Planning and Environmental Consultants

Environmental Impact Assessment (EIAR)

Killoshulan Wind Farm

Non-Technical Summary



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NON-TECHNICAL SUMMARY

This Non-Technical Summary (NTS) provides a plain-language overview of the findings of the Environmental Impact Assessment Report (EIAR) prepared for the proposed Killoshulan Wind Farm in County Kilkenny. The document mirrors the structure of the EIAR, with Sections 1 to 17 corresponding directly to Chapters 1 to 17 of the EIAR and presents the key findings of the environmental assessments in a concise and accessible format.

1 Introduction

This EIAR has been prepared to identify, describe and assess the likely significant effects of the Proposed Project on the environment during construction, operation and, where relevant, decommissioning.

For the purposes of this EIAR:

- Where the 'Proposed Project' is referred to this encompasses the entirety of the project for the purposes of this EIA in accordance with the EIA Directive. The Proposed Project is described in detail in Chapter 4 of this EIAR.
- Where the 'Proposed Wind Farm' is referred to, this refers to turbines (Proposed Turbines) and associated foundations and hardstanding areas, including entrances and access roads, underground cabling, permanent meteorological mast, temporary construction compounds, turbine delivery accommodation works, spoil management areas, borrow pit, tree felling, site drainage, operational stage signage, battery energy storage system (BESS), biodiversity enhancement areas and all ancillary works and apparatus. The Proposed Wind Farm is described in detail in Chapter 4 of this EIAR.
- Where the 'Proposed Grid Connection' is referred to, this refers to the on-site 110kV Substation, all ancillary works and underground 110kV grid connection cabling connecting to the existing Ballyragget 110kV Substation, Co. Kilkenny, and all ancillary works and apparatus. The Proposed Grid Connection is described in detail in Chapter 4 of this EIAR.
    - The 'Proposed 110kV Substation' refers to the new proposed onsite electricity infrastructure proposed within Frankford or Ballykeiran townland, Co. Kilkenny comprising 2 no. control buildings and the electrical substation components necessary to consolidate the electrical energy generated by each wind turbine and export that electricity from the onsite 110kV substation to the national grid.
    - The 'Proposed 110kV Underground Cabling' refers to new proposed 110kV underground electrical cabling connection from the 'Proposed 110kV Substation' to the existing 110kV Ballyragget substation, in the townland of Moatpark, approximately 1km north of Ballyragget, Co. Kilkenny. The underground electrical cabling route measures approximately 12.6km in length, the majority of which is located within the curtilage of the public road network.
- Where the 'Site' is referred to, this relates to the primary study area for the EIAR, as delineated by the EIAR Site Boundary in green as shown on Figure 1-1 of the EIAR and encompasses an area of approximately 796 hectares. Where the 'Proposed Wind Farm site' is referred to, this relates the EIAR Site Boundary without the corridor that encompasses the Proposed 110kV underground cabling route.

The development description for the current planning application as it appears in the public notices is as follows: The proposed development will consist of the provision of;

The proposed project will consist of the provision of the following:

i. *The construction of 10 no. wind turbines with an overall turbine tip height of 185 metres; a rotor blade diameter of 163 metres; and hub height of 103.5 metres, and associated foundations and hard standing areas;*
ii. *A permanent 110kV substation compound (2 no. control buildings with welfare facilities, all associated electrical plant and equipment, security fencing, entrance on to existing track, all associated underground cabling, wastewater holding tank, site drainage and all ancillary works;*
iii. *Underground internal wind farm electrical cabling and communications cabling connecting the wind turbines to the proposed on-site 110kV electrical substation and associated ancillary works;*
iv. *A meteorological mast of 103.5m in height, and associated foundation and hard-standing area;*
v. *All works associated with the upgrade of the existing agricultural access off the R693 Regional road (including the installation of fencing and steel gates) to serve as the main site entrance for the wind farm;*
vi. *The provision of 1 no. new access points along the R693 Regional Road;*
vii. *The provision of 1 no temporary access point along the L1805;*
viii. *Upgrade of existing tracks/roads and junctions and provision of new site access roads and junctions;*
ix. *2 no. temporary construction compounds with temporary offices and staff welfare facilities;*
x. *Accommodation works along the public road network in the townlands of Urlingford, Mountfinn, Balief Lower, Balief Upper, and Barna Co. Kilkenny to facilitate the delivery of turbine components and other abnormal loads;*
xi. *1 no. Borrow Pit;*
xii. *Spoil Management;*
xiii. *Site Drainage;*
xiv. *Tree Felling and hedgerow removal;*
xv. *Biodiversity Management and Enhancement Measures;*
xvi. *Operational stage site signage;*
xvii. *Battery Energy Storage System and all associated electrical plant and equipment, security fencing, 2 no. static water storage tanks and a firewater retention tank, and all associated infrastructure and apparatus;*
xviii. *The provision of underground electrical (110kV) and communications cabling from the proposed on-site 110kV electrical substation to the existing Ballyragget 110kV electrical substation to facilitate the connection to the national grid*
xix. *Provision of 17 no. joint bays, communication chambers and earth sheath links along the proposed underground electrical cabling route;*
xx. *Reinstatement of land, road and track surface above the proposed cabling trench; and*
xxi. *All related site works and ancillary development considered necessary to facilitate the proposed development, including landscaping and the reinstatement of land.*

The applicant is seeking a ten-year planning permission for development and 35-year operational life from the date of commissioning of the wind farm development.

This EIAR assesses that the wind turbine model installed as part of the Proposed Project will have a generating capacity mix of 4MW and 7MW, which is typical of modern wind turbine generators, leading to a combined generating capacity of 62MW (10 no. turbines at 6.2MW each).

The Proposed Wind Farm turbines are located approximately 4km west of the village of Freshford, 5.5km east of the village of Urlingford, Co. Kilkenny and approximately 15km northwest of Kilkenny City. Co. Kilkenny. Current land-use on the Proposed Wind Farm comprises commercial forestry, agricultural pastural land, mixed forest and transitional woodland-shrub. Current land-use along the Proposed Grid Connection comprises of public road corridor, public open space, agriculture, commercial forestry, land principally used by agriculture with significant areas of natural vegetation,

mineral extraction sites, mixed forest and discontinuous urban fabric. Land-use in the wider landscape of the site comprises a mix of agriculture, quarrying, renewable energy, low density residential and commercial forestry. Land-use in the areas proposed for turbine delivery route accommodation comprises a mix of agriculture, transitional woodland-shrub, and coniferous forest and public open space.

Applicant

The applicant for the Proposed Project, Killoshulan Renewable Energy Ltd, is a subsidiary of Atlantic Infrastructure Renewables Ltd. (AIR), which is an Irish-owned, Limerick-based company.

AIR invests in infrastructure projects across Ireland. Their projects help deliver high-quality infrastructure assets that are essential to society and the communities where they are located. AIR helps bridge funding, capacity, and delivery gaps and provides critical infrastructure ahead of when others might have been able to so.

Need for the Proposed Project

Ireland faces significant challenges to its efforts to meet EU targets for renewable energy by 2030 and its commitment to transition to a low carbon economy by 2050. Further detail can be found in Chapter 2 of this EIAR.

The Proposed Project provides the opportunity to capture an additional part of County Kilkenny's valuable renewable energy resource. If the Proposed Project were not to proceed, this opportunity to harness the wind energy resource of County Kilkenny's valuable renewable energy resource would be lost, as would the opportunity to further contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions.

Economic Benefits

The Proposed Project will have both long-term and short-term benefits for the local economy including additional income to local landowners, job creation, work opportunities for local businesses and service providers, local authority commercial rate payments and a Community Benefit Fund.

It is estimated that the Proposed Project has the potential to create in the order of 100-120 jobs during the construction phase and 3-4 jobs during operational and maintenance phases. During construction, additional indirect employment will be created in the region through the supply of services and materials. There will also be income generated by local employment from the purchase of local services i.e., travel, goods and lodgings. Further details on employment associated with the Proposed Project are presented in Chapter 5 of this EIAR, Population and Human Health.

Should the Proposed Project receive planning permission, and be developed under the Renewable Energy Support Scheme (RESS), the proposed Community Benefit Fund would attract a community contribution in the region of approximately €380,000/year for the first 15 years of operation, to be used by the local community (based on the current RESS T&C's). If this project is constructed as currently designed, we estimate that a total of approximately €5.96 million will be available in the local area for community funding over the lifetime of the project. The above figure is indicative only and will be dependent on the generation capacity of the wind farm which is influenced by a number of factors including:

1. *Number of wind turbines.*
2. *Capacity and availability of energy production of those turbines.*
3. *Quantity of wind.*

Purpose and Scope of the EIAR

The purpose of this EIAR is to document the current state of the environment on and in the vicinity of the Site and to quantify the likely significant effects of the Proposed Project on the environment. The compilation of this document serves to highlight any areas where mitigation measures may be necessary in order to protect the surrounding environment from the possibility of any negative impacts arising from the Proposed Project. This EIAR uses the grouped structure method to describe the existing environment, the potential impacts of the Proposed Project thereon and the proposed mitigation measures. Background information relating to the Proposed Project, scoping and consultation undertaken and a description of the Proposed Project are presented in separate sections.

The EIAR project team comprises a multidisciplinary team of experts with extensive experience in the assessment of wind energy developments and in their relevant area of expertise. Each chapter of this EIAR has been prepared by a competent expert in the subject matter. The chapters of the EIAR are as follows:

1. Introduction
2. Background to the Proposed Project
3. Considerations of Reasonable Alternatives
4. Description of the Proposed Project
5. Population and Human Health
6. Biodiversity
7. Ornithology
8. Land, Soils and Geology
9. Hydrology and Hydrogeology
10. Air Quality
11. Climate
12. Noise and Vibration
13. Landscape and Visual
14. Cultural Heritage
15. Material Assets
16. Major Accidents and Natural Disasters
17. Interactions of the Foregoing
18. Schedule of Mitigation Measures
19. Summary of Significance of Effects

A Natura Impact Statement has also been prepared in line with the requirements of the Habitats Directive and accompanies this planning application.

2 Background to the Proposed Project

Chapter 2 presents the relevant international, national, regional and local planning, renewable energy and climate change policies and objectives. It also outlines the planning history of the Site, summarises scoping, pre-application and community consultations undertaken and describes the cumulative impact assessment process. This Chapter should be read in conjunction with the Planning Report accompanying the planning application.

The Proposed Project is being brought forward in response to international, national, regional and local policy supporting Ireland's transition to a carbon-neutral and climate-resilient, a key objective of the National Planning Framework First Revision ('Revised NPF'). The Southern Region is allocated a target of installing an additional 978 Megawatts ('MW') of onshore wind energy by 2030 under the Revised NPF.

The need to decarbonise the economy and reduce emissions has always been imperative, however in recent years the urgency involved has become clearer to all stakeholders. The latest Climate Action Plan 2025 ('CAP25') sets out the detail for taking action to deliver the decarbonisation required under

the carbon budgets and sectorial emissions ceilings. Central to this are the measures set out to increase the proportion of renewable electricity to up to 80% and a target of 9GW from onshore wind by 2030.

The Climate Action and Low Carbon Development Act 2015 (as amended) ('the Climate Act') commits Ireland to a legally binding target of net-zero emissions no later than 2050, and a cut of 51% by 2030 (compared to 2018 levels). To ensure that climate targets are met, Section 15 of the Climate Act requires all public bodies to exercise their functions in a manner consistent with, in so far as practicable, the national climate objective and the latest climate policy. Renewable energy projects such as the Proposed Project are key to helping Ireland achieve these legally binding climate targets.

Failure to meet binding European Union (EU) targets will expose Ireland to financial penalties, increased carbon credit costs, and continued dependence on fossil fuel imports—posing serious risks to energy security and economic stability. Furthermore, Ireland's national interest requires the rapid expansion of renewable energy, making this a matter of strategic economic and social importance.

Every viable renewable energy project plays a crucial role in meeting Ireland's climate targets. The approval of well-planned, appropriately located renewable energy projects, such as the Proposed Project is not just beneficial—it is imperative. Without decisive action to facilitate renewable energy deployment, Ireland risks missing national and EU commitments, incurring financial penalties, and undermining energy security.

The Proposed Project is considered in the context of the Renewable Energy Directive III (Directive (EU) 2023/2413) ('RED III') and the planning application is subject to a completeness check under section 34D of the Planning and Development Act 2000, as amended by the European Union (Planning and Development) (Renewable Energy) Regulations 2025.

Local Planning Policy

The Kilkenny City and County Development Plan 2021-2027 ('KCCDP') came into effect on the 15th of October 2021. Kilkenny County Council ('KCC') have made 10 no. Variations to the KCCDP. However, it should be noted that the Variations do not relate to the climate and renewable energy policies or objectives within the KCCDP (as varied). On 15th October 2021, following a recommendation from the Office of the Planning Regulator ('OPR'), the Minister of State at the Department of Housing, Local Government and Heritage notified KCC of their intention to issue a Ministerial Direction concerning the KCCDP. The Direction related to sections of Chapter 11 – Renewable Energy, including renewable energy targets and wind strategy areas. The draft direction arose due to inconsistencies with national planning guidelines, the absence of defined renewable energy targets in megawatts, and the reduction of areas considered suitable for wind energy development, potentially undermining the County's target of 201MW of renewable energy capacity by 2030.

As the affected provisions of the KCCDP are deemed not to have come into effect, the associated Wind Energy Strategy Areas and policies cannot be taken into account. The Proposed Project has therefore been assessed in line with the relevant adopted policies of the KCCDP (as varied), and the provisions of the Kilkenny County Development Plan 2014-2020 (KCCDP 2014-2020) which remain in effect under Section 31(6)(b) of the 2000 Act since there has been no conclusion the Minister's intervention in the KCCDP at time of writing.

The KCCDP provides for the development of indigenous energy resources, with an emphasis on renewable energy supplies. The Council acknowledges the importance of renewable energy in reducing anthropogenic GHG emissions and the contribution of renewable energy in achieving national and EU target net zero GHG emissions by 2050.

Wind Energy Development Guidelines

Regarding wind energy Development Management Guidance, the KCCDP (as varied) states that "*all planning applications for wind energy developments shall be assessed against the DEHLG's Wind Energy Development Guidelines, 2006, (and any subsequent update of these guidelines) and the County Council's Wind Strategy*".

In the absence of an up to date Wind Energy Strategy for Kilkenny due to the Draft Ministerial Direction on the KCCDP (as varied), it is noted that the design and layout of the Proposed Wind Farm follows the recommendations and guidelines set out in the Wind Energy Development Guidelines published by the then Department of Environment, Heritage and Local Government (DoEHLG) in June 2006 (the Guidelines (DoEHLG, 2006)), and the *'Best Practice Guidelines for the Irish Wind Energy Industry'* published by the Irish Wind Energy Association in 2012. The design and layout of the Proposed Wind Farm also has regard to the draft Revised Wind Energy Development Guidelines published by the then Department of Housing, Planning and Local Government (DoHPLG) in December 2019 (the Draft Guidelines (DoHPLG, 2019)). Should the Draft Guidelines (DoHPLG, 2019) be adopted in advance of a planning decision being made on the planning application, the Proposed Project will be capable of achieving the requirements of the Draft Guidelines (DoHPLG, 2019) as currently proposed.

Planning History

A planning search was carried out through the national planning application database and An Coimisiún Pleanála's ('ACP') online planning portal in October 2026 for relevant planning applications submitted within the past 10 years that fall within the planning application red line boundary of the Proposed Project.

A planning search was carried out to establish proposed, permitted and operational wind energy developments within 25km of the Proposed Turbines. In total, 24 no. wind energy developments were identified within 25km of the Proposed Turbines of the Proposed Project, 22 no. of which relate to proposed, permitted or existing multiple-turbine wind farm developments and a further 2 no. of which relate to proposed, permitted or existing single-turbine developments.

Scoping and Consultation

An EIAR scoping document, providing details of the Proposed Project, was prepared by MKO and circulated in January 2022. The scoping document provided details of the Proposed Project and set out the scope of work for the EIAR. Consultees were invited to contribute to the EIAR by suggesting baseline data, survey techniques and potential impacts that should be considered as part of the assessment process and in the preparation of the EIAR. A revised scoping exercise was carried out in May 2026 due to time elapsed from when previous scoping was carried out, updates in local and national policy and legislation, updates in relevant EIAR guidance, changes in the environmental baseline and refinement of the Proposed Project layout and design. Consultees were invited to contribute again to the EIAR, following these changes. Scoping responses are included in Appendix 2-1.

Pre-planning consultation meetings were undertaken with KCC under the provisions of Section 247 of the Planning and Development Act 2000, as amended ('the Planning Act'), and ACP under the provisions of Section 182E and Section 37B of the Planning Act. On the 18th of August 2026, the Applicant issued a letter to ACP requesting the withdrawal of the Section 182E pre-application consultation request, as it was proposed to submit a single SID planning application for the Proposed Project which includes both the Proposed Wind Farm and the Proposed Grid Connection under the provisions of Section 37E of the Planning Act, subject to an SID determination from ACP.

ACP deemed this acceptable and issued an SID Determination letter on 9th October 2026 stating that under Section 37B, it is the opinion of ACP that the Proposed Project falls within the scope of the paragraphs 37A(2)(a) and (b) of the Planning Act.

Community engagement has also been undertaken by the Applicant including a Public Information Event held in the local area on 1st September 2026. Further details are provided in the Community Engagement Report at Appendix 2-2. The consultation process has been an extremely valuable exercise and has provided a detailed, and enhanced understanding of the key issues and concerns of the local community. There is currently on-going consultation with the local community, and it is the intention of the Applicant to continue with the consultation for the entire lifespan of the Proposed Project.

Cumulative Impact Assessment

The EIA Directive and associated guidance documents state that as well as considering any direct, indirect, secondary, transboundary, short, medium-, and long- term, permanent and temporary, positive and negative effects of the project the description of likely significant effects should include an assessment of cumulative impacts that may arise.

To gather a comprehensive view of cumulative impacts on these environmental considerations and to inform the EIAR process being undertaken by the consenting authority, each relevant impact assessment chapter within the EIAR includes a cumulative impact assessment, where appropriate. The potential for cumulative impacts arising from other projects has therefore been fully considered within the EIAR. A long list of all plans and/or projects considered by each of the different disciplines in their cumulative impact assessment are included in Appendix 2-3 of the EIAR.

The Proposed Project has been designed to avoid and mitigate impacts on the environment, and a suite of mitigation measures is set out within the EIAR. The mitigation measures set out in the EIAR will ensure that significant cumulative effects do not arise during the construction, operational or decommissioning phases of the Proposed Project.

3 Consideration of Reasonable Alternatives

Ch. 3 '*Consideration of Reasonable Alternatives'* contains a description of the reasonable alternatives that were studied by the Applicant, which are relevant to the Proposed Project and its specific characteristics, in terms of site location and other renewable energy technologies, as well as site layout incorporating size and scale of the Proposed Project, connection to the national grid and transport route options to the Proposed Wind Farm. This chapter also outlines the design considerations in relation to the Proposed Project. It provides an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects. The consideration of reasonable alternatives is an effective means of avoiding environmental impacts.

Alternative Site Locations

The process of identifying a suitable location for a development such as the Proposed Project is influenced by a number of factors. While wind speeds, the extent of suitable or available land, proximity to the grid connection point, and planning policy are all very important, a wind farm project must also be commercially viable or it will not attract the necessary project finance required to see it built.

The Site has been identified as having potential for a wind energy development as a result of a nationwide search of suitable lands. The site selection process has been constraints (restrictions that inform the location and design of a project by highlighting sensitivities) and facilitators (factors that give an advantage to a proposed project) led.

Alternative Renewable Energy Technologies

When considering other renewable energy technologies, the Applicant considered offshore wind and commercial solar energy production as an alternative to the Proposed Wind Farm.

The Applicant has a keen interest in offshore wind farms and has explored potential offshore sites. However, it is considered that due to delays with the regulatory process for offshore development, a combination of both onshore and offshore wind farm development will continue to be required to deliver on the ambitious renewable energy targets set out under CAP25. As such, the Applicant's primary focus remains to be onshore wind farms, and they will continue to explore potential development offshore in tandem with delivering suitable sites onshore such as the Proposed Project.

The amount of electrical energy output from renewable generation is generally described in terms of capacity factor. The capacity factor relates to the amount of energy that may be achieved from a renewable technology over the period of one calendar year. Generally solar PV has a lower capacity factor than wind generation. One factor in the energy yield difference is that solar PV does not produce electrical energy at night, but the wind can blow at any time of the day or night.

A solar PV array of the scale necessary to provide the same electricity output as the Proposed Wind Farm Site would require a footprint almost 6 times that Proposed Project footprint. In addition, a solar development of this scale, would have a higher potential environmental effect on Traffic and Transport (construction phase), Air Quality (construction phase) and Biodiversity and Ornithology (habitat loss), a greater potential for direct impacts on unknown subsurface archaeology (construction phase) and glint and glare at the Site (operational phase).

Taking into account the factors outlined above, and considering the forestry and farming practices in the area, it has been determined that wind energy is the most suitable renewable energy technology for the Site with the lesser potential for significant, adverse environmental effects.

Alternative Turbine Numbers and Model

The Proposed Project will have an estimated installed capacity of 62 MW (6.2MW per turbine). Such a wind farm could also be achieved by using smaller turbines (for example, 2.5 MW machines). However, this would necessitate the installation of 25 turbines to achieve a similar output. The selected turbine dimensions and number of turbines for the Proposed Wind Farm is considered to strike the right balance compared to the other alternatives considered in relation to overall development footprint, reducing the potential for environmental effects, while still achieving the optimum output at a more consistent level than would be achievable using different turbines.

Constraints and Facilitators Mapping

The design and layout of the Proposed Project follows the recommendations and guidance set out in the Guidelines (DoEHLG, 2006) and the *'Best Practice Guidelines for the Irish Wind Energy Industry'* (Irish Wind Energy Association, 2012).

The constraints mapping process involves the placing of buffers around different types of constraints so as to clearly identify the areas within which no development works will take place. Should the Draft Guidelines (DoHPLG, 2019) be adopted in advance of a decision being made on this planning application, the Proposed Project will be capable of achieving the requirements of the Draft Guidelines (DoHPLG, 2019) as currently proposed.

The layout for the Proposed Wind Farm included the following constraints and associated buffers:

- **Sensitive Receptors:** a minimum 740-metre setback from third party sensitive receptors (residential dwellings), providing for the 4 x tip height separation distance as recommended the draft Guidelines;

- **Telecommunications**: Setback buffers determined following detailed assessment of telecommunication links that traverse the Proposed Wind Farm site boundary.
- **Designated Sites/Natura 2000:** a minimum 100-metre setback of the Proposed Project infrastructure from Special Areas of Conservation, Special Protected Areas and Proposed Natural Heritage Areas;
- **Hydrology:** Watercourses plus 50m buffer;
- **Archaeology:** Archaeological Sites or Monuments: 50-metre buffer, plus 'Zone of Notification' as required by the National Monuments Service (ROI). Recorded Monuments plus 50m buffer;
- **Transport**: Draft WEDG 2019 setback from National and Regional roads and railways of a distance equal to turbine tip height plus 10% (i.e., 203.5m). To note, for the purposes of identifying the greatest setback buffer from national and regional roads and railway, a tip height of 185m has been utilised.

Facilitators at the Site build on the existing advantages and include the following:

- Available lands for development;
- Acceptable wind resource;
- Proximity to national grid node;
- Opportunity to win construction materials on site, minimising the potential for additional traffic (and associated environmental impacts) and cost generation by acquiring all materials offsite; Existing access points and general accessibility of all areas of the Site due to existing road infrastructure; and,
- Limited extent of constraints.

The inclusion of the constraints on a map of the Proposed Wind Farm site allowed for a viable area to be identified. An initial turbine layout was then developed to take account of all the constraints mentioned above and their associated buffer zones and the separation distance required between the turbines. Following the mapping of all known constraints, detailed site investigations were carried out by the project team including, ecological, hydrological & hydrogeological, and Geotechnical.

The turbine layout for the Proposed Wind Farm has also been informed by the results of noise assessments, landscape and visual assessments, and the separation distance to be maintained between turbines. Thus, the baseline environmental assessment of the Site and wind farm design was an iterative process, where findings at each stage of the assessment were used to further refine the design, always with the intention of minimising the potential for environmental impacts.

Alternative Proposed Project Layout Iterations

The design of the Proposed Project has been an informed and collaborative process from the outset, involving the designers, developers, engineers, landowners, environmental, hydrological and geotechnical, landscape, archaeological, and traffic specialists, all with the objective of reducing the potential for environmental effects while designing a project that is capable of being constructed and viable.

Throughout the preparation of this EIAR, the layout of the Proposed Project was revised and refined to take account of the findings of all site investigations and baseline assessments, and the recommendations and comments of the relevant statutory and non-statutory consultees, the local community and local authority.

The final design of the Proposed Project takes account of all site desktop constraints and the results of the site investigations. The initial constraints study identified a significant viable area within the overall study area of the original site. The initial turbine layout comprised of up to 13 no. turbines, however the proposed 13-turbine layout was reduced to a 10-turbine layout following landowner discussions, the outcome of the detailed hydrological and geotechnical investigations carried out and the potential impact on the existing landscape setting and potential visual impacts on the Clomantagh Hillfort and

the peak of Spahill. All the individual components of the Proposed Project went through several iterations including turbine locations, hardstands, access roads, underground cabling, met mast, borrow pit, substation locations, biodiversity enhancement areas, construction compounds and grid connection routes.

4 Description of the Proposed Project

This Chapter of the EIAR describes the Proposed Project and all its component parts. Construction methodologies for the main infrastructural components of the Proposed Project are also included in Chapter 4 (or its associated appendices) of the EIAR.

The overall layout of the Proposed Project is shown on Figure 4-1. This figure shows the locations of the Proposed Turbines, Proposed 110kV Substation, borrow pit, met mast, construction compounds, biodiversity enhancement and management (BEMP) measures, internal roads layout and Proposed 110kV Underground Cabling route.

The Proposed Wind Farm turbine layout has been verified using industry standard wind farm design software ensuring that it maximises the energy yield from the Proposed Project, while maintaining sufficient distances between the Proposed Turbines so as to ensure turbulence and wake effects do not compromise turbine performance. The Grid Reference coordinates of the proposed turbine locations are listed in Table 1 below. The final finished top of foundation level of the turbine foundations will be determined by the actual ground conditions at each proposed turbine location and may differ slightly from those levels listed in Table 4-1. Also, in accordance with the '*Wind Energy Development Guidelines for Planning Authorities'* (Department of the Environment, Heritage and Local Government (DOEHLG), 2006) micro-siting of the turbine positions may be required within the criteria set out in the guidelines.

Table 1 Proposed Wind Turbine Locations and Elevations

Turbine	ITM Coordinates		Existing Elevation (m OD)
	X (ITM)	Y (ITM)	
T1	635685	664858	204.5
T2	635853	665392	195
T3	635539	665835	240.5
T4	634654	666159	290.5
T5	633855	666146	317
T6	633782	666683	267.5
T7	633553	667069	298
T8	634570	667074	230.5
T9	635249	666901	222.5
T10	635686	666502	229.5

The proposed wind turbines to be installed for the Proposed Wind Farm have the following dimensions:

- Turbine Tip Height – 185 metres
- Hub Height – 103.5 metres
- Blade Rotor Diameter – 163 metres
    - Blade length – 81.5 metres

The wind turbines that will be installed on the Proposed Wind Farm site will be conventional three-blade turbines, that will be geared to ensure the rotors of all turbines rotate in the same direction at all times.

It is proposed to upgrade approximately 4.5 km of existing site roads and tracks, and to construct approximately 9.1 km of new access road on the Proposed Project site. Areas such as wide junctions and proposed hardstands will also be used as passing bays throughout the construction phase of the Proposed Wind Farm site.

One meteorological (met) mast is proposed as part of the Proposed Wind Farm. The mast will be a free-standing slender lattice structure 103.5 metres in height. The met mast will be equipped with wind monitoring equipment at various heights.

It is proposed to construct a 110kV electricity substation within the Proposed Wind Farm site

The Proposed 110kV Substation compound will include 2 no. control buildings and the electrical substation components necessary to consolidate the electrical energy generated by each wind turbine and export that electricity from the Proposed 110kV Substation to the national grid.

Each turbine and the meteorological mast will be connected to the Proposed 110kV Substation via underground (kilovolt) electricity cabling. Fibre-optic cables will also connect each wind turbine and the met mast to the Proposed 110kV Substation. The electricity and fibre-optic cabling connecting to the Proposed 110kV Substation compound will be run in cable ducts in the road or direct buried alongside the internal tracks.

A battery-based energy storage system (BESS) will adjoin the Proposed 110kV Substation and is located adjacent to the substation compound. The battery storage compound will include 10 no. Battery Storage modules and 10 no. transformers..

A 110kV grid connection between the Proposed Wind Farm and the national electricity grid will be necessary to export electricity from the Proposed Wind Farm. It is proposed to connect the Proposed Killoshulan Wind Farm development to the national electricity grid via a 110kV underground electrical cabling connection to the existing 110kV Ballyragget substation, in the townland of Moatpark, approximately 1km north of Ballyragget, Co. Kilkenny. The underground electrical cabling route measures approximately 12.6km in length, the majority of which is located within the curtilage of the public road network.

The construction of the Proposed Project will require the excavation of spoil. The quantities of spoil, requiring management on the Proposed Wind Farm site has been calculated is presented. Stone material will be required to construct the Proposed Project and it is intended to obtain the majority of materials for the construction of the Proposed Project from the proposed on-site borrow pit. The extraction of material from the borrow pit is a construction phase activity only of the Proposed Project which will be a temporary operation run over a short period of time during the construction phase.

It is proposed to manage excess overburden generated through construction activities within the Wind Farm site. A portion of the excavated material will be used as fill for the creation of level works areas for construction. The remaining volume of spoil to be placed within the spoil management area, within

linear berms alongside sections of Proposed Wind Farm site roads (where appropriate, avoiding environmentally constrained areas) and through backfilling of the proposed borrow pit void.

As part of the Proposed Project, tree felling will be required within and around the development footprint to allow for the construction of the turbine bases, access roads underground cabling, and the other ancillary infrastructure. Nearly half of the Proposed Wind Farm site comprises commercial forestry. A total of approximately 27.5 hectares of commercial forestry will be permanently felled as part of the Proposed Project along with existing treeline boundaries. The commercial forestry felling activities required as part of the Proposed Project will be the subject of a Limited Felling Licence application to the Forest Service in accordance with the Forestry Act 2014 and the Forestry Regulations 2017 (SI 191/2017) and as per the Forest Service's policy on granting felling licenses for wind farm developments. The forestry that will befelled for the footprint of the Proposed Project infrastructure will be replaced or replanted elsewhere, on a hectare for hectare basis, as a condition of any felling licence that will be issued in respect of the Proposed Project.

A Biodiversity Enhancement and Management Plan (BEMP) has been prepared for the Proposed Project and is included as Appendix 6-4 of the EIAR. This plan has been developed to offset the loss of habitats identified within the Proposed Project site and further enhance the biodiversity of the Site and its environs.

During the construction phase, the Proposed Wind Farm site will be accessed via an existing agricultural access point off the R693 Regional road. The R693 runs along the southern boundary of the Proposed Wind Farm site in the townland of Barna, Co. Kilkenny. This access point will be upgraded and will be used as the main site entrance for HGVs and abnormal loads during the construction phase of the Proposed Wind Farm.

The construction phase is estimated to take approximately 18 to 24 months, and the works can be broken down into three main overlapping phases, 1) civil engineering works: 10 months, 2) electrical works: 8 months, and 3) turbine erection and commissioning: 6 months.

The Proposed Wind Farm is expected to have a lifespan of approximately 35 years. During the operational period, on a day-to-day basis the wind turbines will operate automatically, responding by means of meteorological equipment and control systems to changes in wind speed and direction.

Following the end of their useful life, the equipment may be replaced with a new technology, subject to planning permission being obtained, or the Proposed Wind Farm may be decommissioned fully. Proposed 110kV Underground Cabling route and Proposed 110kV Substation will remain in place as it will be under the ownership and control of the ESB Networks and/or EirGrid and will form a permanent part of the national electricity grid. The Decommissioning Plan for the Proposed Project is further detailed in Appendix 4-6 to the EIAR.

5 Population and Human Health

The key issues examined in Chapter 5 of the EIAR include population, human health, employment and economic activity, land use, residential amenity (including visual amenity, shadow flicker and noise), community facilities and services, tourism, property values, traffic and health and safety.

One of the principal concerns during the development process is that human beings, as individuals or communities, should experience no significant diminution of their quality of life from the direct, indirect or cumulative effects arising from the construction, operation and decommissioning of a development. Ultimately, all the effects of a development impinge on human beings, directly and indirectly, positively and negatively.

The majority of construction workers and materials will be sourced locally where available, thereby helping to sustain employment in the construction trade. This will have a short-term significant positive effect.

The injection of money in the form of salaries and wages to those employed during the construction phase of the Proposed Project has the potential to result in an increase in household spending and demand for goods and services in the local area. This would result in local retailers and businesses experiencing a short-term positive effect on their cash flow.

There is currently no published credible scientific evidence to positively link wind turbines with adverse health effects. The main publications supporting the view that there is no evidence of any direct link between wind turbines and health are summarised in Chapter 5. Similarly, there is insufficient evidence from the scientific literature discussed in Chapter 5 to credibly determine that there is the potential for a significant effect on property values in Ireland, as a result of the Proposed Project.

Shadow flicker is an effect that occurs when rotating wind turbine blades cast shadows over a window in a nearby property. Shadow flicker lasts only for a short period of time and occurs only during certain specific combined circumstances. The Guidelines (DoEHLG, 2006) recommend that shadow flicker at neighbouring dwellings within 500 metres of a proposed turbine location should not exceed a total of 30 hours per year or 30 minutes per day.

WindPro computer software (version number 4.2.319) was used to model the predicted daily and annual shadow flicker levels in significant detail, identifying the predicted daily start and end times, maximum daily duration and the individual turbines predicted to give rise to shadow flicker.

The model results assume worst-case conditions including 100% sunshine, an absence of any screening and the sub being behind a turbine with the blades facing the property.

- The predicted shadow flicker levels have been modelled for all 110 no. sensitive receptors located within the Shadow Flicker Study Area. Of these: 70 no. sensitive receptors are theoretically predicted to experience some shadow flicker;
  - Of the 70 no. sensitive receptors, 26 no. sensitive receptors are theoretically predicted to experience shadow flicker that exceeds the Guideline thresholds for daily and/or annual shadow flicker. Please see Table 5-11 of Chapter 5 for details.
- The annual threshold of over 30 hours for shadow flicker (Guidelines) is predicted to be exceeded at 2 no. sensitive receptors once the regional sunshine average factor has been considered (i.e the sun shines for c. 30% of all daylight hours.

The results of the cumulative shadow flicker assessment found no potential cumulative shadow flicker effects from the Proposed Wind Farm and the proposed Gathabawn Wind Farm.

The Proposed Project will be constructed, operated and decommissioned in accordance with the design, best practice and mitigation that is described within this EIAR, ensuring that significant effects on population and human health employment and economic activity, land-use, residential amenity, community facilities and services, tourism, property values and health and safety are not anticipated at international, national or county scale.

6 Biodiversity

This chapter assesses the likely significant effects (both alone and cumulatively with other projects) that the Proposed Project may have on Biodiversity, Flora and Fauna, and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified.

A comprehensive desk study and suite of field surveys were carried out to inform the assessment. Multidisciplinary walkover surveys were undertaken in 2025 and 2026. The majority of habitat surveys covered the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith et al., 2011). Dedicated species/habitat surveys including bats and other protected mammals, and detailed habitat/botanical assessment surveys were carried out, during which any incidental records of other species were also recorded. In addition, baseline aquatic habitat, fisheries and macroinvertebrate surveys have been undertaken as part of the detailed baseline assessment. The multi-disciplinary walkover surveys comprehensively covered the lands within the Site. These surveys were carried out in accordance with TII Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (TII, 2008).

The habitats within the Site were the subject of a detailed survey, assessment and habitat mapping. This habitat mapping and assessment was undertaken following the 'A Guide to Habitats in Ireland' (Fossitt, 2000). Grassland habitats have also been categorised to plant communities from the National Survey of Upland Habitats (Perrin et al. 2014) and the Irish Vegetation Classification.

During the multidisciplinary surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) and the 'First Schedule' of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 374 of 2024) was conducted. No species listed under either schedule were recorded during the surveys undertaken.

The Proposed Wind Farm site is dominated by active forestry of varying age classes, classified as Conifer plantation (WD4) and where felling had recently occurred, Recently felled woodland (WS5), as well as large areas of Improved agricultural grasslands (GA1) in the northern and southern sections of the Site. Existing farm and forestry tracks, comprising Spoil and bare ground (ED2) and Recolonising bare ground (ED3), were recorded throughout, with a farm complex of Buildings and artificial surfaces (BL3) recorded in the southern section of the Site.

Within the Proposed Wind Farm site, an area of Exposed calcareous rock (ER2) was identified and presented as a mosaic with Dry calcareous and neutral grassland (GS1). The Exposed calcareous rock recorded was assessed and was found to conform with the following Annex I habitat of the EU Habitats Directive have were recorded:

- 8240 Limestone pavements

The grassland component of this habitat, while exhibiting high diversity and several indicator species of the Annex I 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*), insufficient indicator species and prevalence of negative indicator species suggested that this grassland was not an Annex I habitat. Other habitats recorded included small sections of Scrub (WS1), Wet grassland (GS4), and Stone walls and other stonework (BL1).

An extensive network of Hedgerows (WL1) and Treelines (WL2) were recorded delineating field boundaries in both the northern and southern sections of the Site. To facilitate the Proposed Development, there is requirement for the permanent removal of approx. 1.34 km of these habitats combined. However, these losses will be offset by the measures detailed in biodiversity Enhancement and Management Plan (BEMP) included in Appendix 6-4, which provides for the bolstering of approx. 3.4 km of existing Hedgerow (WL1) and Treeline (WL2) habitat and the planting of approx. 225m of native hedgerow. This will first ensure that the losses of linear features are offset but will also ensure an overall net gain in such habitats within the Site, increasing the quality and connectivity, both within the Site and to the surrounding landscape. Additionally, the BEMP provides for the management of existing Dry calcareous and neutral grassland (GS1) in the west of the Site, to promote greater diversity.

Small first order watercourses, the Foyle_South (15F07) and the Clomantagh_Lower (15C91), are located within the Proposed Wind Farm which were classified as Upland eroding streams (FW1). These

drain the Proposed Wind Farm site to the east and south into the Nuenna (15N02), which in turn, discharges to the River Nore (15N01) A network of Drainage ditches (FW4) were also recorded along existing access roads and within forestry blocks.

The majority of the Proposed 110kV Underground Cabling route will predominantly follow roads classified as Buildings and artificial surfaces (BL3), with small sections within roads of Spoil and bare ground (ED2) and Improved agricultural grasslands (GA1). The Proposed 110kV Underground Cabling route will cross 5 no. EPA mapped watercourses, which were small Lowland depositing streams (FW2) or Upland eroding rivers (FW1). No Annex I habitats were recorded along the route.

No resting or breeding sites for any protected mammals were identified within or in close proximity to the Proposed Project, and no significant effects on any protected fauna are anticipated. Impact on protected fauna, with exception of bats, is limited indirect effects on supporting habitat, as a result of deterioration of water quality and disturbance, which have been robustly mitigated.

Bat species composition and abundance recorded during detailed bat surveys undertaken at the Proposed Project were found to be typical of the geographic location and nature of the area and is utilised by a regularly occurring bat population of Local Importance. One bat roost was identified to be within the farm complex in the southern section of the Site, with a another just to the south. Following the implementation of mitigation, no potential for residual significant effects to bats with regard to loss of commuting and foraging habitat, loss or damage to roosts, displacement or other construction phase impacts have been identified. In relation to potential collision risk and injury with operational turbines, an adaptive monitoring and mitigation strategy has been devised for the Proposed Project in line with NatureScot Guidance (2021), which will ensure that there is no potential for significant residual effects on local bat populations during the operational phase of the Proposed Project.

In relation to designated sites, the following nationally designated sites have been identified as being within the Zone of Influence (ZoI), on a precautionary basis:

- River Nore/Abbeyleix Woods Complex pNHA [002076]
- Inchbeg pNHA [000836]
- Ardaloo Fen pNHA [000821]
- The Loughans pNHA [000407]

No potential for residual significant effects on these pNHAs has been identified following implementation of mitigation measures in relation to potential effects on rivers/streams and sensitive aquatic faunal species and therefore no significant effects on the pNHA's are anticipated.
An Appropriate Assessment Screening Report and Natura Impact Statement (NIS) accompanies this application. This report has been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment screening and an Appropriate Assessment for the Proposed Project in compliance with Article 6(3) of the Habitats Directive. The Appropriate Assessment Screening Report identified the potential for significant effect on the following European Sites:

- River Barrow and River Nore SAC [002162]
- River Nore SPA [004233]

The NIS concludes that the Proposed Project, individually or in-combination with other plans or projects, will not adversely affect the integrity of any European Site.

It is therefore judged that, provided that the Proposed Project is constructed and operated in accordance with the design, best practice and mitigation that is described within this application, significant residual impacts on biodiversity, flora and fauna will not occur. The biodiversity enhancement measures outlined for the Proposed Project will result in an improvement of the existing ecological conditions of the Site.

7 Ornithology

This chapter assesses the likely significant effects that the Proposed Project may have on bird species. Firstly, a brief description of the Proposed Project is provided. This is followed by a comprehensive description of the methodologies that were followed in order to obtain the information necessary to complete a thorough assessment of the potential effects of the Proposed Project on bird species. The survey data are presented in full in the Environmental Impact Assessment Report (EIAR) appendices, with a summary of the information presented within this chapter. An analysis of the results is then provided, which discusses the ecological significance of the birds recorded during surveys. The potential effects of the Proposed Project are then described in terms of the construction, operation and decommissioning phases of the development. An accurate prediction of the effects is derived following a thorough understanding of the nature of the Proposed Project along with a comprehensive knowledge of bird activity within the Proposed Wind Farm. The identification of Key Ornithological Receptors (KORs) and the assessment of effects follow a precautionary approach.

The potential for effects on designated sites is fully described in the Natura Impact Statement (NIS) that accompanies this application. The NIS concluded that where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction, operation and decommissioning of the Proposed Project will not have an adverse effect on the integrity of any European sites in light of their conservation objectives.

Based on the detailed assessment, it is considered that the potential effects of the Proposed Project upon birds will not be significant. Effects associated with habitat loss, disturbance displacement, barrier effect, collision risk and cumulative effects have been assessed to be no greater than long-term slight negative effect (EPA, 2022) and low effect significance (Percival, 2003). The only exceptions are breeding kingfisher, for which significant effects were predicted without intervention.

Consequently, mitigation is proposed to reduce the magnitude of the effects. Please see Sections 7.6 of Chapter 7 of this EIAR for details. Following the measures described in Sections 7.6, no residual effect significance greater than Low, as per Percival (2003) criteria, is identified for any KOR and no effect significance greater than Slight, as per EPA (2022) criteria, is identified for any KOR. Significant residual effects on the KORs with regard to direct habitat loss, disturbance/displacement, barrier effect or collision mortality are not anticipated.

Following consideration of the residual effects (post-mitigation), it is concluded that the Proposed Project will not result in any significant effects on any of the identified KORs. No significant effects on receptors of International, National or County Importance were identified. Provided that the Proposed Project is constructed, operated and decommissioned in accordance with the design, best practice mitigation and enhancement measures that are described within this application, significant individual or cumulative effects on the identified KORs are not anticipated.

8 Land, Soils and Geology

An assessment was completed to identify how the Proposed Project could affect land, soils and the underlying rock. This included the Proposed Wind Farm, the underground grid connection and the temporary works needed along the turbine delivery route. The assessment used published maps and reports, site inspections, trial pits, boreholes and surveys of ground conditions.

The Proposed Wind Farm site consists mainly of agricultural grassland and commercial forestry. The southern part of the site is underlain by limestone, while the northern part is mainly underlain by mudstone and siltstone. Soil cover varies across the site, with rock close to the ground surface in some areas.

Limestone can slowly dissolve over time, forming hollows, underground openings and uneven rock surfaces. These are known as karst features and can affect ground stability. Detailed investigations were completed to identify these features and inform the project layout. The current layout avoids identified surface karst features and reduces excavation in sensitive limestone areas.

The karst assessment identified higher ground-stability risks around turbines T1 and T2 and a medium risk around turbine T3. Further ground investigations, engineering inspections and suitable foundation and road designs will be required in these areas. A procedure will be followed during construction to investigate and safely manage any unexpected weak ground or underground openings.

Construction will involve excavating and moving soil and rock to build turbine foundations, access roads, hardstanding areas, the substation, battery storage compound and cable trenches. Some agricultural and forestry land will be occupied by this infrastructure, while farming and forestry will continue elsewhere on the site. Excavation will permanently change the ground within the construction footprint.

Rock for construction will be obtained from an on-site borrow pit. Excavated soil and other suitable material will be reused for landscaping, reinstating the borrow pit and within a dedicated spoil management area. Material excavated from public-road sections of the cable route will be taken to an authorised facility. Topsoil will be kept separate from other excavated material so that it can be reused during reinstatement.

The main construction risks are soil erosion, accidental fuel or oil spills and localised ground instability. Measures to control these risks include careful storage and placement of excavated material, revegetation of disturbed ground, controlled refuelling, secure fuel storage, regular machinery inspections and spill-response equipment. Additional restrictions on fuel storage and refuelling will apply within the local group water scheme's source protection area.

During operation, ground disturbance will be limited mainly to occasional maintenance. Oil-containing equipment will have containment measures to prevent leaks reaching the ground. The battery storage compound will also have measures to contain firefighting water in the event of a fire.

At the end of the wind farm's operating life, disturbed areas will be reinstated where appropriate. Turbine foundations will be covered with soil to allow vegetation to grow, and the substation and access roads will be retained as described in the decommissioning proposals. Similar soil-protection and pollution-control measures to those used during construction will apply.

With the proposed design, construction controls and ground-stability measures in place, the remaining effects on land, soils and geology are assessed as not significant. No significant combined effects with other developments are expected.

9 Hydrology and Hydrogeology

This chapter assesses the likely effects of the Proposed Project on rivers, streams, groundwater, water supplies and flood risk during construction, operation and decommissioning phases. It also considers effects on protected sites and potential combined effects with other developments. The assessment was informed by published information, site surveys, ground investigations, groundwater-level monitoring and water-quality testing.

The Proposed Wind Farm site drains towards the Nuenna River, which joins the River Nore. The northern part of the site is underlain by mudstone and siltstone, which allow relatively little water to pass through them. Rainfall mainly drains through streams and forestry and agricultural drains. The southern part is underlain mainly by limestone, where more rainfall soaks into the ground and flows underground towards the Nuenna River.

Limestone features, including enclosed depressions and swallow holes, were mapped on the south of the wind farm site and were investigated to inform the project layout. Areas with unsuitable ground conditions were avoided. The assessment also considers local water supplies, including the Clomantagh/Killoshulan Group Water Scheme and nearby private wells, together with the River Barrow and River Nore SAC and The Loughans SAC.

The main construction risks arise from sediment washing off disturbed ground, excavations, stockpiles and tree-felling areas, together with accidental releases of fuel, oil or concrete. Excavation pumping and watercourse crossings could also affect local water quality or flows.

The drainage design separates clean water from water generated within construction areas. Clean water will be diverted around the works. Construction runoff will be collected and treated using swales, check dams, silt fences and settlement ponds before controlled release over vegetated ground. Drainage outfalls will be kept outside the specified buffers around limestone features.

Further measures include restrictions on fuel storage and refuelling within the group water scheme protection area, containment of concrete wash water, spill-response procedures and controls for working in limestone areas. Works will be managed according to weather conditions. Drainage systems will be inspected and maintained, and water-quality monitoring will check that the controls are working effectively.

Three new watercourse crossings are proposed within the wind farm site, using clear-span or bottomless structures. Grid connection crossings will use existing structures or drilling beneath the channel. The River Nore crossing will be drilled beneath the river, with monitoring and procedures to manage any drilling-fluid release. No instream works are proposed.

The Flood Risk Assessment identifies the wind farm, substation and battery storage compound as being in Flood Zone C, where the risk of river flooding is low. Some underground cable crossings pass through mapped flood zones, where construction will be managed to avoid flood conditions. The drainage system will slow runoff and prevent an increase in downstream flood risk.

During operation, permanent drainage controls will remain in place and ground disturbance will be limited mainly to occasional maintenance. Decommissioning effects will be similar to construction effects but smaller in scale, with corresponding pollution-prevention measures applied.

With the proposed design, mitigation and monitoring measures implemented, no significant effects on surface water, groundwater, water supplies or water-dependent protected sites are predicted. No significant effects on Water Framework Directive status, or significant combined effects with other developments, are predicted.

10 Air Quality

Chapter 10 identifies, describes, and assesses the potential significant direct and indirect effects on air quality arising from the construction, operation and decommissioning of the Proposed Project.

The air quality zone for the Site was selected, followed by a review of EPA collated baseline air quality data namely Sulphur Dioxide (SO_2), Particulate Matter (PM_{10}), Nitrogen Dioxide (NO_2), Carbon Monoxide (CO) and Ozone (O_3) for the selected air quality zone to determine the representative levels of such emissions for the Proposed Project.

The EPA has designated four Air Quality Zones for Ireland:

- Zone A: Dublin City and Environs
- Zone B: Cork City and Environs
- Zone C: 16 urban areas within population greater than 15,000

- Zone D: Remainder of the country

These zones were defined to meet the criteria for air quality monitoring, assessment and management as described in the CAFE Directive. The Proposed Project lies within Zone D, which represents rural areas located away from large population centres.

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2024) ('IAQM 2024 Guidance) was considered in the dust impact assessment. This methodology has been used to predict the likely risk of dust as a result of the construction phase works operational phase activities and decommissioning phase.

The production of energy from wind turbines has no direct air emissions as is expected from fossil fuel-based power stations. Harnessing more energy by means of renewable sources will reduce dependency on fossil fuels, thereby resulting in a reduction in harmful emissions that can be damaging to human health and the environment. Some temporary or short-term indirect emissions associated with the construction of the Proposed Project will include vehicular and dust emissions.

A CEMP will be in place throughout the construction phase. The CEMP includes dust suppression measures. In addition, turbines and construction vehicles will be transported to the Site on specified haul routes only, which will be regularly inspected for cleanliness and cleaned as necessary.

During the construction phase of the Proposed Project and the construction of other permitted or proposed developments and plans in the area, there will be exhaust emissions from construction plant and machinery and potential dust emissions associated with the construction activities. However, once the mitigation proposals are implemented there will be no cumulative negative effect on air quality.

Exhaust and dust emissions during the operational phase of the Proposed Project will be minimal, relating to the use of maintenance machinery and vehicles onsite, and therefore there will be no measurable negative cumulative effect with other developments on air quality. The nature of the Proposed Project is such that, once operational, it will have a long-term, moderate, positive impact on the air quality. There will be no measurable negative cumulative effect with other developments on air quality, and it is not significant.

By providing an alternative to electricity derived from coal, oil or gas-fired power stations, the Proposed Project will result in emission savings of carbon dioxide (CO_2), oxides of nitrogen (NO_x), and sulphur dioxide (SO_2). The production of renewable energy from the Proposed Project will have a Long-Term Moderate Positive effect on air quality due to the offsetting of approximately 28,277 tonnes of Carbon Dioxide (CO_2) per annum, or 989,687 tonnes of carbon dioxide over the proposed 35 year lifecycle of the Proposed Project.

11 Climate

This chapter identifies, describes, and assesses the potential likely significant direct and indirect effects on climate arising from the construction, operation and decommissioning of the Proposed Project.

Climate change is one of the most challenging global issues facing us today and is primarily the result of increased levels of greenhouse gases in the atmosphere. These greenhouse gases come primarily from the combustion of fossil fuels in energy use. Changing climate patterns are linked to increased frequency of extreme weather conditions such as storms, floods and droughts. In addition, warmer weather trends can place pressure on animals and plants that cannot adapt to a rapidly changing environment. Moving away from our reliance on coal, oil and other fossil fuel-driven power plants is essential to reduce emissions of greenhouse gases and combat climate change.

A methodology for calculating carbon losses was published in June 2008 by scientists at the University of Aberdeen and the Macauley Institute with support from the Rural and Environment Research and

Analysis Directorate of the Scottish Government, Science Policy and Co-ordination Division. The document, '*Calculating Carbon Savings from Wind Farms on Scottish Peat Lands*', was developed to calculate the impact of wind farm developments on the soil carbon stocks held in peat. This methodology was refined and updated in 2011 based on feedback from users of the initial methodology and further research in the area. The web-based version of the carbon calculator, which supersedes the Excel-based versions of the tool, was released in 2016. Please note that the web-based version of the carbon calculator is currently not available. The Macauley Institute has supplied a worksheet of the calculator (Version 2.15.0) which has been used to complete the carbon loss assessment.

The full life cycle and embodied carbon of the Proposed Turbines have been taken account of in the Macauley Institute model. The emissions associated with the embodied carbon, along with the construction phase transport movements of the ancillary infrastructure and materials required for the construction of the Proposed Project are considered using the TII Carbon Tool (TII, 2022).

The Proposed Project will result in the loss of 111,902 tonnes of carbon dioxide equivalent.

The Proposed Wind Farm will have a maximum output of 62MW, the 111,902 tonnes of CO_2 that will be lost to the atmosphere due to changes in soil and ground conditions and due to the construction and operation of the Proposed Project will be offset by the Proposed Project in approximately **47.2** months (3.9 years) of operation.

The potential for impact between the Proposed Project, and other relevant developments has been carried out with the purpose of identifying what influence the Proposed Project will have on the surrounding environment when considered cumulatively and in combination with relevant existing permitted or proposed projects and plans within 25km of the Site, such as other wind energy developments, extractive industries, battery energy storage systems, forestry etc. Please see Section 11.6 of Chapter 11 for detail. Following construction of the Proposed Project, there will be a Permanent, Imperceptible, Negative, Direct Effect on Climate as a result of greenhouse gas emissions from construction plant and vehicles, embodied carbon associated with the turbines and construction materials. Operation of the Proposed Project will have a Long-Term, Significant, Positive, Indirect Effect on climate as a result of reduced greenhouse gas emissions.

12 Noise and Vibration

A noise and vibration assessment was undertaken to determine the likely significant effects from the construction, operational and decommissioning phases of the Proposed Project, at nearby noise sensitive receptors (residential properties).

A comprehensive background noise survey was undertaken at six noise monitoring locations. The data were analysed in conjunction with onsite measured wind speed data.

Predicted construction noise levels at the nearest noise sensitive receptors during all phases of construction are below the threshold values within BS 5228. Construction vibration will also likely be at low levels and will be short-term. Therefore, the effect from construction noise and vibration is deemed to be not significant. Activities related to decommissioning will use similar plant to that used for construction activities and will occur at the same locations, as such noise level output during the decommissioning phase is expected to be no higher than the construction phase.

During the construction of the Proposed 110kV Underground Cabling there may be short periods of time where noise levels may exceed the BS 5228 threshold levels, however, this will only occur when associated activities occur directly adjacent 50m of residential properties and for very short periods of a few days. Best practice mitigation measures shall be employed in line with recommendations made in BS 5228. The duration of such activities at any given receptor will be short, therefore no significant effects are anticipated.

At residential properties along the local roads, the change in noise levels due to construction traffic will be temporary in nature and there will be no significant effects.

Predicted operational noise levels from the Proposed 110kV Substation and BESS have a low impact as defined in BS 4142, at all of the nearest noise sensitive receptors during the daytime and the night-time. Accordingly, no significant effects are anticipated.

The operational wind turbine noise assessment was undertaken in three stages, which involved setting the Total Guidelines (DoEHLG, 2006) Noise Limits (which are limits for noise from all wind farms in the area) at the nearest Noise Sensitive Receptors (NSRs), predicting the likely effects (undertaking cumulative noise predictions) and finally setting Site-Specific Noise Limits (SSNL) for the operation of the Proposed Wind Farm on its own. Predictions of Proposed Wind Farm turbine noise have been made in accordance with good practice using a candidate wind turbine with a tip height of 185 m, a 163 m rotor diameter and a hub height of 103.5 m.

The Total Guidelines (DoEHLG, 2006) Noise Limits have been derived in relation to background noise levels and other applicable criteria in accordance with the Guidelines (DoEHLG, 2006). Predicted cumulative operational noise levels indicate that for NSRs neighbouring the Proposed Wind Farm, cumulative wind turbine noise (which considers noise predictions from all nearby operational and permitted wind farms and the Proposed Wind Farm) will meet the Total Guidelines (DoEHLG, 2006) Noise Limits at all Noise Assessment Locations (NALs) at all relevant locations near to the Proposed Wind Farm (a small exceedance was predicted at NAL13 but the Proposed Wind Farm has been shown to not be contributing to this exceedance at NAL13).

SSNL have been derived in accordance with the IOA GPG with due regard to cumulative noise by accounting for the proportion of the Total Guidelines (DoEHLG, 2006) Noise Limit which is potentially being used by other nearby developments. Predicted operational noise levels from the Proposed Wind Farm on its own indicate that SSNL at all Noise NALs will be met and therefore the effect is deemed to be not significant.

The use of SSNL will ensure that the Proposed Wind Farm could operate concurrently with other operational wind farm developments in the area and will also ensure that the Proposed Wind Farm's individual contribution could be measured and enforced if required.

Should the Proposed Project receive planning permission, the final choice of wind turbine will be subject to a competitive tendering process. The final choice of wind turbine will be required to meet the noise limits determined and contained within any condition imposed.

13 Landscape and Visual

This chapterreports the Landscape and Visual Impact Assessment (LVIA) of the Proposed Project, focusing on the likely significant effects on landscape and visual amenity within a 20km LVIA Study Area. Although all elements of the Proposed Project are assessed, the Chapter focusses upon the Proposed Turbines, as they are deemed to be the primary essential aspects of the proposal under assessment from a landscape and visual perspective. The assessments were informed by site visits, photomontages (Volume 2 of the EIAR), ZTV mapping, a Route Screening Analysis, and an impact assessment methodology which follows best practice guidance for LVIA of wind farms.

The Proposed Wind Farm is located within a marginal, working upland landscape comprising agricultural pasture and extensive tracts of commercial coniferous forestry. There is little to no recreational value to the Proposed Wind Farm site itself, and it is a landscape which has undergone a degree of human modification due to current land uses such as commercial forestry and agricultural fields. It is a large scale and sparsely settled landscape of marginal upland foothills within the Slieveardagh Hills, which is considered a robust landscape capable of effectively accommodating wind energy development of this scale.

ZTV mapping, photomontage visualisations and site visits determined that visibility of the Proposed Turbines is substantially restricted in parts of the surrounding landscape due to intervening landform and vegetation. The Route Screening Analysis determined that views from much of the surrounding road network are screened or partially screened by mature roadside vegetation. More open views of the Proposed Turbines are available from certain elevated vantage points and locations in close proximity to the Proposed Wind Farm, while visibility from the wider LVIA Study Area is generally more restricted due to intervening landform and vegetation. In terms of location, spatial extent, spacing and layout, the siting and design of the Proposed Wind Farm adheres to the guidance for the siting of wind farms in Transitional Marginal Landscape Types, whilst also adhering to the minimum set-back distance of 500 metres from residential dwellings and provides for the recommended four-times-tip-height set-back from third-party residential properties, as set out in the Guidelines (DoEHLG, 2006) and Draft Guidelines (DoHPLG, 2019) respectively.

Landscape and visual considerations were a key component of the iterative design process, with several design iterations undertaken to mitigate potential landscape and visual effects on surrounding sensitive receptors. This included the omission of all turbines from the western slopes of Clomantagh Hill, providing greater physical and visual separation from Clomantagh Hillfort and surrounding residential receptors, as well as reducing the horizontal extent of the Proposed Turbines in views from the north and south. Turbines were also omitted from lower slopes and potentially viable lands to the south-east of the Proposed Wind Farm site, where they would have resulted in greater visual prominence from surrounding residential receptors. The final turbine layout has been designed to form a visually coherent arrangement, with the Proposed Turbines located across the undulating upland terrain and set back from surrounding sensitive receptors. The Proposed Turbines are also located to the south of designated Kilkenny Scenic View 14, in the opposing direction to the principal scenic views to the north and east, ensuring that the Proposed Turbines will not obstruct the designated scenic views. The Proposed 110kV Substation has also been sited south of the northern ridgeline, within an area enclosed and visually contained by the surrounding landform.

The overall landscape value of the Proposed Wind Farm site is deemed to be 'Medium', with an overall 'Low' sensitivity to wind energy development, and the residual effects upon the landscape of the Proposed Wind Farm site itself are deemed to be 'Moderate'.

The Proposed Wind Farm site itself is located within KK-LCA-A (N) – Slieveardagh Hills (North), a large-scale and robust landscape comprising marginal upland foothills, agricultural pasture and commercial forestry, which has the capability to effectively accommodate the Proposed Turbines as well as other wind energy developments. The LVIA determined a 'Moderate' residual effect on this LCA. No significant landscape effects were deemed to arise on any of the designated LCAs assessed within the LCA Study Area.

The Proposed Turbines are located on the eastern foothills of Spa Hill and Clomantagh Hill, which comprise elevated landscape features and ridgelines identified as sensitive landscape features in the KCCDP. Whilst the sensitivity associated with these ridgelines is recognised, the receiving landscape is predominantly a modified working landscape comprising agricultural pasture and commercial forestry, and does not comprise any distinctive or exceptional landscape qualities of national or international renown. As discussed throughout this LVIA, marginal upland foothills and ridgelines are generally considered suitable landscapes for accommodating wind energy development due to their large scale, sparse settlement patterns and set-back from surrounding receptors. The Proposed Turbines are strategically sited on the eastern slopes of Spa Hill and Clomantagh Hill, with the intervening ridgelines providing visual containment and restricting visibility for receptors immediately west. Whilst the Proposed Turbines will introduce new vertical features into the landscape, the large scale and robust nature of the receiving landscape is considered capable of accommodating such change.

There are 10 No. existing, 3 No. proposed and 4 No. permitted wind farms within 20km of the Proposed Turbines, with the greatest potential for cumulative landscape effects occurring within the Slieveardagh Hills landscape. The existing Lisdowney Wind Farm is located within the same LCA as the Proposed Turbines, while other existing and permitted wind energy developments are located

within the wider Slieveardagh Hills landscape. This is a large scale and robust landscape, mostly comprising ridgelines, hills and foothill landscape types, capable of effectively accommodating multiple wind energy developments.

The assessment of visual effects was primarily informed by photomontage visualisations, a Route Screening Analysis, and observations recorded during site visits. Photomontages were used to assess the visual effects of the Proposed Project from 20 No. viewpoints within the LVIA Study Area. The assessment concluded that no 'Profound' or 'Very Significant' effects occurred at any of the 20 photomontage viewpoints. Residual effects of 'Significant' occurred at one viewpoint location (VP18), given the proximity of the viewpoint to the closest Proposed Turbine (approximately 790m). All other viewpoints were assessed as 'Moderate' (5), 'Slight' (11) and 'Not Significant' (3). The significant visual effect at VP18 occurs at Clomantagh Hillfort, where there is no public access, and as such, views from this location would only be experienced by a limited number of people permitted access to the site (i.e. the landowner and those granted access). These significant effects are localised and are not representative of visual effects throughout the wider LVIA Study Area. Residual visual effects on residential receptors range from 'Imperceptible' to 'Moderate' and are not considered significant.

Cumulative visual effects have the greatest potential to arise with other existing, permitted and proposed wind energy developments. The most notable combined views of the Proposed Turbines and cumulative turbines occur from elevated vantage points within the surrounding Slieveardagh Hills landscape. Cumulative visual effects will also occur from longer ranging views of the upland area from elevated vantage points throughout the wider landscape. The proposed Gathabawn, Seskin Renewables and Littleton Wind Farms may contribute to further cumulative visual effects in an uncertain future receiving environment, subject to the outcome of the planning process.

In conclusion, this LVIA determined that the Proposed Wind Farm is located within a landscape that can effectively accommodate a wind energy development of this scale, given the large scale and nature of the receiving environment, comprising marginal upland foothills, agricultural pasture and commercial forestry, and the mitigation measures incorporated into the design of the Proposed Project. Whilst 'Significant' residual landscape and visual effects were identified in relation to Clomantagh Hillfort, these effects are localised and do not involve any direct alteration to the physical fabric of the hillfort. The assessments have determined that the landscape of the Proposed Wind Farm site is capable of effectively accommodating the Proposed Project.

14 Cultural Heritage

An assessment of the potential effects of the Proposed Project on the Cultural Heritage resource was carried out. Cultural heritage includes archaeology, architectural heritage and any other tangible assets. The assessment was based on desktop research, field survey, GIS based mapping, ZTV, and was also assisted by representative photomontages.

Where potential effects have been identified, such as to potential sub-surface archaeology appropriate mitigation measures have been recommended in order to minimise any such effects. Proposed mitigation includes pre-development testing, archaeological monitoring of construction stage ground works and any further geotechnical site investigations. No potential direct effects to National Monuments, recorded monuments, Protected Structures or NIAH structures are identified.

Potential indirect effects on the setting of any UNESCO World Heritage Sites and those on a Tentative List within 20km, National Monuments within 10km, recorded monuments within 5km and RPS/NIAH structures within 5km were included in order to assess potential effects on setting in the wider landscape. The ZTV was utilised to assess the level of theoretical visibility of the Proposed Turbines from cultural heritage assets within the 5km and 10km study areas. No significant effects on setting of recorded cultural or archaeological heritage assets, as a result of the Proposed Project, have been identified.

An assessment of potential cumulative effects was also undertaken taking into consideration other extant planning applications and existing and proposed wind farms within 20km. While some potential cumulative visual effects to the wider setting of cultural heritage assets is possible when considered with the existing, permitted and proposed wind farms, no significant cumulative impacts have been identified and no cumulative effects to the immediate setting of cultural heritage assets will occur.

15 Material Assets

1.15.1 Traffic and Transport

This assessment considers the likely effects of the proposed Killoshulan Wind Farm, Co. Kilkenny on the surrounding road network during the construction, operation and decommissioning phases.

During construction, the Proposed Project will generate traffic associated with construction workers, the delivery of materials, concrete, cranes, electrical equipment and turbine components, as well as the installation of the Proposed 110kV Underground Cabling. The majority of stone required for construction will be sourced from the proposed on-site borrow pit, reducing the requirement for deliveries from external quarries. Construction is expected to take approximately 18 to 24 months. For assessment purposes, the shorter 18-month period has been assumed, as this represents a precautionary scenario with higher average construction traffic volumes.

The greatest traffic effects will arise during the construction phase, particularly on the 10 days when concrete is poured for the turbine foundations. On these days, traffic volumes are predicted to increase by approximately 14.4% on the R639 and between 9.4% and 13.5% on the R693. Higher percentage increases of approximately 42.1% and 53.1% are predicted on the L4115 and L1818 local roads, respectively, reflecting the lower existing traffic volumes on these roads. These increases are based on a precautionary assessment which assumes that all construction traffic uses each assessed route. The resulting effects are assessed as temporary, slight and negative, with no significant effects predicted.

The assessment identifies that sections of the R693 are forecast to operate above the adopted road link capacity threshold in the assumed construction year of 2032, even without the Proposed Project. Although construction traffic will temporarily increase traffic volumes on these sections, the additional effects are considered slight. Detailed assessments of the proposed site access junction on the R693 and the R639/L4115 junction indicate that both junctions will be capable of accommodating the additional construction traffic.

Turbine components are expected to be delivered from the Port of Cork at Ringaskiddy, travelling via the N28, N40, M8, R639, L1857 and R693 to the Proposed Wind Farm site. These deliveries will involve abnormally sized loads and will be undertaken at night, when traffic volumes are generally lower, in consultation with the relevant roads authorities and An Garda Síochána. Temporary works will be required at several locations along the delivery route to accommodate the large vehicles, including temporary alterations to junctions, vegetation, street furniture and utilities. These areas will be reinstated following completion of the turbine deliveries. The resulting traffic effects are expected to be temporary, slight and negative.

The Proposed 110kV Underground Cabling will extend approximately 12.6km from the Proposed 110kV Substation to the existing Ballyragget 110kV Substation, with approximately 10.4km located within the public road corridor. Construction works will require temporary road closures and diversions along sections of the local road network, while a Stop and Go traffic management system will be implemented along the N77 in order to maintain 2-way traffic flow. The works will progress along the cable route, meaning that disruption at any individual location will be temporary. Some road users may experience additional journey distances during temporary closures. Approximately 30 daily return truck trips are estimated for the removal of excavated spoil and transportation of construction materials, together with four daily return car trips for construction personnel. The effects of these additional vehicle movements are assessed as temporary and slight, with no significant effects predicted.

A Traffic Management Plan has been prepared for the Proposed Project and is included in Appendix 15-2 of the EIAR. The plan sets out measures to minimise disruption to the surrounding road network during construction, including designated delivery routes, management of abnormal load deliveries, temporary signage, road condition surveys, wheel washing, road cleaning and reinstatement of affected road infrastructure. Specific traffic management measures are also proposed during the construction of the Proposed 110kV Underground Cabling, including temporary road closures, diversion routes and Stop and Go traffic management along the N77. The detailed Traffic Management Plan will be finalised and agreed with the relevant roads authorities and An Garda Síochána prior to the commencement of construction.

Once operational, the Proposed Wind Farm will be remotely monitored, with vehicle movements generally limited to occasional maintenance visits. Operational traffic effects are therefore expected to be imperceptible. At the end of the Proposed Wind Farm's operational life, traffic generated during decommissioning is expected to be lower than during construction, as some infrastructure will remain in place. Residual traffic effects during decommissioning are expected to be slight to imperceptible.

An assessment of cumulative traffic effects was also undertaken, taking account of other permitted and proposed developments in the surrounding area. Gathabawn Wind Farm and Littleton Wind Farm were identified as having the greatest potential for cumulative traffic effects due to their use of the R639. Where possible, construction of the Proposed Project will be scheduled to avoid overlapping with these developments. Should construction periods overlap, cumulative traffic effects are expected to be negative, short-term and slight, with no significant effects predicted.

Overall, the assessment concludes that the most noticeable traffic and transport effects will occur during construction, particularly during concrete deliveries and the installation of the Proposed 110kV Underground Cabling. Following implementation of the proposed mitigation measures, residual construction traffic effects are assessed as short-term, slight and negative, with no significant effects anticipated.

1.15.2 Telecommunications and Aviation

Wind turbines, like all large structures, have the potential to interfere with broadcast signals, by acting as a physical barrier or causing a degree of scattering to microwave links. The most significant effect at a domestic level relates to a possible flicker effect caused by the moving rotor, affecting, for example, radio signals. The most significant potential effect occurs where there are proposed turbines directly in line with the transmitter radio path.

During the development of any large project that holds the potential to affect telecoms or aviation, the developer is responsible for engaging with all relevant telecom operators and the relevant aviation authorities through a scoping exercise to ensure that the proposal will not interfere with television or radio signals by acting as a physical barrier. In the event of any potential impact, the developer for each individual project is responsible for ensuring that the necessary mitigatory measures are in place.

There are no IAA assets within the Proposed Wind Farm site or surrounding area that may be impacted by the proposed turbines. The nearest licensed aerodrome to the Proposed Wind Farm site is Kilkenny Airport which is located approximately 14km to the southeast of the Proposed Wind Farm site. The closest operational airport to the Proposed Wind Farm site is Waterford Airport which is located approximately 65km to the south of the Proposed Wind Farm site.

An Aviation Impact Assessment (AIA) has been prepared by Cyrrus Limited to assess the potential effects of the Proposed Wind Farm on civil and military aviation, particularly in response to concerns raised by the Department of Defence (DoD). The AIA concludes that the Proposed Wind Farm is located within Class G uncontrolled airspace and Military Operating Area 5, approximately 50 nautical miles (NM) from Casement Aerodrome and outside designated low-flying training areas.

There are no electromagnetic interference impacts for telecommunications and aviation assets or operations associated with the construction phase of the Proposed Wind Farm or Proposed Grid Connection and therefore no mitigation is required. The potential for electromagnetic interference from proposed turbines may only occur during the operational phase of the Proposed Project.

1.15.3 Other Material Assets

This section of the Material Assets chapter considers other utilities or built services in the area such as electricity supply and transmission, water, gas and underground telecommunications. This section also considers waste management during the construction, operational and decommissioning phases of the Proposed Project.

In order to assess the potential for significant effects on built services and waste management in the vicinity of the Site, two rounds of scoping requests were made to EirGrid, Uisce Éireann, and numerous sections of Kilkenny City & County Council, including the Roads Department and Environment Department. The bodies engaged with at scoping stage are set out below in Table 2-4

The Proposed Project has been designed to avoid identified services and utilities where insofar as possible. Prior to commencement of construction detailed site investigations will be carried out to confirm design assumptions and undertake additional surveys to identify any new services and utilities and ensure they will not be impacted by the Proposed Project.

Gas Networks Ireland (GNI) supply MKO their latest infrastructure data quarterly. The latest data share illustrating all GNI infrastructure was provided to MKO in Q2 2026. No gas supply lines are located within the Site, the closest gas line is located approximately 270m west of the Site at its nearest point – in the townland of Ballyconra, Co. Kilkenny

Existing water infrastructure includes Uisce Éireann services along the R693 Regional Road and private water supplies in the surrounding area. Seven private wells have been identified downslope of the Proposed Wind Farm site, together with groundwater monitoring locations within the Clomantagh/Killoshulan Group Water Scheme Source Protection Area. The assessment concludes that, with the implementation of the mitigation measures outlined in Chapter 9 of the EIAR, no significant effects on public or private water supplies will occur. Following mitigation, residual effects on local water supply are assessed as temporary, slight and negative.

There are no EPA-licensed or local authority-authorised waste facilities or activities located within the Site. The nearest licensed waste facility to the Proposed Wind Farm site is Dunmore Recycling and Waste Disposal located approximately 14.5km to the southeast of the Site.

A Waste Management Plan (WMP) has been prepared and forms part of the CEMP. The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Project. Disposal of waste will be a last resort. The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Project. Disposal of waste will be a last resort.

16 Major Accidents and Natural Disasters

Chapter 16: Major Accidents and Natural Disasters of the EIAR describes the likely significant effects on the environment arising from the vulnerability of the Proposed Project to risks of major accidents and/or natural disasters.

Major accidents or natural disasters are hazards which have the potential to impact the Proposed Project and consequently have potential impacts on the environment. This assessment also identifies the potential of the Proposed Project to impact major accidents or natural disasters. These include accidents during construction, operation and decommissioning caused by operational failure and/or natural hazards. The assessment of the risk of major accidents and/or disaster considers all factors defined in the EIA Directive that have been considered in this EIAR, i.e., population and human health, biodiversity, birds, land and soil, water, air quality, climate, material assets (including traffic and transport), cultural heritage and the landscape.

A desk-study has been completed to establish the baseline environment for which the proposed risk assessment is being carried out. This will influence both the likelihood and the impact of a major accident or natural disaster. Local and regional context has been established prior to undertaking the risk assessment to develop an understanding of the vulnerability and resilience of the area to emergency situations. Further detail on the baseline environment is provided in Section 16.3 of this Chapter.

The scenarios with the highest risk score in terms of the occurrence of major accident and/or disaster during construction, were identified as 'Major Fire', 'Pollution/Contamination' and 'Karst Risk'.

The Proposed Project has been designed and will be built in accordance with the best practice measures outlined throughout this EIAR and, as such, mitigation against the risk of major accidents and/or disasters is embedded through the design.

The risk of a major accident and/or disaster during the construction of the Proposed Project is considered 'low' in accordance with the '*A Framework for Major Emergency Management – A Guide to Regional Risk Assessment'* (DHLGH, 2024). Similarly, the likelihood of any cumulative effects arising from or contributing to major accidents or natural disasters will be low.

When the implementation of best practice measures and all proposed mitigation and monitoring measures detailed throughout this EIAR are implemented, the residual effect(s) associated with the construction, operation and decommissioning of the Proposed Project are not significant with regards to major accidents and natural disasters.

17 Interactions of the Foregoing

This chapter identifies the potential significant environmental effects that may occur in terms of Population & Human Health, Biodiversity, Ornithology, Land, Soils & Geology, Hydrology & Hydrogeology, Air Quality, Climate, Noise & Vibration, Landscape & Visual, Cultural Heritage, Material Assets and Major Accidents & Natural Disasters, as a result of the Proposed Project. All potential significant effects of the Proposed Project and the measures proposed to mitigate them have been outlined in the main EIAR. However, for any development with the potential for significant environmental effects there is also the potential for interaction between these potential significant effects. The result of interactive effects may exacerbate the magnitude of the effects or ameliorate them or have a neutral effect. A matrix is presented in Chapter 17 to identify interactions between the various aspects of the environment already discussed in the EIAR. The matrix highlights the occurrence of potential positive or negative impacts during the construction, operational and decommissioning phases of the Proposed Project. Where any potential interactive impacts have been identified, appropriate mitigation is included in the relevant sections (Chapters 5–16) of the EIAR.

