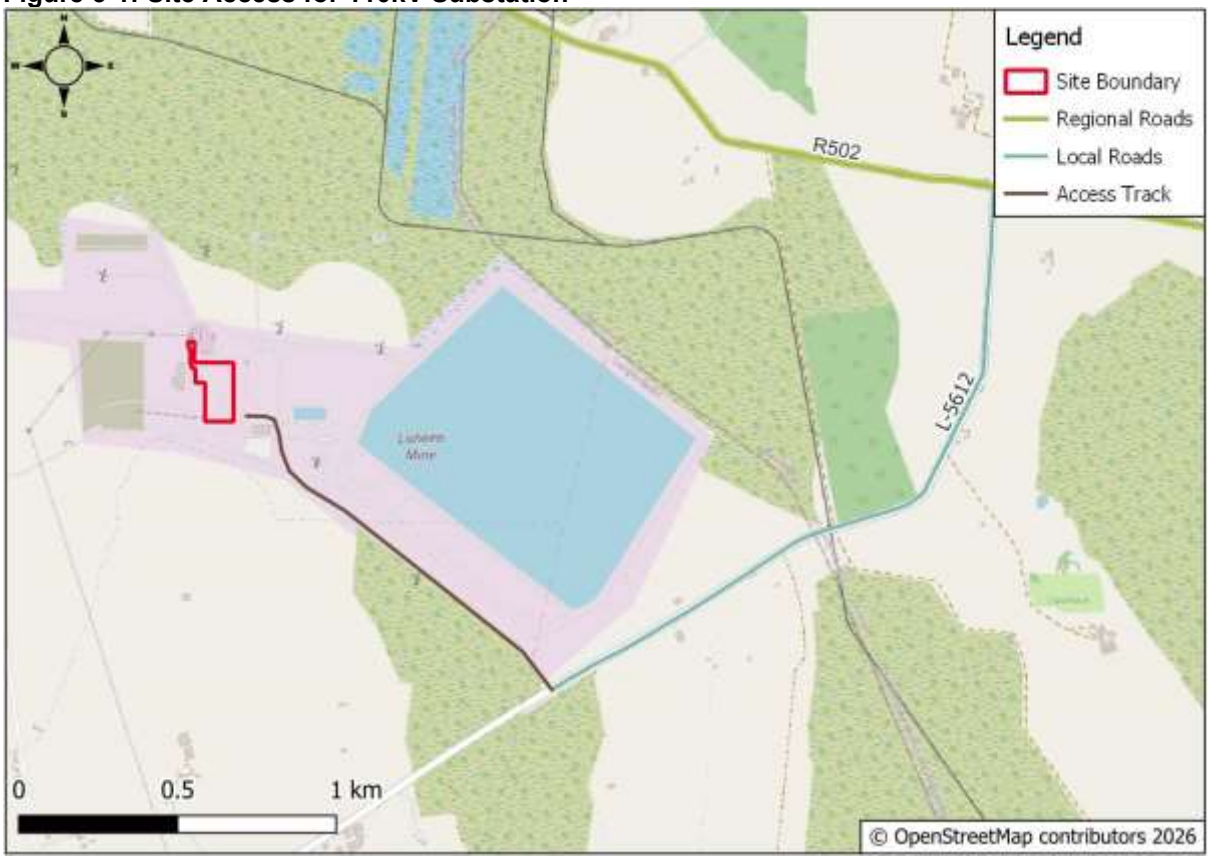
Operational Phase Access and Egress

All Operational Phase access and egress will be via the existing access.

All access and egress arrangements as detailed above were granted as part of the Permitted PV Development, and therefore the principle of use has already been established. It should

also be noted that Transport Infrastructure Ireland ('TII') or the municipal district engineer had no objection to the access arrangement for the Permitted Development.

Figure 5-1: Site Access for 110kV Substation



5.1.5 Sightlines

All Site access and egress sightlines are in accordance with all sightline visibility requirements, as set out by the TII Design Manual for Roads and Bridges.

For vehicles entering the Site, the forward visibility in both directions is in excess of 150m, and for vehicles departing the Site, the forward visibility in both directions is in excess of 90m.

The L5612 provides adequate stopping Site distances and satisfies current standards; therefore, the Proposed Development will not significantly contribute to the risk to road users.

5.1.6 Security Fencing / Hoarding Fencing

The Site will be secured by palisade fencing and gates.

5.2 Specialist Ecological Input / Sensitive Design

Specialist ecological input was a key element of the design of the Proposed Development. This ensured that the design was sensitive to valued ecological features that occur or may occur within the Site and the surrounding landscape. The key sensitive design measures are as follows:

- The Proposed Development will use the approved access arrangements as per the Permitted Development, which utilises the existing Lisheen Mine Complex access point;
- Buffers will be implemented and maintained throughout the lifecycle of the Proposed Development, including:

- A >1km buffer between the Proposed Development; and any designated European site;
- A >40m buffer between the Proposed Development and all EPA-designated watercourse;
- A ca. 6m buffer between the Proposed Development and existing hedgerows / treelines; and,
- A minimum ca. 200m buffer between likely acoustic emission infrastructure associated with the Proposed Development, and sensitive residential dwellings.

5.3 Construction Procedure

During the Construction Phase, the methods of working will comply with all relevant legislation and best-practice guidelines to reduce the environmental adverse effects of the works. Although Construction Phase adverse effects are generally of a short-term duration and are localised in nature, the adverse effects will be reduced as far as practicable through compliance with current construction industry guidelines.

It is proposed that there will be a single construction programme for the Permitted Development and the Proposed Development.

A Construction Environmental Management Plan ('CEMP') will be prepared and submitted to the planning authority by the appointed contractor in advance of works commencing at the Site. The pCEMP will be a 'living document', and the final CEMP will be issued by the appointed contractor prior to construction commencing. The following guidance will be referred to and will be followed during the Construction Phase of the project to prevent environmental pollution that may occur:

- C532 – Control of Water Pollution from Construction, Guidance for Consultants and Contractors [34];
- C811 - Environmental Good Practice on Site (5th edition) [35];
- C648 - Control of Water Pollution from Linear Construction Projects: Technical Guidance [36];
- Guidance for the Treatment of Otters Prior to the Construction of National Road Schemes [37];
- All works will be undertaken in accordance with the Inland Fisheries Ireland ('IFI') '*Requirements for the Protection of Fisheries Habitat during Construction and Development'* [38];
- The recommendations included within National Roads Authority ('NRA') Guidelines for the crossing of watercourses [39]; and,
- NRA, 'Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads' [40].

The following measures will be incorporated and adhered to in order to ensure that the proposed works will not result in any contravention of wildlife legislation:

- All activities will comply with all relevant legislation and best practice to reduce any potential environmental impacts. The measures detailed within this report will be fully adhered to;
- In advance of works, all Site personnel will receive an induction which will include reference to measures in relation to protected species and measures to prevent the spread of invasive species;

- Should construction works be required outside of daylight hours, the appointed project Ecological Clerk of Works ('ECoW') will be consulted as required; and,
- If protected or notable species are encountered during operations at the Proposed Development, the ECoW will be contacted for advice.

5.3.1 UGC Construction Methodology

The UGC ducts will be installed and the trench reinstated in accordance with the landowner's requirements, where installed on private lands. The installation of the electrical cabling / fibre cable will be pulled through in some sections. Construction methodologies to be implemented and materials to be used will ensure that the UGC is installed in accordance with the requirements of the Council and private landowners.

5.3.2 Hours of Work

Working hours will generally be restricted to between 08:00 and 20:00 hours Monday to Friday inclusive and between 08:00 and 18:00 hours on Saturdays. Construction work will not be permitted on Sundays, public holidays or at night-time except where safety concerns necessitate it or if agreed in advance with the Planning Authority.

5.3.3 Temporary Construction Compound

Given that the Overall Development will be constructed as a single construction project, the secure construction compound will be established in accordance with the arrangements approved under the Permitted Development. Tipperary County Council previously granted the construction compound permission as part of the Permitted Development, and no change to its location or extent is proposed.

All materials for the construction of the Proposed Development will be deployed and stored within a temporary construction compound. All equipment and materials unloaded in the construction compound would be distributed throughout the Site using smaller machines, such as bobcats, via a network of pre-existing hardcore tracks.

The Site Compound (including welfare areas) would be erected on existing hardstanding only. No earthworks or sub-surface disturbance will occur as part of these proposed facilities.

The compound will operate as a secure, designated area and will be located away from any drainage ditches, watercourses, or other sensitive environmental receptors. This arrangement will ensure that construction activities are appropriately managed and that potential risks to the surrounding environment are avoided.

5.3.4 Waste Management – Construction

- All excavated materials within the Site will be reused onsite, where possible. Excavated material from the UGC shall be employed to backfill the trench where appropriate, and any surplus material will be transported off-site and disposed of at a fully authorised soil recovery site;
- Waste materials will be collected and stored in suitable receptacles before they are taken offsite;
- Waste materials will not be allowed to accumulate because of the fire / vermin risk; and,
- All wastes will be appropriately segregated with the objective of maximising the level of recycling.

5.3.5 Monitoring Works.

An ECoW will inspect the Site in advance of works commencing and will undertake Site inspections as required during the works to ensure that they are completed in line with the

measures detailed within this ER, along with the AA and CEMP prepared as part of this planning submission to ensure compliance with all relevant wildlife legislation.

The ECoW will either deliver the Site induction directly or provide the resident engineer with sufficient environmental information to ensure that a comprehensive Site induction is delivered to all personnel working onsite.

5.4 Operational Procedures

Once operational, significant maintenance works will not be required. The Proposed Development will be an unmanned facility, which will be remotely monitored by way of CCTV. Any fault flagged on the control system will be inspected by maintenance personnel or dealt with remotely if possible. All systems onsite will be automated, with remote access provided to the control building.

The Proposed Development will require as low as one maintenance visit per month to undertake routine, non-intrusive maintenance tasks such as Site inspection, cable and power plant checks and servicing. Only small vans / jeeps will be used to access the Site.

The transformer units will contain oil that will be bunded. Under normal operation, this oil is maintained within the system, and no emissions will occur. To prevent unforeseen impact on the environment, the transformer and step-up transformer units will be monitored and maintained.

5.4.1 Waste Management

There will be no operational waste associated with the Proposed Development, with the exception of the foul wastewater that will need to be removed periodically from the storage tank by a licensed contractor. The Decommissioning Plan, prepared as part of the overall planning application, addresses all aspects of waste management during the Operational Phase.

5.5 Decommissioning

The operation of the facility will be for approximately 40 years, as determined by the grant of planning. At this time, a decision will be made as to whether the Permitted Solar Development that will be connected to the Proposed Development will be decommissioned or repowered. If the decision is taken to decommission the Permitted Development, then the Proposed Development will also be decommissioned, and the Site will return to agricultural usage. However, if the solar farm were to be repowered, then the Proposed Development would remain in use.

It is proposed that there will be a single decommissioning programme for the Permitted Development and the Proposed Development.

The decommissioning tasks and removal of all solar farm components from the leased land will be completed within twelve months of the cessation of electricity generation by the solar farm, and the Site shall be reinstated to its former use.

At the end of the Proposed Development's lifetime, the substations will be completely dismantled (including underground electrical interconnection and distribution cables), and the Site will be restored to its preconstruction state.

The Decommissioning Plan addresses all aspects of waste management post-Operational Phase. The Applicant will re-use or recycle as many of the substation's components as reasonably practicable. All residual waste will be removed by a licensed contractor and transported to a licensed waste facility.

Given the nature of the Proposed Development and the small amount of infrastructure required, it is considered highly unlikely that any adverse effects would occur as a result of

decommissioning works. However, decommissioning works will have to be carried out in accordance with best practices and any legislation applicable at the time of decommissioning.

Full details of the decommissioning works are included within the 'Decommissioning Plan' submitted as part of the overall planning application.

6 BIODIVERSITY

This chapter of the report provides a description and assessment of the potential, likely and significant impacts of the Proposed Development on ecology.

A detailed ecological appraisal has been carried out by a team of fully qualified and experienced MOR Environmental Ecologists in line with *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (2018 and revisions) [41]. This chapter details the methods and results of a desk study and field surveys undertaken to establish the baseline ecological status of the Site and its immediate surroundings and to assess the potential impacts of the Proposed Development.

In addition, an assessment on potential impacts on European sites was also undertaken and is presented in the Appropriate Assessment – Stage 1: Screening Report ('AA') submitted as part of this planning application. The AA should be read in conjunction with this chapter.

6.1 Statement of Authority

This report was reviewed and approved by Ms. Kathryn Broderick, Principal Consultant - Ecologist. Kathryn has over 9 years of experience working in the ecological consultancy sector. As part of her role, Kathryn is required to undertake habitat surveys and appraisals as well as specialist protected species surveys in support of Ecological Impact Assessments and Appropriate Assessments.

6.2 Methodology

6.2.1 Legislation / Policy Context

Within Ireland, a number of sites of international or national importance to nature conservation, as well as many species of animal and plants, are afforded some degree of legal protection; for details, see Box 1 below.

A study of biodiversity-related planning policy at the national and local level has been undertaken for the Site and locality to highlight any potential conflicts with the relevant legislation and guidance documents as outlined in Box 1.

Box 1 Designated Wildlife Sites and Protected and Otherwise Notable Habitats and Species

The National Park and Wildlife Service ('NPWS') notifies sites in Ireland that are of international or national importance for nature conservation (although some sites that are of national importance for certain species have not been so designated).

Internationally important sites may also be designated as:

- Special Areas of Conservation ('SACs') and Candidate Special Area of Conservation ('cSACs'): the legal requirements relating to the designation and management of SACs in Ireland are set out in the European Communities (Birds and Natural Habitats) Regulations 2011-2021 (S.I. No. 477/2011);
- Special Protection Areas ('SPAs') and candidate Special Protected Areas ('cSPAs'): strictly protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (2009/147/EC), also known as the Birds Directive; and,
- Ramsar sites: wetlands of international importance designated under the Ramsar Convention, to which Ireland is a signatory.

Other statutory site designations relating to nature conservation are:

- National Heritage Areas ('NHA'): these represent examples of some of the most important natural and semi-natural terrestrial and coastal habitats in the country and are afforded protection under the Wildlife (Amendment) Act 2000. NHAs are legally protected from damage and receive protection from the date they are formally proposed for designation; and,
- Proposed Natural Heritage Areas ('pNHAs'): these sites are not afforded the same protection as NHAs. The National Parks and Wildlife Service ('NPWS') proposes these sites but are not statutorily proposed or designated. Prior to statutory designation, these are subject to a very limited legal protection. They are, however, sites of significance for wildlife and habitats and are important for the purposes of this Biodiversity Chapter.

Legally protected species

Many species of animal and plant receive some degree of legal protection. For the purposes of this study, legal protection refers to:

- Species included in the Wildlife (Amendment) Act 2000, excluding species that are only protected in relation to their sale, reflecting the fact that the site disposal will not include any proposals relating to the sale of species; and,
- Species afforded protection under the Flora (Protection) Order 2022 (S.I.No.235/2022).

Other notable habitat/species categories

- Biodiversity Action Plan ('BAP') species: those targeted in local or national BAPs as being of particular conservation concern (priority species).
- Red and Amber List birds: those listed as being of high or medium conservation concern as listed by Birdwatch Ireland on the Birds of Conservation Concern in Ireland 2020-2026 [42].
- Other Irish Red Data Book species [43] and Nationally/Regionally/Locally Notable species where appropriate.

6.2.2 National Planning Context

A study of biodiversity-related planning policy at the national and local level has been undertaken for the Site and locality to highlight any potential conflicts with the relevant legislation and guidance documents as outlined in Box 1.

6.2.2.1 Project Ireland 2040 National Planning Framework

The Government launched Project Ireland 2040 in February 2018 [15] and incorporates two policy documents - the National Planning Framework and the National Development Plan.

National Planning Framework

Under the biodiversity section "Project Ireland 2040 National Planning Framework", the National Policy Objective 59 is to:

'Enhance the conservation status and improve the management of protected areas and protected species by:

- *Implementing relevant EU Directives to protect Ireland's environment and wildlife;*
- *Integrating policies and objectives for the protection and restoration of biodiversity in statutory development plans;*

- *Developing and utilising licensing and consent systems to facilitate sustainable activities within Natura 2000 sites; and,*
- *Continued research, survey programmes and monitoring of habitats and species.*'

The National Policy Objective 60 in the same document is to:

> *'Conserve and enhance the rich qualities of natural and cultural heritage of Ireland in a manner appropriate to their significance.'*

Updated Draft Revised National Planning Framework (April 2025)

Following a Government decision in June 2023, the preparation of a revised National Planning Framework commenced to take account of changes that have occurred since it was published in 2018 and to build on the framework that is in place. Public consultation took place from 10th July 2024 to 12th September 2024, following which the Government agreed to progress and publish a draft schedule of amendments to the First Revision to the National Planning Framework in November 2024. On 8th April 2025, the Government approved the revised NPF, following the conclusion of environmental assessments that included a Strategic Environmental Assessment ('SEA'), a Natura Impact Statement ('NIS') and an Appropriate Assessment Determination, as well as a Strategic Flood Risk Assessment ('SFRA'). Both houses of the Oireachtas, the Seanad and the Dáil, approved this document as of 30th April 2025. The Revised NPF is a direct replacement of the NPF and is detailed further below.

Objectives under the '*Strategic Planning for Biodiversity*' section of this draft framework include the following:

National Policy Objective 84

> *'In line with the National Biodiversity Action Plan and European Union Nature Restoration Law, and best available scientific information, regional and local planning authorities shall support the preparation and implementation of the National Restoration Plan.'*

National Policy Objective 85

> *'In line with the National Biodiversity Action Plan; the conservation, enhancement, mitigation and restoration of biodiversity is to be supported by:*
>
> - *Integrating policies and objectives for the protection and restoration of biodiversity, including the principles of the mitigation hierarchy of - avoid, minimise, restore and offset - of potential biodiversity impacts, in statutory land-use plan.*
> - *Retention of existing habitats which are currently important for maintaining biodiversity (at local/regional/national/international levels), in the first instance, is preferable to replacement/restoration of habitats, in the interests of ensuring continuity of habitat provision and reduction of associated risks and costs.'*

National Policy Objective 86

> *'In line with the objectives of the National Biodiversity Action Plan, planning authorities should seek to address no net loss of biodiversity within their plan making functions.'*

National Policy Objective 87

> - *'Enhance the conservation status and improve the management of protected areas and protected species by:*
> - *Implementing relevant EU Directives to protect Ireland's environment and wildlife and support the objectives of the National Biodiversity Action Plan;*
> - *Developing and utilising licensing and consent systems to facilitate sustainable activities within Natura 2000 sites; and,*

- *Continued research, survey programmes and monitoring of habitats and species.'*

National Policy Objective 88:

Facilitate the protection and restoration of biodiversity (including in European sites and the habitats and species for which they are selected) through the preparation of national guidance in relation to Planning and Biodiversity to:

- *Plan and manage for integration of biodiversity protection and restoration in future planning and development;*
- *Ensure a consistent and strategic approach to biodiversity protection and restoration across planning authorities and administrative boundaries, and*
- *Support the implementation of the National Biodiversity Action Plan (2023-2030) and the forthcoming National Restoration Plan.*

The National Development Plan 2021-2030

The National Planning Framework and the National Development Plan will continue to align and form a single vision for Ireland under Project Ireland 2040. The National Development Plan [44] also lists the following items as strategic investment priorities in relation to National Heritage and biodiversity:

- *'Implementation of the current and future National Biodiversity Action Plan, delivery of National Parks and Wildlife Service Farm Plans and LIFE projects, enhanced wildlife crime investigation capacity and identification and delivery conservation measures at designated sites as identified in the Prioritised Action Framework for Ireland (2021-2027).'*
- *'Investment in nature and biodiversity, to improve the quality of natural habitats and support native plants and animals, including those under threat, and to bolster broader societal wellness and sustainability goals.'*
- *'Future-proofing obligations under the Biodiversity Strategy 2030, including potential national designations and the preparation and delivery of a National Restoration Plan.'*

6.2.2.2 Ireland's 4th National Biodiversity Action Plan 2023-2030

Ireland's 4th National Biodiversity Action Plan ('NBAP') sets out a number of strategic objectives that lay out a clear framework for Ireland's approach to biodiversity and demonstrate Ireland's commitment to protecting our biodiversity and halting the decline. The following objective within the current NBAP was considered relevant to the Proposed Development and this report:

Objective 2 of the NBAP aims to:

'*Meet urgent conservation and restoration needs,'*

A number of targeted outcomes are listed under this objective, which are considered relevant to the Proposed Development. These include the following:

Outcome 2A:

'The protection of existing designated areas and protected species is strengthened and conservation and restoration within the existing protected area network are enhanced.'

Outcome 2B:

'Biodiversity and ecosystem services in the wider countryside are conserved and restored – agriculture and forestry.'

Outcome 2D:

> *'Biodiversity and ecosystem services in the marine and freshwater environment are conserved and restored.'*

Outcome 2H:

> *'Invasive alien species (IAS) are controlled and managed on an all-island basis to reduce the harmful impact they have on biodiversity and measures are undertaken to tackle the introduction and spread of new IAS to the environment.'*

Objective 3 of the NBAP is to:

> *'Secure Nature's Contribution to People.'*

Under Objective 3, the following targeted outcome is considered relevant to the Proposed Development:

Outcome 3A:

> '*Ireland's natural heritage and biocultural diversity is recognised, valued, enhanced and promoted in policy and practice.'*

Outcome 3C:

> *'Planning and development will facilitate and secure biodiversity's contributions to people.'*

6.2.3 Regional Planning Context

6.2.3.1 Regional Spatial and Economic Strategy for the Southern Region

The Regional Spatial and Economic Strategy for the Southern Region ('RSES') [45] recognises the need to conserve and enhance biodiversity through coordinated spatial planning between the counties within the southern region of Ireland. This strategy came into effect on 31st January 2020.

Under the biodiversity section, Regional Policy Objective 126 states that the Southern Regional Assembly will:

a) *'Promote biodiversity protection and habitat connectivity both within protected areas and in the landscape through promoting the integration of green infrastructure and ecosystem services, including landscape, heritage, biodiversity and management of invasive and alien species in the preparation of statutory and non-statutory land-use plans. The RSES recognises the role of the National Biodiversity Data Centre through its Citizen Science initiatives;*

b) *Support local authorities acting together with relevant stakeholders in implementing measures designed to identify, conserve and enhance the biodiversity of the Region; seek and support the implementation of the All-Ireland Pollinator Plan, National Biodiversity Action Plan and National Raised Bog SAC Management Plan;*

c) *Local Authorities are required to carry out required screening of proposed projects and any draft land-use plan or amendment/ variation to any such plan for any potential ecological impact on areas designated or proposed for inclusion as Natura 2000/ European Sites and shall decide if an Appropriate Assessment is necessary, of the potential impacts of the project or plan on the conservation objectives of any Natura 2000/European Site;*

d) *Support local authorities to carry out, monitor and review biodiversity plans throughout the Region. Planning authorities should set objectives in their land use plans to*

implement and monitor the actions as set out in the National and County Biodiversity Plans, as the conservation of biodiversity is an essential component of sustainable development. Local authorities should address the issue of fisheries protection and invasive introduced species and encourage the use of native species for landscape planting in rural areas, in the review of their biodiversity plans;

e) *Support local authorities to work with all stakeholders to conserve, manage and where possible enhance the Regions natural heritage including all habitats, species, landscapes and geological heritage of conservation interest and to promote increased understanding and awareness of the natural heritage of the Region.'*

The RSES also contains policies relating to invasive species. Regional Policy Objective 127 states that it is an objective to:

a) *'Support coordination between the Region's local authorities in terms of their measures to survey invasive species in their counties and coordinate regional responses;*

b) *Encourage greater awareness of potential threats caused by invasive species and how they are spread;*

c) *Carefully consider and implement the management of invasive species where there is a corridor, such as hydrological connections to European Sites in order to prevent the spread of invasive to sensitive sites.'*

6.2.4 Local Planning Context

6.2.4.1 Tipperary County Development Plan 2022-2028

The TCDP [30] contains a number of policies and objectives that relate directly to the protection of biodiversity and natural heritage in the context of proposed developments [66]. The policies and objectives of the 'TCDP' with regard to the natural environment that are relevant to the Proposed Development are as follows:

Strategic Objective 1:

'To support the just transition to a climate resilient, biodiversity-rich, environmentally-sustainable and climate-neutral economy.'

Strategic Objective 7:

'To protect, enhance and connect areas of natural heritage, blue and green infrastructure and waterbodies, for quality of life, biodiversity, species and habitats, while having regard to climate change adaptation and flood risk management measures.'

Section 11.2:

'The Council will support stakeholders and sectors in achieving the objectives of the National Biodiversity Plan, '2017-2021', (DCHG 2017) as follows:

1. *To mainstream biodiversity into decision-making across all sectors;*
2. *To strengthen the knowledge base for conservation, management and sustainable use of biodiversity;*
3. *To increase awareness and appreciation of biodiversity and ecosystems;*
4. *To conserve and restore biodiversity and ecosystems in the countryside;*
5. *To expand, and improve management, of protected areas and species, including control of invasive species; and,*

6. To strengthen governance for biodiversity and ecosystem services.'

Policy 10-3:

'Support and facilitate the development of a sustainable and economically efficient agricultural and food sector and bioeconomy, balanced with the importance of maintaining and protecting the natural services of the environment, including landscape, water quality and biodiversity.'

Policy 11-1:

'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).'

Policy 11-2:

'Ensure the protection, integrity and conservation of European Sites and Annex I and II species listed in EU Directives. Where it is determined that a development may individually, or cumulatively, impact on the integrity of European sites, the Council will require planning applications to be accompanied by a NIS in accordance with the Habitats Directive and transposing Regulations, 'Appropriate Assessment of Plans and Projects, Guidelines for Planning Authorities', (DEHLG 2009) or any amendment thereof and relevant Environmental Protection Agency (EPA) and European Commission guidance documents.'

Policy 11-3:

'Ensure the conservation and protection of existing, and proposed NHAs, and to ensure that proposed developments within or in close proximity to an existing or proposed NHA would not have a significant adverse impact on the status of the site as described'.

Policy 11-4:

'(a) Conserve, protect and enhance areas of local biodiversity value, habitats, ecosystems and ecological corridors, in both urban and rural areas, including rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands in accordance with the objectives of the National Biodiversity Plan (DCHG 2017) and any review thereof.

(b) Safeguard, enhance and protect water bodies (rivers/canals/lakes) and river walks and to provide links, where possible, to wider green infrastructure networks as an essential part of the design process.

(c) Require an 'Ecosystems Services' approach for new development to incorporate nature-based solutions to SUDS, in so far as practical, as part of water management systems, public realm design and landscaping, in line with best practice.

(d) Where trees or hedgerows are of particular local value, the Council may seek their retention, or where retention is not feasible, their replacement and will seek a proactive focus on new tree-planting as part of new development.'

Policy 11-13:

'Seek to control the spread of invasive plant and animal species, including consideration of potential pathways for invasive species spread, i.e. watercourses.'

Policy 11-19:

'Ensure that new development does not result in significant disturbance as a result of light pollution and to ensure that all new developments are designed and constructed to minimise the impact of light pollution on the visual, environmental and residential amenities of surrounding areas.'

Objective 11-G:

'Apply best practice in sustainable environmental standards in the design and development of collaborative and/or public sector development in Tipperary, including:

(a) Ensure that biodiversity issues are considered at the earliest possible stages of plan making;

(b) Ensure that plans and strategies comply with nature conservation legislation and policy as required (fulfil SEA and AA requirements); and

(c) Carry out ecological impact assessment of plans and strategies as appropriate.'

6.2.4.2 Thurles and Environs Local Area Plan 2024-2030

The LAP [3] outlines the local spatial planning framework for Thurles with planning policies and objectives unique to Thurles and the wider region, including Lisheen and the Lisheen Bioeconomy Campus. Tipperary County Council produced the LAP on 12th February 2024 and came into effect on 25th March 2024. It contains a number of policies and objectives that relate directly to the protection of biodiversity and natural heritage in the context of the Proposed Development.

Policy 7.7:

'a) Support the retention of trees of significant amenity value, and require public realm proposals to include for urban greening that is appropriate to the character of the area, provides for urban shading, supports biodiversity and provides an appropriate visual setting.

b) Consider the removal of mature trees, or trees of significant amenity value, only where it can be demonstrated that the loss of the tree(s) is outweighed by the wider public benefits of the proposal.

c) Require development proposals which affect trees of significant amenity value to identify trees to be retained, and methods for the protection of those trees to be retained during and post construction to be set out within development proposals.

d) Require new development proposals to incorporate the provision of trees, in accordance with the requirements of Section 3.7 of the Development Management standards of the TCDP.'

6.2.5 Desk-Based Studies

The following literature sources were consulted as part of this desktop study:

- Review of aerial maps of the Site and surrounding area;
- The NPWS website was consulted with regard to the most up-to-date details on conservation objectives for the Natura 2000 sites relevant to this assessment [46];
- The Tipperary County Council planning portal was consulted to obtain details about existing / proposed developments in the vicinity of the Site [47];

- The National Biodiversity Data Centre ('NBDC') website was consulted with regard to species distributions [48]; and,
- The EPA Maps website was consulted to obtain details about watercourses in the vicinity of the Site [4].

6.2.6 Field Survey

Habitat surveys were undertaken on 1st May 2024 and on 19th September 2024 by a suitably qualified and experienced MOR Environmental Ecologist to assess the extent and the quality of habitats present on the Site and to identify any potential ecological receptors associated with the European sites. An updated habitat survey was undertaken on 19th December 2025.

All the surveys were undertaken using the Heritage Council's – '*A Guide to Habitats in Ireland'* [49] and were conducted in line with the Heritage Council's '*Best Practice Guidance for Habitat Survey & Mapping'* [50]. This is the standard habitat classification system used in Ireland and includes both a desk-based and field-based assessment.

The assessment was also extended to identify the potential for these habitats to support other features of nature conservation importance, such as species afforded legal protection under either Irish or European legislation (see Box 1). Based on the habitats present, no additional species-specific surveys were undertaken.

6.2.6.1 Protected / Notable Species

The methodologies used to establish the presence / potential presence of faunal species are summarised below. These relate to those species / biological taxa that the desk study and habitat types present indicated could occur on the Site.

Flora

The Site was assessed for the presence of notable / protected flora species in accordance with the following:

- Flora (Protection) Order 2022 (S.I. No. 235/2022); and,
- Ireland Red List No. 10: Vascular Plants [51].

Amphibians

The Site was assessed for its potential to provide sheltering, foraging and breeding habitat for amphibians. These included water bodies suitable for egg-laying and terrestrial habitats comprising open areas with mixed-height vegetation, such as heathland, rough grassland, open scrub or waterbody margins. Suitable, well-drained and frost-free areas are needed to enable amphibians to survive the winter.

The survey was undertaken in line with the NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' [52].

Otter

The habitat survey was extended to investigate and examine areas where otter might occur by noting any evidence of otter observed. Evidence of otter searched for included:

- Holts (features log piles, caves and cavities);
- Slides (flattered areas of mud or vegetation);
- Paw prints;
- Evidence of foraging (usually in the form of feeding remains such as fish scales and shellfish); and,
- Spraints.

The field survey of the Site was conducted in line with the following relevant guidance for otter:

- Scottish Natural Heritage ('SNH'), '*Technical Advice Note #2: Otter Surveys'* [53];
- DoAHG, 'National Otter Survey of Ireland 2010 / 12' [54]; and,
- NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' [52].

Badger

The Site was surveyed for its potential to provide suitable habitat for badger. The assessment aimed to identify and examine areas where badgers (*Meles meles*) might occur by noting any evidence of badger activity. This included:

- Mammal paths;
- Badger hairs caught in sett entrances / fences / vegetation;
- Paw prints;
- Evidence of foraging (usually in the form of 'snuffle holes');
- Badger Scat (isolated badger droppings);
- Latrines (shallow pits / holes occurring together comprised of exposed badger droppings); and,
- Badger setts.

A mammal path was assumed to be used by badgers if the character of the path (in terms of size) was appropriate and/or if any other signs were in close vicinity (e.g. a badger sett).

The field survey of the Site was conducted in line with the following relevant guidance for badgers:

- Scottish Badgers, '*Surveying for Badgers: Good Practice Guidelines,*' [55];
- The Mammal Society, 'Surveying Badgers,' [56]; and,
- NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' [52].

Bats

An initial assessment was carried out during the habitat survey of the suitability of the habitats within the Site to support bat roosting, foraging and commuting. The assessment utilised close-focusing binoculars as required.

Bat habitats and commuting routes identified were considered in relation to the wider landscape to determine connectivity for local bat populations, and through the examination of aerial mapping.

Assessment criteria for evaluating the potential suitability of the Site for bats were carried out in line with *'Bat Surveys for Professional Ecologists: Good Practice Guidelines,'* [57].

Table 6-1: Guidelines for Assessing the Potential Suitability of Proposed Development Sites for Bats, Based on the Presence of Habitat Features within the Landscape, to be Applied using Professional Judgement [57]

Potential Suitability	Description of Roosting habitats in structures	Description of Potential flightpaths and foraging habitats
None	No habitat features onsite are likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevice /	No habitat features onsite are likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitats that provide continuous lines of shade / protection for

Potential Suitability	Description of Roosting habitats in structures	Description of Potential flightpaths and foraging habitats
	suitable shelter at all ground / underground levels).	flight-lines or generate / shelter insect populations available to foraging bats).
Negligible*[1]	No obvious habitat features onsite are likely to be used by roosting bats; however, a small element of uncertainty remains, as bats can use small and apparently unsuitable features on occasion.	No obvious habitat features on site are likely to be used as flightpaths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions*[2] and/or suitable surrounding habitat to be used regularly or by larger numbers of bats (i.e., unlikely to be suitable for maternity and not a classic cool / stable hibernation site but could be used by individual hibernating bats*[3]).	Habitat that could be used by small numbers of bats as flightpaths, such as a gappy hedgerow or unvegetated stream, but isolated, i.e., not very well connected to the surrounding landscape by another habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats, such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flightpaths such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. The Site is close to and connected to known roosts.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support a high conservation status roost, e.g. maternity or classic cool / stable hibernation site.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats, such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape, which is likely to be used regularly by foraging bats, such as broadleaved woodland, tree-lined watercourses and grazed parkland. The Site is close to and connected to known roosts.

*[1] Negligible is defined as 'so small or unimportant as to be not worth considering, insignificant'. This category may be used where there are places that a bat could roost or forage (due to one attribute) but it is unlikely that they actually would (due to another attribute).

*[2] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

*[3] Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments ([58] and [59]).Common pipistrelle swarming has been observed in the UK ([60] and [61]) and winter hibernation of numbers of this species has been detected at Seaton Delaval Hall in Northumberland ([62]). This phenomenon requires some research in the UK, but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in prominent buildings in the landscape, urban or otherwise.

The survey was undertaken in accordance with recognised best practice as outlined below:

- DoEHLG, '*Bat Mitigation Guidelines for Ireland*' [63];

- NRA, now TII, *'Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes*' [64]; and,
- Bat Conservation Trust ('BCT'), '*Bat Surveys for Professional Ecologists Good Practice Guidelines 4th Edition*' [57].

Birds

The Site was assessed for its potential to support important assemblages of birds of rare or notable species, as well as designated bird species. The habitat survey aimed to identify and examine the suitability of the Site for potential wintering and breeding birds. Any bird activity onsite and potential nesting habitats were noted.

Invasive Species

The Site was visually assessed for the presence of any noxious / invasive species that are regulated under the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) [65] such as Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*).

The Site was also assessed for the presence of non-regulated invasive species that have the potential to impact local biodiversity.

Other Species

In addition, an assessment was carried out of the potential of the Site to support other species considered to be of value for biodiversity, including those identified as occurring locally based on the desktop study and professional judgment.

6.2.6.2 Survey Limitations

The most recent habitat survey was undertaken outside of the optimal botanical season for flowering plants, which is usually considered to be April – September inclusive [66]. However, given the nature of the habitats on site, the size of the Site and the fact that most species present on site could be identified, it was not considered that this limitation will alter the findings of this assessment, and no further habitat surveys were considered necessary.

No further survey limitations were encountered.

6.2.7 Assessment Methodology

The starting point for the assessment was a scoping exercise to identify ecological receptors that would require further consideration. This involved differentiating the biodiversity receptors (i.e., designated sites, habitats, and species populations) that could be significantly affected by the Proposed Development.

The approach used to determine which receptors have the potential to be significantly affected by the Proposed Development involved using baseline data collected through the desk study and field surveys for the Site. Based on professional judgement, data from the following radii were collected: 2km away for protected species, 15km for European sites and 5km away from Natural Heritage Areas. The desk and field-based data were used to determine:

- Which, if any, of the species or habitat that have been recorded are legally protected or controlled (see Box 1); and,
- Which, if any, sites, areas of habitat and species that have been recorded are of importance for biodiversity conservation.

The next stage of the assessment was to determine whether the identified receptors are of sufficient biodiversity value that an impact upon them would be of potential significance in terms of this ER. In this regard:

- Biodiversity conservation value relates to the quality and / or size of sites or habitats, or the size of species' populations; and,
- Potential significance means that the effect could be of sufficient concern or, for positive effects, of such substantial benefit that it could be material to influencing the decision on planning.

Receptors that have been identified as having sufficient value, and where an impact upon them could be of potential significance, have been taken forward for further consideration. Legally protected species were also considered further (refer to Box 1 above). This involved:

- Identifying, for each receptor, any significant impact that is likely to be caused by the Proposed Development, which has the potential to lead to a significant effect and / or to contravene relevant legislation;
- Determining the area within which the likely impacts would cause a potentially significant impact on the identified receptor and / or could contravene relevant legislation (ecological zone of influence); and,
- If the receptor occurs or is likely to occur within the zone of influence and concluding that the receptor could be significantly affected and / or the relevant legislation contravened, the receptor would be subject to further assessment.

6.2.8 Evaluation of the Conservation Importance of the Site

In terms of biodiversity conservation value, identified receptors have been valued using the NRA Scheme [67], using the following scale:

- International importance;
- National importance;
- County importance (or vice-county in the case of plant or insect species);
- Local importance (higher value); and,
- Local importance (lower value).

6.3 Study Results

6.3.1 Desk Study

Prior to conducting any Site surveys, a desk-based review of information sources was completed. This baseline information provides a valuable insight into the types of flora and fauna that may occur on site. It allows the identification of features / habitats located off-site that may require further assessment.

6.3.1.1 European Designated Sites

In accordance with the European Commission Methodological Guidance [68] and policies 11-1 and 11-2 of the TCDP [30] a list of European sites that can be potentially affected by the Proposed Development has been compiled. Guidance for Planning Authorities prepared by the Department of Environment, Heritage and Local Government [69] states that defining the likely Zone of Influence for the screening of a project or plan, and the approach used will depend on the nature, size, location and the likely significant effects of the project / plan. The key variables determining whether or not a particular European site is likely to be negatively affected by a project are:

- The physical distance from the Site to the European site;

- The presence of impact pathways;
- The sensitivities of the ecological receptors; and,
- The potential for in-combination effects.

All SPAs and SACs within 15km have been considered to assess their ecological pathways and functional links. As acknowledged in the OPR guidelines [70], few projects have a zone of influence this large; however, the identification of European sites within 15km has become widely accepted as the starting point for the screening process.

There are five European sites located within 15km of the Site. These are identified in Figure 6-1 and Table 6-2.

Figure 6-1: Proposed Development Location and European Designated sites within 15km

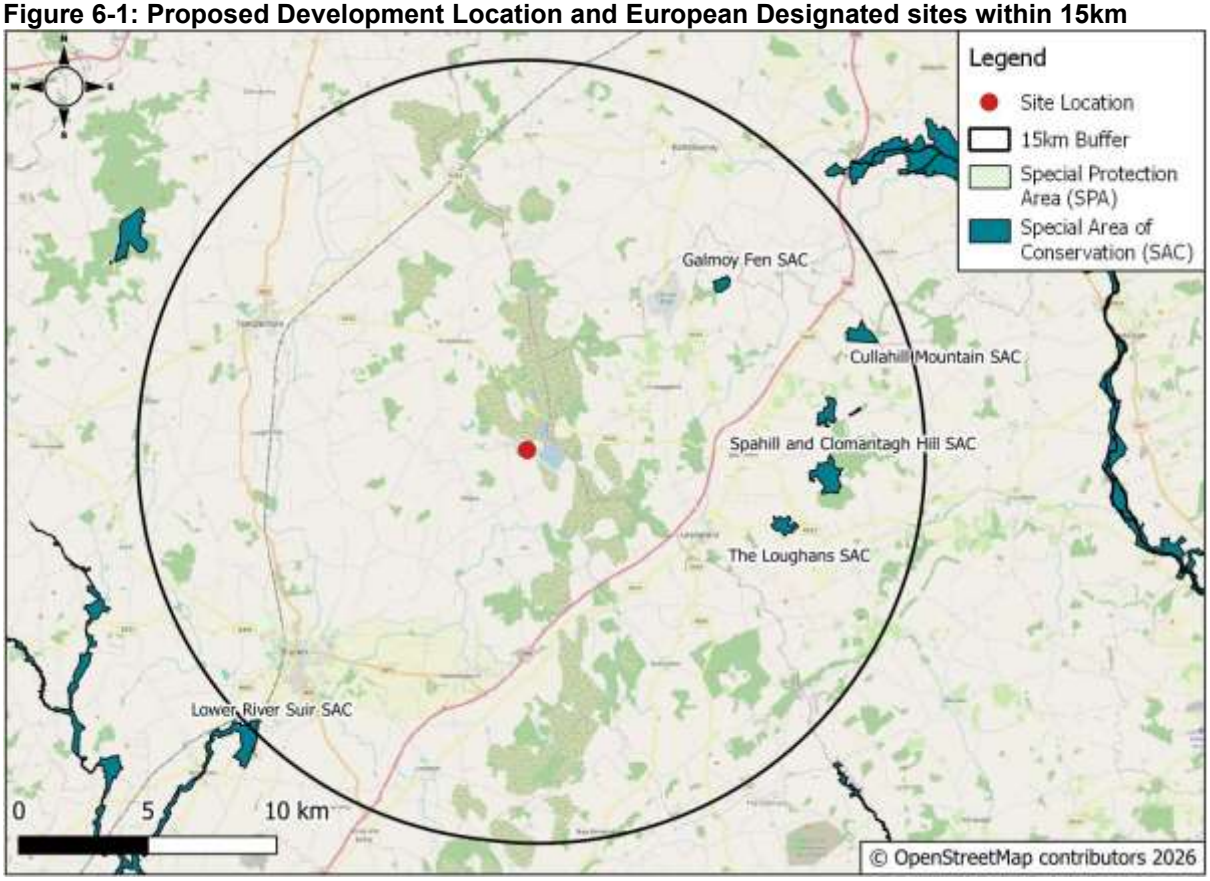


Table 6-2: European Designated sites within 15km of the Proposed Development

Site Name	Code	Distance (km)	Direction from the Site
Special Areas of Conservation ('SAC')			
Galmoy Fen SAC	001858	Ca. 9.4km	W
Loughans SAC	000407	Ca. 9.4km	E
Spahill and Clomantagh Hill SAC	000849	Ca. 10.5km	NE
Cullahill Mountain SAC	000831	Ca. 12.8km	S
Lower River Suir SAC	002137	Ca. 14.5km	SW

The Site is not located within or directly adjacent to any European sites; however, the boundaries of five SACs are located within 15km of the Site.

An AA Screening Report has been prepared in support of this SID application. The AA has fully considered the European sites located within 15km of the Proposed Development.

6.3.1.2 Nationally Designated Conservation Sites

Sites designated as Natural Heritage Areas ('NHAs') and proposed Natural Heritage Areas ('pNHAs') within a 5km radius of the Site have been considered in line with the TCDP.

No NHAs or pNHAs are located within the Site, adjacent to the Site, or within 5km of the Site.

6.3.1.3 Notable / Protected Species

Table 6-3 provides a summary of records of legally protected or otherwise notable species that occur within 2km of the Site at the time of writing this report [48]. The NBDC records were checked on 9th January 2026. The following NBDC 2km grids have been checked: S26C, S26D, S26E, S26H, S26I, S26J, S26X.

Only species recorded within the past 10 years were included in Table 6-3. The parameter of 10 years was chosen on the basis of habitat adaption and modification; it is considered that any records over 10 years old are not representative of the current distribution of species populations.

Table 6-3: NBDC Records of Notable / Protected Species within a 2km of the Proposed Development (Grid Codes: S26C, S26D, S26E, S26H S26I, S26J, S26X)

Common Name	*Scientific Name*	Date of Last Record	Designation
Amphibians			
Common Frog	*Rana temporaria*	11/10/2019	Wildlife Acts 1976 / 2000
			EU Habitats Directive Annex V
Bird Species*			
Barn Swallow	*Hirundo rustica*	31/05/2018	Wildlife Acts 1976 / 2000
			Birds of Conservation Concern Amber List
Common Kestrel	*Falco tinnunculus*	01/05/2024	Wildlife Acts 1976 / 2000
			Birds of Conservation Concern Red List
Common Snipe	*Gallinago gallinago*	29/03/2019	Wildlife Acts 1976 / 2000
			EU Habitats Directive Annex II Section I and Annex III and Section III Bird Species
			Birds of Conservation Concern Red List
Little Egret	*Egretta garzetta*	29/03/2019	Wildlife Acts 1976 / 2000
			EU Habitats Directive Annex I Bird Species

Common Name	*Scientific Name*	Date of Last Record	Designation
			Birds of Conservation Concern Green List
Mallard	*Anas platyrhynchos*	29/03/2019	Wildlife Acts 1976 / 2000
			EU Birds Directive Annex II Section I and Annex III and Section I Bird Species
			Birds of Conservation Concern Amber List
Meadow Pipit	*Anthus pratensis*	16/08/2019	Wildlife Acts 1976 / 2000
			Birds of Conservation Concern Red List
Mute Swan	*Cygnus olor*	29/03/2019	Wildlife Acts 1976 / 2000
			Birds of Conservation Concern Amber List
Northern Lapwing	*Vanellus vanellus*	01/05/2024	Wildlife Acts 1976 / 2000
			EU Birds Directive Annex II Section II Bird Species
			Birds of Conservation Concern Red List
Ringed Plover	*Charadrius hiaticula*	12/06/2018	Wildlife Acts 1976 / 2000
			Birds of Conservation Concern Amber List
Sky Lark	*Alauda arvensis*	29/03/2019	Wildlife Acts 1976 / 2000
			Birds of Conservation Concern Amber List
Yellowhammer	*Emberiza citrinella*	16/08/2019	Wildlife Acts 1976 / 2000
			Birds of Conservation Concern Red List
Terrestrial Mammals			
West European Hedgehog	*Erinaceus europaeus*	05/06/2023	Wildlife Acts 1976 / 2000
Aquatic Species			
Freshwater White-clawed Crayfish	*Austropotamobius pallipes*	14/07/2017	Wildlife Acts 1976 / 2000
			EU Habitats Directive Annex IV
Invasive species* **			

Common Name	*Scientific Name*	Date of Last Record	Designation
Jenkins' Spire Snail	*Potamopyrgus antipodarum*	14/07/2017	Medium Impact Invasive Species

*Note that only Annex I bird species protected under European legislation or nationally protected bird species with amber or red-list status according to Birds of Conservation Concern in Ireland 2020-2026 were included in this Table.

6.3.2 Field Survey

6.3.2.1 Habitats

The following section provides details of the field-based assessments undertaken for the Site on 1st May 2024, 19th September 2024 and 19th December 2025. A description of the habitats and features of ecological significance is outlined below and illustrated in Figure 6-2.

Recolonising Bare Ground (ED3)

The majority of the Site comprised recolonising bare ground habitat. The substrate size ranged from silt to gravel with some cobbles and boulders present.

The dominant species present was cock's-foot (*Dactylis glomerata*). Abundant species included common dandelion (*Taraxacum officinale*). Other species recorded within this habitat included red clover (*Trifolium pratense*), wild carrot (*Daucus carota*), yarrow (*Achillea millefolium*), gorse (*Ulex europaeus*), common tansy (*Tanacetum vulgare*), creeping thistle (*Cirsium arvense*), common ragwort (*Jacobaea vulgaris*), butterfly bush (*Buddleja davidii*), bull thistle (*Cirsium vulgare*), willowherb (*Epilobium* spp.), dyer's rocket (*Reseda luteola*), common mullein (*Verbascum thapsus*), common bramble (*Rubus fruticosus*) and common dogwood (*Cornus sanguinea*). There were also some immature grey willow (*Salix cinerea*) and basket willow (*Salix viminalis*) trees present.

Other Artificial Lakes and Ponds (FL8)

The proposed 110kV Substation will be developed on ca. 1ha within the overall ca. 2ha Site. This area was dry at the time of the survey and corresponds to the Recolonising Bare Ground habitat described above.

The remainder of the Site is reserved for future expansion works, as specified by EirGrid. This area has been subject to historical earthworks associated with the decommissioning of the former mine and the associated filling of the Tailings Pond located to the east of the Site. These excavation works reached a depth at which they intersected the high-water table, leading to seasonal groundwater emergence and the formation of temporary standing water during periods of high-water table.

During the survey on 19th December 2025, temporary areas of standing water were recorded within this section of the Site. The substrate in these areas comprises silt to gravel, with occasional cobbles and boulders. The areas of water varied in depth, ranging from 10-20cm in depth. These areas are considered artificial and ephemeral, reflecting altered ground conditions rather than natural standing waterbodies.

The species recorded included rushes (*Juncaceae* spp.) and grey willow (*Salix cinerea*). Other species present within this habitat included meadowsweet (*Filipendula ulmaria*), common water plantain (*Alisma plantago-aquatica*), purple-loosestrife (*Lythrum salicaria*), bulrush (*Typha latifolia*), creeping-jenny (*Lysimachia nummularia*), water-speedwell (*Veronica anagallis-aquatica*) and dogwood (*Cornus sanguinea*).

Earth banks (BL2)

Earth banks were present around the perimeter of the recolonising bare ground habitat. The earth banks were ca. 1m in height and ca. 2.5m in width. The species recorded within this

habitat included grey willow and common dandelion (*Taraxacum officinale*). Cock's-foot (*Dactylis glomerata*) was an abundant species present. Other species recorded include gorse (*Ulex europaeus*), red clover (*Trifolium pratense*), common self-heal (*Prunella vulgaris*), creeping thistle (*Cirsium arvense*), common bramble (*Rubus fruticosus*), yarrow (*Achillea millefolium*), rushes (*Juncaceae* spp.), common ragwort (*Jacobaea vulgaris*), common daisy (*Bellis perennis*), ribwort plantain (*Plantago lanceolata*), creeping buttercup (*Ranunculus repens*), wild carrot (*Daucus carota*), butterfly bush (*Buddleja davidii*), common tansy (*Tanacetum vulgare*), bull thistle (*Cirsium vulgare*), basket willow (*Salix viminalis*), willowherb (*Epilobium* spp.) and common dogwood (*Cornus sanguinea*).

Buildings and Artificial Surfaces (BL3)

Artificial surfaces were recorded as minor roads serving the nearby businesses and the existing 110kV Lisheen substation. There were no species of note recorded within this habitat.

Figure 6-2: Habitat Map

6.3.3 Notable / Protected Species

Flora

No plant species protected under the Flora Protection Order were recorded on the Site.

Amphibians

The NBDC does hold records of common frog within 2km of the Site over the last 10 years [48]. Amphibians require static or slow-moving water bodies in order to successfully lay their eggs and tend to favour shallow areas where they are less susceptible to being preyed on by fish.

During the walkover, no common frog (*Rana temporaria)* spawn or smooth newts *(Triturus vulgaris)* were observed on the Site. No drainage ditches or permanent waterbodies were identified within the Site boundary. It is therefore considered that the Site would not be of value to amphibians during their breeding season.

However, it was considered that the terrestrial habitats surrounding the Site have the potential to provide suitable habitat for amphibians during the terrestrial phase of their lifecycle. A settlement pond associated with the former TMF is located over 350m to the east of the Site. This settlement pond has the potential to support amphibians.

Badger

The NBDC does not hold records for badger within 2km of the Site within the last 10 years [48].

In addition, the Site surveys did not identify any evidence of badger activity within the Site. The habitats present onsite were considered sub-optimal for this species, lacking suitable foraging or sett-building opportunities. However, as badgers are common and widespread in Ireland, and given the nature of the surrounding landscape, it was considered that the Site has the potential to be utilised by badger for commuting purposes.

Bats

NBDC Records and Landscape Suitability

The NBDC holds no records for bat species within 2km of the Site. As per the NBDC landscape suitability metric, the Site and surrounding area are considered to be of moderate suitability for bats (Landscape Suitability Metric Score ranging from 21-28).

Please note that the landscape suitability metric is calculated using a desk-based model only and is a regional-scale assessment. The metric is not tailored to local site-specific ecological features or conditions but rather averages over a much larger landscape. The metric is an average score; it does not guarantee that the Site itself is of moderate bat suitability.

The predictor layers are constructed from this database, ranging in scale from 0.5km to 20.5km, which shows suitable regions for each species to exist, but makes large generalisations of species occurrence rather than site-specific detail obtained during field surveys. This metric is not a substitute for a Site visit to assess bat suitability by a suitably qualified and experienced ecologist following the current best practice guidelines [71].

Bat Commuting and Foraging Suitability

Bats are known to follow linear features as they commute through the landscape. The Site lacked any continuous linear features suitable for bat commuting. No drainage ditches or permanent waterbodies were identified within the Site boundary. It was therefore considered that the Site would not be of value to bat species and is unlikely to provide optimal foraging habitats for bats during the bat activity season (April – October [57]). Therefore, the commuting and foraging potential for bats on the Site was assessed as *Negligible*.

Bat Roost Suitability

Bats are known to roost in mature trees and buildings with suitable emergence / re-entry points and potential roost features. A ground-based inspection was undertaken to assess the Site for bat roost suitability. No mature trees or buildings were present on the Site. Therefore, the bat roosting potential of the Site was assessed as *None*.

Following the Site visits, it was concluded that the suitability metric overestimates the bat landscape suitability of the Site. The Site was assessed as having *Negligible* commuting and foraging potential, and bat roosting potential was assessed as *None*.

Birds

The NBDC held records for a number of protected bird species within 2km of the Site [48]. During the habitat survey, the following species were recorded:

- Six Green-listed BoCCI non-Annex I species – dunnock (*Prunella modularis*), hooded crow (Corvus cornix), pied wagtail (*Motacilla alba yarrellii*), robin (*Erithacus rubecula*), rook (*Corvus frugilegus*) and wood pigeon (*Columba palumbus*); and,
- Two Red-listed BoCCI non-Annex I species, common snipe (*Gallinago gallinago*) and meadow pipit (*Anthus pratensis*)

Given the nature of the onsite habitats, the majority of the bird species recorded onsite are typical of the wider countryside, are therefore considered common and widespread. The predominantly terrestrial nature of the Site provides limited suitable habitat for nesting or foraging for these species. However, the areas of seasonal standing water present on site are considered to provide temporary resting habitat for notable birds, such as snipe, particularly during wetter periods.

Otter

The NBDC holds no records for otter within 2km of the Site in the last 10 years [48]. Additionally, no evidence of otter was found on the Site, including holts, slides, feeding remains, or spraints. Furthermore, no suitable habitats in the form of waterbodies or suitable terrestrial habitat for otter were found within or bordering the Site. Overall, it was considered that the Site was of no value to otter.

Other Species

The NBDC does hold records of protected and notable mammals within 2km of the Site, including freshwater white-clawed crayfish and hedgehog [48]. However, no evidence of any notable species was identified on the Site. Hedgehogs are common and widespread species that typically occur in scrub, woodland, and rank grassland habitats. It was not considered that the Site was of value to this species. However, it was noted that the surrounding habitats have the potential to provide suitable foraging habitat and connectivity to the wider landscape for a wide range of commonly occurring species, such as fox, field mice, hedgehog, pygmy shrews and rabbit. No evidence of freshwater white-clawed crayfish was identified on site, and no suitable aquatic habitats capable of supporting this species were identified on the Site. However, the Cooleeny Stream, located ca. 40m south of the Site, has the potential to support freshwater white-clawed crayfish.

Invasive Species

The NBDC held records for Jenkins' Spire Snail within 2km of the Site [48]. This is considered a medium-impact invasive species in Ireland [72] but is not regulated under European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) [65].

Multiple small stands of butterfly bush (*Buddleja davidii*) were recorded on site. This is considered a medium-impact invasive species in Ireland [72] but is not regulated under the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024).

No other invasive species were noted during the Site walkover.

6.4 Characteristics and Potential Impacts

6.4.1 Identification of Potentially Significant Effects on Identified Receptors

Based on the methodology that is set out in Section 6-1, Table 6-4 sets out the findings of the evaluation of important and legally protected receptors. Each receptor was assessed, and a scoping justification for each receptor is provided for the Construction and Operational Phases.

Table 6-4: Valuation of Potential Ecological Receptors

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Results
Protected Sites				
European Sites	European Communities (Natural Habitats) Regulations 1997 (as amended)	Internationally designated sites for conservation	An AA was prepared as part of the overall planning application, in line with policies 11.1 and 11.2 of the TCDP. 'The AA concluded that '*activities associated with the Proposed Development either alone, or in-combination with other projects or land uses, will not have any direct or indirect significant effects on the conservation objectives of any European sites and that progression to Stage 2 of the Appropriate Assessment process (i.e. preparation of a Natura Impact Statement,) was not considered necessary'* Therefore, this receptor has been scoped out from further consideration. For full details on the assessment of impacts to Natura 2000 sites, refer to the AA submitted as part of planning [73].	This receptor has been scoped out from further consideration.
Natural Heritage Areas (NHAs)	Wildlife Act 2000 (as amended)	Nationally designated sites for conservation	No NHAs or pNHAs are located within 5km of the Site. Therefore, this receptor has been scoped out from further consideration.	This receptor has been scoped out from further consideration.
Habitats				
Recolonising Bare Ground (ED3)	N/A	Low Local Value	This habitat type is relatively common throughout Ireland and is generally of low ecological value. As such, it was not considered to be of significant conservation importance. However, 14 common snipe were observed utilising this habitat in the form of resting. To facilitate the Proposed Development, this habitat will be lost; however, given its limited ecological value and the bird protection measures to be implemented, no significant effects were predicted. Consequently, this receptor has been scoped out from further assessment.	This receptor has been scoped out from further consideration

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Results
Other Artificial Lakes and Ponds (FL8)	N/A	Moderate Local Value	Areas of temporary standing water were identified within the Site. This habitat type is relatively common throughout Ireland and is typically associated with disturbed or low-lying ground. Due to its ephemeral nature and the absence of notable or protected flora species, it was considered to be of low ecological value and not of significant conservation importance. The areas of standing water present onsite were not considered to be of significant ecological value; however, a small number of common snipe were recorded utilising the margins of these features, which provide suitable temporary resting habitat for certain bird species. No evidence of breeding activity associated with this habitat was recorded. All site clearance will be scheduled to take place outside of the nesting bird season (typically between 1st March and 31st August, subject to weather conditions). Where works will be required within this period, appropriate pre-construction nesting bird checks will be undertaken by a suitably qualified ecologist. Further detail is provided in the Bird section below. Therefore, this receptor has been scoped out from further consideration.	This receptor has been scoped out from further consideration
Earth Banks (BL2)	N/A	Low Local Value	This habitat was present around the margins of the recolonising bare ground habitat and was likely created by previous ground works within the area. This habitat was species-poor, and no protected / notable species were identified within this habitat. The earth banks are small in size and were not considered to be of significant conservation value. Therefore, their loss was not considered significant. Therefore, this receptor has been scoped out from further consideration.	This receptor has been scoped out from further consideration
Buildings and Artificial Surfaces (BL3)	N/A	Low Local Value	Small areas of hardstanding are located within the Site. This habitat type is of no ecological value, and its loss was not considered significant. This receptor has been scoped out from further consideration.	This receptor has been scoped out from further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Results
Flora and Fauna				
Protected Flora	Flora (Protection) Order 2022 (S.I. No. 235/2022)	N/A	No plant species protected under the Flora Protection Order were noted on site. Overall, the impact of the Proposed Development on notable / protected flora was considered unlikely to be significant as the Site holds no value as a habitat for these protected species.	Protected Flora have been scoped out from further consideration.
Amphibians	Wildlife Act 2000 (as amended) EU Habitats Directive Annex V	Low Local Value	The NBDC held records of amphibians within 2km of the Proposed Development in the last 10 years [48]. However, no evidence of any amphibian species were identified on site. It should be noted that these species are relatively widespread and abundant in Ireland; however, they are of conservational interest and are protected under Schedule V of the Wildlife Act. The Site was not considered to be of significant value to amphibians, given the fact that no suitable permanent waterbodies / drainage ditches for breeding amphibians were recorded within the Site. However, it was considered possible that these species utilise the area, given the presence of suitable on-site terrestrial habitats and the presence of suitable breeding habitats within the wider area. In order to mitigate any potential disturbances to this species during the Construction Phase, mitigation measures (Section 6.4) will be put in place in order to ensure no impacts occur during clearance works and the construction works. Therefore, this receptor has been scoped in for further consideration.	Amphibians have been scoped in for further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Results
Badgers	Wildlife Act 2000 (as amended)	Moderate Local Value	The NBDC holds no records of badger within 2km of the Site in over 10 years [48]. Additionally, no signs of badger activity were noted during the field survey. Given the seasonal wet conditions of sections of the Site, it was considered that the Site is suboptimal for sett construction. The Site does, however, provide suitable habitat for commuting badger, and it is possible that they may pass through the Site. Therefore, standard precautionary measures for terrestrial mammals will be incorporated into the construction works. In addition, as badger are nocturnal, the inappropriate installation of lighting, resulting in light spillage, has the potential to cause adverse effects to badger and other nocturnal species within the area. Temporary lighting will be provided during the Construction Phase of the Proposed Development. Mitigation measures have been included below to ensure this temporary lighting does not negatively affect nocturnal mammals, such as badger; refer to Section 6.4 below. It should be noted that only emergency lighting will occur as part of the Operational Phase of the Proposed Development, and therefore, negative effects associated with excessive lighting during operations have been dismissed. Taking a precautionary approach, this receptor has been scoped in for further consideration and mitigation measures are outlined below (Section 6.4).	Badgers have been scoped in for further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Results
Bats	Wildlife Act 2000 (as amended) EU Habitats Directive Annex IV	Moderate Local Value	Roosting Bats During the habitat assessment, no trees suitable for roosting bats were identified. Consequently, the Site was considered unsuitable for bat roosting, and no further assessments related to potential bat roosts were deemed necessary. Commuting and Foraging The onsite habitats were assessed and found to have a negligible value for both foraging and commuting bats. This was based on the absence of linear features that are required for providing connectivity to be utilised by commuting bats. Furthermore, no drainage ditches or permanent waterbodies were identified within the Site boundary. It was therefore considered that the Site would not be of value to bat species. The areas of recolonising bare ground, which offer limited value to bats, will be removed to facilitate the Proposed Development. However, given the low suitability of these areas for supporting bat populations, their removal will not have a significant impact on bat foraging or commuting. Furthermore, considering the surrounding environment provides more suitable habitats, the loss of the onsite habitats will not significantly affect bat activity. Foraging and commuting bats have therefore been scoped out from further consideration. Lighting Impacts Bats are averse to excessive lighting; subsequently, the installation of inappropriate lighting, resulting in light spillage, has the potential to cause adverse effects to bats. However, as discussed above, the Site has no roosting potential and negligible commuting and foraging potential; therefore, it can be concluded that the Proposed Development will not negatively affect bat species, and this receptor has been scoped out from further consideration in relation to lighting effects. In the unlikely event that bats disperse into the Site, they will be protected by the mitigation measures for nocturnal mammals, such as badger, outlined in Section 6.4 below.	Bats have been scoped out from further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Results
Birds	Wildlife Act 2000 (as amended)	Moderate Local Value	The Site provided limited suitable habitat for nesting or foraging bird species, given the sparse vegetation and exposed ground. However, on-site areas of seasonal standing water may provide temporary resting habitat for birds during wetter periods. Snipe were recorded utilising the recolonising bare ground habitat and the margins of the temporary standing water. As snipe are a ground-nesting bird species, there is potential for nesting to occur within suitable habitats onsite. Although birds are highly mobile species and will subsequently move away from disturbances, once breeding bird species have established a nest, they will be less likely to move away from disturbances. Therefore, should any bird species nest onsite, it was considered that, without appropriate mitigation measures, they may be impacted by clearance works during the Construction Phase. Therefore, mitigation measures will be implemented onsite, as outlined in Section 6.4. Therefore, birds have been scoped in for further consideration.	Birds have been scoped in for further consideration.
Otter	Wildlife Act 2000 (as amended)	Low Local Value	The NBDC holds no records of otters within 2km of the Site in the last 10 years. Additionally, no suitable habitats or evidence of otter activity were identified within the Site boundary. Furthermore, species such as otter are highly mobile, and therefore will move away from disturbances should they occur in the wider area. The Site was not considered to be of value for this species, and it is therefore unlikely that otter will utilise the Site. This receptor has been scoped out from further consideration.	Otter have been scoped out from further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Results
Invasive Species	Regulation S.I. 374	N/A	The NBDC does not hold records for invasive species within 2km of the Site. [48]. No high-impact invasive species or plant species were noted on the Site during the field surveys. However, an invasive species (butterfly bush) was identified within the Site. This was considered a medium-impact invasive species in Ireland but is not regulated under the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024). Nonetheless, butterfly bush is known to spread easily and can produce over 3 million seeds per plant. This species is known to outcompete native flora. Therefore, this invasive species will be removed from the Site to a licenced facility, and any regrowth onsite will be monitored and controlled. In addition, standard measures will be implemented in order to ensure no invasive species are introduced on the Site during the Construction Phase (see Section 5.6). Therefore, invasive species have been scoped in for further consideration.	Invasive species have been scoped in for further consideration
Other fauna	Wildlife Act 2000 (as amended) EU Habitats Directive Annex II and V	N/A	Given the presence adjacent to the Site within the wider area for hedgehogs and other nocturnal and terrestrial species, standard protection measures for these species will be incorporated into the construction works as outlined in Section 5.6. Other fauna have, therefore, been scoped in for further consideration.	Other fauna have been scoped in for further consideration.

The following receptors have been taken forward for further consideration. Mitigation measures have been included in Section 6.5 below:

- Amphibians;
- Birds;
- Terrestrial Non-volant Mammals (badger, and other fauna); and,
- Invasive Species.

In addition to the species listed above, general mitigation / best practice measures have also been included for the Proposed Development.

6.5 Proposed Mitigation Measures

The following mitigation measures will be incorporated and adhered to during the Construction and Operation Phases of the Proposed Development to ensure that the works do not result in contravention of wildlife legislation.

6.5.1 Construction Phase

Disturbance to fauna during the construction stage may potentially arise as a result of a short-term increase in on-site human presence and additional construction noise and lighting within the Site. However, all construction works will be temporary and short-term in nature, estimated to last approximately 20 months.

During the Construction Phase, all works will comply with all relevant legislation and best practice guidance to reduce any potential environmental impacts. A Preliminary Construction Environmental Management Plan ('CEMP') has been prepared by MOR Environmental and submitted as part of this application. This is a working document and will be updated by the appointed contractor and submitted to the Planning Authority in advance of works commencing at the Site.

The following guidance will be referred to and followed during the Construction Phase of the Proposed Development [73]:

- CIRIA C532 – *Control of Water Pollution from Construction, Guidance for Consultants and Contractors* [74];
- CIRIA C811- Environmental Good Practice on Site (5th edition) [35];
- CIEEM, *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (2018 and revisions) [41];
- NRA, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes,'* [75];
- NRA, '*Best Practice Guidelines for the Conservation of Badgers in the Planning of National Road Schemes'* [76];
- NRA, '*Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads'* [40]; and,
- Inland Fisheries Ireland - '*Requirements for the Protection of Fisheries Habitat during Construction and Development'* [77].

The following mitigation measures will be incorporated and adhered to in order to ensure that the proposed works will not result in any contravention of wildlife legislation:

- All activities will comply with all relevant legislation and best practice to reduce any potential environmental impacts. The mitigation measures detailed within this report will be fully adhered to;

- The Site manager shall ensure that all personnel working onsite will be trained and made aware of the mitigation measures detailed within the ER;
- In advance of works, all Site personnel will receive an induction which will include reference to mitigation measures in relation to protected species and measures to prevent the spread of invasive species;
- Should construction works be required outside of daylight hours, the appointed project ECoW will be consulted as required; and,
- If protected or notable species are encountered during operations at the Proposed Development, the ECoW will be contacted for advice.

An ECoW will inspect the Site in advance of works commencing and will undertake Site inspections as required during the works, to ensure that all works will be completed in line with the CEMP and all wildlife legislation.

6.5.1.1 Protection Measures for Water Quality

Potential pollutants resulting from the construction of the Proposed Development will include suspended solids, cementitious materials, silt and hydrocarbon leaks or spills. Sediment / silt has the potential to clog fish gills, degrade spawning habitats and cover / smother aquatic plants. The potential release of these pollutants would result in decreased food availability and, therefore, could indirectly affect predators by impacting their food supply. In addition, should hydrocarbons enter the river network, there would be a potential that the chemical balance of the river network could change, which could prove toxic for fish and other wildlife.

Therefore, should potential runoff of pollutants / sediments enter the Cooleeny stream during construction, it has the potential to adversely affect the water quality within the Cooleeny stream. However, it would be considered highly unlikely that any potential pollutants will reach the stream based on the following:

Construction Phase:

- No in-river works will be undertaken;
- No direct discharges from the Proposed Development to any watercourse will occur during the Construction or Operational Phases;
- Localised construction works will occur; the majority of construction activities associated with the Proposed 110kV substation will be undertaken ca. 140m from Cooleeny Stream;
- There will be an existing access road separating these works from the Cooleeny Stream. Therefore, providing for filtration of any silt / sediment surface water runoff should it occur; and,
- There is no existing drainage connection in place that connects the Site to the Cooleeny Stream that could provide a conduit to the stream during construction activities.

During the Construction Phase, all works will comply with all relevant legislation and best practice to reduce potential environmental impacts of the works. Furthermore, as a precautionary principle, water protection measures will be put in place to ensure that water quality will be protected within the vicinity of the Site. By preventing potential contamination and establishing emergency response procedures for accidental releases or spills, these measures will protect aquatic habitats and downstream ecosystems.

All measures to be implemented as part of the proposed works are also in line with policy 11.4 of the TCDP and are outlined in full in Chapter 7: Water.

6.5.1.2 Protection Measures for Terrestrial Non-Volant Mammals

Given the presence of habitats with features that have the potential to support sheltering, foraging and commuting mammals (inclusive of badger), and in order to ensure that the works in relation to the Proposed Development will not have significant impacts on mammals, general construction procedures and mitigation measures, which are in line with the NRA (now TII) '*Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes'* [64] and '*Guideline for the Treatment of Otters Prior to the Construction of National Road Schemes'* [78] will be undertaken.

- Waste will be kept contained in a designated area to avoid animals becoming trapped in litter;
- Where deep excavations will be required onsite, appropriate measures to protect mammals from ingress will be installed;
- Should construction works be required outside of daylight hours during the site clearance works, the appointed project ecologist will be consulted as required; and,
- If unidentified burrows, holts, or setts are identified within the works area during construction, works will cease within the area, and the project ECoW will be contacted for advice.

Construction noise can also impact species such as badger, which include disturbance, behavioural impacts, stress and displacement from feeding grounds. Although terrestrial mammals are highly mobile and are likely to move away from any temporary disturbances, mitigation measures will be implemented during the Construction Phase of the Proposed Development to ensure that impacts can be avoided. Refer to Chapter 8: Acoustics (Noise and Vibration) for further details.

6.5.1.3 Protection Measures for Breeding Birds

In order to ensure no impacts occur to birds as a result of the Proposed Development, the following measures will be put in place:

- Given the presence of ground nesting bird species onsite, should any ground clearance works be required during the nesting bird season (1st March to 31st August inclusive), a breeding bird survey will be undertaken across the entirety of the Site by a suitably qualified and experienced ECoW;
- Areas where nesting activity will be noted will be clearly marked to ensure disturbance will be avoided and routinely monitored, and changes will be made to these marked areas as necessary. No works will take place within an area containing active nests; and,
- Active nests (taken as the commencement of nest building through to fledging) within the Site will be monitored by the ECoW and will be left undisturbed throughout the breeding season, or until the chicks have fledged, left the nest, and the ECoW has signed off on works commencing.

6.5.1.4 Protection Measures for Nocturnal Species

All temporary lighting installed within the Site will be completed with sensitivity for local wildlife while still providing the necessary lighting for human usage during construction. Therefore, appropriate lighting, as detailed below, will be used during the Construction Phase:

- Lighting will be kept to the minimum necessary for health and safety purposes;
- Lighting will only be utilised during working periods where required and will be shut down during non-working periods;

- Any external security lighting will be set on motion-sensors and short (1min) timers; and,
- Accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

6.5.1.5 Biosecurity Measures for Invasive Species

The removal of the on-site butterfly bush will be undertaken as part of the proposed works.

As butterfly bush is capable of re-rooting from cuttings, all parts of the plant, such as the branches and roots, will be removed. These plants will be removed before June. Prior to setting seed, to avoid the risk of spreading seeds further during the removal works.

In areas where butterfly bush will be cut back but the plants cannot be removed, then these plants will be treated with systemic weed killer. The treatment will be undertaken in late spring / early summer. Follow-up treatment will also be required.

Soil from areas where butterfly bush was growing should not be reused as part of future landscaping works. This will be to reduce the potential for the accidental spread of this invasive species.

In addition to the above, mitigation measures to ensure that there will be no unintentional introduction of invasive species during construction will be implemented in line with policy 11.13 of the TCDP [79]. These measures are in line with NRA (now TII) *Guidance for the Management of Noxious Weeds and Non-Native Invasive Plant Species* [80]:

- All vehicles, machinery and any other equipment used for the works will be washed prior to its use at the Site to prevent the import of plant material or seeds;
- Before machinery or equipment is unloaded at the Site, equipment will be visually inspected to ensure that all adherent material and debris have been removed;
- Any vehicles and machinery that are not clean will not be permitted entry to the Site;
- All materials to be imported to the Site, including additional planting, will be sourced from a reputable supplier, and records of all materials and supplies will be maintained;
- In advance of works, all Site personnel will receive a toolbox talk with regard to invasive species; and,
- Everybody working on site must understand the role and authority of the EcoW managing the issue of the non-native species.

6.5.2 Operational Phase

It was not predicted that the Operational Phase of the Proposed Development will result in any impacts to species on the Site or within the vicinity of the Site, and as such, no Operational Phase mitigation measures will be required.

6.6 Cumulative Impacts

Following a review of the files on Tipperary Planning website, no projects were identified that were considered likely to have a significant effect alone or in-combination with the Proposed Development. Based on the following, it was not predicted that the Proposed Development will result in any cumulative or in-combination impacts in relation to Biodiversity:

- The Proposed Development will be located on lands zoned for Industrial use, and is currently considered to be of low ecological value;
- The Proposed Development will be consistent with the National, Local and Municipal planning policies and objectives as outlined in Section 6.3, including Policies, which refer to:

- The avoidance of impacts on Natura 2000 sites; and,
- The integration, the protection and enhancement of biodiversity and landscape features wherever possible.

Furthermore, as part of this Proposed Development, an AA screening report has been prepared that has assessed any in-combination effects with adjoining developments. It was concluded that there will not be any significant in-combination contribution by the Proposed Development to possible adverse effects on European Sites and that it will not cause any adverse effect on the integrity of any European site in combination with other plans and projects.

- The Proposed Development is in line with Policy 11.4, 11.8 and 11.13 of the TCDP, which refer to the provision of biodiversity enhancement.

The implementation of Biodiversity Enhancement Measures, along with the Landscape works as part of the Overall Development, will increase the diversity and quality of the habitats on the Site. It was predicted that these enhancements have the potential to increase associated biodiversity within the Site and surrounding environs and therefore have an overall slight positive impact.

In addition, any potential cumulative impacts will be reduced as all works will be completed in line with relevant best practice and legislation and mitigation measures detailed within the ER. It was therefore considered unlikely that any significant cumulative impacts will arise as a result of the Proposed Development.

Based on the low ecological value of the Site, the nature of the Site, it was considered that the Proposed Development will not result in any significant cumulative impacts in relation to significant impacts on flora or fauna and will not cause any adverse effect on the integrity of any European site in combination with other plans and projects.

6.7 Conclusions

Based on the findings of a detailed desk-based study, a review of all the ecological information available for the Site and wider area and field surveys by MOR Environmental Ecologists, it was considered reasonable to conclude the following:

- The overall Site itself is currently of low ecological value;
- The Site is located within the former Lisheen Mine Campus, comprised of existing and proposed industrial developments;
- The Site is located in an area predominantly made up of recolonising bare ground; and,
- The Proposed Development will not result in any significant impacts on ecological receptors identified both onsite and in the surrounding area following the implementation of appropriate mitigation measures / enhancement measures.

Taking into account the nature of the Proposed Development, it was considered that the Proposed Development will be consistent with the National, Local and Municipal planning policies and objectives, will support the protection and enhancement of the environmental quality of the area.

7 WATER

The main objective of this chapter was to assess whether there will be any likely hydrological effects on water, including hydrology, hydrogeology and flood risks, during all phases of the Proposed Development. To assess whether there are any flood risks that would warrant further consideration, a Preliminary Site-Specific Flood Risk Assessment ('PFRA') was completed.

A Water Framework Directive ('WFD') Assessment Screening Report was also prepared to determine whether specific components or activities associated with the Proposed Development will compromise WFD objectives or result in a deterioration of the status of any waterbodies in the vicinity or downstream of the Site. A copy of this report is submitted as part of the planning application.

7.1 Methodology

7.1.1 Desk-based Study

A desk-based study of publicly available water quality and flooding data was undertaken in order to characterise the receiving environment using the following data sources:

- Tailte Éireann online mapping [81] ;
- Geological Survey of Ireland ('GSI') Online mapping [82];
- The Office of Public Works ('OPW') website and Online mapping [5];
- Environmental Protection Agency ('EPA') Online mapping [4];
- TCDP [83];
- Flood Risk Management Plan for the Suir River Basin (UOM16) [84]; and,
- Department of Environment, Community and Local Government Online mapping [85];

Additional information, including Site-specific design drawings, were also received from the Applicant and utilised in the desk-based assessment work.

7.1.2 Site Investigations

Given the past land usage as a former EPA-licensed mine, extensive Site investigations have been undertaken near the Site to characterise the geological, hydrogeological and hydrological environment. Since the closure of the Lisheen Mine Complex, regular groundwater monitoring continues to be undertaken by Vedanta in compliance with their EPA Licence. The results of these monitoring events are a representation of the current Site conditions. The investigations included the following:

- Vedanta Lisheen Milling Limited 2024 Lisheen Tailings Management Facility ('TMF') Review [86]; and,
- Vedanta Lisheen Milling Limited 2024 Annual Environmental Report ('AER') for Lisheen Mine [87].

7.1.2.1 Groundwater

Following the cessation of mining activities at Lisheen Mine, groundwater levels were reestablished to pre-mining levels, and groundwater was monitored to ensure water quality improvements aligned with pre-mining conditions. Tailings not used for mine backfill were discharged into the TMF starting in 2016. As per Schedule C.4 of the Licence P0088-04 [88], Vedanta are required to monitor groundwater in the vicinity of the TMF on a quarterly basis. Monitoring of the TMF is ongoing, with the most recent published results provided in the Lisheen TMF Annual Review [86] and summarised within the 2024 AER presented in Appendix 7-1 and Appendix 7-2, respectively [87].

20 monitoring wells (MW1-MW4, MW6, MW7, MW9, MW10, MW12, MW14-MW16, MW23, MW30, MW33, MW35, MW37, MW40A, MW41A and MW42A) across the former mine site are monitored as part of their ongoing monitoring programme. The full list of parameters is listed in the Licence [88].

7.1.2.2 Surface Water

Surface water monitoring at the former mine is conducted under Licence P0088-04. Stormwater run-off from the former TMF is treated in a peat wetland, then flows to an attenuation pond before discharging into the Cooleeny Stream at SW1. However, the releases are infrequent, occurring primarily between October and April.

7.1.3 Preliminary Site-Specific Flood Risk Assessment ('PFRA')

The following relevant best practice guidance was followed in the assessment:

- "The Planning System and Flood Risk Management – Guidelines for Planning Authorities" [89].

This guidance sets out a risk-based sequential approach to flood risk assessment. Three key stages are identified as follows:

- **Stage 1 - Flood Risk Identification -** To identify whether there may be any flooding or surface water management issues related to a plan area or Proposed Development that may warrant further investigation;
- **Stage 2 - Initial Flood Risk Assessment** - To confirm sources of flooding that may affect a plan area or a proposed development site, to appraise the adequacy of existing information and to determine what surveys and modelling approach is appropriate to match the spatial resolution required and complexity of the flood risk issues. The extent of the risk of flooding should be assessed. Where existing river or coastal models exist, these should be broadly used to assess the extent of the risk of flooding, and potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures; and,
- **Stage 3 - Detailed Flood Risk Assessment** - To assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed area or existing development, its potential impact on flood risk elsewhere and the effectiveness of any proposed mitigation measures. This will typically involve construction of a new, or use of an existing, hydraulic model of the river or coastal cell across a wide enough area to appreciate the catchment-wide impacts and hydrological processes involved. The need to progress to Stage 3 is carefully considered following completion of Stage 1 and Stage 2.

This PFRA has been carried out in accordance with the aforementioned relevant best practice guidance and comprised the completion of the following key stages, using the phased approach:

- Stage 1 - Flood Risk Identification; and,
- Stage 2 - Initial Flood Risk Assessment.

Specifically, the agreed scope of works undertaken as part of the assessment comprised the elements detailed below.

7.1.4 Site Walkover Surveys

MOR Environmental personnel are very familiar with the Site and the environs, having worked on a number of projects at the former Lisheen site over the years. An updated Site walkover

was completed on 19th December 2025 by a suitably qualified and experienced MOR Environmental consultant. The field survey comprised the following:

- A Site walkover to assess existing drainage patterns; and,
- Visual assessments of ground conditions and drainage at the Site were undertaken and documented.

7.1.5 Data Assessment and Reporting

All available information from the Site visit and desk-based studies has been evaluated, and the findings are presented in this chapter.

7.2 Receiving Environment and Stage 1 – Flood Risk Identification

7.2.1 Topography

The Proposed Development is located within a relatively low-lying, flat landscape and is situated at an elevation of ca. 130 metres above Ordnance Datum ('mAOD').

7.2.2 Hydrology

7.2.2.1 Watercourses within the Vicinity of the Site

According to EPA Maps [90], the Site and the study area are entirely within the Suir Catchment (Catchment ID: 16). The Site and the majority of the study area lie within the Suir_SC_040 WFD Sub-catchment (Catchment ID: 16_12), the northwest portion of the study area lies within the Suir_SC_010 WFD Sub-catchment (Catchment ID: 16_22) [90].

The Cooleeny Stream (IE_SE_16D020100) is the closest hydrological feature in the vicinity of the Site. It is located ca. 40m to the south of the Site, at its closest point. This stream flows southerly before turning southwest and draining into the River Drish, ca. 4km downstream of the Site. The River Drish eventually discharges into the River Suir, ca. 14km downstream of the River Drish, which forms part of the Lower River Suir SAC.

The Athlummon River level and flow monitoring station is the nearest monitoring station downstream of the Site. It is located ca.8.3 km southwest of the Site. OPW flow data collected from this station between 1972 to 2025 indicates no significant change in river flows from before mining operations, during mining operations and after mining operations ceased [91]. Mining operations involved discharges to the Cooleeny Stream with a peak licence discharge limit of 100,000 m^3/day from the mid-1990s to 2017. The EPA report a Q95 (95 percentile flow) of 0.201 m^3/sec (ca. 17,366 m^3/day) for the River Drish [92]. Figure 7-1 below shows the hydrological features within the vicinity of the Site.

Figure 7-1: Watercourses in the Vicinity of the Site

7.2.2.2 Surface Water Quality

Under the Water Framework Directive ('WFD') 2000/60/EC, the EPA classifies the status and the risk of not achieving good water quality status for all waterbodies in Ireland [93]. According to the river waterbody WFD 2019-2024 [93], the most recent data available at the time of writing these reports, the quality status of the Cooleeny Stream is considered to be '*moderate*', and the risk status of this river is considered to be *'at risk'* [93]. Further downstream of the Site, the River Drish and the River Suir have a *'moderate'* water quality status; however, they are still considered to be *'at risk'* [93].

Although there have been non-compliances at the Vedanta discharge location SW1, based on the overall published surface water monitoring results, there was a general reduction in emissions and improvement in compliance for 2024 compared to previous years and a significant reduction in several parameter emissions in comparison to 2019/2020 results. In relation to metals, the 2024 AER notes that the mass emission from the Site is compliant, and the Drish River is unaffected (i.e. metal concentrations are below the 2009 Surface Water Quality Objectives values, S.I. No. 272 of 2009 as amended).

7.2.2.3 OPW Arterial Drainage Ditches

The OPW Flood Maps identify Drainage Districts, Arterial Drainage Schemes and Benefited Areas. Arterial Drainage Schemes were works that were carried out under the Arterial Drainage Act, 1945 to improve land for agriculture and to mitigate flooding. The Benefited Land identifies land that was drained as part of the Drainage District with the aim of improving land for agriculture and mitigating flooding.

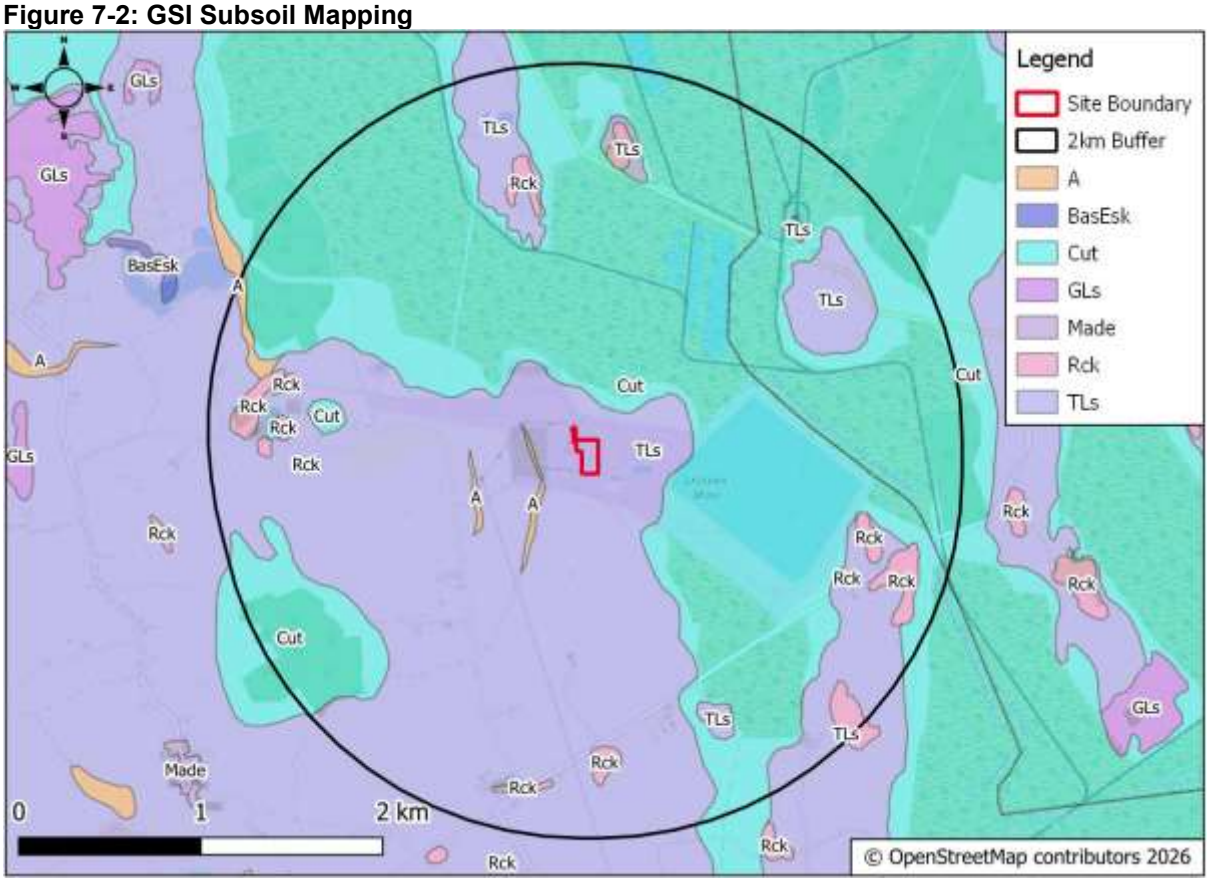
There were no mapped arterial drains within the Site, and the Site does not form part of the Benefitted Lands Scheme. Furthermore, there were no drainage ditches noted within the Site.

7.2.3 Subsoils and Hydrogeology

7.2.3.1 Subsoils

The Site is currently vacant and is primarily made up of recolonising bare ground. Based on the GSI subsoil maps, the entirety of the Site is comprised of Limestone till ('TLs') [94]. Refer to Figure 7-2 below.

Figure 7-2: GSI Subsoil Mapping



Site investigation results from three boreholes drilled on the Glanbia Ireland DAC site, ca. 70m to the east of the Site, in 2018 (refer to Tipperary County Council planning ref 18601296) [95] showed thin, clay subsoils of between 0.3 and 0.7m thick.

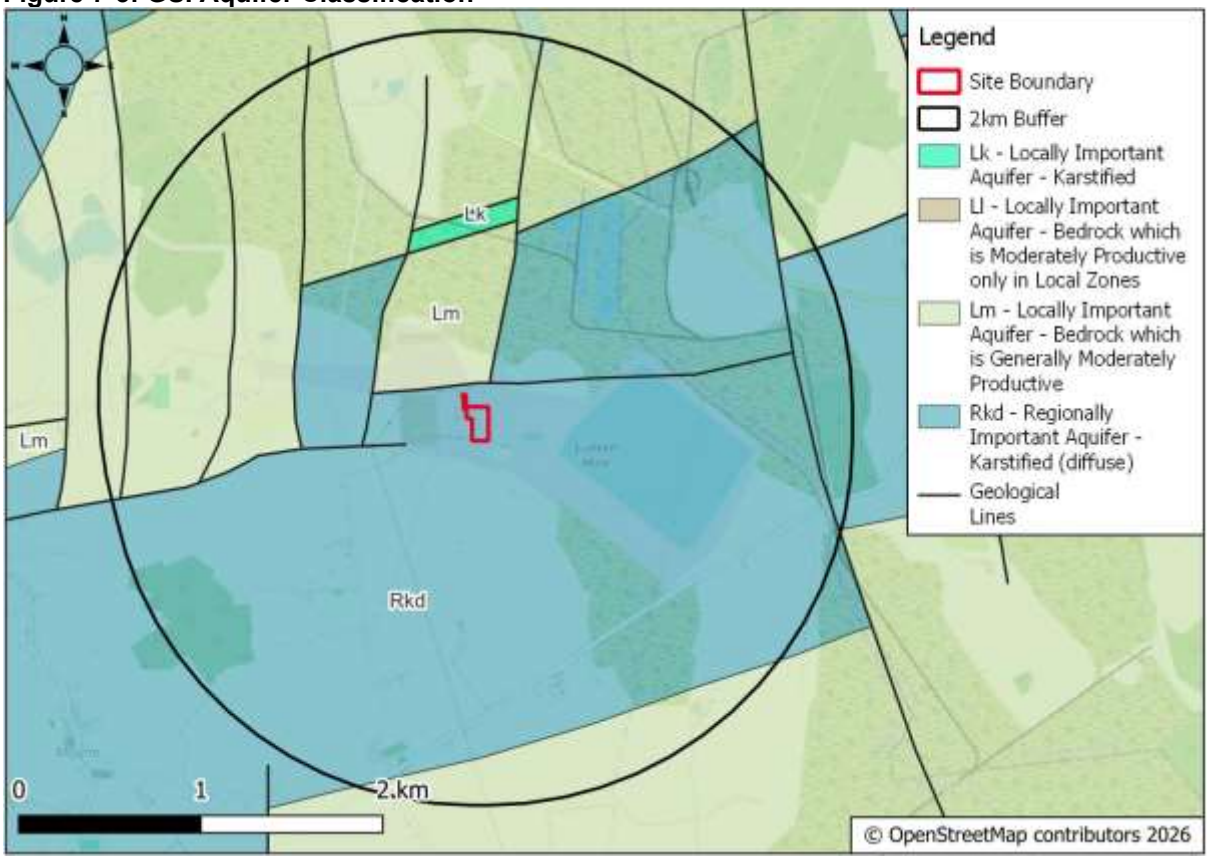
7.2.3.2 Bedrock Aquifer

The GSI provides a methodology for aquifer classification based on resource value (regionally important, locally important and poor), referring to the scale and production potential of the aquifer.

The underlying bedrock aquifer beneath the Site is classified as Rkd (regionally important aquifer – Karstified diffuse bedrock). Refer to Figure 7-3.

This bedrock aquifer corresponds with the Waulsortian Limestones mapped in the area. This is confirmed by the site investigation carried out in the adjacent Glanbia Ireland DAC site (Tipperary County Council planning ref 18601296) [95] which shows the presence of black to light brown, weathered Limestone overlying black to white competent limestone. The boreholes were screened within the competent limestone, and water strikes were encountered between 3.8 ('mbgl') and 9.8mbgl.

Figure 7-3: GSI Aquifer Classification



7.2.3.3 Groundwater Vulnerability

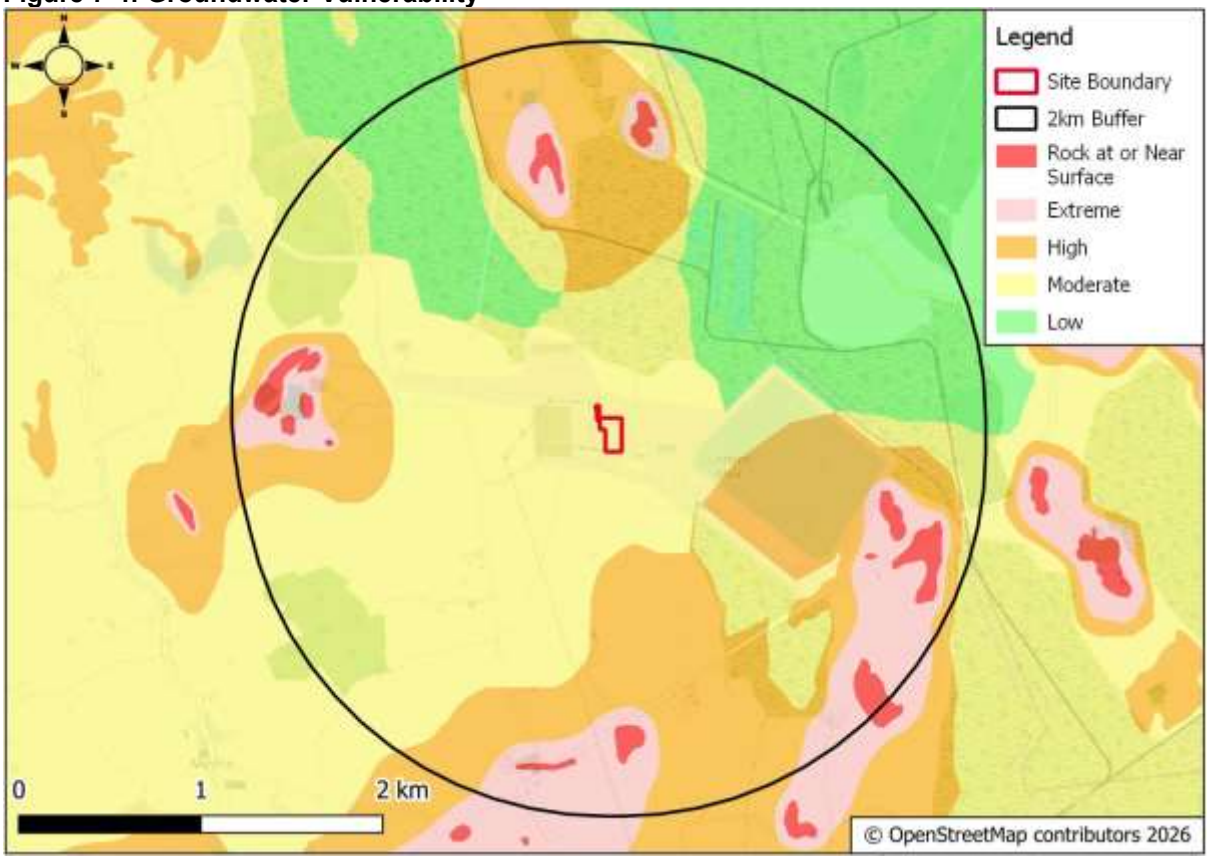
The GSI provides a methodology for aquifer classification based on vulnerability (At or Near Surface or Karst, Extreme, High, Moderate or Low), referring to the ease with which groundwater may be contaminated by human activities. The groundwater vulnerability classification is primarily based on the permeability and thickness of subsoils [82]. According to the GSI database, the groundwater vulnerability across the Site is Moderate, and the subsoil permeability across the Site is also Moderate [82].

This desk-based information does not reflect mine-related remediation works that have resulted in the removal of significant volumes of overburden in areas across the former mine complex [96]. All of these remediation works were approved by the EPA. These works have resulted in splitting the Site, whereby the northern portion sits at a higher elevation than the southern portion of the Site. This is because greater excavation works were undertaken in the southern portion, which has resulted in groundwater being exposed during times of seasonally high groundwater levels in this portion of the Site. The Proposed Development will only involve works in the northern portion of the Site, while the southern portion will only be subject to future expansion.

Subsoil permeability and groundwater vulnerability across the Site and the majority of the study area are both classified as ‘moderate’. This indicates a subsoil thickness of more than 10m in these areas. However, based on site investigation in the Glanbia Ireland DAC (Tipperary County Council planning ref 18601296) [95], the subsoils are between 0.3 and 0.7m thick and clay in nature, indicating thin, low-permeability subsoils. This would change the site-specific groundwater vulnerability rating to ‘Extreme’ or ‘Rock at or Near Surface’.

The aquifer can therefore be considered extremely vulnerable across the entire excavated area. The vulnerability of the underlying aquifer, according to the GSI [97] is presented in Figure 7-4 below. However, due to the previous excavation works, the groundwater vulnerability for the Site should be reflected by a pink or red polygon in the figure below.

Figure 7-4: Groundwater Vulnerability



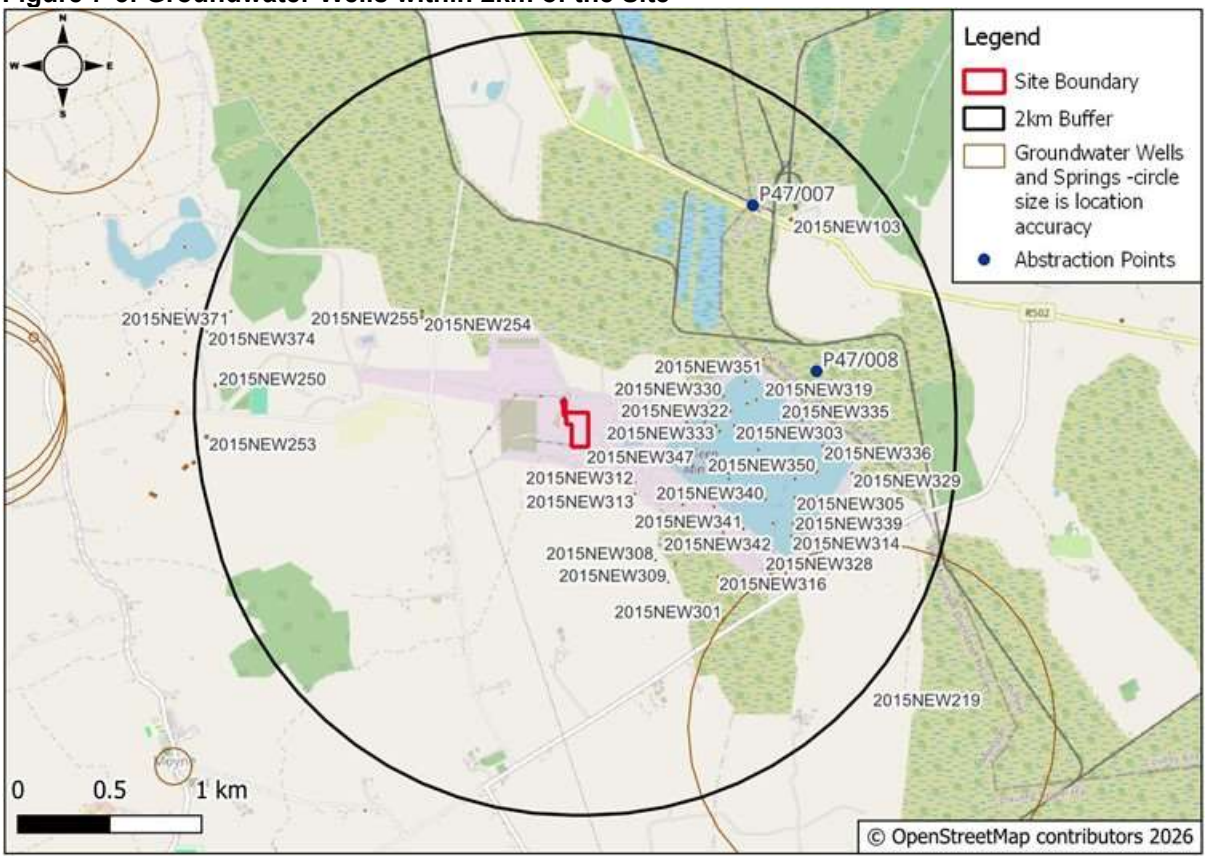
7.2.3.4 Groundwater Use and Source Protection

Groundwater Protection Schemes provide a framework for the protection of groundwater source zones (i.e. areas of contribution to water supply bores). The Site is not located within or in the direct proximity of any groundwater Source Protection Zone ('SPZ'), the closest SPZ is located ca. 4km south of the Site (Moyne Group Water Scheme).

A search of the GSI groundwater well database was conducted to identify registered wells in the surrounding area. There are 59 wells within 2km of the Site. According to online records, there is one dug well, and 58 borehole wells within 2km of the Site. A well designated for agricultural only purposes is located ca. 1.6km northeast of the Site, and a well designated for agricultural and domestic use is located ca 0.3km east of the Site. The location of the identified groundwater wells is presented in Figure 7-5.

It was noted that the majority of the listed groundwater well use is recorded as unknown. It was considered likely that the wells located to the east of the Site are predominantly associated with past mining activities and the former TMF.

Figure 7-5: Groundwater Wells within 2km of the Site



Groundwater sources for public water supplies, group water schemes and industrial abstractions are of critical importance in many regions. The objective of a Source Protection Area is to provide protection for the supply by placing tighter controls on activities within all or part of the delineated source protection area. Zones of Contribution ('ZOCs') are delineated areas which contribute groundwater to a borehole or spring.

There are no public water supplies or private group water schemes within the study area. The nearest groundwater-derived drinking water source is the Baunmore group water scheme, located ca. 2.9 km to the east-northeast of the Site. This group water scheme is upgradient of the Site and hence is not connected to the Site.

The abstraction point for the Moyne Group Water Scheme is located ca. 5.5km south-southwest of the Site, and the outer protection zone extends to 4.1 km south of the Site. The Moyne Group Water Scheme currently serves the National Bioeconomy Campus and a supply pipe runs along the western and southern boundaries of the Site. However, the Site remains unconnected to the abstraction point and the delineated source protection area for the Moyne.

7.2.3.5 Groundwater Quality

The European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010) [98] came into effect on 22nd January 2010. The aim of the Regulations is to achieve the environmental objectives established for groundwater by Article 4 (1) (b) of the WFD (2000/60/EC). Refer to the WFD assessment report included as part of this planning application for further information.

The objectives of the WFD are to protect all high-status waters, prevent further deterioration of all waters and restore degraded surface and groundwater to at least good status [99].

The Site is underlain by the Thurles groundwater body (IE_SW_G_158). The Thurles groundwater body is assigned a "*Good"* status under the WFD 2019-2024 monitoring round.

The groundwater body risk is currently considered "*not at risk*" of meeting its environmental objectives [4].

As discussed in Section 7.1.2.1, there are twenty groundwater wells monitored on an ongoing basis in the area surrounding the Site by Vedanta as part of their monitoring requirements under their IPC Licence P0088-04 [88]. The most recently published Annual Environmental Report submitted to the EPA by Vedanta stated the following regarding groundwater:

> *"It is believed there is no ground water pollution at the Lisheen site, however work is ongoing to understand all groundwater data to provide assurance that there is no impact on regional groundwater. During the current Aftercare phase, a full groundwater monitoring programme is in place and reviewed often by external consultants and the Regulatory Authorities. This groundwater programme will continue in Aftercare. The nickel issue at Compliance Well 1 is most likely due to naturally present nickel in the groundwater due to local mineralisation anomalies, as stated above 2023 & 2024 has seen an improvement in this".*

7.2.4 OPW National Flood Hazard Mapping

The OPW's Community-scale Flood Maps (a combination of Catchment Flood Risk Assessment and Management ('CFRAM') maps, National Flood Map Reviews and Completed Flood Relief Schemes), National Indicative Flood Mapping, GSI Groundwater Flooding Probability Maps, past flood events and historical mapping (i.e. 6" and 25" base maps) were reviewed to assess flood risk in the area of the Proposed Development [5].

Based on the Community-scale Flood Maps, there were no modelled flood extents for river flooding at the Site, and there were no historically recorded single or recurring surface water flood events at the Site. The closest mapped flood events were recorded ca. 8.2km southeast of the Site at Garryclogh as a result of surface run-off and ca. 10.3km east of the Site at Turlough, Balief Lower, Kilkenny (classified as naturally occurring flooding).

According to the National Indicative Fluvial Mapping, the Cooleeny Stream is associated with a medium probability (1% Annual Exceedance Probability) fluvial flood extent ca. 750m southwest and downstream of the Site. The modelled flood extents for this flood do not extend as far as the Site.

The GSI Groundwater Flooding Probability Maps do not show a probability of groundwater flooding in the area of the Site. However, as discussed in Section 7.2.3.2, groundwater flooding occurs in the southern portion of the Site, which is reserved for future expansion works, but not in the northern area of the Site where the Proposed Development will be located.

7.3 Stage 2 – Initial Flood Risk Assessment

7.3.1 Appraisal of the Availability and Adequacy of Existing Information

Based on the findings of the desk-based assessment and the Site surveys, it was considered that there was sufficient technical information to complete this PFRA.

The key potential effects to the receiving water environment which could arise from the Proposed Development have been identified as follows:

- Potential effect on surface water / groundwater quality; and,
- Potential flood risk.

Accordingly, each of these potential effects have been further assessed for both the Construction and Operational Phases of the Proposed Development.

7.3.2 Evaluation of Potential Sources of Flooding

The following types of flooding sources have been identified, which could affect the Proposed Development:

- Groundwater systems and infiltration capacity of the soils;
- Fluvial flood risk posed by nearby watercourses; and,
- Pluvial flood risk posed by heavy rainfall and associated surface water ponding.

Accordingly, each of these potential sources of flooding warrants further consideration as part of this assessment.

7.4 Review of Available Detailed Flood Risk Mapping – Key Findings

7.4.1 Groundwater Systems

Based on the groundwater level monitoring data in wells adjacent to the Site, a topographic survey and visual observations, the southern portion of the Site floods during seasonally high groundwater levels as result of the mine decommissioning works. This area was excavated to a depth below the high winter water-table but was never reinstated as part of the decommissioning works. Please note that all of these works were completed to the satisfaction of the EPA.

This southern portion of the Site will be reserved for future expansion works only. However, there was no evidence to suggest that groundwater flooding has occurred or will occur in the northern portion of the Site where the Proposed Development will be located, as this sits on a higher elevation. Regardless, the design includes finished ground levels to be raised by approximately 1 metre across Site:

- Proposed 110kV substation area: Existing ground level of approximately 127.3 m will be raised to a finished floor level of approximately 128.3 m.
- Future Expansion Area: Existing ground level of approximately 126.3 m will be raised to a finished level of approximately 127.3 m

This will ensure that all the lands within the redline boundary will be significantly above the high winter water table. Therefore, groundwater flooding will not be a risk for the Proposed Development. Please refer to drawing COOL d23.01.02 Substation Compound Elevation rev E3 submitted as part of the planning application.

7.4.2 Fluvial Flooding Risk

Based on the currently available information from the OPW CFRAM mapping and National Indicative Fluvial Mapping, there is no identified risk of fluvial flooding on the Site or within the close vicinity of the Site [5].

7.4.3 Pluvial Flood Risk

A review of the currently available OPW information shows that there is no identified risk of pluvial flooding (i.e., flooding as a result of rainfall-generated overland flow before the water enters a watercourse) within the Site [5]. Furthermore, the Site is underlain by well-draining soils. Therefore, it is not considered that there is a risk of pluvial flooding within the Site.

7.5 Potential Effects

7.5.1 Construction Phase

Construction and Site development works, in general, can potentially impact on surface water and groundwater quality. Potential impacts include the following:

- Silt runoff and the incorrect handling of deleterious materials such as lubricants, waste oils, cement, etc;

- Earthmoving activities have the potential to release sediment, and additionally, cement can enter waterbodies during construction works; and
- Contamination to the water environment from hydrocarbon spills on Site.

The majority of the construction activities associated with the Proposed Development will be undertaken ca. 150m from the Cooleeny Stream, part of the Drish_040 river waterbody. There is no existing drainage connection in place that connects the Site to this river waterbody that could provide a conduit to the river waterbody during construction activities. There will be an existing access road separating these works from the river waterbody. In summary, it was predicted that the potential impacts on the Drish_040 river waterbody during the Construction Phase will be not likely and not significant.

The proposed 110kV substation will be developed on ca. 1 ha within the overall ca. 2ha site. The levels in this portion of the Site will be raised by ca. 1m with imported engineering fill materials. Existing ground level of approximately 127.3 m will be raised to a finished floor level of approximately 128.3m. Furthermore, within the expansion area, existing ground level of approximately 126.3 m will be raised to a finished level of approximately 127.3 m. This will ensure that all the lands within the redline boundary will be above the high winter water table.

Underground cable trenches and cabling connecting the proposed on-site 110kV substation to the existing Lisheen 110kV substation will also be undertaken. Any earthworks required for the Proposed UGC will be backfilled using suitable excavated material, with surface levels reinstated to match the surrounding ground profile.

Excavation works for placing cables will occur after ground level have been raised by the imported engineered fill material. In the unlikely event that groundwater is encountered during the excavation works, limited and temporary dewatering may be necessary. However, given the project's scale, scope, duration and location, substantial dewatering is not anticipated, and any localised dewatering effects on groundwater will likely be imperceptible.

The Construction works will need to be very carefully planned, as during the winter months, they will potentially be located adjacent to an area of exposed groundwater. In the event there was any spillage from the construction works that migrated into this area, it would have the potential to have a direct negative effect on the underlying aquifer. All construction works will be undertaken in accordance with recognised best practice guidance. Nonetheless, mitigation measures will be put in place as part of the Site-specific CEMP to minimise the potential risk to groundwater quality associated with the Construction Phase of the Proposed Development.

7.5.2 Operational Phase

Once completed, the majority of the surfaces onsite will be permeable, i.e. hardcore installed on top of a geotextile; thus, rainwater will continue to percolate into the ground.

Small areas of the Proposed Development will be comprised of impermeable surfaces. The total area of hardstanding within the Proposed Development will be 666.5m^2, comprising the 110kV substation building (216.5m^2) and the EirGrid Switch Room (450m^2).

However, all rainwater will run directly off these surfaces to the adjacent permeable surface of crushed stone, allowing rainwater to percolate directly to the ground. There will be no resulting alterations to the existing drainage patterns within the Site as a result of the Proposed Development.

The internal access tracks and the access road to the sub-station will comprise permeable hardcore. This free-draining material will allow rainfall to permeate into the ground. It can be concluded that the Proposed Development has been designed to maintain existing conditions and, as such, will not impede drainage.

No wastewater discharges will be generated during the Operational Phase of the Proposed Development. As the welfare facilities on the Site will be infrequently used, it is proposed that

foul water will be diverted into a holding tank. All wastes collected in this holding tank will be frequently removed by a suitably licensed waste contractor. In summary, no specific drainage infrastructure will be required for the Proposed Development.

7.5.3 Potential Effect of Development on Flooding Elsewhere

There will be no net increase in discharge rate or runoff volume arising from the Proposed Development. Therefore, the Proposed Development will not have an impact on flooding elsewhere.

7.5.4 Justification Test Criteria

According to best practice guidance [85] flood zones are geographical areas within which the likelihood of flooding is in a particular range, and they are a key tool in flood risk management within the planning process. There are three types / levels of flood zones defined for the purposes of these guidelines, as presented below:

- Flood Zone A: where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);
- Flood Zone B: where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 year for coastal flooding); and,
- Flood Zone C: where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

Based on available predictive flood mapping [100], the entire Site can be categorised as Flood Zone C. Furthermore, there is no historical evidence of any fluvial flooding in the immediate vicinity of the Site. The Proposed Development would be considered a highly vulnerable development to flood risk, as the development includes essential infrastructure (electricity-generating power stations and substations). However, as the Site is located in Flood Zone C, the Proposed Development is deemed to be an 'appropriate land use' in accordance with the relevant Planning System and Flood Risk Guidelines [85]. Therefore, a Justification Test is not required. Refer to Figure 7-6.

Figure 7-6: Justification Test Criteria (Extract from DEHLG Guidelines, 2009)

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

7.6 Mitigation Measures

As part of the Proposed Development, a site-specific CEMP will be implemented to ensure that construction works will have no significant impacts on water quality and will not result in excess runoff or soil erosion / compaction of the soils. The following measures will be implemented during the Construction and Operational Phases of the Proposed Development.

7.6.1 Construction Phase

The following mitigation measures will be implemented through the Site-specific CEMP to ensure that water quality will be protected within the vicinity of the Proposed Development. These measures will include the following:

- All materials shall be stored at the main contractor compound and transported to the works zone immediately prior to construction;
- Excavations will be left open for minimal periods to avoid acting as a conduit for surface water flows;
- No surface water runoff will be discharged onto public roads, foul sewers or adjacent property;
- Weather conditions will be considered when planning construction activities to minimise the risk of runoff from the Site;
- Provision of exclusion zones and barriers between any stockpiled materials and any surface water features to prevent sediment washing into the receiving water environment;
- An Environmental Clerk of Works shall be engaged to periodically inspect all elements of the works for their entire duration;
- Emergency response procedures will be put in place;
- Chemicals used will be biodegradable where possible;
- Preventive maintenance and relevant maintenance logs will be kept for all onsite plant and equipment;
- Adequate spill kits, including absorbent booms and other absorbent material, will be maintained on site;
- All contractor workers will be appropriately trained in the use of spill kits;
- Any spillage of cementitious materials will be cleaned up immediately;
- Silt fences will be installed on the southern perimeter of the Proposed Development area of the Site to ensure that any potentially contaminated runoff from the northern area of the Site won't enter the groundwater/ bedrock aquifer in the southern area of the Site, where extreme groundwater vulnerability conditions are present;
- Any sediments adversely effected by contamination will be excavated and stored in appropriate sealed containers for disposal off-site in accordance with all relevant waste management legislation;
- The working area will be clearly defined, and construction activities will be carefully planned to minimise ground disturbance;
- Temporary stockpiles of material will be covered during periods of prolonged or heavy rain and will be located in the northern portion of the Site;
- Concrete pours will be adequately planned and executed;
- Any pouring of concrete will only be carried out in dry weather. Washout of concrete trucks will not be permitted on site;
- Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening;
- Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete;

- Surplus concrete will be returned to the batch plant or off-site concrete wash facility after completion of a pour;
- Any spillage of cementitious materials will be cleaned up immediately; and,
- Washouts of equipment used for concrete operations will be done either off-site or within a designated washout area, which will comprise a container that will capture the washout material / water for reuse or disposal off-site.

The proposed measures to remove the risk from potential contamination and emergency procedures to be implemented in the event of an accidental release or spill of potentially contaminating substances are outlined below.

These procedures will be communicated to all relevant site staff. At a minimum, the following measures will be in place:

- Any chemical / oils to be stored onsite will be placed within a bund on an area of hardstanding in the northern portion of the Site, to ensure there will be no seepage of pollutants into groundwater or surface water;
- All bunds will have the capacity of the largest tank volume plus 10 per cent, at a minimum, with additional capacity to hold 30mm of rainfall;
- All drainage from bund areas will be directed to secure containment prior to suitable disposal;
- Fuelling, refuelling and lubrication of equipment will be carried out off-site;
- All plant and machinery will be serviced before being mobilised to the Site;
- No vehicle or equipment maintenance work will take place on site;
- Appropriate containment facilities will be provided to ensure that any spills from vehicles will be contained and removed off-site. Adequate stocks of absorbent materials, such as sand or commercially available spill kits, will be available;
- The Contractor will ensure that all personnel working onsite will be trained in pollution incident control response;
- A regular review of weather forecasts for heavy rainfall events will be undertaken with works scheduled accordingly;
- No storage of hydrocarbons or any polluting chemicals will occur within 5m of watercourses or surface water features;
- Design and installation of fuel bowsers will be in accordance with best practice guidelines;
- Drip trays and spill kits will be kept available on site;
- Cabins, containers, workshops, plant, materials storage and storage tanks will be located close to the northern boundary of the Site;
- Measures will be implemented to minimise waste and ensure correct handling, storage, and disposal of waste;
- Fuel and oil stores, including tanks and drums, will be regularly inspected for leaks and signs of damage; and,
- Drip trays will be used for fixed or mobile plant, such as pumps and generators, in order to retain oil leaks and spills.

The contractor will undertake periodic visual monitoring during construction to ensure the above measures will be effective.

Additionally, the contractor will maintain a drainage inspection regime to ensure there will be no negative impact to the drainage patterns at the Site.

7.6.2 Operational Phase

Once operational, the development will receive monthly maintenance visits. Should any unforeseen issues with equipment and / or holding tank occur, they will be detected at an early stage, and remedial measures will be implemented accordingly in order to protect receiving waters.

Decommissioning

The Proposed Development will have an estimated life span of 40 years, at which time the Overall Development will be decommissioned, and the Site returned to its current use. Upon decommissioning, the same measures will be applied as during the Construction Phase. After the removal of the infrastructure, the Site will be inspected.

Mitigation measures outlined above will minimise the identified potential risks to soils and water quality associated with the Operational Phase of the Proposed Development.

7.7 Cumulative Effects

As stated in Section 1.4, the Masterplan for the National Bio-economy Campus is proposed to develop the Campus for multiple, mutually beneficial bio-economy industrial and research facilities. Although the Proposed Development on its own will not have any significant impact on water, the cumulative impact of several facilities may have the potential to have a significant impact on water. However, it was not predicted that this will be the case for the following reasons:

- No discharges to the Cooleeny Stream will occur;
- The majority of the surfaces onsite will remain permeable surfaces, allowing rainwater to percolate directly to the ground. As a result, surface water runoff will be minimal and comparable to existing baseline conditions;
- Surface water will continue to be managed through natural infiltration processes; and,
- Any potential future development will require the Management Association's approval before any application for future developments will be submitted to competent authorities. The cumulative impact of any future facility on the local environment and available infrastructure (e.g. water abstraction) will be considered when making such decisions.

7.8 Assessment Conclusions

- This PFRA has been completed for the Proposed Development, in accordance with the planning system and Flood Risk Management Guidelines [66];
- The southern portion of the Site, which will be set aside for future expansion, is subject to seasonal groundwater emergence, which can result in localised flooding during periods of a high-water table;
- As there will be no net increase in the discharge rate or runoff volume from the Proposed Development, it will not have any impact on any potential off-site flooding events;
- In accordance with the relevant Planning System and Flood Risk Guidelines [66], a Justification Test is not required;
- The Proposed Development will not require any alterations to the existing drainage network; and,

- The Proposed Development, subject to the implementation of the stipulated mitigation measures, will not result in any adverse effect on the hydrological regime of the receiving environment, as there will be no effects onsite or on any off-site receptors.

8 NOISE

This chapter provides a noise impact assessment that comprehensively assessed the likely noise arising during the Construction and Operational Phases of the Proposed Development over its lifetime.

8.1 Scope

The scope of this Chapter is to:

- Characterise the existing ambient acoustic environment;
- Identify local Noise Sensitive Receptors ('NSRs') to the Site;
- Assess the likely noise emissions arising during construction;
- Assess the likely noise emissions from identified noise sources during operation of the Proposed Development;
- Assess the likely impact from the Proposed Development on NSRs; and,
- Identify any relevant mitigation measures, where appropriate.

A glossary of terms of the main parameters utilised is detailed below:

- **$L_{Aeq,T}$** is the equivalent continuous sound level, used to describe the fluctuating noise in terms of a single noise level over the same sampling time period (T); and,
- **$L_{A90,T}$** is the A-weighted noise level in the lower 90th percentile of the sampling interval 'T', excludes intermittent features typical of traffic and is typically utilised to describe background noise.

A full acoustic glossary of terms is given in Appendix 8-1.

8.2 Methodology

The following documentation was reviewed and utilised in the preparation of this report:

- BS 5228-1:2009+A1:2014, Code of practice for noise and vibration control on construction and open sites, Noise [101];
- BS5228-2:2009, Code of practice for noise and vibration control on construction and open sites, Vibration [102];
- BS 7385-1 Evaluation and measurement for vibration in buildings – Part 1 Guide for measurement of vibrations and evaluation of their effects on buildings [103];
- S.I. No. 549/2018 European Communities (Environmental Noise) Regulations 2018 [104];
- AACI Environmental Noise Guidelines for Local Authorities [105];
- ANC Guidelines (Greenbook) Environmental noise measurement guide 2013 [106];
- ISO 1996-1:2016 Acoustics - Description, measurements, and assessment of environmental noise - Part 1: Basic quantities and assessment procedures 2003 [107];
- ISO 1996-2:2017 Acoustics - Description, measurements, and assessment of environmental noise - Part 2: Determination of sound pressure levels [108];
- ISO 9613-1:1993 Acoustics — Attenuation of sound during propagation outdoors — Part 1: Calculation of the absorption of sound by the atmosphere [109];
- ISO 9613-2:1996 Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation [110];

- ISO 9613-2:2024 Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation [111];
- EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) [112];
- Institute of Acoustics ('IOA') / Institute of Environmental Management and Acoustics ('IEMA') Guidelines for Environmental Noise Impact Assessment, 2014 [113];
- NRA Guidelines for the treatment of noise and vibration in National Road Schemes, 2004 [114];
- NRA Good practice guidance for the treatment of noise during the planning of National Road schemes, March 2014 [115];
- Smith, Peterson and Owens Acoustics and Noise Control, 1996 [116];
- World Health Organization's ('WHO') Night noise guidelines for Europe [117];
- WHO Environmental Noise Guidelines for the European Region 2018 [118];
- TCDP [119]; and,
- Tipperary Noise Action Plan 2024 – 2028 [120].

The 'National Planning Framework 2040', originally published in 2018, was revised in April 2025, and a specific reference to noise is made under Objective 94:

> *"Promote the pro-active management of noise where it is likely to have significant adverse impacts on health and quality of life and support the aims of the Environmental Noise Regulations through national planning guidance and Noise Action Plans."*

The following policy and objective relating to the assessment of noise for new developments are also contained within the TCDP:

Policy 11-18:

> *'Ensure that new development does not result in significant noise disturbance and to ensure that all new developments are designed and constructed to minimise noise disturbance in accordance with the provisions of the Noise Action Plan 2018[1] and relevant standards and guidance that refer to noise management.'*

Objective 11-H:

> *'Apply the provisions of the Tipperary County Council Noise Action Plan 2018 – 2023 as it relates to Noise Action Areas in order to reduce disturbance from noise.'*

The Tipperary Noise Action Plan ('NAP') 2024-2028 states:

> *'In permitting new development outside of the Action Planning Areas identified in the Noise Action Plan, the Council will refer to the appropriate regulations and guidance in place, and where a proposed development may result in excessive noise levels or, by virtue of its proximity to a noise sensitive receptor may result in a loss of amenity to that receptor or result in general nuisance, a Noise Impact Assessment may be required. The Council may apply conditions at planning permission stage to manage noise emissions from new developments.'*

[1]This have been superseded by new Noise Action Plan 2024-2028.

8.2.1 Competency

The detailed desk-based assessment and the design of the monitoring programme was undertaken by a MOR Environmental acoustician and Associate Director, who is a full member of the Institute of Acoustics ('MIOA') and a member of the Association of Acoustic Consultants of Ireland ('AACI'[2]) with over 15+ years' experience.

8.2.2 Construction Phase Noise

A review of noise nuisance criteria in Ireland was conducted. For construction stage noise, the limits and methodology within the British Standard BS5228-1 are designed for the assessment of noise arising from construction and open sites.

This standard identifies a methodology (the ABC method, section E.3.2 of standard) for assigning construction noise limits at NSRs based upon the ambient noise levels. An excerpt detailing the ABC method is shown in Table 8-1 below.

Table 8-1: Maximum Permissible Construction Noise Levels (BS5228-1)

Assessment category and threshold value period (L_{Aeq})	**Threshold value, in decibels (dB) ($L_{Aeq,T}$)**		
	Category A[A)]	**Category B[B)]**	**Category C[C)]**
Night-time (23:00-07:00)	45	50	55
Evening and weekends [D)]	55	60	65
Daytime (07:00-19:00) and Saturday (07:00-13:00)	65	70	75
Note 1 A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.			
Note 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3dB due to site noise.			
Note 3 Applied to all residential receptors only.			
A) Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.			
B) Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as Category A values.			
C) Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than Category A values.			
D) 19:00-23:00 weekdays, 13:00-23:00 Saturday and 07:00-23:00 Sunday.			

8.2.3 Construction Phase Vibration

During the Construction Phase, activities such as piling and excavation works have the potential to generate ground-borne vibrations. However, due to the distance of the activities from sensitive receptors and similar activities on other sites, it was not considered that ground-borne vibrations associated with activities during the Construction Phase will be in the order of magnitude required to result in complaints due to human discomfort or cause cosmetic damage to nearby buildings. Therefore, the potential vibrational effects associated with the Construction Phase are not discussed further.

[2] The Association of Acoustic Consultants Ireland ('AACI') is the European Acoustics Association ('EAA's') membership society for the Republic of Ireland, since January 2021.

8.2.4 Operational Phase Noise

Although a single figure limit value is a preferred option for noise compliance, an assessment of the likely change from the ambient acoustic environment is typically a more accurate representation of the likely impact from a Proposed Development. There are two general methodologies for assessing the change in terms of acoustics:

- BS4142:2014; and
- Institute of Acoustics ('IOA') / Institute of Environmental Management and Assessment ('IEMA').

The IOA / IEMA methodology has been selected for this assessment.

Figure 8-1 below presents the relationship between noise impact and noise effect in generating an understanding of significance from the change to an acoustic environment under the IOA / IEMA methodology.

Figure 8-1: IEMA IOA Table on Relationship between Impact and Noise Effect

MAGNITUDE (Nature of Impact)		DESCRIPTION OF EFFECT (on a specific sensitive receptor)	SIGNIFICANCE (as required within EIA)
Substantial	BENEFICIAL	**Receptor perception = Marked change** Causes a material change in behaviour and/or attitude, e.g. individuals begin to engage in activities previously avoided due to preceding environmental noise conditions. Quality of life enhanced due to change in character of the area.	More Likely to be Significant (Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a non-significant effect)
Moderate	BENEFICIAL	**Receptor perception = Noticeable improvement** Improved noise climate resulting in small changes in behaviour and/or attitude, e.g. turning down volume of television; speaking more quietly; opening windows. Affects the character of the area such that there is a perceived change in the quality of life.	↕
Slight	BENEFICIAL	**Receptor perception = Just noticeable improvement** Noise impact can be heard, but does not result in any change in behaviour or attitude. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	(Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a significant effect) Less Likely to be Significant
Negligible		N/A = No discernible effect on the receptor	**Not Significant**
Slight	ADVERSE	**Receptor perception = Non-intrusive** Noise impact can be heard, but does not cause any change in behaviour or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	Less Likely to be Significant (Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a significant effect)
Moderate	ADVERSE	**Receptor perception = Intrusive** Noise impact can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Potential for non-awakening sleep disturbance[81]. Affects the character of the area such that there is a perceived change in the quality of life.	↕
Substantial	ADVERSE	**Receptor perception = Disruptive** Causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in character of the area.	(Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a non-significant effect) More Likely to be Significant
Severe	ADVERSE	**Receptor perception = Physically Harmful** Significant changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Significant

In forming an assessment on the impact, this methodology looks at the following key elements:

- The change from the baseline presented by the Proposed Development;
- Type of noise source;
- Nature of the change; and,
- Other factors.

The guidance further identifies that the impact assessment should consider the following influences:

- Averaging period;
- Time of day;
- Nature of the noise source (intermittency, etc.):
- Frequency of occurrence;
- Spectral characteristics;
- Absolute level of the noise indicator; and,
- Influence of the noise indicator used.

The IEMA Guidelines note under section 2.7 regarding perception of acoustic change that:

> *"Measuring in decibels means that a 3 dB increase is equivalent to a doubling of the sound energy, and a 10 dB increase is a tenfold increase in energy. For broad band sounds which are very similar in all but magnitude, a change or difference in noise level of 1 dB is just perceptible under laboratory conditions, 3 dB is perceptible under most normal conditions, and a 10 dB increase generally appears to be twice as loud. These broad principles may not apply where the change in noise level is due to the introduction of a noise with different frequency and/or temporal characteristics compared to sounds making up the existing noise climate. In which case, changes of less than 1 dB may be perceptible under some circumstances."*

8.2.5 Baseline Noise Monitoring

MOR Environmental undertook noise monitoring at one continuous location (NM1) to characterise local ambient sound levels. Sound measurements were carried out utilising the following equipment:

- NTi XL3 Audio Acoustic Hand-held Analyser Sound Level Meter ('SLM') (Serial number A3A-00551-D1).

The SLM was calibrated prior to and following the measurement period using a:

- Bruel and Kjaer sound level calibrator Type 4231 (Serial number 2217952).

The SLM was laboratory calibrated within the previous 24 months of the survey, and the field calibrator was laboratory calibrated within the previous 12 months of the survey, as recommended by the manufacturer. The calibration certificates for the SLM and field calibrator utilised for the survey in 2025 are available upon request.

The SLM was set to measure sound in the A-weighted network and with a Fast ('F') sampling interval, unless otherwise stated, for broadband parameters. A-weighted fast sampling is utilised to better replicate human hearing response to sound. Tonality (1/3 octave frequencies) was measured unweighted, defined as 'Z-weighting' within the BK software systems, to enable an assessment for tonality.

MOR Environmental deployed a weather station to ensure local weather conditions were recorded.

8.2.6 Noise Modelling

Noise modelling was carried out using iNoise version 2026 software. The noise model was developed for the Site, incorporating noise emission sources during the Proposed Development's operation and the local environment's layout.

The model was run utilising ISO 9613 1 & 2 for the basis of sound transmission from source to receiver.

This section details the methodology, inputs and assumptions taken regarding the completed noise modelling. The plant and equipment to operate the Proposed Development will have associated noise emissions. Fixed plant emissions incorporate all building services associated with the Proposed Development.

The noise model only assesses site-specific emissions – i.e., it does not incorporate existing ambient sources such as road traffic. Source sound values were populated utilising the in-house MOR Environmental source library, consisting of measured sources from similar facilities and the SourceDB provided with the DGMR software package.

The model was run utilising ISO 9613 1 & 2 for the basis of sound transmission from source to receiver.

8.2.6.1 Model Calculations

The Noise Model calculation formula is based on ISO 9613 – 1 & 2. Utilising this standard, Predictor calculates the noise level as follows:

$$L|t.per = L_{dW} - C_{m,per} - C_{t,per}$$

Where;

$$L_{dw} = L_W + D_c - A$$

$L_{lt,per}$ Long-term average octave (or 1/3-octave) Sound Pressure Level ('SPL') during the evaluation period in dB

L_{dw} Equivalent continuous downwind octave (or 1/3-octave) SPL in dB

$C_{m,per}$ Meteorological correction during the evaluation period in dB

$C_{t,per}$ Correction for the active time of the source during the evaluation period in dB

L_W Sound power level in dB(A) per octave (or 1/3-octave), re 1 pW

D_c Directivity correction in dB

A Attenuation (octave-band) in dB per octave (or 1/3-octave)

The attenuation A is calculated as follows:

$$A = A_{div} + A_{atm} + A_{gr} + A_{bar} + A_{fol} + A_{site} + A_{hous}$$

A_{div} Geometrical divergence in dB

A_{atm} Atmospheric absorption in dB/octave (or 1/3-octave)

A_{gr} Ground effect in dB/octave (or 1/3-octave)

A_{bar} Screening in dB/octave (or 1/3-octave)

A_{fol} Attenuation due to foliage in dB/octave (or 1/3-octave)

A_{site} Attenuation due to installations on an industrial site in dB/octave (or 1/3-octave)

A_{hous} Attenuation due to housing in dB

The modelling inputs and outputs are presented in Appendix 8-2. In developing the model, all operational sources were deemed on or off for the time period, i.e., where a noise is on during the night-time, it is calculated as being on for the full 8-hour period and operating at full duty capacity. In reality, many emissions within the Proposed Development will operate below duty capacity, as the power transmission will be related to the power transfer and power transmission (grid requirement dependent). As such, this model presents a worst-case scenario for most hours.

8.3 Receiving Environment

A consented 122MW Solar PV farm will be developed on the former TMF. Lisheen is also the location of an 89MW wind farm, which is operated by Orsted and provides renewable electricity to the locality. Agricultural land borders the Site to the south. The Proposed Development will not be located immediately adjacent to any residential areas.

8.3.1 Quiet Area Screening

The locality was assessed for 'Quiet Area' status as per SI 549/2018 [121]. Currently, the only recognised methodology for this assessment in rural areas is within the EPA's noise guidance document NG4 [112]. As per Section 4 of the NG4 document, an assessment as to whether this rural area could be classified as 'Quiet Area' was conducted. This assessment was a desk-based review and assessed the likely impact on an area from human (anthropogenic) noise sources, such as urban and industrial areas or major infrastructural routes. The assessment is detailed in Table 8-2 and shown in Figure 8-2 below.

If all criteria for a 'Quiet Area', as listed in Table 8-2 below, are met, alternative methodologies to evaluate the potential impact are utilised. A 'Quiet Area' may still have high levels of noise, from other sources, or from local road infrastructure, and additional site monitoring would be required to characterise the acoustic environment further.

Figure 8-2: Quiet Screening Area

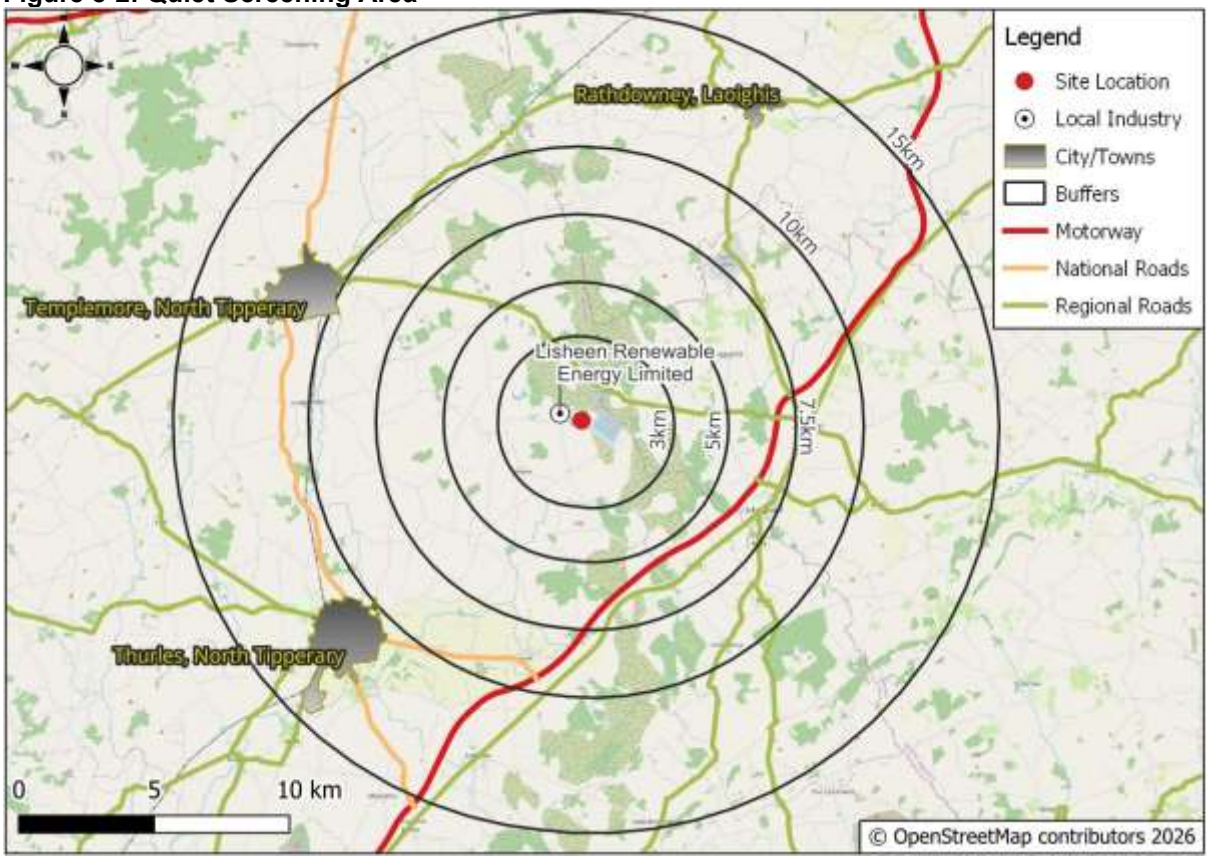


Table 8-2: EPA Assessment Criteria for Rural Quiet Area

Quiet Area Criteria	Yes / No	Comment
At least 3km from any urban areas with populations greater than 1,000 persons	Yes	No urban areas with population >1,000 within 3km of Site.
At least 10km from any urban area with a population greater than 5,000 persons	Yes	No urban areas with population >5,000 within 10km of Site.
At least 15km from any urban areas with a population greater than 10,000 persons	Yes	No urban areas with population >10,000 within 15km of Site.
At least 3km from any local industry.	No	Lisheen Renewable Energy Limited within 1km northwest of Site
At least 10km from any major industry centre.	Yes	Thurles within 12km to the southwest of the Site.
At least 5km from any National Primary Route.	No	Nearest National Primary Route is the R502 ca. 1.3km north of Site
At least 7.5km from any Motorway or Dual Carriageway.	No	M8 ca.5.5km east of Site.
Finding	**Not a Quiet Area. Proximity to local industrial premises and National Road and Motorway.**	

*Sources: CSO, Google Maps and www.myplan.ie

Table 8-3 shows that the area is not a rural 'Quiet Area', as per the metrics issued by the EPA.

A baseline noise survey was undertaken to characterise the ambient noise environment. The scope of the assessment was to quantify both the level of existing noise and characterise the acoustic character and source(s) in the vicinity of the Site.

8.3.2 Noise Sensitive Receptors ('NSRs')

To assess potential noise impacts, local NSRs were identified. NSRs are defined in EPA NG4 as:

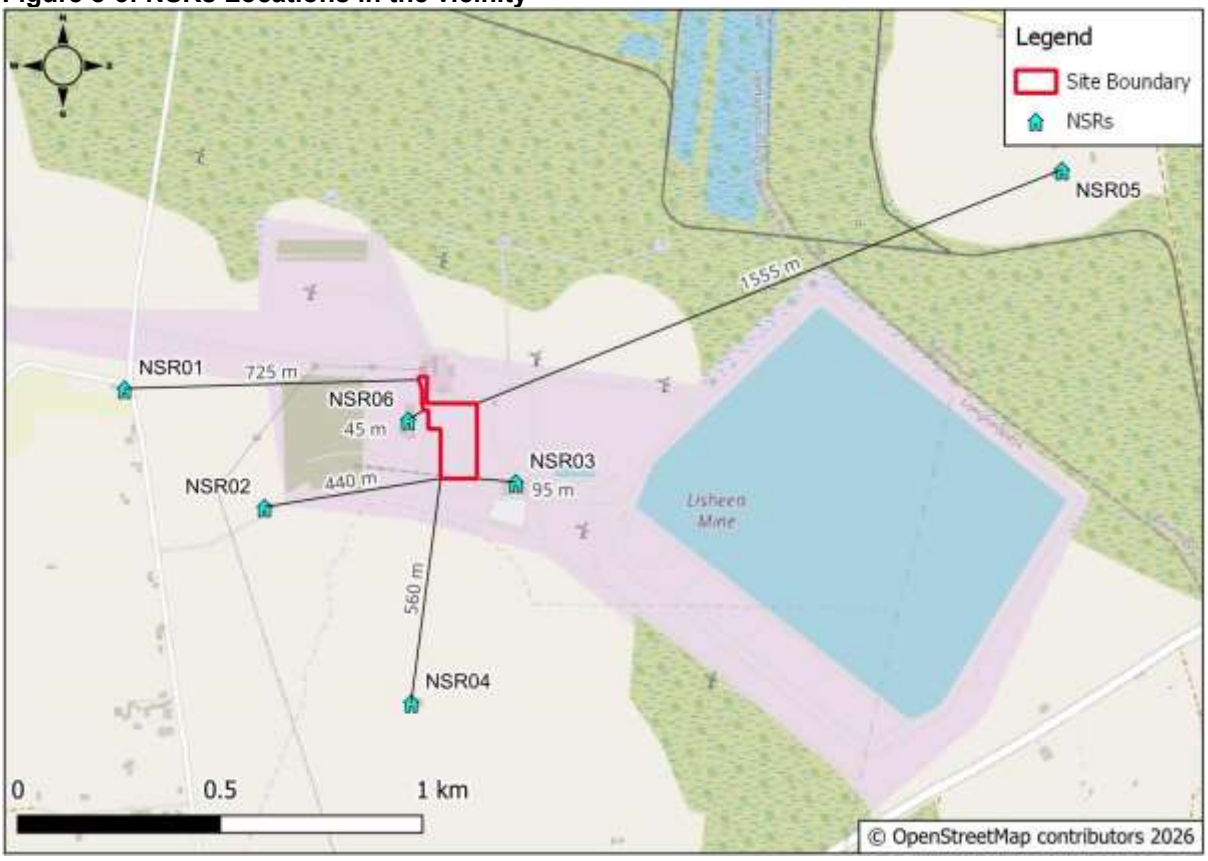
> *'any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.'*

The locations of NSRs in the vicinity of the Site are outlined in Table 8-3 and shown in Figure 8-3.

Table 8-3: NSRs in the Vicinity of the Site

NSR ID	Easting (ITM)	Northing (ITM)	Notes
NSR01	620702	666709	Dwelling located to the west of the Site and proxy for other locations.
NSR02	621048	666417	Dwelling located to the southwest of the Site and proxy for other locations.
NSR03	621668	666478	Commercial Receptor located to the southeast of the Site (AQS Environmental Solutions).
NSR04	621410	665935	Dwelling located to the south of the Site and proxy for other locations.
NSR05	623018	667249	Dwelling located to the northeast of the Site and proxy for other locations.
NSR06	621403	666632	Commercial Receptor located to the southeast of the Site (Irish Bioeconomy Foundation).

Figure 8-3: NSRs Locations in the vicinity



8.3.3 Ambient Noise Characterisation

The noise monitoring location is shown in Figure 8-4 below and described in Table 8-4 below.

Table 8-4: Noise Monitoring Locations

Monitoring Location ID	Easting (ITM)	Northing (ITM)	Description of Locality
NM1	621464	666667	Located within the Site Boundary.

Weather conditions during the ambient sound survey were variable. For the continuous measurements at location NM1, weather conditions onsite were recorded by a Davis Vantage Vue automated weather station, with weather recorded in 1-hour periods. These 1-hour intervals recorded wind speed, wind direction and rainfall events. Summaries for the monitoring period are presented in Table 8-5 below, and the full dataset is available upon request.

Table 8-5: Davis Vantage Vue Weather Data 05/12/2025-09/12/2025

Date	Temp Low (°C)	Temp Median (°C)	Temp Max (°C)	Wind Speed Min (m/s)	Wind Speed Median (m/s)	Wind Speed Max (m/s)	Rain Total (mm)
05/12/2025	7.5	9.9	11.8	1.3	3 .6	7.2	0.0
06/12/2025	5.6	9.3	10.3	0.4	2.7	4.5	7.1
07/12/2025	6.4	9.0	10.8	0.0	1.3	2.7	6.9
08/12/2025	7.2	9.9	11.3	0.9	2.2	4.0	9.1
09/12/2025	10.8	13.7	14.4	4.0	4.5	6.3	5.1

Figure 8-4: Noise Monitoring and Weather Station Locations

The continuous data was analysed and compared against the results of the weather station. Table 8-6 presents the values measured at location NM1 and the calculated L_{den} values without any analysis.

As shown in Figures 8-5 and 8-6, the measurement values are presented against the wind speed and the rain recorded, respectively. As shown in the figures, weather conditions were not ideal and only 55% of daytime values are useful; 86% for the evening period and 40% of night-time period.

Figures 8-7, 8-8 and 8-9 below present the number of occurrences of $L_{A90,T}$, $L_{AFmax,T}$ and $L_{Aeq,T}$ at NM1 for daytime, evening, and night-time periods, respectively. The data was analysed to discard any values during periods of rainfall and the following 1-hour post rainfall to discard any influence from the wet ground. In addition, sound measurements where windspeeds greater to or equal to 5m/s (9.7knots) occurred were also removed.

Table 8-6: Continuous monitoring location NM1 05/12/2025-09/12/2025

Location ID	Date and Start Time	Elapsed Time (hh:mm)	$L_{Aeq,T}$ dB	Commentary
NM1	05/12/2025 12:15:00	06:45:00	56	**05/12/2025 12:15-12:30** Wind was the dominant noise source. Wind turbines in the locality were faintly audible. No other noise sources were identified. Wind speed of up to 13m/s was recorded. **09/12/2025 08:15-08:30** Wind was the dominant noise source. Wind turbines in the locality were faintly audible. No other noise sources were identified. Wind speed of up to 14m/s was recorded.
	05/12/2025 19:00:00	04:00:00	50	
	05/12/2025 23:00:00	08:00:00	48	
		05/12/2025 - L_{den}	**52**	
	06/12/2025 07:00:00	12:00:00	52	
	06/12/2025 19:00:00	04:00:00	48	
	06/12/2025 23:00:00	08:00:00	43	
		06/12/2025 - L_{den}	**53**	
	07/12/2025 07:00:00	12:00:00	47	
	07/12/2025 19:00:00	04:00:00	50	
	07/12/2025 23:00:00	08:00:00	50	
		07/12/2025 - L_{den}	**56**	
	08/12/2025 07:00:00	12:00:00	50	
	08/12/2025 19:00:00	04:00:00	47	
	08/12/202523:00:00	08:00:00	52	
		08/12/2025 - L_{den}	**58**	
	09/12/2025 07:00:00	01:42:19	62	

Figure 8-5: NM1 recorded values of $L_{Aeq,T}$, $L_{A90,T}$ and L_{AFmax} against wind speed recorded and wind speed limit (5m/s)

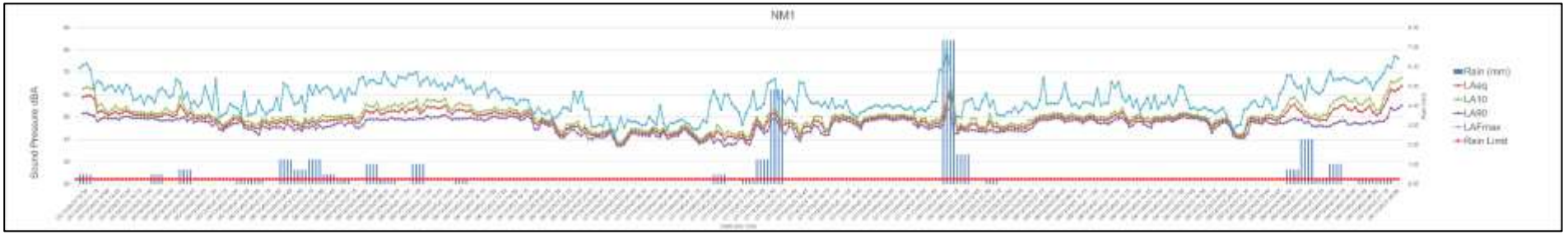


Figure 8-6: NM1 recorded values of $L_{Aeq,T}$, $L_{A90,T}$ and L_{AFmax} against rain rate recorded and rain recommendation (0.25mm)

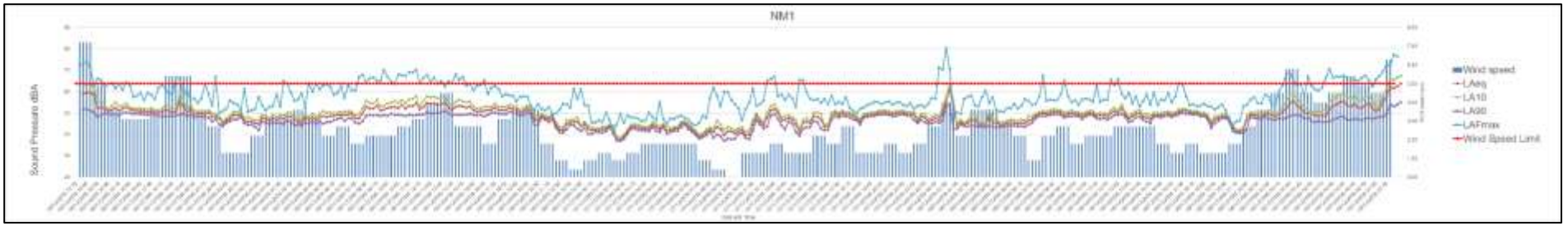


Figure 8-7: Daytime Statistical Analysis (NM1)

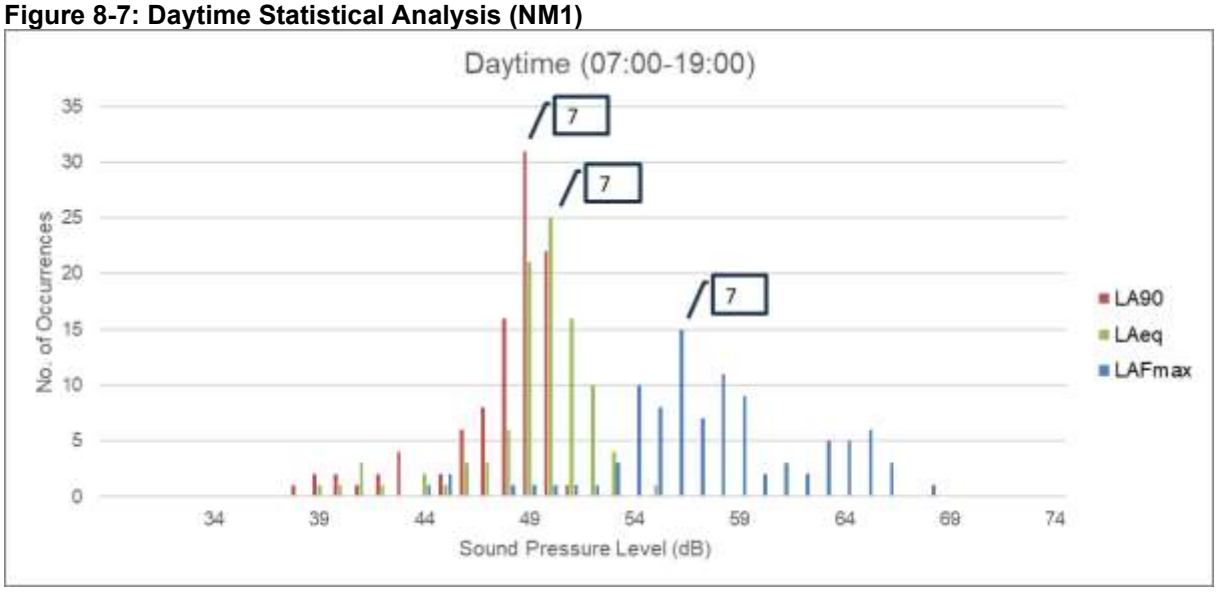


Figure 8-8: Evening Time Statistical Analysis (NM1)

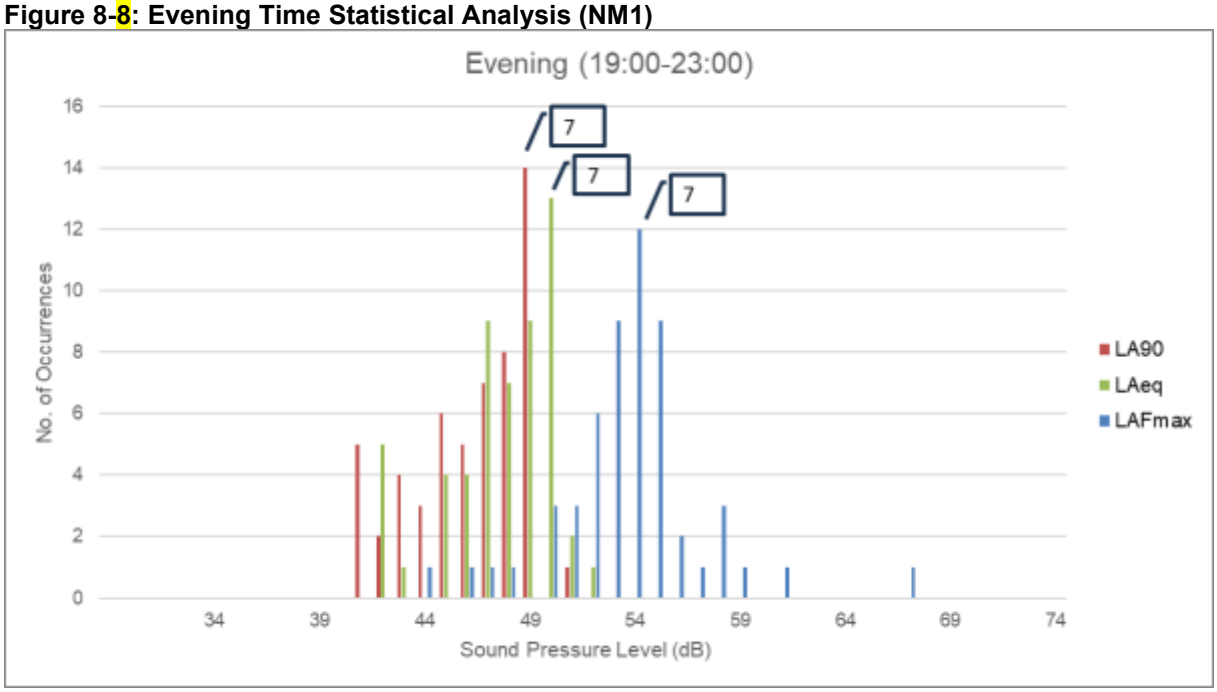


Figure 8-9: Night-time Statistical Analysis (NM1)

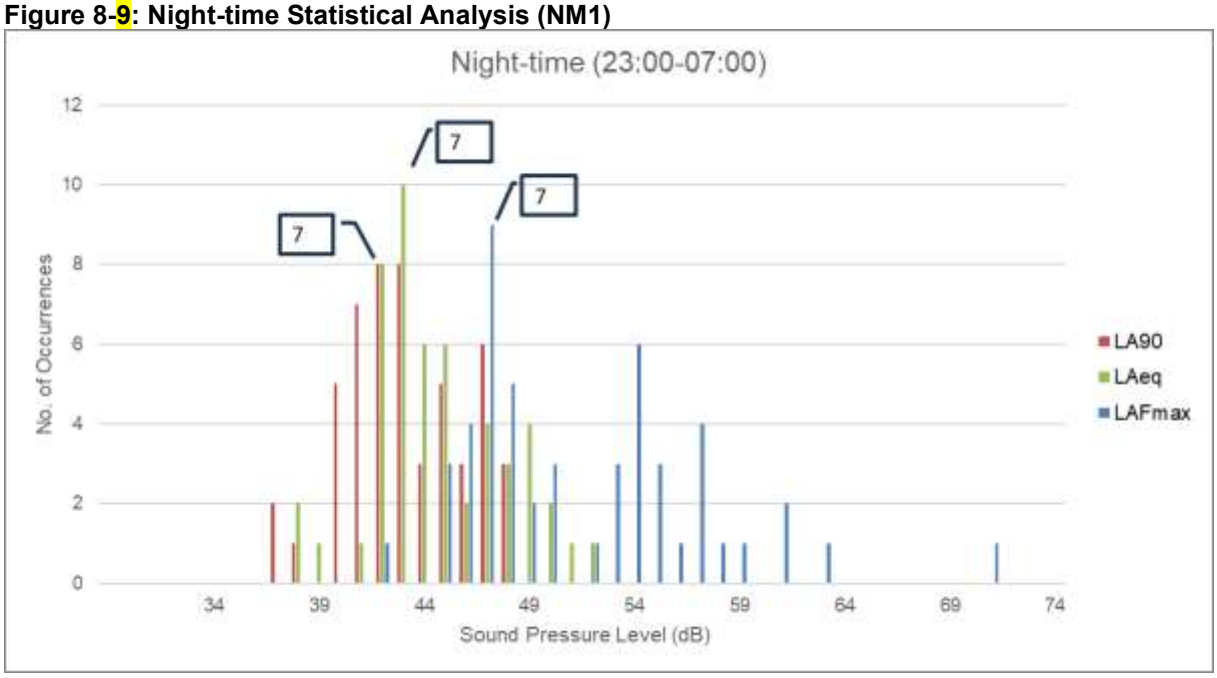


Table 8-7 below provides the most occurrent values for ambient ($L_{Aeq,T}$), background ($L_{A90,T}$) and L_{AFmax} noise levels for the daytime, evening time and night-time.

Table 8-7: Summary of Typical Ambient and Background Noise Levels at NM1

Period	$L_{Aeq,T}$ (dB) Ambient	$L_{A90,T}$ (dB) Background	L_{AFmax} (dB)
Daytime (07:00 – 19:00)	50	49	56
Evening (19:00 -23:00)	50	49	54
Night-time (23:00 – 07:00)	43	42	47

Public data from Planning Applications located within the area were reviewed to validate the noise monitoring location. The two planning applications reviewed were a healthcare waste treatment and recycling facility and a waste transfer station (planning ref: 2460978) and an anaerobic digestion plant (planning ref: 2460936). Refer to Table 4-1 for further details.

MOR Environmental undertook the baseline ambient noise monitoring for Planning Ref. 2460978 in June 2024, and a baseline monitoring was conducted in June 2025 by a third party for Planning Ref. 2460936. The locations for the different surveys are shown in Figure 8-9, and the results are summarised in Table 8-8 below.

Figure 8-10: Additional Noise Monitoring Locations

Table 8-8: Summary results for Additional monitoring locations

Monitoring Locations PR 2460936	Range (dB) $L_{Aeq,T}$	Range (dB) $L_{AF90,T}$	Monitoring Locations PR 2460936	Range (dB) $L_{Aeq,T}$	Range (dB) $L_{AF90,T}$
NM1 Daytime	53-55	34-38	A1 (Daytime)	44	26
NM1 Evening	50	37	A1 (Night-time)	45 - 49	29 - 34
NM1 Night-time	35-37	31-35	A2 (Daytime)	44	30
NM2 Daytime	35-56	33-45	A2 (Night-time)	45 - 54	34 - 36
NM2 Evening	48-52	47-51	A3 (Daytime)	43	32
NM2 Night-time	46-52	44-50	A3 (Night-time)	37 - 40	33 - 33
NM3 Daytime	53-54	29	L1 Continuous (Daytime)	35 - 46	29 - 40
NM3 Evening	47	36	L1 Continuous (Night-time)	35 - 42	30 - 34
NM3 Night-time	41-49	32-35			

To characterise the ambient, locations NM1 and NM3 from planning ref:2460936, and A2 from planning ref:2460936, were utilised. Table 8-9 details the ambient noise characteristics that can be assigned to the identified NSRs based on the similarities between the ambient noise monitoring locations and the NSR locations, including proximity to industrial, agricultural and road infrastructure sources of noise.

Table 8-9: NSR Ambient Noise Characteristics

Monitoring ID	NSR ID	Period	Range $L_{Aeq,T}$ (dB)	Range $L_{A90,T}$ (dB)
NM1 PR 2460936 (Refer to Table 8-8)	NSR01 NSR02	Day	53-55	34-38
		Evening	50	37
		Night	35-37	31-35
NM1 (Refer to Table 8-7)	NSR03 NSR06	Day	50	49
		Evening	50	49
		Night	43	42
A2 PR 2460936 (Refer to Table 8-8)	NSR04	Day	46	39
		Evening	No data	No data
		Night	41-49	35-35
NM3 PR 2460936 (Refer to Table 8-8)	NSR05	Day	53-54	29
		Evening	47	36
		Night	41-49	32-35
The lowest value of each range was used as a worst-case scenario.				

8.4 Noise Impact Assessment

An assessment of the likely effects arising from the Proposed Development on the receiving environment has been conducted. This chapter specifically assesses the Construction and Operational Phase effects, based on the notable acoustic differences of the two Phases and the duration of effects arising from both Phases.

8.4.1 Noise Emission Sources

The sources of noise were selected based either upon standardised equipment, such as that which is likely to be used during construction, or from the selection of plant currently available on the open market for the Operational Phase of works. However, in both cases, the effect associated with this assessment was deemed conservative, i.e., the actual plant will be either quieter or will not be run for as long as assessed in this chapter.

8.4.1.1 Construction Phase

The Construction Phase consist of the construction of the Proposed Development and the connection to the 110kV Substation. The 110kV grid connection route will consist entirely of underground cables ('UGC'), which will be installed in the public road network and private lands

The different phases for the Construction Phase and the likely noise emission sources are presented in Table 8-10 below.

Table 8-10: Sources of Construction Noise

Phase	Likely Noise Sources
UGC (Preliminary)	It would be proposed to carry out Preliminary site investigations along the ducting route prior to construction to confirm design assumptions.
Ducting installation methodology	Digging and covering of trenches for cables.
Site Construction	

The movement of workers to and from the Site was not assessed within this report. All worker movements will likely peak during the 60 to 90 minutes prior to and following the construction day, with associated vehicle movement on the public road network. This temporary additional construction traffic in respect of the overall annual average daily traffic volumes was predicted to be negligible in relation to existing traffic on the surrounding road network and to coincide with general commuter traffic in terms of its acoustic profile.

The order of the Construction Phases and the precise work schedule within each phase will be determined by the successful contractor at the tendering stage. This noise assessment was based on the notable noise emission sources anticipated during the construction works and a typical duration and schedule of works, which are outlined in Table 8-11.

Table 8-11: Predicted Noise Emissions – Construction Phase

Phase	Plant	BS5228 – 1 Ref.	Sound Pressure at 10m $L_{Aeq,T}$, dB	Combined Sound Pressure, at 10m, $L_{Aeq,T}$ dB
UGC (Preliminary)	4X4 vehicle Concrete vibrator Wheeled dumper Soil compactor 360 tracked excavator (only rubber tracked machines will be allowed on public roads)	C.2.34 C.5.20 C.4.3 C.2.42 C.2.29	80 75 76 78 79	85
Ducting installation methodology	Tracked excavator Dumper or tractor and trailer	C.2.29 C.4.3	76 79	81
Site construction	Excavator operator 360 Tracked exactor (13 ton normally, 22 ton for rock breaker) Tracked dumper or tractor and trailer	C.2.29 C.4.3 C.2.14 C.2.29 C.4.3	79 76 79 79 76	85

The construction plant and machinery will change as the project develops, with plant and equipment only operating within any section of the Site for a relatively short period of time. The above construction programme includes the Site structures development and associated cabling, transformers and inverters across the Site.

This Noise Impact Assessment has utilised generic sound pressure values from BS5228-1 as specific plant equipment is currently unknown. This is deemed a worst-case scenario.

8.4.1.2 Operational Phase

The noise sources related to the Operational Phase are related to the transformers for the 110kV substation.

The noise values were taken from the MOR Environmental Library. As no octave band data was provided, a flat spectrum was considered within the noise model. The sound emission used for this assessment should be considered as a tender criterion for suppliers. The Proposed Development noise source for the Operational Phase is shown in Table 8-12 below.

Table 8-12: Noise Emissions – Operational Phase

Plant/Equipment Type use for acoustic assessment	Sound Power dBA at Source	Sound Pressure (dBA) at 10m[3]
Transformer Substation (110kV)	89	61

A Principal MOR Environmental acoustician reviewed the key potential noise sources associated with the Proposed Development to assess likely sources of noise emissions during operation. Based on the use of each of the above components and the type of equipment to be utilised, no additional noise sources were identified.

The assessment process identified no likely significant noise emissions, such as fans, temperature control systems, or internal high-noise plant, within the other buildings and structures proposed for the development.

8.4.2 Construction Phase Noise

Construction activities during the preliminary works will be conducted along the Grid Connection Route. The Construction Phase noise was assessed using the distances presented in Figure 8-4 to the main Site Boundary, and the peak noise used was from Site Construction with a combined sound pressure of 85dB at 10m.

The following standard noise equation, to assess the distance r_2 from a known sound pressure (L_{p2}) and with a known sound pressure limit (L_{p1}) at distance r_1 was used to predict the minimum distance to achieve the construction noise limit (L_{p2}).

$$Lp2 = Lp1 - 20\log 10\,(\frac{r2}{r1})$$

Based on the 'ABC' method outlined in Table 8-1 above, the construction noise limits are derived and shown in Table 8-13 below. An assessment of construction noise based on the ABC method is shown Table 8-14 below.

In the event that specific out-of-hours works are required, lower limits are presented in 8.2.2, and specific works will be assessed and agreement sought from the Competent Authority prior to such specific works. However, no evening or night-time works are anticipated; therefore, only daytime values are relevant for this assessment.

Table 8-13: Determination of NSRs Construction Limit Values

NSR ID	NML ID (proxy)	Average Ambient Baseline $L_{Aeq,T}$	Rounded value (closest 5dB)	ABC Limit
NSR01	NM1 PR 2460936	53	55	65
NSR02	NM1 PR 2460936	53	55	65
NSR03	NM1	50	50	75[Note 1]
NSR04	A2 PR 2460936	46	45	65
NSR05	NM3 PR 2460936	53	55	65
NSR06	NM1	50	50	75[Note 1]
Note 1: Commercial buildings and therefore, higher limit of 75dBA is applied.				

[3] Calculated using standard hemispherical expansion of the sound wave.

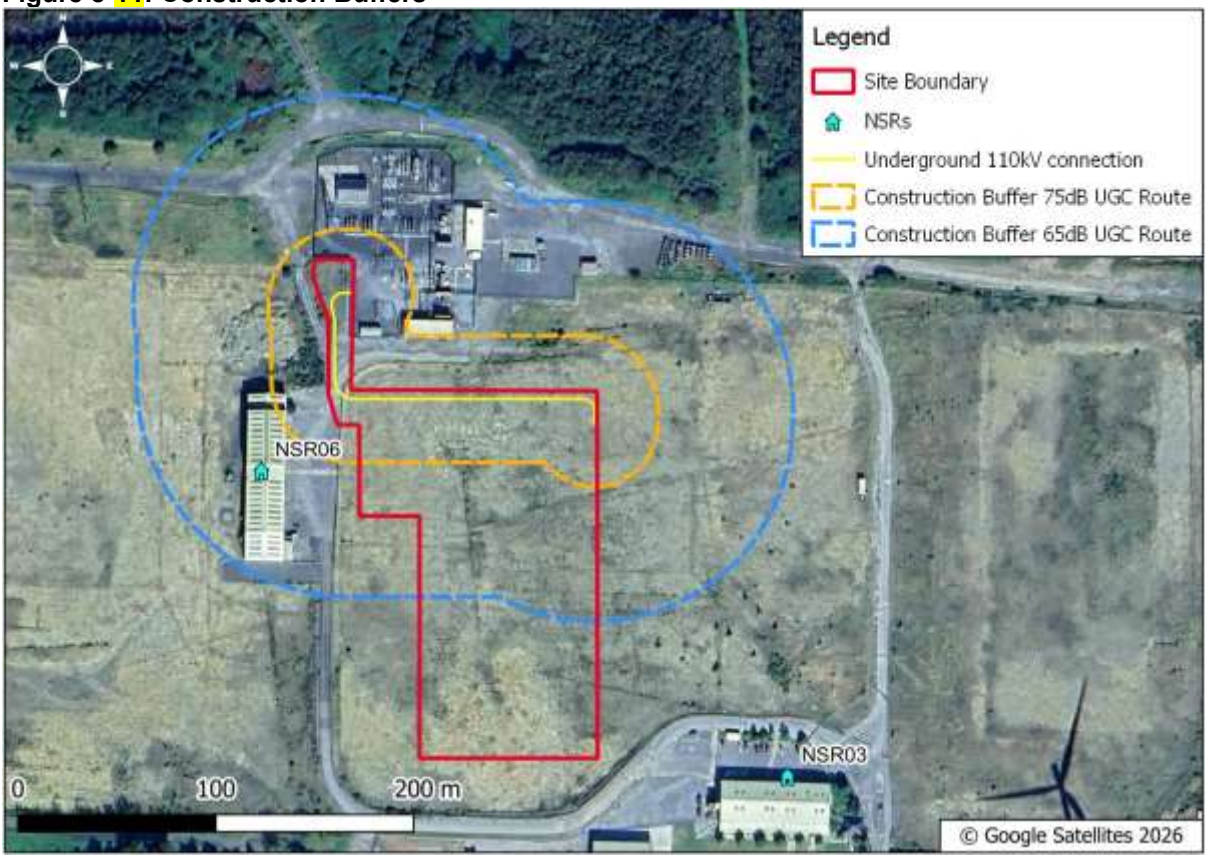
Table 8-14: Construction Phase Noise Impact Assessment

NSR ID	Distance to Site Boundary (m)	Predicted Site Specific Sound Pressure Level at NSR Façade $L_{Aeq,T}$ dB	Measured Ambient Sound $L_{Aeq,T}$ dB	Combined Noise Level (Predicted + Measured $L_{Aeq,T}$)	'ABC' Threshold Compliant
NSR01	ca.725m	48	53	54	Yes
NSR02	ca.440m	52	53	56	Yes
NSR01	ca.95m	65	50	66	Yes
NSR02	ca.560m	50	46	51	Yes
NSR05	ca.1555m	41	53	53	Yes
NSR06	ca.45m	72	50	72	Yes

Utilising the ABC method, all NSRs were predicted to comply with construction noise thresholds as provided in Table 8-14 above, from plant and machinery operating in the main development area as presented in Table 8-12 above.

UGC will have preliminary works as stated in Table 8-11 above. The outer extents of the 65dBA and 75dBA Construction Phase contours from the UGC preliminary works are presented in Figure 8-11 below.

Figure 8-11: Construction Buffers



One receptor, NSR06, with a 75dBA construction limit, was predicted to experience a higher construction noise level due to the distances from the works, prior to mitigation. This assessment assumed that all onsite plant will be operating at the closest point of the connection route to this NSR, NSR06, for a constant duration 1 hour. This was deemed to be a worst-case scenario.

Works, if required due to safety or other concerns, necessitating construction activities outside the 'normal' construction hours, as stated in Section 8.2.2, will be managed to comply with the lower limits, either through working distance to NSRs or undertaking quieter tasks at those hours.

8.4.3 Operational Phase Noise

Noise Modelling utilising sound levels in Table 8-13 above was performed to assess the $L_{Aeq,T}$ operational noise levels at NSRs. The Operational Phase noise was assessed from the fixed plant within the Site; the results are shown in Table 8-15 below. The predicted specific noise levels at each NSR represent a predicted 'worst case scenario' for day and night-time where all site-specific operational noise emissions onsite would be operating at full duty capacity.

Specific noise calculations were completed for the NSRs at either 1.5m (A) or 4m (B) height. The maximum was selected to represent the worst-case scenario and presented in Table 8-15 below.

Table 8-15: Day & Night-time Operational Noise Assessment for the Proposed Development

NSR ID	Predicted Site-Specific Sound Pressure Level $L_{Aeq,T}$ dB	
	Daytime	Night-time
NSR01	18	18
NSR02	21	21
NSR03	17	17
NSR04	30	30
NSR05	10	10
NSR06	35	35

Table 8-15 above shows the highest value at the closest NSR at a $L_{Aeq,T}$ 35dB. Figure 8-12 shows the predicted operational stage noise levels for the Proposed Development for daytime (L_{day}).

Figure 8-12: Predicted Daytime Operational Phase Noise at 4m

Utilising the predicted operational noise levels associated with the Proposed Development (refer to Table 8-15 above), an assessment was undertaken to determine the likely effects of the noise on nearby NSRs, if any. A cumulative assessment of the predicted Site-specific, as shown in Table 8-15 above, and added to the measured ambient background, as $L_{A90,T}$, was completed, based on the IOA & IEMA guidance. This assessment did not utilise the $L_{Aeq,T}$ values, which are typically higher than L_{A90} background due to short-term noise events such as passing traffic and animal calls. The predicted change identified during operational noise would be the worst-case. The results are shown in Tables 8-16 and 8-17, respectively, for daytime and night-time periods.

Table 8-16: Predicted Daytime Operational Noise and Calculated Cumulative

NSR	Ambient Background* $L_{A90,T}$ dB	Predicted Site Specific $L_{Aeq,T}$ dB	Calculated Cumulative $L_{Aeq,T}$ dB	Predicted Change on Ambient background dB
NSR01	34	18	34	0
NSR02	34	21	34	0
NSR03	49	17	49	0
NSR04	39	30	39	0
NSR05	29	10	29	0
NSR06	49	35	49	0

**lowest value selected.*

Table 8-16 above presents the daytime assessment of the noise levels at all NSRs. All NSRs will remain considerably below the typical noise limits for daytime ($L_{Aeq,T}$ 55dB), with a peak site-specific contribution of 31dB at NSR06.

All the receptors were predicted not to experience a change from the ambient background. Therefore, as per IOA / IEMA guidelines (refer to Figure 8-1 above), it was predicted that the cumulative effect was deemed to be negligible, resulting in a not significant effect at all NSRs.

Predicted night-time effect due to ambient change is presented in Table 8-17 below.

Table 8-17: Predicted Night-time Operational Noise and Calculated Cumulative

NSR	Ambient Background* $L_{A90,T}$ dB	Predicted Site Specific $L_{Aeq,T}$ dB	Calculated Cumulative $L_{Aeq,T}$ dB	Predicted Change on Ambient background dB
NSR01	31	18	31	0
NSR02	31	21	31	0
NSR03	42	17	42	0
NSR04	34	30	35	+1
NSR05	32	10	32	0
NSR06	42	35	43	+1

**lowest value selected.*

Table 8-17 above presents the night-time assessment of the noise levels at all NSRs. All NSRs will remain considerably below the typical noise limits for night-time ($L_{Aeq,T}$ 45dB), with a peak site-specific contribution of 31dB at NSR06.

Only two receptors, NSR03 and NSR06, were predicted to experience a change from the ambient background of ca. 1dB. As presented in Section 8.2.4 above, a change below 3dB is not perceptible by the human ear.

The WHO NNG recommends that the population should not be exposed to night noise levels greater than 40dB of $L_{night,outside}$ during the part of the night when most people are in bed. The highest cumulative (predicted plus ambient background) noise level predicted at NSRs was

$L_{Aeq,T}$ 35dB at NSR04, remaining below the WHO NNG of 40dB (outside). NSR03 and NSR06 are commercial receptors, and therefore, they are not considered within the WHO NNG.

Therefore, as per IOA/IEMA guidelines (refer to Figure 8-1 above), it was predicted that the cumulative effect was deemed to be negligible, resulting in a not significant effect at all NSRs.

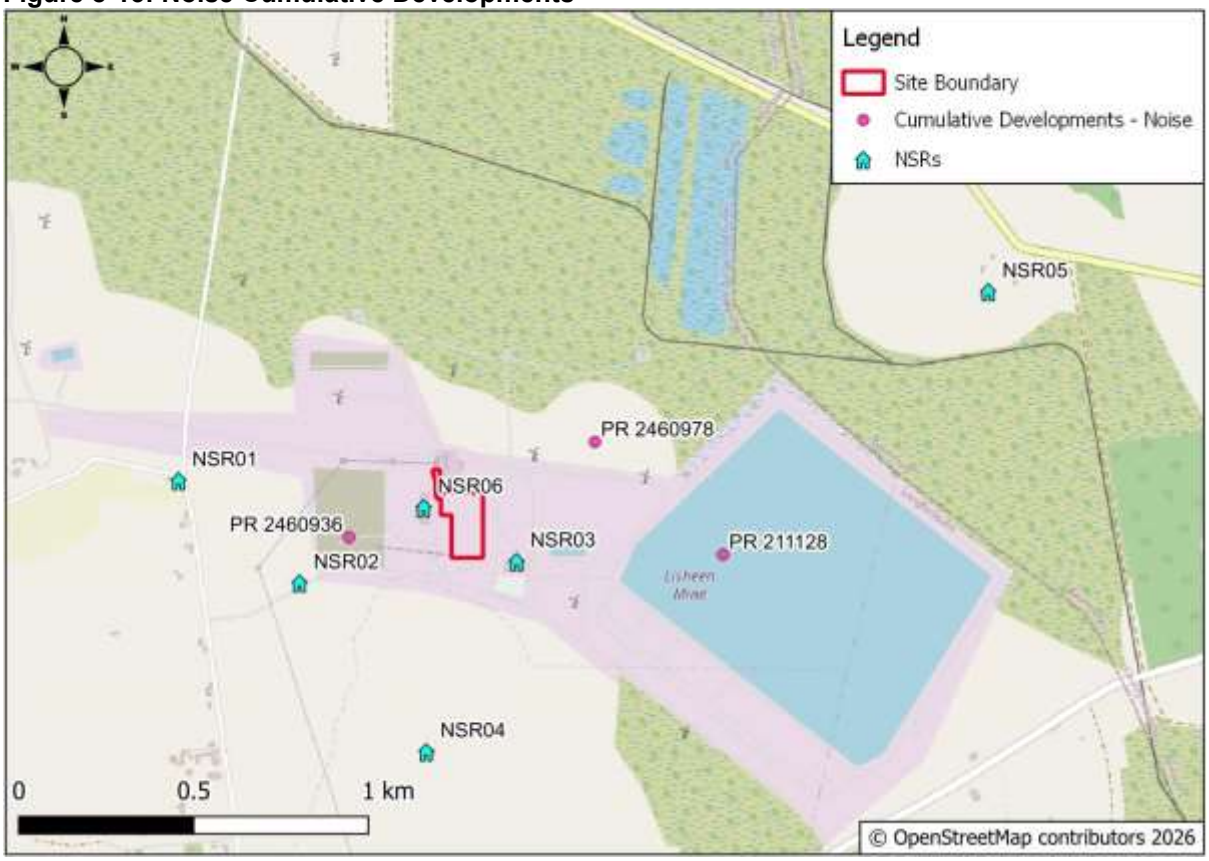
8.5 Cumulative and In-combination Effects

The Proposed Development construction will occur in tandem with the Permitted Solar farm (planning ref: 211128).

Additionally, as a worst-case scenario, the Granted Developments (planning ref: 2460978 and planning ref: 2460936) were considered. Both planning applications were reviewed, and the Construction and Operational Phases assessment in cumulative is presented in the sections below.

NSRs from each Development were reviewed and matched to the NSRs listed in Section 8.3.2 above. Proxy locations were used where the NSRs did not match any of the NSRs used.

Figure 8-13: Noise Cumulative Developments



8.5.1 Construction Phase

Construction Phase was assessed cumulatively with the three Granted Developments as a worst-case scenario. The construction cumulative assessment is presented in Table 8-18 below.

Table 8-18: Construction Cumulative Assessment

NSR	Measured Ambient Sound Pressure Level $L_{Aeq,T}$	Predicted Site Specific Sound Pressure Level at NSR Facade $L_{Aeq,T}$ dB	Construction Predicted Site Specific Sound Pressure Level $L_{Aeq,T}$ dB			Combined Noise Level (Predicted + Measured Ambient $L_{Aeq,T}$)	ABC' Threshold Compliant
			211128	2460978	2460936		
NSR01	53	48	39	65	51	66	No
NSR02	53	52	42	65	53	66	No
NSR03	50	65	45	65	62	69	Yes
NSR04	46	50	45	65	53	65	Yes
NSR05	53	41	45	65	52	66	No
NSR06	50	72	45	65	62	73	Yes

Three NSRs, NSR01, NSR02 and NSR05, were predicted to exceed the construction noise limit of 65dB $L_{Aeq,1hr}$ by 1dB. Although this will be for a short duration, construction noise is unavoidable but temporary; the predicted noise levels will reduce with distance and are generally less severe during the later stages of construction.

It was considered unlikely that the construction noise level peaks will occur simultaneously for the four different developments, and therefore it was considered that all NSRs will be compliant with the construction noise limits.

8.5.2 Operational Phase

The cumulative acoustic assessment during the Operational Phase is detailed in 8-19 and 8-20 below for daytime and night-time, respectively.

Table 8-19: Cumulative In-Combination Noise in dB for Daytime

NSR ID	Measured Background Sound Pressure Level $L_{A90,T}$ dB	Predicted Site Specific Sound Pressure Level Proposed Development $L_{Aeq,T}$ dB	Predicted Site-specific Permitted Developments (dBA)			Combined Noise Level (Predicted + Measured Background $L_{A90,T}$)	Predicted Change on Background +/-
			211128	2460978	2460936		
NSR01	34	18	28	30	28	37	+3
NSR02	34	21	32	30	29	37	+3
NSR03	49	17	32	30	35	49	0
NSR04	39	30	35	20	26	41	+2
NSR05	29	10	33	29	24	36	+7
NSR06	49	35	32	30	35	49	0

For the daytime cumulative assessment, the predicted change in the ambient background noise levels was 7dB at NSR05. This change was associated with the already Granted Developments, as the predicted Site-specific noise level from the Proposed Development was 10dB. The overall cumulative of 36dB $L_{Aeq,T}$ was predicted to be considerably below the typical noise nuisance limit of 55dB $L_{Aeq,T}$.

The remaining NSRs were predicted to have a change in the background of ca. 2-3dB. Therefore, as per IOA / IEMA guidelines (refer to Figure 8-1 above), the predicted cumulative effects were predicted to be negligible, resulting in a not significant effect at all NSRs.

Table 8-20: Cumulative In-Combination Noise in dB for Night-time

NSR ID	Measured Background Sound Pressure Level $L_{A90,T}$ dB	Predicted Site Specific Sound Pressure Level Proposed Development $L_{Aeq,T}$ dB	Predicted Site-specific Permitted Developments (dBA)			Combined Noise Level (Predicted + Measured Background $L_{A90,T}$)	Predicted Change on Background +/-
			211128	2460978	2460936		
NSR01	31	18	28	30	28	36	+5
NSR02	31	21	32	30	29	36	+5
NSR03	42	17	32	30	35	43	+1
NSR04	34	30	35	20	26	38	+4
NSR05	32	10	33	29	24	36	+4
NSR06	42	35	32	30	35	43	+1

For night-time period, all NSRs will remain below the typical noise limits for night-time ($L_{Aeq,T}$ 45dB), with a peak cumulative effect of 43dB $L_{Aeq,T}$ at NSR03 and NSR06. Four receptors, NSR01, NR02, NSR04 and NSR05 were predicted to experience a change in background of ca. 4-5dB; this could be potentially audible; however, the predicted change in the background was due to the already Granted Developments.

As presented in Section 8.4.3, the WHO NNG recommends that the population should not be exposed to night noise levels greater than 40dB of $L_{night,outside}$ during the part of the night when most people are in bed. The highest cumulative (predicted Site-specific plus ambient background and Granted Developments) noise level predicted at NSRs was $L_{Aeq,T}$ 38dB at NSR04, remaining below the WHO NNG of 40dB (outside).

Therefore, as per IOA / IEMA guidelines (refer to Figure 8-1 above), the predicted cumulative effect was predicted to be locally slight and non-intrusive.

8.6 Proposed Mitigation Measures

8.6.1 Construction Phase

The Applicant is committed to implementing standard noise mitigation measures throughout the Construction Phase of the Proposed Development. This will include the development of a Construction Environmental Management Plan ('CEMP'), where noise mitigation measures, complaints procedures and monitoring programmes will be clearly defined.

Such measures will include:

- Activities and deliveries to the Site to occur only during permitted hours;
- All plant where possible shall be low noise rated;
- Where necessary the use of enclosures and noise screens will be used to control noise from plant;
- Onsite policy for all plant and equipment, including Site delivery vehicles, to power off rather than to be left with idling engines;
- All plant and vehicles on the Site will be in a fit condition for use, to prevent the addition of noise from maintenance issues;
- Working Method Statements will be developed for the Site Construction Personnel to ensure optimal working procedures are employed, thereby minimising time spent in proximity to NSRs; and,

- A Site Representative will be appointed to receive and respond to noise complaints and enquiries during construction by local residents, the Local Authority and any other regulatory body. Relevant details will be provided to the Local Authority prior to construction, and will be made available to third parties, including local residences.

Utilising the above measures, along with the implementation of a dedicated contractor-designed CEMP, will ensure construction works noise will be maintained below a best practice noise nuisance value of $L_{Aeq,1hr}$ of 65dB at local receptors, and therefore no impacts will occur.

8.6.2 Operational Phase

Based on the proposed equipment specification and the layout of the Proposed Development, it has been assessed that no noise nuisance impacts will occur at surrounding NSRs and therefore no specific noise mitigation measures will be required.

8.7 Assessment Conclusions

A comprehensive noise impact assessment was undertaken by a MOR Environmental acoustician, who is a full member of the Institute of Acoustics ('MIOA').

The assessment included baseline noise monitoring at one location, which characterised the existing noise environment as ranging from 43dB to 50dB, $L_{Aeq,T}$ and background levels of 42dB to 49dB $L_{A90,T}$. Additional baseline noise information was used from public data available.

During the Construction Phase of the substation, as per any construction project, the potential exists for temporary noise nuisance during specific construction works. Due to the distance of proposed construction works from the NSRs identified and the general methods that will be involved in constructing the solar farm and ancillary infrastructure, standard noise construction noise will not breach noise limits at NSRs. During the grid route connection, there will be a potential for short-term exceedances of typical construction noise limits, prior to mitigation.

Noise mitigation measures will be implemented during the Construction Phase, which will be in accordance with recognised best practice guidelines for construction sites. These have been outlined in Section 8.6. Therefore, it can be concluded that noise nuisance will not likely occur during the Construction Phase of the Proposed Development.

Regarding the Operational Phase of the Proposed Development, based on the design stage acoustics input, the submitted layout and plant selection, there will be no likely noise nuisance during the daytime and night-time operation of the Proposed Development and, as such, specific mitigation measures were not deemed to be warranted.

9 LANDSCAPE AND VISUAL

This LVIA describes the landscape context of the Proposed Development and assesses the likely landscape and visual impacts of the Proposed Development on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

Landscape Impact Assessment ('LIA') relates to assessing the 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 the 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).

9.1 Statement of Authority

This LVIA was prepared by Macro Works Ltd of Cherrywood Business Park, Loughlinstown, Dublin 18; a consultancy firm specialising in Landscape and Visual Assessment and associated maps and graphics.

Macro Works' relevant experience includes a broad range of infrastructural, renewable energy, industrial and commercial projects since 1999, including numerous urban, residential, and mixed-use development projects.

9.2 Assessment Methodology

This LVIA utilised the following best practice and professional guidance documents:

- Landscape Institute and the Institute of Environmental Management and Assessment ('IEMA') publication entitled Guidelines for Landscape and Visual Impact Assessment, 2013 ('GLVIA3') [122];
- Environmental Protection Agency ('EPA') publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2022) [15]; and,
- Photography and Photomontage in Landscape and Visual Impact Assessment, Landscape Institute Technical Guidance Note 06/2019 [123] .

9.2.1 Scope of the Assessment

This document uses methodology as prescribed in the previously mentioned GLVIA3, which follows the European Landscape Convention ('ELC') definition of landscape:

> *"Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (Council of Europe, 2000). Thus, GLVIA-2013 covers all landscapes from "high mountains and wild countryside to urban and fringe farmland (rural landscapes), marine and coastal landscapes (seascapes) and the landscapes of villages towns and cities (townscapes)" - whether protected or degraded."*

GLVIA3 establishes guidelines and not a specific methodology. The preface recognises that:

> *"This edition concentrates on principles and processes. It does not provide a detailed or formulaic 'recipe' that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand."*

The methodology for this assessment has therefore been developed specifically for this assessment to ensure that it is appropriate and fit for purpose. The methodology can be summarised as undertaking the following key tasks:

- Desk study and site visits in November 2025;
- Defining the Baseline Landscape setting and conditions;
- Identification and Evaluation of key components of the Proposed Development;
- Consideration of Mitigation Measures;
- Assessment of Landscape Effects;
- Assessment of Visual Effects; and,
- Summary Statement of Significance.

9.2.2 Landscape Impact Assessment Criteria

This part of the LVIA provides an assessment of how the introduction of the Proposed Development will affect the physical features and fabric of the landscape, and then how the proposals influence landscape character with reference to published descriptions of character and an understanding of the contemporary character of the landscape as informed through desktop and Site studies.

When assessing the potential landscape effects of the Proposed Development, the value and sensitivity of the landscape receptor is weighed against the magnitude of impact to determine the significance of the landscape effect. The criteria outlined below are used to guide these judgements.

9.2.2.1 Landscape Sensitivity

The sensitivity of the landscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. In accordance with GLVIA3, the sensitivity of a landscape receptor (Landscape Character Area or feature) is derived from combining judgements in relation to its susceptibility to change and its value. The judgement reflects such factors as its quality, value, contribution to landscape character and the degree to which the particular element or characteristic can be replaced or substituted. Landscape Sensitivity is classified using the following criteria set out in Table 9-1.

Table 9-1: Landscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair, and restoration.

Sensitivity	Description
Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

9.2.2.2 Magnitude or Change – Landscape

The magnitude of change is a product of the scale, extent or degree of change that is likely to be experienced as a result of the Proposed Development and to a lesser extent the duration and reversibility of that effect. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the immediate setting that may have an effect on the landscape character. Table 9-2 outlines the criteria used to inform this judgement.

Table 9-2: Magnitude of Landscape Impacts

Magnitude of Impact	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an extensive change of the landscape in terms of character, value, and quality.
High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to a considerable change of the landscape in terms of character, value, and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to noticeable changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements that would lead to discernible changes in landscape character, and quality.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable leading to no material change to landscape character, and quality.

9.2.3 Visual Impact Assessment Criteria

This part of the LVIA provides an assessment of how the introduction of the Proposed Development will affect views within the landscape. It therefore needs to consider:

- Direct impacts of the Proposed Development upon views through intrusion or obstruction;
- The reaction of viewers who may be affected, e.g. residents, walkers, road users; and,
- The overall impact on visual amenity.

It has been deemed appropriate to structure the assessment around a series of representative viewpoint locations. All viewpoints are located within the public domain and are representative of views available from main thoroughfares and pedestrian areas within the vicinity of the Proposed Development. The selected viewpoints are considered to be comprehensive in communicating the variable nature of the visual effects.

When assessing the potential visual effects of the Proposed Development, the sensitivity of the visual receptor is weighed against the magnitude of the visual impact to determine the significance of the visual effect. The criteria outlined below are used to guide these judgements.

9.2.4 Sensitivity of Visual Receptors

As with landscape sensitivity, the sensitivity of a visual receptor is categorised as 'Very High', 'High', 'Medium', 'Low', or 'Negligible'. Unlike landscape sensitivity, however, the sensitivity of visual receptors has an anthropocentric (human) basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity the viewer is engaged in and whether this heightens their awareness of the surrounding environment.

A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below to establish visual receptor sensitivity at each viewpoint location.

9.2.5 Susceptibility of Visual Receptors to Change

In accordance with GLVIA3, visual receptors most susceptible to changes in views and visual amenity are:

- *"Residents at home;*
- *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;*
- *Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;*
- *Communities where views contribute to the landscape setting enjoyed by residents in the area; and,*
- *Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened."*
- *Visual receptors that are less susceptible to changes in views and visual amenity include:*
- *People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape; and,*
- *People at their place of work whose attention may be focused on their work or activity, not their surroundings and where the setting is not important to the quality of working life."*

9.2.6 Value Attached to Views

The value attached to a view is determined by considering the following:

- Recognised scenic value of the view (County Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Development Plans, for example, a public consultation process is required;
- Views from within highly sensitive landscape areas. These are likely to be in the form of Architectural Conservation Areas, which are incorporated within the Development Plan and therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;

- Primary views from residential receptors. Even within a dynamic city context, views from residential properties are an important consideration in respect of residential amenity;
- Intensity of use, popularity. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at a national or regional scale;
- Provision of vast, elevated panoramic views. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;
- Sense of remoteness and/or tranquillity. Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;
- Degree of perceived naturalness. Where a view is valued for the sense of naturalness of the surrounding landscape, it is likely to be highly sensitive to visual intrusion by distinctly manmade features;
- Presence of striking or noteworthy features. A view might be strongly valued because it contains a distinctive and memorable landscape / townscape feature such as a cathedral or castle;
- Historical, cultural and / or spiritual significance. Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
- Rarity or uniqueness of the view. This might include the noteworthy representativeness of a certain landscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;
- Integrity of the landscape character. This looks at the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;
- Sense of place. This considers whether there is a special sense of wholeness and harmony at the viewing location; and,
- Sense of awe. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity, and no relative importance is inferred by the order of listing.

It is recognised that a viewer's interpretation and experience of the landscape can have preferential and subjective components. Where relevant, judgements are made on those elements of the landscape that are considered to contribute more prominently and positively to the visual landscape resource as well as those elements that contribute negatively. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

9.2.7 Magnitude of Change – Visual

The magnitude of change is again a product of the scale, extent, or degree of change that is likely to be experienced as a result of the Proposed Development. This is directly influenced by its 'visual presence / prominence', as experienced by visual receptors in the landscape. These terms are somewhat quantitative in nature and essentially relate to how noticeable or 'dominant' the proposal is within a particular view. Aside from the obvious influence of scale and distance, a development's visual presence is influenced by the extent and complexity of the view, contextual movement in the landscape, the nature of its backdrop, and its relationship with other focal points or prominent features within the view. It is often, though not always, expressed using one of the following terms: 'Minimal', 'Sub-dominant', 'Co-dominant',

'Dominant' or 'Highly dominant'. The criteria used to inform judgments are provided in Table 9-3 below.

Table 9-3: Magnitude of Change - Visual

Criteria	Description
Very High	Complete or very substantial change in view, dominant, involving complete or very substantial obstruction of existing view or complete change in character and composition of baseline, e.g., through removal of key elements.
High	A major change in the view that is highly prominent and has a strong influence on the overall view. This may involve the substantial obstruction of existing views or a complete change in character and composition of baseline, e.g. through removal of key elements or the introduction of new features that would heavily influence key elements.
Medium	Moderate change in view: which may involve partial obstruction of existing view or partial change in character and composition of baseline, i.e., pre-development view through the introduction of new elements or removal of existing elements. Change may be prominent but would not substantially alter scale and character of the surroundings and the wider setting. View character may be partially changed through the introduction of features which, though uncharacteristic, may not necessarily be visually discordant.
Low	Minor change in baseline, i.e. pre-development view - change would be distinguishable from the surroundings whilst composition and character would be similar to the pre change circumstances.
Negligible	Very slight change in baseline, i.e. pre-development view - change would be barely discernible. Composition and character of view substantially unaltered.

9.2.8 Significance of Effect

The significance of a landscape or visual effect is based on a balance between the sensitivity of the receptor and the magnitude of change, and is categorised as 'Profound', 'Substantial', 'Moderate', 'Slight', or 'Imperceptible'. Intermediate judgements are also provided to enable an effect to be more accurately described where relevant. 'No Effect' may also be recorded as appropriate where the effect is so negligible that it is not noteworthy.

The significance category judgement is arrived at using the Significance Matrix in Table 9-4 as a guide. This applies the principle of significance being a function of magnitude weighed against sensitivity, but employs slightly different terminology that avoids the potentially confusing use of the term 'significant' (as recommended by GLVIA3 Statement of Clarification 1/13 [122]).

Indicative criteria descriptions used in relation to the significance of effect category are presented in Table 9-4.

Table 9-4: Impact Significance Matrix

Scale/Magnitude	**Sensitivity of Receptor**				
	Very High	*High*	*Medium*	*Low*	*Negligible*
Very High	Profound	Profound-substantial	Substantial	Moderate	Minor
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Note: The significance matrix provides an indicative framework from which the significance of impact is derived. The significance judgement is ultimately determined by the assessor using professional judgement. Due to nuances within the constituent sensitivity and magnitude judgements, this may be up to one category higher or lower than indicated by the matrix. Judgements indicated in orange are considered to be 'significant impacts' in EIA terms.

Table 9-5: Indicative Significance of Effect Criteria descriptions

Significance of Effect Criteria	Landscape	Visual
Profound	There are notable changes in landscape characteristics over an extensive area or a very intensive change over a more limited area.	The view is entirely altered, obscured or affected.
Substantial	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the landscape. There are notable changes in landscape characteristics over a substantial area or an intensive change over a more limited area.	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment. The proposal affects a large proportion of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. There are minor changes over some of the area or moderate changes in a localised area.	An effect that alters the character of the visual environment in a manner that is consistent with existing and emerging trends. The proposal affects an appreciable segment of the overall visual composition, or there is an intrusion in the foreground of a view.
Slight	An effect which causes noticeable changes in the character of the landscape without affecting its sensitivities. There are minor changes over a small proportion of the area or moderate changes in a localised area or changes that are reparable over time.	An effect which causes noticeable changes in the character of the visual environment without affecting its sensitivities. The affected view forms only a small element in the overall visual composition or changes the view in a marginal manner.
Imperceptible	An effect capable of measurement but without noticeable consequences. There are no noticeable changes to landscape context, character or features.	An effect capable of measurement but without noticeable consequences. Although the development may be visible, it would be difficult to discern resulting in minimal change to views.

It is important that the likely effects of the Proposed Development are transparently assessed and understood, so that the determining authority can bring a balanced, well-informed judgement to bear when making a planning decision.

As such, whilst the significance matrix and criteria provide a useful guide, the significance of an effect is ultimately determined by the landscape specialist using professional judgement, and also in the context of occasionally using hybrid judgements to account for nuance.

Effects assessed as 'Substantial' or greater (shaded cells) are considered to be the most notable in landscape and visual terms, and may be regarded as 'Significant', albeit it is important to note that this is not a reflection on their acceptability in planning terms.

9.2.9 Quality and Duration of Effects

In addition to assessing the significance of landscape and visual effects, the quality of the effects was also determined. Within this LVIA, effects are described as negative / adverse, neutral, or positive / beneficial, and the following criteria have been used to guide these judgements.

- Positive / beneficial - A change which improves the quality of the environment, enhancing the existing view / landscape;
- Neutral - No effects or effects that are imperceptible, within normal bounds of variation e.g. will neither detract from nor enhance the existing view/landscape; and,
- Negative / adverse - A change which reduces the quality of the environment, detracting from the existing view / landscape.

In the case of new energy / infrastructure developments within rural and semi-rural settings, the landscape and visual change brought about by an increased scale and intensity of built form is seldom considered to be positive / beneficial. Effects in these contexts are generally considered to be adverse in nature, or neutral, where the effect has little influence on the landscape/views.

9.2.9.1 Extent of Study Area

From similar studies, it was predicted that the Proposed Development will likely be difficult to discern beyond ca. 5km and will not likely to give rise to significant landscape or visual impacts beyond ca. 2km. In the interests of a comprehensive appraisal, a 5km radius study area was used in this instance. However, there will be a particular focus on receptors contained within 2km, except where iconic or designated scenic viewpoints exist at greater distances out to 5km (Refer to Figure 9-1).

Figure 9-1: Study Area

9.3 Landscape and Visual Policy Context and Designation

9.3.1 Tipperary County Development Plan 2022-2028

A Landscape Character Assessment was carried out for Tipperary and has been incorporated into the current County Development Plan. The Landscape Character Assessment divides the county into four generic landscape archetypes: 'A - The Plains'-The Lakelands's-The Foothills', and D-The Uplands'. These Landscape Archetypes are illustrated in Figure 3.2 in the

Landscape Character Assessment (Refer to Figure 9-2). The Proposed Development occurs within 'A- The Plains'. This archetype is described as:

> *"..working landscape containing most settlements and services as well as large continuous areas used for pasture, tillage and peat harvesting."*

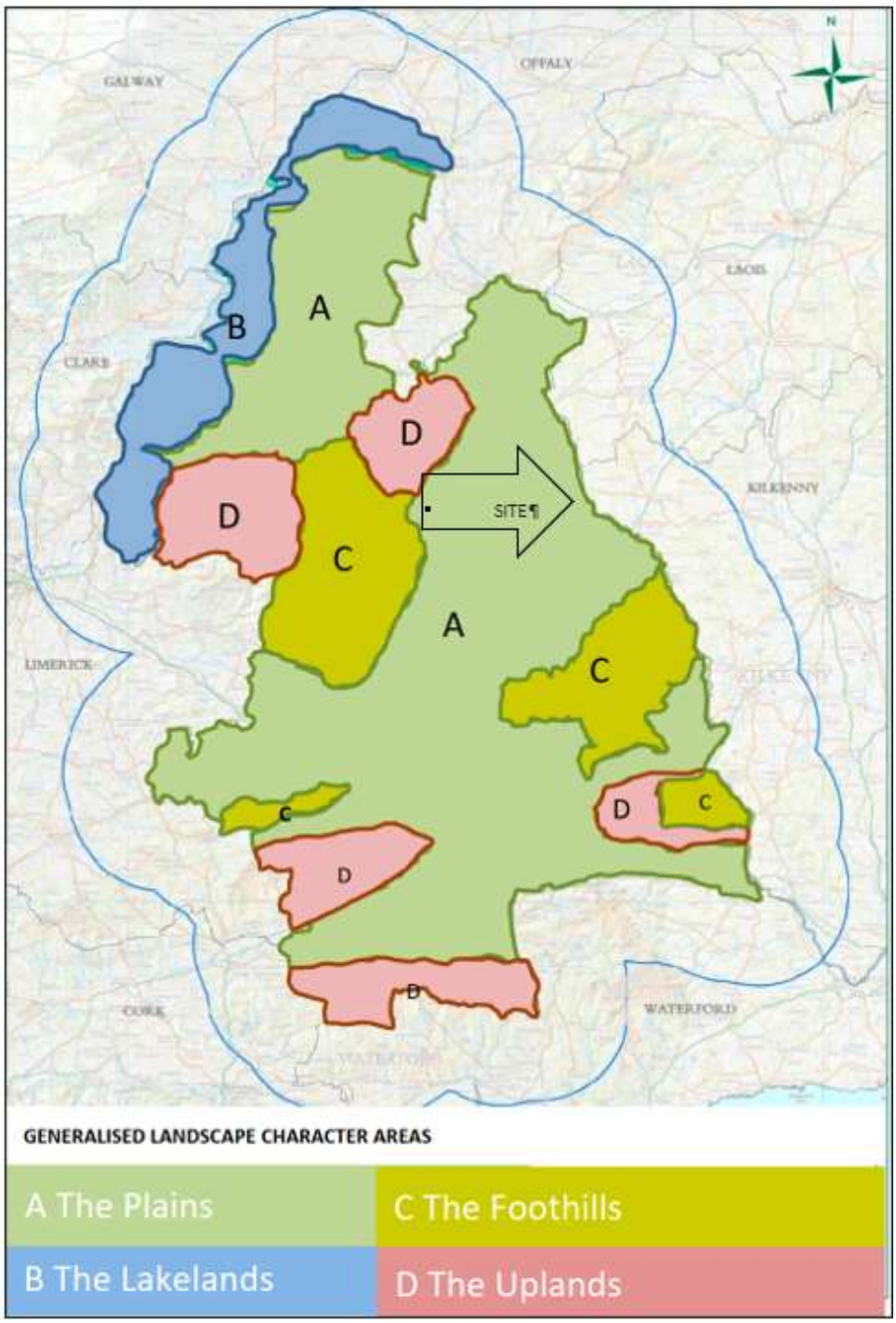
The four landscape archetypes have been divided into seven Landscape Character Types ('LCT'), which are then further subdivided into 23 geographically distinct Landscape Character Areas ('LCA'). While there is no map illustrating the exact boundaries of the LCTs, the LCAs within Tipperary are illustrated in Figure 3.8 of the Tipperary Landscape Character Assessment, which forms part of the current CDP. With regards to this assessment and study area, the proposed development occurs within 'LCA 5 - Templemore Plains' as indicated on Figure 3.8 of the Landscape Character Assessment (Refer to Figure 9-2). The extent of this LCA is across the entirety of the study area that occurs within County Tipperary. Furthermore, with reference to Table 3.2 in the Tipperary Landscape Character Assessment, LCA 5 occurs with LCT A1 - Lowland Pasture & Arable'. LCT A1 is described as:

> "…*the most common type of landscape in Tipperary. It consists mainly of grasslands and tillage enclosed by hedges. These areas also contain areas of woodlands, rivers and settlements- as well as a dense network of roads, utility lines and farm buildings."*

In Table 5.2 of the Landscape Character Assessment, each LCA has been assigned a 'Sensitivity', 'Capacity' and 'Objective'. "Sensitivity refers to visual absorption capacity; in other words, the capacity to absorb new development without exhibiting a significant loss of character or change of appearance. Capacity is understood to refer to capacity for change, and "Objective" refers to the areas' aims, guidelines, and policies. The Sensitivity Rating for LCA 5 as 'Normal', also referred to as 'Class 1- Low Sensitivity to Change', with a 'Reduced' capacity to accommodate change. Class 1 landscapes are described as *"Working landscapes with no sensitivities and established patterns of use and settlement"*. Table 5.1 of the Landscape Character Assessment provides several objectives and guidelines for each sensitivity class. For landscapes in 'Class 1', the objective is to 'Continue', with the associated guidelines being to *"Facilitate development that continues established patterns of use and settlement".*

It should also be noted that Table 2.1 of the Landscape Character Assessment identifies the drivers of change in County Tipperary and their likely landscape effects. None of the identified 'likely drivers of change' are considered relevant to the nature of this development.

Figure 9-2: Excerpt from Tipperary County Landscape Character Assessment showing approximate location of Proposed Development in relation to principal landscape character areas.



9.3.2 Kilkenny County Development Plan 2022-2028

Whilst the Proposed Development is entirely contained within County Tipperary, the eastern extent of the wider study area is located within County Kilkenny, and thus, it is important to include landscape and visual related designations, policies and objectives within the current Kilkenny CDP.

The current Kilkenny Landscape Character Assessment divides the county into four generic LCT: Upland Areas, Lowland Areas, River Valleys and Transitional Areas. These LCTs are further subdivided into 14 geographically specific LCAs. The Site is closest to a *'Transition Area'* LCT and specifically with LCA *'A1 - Slieveardagh Western Transition Zone'*. The key

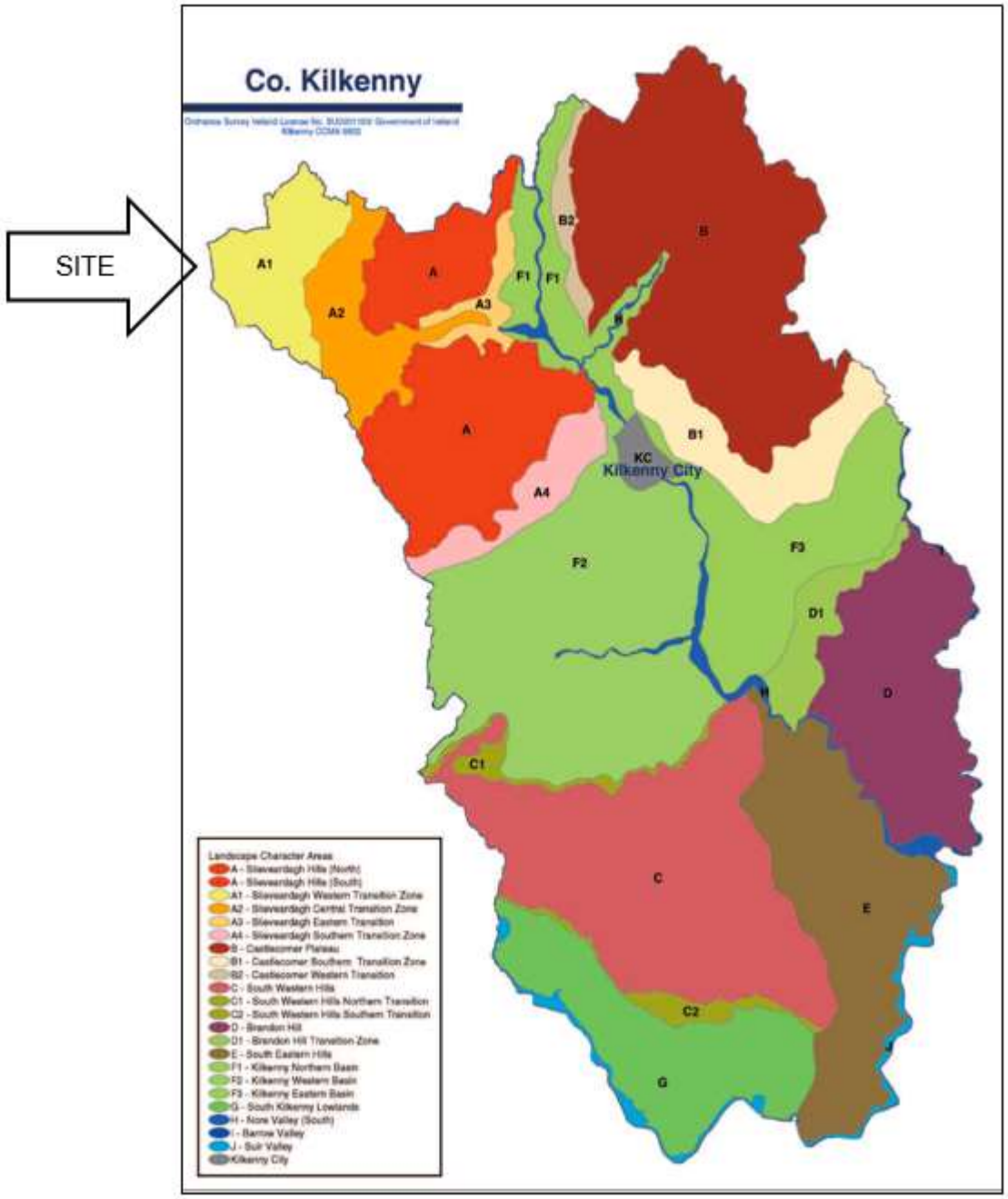
maps are included within Chapter 9 of the County Development Plan and include Figure 9.2 Landscape Character Assessment and Figure 9.3 Landscape Sensitivities.

The Kilkenny Landscape Character Assessment also includes consideration of relative landscape sensitivity. These are areas that;

> *"are highly sensitive to development and have low capacity for change. These areas are identified in Figure 8.3. These areas take account of areas of higher altitude in the country and of land cover in general areas of elevated topography, with low growing or sparse vegetation and little existing development are landscapes of high sensitivity and have a low potential to absorb new development".*

The nearest landscape sensitivity area relates to the *'peat bog'* sensitivity factor, which in this case relates the cutaway peat bogs around the Lisheen Mine facility and which host a concentration of wind energy developments. The Site is not close to any designated scenic views (Figure 8.1 of the CDP, refer to Figure 9-3 below).

Figure 9-3: Excerpt from Kilkenny County Development Plan showing the Landscape



9.3.3 Views of Recognised Scenic Value - Tipperary & Kilkenny County Development Plans 2022-2028

Views of recognised scenic value are primarily indicated within the current development plans in the context of scenic routes/view designations, but they might also be indicated on touring maps, guidebooks, roadside rest stops or on post cards that represent the area.

There are no scenic designations within the study area. The nearest is to the south of the site with *'Views from M8 near Longford's Pass'* within Co. Tipperary. This view is outside the study area by 800m and there are no other views considered relevant.

9.4 Existing Environment

9.4.1 Landscape Baseline

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the Proposed Development will be assessed. A description of the landscape context of the Site and wider study area is provided below under the headings of landform and drainage, vegetation and land use, centres of population and houses, transport routes and public amenities and facilities. Although this description forms part of the landscape baseline, many of the landscape elements identified also relate to visual receptors i.e. places and transport routes from which viewers will potentially be able to see the Proposed Development. The visual resource will be described in greater detail in section 9.4.3 below.

9.4.2 Landscape Context

Landform and Drainage

The Site is located in an area comprised predominantly of flat lands ca.130m AOD. The landscape is defined by the expansive areas of peatland located to the north of the Site. To the south of the Site the landscape transitions into agricultural farmland bordered by dense hedgerow vegetation interspersed with residential housing. The most notable watercourse in the area would be the Cooleeny Stream which runs ca. 40m to the south of the Site at its nearest point. Several streams originating from the River Drish traverse the study area at different points to the north and south of the Site.

Vegetation and Land Use

The principal land use within the study area is agricultural farmland which cover the majority of the land to the west. The east is mainly dominated by peatland interspersed with agricultural land. Around the fringes of the peatland areas is generally a transitional zone of regenerating scrub and woodland interspersed with blocks of commercial conifer forest. This soon gives way to good quality farmland and a higher intensity of rural settlement. The Site and its immediate surroundings are dominated by the Lisheen windfarm and the substantial Lisheen Mines facility, which is now redundant. The Site is immediately south of an existing 110kV substation and ca. 300m west of the Lisheen TMF, which was a long-term waste storage site for the Lisheen Mine. The peatland on which the windfarm is located allows for broad views of the surrounding landscape with low-lying intervening vegetation. The land to the south of the site is dominated by agricultural farmland bordered by dense hedgerow vegetation. The peatland stretches across the eastern half of the land, then transitions into agricultural farmland to the north, west and south.

Centres of Population and Housing

The largest centre of population in the study area is Moyne, located ca.2.6km to the southwest. There are no other large centres of population, however, there are several clusters of housing scattered throughout the study area and align with the road patterns, typical of a rural landscape in Ireland. The population density is particularly sparse in the immediate surroundings of the Site due to the proximity to the Lisheen windfarm and peatland on which it is located. The nearest residential dwellings to the Site are located some 380m to the west.

Transport Routes

Due to the rural context of the Site, there are no major motorway corridors within the study area, although the M8 motorway is located just outside the study area to the southeast. The principal transport route is the R502 regional road passing ca. 1.3km to the north. The majority of the study area is connected through a network of local roads, the closest of which runs ca. 700m to the west at its nearest point to the Site.

Tourism, Heritage and Public Amenities

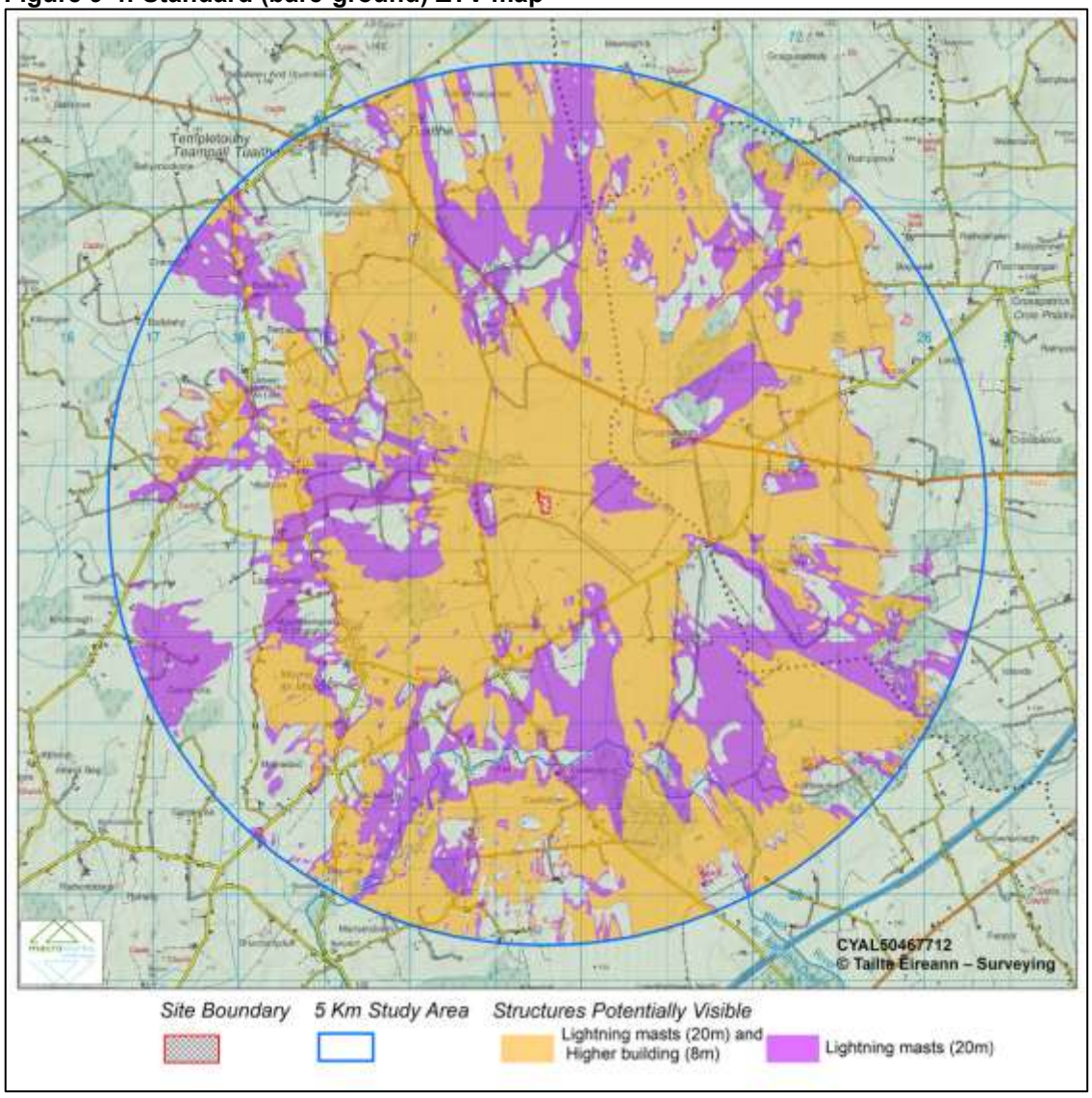
There does not appear to be any particular tourism, amenity or heritage features contained within the central study area that might draw regular visitors. There is a small community feature in the St. Mary's Church in Moyne located ca.2.7km southwest of the Site. In the periphery of the study area is Lisheen Castle, which is currently being used as a self-catering accommodation. That is not to say that there are no heritage features of importance to the archaeological record.

9.4.3 Visual Baseline

Analysis of Zone of Theoretic Visibility Mapping

Only those parts of the receiving environment that potentially will afford views of the Proposed Development are of concern to this section of the assessment. A computer-generated Zone of Theoretical Visibility ('ZTV') map has been prepared to illustrate where the Proposed Development will potentially be visible from. The ZTV map was based solely on terrain data (bare ground visibility), and ignores features such as trees, hedges or buildings, which may screen views. Given the complex vegetation patterns within this landscape, the main value of this form of ZTV mapping was to determine those parts of the landscape from which the Proposed Development will definitely not be visible, due to terrain screening within the 5km study area.

Figure 9-4: Standard (bare-ground) ZTV map



The following key points are illustrated by the 'bare-ground' ZTV map (see Figure 9-4 above):

- Due to the flat low-lying terrain of the study area there is comprehensive visibility throughout large parts of the 5km extent. The central areas have notable areas of ZTV pattern with it only becoming more sporadic at the periphery of the 5km boundary; and,
- The ZTV pattern indicates that, whilst theoretical visibility of both the proposed buildings and lightning masts will be afforded up to 5km from the Site, the visibility pattern for the lightning masts alone will be more prominent across the wider surroundings of the study area, where low undulations in the terrain have greater potential to screen lower built features such as the proposed buildings.

The most important point to make in respect of this 'bare-ground' ZTV map is that it is theoretical. Some of the lower built features within the site will be considerably screened by surrounding and intervening hedgerow vegetation, trees and numerous buildings, walls and embankments scattered throughout the study area, resulting in a much lesser degree of actual visibility.

9.4.4 Identification of Viewshed Reference Points as a Basis for Assessment

Viewshed Reference Points ('VRP's') are the locations used to study the visual impacts of a proposed development in detail. It is not warranted to include each and every location that provides a view of a development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the Proposed Development. Instead, the selected viewpoints are intended to reflect a range of different receptor types, distances and angles. The visual impact of a Proposed Development is assessed by Macro Works using up to six categories of receptor type as listed below:

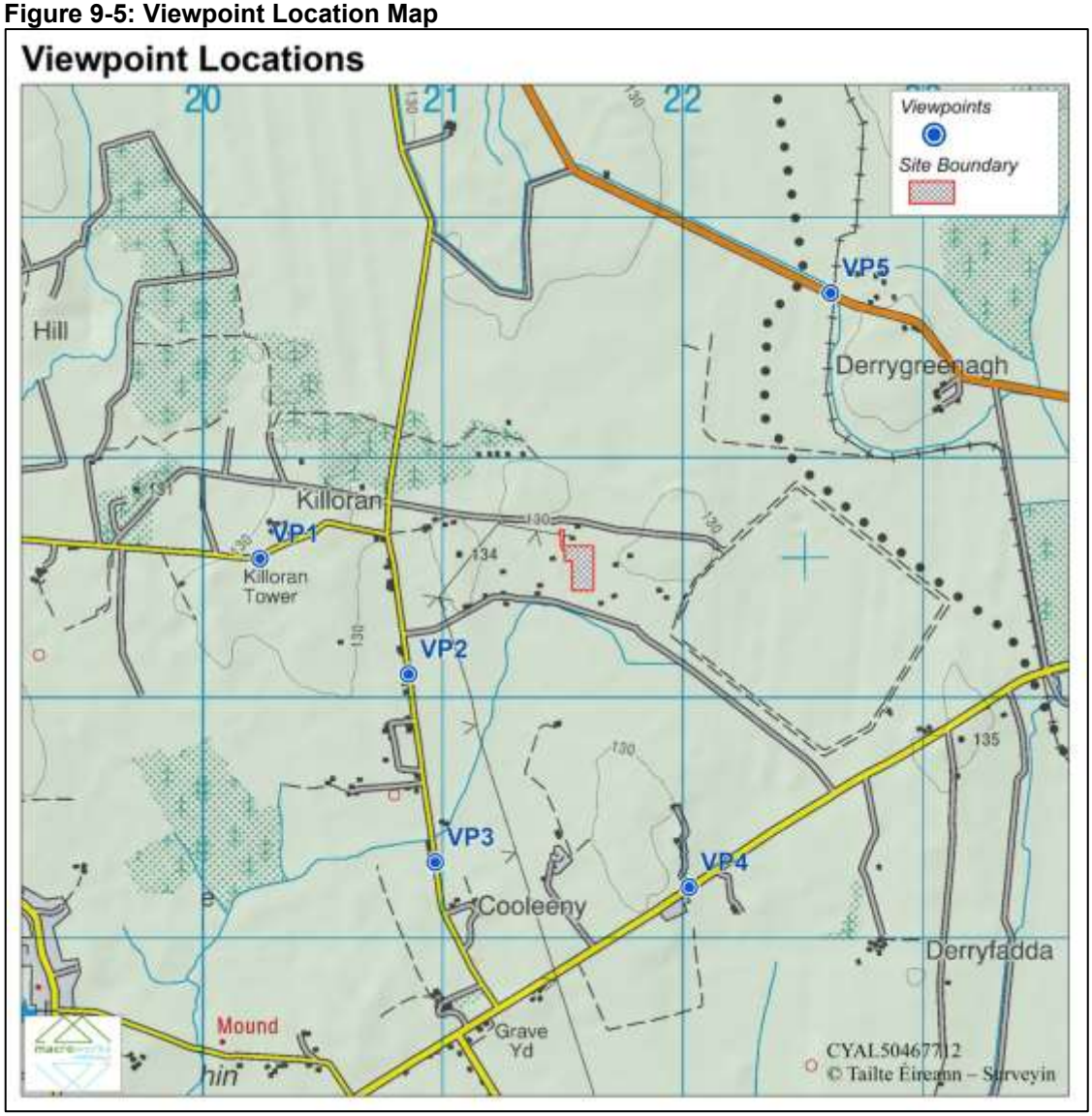
- Key Views (from features of national or international importance) ('KV');
- Designated Scenic Routes and Views ('SR/SV');
- Local Community views ('LCV');
- Centres of Population ('CP');
- Major Routes ('MR'); and,
- Amenity and heritage features ('AH').

VRP's might be relevant to more than one category and this makes them even more valid for inclusion in the assessment. The receptors that are intended to be represented by a particular VRP are listed at the beginning of each viewpoint appraisal. The VRPs selected in this instance are set out in Table 9-6 and Figure 9-5 below.

Table 9-6: Outline Description of Selected Viewshed Reference Points

VP	Location	Representative of	Direction of view
VP1	L7004 at Killoran	LCV	SE
VP2	L3202 at Killoran	LCV	NE
VP3	L3202 at Cooleeny	LCV	NE
VP4	L3201 at Cooleeny	LCV	NW
VP5	R502 at Baunmore	MR, LCV	SW

Figure 9-5: Viewpoint Location Map



9.4.5 Mitigation Measures

The principal mitigation-by-avoidance measure embedded within the Site is its strategic siting within a modified landscape characterised by established large-scale land use and a relatively low population density. The Proposed Develoment forms part of the wider Lisheen Mine and Lisheen Bog complex, an area with a long-standing association with industrial-scale activity and infrastructural development.

This landscape context has already undergone substantial alteration in terms of landform, land cover, and visual character. As such, the receiving environment possesses an inherent capacity to accommodate development of a similar scale and typology without giving rise to incongruous landscape effects.

The Lisheen lands are specifically recognised and zoned within the Tipperary County Development Plan as suitable for the National Bioeconomy Campus, reflecting a strategic policy objective to facilitate the transition from historic extractive industry to sustainable and renewable energy-led enterprise. The Proposed Development aligns with this established planning framework and builds upon the existing industrial character of the area.

In landscape terms, this represents mitigation through appropriate site selection, ensuring that the development is located within a landscape of compatible scale, grain, and function, thereby avoiding more sensitive rural or scenic landscapes where potential adverse effects would be significantly greater.

In addition, the Proposed Development has been carefully sited within an agricultural greenfield parcel that does not contain notable vegetation, mature tree groups, or distinctive landscape features. The layout has been designed to avoid the removal of established hedgerows or landscape structure where possible, thereby retaining the prevailing field pattern and vegetative framework. As a result, the Proposed Development will not disrupt the existing landscape pattern or introduce discordant elements into an otherwise intact rural fabric.

This considered approach to siting and land-take further reduces the potential for adverse landscape effects and reinforces the overall mitigation strategy embedded within the design of the scheme.

9.5 Impact Assessment

9.5.1 Do nothing Scenario

The 'do-nothing' impact refers to the non-implementation of the Proposed Development. The primary effect of this would be that the impacts and effects identified would not directly occur. In this regard, the following issues are relevant. The Site, which is currently located at the interface of several other anthropogenic land uses such as existing industrial units and the existing 110kV Lisheen Substation, is currently contained in scrubby grassland. It is likely to be managed as a grassed area with potential for applications for other anthropogenic developments due to its location within the existing Lisheen Mine complex.

9.5.2 Assessment of Receptor Sensitivity – Landscape

Landscape value and sensitivity are considered in relation to a number of factors highlighted in the Guidelines for Landscape and Visual Impact Assessment 2013, which are set out below and discussed relative to the Proposed Development and the wider study area.

This is an industrial / post-industrial landscape consisting of historic, decommissioned mine facility surrounded by cutaway peatland that has transition to a wind energy development. Notwithstanding the large-scale utilitarian nature of these forms of development, they are all extensive rural-based land uses in a generally sparsely populated area. Beyond the scrubby and forested borders of the peatland and Lisheen Mine TMF landform, there is a relatively rapid transition into good-quality pastoral farmland with a higher-density rural population. These peatland / farmland areas intertwine in a manner that is familiar throughout the midlands of Ireland and do not undermine the overall integrity of the landscape but rather transition with increasing distance from the Site to higher rural amenity character in a west and southwest direction. The eastern study area and the border between Co. Tipperary and Co. Kilkenny is dominated by cut bog and wind farms, in particular to the north. On the far side of this band of bog is an area of medium to large fields and more industrial agriculture.

In terms of landscape and scenic designations within the relevant county development plans, there are no particularly sensitive landscapes that would preclude the Proposed Development, even if the Site and its surrounds were consistent with the underlying generalised 'LCA 5 - Templemore Plains' characterisation. The reality is that this Site and its immediate surroundings have its own inherent character and a considerable degree of robustness for large-scale utility development, which is not comparable to the wider rural landscape of the study area.

Landscape Sensitivity Summary

Therefore, on balance of these factors and in accordance with the criteria outlined in Table 9-1 above, the landscape sensitivity is deemed to be Low at the site scale, with the more cohesive rural pastoral areas to the southwest deemed Medium-low sensitivity.

9.5.3 Assessment of Receptor Sensitivity – Visual

The study area generally presents as a rural landscape. There are no scenic designations within the area, and in general, there are no areas that are particularly sensitive in terms of visual amenity.

Views of the working agricultural landscape are generally pleasant in terms of its rolling pastoral aesthetic and '*green*', settled working character. The network of hedgerows and vegetation throughout it contributes to some sense of naturalness and combined with its undulating topography, generates a sense of containment in many locations. However, whilst a pleasant pastoral aesthetic is noted throughout some parts of the study area, as noted above, the surrounding local and wider landscape is also influenced by an array of anthropogenic features such as the existing wind farm development, major transport routes, urban settlements and industrial development. Overall, the sensitivity of visual receptors within the more typical working landscape context tends to range between Medium and Medium-low, with those of a Medium sensitivity representing more open expansive views across the wider landscape.

Key differentials in terms of visual receptor sensitivity relate to the occupation of the visual receptor and whether views of the surrounding landscape are an inherent part of the experience. Static residential receptors are considered generally more susceptible to changes in views over those where views are experienced transiently by those travelling through the landscape, particularly on major transport routes where road infrastructure and traffic volume draw from visual amenity. Likewise, receptors located in closer proximity to the Site are considered more susceptible to changes in views over those where views are experienced at a distance.

On the basis of the site-specific factors outlined above and in accordance with the general visual receptor sensitivity considerations contained in the methodology Section 9.2, visual receptor sensitivity judgements are provided for each representative viewpoint in the table in Section 9.5.7 below.

9.5.4 Magnitude of Landscape Effects – Construction Phase

During the Construction Phase, there will be a far higher intensity of activity at the Site than during the Operational Phase. This will consist of heavy vehicle movement to and from the Site as well as construction machinery within the Site, delivery and storage of materials and the staged elevation of the buildings. However, the Site is located adjacent to an existing substation which is not serviced by a public road, rather the historic Lisheen Mine access road contained within the Lisheen Mine Complex. As such, the increase in activity and the presence of industrial development will be consistent with existing and historic landscapes, well separated from lower-intensity rural and residential land uses.

The Site access will not require notable vegetation removal, while only minor clearance will be required within the footprint of the Proposed Development. It should also be noted that the full footprint of the Proposed Development will be contained within the highly modified context of the historic Lisheen Mine Complex. Whilst there will be some physical landscape impacts on the Site, these will be relatively minor and relate to soil stripping for the incoming compound and some localised excavations to accommodate the proposed control buildings. It should also be noted that the Construction Phase of the Proposed Development will last for less than 12 months, and thus, Construction Phase landscape effects were classified as Temporary in nature.

On the basis of the factors discussed above, it is considered that the magnitude of the Construction Phase landscape impact is Medium within the immediate vicinity, being those lands contained within ca. 200-500m of the Proposed Development. Thereafter, the magnitude of landscape impact was deemed to reduce to Low and Negligible, as the Proposed Development becomes a progressively smaller component of the overall landscape fabric, clearly separated from the wider rural settled context.

Coupled with the Medium-Low and Low landscape receptor sensitivities in the near surrounds of the Site, the Construction Phase landscape impacts in the immediate vicinity of the Site will be no greater than Slight and will reduce considerably beyond 500m-1000m from the Site, where the Proposed Development will be heavily screened. As a result, Construction Phase landscape impacts were assessed as Not Significant.

9.5.5 Magnitude of Visual Effects – Construction Phase

During construction, the main visual impacts will arise from frequent heavy vehicle movements and worker vehicles travelling to and from the Site and utilising the Site entrance. In addition, there will be on-site construction machinery, which may rise above intervening vegetation and buildings. There will also be stockpiles of stripped topsoil and construction materials awaiting use. However, aside from the Site's immediate vicinity, a large part of this temporary activity within the Site will remain screened and partially screened from view the surrounding mature layers of intervening vegetation. Furthermore, construction-related activity is temporary in nature and will cease once the Proposed Development becomes fully operational. Thus, Construction Phase visual effects will likely result in a visual effect no greater than Medium-low in the immediate surroundings of the Site.

Coupled with the Medium-low visual receptor sensitivities in the near surrounds of the Site, the Construction Phase visual impacts in the immediate vicinity of the Site will be no greater than Moderate-slight and Slight, and will reduce considerably beyond 500m-1000m from the Site, where the Proposed Development will be heavily screened. As a result, Construction Phase visual impacts are assessed as Not Significant.

9.5.6 Magnitude of Landscape Effects – Operational Phase

With regard to the landscape character of the Site, the Proposed Development will see the introduction of an additional built form and hard surface within a setting typified by large-scale, open landcover and forms. The exception to this is to the north of the Site, where electrical infrastructure and a number of retained buildings from the Lisheen Mine are set within the cleared context of the historic mine complex. Thus, the Proposed Development represents the extension of existing land use (specifically the form of large buildings within paved sites) instead of the introduction of a new and unfamiliar one. Once fully constructed, the Proposed Development will represent a slight increase in the intensity of electrical infrastructure within the immediate surroundings of the Site; however, within the wider context, it is clustered within an existing node of intensifying land uses and historic development. Overall, the Operational Phase landscape impacts were deemed Medium-low at the Site and in its immediate surrounds, quickly reducing to Low and Negligible beyond 500m from the Site.

With reference to the significance matrix (Table 9-4) above, the Medium-low landscape sensitivity judgement attributed to the study area, coupled with a Medium-low magnitude of landscape impact in the immediate vicinity (<500m) of the Proposed Development was considered to result in an overall significance of no greater than Slight, with the remainder of the 5km radius study area likely to experience Slight-imperceptible or Imperceptible landscape effects. As a result, Operational Phase landscape effects are assessed as Not Significant.

9.5.7 Magnitude of Visual Effects – Operational Phase

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the Proposed Development. Refer to Appendix 9-1.

Photomontages are a ‘photo-real’ depiction of the scheme within the view, utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced:

1. Existing view;
2. Outline view (yellow outline showing the extent of the proposed solar farm location, including all associated overground works overlaid on the photograph);
3. Montage view; and,
4. Montage view with mitigation established.

Table 9-7: Magnitude of Visual Effects

VP No.	Existing View	VP Sensitivity	Magnitude Of Visual Effect	Significance / Quality / Duration Of Effect
VP1	L7004 at Killoran This view is afforded from the verge of local road L7004 and is representative of surrounding local community receptors. This is a broad open view across agricultural land contained in the background by a mature tree line. Beyond the trees clear views of part of the turbine array within the Lisheen Mines Wind Farm are afforded.	Medium-low	No views, partial or otherwise, are afforded of the proposed development at this viewpoint location. Therefore, the magnitude of effect is deemed to be negligible by default.	**Imperceptible / Neutral / Permanent**
VP2	L3202 at Killoran: This view is afforded from local road L3202 to represent the local community views in the area. The low-lying hedgerows bordering the narrow local road afford open visibility across the foreground field before the view is contained by mature vegetation towards the background. The most distinctive landscape features are the wind turbines that can be clearly seen past the agricultural lands.	Medium-low	No views, partial or otherwise are afforded of the proposed development from this viewpoint location. Therefore, the magnitude of effect is deemed to be negligible by default.	**Imperceptible / Neutral / Permanent**
VP3	L3202 at Cooleeny: This view is afforded from the local road L3202 to represent the local community views in the immediate surrounds of the site. The narrow road corridor is bordered by dense hedgerow vegetation allowing for partial views of the land beyond the distant landscape it is contained by mature trees. The view is punctuated with electricity pylons along the road and around a dozen wind turbines are visible beyond and above the tree line.	Medium-low	No views, partial or otherwise, are afforded of the proposed development from this viewpoint location. Therefore, the magnitude of effect is deemed to be negligible by default.	**Imperceptible / Neutral / Permanent**
VP4	L3201 at Cooleeny: This is a view overlooking large agricultural fields to the north. This view represents the local community views in the vicinity. Partially open views of the landscape are afforded from the roadside; however, the intervening mature tree lines prevent broad views over the agricultural fields beyond.	Medium-low	No views, partial or otherwise, are afforded of the proposed development at this viewpoint location. Therefore, the magnitude of effect is deemed to be negligible by default.	**Imperceptible / Neutral / Permanent**
VP5	R502 at Baunmore: This view is afforded from the side of the regional road R502 to represent the local community and major route. This is a channeled view towards a narrow local road directly south of the Site. The road is heavily screened by dense hedgerows and interspersed with large mature trees. On either side of the road more open views are afforded across agricultural fields allowing for clear views of two wind turbines to the north.	Medium-low	No views partial or otherwise, are afforded of the proposed development at this viewpoint location. Therefore, the magnitude of effect is deemed to be negligible by default.	**Imperceptible / Neutral / Permanent**

9.6 Potential Cumulative and in-combination Impacts

In terms of cumulative landscape and visual effects, the principal development of relevance to the Proposed Development is the Permitted Solar Development (Planning Ref. 211128), located approximately 400 m to the east of the Site.

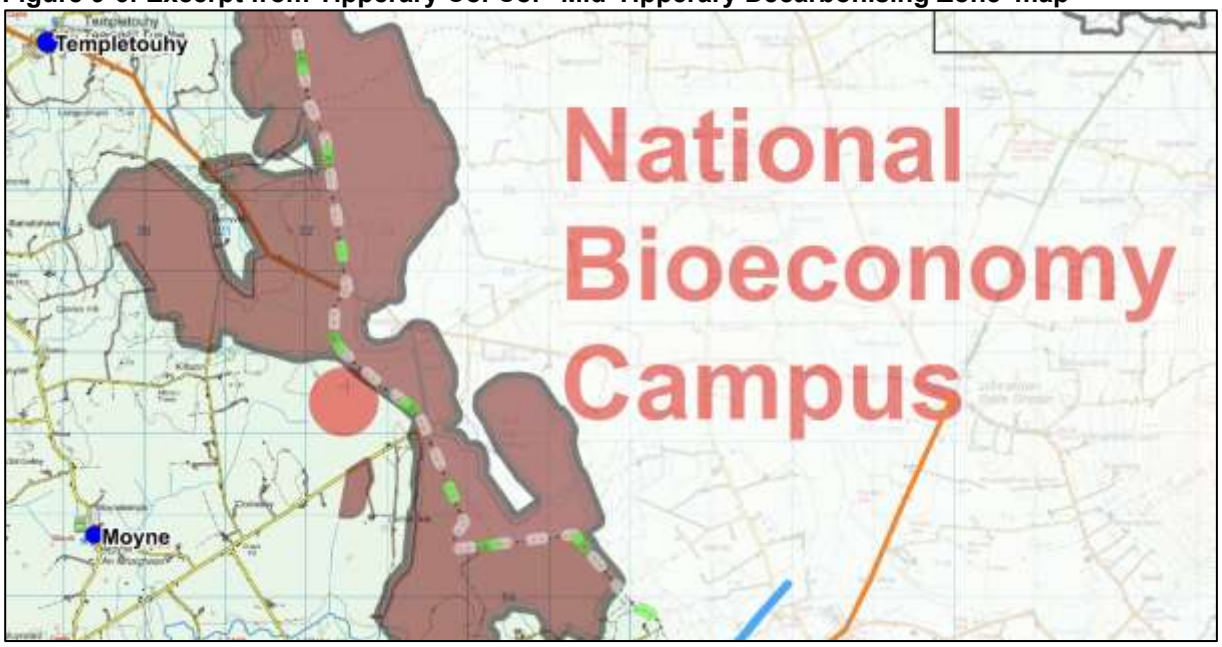
The Permitted Solar Development forms part of the evolving renewable energy and bioeconomy cluster within the wider Lisheen area and is functionally linked to the Proposed Development. The Proposed Development will transmit power from the Permitted Solar Development via the UGC, which will connect into the existing Lisheen 110kV ESB substation, and therefore operates as enabling infrastructure associated with this broader renewable energy framework. From a landscape perspective, the Permitted Solar Development already introduces a recognisable renewable energy land use into the receiving environment. When considered cumulatively, the addition of the Permitted Solar Development will incrementally increase the intensity and infrastructural character of development within the immediate local context. However, it is important to note that both developments are located within a landscape that has historically accommodated large-scale industrial activity associated with the former Lisheen Mine and associated infrastructure. The immediate surrounding landscape is also heavily influenced by infrastructure of a similar scale and character such as the existing Lisheen 110kV substation, and existing wind farm and other surrounding industrial buildings. Indeed, the baseline character is therefore one of modified, working landscape with an established capacity to absorb utilitarian and energy-related development.

In visual terms, cumulative effects are likely to be most perceptible from limited localised receptors where views extend toward both the Permitted Solar Development and the Proposed Development. However, given the relatively low-profile nature of solar arrays, the containment provided by existing field boundaries and vegetation, and the modest scale and functional form of the Proposed 110kV substation, the cumulative visual effect is not considered to result in a disproportionate or visually discordant expansion of built form. In fact, as highlighted in the visual impact appraisal above, the Proposed Development will be barely discernible within even the local surrounding landscape context, and therefore combined views of the Permitted Solar Development and the Proposed Development are highly unlikely. Even if briefly discerned from the surrounding local landscape, the developments will read as components of a coherent renewable energy cluster within a designated bioeconomy and energy transition landscape. While there will be a discernible increase in development intensity at a localised scale, the cumulative landscape and visual effects are considered to be consistent with the established and emerging character of the area and are not assessed as giving rise to significant adverse cumulative effects.

There are a number of granted (conditional) planning applications within the study area. The most significant relate to the National Bioeconomy Campus, included in Section 6 of the Tipperary County Council Local Authority Climate Action Plan, which sets out a a strategic vision for the Mid-Tipperary area as a hub for renewable energy generation, low-carbon enterprise, circular economy innovation, and sustainable industrial transition as set out below:

> *"It is proposed that this area will be a focus for opportunities presented by the National Bioeconomy Campus at Lisheen and the opportunities presented by investment in and stakeholder/community support for opportunity areas including; the bioeconomy, climate adaptation, biodiversity, forestry, peatland restoration, energy retrofitting, and sustainable energy communities etc and the many other co-benefits that may arise as a result of sustainable rural development."*

Figure 9-6: Excerpt from Tipperary Co. Co. ' Mid-Tipperary Decarbonising Zone' map



Summary of a selection of other surrounding permitted developments are included below:

Table 9-8: Cumulative Developments

Tipperary Planning Reference No.	Description	Location Relevant to the Site
211128	Permitted Solar PV Development	Adjacent to the east of the Site
2260395	Bioproducts Campus development [which] consists of an integrated Compost / Growing Media Facility and Anaerobic Digestion Facility as well as a Biorefinery	2km N of the Site
2361035	Sludge holding building of ca. 60m in length, 30m in width and 13.5m in height	1.2km N of the Site
18601296	Glanbia Ireland Biorefinery Facility (pictured below)	Adjacent to the south of the Site
21709	Revive Environmental "*Building (3657 sq. m) with a car park and access road, commercial yard area and access road, truck prep building (110 sq. m), 2 m high boundary architectural fence, signage, public lighting, solar panels to the building roof, an on-site waste water treatment system and associated polishing filter bed percolation area, rainwater harvesting tank, emergency storage tank, attenuation tank, bored well and all associated site works*"	600m south of the Site
2360281	Acorn Recycling "*Development consisting of Workshop Building (1242m2), Truck Washout Building (64m2), commercial yard area, new boundary fence and entrance gates, an on-site Wastewater Treatment System and associated polishing filter bed percolation area, attenuation tank, bored well & water storage tank, rainwater harvesting tank, emergency storage tank, solar panels to roof of existing building and all associated siteworks*"	300m south of the Site

Tipperary Planning Reference No.	Description	Location Relevant to the Site
2460978	Waste Treatment Facility Tatver Properties Ltd. " *A state-of-the-art healthcare waste treatment facility and recycling facility and a waste transfer station. The development will include the construction of 3 no. buildings; Building 1 (2,242m2) (9mtall), Building 2 (229m2) (6m tall) and Building 3 (68m2) (4m tall) with associated ancillary development including rooftop photovoltaic panels, 1no. battery energy storage system (34m2 x 2m tall) and inverter, onsite tank with bunding. The total development area will be ca. 3.75 hectares. The development will intake ca. 10,000 tonnes per annum of healthcare waste for treatment and recycling and an additional ca. 15,000 tonnes per annum of hazardous waste will be accepted, temporarily stored, handled and consolidated onsite for onward transfer."*	Adjacent to northeast of the Site

Should all developments progress to construction, there will be a proliferation of large-scale industrial sites and higher-intensity land uses across the wider context.

This would represent a continued transition from the site's historic extractive function toward a diversified, higher-intensity employment and renewable energy landscape. In cumulative terms, this evolution will reinforce the emerging character of the area as a strategically planned energy and bioeconomy cluster rather than a predominantly agricultural rural landscape.

However, when considered within this broader narrative of regeneration and policy-led transformation to the National Bioeconomy Campus, the Proposed Development represents a logical and proportionate component of the overall framework. It does not introduce a new or discordant land use typology but instead supports and complements the established trajectory of development. The scale, form, and functional characteristics of the proposal are consistent with the pattern of permitted developments and do not materially extend the geographical spread of development into previously unaffected or sensitive landscapes. Indeed, the Proposed Development represents one of more modest scale developments within its immediate context, and thus its potential to notably contribute to any adverse cumulative landscape and visual effects is limited.

Therefore, the additional cumulative landscape and visual change attributable specifically to the proposed development is considered to be of a lower order of magnitude and is assessed as Not Significant.

9.7 Assessment Conclusions

In terms of landscape impacts, the Proposed Development will be located within a highly modified context, with a high level of disturbance and a history of extractive industry. Recently, the introduction of wind farms, reduction of peat harvesting and decommissioning of the Lisheen Mine have changed the character of the immediate context to a lower-intensity but highly modified pattern of large-scale land uses.

The Proposed Development will be clustered at the centre of these land uses, set away from surrounding, higher-sensitivity landscapes. It will be located on the Site of the former Lisheen Mine, at the border of the surrounding Wind Farm and peat bog context. As such, the Low landscape sensitivity judgement attributed to the study area, coupled with a Medium-Low magnitude of landscape impact in the immediate vicinity of the Proposed Development was considered to result in an overall significance of no greater than Slight, with the remainder of the 5km radius study area likely to experience Slight or Imperceptible landscape effects.

Visual impacts were assessed at five viewpoint locations throughout the 5km study area, representing a range of viewing angles, distances, and contexts. The sensitivity of each of

these visual receptors within the study area was deemed to Medium-low which reflects the generally robust working nature of this working rural landscape context. In terms of visual impacts, as there was no visibility of the Proposed Development from any of the viewpoint locations, the significance of effects were Imperceptible and of Neutral quality.

With regard to cumulative effects, the greatest potential contribution of cumulative impacts will be the setting of the Site adjacent to the National Bioeconomy Campus. In the scenario where all of the projects identified within the cumulative context become operational, it was considered that the Proposed Development will not contribute notable visual cumulative effects due to the limited visibility of the Proposed Development. However, there will be cumulative effects on the landscape due to the introduction of a higher density of industry within the local landscape. This area has been zoned for industrial development within the TCDP as it has a history of industrial use. The collective projects represent an intensification of an established industrial landscape character and will have a lower grade cumulative effect as a result.

9.8 Overall Significance of Effect

Based on the landscape and visual effect judgements provided throughout this LVIA, the Proposed Development comprising the substation and grid connection, underground cabling and other ancillary development will not give rise to any significant residual effects. Instead, landscape effects were not considered to exceed 'Moderate' significance, even in the immediate context of the Site and residual visual effects were not considered to exceed '***Slight-imperceptible'*** significance. In the context of this substation, it was deemed that these moderate to low-level residual effects will be Not Significant.

10 CULTURAL HERITAGE

This Chapter provides a description and evaluation of the potential, likely and significant impacts of the Proposed Development on archaeological, architectural and cultural heritage resource of the Proposed Development.

This aim of this assessment was to evaluate the baseline cultural heritage environment at the Site and the likely adverse effects, if any, that the Proposed Development may have on the environment and to provide mitigation measures as may be necessary.

This assessment was prepared by Dr. Maurice F Hurey (Dlitt, MA, FSA, MIAI) Consultant Archaeologists with the assistance of Mr. Vincent Price (BA, Hdip.,) to accompany a SID application for the Proposed Development.

10.1 Introduction

During the 1990s, a vast area, intended for the development of various components of Lisheen Mine, was subject to archaeological resolution; the lands owned by Lisheen Mine were archeologically surveyed, excavated and analysed by the archaeology firm Margaret Gowen & Co. Ltd., and the results were published in a monograph in 2005 (Gowen, Ó Néill & Phillips eds. 2005). Subsequently, work was undertaken by the firm IAC Archaeology under the direction of Tim Coughlan (Carroll and Coughlan, unpublished report Licence No. 13E0059).

The Site now proposed for redevelopment was previously subject to significant impact during the construction of the Management Building and other structural components related to the mine, refer to Figures 10-1 -10-4). All of the areas where the buildings were constructed were subject to archaeological survey, excavation and recording in the course of the Lisheen Mine archaeological mitigation; see Figures 10-2 to 10-4, and Plate 1. The removal of the archaeological material from the landscape through the excavation process has resulted in preservation by Record. While the former existence of these sites is included in the Archaeological Survey of Ireland's database, they are not scheduled for inclusion in the next revision of the Record of Monuments and Places, as they no longer have a physical presence in the landscape. Details on these sites are presented below. All of the other monuments in the area have been excavated as part of the Lisheen Mine project and no longer have a physical presence and have therefore been classified as having been ‘preserved by record’, see Figure 10-5.

Figure 10-1: Site location shown on contemporary aerial image (September 2024)

Figure 10-2: The site as it was in 2010

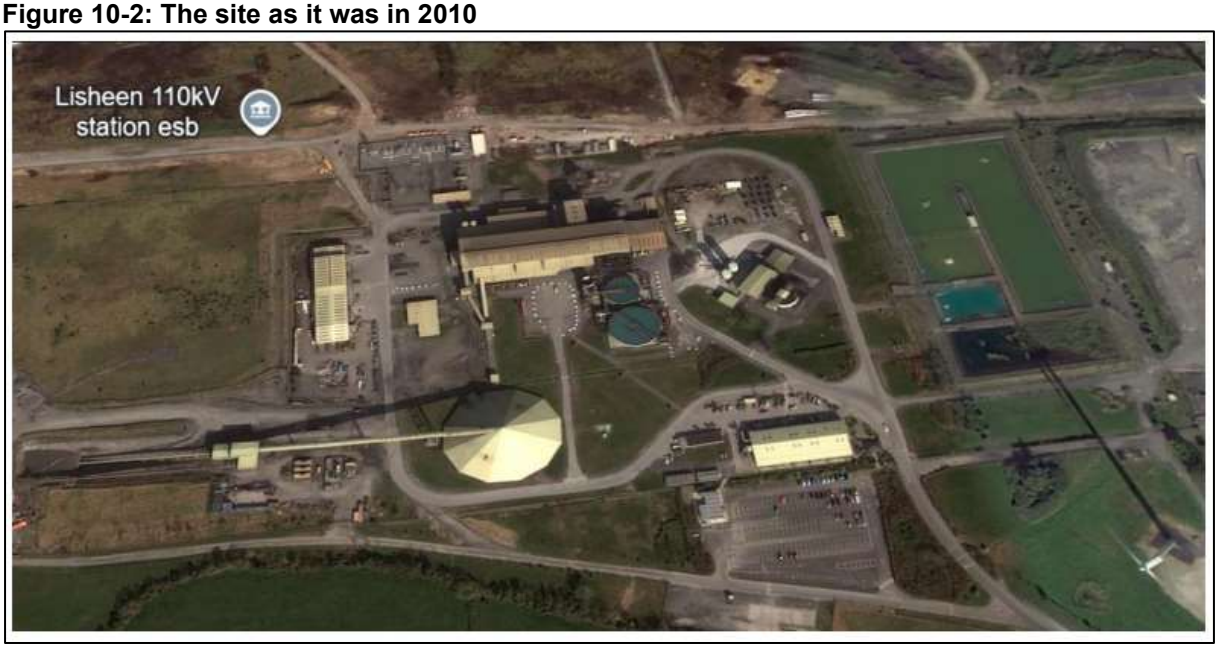


Figure 10-3: The Site as it was in 2012. Extensive ground works can be seen to have taken place

Plate 1: Aerial view of the site with the reinstated rectangular tailings pond in the background. The location of the proposed Cooleeny substation is marked with a blue circle and the proposed cable

Figure 10-4: Archaeological Monuments present on the Site

The red dots denote archaeological monuments located within the Site. All of the sites within that area have been fully resolved (preservation by record) and therefore are no longer present in the landscape.

10.2 Methodology

This study was produced to assess the archaeological and cultural heritage resource of the Site in the context of the archaeological and historical environment of the area, taking the following into account:

- Documentary and map research regarding the location of the Proposed Development with particular reference to the archaeological landscape;
- A Site inspection (October 2024) with the aim of assessing the current landscape and likely impact of the development on archaeological monuments, features and possible deposits;
- A detailed record of any upstanding monuments that will be affected by the Proposed Development;
- Recommendations with regard to the visual amenity of the development in relation to the archaeological landscape; and,
- Recommended mitigation measures to protect archaeological deposits / features.

All of the above informed this study, and additionally, specific publications listed below were consulted.

- Detailed proposals for the development have been prepared, and the location of the development relative to known archaeological monuments can be ascertained. The Archaeological Survey of Ireland ('ASI') (a unit of the National Monuments Service) was consulted. The ASI was established to compile an inventory of the known archaeological monuments in the State. The information is stored on a database and in a series of paper files that collectively form the ASI Sites and Monuments Record ('SMR');
- The principal source of information on the archaeology of the site and area is The Lisheen Mine Archaeology Project 1996-1998 by Margaret Gowen, Michael Phillips & John O Neill, published in 2005, and additional information on sites excavated for Bord na Mona projects in 2013 (Licence No. 13E059) was consulted (IAC in Excavations 2013 edited by I. Bennett);
- Test excavations undertaken in 2017 (Licence No. 17E0381) on the adjoining CMP site to the west (Killoran townland) by A. Quinn were consulted at the Archive Unit, National Monuments Service, Department of Culture, Heritage & Gaeltacht;
- A comprehensive series of Ordnance Survey Maps and available aerial photographs with particular reference to the modern evolution of the Site were consulted;
- The Record of Monument and Places ('RMP'). These files are based on the pre-existing SMR and information from completed county archaeological inventories. As such it records known upstanding archaeological monuments, their location (in cases of destroyed monuments) and the position of possible sites identified as cropmarks on vertical aerial photographs [124];
- The topographical files of the National Museum of Ireland; and,
- Published and unpublished documentary sources for the area, including unpublished field survey and references on archaeological testing and excavation in the vicinity.

10.2.1 Legislation and Guidelines in Ireland

The principal legislative measures protecting cultural heritage assets are:

- National Monument (Amendments) Acts 1930 [125] to 2004 [126];
- Heritage Act 1995 [127];
- Relevant provisions of the National Cultural Institutions Act 1997 [128];
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 [129]; and,
- Planning and Development Act 2000 [130].

Moreover, policies for both archaeological and architectural heritage are conveyed through a series of specific published guidelines. This chapter was prepared having regard to the following guidelines:

- Guidelines on the information to be contained in Environmental Impact Statements [15], and Draft Revised Guidelines [14];
- Framework & Principles for the Protection of the Archaeological Heritage [131];
- Policy & Guidelines on Archaeological Excavation [132]; and,
- Architectural Heritage Protection-Guidelines for Planning Authorities [133].

10.3 Desktop Study

The desktop study provided an overview of the cultural heritage features of the Proposed Development and study area and used the following sources.

10.3.1 Record of Monuments and Places ('RMP')

This record was established under Section 12 (1) of the National Monuments (Amendment) Act 1994. It lists all monuments and places believed to be of archaeological importance in the County. The numbering system consists of two parts: the first part is the county code (TN for Tipperary North Riding) followed by the Ordnance Survey map number (six inch to the mile scale); the second part is the number of a circle surrounding the site on the RMP map, e.g., TN008-020 refers to circle 020 on OS sheet 08 for County Tipperary (North Riding). The area within the circle is referred to as the Zone of Archaeological Potential ('ZAP') or zone of notification for that site. Its diameter can vary depending on the size and shape of the site, but it averages out at ca. 120m. The RMP for County Tipperary (North Riding) was published in 1998.

10.3.2 Sites and Monuments Record Database of the ASI

The purpose of the ASI is to compile a baseline inventory of the known archaeological monuments in the State. It contains details of all monuments and places or sites known to the ASI which pre-date AD 1700, and a selection of monuments which post-date 1700. The large record archive and databases resulting from the survey are continually updated. This database, complete with maps, is available for consultation via the NMS website at www.archaeology.ie.

10.3.3 Archaeological Inventory

The inventories for each county are followed by the Archaeological Survey of Ireland, to the RMPs. They give a written description of each archaeological site in the county. The archaeological inventory for County Tipperary was published in 2002 (compilers J. Farrelly & C. O'Brien).

10.3.4 The topographic files of the NMI

The topographical files were searched for the townlands in the study area. No stray finds are recorded where the proposed substation or UGC are planned.

10.3.5 Tipperary County Development Plan (2022-2028)

The TCDP outlines Tipperary County Council's objectives with regard to the preservation of the archaeological, architectural, and cultural heritage of the County. The plan also outlines the Council's objectives regarding the protection of the archaeological heritage, including the protection of monuments listed in the Sites and Monuments Record and Record of Monuments and Places, by preservation in situ, or in exceptional cases, preservation by record.

The policies of the council in relation to Archaeology include.

> *"**BH. Policy 13-1**. Encourage and support the sympathetic restoration, re-use and maintenance of protected structures thereby ensuring their conservation and protection. In considering proposals for development, the Council will have regard to the Architectural Heritage Protection Guidelines for Planning Authorities, (DAHG 2011) or any amendment thereof, and proposals that will have an unacceptable impact on the character and integrity of a protected structure or adjoining protected structure will not be permitted.*
>
> ***BH Policy 13-4**. Safeguard sites, features and objects of archaeological interest, including Recorded Monuments, National Monuments and Monuments on the Register of Historic Monuments, and archaeological remains found within Zones of Archaeological Potential located in historic towns and other urban and rural areas. In safeguarding such features of archaeological interest, the Council will seek to secure their preservation (i.e. in situ or in exceptional circumstances preservation by record) and will have regard to the advice and recommendations of the Department of Arts, Heritage and the Gaeltacht. Where developments, due to their location, size or nature, may have implications for archaeological heritage, the Council may require an archaeological assessment to be carried out. This may include for a requirement for a detailed Visual Impact Assessment of the proposal and how it will impact on the character or setting of adjoining archaeological features. Such developments include those that are located at, or close to an archaeological monument or site, those that are extensive in terms of area (1/2 ha or more) or length (1 kilometre or more), those that may impact on the underwater environment and developments requiring EIA.*
>
> ***BH Policy 13-6**. Consider landscapes of archaeological significance and, if considered necessary, require an impact assessment for proposed development which could have a significant impact on the identified landscape.*
>
> ***BH Policy 13-7**. Consider underwater archaeology and ensure that development to river banks or coastal edges within the vicinity of a site of archaeological interest shall not be detrimental to the character of the archaeological site or its setting."*

10.3.6 National Inventory of Architectural Heritage ('NIAH')

The NIAH was set up under the Convention for the Protection of the Architectural Heritage of Europe or the Granada Convention of 1985. It was established on a statutory basis under Section 2 of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 [129]. The work of the NIAH involves identifying and recording the architectural heritage of Ireland, from 1700 to the present day, in a systematic and consistent manner. It is divided into two parts: The Building Survey and Historic Garden Survey (www.buildingsofireland.ie). The main function of both is to identify and evaluate the State's architectural heritage in a uniform and consistent manner, so as to aid in its protection and conservation.

The NIAH carried out a survey of the buildings of North County Tipperary in 2004. Under Section 53 of the Planning and Development Act 2000, all structures considered of regional, national, or international Importance within the survey are recommended for inclusion in the Record of Protected Structures by the Minister for Arts, Heritage and the Gaeltacht. If this is not adopted by the local authority, the reasons must be communicated to the Department. The

Building and Historic Garden Survey for County Tipperary is available online. No buildings or gardens included in the Inventory are located within the Site.

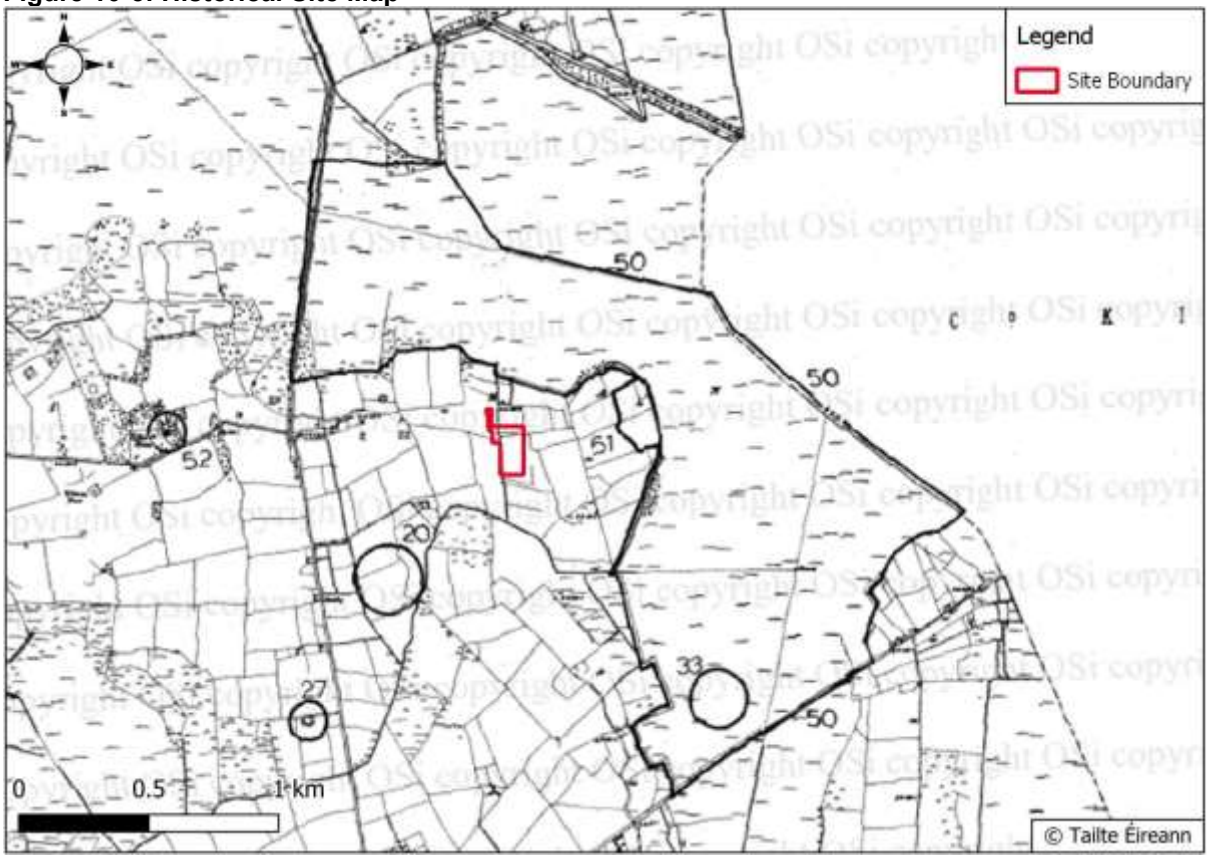
10.3.7 Database of Irish Excavation Reports

This website provides a database of summary accounts of archaeological excavations and investigations in Ireland undertaken between 1970 and 2015. Until 2010, these accounts were also published in book form.

10.4 The Receiving Environment

The natural environment of the pre-mine area was one of agricultural use on the margin of extensive bogland (See Figure 10-5 below). This situation remained to some extent when the mine was operational and can be seen on the aerial photograph taken in the early phase of mine development in the early 1990s. The most significant impact on the area under review occurred during the Construction Phase of Lisheen Mine Management Facilities (Figure 10-3 and 10-4 above) and subsequent decommissioning (Figure 10-2 and Plate 10-1 above).

Figure 10-5: Historical Site Map



Following the cessation of extraction of ore from the Lisheen mine in 2015 and the commencement of closure works, the industrial building compound was demolished (Figure 10-2 and Plate 10-1 above).

Following two phases of archaeological resolution, all of the archaeological sites that once occurred in this area were fully resolved by archaeological excavation and are therefore preserved by record. Consequently, there is now no surviving element of the former landscape, neither bogland nor adjoining agricultural land. As the former landscape has been removed, none of the former archaeological content remains.

While the Sites and Monument map records the existence (see locations on Figure 10-5 above) of all of the significant finds made in the course of the archaeological surveys and excavations, the dots do not in this case signify the ongoing presence of archaeological monuments, as these have been removed from the landscape by archaeological excavation and are now preserved by record. The Lisheen Mine Archaeology Project 1996-1998 by

Margaret Gowen, Michael Phillips & John O Neill, published in 2005, is the most publicly accessible record of the excavations.

The Site was examined by field walking most recently in October 2024. The area proposed for development lies on former agricultural land on the margins of former bogland. The ground has been extensively altered by modern interventions, including buildings (Figures 10-3 and 10-4), which have since been demolished (Figure 10-2), as well as trackways, drainage trenches and redeposition of hardcore. As a consequence, the ground surface of the area under review can be defined as archaeologically resolved, as the greater part of the site has been greatly disturbed by modern usage.

The Record of Monuments (Figure 10-5) shows a red dot on the site of a monument (TN036-050177, house of indeterminate date) scheduled for inclusion in the next revision of the RMP. The red dot on the SMR map (Figure 10-5) is misplaced on the map, because TN036-050177, as described, refers to TN0360052, Killoran House, which in reality is located ca. 1.2km south of the red dot. No monument or archaeological feature is located at the point where the red dot is placed on the SMR map; this area is densely covered in scrub, and a drain associated with the mining works cuts through this area.

10.4.1 Previous Archaeological Excavations

The Lisheen Archaeological project, as it was known, was carried out as part of the development of the Lisheen Mine, a lead / zinc mine located near Moyne, Thurles, Co. Tipperary. The mine covered an area of over 200 hectares. Part of the site included a ‘peninsula’ of bog extending southwards from a large area of Bord na Mona, a worked raised bog called Derryville Bog. The basin in which a portion of this bog formed incorporated a portion of the townland of Killoran. This area was chosen as the site of a Tailings Management Facility (‘TMF’) for the mine. This embanked reservoir covered an area of 72 hectares.

Sixty-nine archaeological sites and features of various types, dating from the Late Neolithic to the medieval period, were excavated within the bog between 1996 and 1998 as a requirement of planning permission issued for the Lisheen Mine Project. Archaeological monitoring of the dryland Construction Phase to the west of the bog revealed over twenty additional prehistoric sites, many of which are fulacht fiadh. Many of these sites were fully excavated in the 1990s, thereby preserved by Record, and now they no longer have a physical presence on the landscape.

10.4.2 Archaeology Sites in the Region

The townlands of Killoran and nearby Derryville have a significant density of Recorded Monuments in the Archaeological Survey of Ireland database, primarily as a result of the intensive archaeological investigations conducted in association with the Lisheen Mine Project between 1996 and 1998, and subsequent work by Bord na Mona in the adjoining bogland. While the archaeological richness of the area is proven beyond doubt and projects in undeveloped lands may reveal further archaeological features, the sites that have been fully excavated and the ground which has been significantly altered now no longer contain the physical remains of archaeological sites and monuments, i.e. the ground, such as the Site under review, is archaeologically sterile. While many archaeological sites identified and excavated as part of the Lisheen Mine Project are listed in the *Archaeological Survey of Ireland* database (Figure 10-5), most of these sites have been fully excavated and thereby removed from the landscape (Preserved by Record); the sites are listed in the database but are not scheduled for inclusion in the Record of Monument and Places because they no longer have a physical entity in the ground; below are a description of the Recorded Monuments.

Table 10-1: Monuments within close proximity to the Proposed Development

Reference Number	Classification	Townland	Description as per National Monument Service [124]
TN036-050039	Platform-peatland	Derryfadda	Situated on flat bogland. The site consisted of a platform (dims. 8.2m x 3.2m) constructed with a linear deposit of roundwood and brushwood supporting the main surface of timbers. Two-headed shafts of cherry wood were found amongst the lower level of wood (Murray and Ó Néill 1999, Derryfadda 9, 31-2).
TN036-050044	Road-togher unclassified	Derryfadda	Situated on flat bogland. This site (Derryfadda 203) consisted of a trackway (L 15m; Width 3-6.5m) constructed of transverse roundwood and brushwood which was dated to 385-165 BC (Murray and Ó Néill 1999, 41-2).
TN036-050045	Road-togher unclassified	Derryfadda	Situated on flat bogland. This site consisted of a trackway (L 15m; Width 3-6.5m) formed by six clusters of roundwood and brushwood, orientated NW-SE, which were intermittently deposited in areas where underfoot conditions dictated (Murray 1999, Derryfadda 204, 41-2). This trackway was dated to 2120-1755 BC (Ó Néill 2000, 176).
TN036-050041	Road / trackway	Derryfadda	Situated on flat bogland. A trackway (L 52m; Wth 3-10.8m) consisting of eight separate deposits of compacted small stones used intermittently where necessary to create a walking surface. In order to extend the life of the road, it was supplemented with deposits of small split timbers and wood chips. The site appears to have been constructed after the bog burst of 1250 BC (Murray 1999, Derryfadda 17, 35-7) and has been radiocarbon dated to 1315-980 BC (Ó Néill 2000, 186).
TN036-050038	Platform-peat	Derryfadda	Situated on flat bogland overlying a fulacht fia (TN036-050053). The site consisted of a platform (dims. 5.75m N-S x 3.9m E-W) constructed with roundwoods and brushwoods lying SW-NE. (Murray and Ó Néill 1999, Derryfadda 6, 30-31).
TN036-050053	Fulacht fia	Derryfadda	Situated on flat bogland overlying a fulacht fia (TN036-050053). The site consisted of a platform (dims. 5.75m N-S x 3.9m E-W) constructed with roundwoods and brushwoods lying SW-NE. (Murray and Ó Néill 1999, Derryfadda 6, 30-31).
TN036-050054	Platform-peatland	Derryfadda	Situated on flat bogland. A poorly preserved site consisting of a crudely built wooden subcircular platform (dims. 4.29m N-S x 4.85m E-W) constructed of irregularly deposited roundwood and brushwood (Murray 1999, Derryfadda 218, 53-4).
TN036-050046	Road-unclassified togher	Derryfadda	Situated on flat bogland. This site (Derryfadda 206) consisted of a short trackway (L 5m; Wth 1m) orientated NW-SE constructed of longitudinally laid roundwood placed on the surface of the bog. (Murray and Ó Néill 1999, 43).
TN036-050057	Road-unclassified togher	Killoran	Situated on flat bogland. This site consisted of two isolated pieces of roundwood orientated NE-SW, indicating a short trackway (L 5.5m). (Murray 1999, Killoran 57, 63-4).

Reference Number	**Classification**	**Townland**	**Description as per National Monument Service** [124]
TN036-050075	Road-unclassified togher	Killoran	Situated on flat bogland. This site consisted of two isolated pieces of roundwood orientated NE-SW, indicating a short trackway (L 5.5m). (Murray 1999, Killoran 57, 63-4).
TN036-050056	Road-trackway	Killoran	Situated on flat bogland. Archaeologically excavated over two seasons, this site consisted of a causeway (L 555m; Width 0.35m) orientated E-W and constructed before 1440 BC +/-9 yrs. The causeway revealed three phases of construction with a variation in building techniques over the length of the road. Originally, the site consisted of two parallel rows of stakes (L 456-488m), up to 1,400 in number, which acted as marker posts for the causeway (Width 1.4m). This phase was radiocarbon dated to between 1745 and 1405 BC. Phase two was represented by the construction of a paved flagstone surface on top of the well-worn compressed peat and was radiocarbon dated to 1605-1285 BC. In places, there was a need for a brushwood and sand foundation for the causeway. At both ends of the trackway, a different construction method was used. At the West end, the road consisted of a deep deposit of longitudinal roundwood, occasional planks and brushwood. A later phase of intermittent repairs to the stone causeway with oak planks being laid over transverse roundwood was dated to before 1440 BC +/-9yrs (Coughlan and Stevens 1999, Killoran 18, 56-60).
TN036-050070	Road-unclassified togher	Killoran	Situated on flat bogland. Excavation revealed a wooden trackway (L 24m; Width 2- 4m) orientated E-W and constructed of a single layer of longitudinal brushwood and split timbers. The trackway was radiocarbon dated to 394-199 BC. (Stevens 1999, Killoran 248, 83-4).
TN036-050061 and T036-050062	Road-unclassified togher	Killoran	Situated on flat bogland. Excavation revealed two distinct trackways (TN036-050061, TN036-050062) built on the same alignment but about 300 years separate in date.
TN036-050058	Road-Class 2 togher	Killoran	Situated on flat bogland. This site consisted of a narrow linear trackway (L 69.5m; Width 1.5m) constructed of longitudinally laid roundwood one layer deep. The trackway was dated to between 838 and 799 BC. (Murray 1999, Killoran 69, 64-5).
TN036-050076	Road-togher unclassified	Killoran	Situated on flat bogland. Excavation revealed a wooden trackway (L 18m; Width 1.2-2.35m) constructed of a single layer of longitudinal roundwood and brushwood with a small platform area N of the track (Stevens 1999, Killoran 306, 93-4).
TN036-050073	Road-togher unclassified	Killoran	Situated on flat bogland. Excavation revealed a wooden trackway (L 17.4m; Width 2.8m) constructed of alternating sections of longitudinal roundwood with diagonal planks and roundwood. The trackway was radiocarbon dated to 367-195 BC and dendro-dated to 426 BC +/- 9yrs and 322 BC +/- 9yrs. (Stevens 1999, Killoran 301, 89-90).

Reference Number	**Classification**	**Townland**	**Description as per National Monument Service** [124]
TN036-050080	Hut Site	Killoran	Situated on flat bogland. Excavation revealed a mound (4.2m N-S; 2.9m E-W; 0.2m D) of burnt material 10m S of a fulacht fia (TN036-050067). No other features were identified in associated with this burnt mound. (Ó Néill 1999, Killoran 316, 99).
TN036-050078	Road-unclassified togher	Killoran	Excavation revealed a wooden trackway (L18m; Width 3m) which terminated at a small platform at its E end. The trackway overlay the mound of a fulacht fia (TN036-050067). The trackway consisted of dense bundles of transversely laid roundwood and brushwood occasionally pegged down with a few centrally placed longitudinal runners for added stability. A hurdle was added to the S end of the trackway. (Ó Néill 1999, Killoran 314, 96-7).
TN036-050068 & 78	Road-unclassified togher	Killoran	Situated on flat bogland. Excavation revealed a wooden trackway which partially overlies a fulacht fia (TN036-050067).
TN036-050067	Fulacht Fia	Killoran	Situated on flat bogland. The fulacht fia consisted of a rectangular-shaped plank-lined trough (dims 2.4m x 1.75m x 0.6m) with a roughly circular spread of burnt material (dims. 19.5m x 19m) with a dense deposit of charcoal directly E of the trough. A saddle quern (dims. 0.23m x 0.15m x 0.55m) was found in the peat directly W of the site at a depth of 0.3m below the level of the trough. From a technical assessment of the volume of the mound material, the excavator suggested a possible figure of 3167-3967 firings over the life of the site. (Ó Néill 1999, Killoran 240, 78-81).
TN036-050080	Hut Site	Killoran	Situated on flat bogland. This structure was first recorded and surveyed by the Irish Archaeological Wetland Unit (UCD) in 1994 but was subsequently destroyed during peat milling between 1994 and 1995. The site consisted of a subrectangular area (dims. 5.6m E-W x 4m N-S) defined by wooden uprights, including roundwood, brushwood and half-split posts with an internal setting of three stakes bisecting the site. (Ó Néill 1999, Killoran 66, 67-9).
TN036-050074	Fulachta Fia	Killoran	Situated on a gentle, undulating slope in poorly drained, undulating countryside. The site consisted of a subcircular trough (diam. 1.5m x 0.4m) with a semicircular spread of burnt material (diam. C.7.5m) and an area of charcoal-rich clay (dims. 1.8m x 1.5m) which may represent the hearth area directly SE of the trough. The trough was filled by a natural spring which was located directly below the site. A date of 2138-1935 BC was obtained from the charcoal. (Ó Néill 1999, Killoran 304, 90-91).
TN036-050077	Road-unclassified togher	Killoran	Situated on flat bogland. Excavation revealed a short brushwood track (dims. 3m x 1m) leading to a hurdle which had been built on top of the track in a second phase of construction with a later brushwood track (dims. 2.2m x 1m) constructed in order to connect these features to a nearby trackway (TN036-050059). (Cross 1999, Killoran 312, 95-6).
TN036-050065	Road-unclassified togher	Killoran	Situated on flat bogland. Excavation revealed a wooden trackway consisting of an irregular dump of brushwood resting on a layer of burnt stone and charcoal. A date of 1212 BC +/- 9yrs was obtained from a collapsed oak lying directly on top of the brushwood. (Stevens 1999, Killoran 235, 76-7).

Reference Number	Classification	Townland	Description as per National Monument Service [124]
TN036-050079	Road-unclassified togher	Killoran	Situated on flat bogland. Excavation revealed a short wooden track (dims. 3m x 1m) leading to a hurdle (dims. 2.5m x 2m) which had revealed evidence for four phases of construction. Initially a foundation layer (dims. 4m x 3m) of roundwood was placed on top of tree stumps which was followed by a second layer (dims. 5m x 4m) of mixed wood which represented the first surface of the track. This was followed by the construction of a hurdle at the NE edge of the track which in the final phase was extended by placing another layer (dims. 4m x 1.5m) of substantial roundwood at the W edge of the hurdle (Cross 1999, 98-9). This track has been dated to 405-180 BC (Ó Néill 2000, Killoran 315, 187).
TN036-050063	Road-unclassified togher	Killoran	Situated on flat bogland. Excavation revealed a wooden trackway lying over pits filled with burnt stone associated with a nearby fulacht fia (TN036-050072). The trackway consisted of bundles of brushwood and roundwood laid longitudinally and pegged irregularly with evidence for extension and repair of the track (Cross 1999, Killoran 230, 73-5). This track was dated to 1500-1195 BC (Ó Néill 2000, 185).
TN036-050072	Fulacht Fia	Killoran	Situated on flat bogland. The fulacht fia consisted of a carved oak trough (dims. 8.8m N-S x 8.4m E-W) and a timber platform (dims. 4m x 3m) directly E of the trough. A date of 1425-1120 BC was obtained from the timber used in this platform. From a technical assessment of the volume of the mound material the excavator suggested a possible figure of 615 firings over the life of the site. (Ó Néill 1999, Killoran 265, 87-8).
TN036-050081	Fulacht Fia	Killoran	Situated on flat bogland. The site was identified during trench cutting for an embankment road and was only partially excavated due to health and safety restrictions. It consisted of a large burnt mound (dims. 10.6m E-W; 0.51m D) sealing an irregular-shaped trough (Wth 1.67m; D 0.3m) which was filled with fire-cracked stone and charcoal-rich silt. (Stevens 1999, Killoran 400, 99-100).
TN036-050066	Road-unclassified togher	Killoran	Situated on flat bogland. Excavation revealed a small platform built in two phases, the first consisting of a small area (dims. 6-7m E-W x 6m N-S) covered with an irregularly laid layer of roundwood and brushwood which may have acted as a foundation layer for the overlying platform. This secondary feature consisted of a larger area (dims. 8-10m E-W x 6.5m N-S) covered with a heavier layer of irregularly laid roundwood. Both layers of roundwood were held in place by irregularly spaced pegs. A possible yew shaft for a socketed spearhead was found lying horizontally in the lowest level of the platform. (Cross 1999, Killoran 237, 77-8).
TN036-050071	Fulachta Fia	Killoran	Situated on flat bogland. The fulacht fia consisted of a wicker-lined trough (dims. 1.8m x 1.1m x 0.6m) with a spread of burnt material (dims. 5.5m N-S x 6.5m E-W) and a stone and timber platform (5m N-S x 2.3m E-W) directly S and E of the trough respectively. From a technical assessment of the volume of the mound material the excavator suggested a possible figure of 80 firings over the life of the site. (Ó Néill 1999, Killoran 253, 84-6).
TN036-0500146-173	Road-unclassified togher	Killoran	29 toghers, including possible toghers, were identified in Killoran townland in Derryville Bog as a result of field survey (Gowen 1999, 124-30). In 15 examples brushwood was the only component identified. The remaining examples were constructed from a mixture of brushwood and roundwood. Three toghers had evidence of pegs or stakes. An early medieval date of AD 1024-1162 was obtained from one togher (TN036-050164) sample. Wood species were identified in thirteen toghers, these included

Reference Number	Classification	Townland	Description as per National Monument Service [124]
			alder, ash, birch, elm, hazel, holly and mountain ash, with ash and hazel being predominant.

10.5 Characteristics and Potential Effects of the Proposed Development

The ground on the Site under review has been radically altered following works undertaken in the 1990's. There is no surviving old ground surface within the Site under review. All former archaeological remains have been removed by the archaeological excavation process; therefore, there is no potential effect from any elements of the Proposed Development.

Scraping of the ground, drainage, the creation of access roads and the construction of wind turbines have all taken place in the immediate vicinity of the Site under review. There is little possibility that remnants of the former landscape survive, and therefore, there is little possibility that the ground contains archaeological features.

10.6 Proposed Mitigation Measures

No mitigation measures will be considered necessary on the area of the Proposed Development.

10.7 Interactions with other Environmental Attributes

Not applicable.

10.8 Residual Effects

There will be no residual impacts on the cultural heritage of the Proposed Development or the surrounding area.

10.9 Monitoring

Not required.

10.10 Reinstatement

Not required.

10.11 Difficulties Encountered in Compiling this Information.

No difficulties were encountered in compiling this information.

11 MATERIAL ASSETS – TRAFFIC

This chapter documents the findings of a Traffic Impact Assessment that was undertaken to determine whether there would be any potential effects associated with the Proposed Development on the existing road network that would warrant further consideration.

In advance of construction commencing, the appointed contractor will use the findings outlined in this chapter to prepare a Construction Traffic Management Plan ('CTMP'). The CTMP will be termed a "Living Document", such that any changes to the construction programme, operations or unforeseen issues will be incorporated into the CTMP throughout the project as deemed necessary by the contractor or relevant authorities.

In the event that planning consent is granted for the Proposed Development, the CTMP will be updated prior to the commencement of development to address the requirements of any relevant planning conditions, including any additional mitigation measures that are conditioned and will be submitted to the planning authority for written approval.

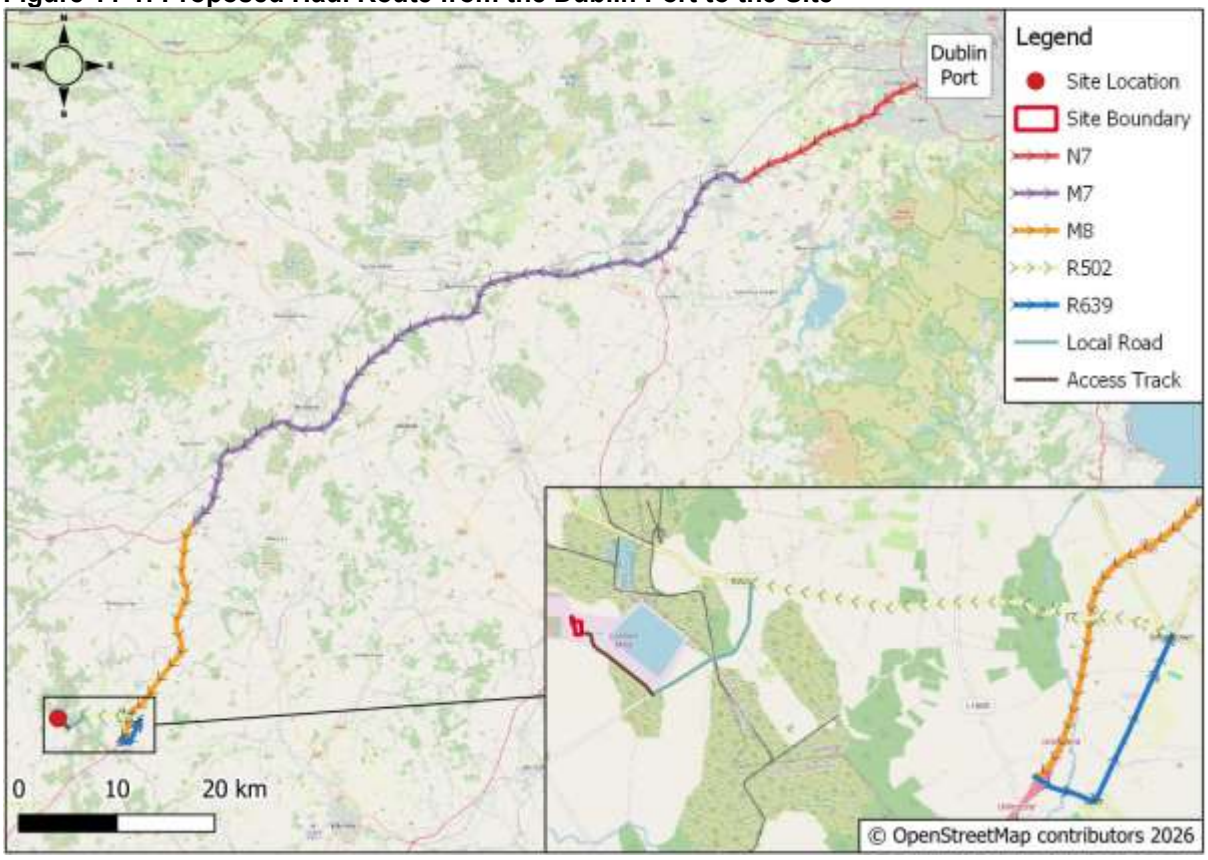
11.1 Road Network

11.1.1 Existing Road Network

The proposed haul route for key plant and equipment will be from Dublin Port. The existing road network within the vicinity of the Proposed Development is presented in Figure 11-1 and described in the following text:

- **M7:** The M7 is a National primary road in Ireland, connecting Limerick to Dublin. The majority of the route is motorway standard and is designated as the M7 motorway with a 2m wide hard shoulder running in each direction and a top speed limit of 100-120km/h;
- **M8:** The M8 motorway is an inter-urban motorway in Ireland, which forms part of the motorway from Dublin to Cork City. The motorway is a separated 2+2 dual carriageway road with a 2m wide hard shoulder running in each direction and a top speed limit of 120km/h;
- **R693:** The R693 is a regional road in Ireland linking Urlingford to Kilkenny City. The road is a single carriageway with two lanes throughout. It is a rural road, ca. 5m wide;
- **R639:** The R639 is a regional road, once designated as the N8 National primary road. It is a single carriageway with two lanes throughout;
- **R502:** The R502 is a regional road. The road is a single carriageway with two lanes throughout; and,
- **L5612:** The L5612 is a local road. The existing commercial entrance is located on this road. This will serve all construction access and Operational Phase access to the Site.

Figure 11-1: Proposed Haul Route from the Dublin Port to the Site



11.1.2 Future Road Network

There are currently no proposed road network improvements in the vicinity of the Proposed Development.

11.1.3 Collisions

At the time of writing this report, the Road Safety Authority ('RSA') are reviewing its road traffic collision ('RTC') data sharing policies and procedures. The RSA have stated on their website that RTC data cannot be shared until its review is complete. As such, information on local accident history cannot be publicly accessed [134].

11.2 Site Access and Egress

The Site is accessed from the existing Lisheen Mine entrance along the L5612 local road via the R502 regional road.

The Site is well placed for national distribution and export. It is strategically located adjacent to the M8 motorway. A purpose-built 8km primary road connects the Site directly to the former N8 national road (now R639), which connects to the M8 motorway at Junction 4 (Urlingford) and Junction 6 (Horse and Jockey), midway between Dublin and Cork.

- The Dublin-Cork M8 motorway is accessible via an 8km purpose-built primary road;
- The Dublin-Limerick M7 motorway is within 20km;
- The Dublin-Cork train line passes through Thurles, 15km to the south; and,
- The nearby town of Thurles is also on the main Dublin – Cork intercity railway line.

Construction Phase Access and Egress

The Site is accessed from the existing commercial Lisheen Mine entrance along the L5612 local road via the R502 regional road, which currently provides access for Lisheen Mine Complex.

All Construction and Operational Phase access and egress will be via the existing access. The existing entrance is wide and well-serviced and is capable of taking all the vehicle movements during the Construction Phase of the Proposed Development.

The construction of the Proposed Development will utilise the existing network of established hardcore tracks, which extend to all areas of the Site and provide access to all required construction areas.

These access routes have previously been used to facilitate the delivery and installation of large-scale infrastructure, including wind turbine components and MVA transformers, as part of permitted developments associated with the Lishen Mine Complex. The successful use of these routes for abnormal load deliveries demonstrates that the existing access network is suitable for construction traffic associated with the Proposed Development.

Based on the existing condition of the access infrastructure, it is not anticipated that any significant upgrades or widening works will be required to facilitate construction access. Routine maintenance and localised repairs, if required, would be undertaken as part of standard construction management.

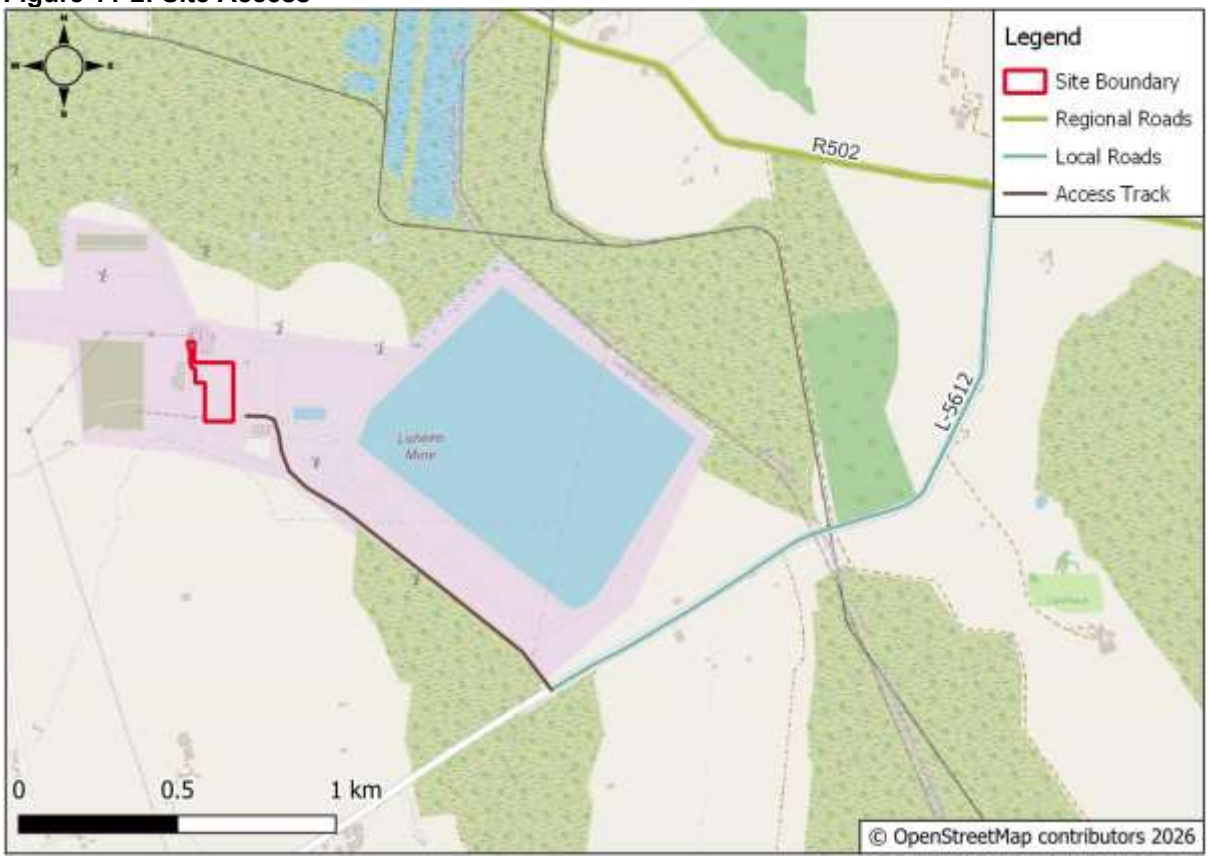
Overall, the existing access network is considered adequate to support the Construction Phase of the Proposed Development.

Operational Phase Access and Egress

All Operational Phase access and egress will be via the existing access.

All access and egress arrangements as detailed above were granted as part of the Permitted PV Development (Planning application ref: 211128) and therefore the principle of use has already been established. It should also be noted that Transport Infrastructure Ireland ('TII') or the municipal district engineer had no objection to the access arrangement for the Permitted Development.

Figure 11-2: Site Access



11.3 Sightlines

All site access and egress sightlines are in accordance with all sightline visibility requirements, as set out by the TII Design Manual for Roads and Bridges.

The Site is accessed from the L5612 local road, which has an average carriageway width of ca. 5m and is subject to a speed limit of 80km/h. The existing Site entrance has previously been upgraded to an industrial-standard access and accordingly provides appropriate visibility.

The access provides sightlines of ca. 150m in each direction, measured from a set-back distance of 2.4m from the edge of the public road to the nearside carriageway edge. For vehicles entering and leaving the Site, forward visibility in both directions exceeds 90m, thereby satisfying the required stopping sight distance for the prevailing speed environment.

The L5612 provides adequate stopping sight distances, and the proposed access arrangements are considered to be in accordance with current design standards and suitable to safely accommodate the traffic associated with the Proposed Development.

Therefore, the Proposed Development will not significantly contribute to the risk to road users.

11.4 Proposed Construction Traffic

There will be two distinct elements during the construction phase as follows:

Enabling Works Phase:

Engineering fill will be required to raise site levels by approximately 1 metre across a total area of circa 17,668 m², comprising:

- The proposed 110kV substation area (10,191m^2); and,
- The extension area beyond the fence line (7,477m^2).

It is estimated that approximately 27,000 tonnes of stone will be required to achieve the proposed level increase across the Site. This will consist of 150mm graded stone topped with 50mm single-sized crushed limestone, providing a stable and free-draining surface suitable for access and maintenance.

There are a number of quarries in the area including Maher Quarries Ltd. at Castletown, Moyne; Roadstone at Killough; Gleeson Quarries at Laffansbridge Killenaule; Dowling Quarries at Errill, Rathdowney and Kelly's of Fantane.

Maher Quarries Ltd. is within 6km-7km of the Proposed Development and has previously supplied stone and concrete to the Lisheen Mine. Given that it is the closest quarry to the Site and therefore has a commercial advantage, it will be most likely quarry utilised. However, this will only be confirmed once a contractor has been appointed.

Construction Phase

Construction traffic and the construction programme have been calculated based on similar-scale developments. Any substantial changes in the actual build programme and / or number of vehicular movements, following the appointment of a construction contractor, will be communicated to TCC in advance of construction.

The proposed HGV haul route will be utilised for plant and equipment coming from Dublin Port. It is anticipated that other materials will be sourced locally where possible and appropriate, and, as such, delivery of these local materials will simply utilise the local road network.

11.4.1 Construction Traffic Routing

Enabling Works Phase

The delivery of engineering fill materials from the Maher Quarry facility, which is located within 6km-7km of the Site, will minimise the number of road miles or kilometres required to supply stone.

Deliveries and dispatches will be required to travel via national routes and along the R639 to the right turn lane onto the L4115 and the L3201 to the entrance to the Site. The right turn lane on the R639 was constructed, and the L4115 and L3201 from there to the Site entrance were improved and strengthened for the Lisheen Mine development and remain in good structural condition.

Construction Works Phase

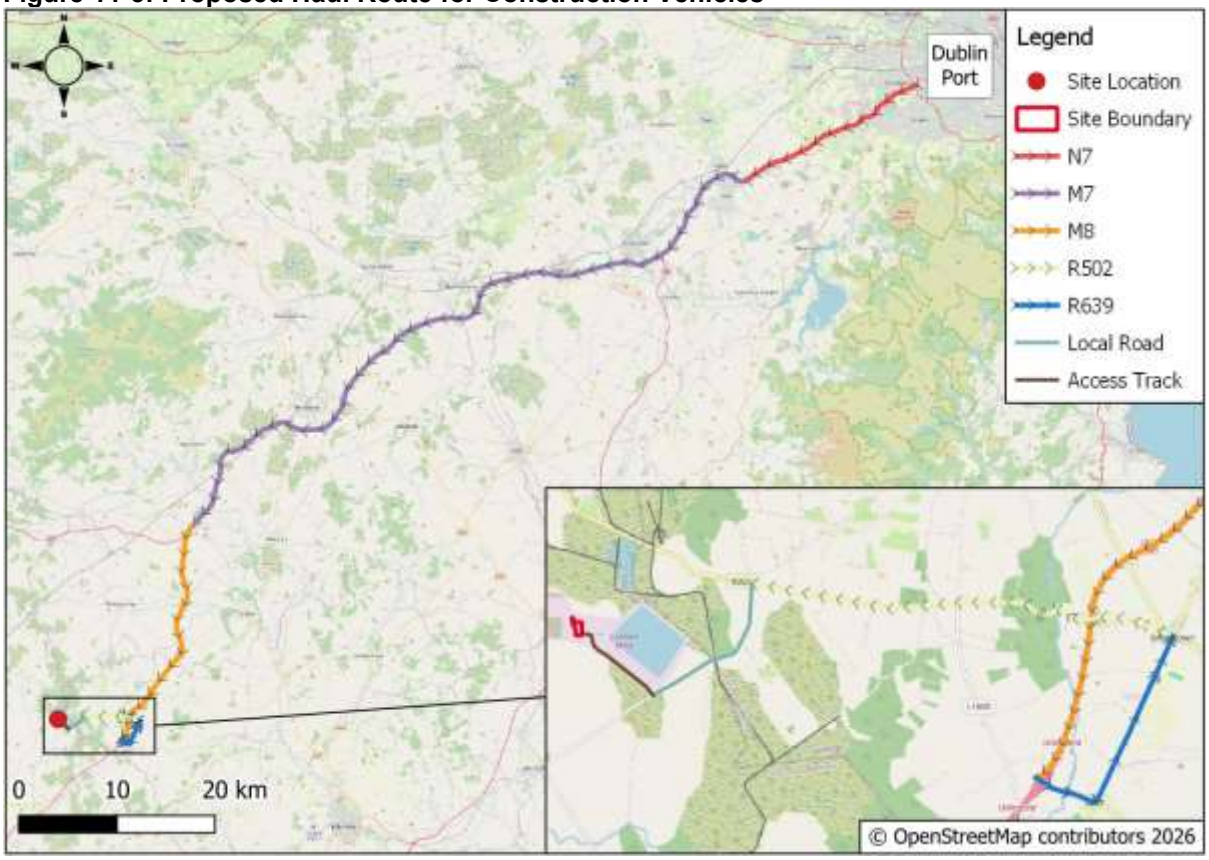
The appointed contractor will outline the haul route to all subcontractors and staff, ensuring that they will be informed of these routes and any restrictions before commencing work. Heavy vehicles will use the haul route as illustrated in Figure 11-3, subject to agreement from TCC.

Construction traffic will primarily travel from Dublin Port via the M50 along the N7 to Kilkenny and take Exit 4 to merge with the M8. Construction traffic will continue on the M8 for ca. 2.4km. All vehicles will then take the M8 exit towards Waterford / Johnstown / Urlingford.

At Junction 4, all vehicles will take the R693 exit to Waterford / Johnstown / Urlingford. All traffic will follow the R693 for ca. 750m before turning left onto the R639 for ca. 2.6km before turning left onto the R502. All traffic will then continue along the R502 for ca. 6km before turning left onto the local road L5612.

This proposed haul route has been identified by considering the ability of the route to physically accommodate the required vehicles, in addition to the sensitivity of the route to potential disruption by the movements of traffic to and from the Site.

Figure 11-3: Proposed Haul Route for Construction Vehicles



This route has been carefully selected to maximise the use of the National Road network and to minimise any potential impact on the surrounding local road network.

All truck drivers will be notified of this route in advance of the commencement of their journey. The main contractor will strictly enforce the traffic management plan to ensure that all construction vehicles will follow this route. Deliveries to the Site will be carefully coordinated, ensuring that the risk of arriving and departing trucks meeting on the local road will be significantly reduced.

There will be other local deliveries to the Site. Such deliveries will be carefully coordinated to minimise the risk of arriving and departing trucks meeting on rural roads.

All materials will be stored in a temporary construction compound and will be transported around the Site via the existing access road and temporary construction crossings. This route has been carefully selected to maximise the use of the National Road network and to avoid urban centres such as Urlingford.

11.5 Development Traffic -Underground Cable Route

The entirety of the UGC is within private lands, and therefore, no disruption to the surrounding road network will occur. No road closures will be required.

11.5.1 Local Residents

The following measures will be implemented to communicate relevant information to all households located along the route for roads designated for use as a haul route:

- Information signage will be erected ahead of the commencement of construction.
- An informational flyer drop will be conducted to notify residents along the local road leading to the Site about the planned construction programme; and,

- Contact details for a Liaison Officer will be provided so that any concerns can be easily communicated to the Developer.

11.5.1.1 Traffic Management Signage and Signals

Throughout all construction works, road warning signage indicating traffic movements associated with the development will be erected.

Temporary signage will be used to highlight the entrance to the Site and to direct construction traffic to the Site from the national and regional roads. Temporary signage will also be used to prohibit the parking of delivery vehicles on the L5612 road. The signage will direct drivers to the construction compound within the Site.

All signage will be in accordance with the Department of Transport's Traffic Signs Manual, Chapter 8 – Temporary Traffic Measures and Signs for Roadworks and will be installed prior to works commencing on-site. All signage will be inspected at least twice daily by the contractor to ensure that it is in place, secure and appropriately fitted with warning lights as required. All sign faces are to be retro-reflective material to Class Ref 2 of EN 12899. The colours, chromaticity and luminance factors shall be as specified in Specification TS4.

The traffic signals will be in place prior to the works commencing and will remain in place until after the works are completed.

The construction compound area will allow loading and unloading of all construction vehicles and will provide a turning area for vehicles to exit the Site. Adequate signage will be erected where required.

11.6 Temporary Construction Compound

A secure construction compound will be set up in the Permitted Solar Development. This compound will be utilised as part of the Overall Development. It is expected that the compound will contain the following:

- Temporary site facilities (Port-a-Cabin type) to be used for site office and welfare facilities, including welfare facilities with provision for sealed waste storage and removal;
- Container storage unit(s) for tools and equipment storage;
- Container storage unit(s) for components and materials;
- Refuelling compound for construction vehicles and machinery;
- Parking for staff, construction vehicles and machinery;
- Designated skips for construction waste; and,
- Wheel washing facility.

The Site Compound and Welfare area will be erected on existing hardstanding only. No earthworks or sub-surface disturbance will occur as part of these proposed facilities.

All materials for the construction of the Overall Development will be deployed and stored within the temporary construction compound. All equipment and materials unloaded in the construction compound will be distributed throughout the site using smaller machines such as bobcats via a network of pre-existing hardcore tracks extending to all areas of the Site that will serve to provide internal access.

The construction compound area has been designed to allow for the loading and unloading of all construction vehicles and will provide a turning area for vehicles to exit the Site. Adequate signage will be erected where required. The design of the compound will ensure that no impacts will arise on the surrounding local road network as a result of deliveries to the Proposed Development.

11.6.1 Construction Programme

The Proposed Development will be constructed in tandem with the Permitted Solar Development, the construction programme, indicative phasing and construction details have been prepared on the basis of one construction project.

A typical construction timeline for a 214,800 no panel solar farm, and onsite substation are outlined in Table 11-1 below. This is an indicative Construction Programme with corresponding construction related traffic. The entire construction, including enabling works, mobilisation of the Permitted Solar Development and Proposed Development is anticipated to last for approximately 18-20 months.

The heavy construction traffic will be broadly spread evenly over the majority of the construction programme, namely between weeks 0 – 45. Outside of this period, traffic will mostly be limited to light traffic from workers commuting to and from the Site. The construction programme is further broken down into 4 phases, which are described in Table 11-2 along with anticipated vehicle movements.

The bulk of the heavy construction traffic will be based around the delivery of materials to the Site, which will be concentrated in a period of 45 weeks at the beginning of construction (weeks 0-45). Outside of this period, traffic will mostly be limited to light traffic from workers commuting to and from the Site.

Table 11-1: Indicative Construction Programme

Task Name	**Weeks**											
	1-5	5-10	10-15	15-20	20-30	30-40	40-45	45-50	50-55	55-60	65-70	70-80
Mobilisation Period												
Enabling Works												
Construction Phase												
Phase 1												
Phase 2A												
Phase 2B												
Phase 3												
Phase 4												
Testing & Commissioning												

The construction programme is further broken down into four phases, which are described in Table 11-2 along with anticipated vehicle movements.

Table 11-2: Indicative Construction Phase Details

Phase	**Timeline (weeks)**	**Phase Description**	**Vehicle Movements**
Mobilisation and Site Prep	0-10	• Notice to proceed; • Detailed design finalisation; • Grid compliance coordination;	Ca. 1-3 lorry movements per day.

Phase		Timeline (weeks)	Phase Description	Vehicle Movements
			• Health & Safety planning and Construction Management Plan; • Procurement of long-lead items (transformers, HV switchgear); and, • Site mobilisation and welfare setup.	
Enabling Works		0-15	Importation and placement of engineering fill (where required) ○ 150 mm thick crushed stone ○ 50 mm single sized crushed limestone ○ Estimated 20,000 Tonnes to be required.	Typical maximum of 15–20 deliveries per day during peak importation periods. Engineering fill quantities and delivery rates to be managed to avoid peak traffic impacts.
1	Site Setup and Laying Foundations	15-30	This Phase involves: • Set up site and access roads, excavation of the ground, laying for concrete foundations, perimeter fencing and security. • Site Welfare and construction worker parking set–up; • Substation platform formation • Drainage and attenuation installation; and, • Temporary construction compound.	Maximum of 5 deliveries per day
2A	Installation of Solar Panel Frames	30-55	This Phase involves: • Installing ballast solution, setting-out of the frame and inverter positions; • Mounting frame assembly; • Inverter station foundations; • Internal access track; • Installation of transformers and cabling; and,	Typically 5–10 deliveries per day at peak installation.

Phase		Timeline (weeks)		Phase Description	Vehicle Movements
				• Opening and reinstatement of service trenches.	
2B		110kV Substation Construction	30-55	• Substation civil foundations • Control building construction • Transformer bund construction • Installation of primary plant (transformers, circuit breakers, busbars) • Protection and control installation	Transformer delivery will require abnormal load deliveries, typically limited to 1–2 planned events. General activity: approx. 5–10 deliveries per day during peak build-out.
3	Installation of Cabling and Ducting		55-65	This Phase involves: • Installation of MV and LV AC cables, the DC submains and mains, comms and security ducts, earthing systems, inverters and MV subs. • Inverter installation • MV cabling and trenching • Earthing system installation • 110kV cable / UGC installation.	Maximum of 2-8 deliveries per day
4	Connections and Commissioning		65-80	This Phase involves: • Electrical testing; • Energisation of 110kV substation; • Phased commissioning of PV arrays; • Grid compliance testing; and, • Demobilisation and reinstatement	Maximum of 2-5 deliveries per day

11.6.2 Construction Deliveries

The construction delivery generation for the Proposed Development has been informed through discussion with the Applicant and through assessment of recently constructed solar farms and consultation with designers.

There will be two distinct elements during the Construction Phase:

1. The enabling phase will involve site preparation and the importation of engineering fill to raise finished ground levels. This phase is currently estimated to extend for

approximately 15 weeks within the overall 80-week programme. It is anticipated that approximately 27,000 tonnes of stone will be required to achieve the proposed level increase across the Site. This will comprise 150 mm graded crushed stone overlain with 50 mm single-sized crushed limestone to provide a stable, free-draining surface suitable for operational access and equipment installation.

2. The construction period is currently estimated to last for up to 45 weeks of the 80 weeks, with deliveries fluctuating within this period. The main deliveries to the construction compound will be the solar panels, their frames and supports, including piles, materials associated with the 110kV substation (including transformer, switchgear, control building components and electrical plant), and other associated infrastructure. Solar panels, mounting systems and ancillary electrical components are typically delivered in containerised units and are readily transported to the Site by standard articulated HGVs.

Given the size of the overall development, there will not be a requirement to remove a significant amount of materials from the Site. All surplus excavated materials arising from development works will be reused onsite for landscaping works, thereby minimising the potential for traffic generation. Any necessary exceptions to this will be collected and stored in suitable receptacles before they will be taken off-site and transported to a suitably licensed waste facility in strict accordance with all requirements of the Waste Management Act and subsequent regulations.

11.6.2.1 Enabling Phase

The predicted total number of HGV deliveries during the Enabling Phase is ca. 1,115, and the weekly and daily distribution of those deliveries over the 15-week enabling timeline is indicated in Table 11-3 below.

Table 11-3: Indicative deliveries over the Enabling Phase

Weeks	HGV deliveries	Weekly HGV Deliveries	Maximum Daily HGV deliveries
1-5	372	74	15
5-10	372	74	15
10-15	371	74	15
Total	**1,115**	**222**	**45**

The median average weekly delivery rate during the enabling works (weeks 1 - 15) equates to 74 deliveries (74 inbound / 74 outbound movements) each week.

It is envisaged that the majority of movements would be Monday to Friday, with only a limited number of movements on a Saturday. Adopting these figures, the average daily trip rate over the enabling works period (15 weeks) would be approximately 15 deliveries (15 inbound / 15 outbound movements) per day.

11.6.2.2 Construction Phase

The predicted total number of HGV deliveries during the Construction Phase is ca. 1,125, and the weekly and daily distribution of those deliveries over the 55-week construction timeline is indicated in Table 11-3 below.

Table 11-4: Indicative deliveries over the construction period

Weeks	HGV deliveries	Weekly HGV Deliveries	Maximum Daily HGV deliveries
15-20	125	25	5
20-25	150	30	6
25-30	160	32	7
30-35	160	32	7
35-40	155	31	6
40-45	150	30	6
45-50	75	20	3
50-55	50	10	2
Total	**1,125**	**225**	**45**

The median average weekly delivery rate during the main construction period (weeks 1 - 45) equates to 20 deliveries (20 inbound / 20 outbound movements) each week.

It was predicted that the majority of movements would be Monday to Friday, with only a limited number of movements on a Saturday. Adopting these figures, the average daily trip rate over the course of the main construction period (45 weeks) would be approximately four deliveries (four inbound / four outbound movements) per day, with five deliveries (five inbound / five outbound movements) per day throughout the peak weeks of 20–35.

Delivery of the main power transformer to the 110kV substation will constitute an abnormal load; however, this will occur on a limited number of pre-planned occasions.

Delivery vehicles will likely attend the Site for approximately one hour per vehicle. There will be sufficient space within the Site and construction compound areas to ensure that no vehicles will have to wait at any time on the surrounding road network.

11.6.3 Construction Staff

During construction, taking into consideration the normal intensity of on-site activity and the duration of the programme, it is expected that the construction schedule is likely to require no more than 30 staff to be on the Site at any one time. Staff will arrive at the Site in the 30-minute period preceding the start of the operating day (i.e. 07:30 to 08:00hrs) and depart in the 30-minute period following the end of the operating day (i.e. 18:00 to 18:30hrs). Staff will likely travel from different origins and hence distribute their impact across the roadway network.

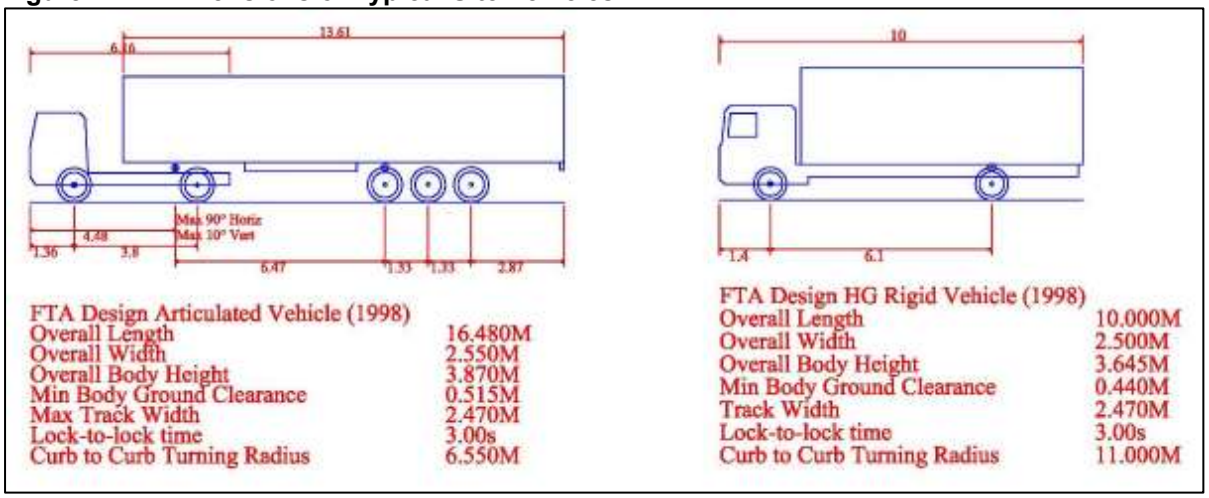
It would be expected that teams of specialist operatives will arrive together in shared transport and that other general operatives will arrive in single-occupant cars. It was assumed that no operatives will arrive by walking, cycling or use of public transport.

All workers' vehicles will park within the Site to avoid obstruction to the operation of the public roadway, and this will be strictly enforced. Temporary signage will be used to prohibit the parking of staff vehicles on the local road. The signage will direct drivers to the staff parking area.

11.6.4 Vehicles

The variety of vehicles that will need to access the Site during construction will include low-loaders to deliver plant / machinery and articulated goods vehicles to deliver materials. The dimensions of the largest of the typical vehicles likely to visit the Site during construction are shown in Figure 11-4 below.

Figure 11-4: Dimensions of Typical Site Vehicles



11.6.5 Traffic Management Speed Limits

Adherence to posted / legal speed limits will be emphasised to all staff / suppliers and contractors during induction training.

Drivers of construction vehicles / HGVs will be advised that vehicular movements in sensitive locations, such as schools and local community areas, shall be restricted to 60km/h, or other as requested by Tipperary County Council. Such recommended speed limits will only apply to construction traffic and shall not apply to general traffic. It is not proposed to signpost such speed limits in the interest of clarity for local road users.

11.7 Measures, Management and Control Processes

A management structure and control processes will be put in place to implement, monitor, and manage the CTMP. The appointed Site Manager will be responsible for the Site works, which will ensure that the control processes are efficiently communicated and implemented.

11.7.1 Working Hours

Working hours will generally be restricted to between 08:00 and 20:00 hours Monday to Friday inclusive and between 08:00 and 18:00 hours on Saturdays. Construction work will not be permitted on Sundays, public holidays or at night-time except where safety concerns necessitate it or if agreed in advance with the Planning Authority.

11.7.2 Delivery of Plant and Materials

The Contractor will be required to schedule all deliveries in such a way that construction activities and delivery activities do not occur during peak traffic flows or run concurrently with other deliveries / activities. If required, the contractor will also liaise with the management of other construction projects and the Local Authority to coordinate deliveries.

All materials associated with the development process will be stored within the proposed site boundary:

- Skips and other plant will also be stored within the curtilage of the Site;
- A loading and unloading area for plant and materials is provided on the Site. The majority of deliveries will be made via articulated vehicles; and,
- All car parking, by staff and others, will take place on the Site, not on the public road.

In order to streamline and manage the arrival / departure of construction vehicles over a working day, a delivery booking and scheduling system will be implemented. On a weekly basis, the Site Manager will evaluate the proposed daily truck movement schedule for the upcoming week and schedule it to spread out throughout the day to prevent potential overlap.

Sufficient time will be allowed between truck movements to accommodate any delays in arrival times or longer-than-expected loading / unloading. Prior to the departure of a delivery truck from the Site, the Site Manager will review the delivery schedule for that day, and if there will be any risk of conflict with another scheduled delivery arrival, the departing vehicle will be held on site until that vehicle arrives.

11.7.3 Route Compliance

Use of the agreed vehicle route will be included as a contractual requirement of the Contractor and will be communicated to all drivers.

11.7.4 Vehicle Compounds

All vehicles will use the construction compound area. The compound will be capable of accommodating a turning vehicle whilst at least one vehicle is parked, to allow for vehicles to be held back during restricted periods. All car parking, by staff and others, will take place on the Site, within the construction compound.

11.7.5 Road Cleaning / Dust and Dirt Control

Mud and debris on the road are typically among the main nuisances and safety problems arising from construction sites. Dust arises mainly when existing materials are removed or broken up, typically during the demolition of structures or the removal of earthworks.

However, in the unlikely event of dust problems arising, the contractor will use hoses to saturate all bulk materials with water, whilst loading / unloading. Burning of materials onsite will be strictly prohibited in order to prevent smoke emissions.

The contractor will ensure that the area around the Site, including the public roadway, will be regularly and adequately swept to remove any project-related dirt and material deposited on the road network by construction-related vehicles.

11.7.6 Waste Management

- All excavated materials will be reused on the Site;
- Waste materials from grid connection trenching will be collected and stored in suitable receptacles before they will be taken off-site and transported to a suitably licensed waste facility in strict accordance with all requirements of the Waste Management Act and subsequent regulations;
- Waste materials will not be allowed to accumulate because of the fire / vermin risk; and,
- All wastes will be appropriately segregated with the objective of maximising the level of recycling.

There will be no operational waste associated with the Proposed Development, with the exception of the foul wastewater that will need to be removed periodically from the storage tank by a licensed contractor. The decommissioning plan, prepared as part of the overall planning application, addresses all aspects of waste management post the Operational Phase.

11.8 Operational Phase Traffic

Operational access will also be via the L5612 and will be used for occasional maintenance visits during the Operational Phase.

The Proposed Development will not have staff on-site during the operational stage. There will be occasional visits only as required during the lifetime of the Proposed Development for the purpose of maintaining and checking the plant with no HGV traffic. The traffic generation during the operational stage will therefore be very small and insignificant.

11.9 Site Manager

A Site Manager will be appointed prior to the commencement of any works. The principal contractor shall agree and implement monitoring measures to confirm the effectiveness of the TMP. Regular inspections / spot checks will also be carried out to ensure that all project staff and material supplies follow the agreed measures adopted in the TMP.

11.9.1 Transport Co-Ordination

The Site Manager will undertake the transport co-ordination role for the Site. In this respect, their main responsibilities will include:

- Managing the implementation of the CTMP;
- Vehicle / Delivery scheduling;
- Scheduling refuse collections;
- Handling complaints; and,
- Acting as a point of contact for employees, contractors and the general public.

11.9.2 Communication

The Site Manager will be responsible for ensuring that there will be adequate liaison between the following key stakeholders throughout the construction period:

- The Contractor;
- The Applicant;
- Site neighbours;
- Other local stakeholders such as emergency services or local transport providers and,
- Tipperary County Council.

Prior to any works starting, the contractor will inform neighbours in close proximity to the Site of the nature of the works, proposed hours of work and their expected duration. In addition to this, a notice will be placed at the main entrance to the Site informing neighbours of the hours of work. Meetings and telecommunication will be held between the Site Manager and the Council as required.

11.9.3 Complaints

The Site Manager will provide any monitoring data, delivery schedules, complaints, or breaches of agreements to the Local Authority if requested.

Furthermore, the Site Manager will be available to meet and explore issues with concerned neighbours. Complaints will be addressed immediately by the construction team and will be reviewed in weekly Site meetings to ensure that any required actions will be communicated to all employees.

Contact details for the Site Manager will also be displayed at the proposed Site entrance.

11.10 Mitigation Measures

The impacts arising from the construction of the Proposed Development will be temporary in nature, extending over a period of 20 months. However, it is still important to ensure the safe and convenient use of the public road by motorists, cyclists and pedestrians and that any impact will be minimised as far as possible. To that end, the following mitigation measures have been considered:

- A dedicated person will be appointed for the management of the deliveries during the construction stage. It will also be this person’s duty to make sure the haul route will be adhered to;

- The appointed contractor will conduct a pre- and post-construction condition survey of the roads and bridges along the haul (see Figure 11-1), with the contractor liable to repair any damage to the public roads attributed to the construction of the permitted development;
- Deliveries will be scheduled to avoid morning and evening peak hours. This will avoid HGV traffic arriving during the morning peak hours and creating conflict with local residents' commute or school run. Construction personnel will also be encouraged to carpool;
- The Site entrance points and works areas will be appropriately signed during the Construction Phase. Clear construction warning signs will be placed on the approach to the Site access points and works areas, in accordance with Chapter 8 of the Traffic Signs Manual;
- Access to the working areas will be controlled by onsite personnel, and all visitors will be asked to sign in and out of the Site by security / Site personnel. Site visitors will receive a suitable Health and Safety site induction, and Personal Protective Equipment ('PPE') will be worn; and,
- To control, prevent and minimise dirt on the access route and emissions of dust and other airborne contaminants during the construction works, the following mitigation measures will also be implemented:
    - Wheel washing facilities should consist of a water bowser with pressure washer. The bowser will contain water only and no other additives. Run-off from this activity will be directed to the onsite drainage network. All drivers will be required to check that their vehicle is free of dirt, stones and dust prior to departing from the Site;
    - Any dust-generating activities will be avoided or minimised, wherever practical, during windy conditions;
    - Drivers will adopt driving practices that minimise dust generation, including a 30km/h speed limit within the works areas and the temporary compound; and,
    - Once construction of the development is completed, all portacabins, machinery and equipment will be removed and any temporary hard standing excavated.

11.11 Assessment Conclusion

The main potential period in which traffic issues might arise will be the temporary Construction Phase. The existing access to the Site will provide a safe access for all construction vehicles.

The traffic management measures, as detailed in this chapter, will minimise any potential roadway impacts to ensure roadway safety and protect the amenity of the area surrounding the Proposed Development. The key element of these measures will be that all deliveries will be required to follow a specific route on arrival and departure from the proposed site. A specific traffic management plan will be agreed with the Council for all large HGVs delivering materials to the Site. The contractor will manage this plan to minimise any potential disruption.

There will be no potential for traffic impacts to arise during the Operational Phase of the Proposed Development.

12 CONCLUSIONS

12.1 Cumulative Effects

There is a clear justification for the need for the Proposed Development. The Proposed Development is in line with national action plans on greener energy. There has been extensive review of the planning history for the surrounding area and no cumulative impacts associated with the Permitted Developments were predicted as a result of the Proposed Development. Furthermore, the Proposed Development will not give rise to any in combination effects on ecological, landscape and visual, hydrological, acoustic, cultural heritage and traffic receptors.

12.2 Assessment Conclusions.

MOR have prepared this ER in support of an SID application in respect of both the construction and operation of the proposed 110kV substation and UGC in Co. Tipperary.

The key conclusions of the ER are that the Proposed Development will not result in any likely or significant environmental impacts based on the following:

- The design has taken full cognisance of all requirements of all relevant development plans;
- The Site is located within the National Bioeconomy Campus that will be developed on the former Lisheen Mine Site. The permitted solar farm will be integral to the development of the overall campus.
- The Permitted Solar Development will not be able to function as a standalone development as it will be reliant on connections to the Proposed Development in order to connect to the grid. In addition, the design of the Proposed Development will allow for ready expansion to serve other renewable developments;
- The AA undertaken concluded that activities associated with the Proposed Development either alone, or in-combination with other projects or land uses, will not have any direct or indirect adverse impacts on the conservation objectives of any Natura 2000 Sites;
- The Ecological Assessment concluded that the lands within the Site are currently of low ecological value, and that the Proposed Development will not have any direct or indirect adverse impacts on the conservation objectives of any Natura 2000 sites or on any notable / protected flora and fauna;
- The landscaping proposed as part of the Permitted Development will ensure that the Proposed Development will not result in any significant residual impacts on receptors in regard to direct visual impacts;
- A Preliminary Site-Specific Flood Risk assessment confirmed that the Proposed Development will not result in any increased flood risk;
- The Proposed Development will not require any alternations to the existing drainage network and no specific drainage infrastructure will be required;
- The Site levels will be increased by ca. 1m with imported engineering fill materials, to raise future site levels above high winter water table.
- The Site is located in an area classed as having ‘Low’ landscape sensitivity. It is not considered that at a local level, this landscape is highly sensitive or highly susceptible to change. There will be no impacts, direct, indirect, or residual on receptors in regard to visual amenity of the area;
- During the construction period the potential exists for temporary noise nuisance. However, due to the distance of the proposed construction works from the NSR’s identified and the general methods that will be involved in constructing the Proposed

Development, these will not exceed standard construction noise limits at nearby NSR's;

- Detailed noise modelling concluded that there will be no cumulative noise impacts arising from the Permitted Solar Development and Proposed Development at any nearby receptors either during day or night-time periods;
- A Preliminary Construction Environmental Management ('pCEMP') has been submitted in support of the planning application. This pCEMP will be used by the appointed contractor to prepare an updated and comprehensive CEMP prior to the commencement of any on-site works. It is proposed that this plan will be agreed with the Council in advance and will be fully implemented during the construction of the Proposed Development;
- The CTMP outlines strategies to mitigate transport-related impacts during the proposed development's construction phase. The plan focuses on minimising congestion and disruption to the local road network, as well as reducing environmental impacts and safety risks associated with the permitted development. It includes details on working hours, temporary compounds, parking arrangements, traffic routing, deliveries, enforcement, complaint management, staff movements and travel, as well as controls for noise, mud and debris;
- The CTMP is a working document and will be fully implemented during the construction of the Overall Development, to minimise any impacts on the existing road network during this temporary period;
- No protected archaeological sites will be impacted either directly or indirectly as a result of the Proposed Development;
- The applicant will fully implement all of the environmental commitments outlined in Section 13; and,
- The Proposed Development will have a design life of approximately 40 years at which time it will be fully decommissioned, and lands reinstated.

13 ENVIRONMENTAL COMMITMENTS

Commitment
General
• Construction works will comply with all relevant legislation and best practice to reduce any potential environmental impacts; • A comprehensive CEMP will be submitted to the Planning Authority for approval prior to the commencement of construction works; • The contractor shall ensure that all personnel working on site are trained and aware of the mitigation measures detailed within the ER; • Sufficient setbacks will be implemented from all sensitive receptors- adjacent dwellings, transport route receptors (road or rail), on-site tree / hedge lines and drainage ditches; and, • Construction works will be restricted to normal working hours, 08:00-20:00 Monday to Friday and 08:00-18:00 on Saturday with the exception of essential activities such as repairs.
Biodiversity
General Measures – Construction • An EcoW will inspect the Site before works commence and will undertake Site inspections as required during the works; • Any removal of vegetation will be scheduled to take place outside of the nesting bird season, typically considered to be between the 1st March to 31st August (weather dependant). Should works be required within this season, they will need to approved by the appointed project EcoW; • In advance of works, all Site personnel will receive an induction which will include reference to mitigation measures in relation to protected species; • During construction, all boundary trees and treelines that are to be retained will be protected from unnecessary damage; • All works and infrastructure will be set back a minimum of 5-6m to ensure that no impacts occur on existing drainage ditches or hedge / treeline; • All works will be set back a minimum of ca. 40m from all EPA watercourses; • Should construction works be required outside of daylight hours, the appointed project EcoW will be consulted as required; • Protected Species posters will be erected on the Site notice board and maintained throughout the duration of the works; and,

Commitment
• All vehicles, machinery and any other equipment that may be used for the works will be washed and cleaned as required prior to being used on the Site to prevent the import of plant material / seeds.
Protection for Mammals: Badgers • Where deep excavations will be required onsite, appropriate measures to protect mammals from ingress will be installed; • Obvious mammal paths will be left clear of obstruction to allow for the free movement of smaller mammals throughout the landscape; and, • If unidentified burrows are identified within the works area during construction, the project EcoW will be contacted for advice.
Water
Construction – Water Quality • All materials shall be stored at the main contractor compound and transported to the works zone immediately prior to construction; • Excavations will be left open for minimal periods to avoid acting as a conduit for surface water flows; • No surface water runoff will be discharged onto public roads, foul sewers or adjacent property; • Weather conditions will be considered when planning construction activities to minimise risk of run off from the Site; • Provision of exclusion zones and barriers between any stockpiled materials and any surface water features to prevent sediment washing into the receiving water environment; • An Environmental Clerk of Works shall be engaged to periodically inspect all elements of the works for their entire duration; • Emergency response procedures will be put in place; • Chemicals used will be biodegradable where possible; • Preventive maintenance and relevant maintenance logs will be kept for all onsite plant and equipment; • Adequate spill kits, including absorbent booms and other absorbent material, will be maintained on site; • All contractor workers will be appropriately trained in the use of spill kits; • Any spillage of cementitious materials will be cleaned-up immediately;

Commitment
• Silt fences will be installed on the southern perimeter of the Proposed Development area of the Site to ensure that any potentially contaminated runoff from the northern area of the Site won't enter the groundwater/ bedrock aquifer in the southern area of the Site, where extreme groundwater vulnerability conditions are present; • Any sediments adversely effected by contamination will be excavated and stored in appropriate sealed containers for disposal off site in accordance with all relevant waste management legislation; • The working area will be clearly defined, and construction activities will be carefully planned to minimise ground disturbance; • Stockpiles of material will be covered during periods of prolonged or heavy rain; • Concrete pours will be adequately planned and executed; • Any pouring of concrete will only be carried out in dry weather. Washout of concrete trucks will not be permitted on site; • Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening; • Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete; • Surplus concrete will be returned to the batch plant or off-site concrete wash facility after completion of a pour; • Any spillage of cementitious materials will be cleaned up immediately; and, • Washouts of equipment used for concrete operations will be done either off-site or within a designated washout area, which will comprise a container that will capture the washout material / water for reuse or disposal off-site. • Any chemical / oils to be stored onsite will be placed within a bund on an area of hardstanding to ensure there is no seepage of pollutants into groundwater or surface water; • All bunds will have the capacity of the largest tank volume plus 10 per cent, at a minimum, with additional capacity to hold 30mm of rainfall; • All drainage from bund areas will be directed to secure containment prior to suitable disposal; • Fuelling, refuelling and lubrication of equipment will be carried out off-site; • All plant and machinery will be serviced before being mobilised to the Site; • No vehicle or equipment maintenance work will take place onsite; • Appropriate containment facilities will be provided to ensure that any spills from vehicles are contained and removed off-site. Adequate stocks of absorbent materials, such as sand or commercially available spill kits, shall be available;

Commitment
• The Contractor shall ensure that all personnel working onsite will be trained in pollution incident control response; • A regular review of weather forecasts for heavy rainfall events will be undertaken with works scheduled accordingly; • No storage of hydrocarbons or any polluting chemicals will occur within 5m of watercourses or surface water features; • Design and installation of fuel bowsers to be in accordance with best practice guidelines; • Drip trays and spill kits will be kept available onsite; • Cabins, containers, workshops, plant, materials storage and storage tanks shall not be located within 20m of any watercourse; • Measures will be implemented to minimise waste and ensure correct handling, storage, and disposal of waste; • Fuel and oil stores, including tanks and drums will be regularly inspected for leaks and signs of damage; and, • Drip trays will be used for fixed or mobile plant, such as pumps and generators, in order to retain oil leaks and spills. • The contractor will undertake periodic visual monitoring during construction to ensure the above measures are effective. • Additionally, the contractor will maintain a drainage inspection regime to ensure there is no negative impact to the drainage patterns at the Site.
Noise
Construction • Activities and deliveries to the Site to occur only during permitted hours; • The following noise limits will apply the façade of dwellings during construction activities (BS5228 ABC Method for assessing Construction Noise Impact); ○ $L_{Aeq,1hr}$ 65dB – Daytime (7am to 7pm Monday to Friday, & 7am to 1pm Saturday); ○ $L_{Aeq,1hr}$ 55dB – Evening & Weekends; and, ○ $L_{Aeq,1hr}$ 45dB – Night-time (11pm to 7am). ○ NSR03 and NSR06 are commercial receptors and not residential dwellings, a $L_{Aeq,1hr}$ 75dB limit will apply for these NSRs. • All plant where possible shall be low noise rated; • Where necessary the use of enclosures and noise screens shall be used to control noise from plant;

Commitment
• Onsite policy for all plant and equipment, including Site delivery vehicles, to power off rather than to be left with idling engines; • All plant and vehicles on the Site will be in a fit condition for use, to prevent the addition of noise from maintenance issues; • Working Method Statements will be developed for the Site Construction Personnel to ensure optimal working procedures are employed, thereby minimising time spent in proximity to NSRs; and, • A Site Representative will be appointed to receive and respond to any noise complaints received from local residents, the Local Authority, and any other regulatory body.
Material Assets – Traffic

• All construction vehicles arriving and departing from the site will follow a dedicated route. This route has been carefully selected to maximise the use of the National Road network. All truck drivers will be notified of this route in advance of commencement of their journey. The main contractor will strictly enforce the traffic management plan to ensure that all construction vehicles will follow this route. Deliveries to the Site will be carefully coordinated to minimise the risk of arriving and departing trucks meeting on the L725. If required, departing trucks will be held on site until a truck delivering to the Site has arrived;
• The appointed contractor will conduct a pre – and post-construction condition survey of the roads and bridges along the haul route's, with the contractor liable to repair any damage to the public roads attributed to the construction of the Proposed Development;
• Deliveries will be scheduled to avoid morning and evening peak hours. This will avoid HGV traffic arriving during the morning peak hours and creating conflict with local residents' commute or school run. Construction personnel will also be encouraged to car-pool;
• The site entrance points and works areas along the cable route will also be appropriately signed during the construction phase. Clear construction warning signs will be placed on the approach to the site access points and works areas, in accordance with Chapter 8 of the Traffic Signs Manual;
• Access to the working areas will be controlled by onsite personnel and all visitors will be asked to sign in and out of the site by security/site personnel. Site visitors will receive a suitable Health and Safety site induction and Personal Protective Equipment ("PPE") will be worn; and,
• To control, prevent and minimise dirt on the access route and emissions of dust and other airborne contaminants during the construction works, the following mitigation measures will also be implemented:
  ○ Wheel washing facilities should consist of a water bowser with pressure washer. The bowser will contain water only and no other additives. Run-off from this activity will be directed to the onsite drainage network. All drivers will be required to check that their vehicle is free of dirt, stones and dust prior to departing from the site;
  ○ Any dust generating activities will be avoided or minimised, wherever practical, during windy conditions;

Commitment
○ Drivers will adopt driving practices that minimise dust generation including a 30km/h speed limit within the works areas and the temporary compound; and, ○ Once construction of the development is completed, all portacabins, machinery and equipment will be removed and any temporary hard standing excavated.

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