

## **Non-Technical Summary**

Proposed Repowering of  
the Existing Kilgarvan Wind  
Farm, Co. Kerry





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# 1. NON-TECHNICAL SUMMARY

## 1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by MKO on behalf of Orsted Onshore Ireland Midco Ltd (Orsted), who intends to apply to An Bord Pleanála for planning permission to remove the existing 28 no. turbines, and erect 11 no. wind turbines, and upgrade the associated infrastructure on the existing Kilgarvan Wind Farm site in the townlands of Inchincoosh, Lettercannon, Inchee, Coomacullen, and Cloonkeen in County Kerry.

For the purposes of this EIAR:

- Where the ‘Proposed Development’ is referred to, this relates to the project components described in detail in Chapter 4 of this EIAR.
- 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 1-2.
- Where the ‘Existing Kilgarvan Wind Farm’ is referred to, this relates to the Kilgarvan I and Kilgarvan II wind farm developments as outlined in Section 1.1.1, Chapter 1..

In addition:

- Where the construction phase is detailed and assessed within the EIAR, this includes for the removal of the existing 28 turbines and the construction of the proposed 11 no. turbines and associated infrastructure in on site.
- Where the operational phase is detailed and assessed within the EIAR, this includes for the operation of the proposed 11 no. turbines on site.
- Where the decommissioning phase is detailed and assessed within the EIAR, this includes for the decommissioning of the proposed 11 no. turbines on site.

The Proposed Development, which will have a potential generating capacity greater than 50 megawatts (MW) and will make use of the existing 110kV infrastructure built as part of the Existing Kilgarvan Wind Farm. This infrastructure will continue to connect the Proposed Development to the National Electricity Grid via the existing 110kV Coomagearlahy substation. There will be minor upgrades to the existing onsite 110kV Coomagearlahy substation to facilitate the Proposed Development.

The planning application which will be submitted to An Bord Pleanála (ABP), will seek to remove the existing 28 no. turbines and to construct 11 no. new turbines in their place. The 11 no. turbines will meet the potential generation capacity of greater than 50MW. The application meets the threshold for wind energy set out in the Seventh Schedule of the Planning and Development Act 2000, as amended (being ‘*An installation for the harnessing of wind power for energy production (a wind farm) with more than 25 turbines or having a total output greater than 50 megawatts*’) and is therefore being submitted directly to An Bord Pleanála as a Strategic Infrastructure Development (SID) in accordance with Section 37E of the Planning and Development Act, 2000 as amended. This approach has been confirmed following consultations with the Board under the provisions of Section 37B of the Planning and Development Act 2000 as amended (Case Reference ABP-314798).

This EIAR accompanies the planning application for the proposed 11 no. turbines and associated infrastructure submitted to the Board. The planning application is also accompanied by a Natura Impact Statement (‘NIS’).

This EIAR complies with the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU.

### Applicant

The Applicant for the Proposed Development is Orsted Onshore Ireland Midco Ltd, hereafter to be referred to as Ørsted or Orsted. Ørsted plans, constructs, and operates offshore and onshore wind

farms, solar farms, energy storage facilities, renewable hydrogen and green fuels facilities, and bioenergy plants. Ørsted is recognised on the CDP Climate Change A List as a global leader on climate action and was the first energy company in the world to have its science-based net-zero emissions target validated by the Science Based Targets initiative (SBTi). Headquartered in Denmark, Ørsted employs approx. 8,000 people. Across the island of Ireland, Orsted owns and operates a portfolio of onshore wind farms with a combined capacity of 378MW, all managed from its Ireland and UK onshore headquarters in Cork City. Additionally, Orsted has a further onshore pipeline of over 1000MW of projects at various stages of development.

## Brief Description of the Proposed Development

The Proposed Development will comprise the removal of 28 no. existing turbines and the construction of 11 new turbines with a blade tip of up to 200m, and all associated works. It is proposed that the Repowering of the site will utilise the existing 110kV Grid Infrastructure (i.e., existing substation, existing overhead line). The full description of the Proposed Development is detailed in Chapter 4 of this EIAR. The current planning application, relating to the Proposed Development is being made to An Bord Pleanála under Section 37E of the Planning and Development Act, 2000, as amended.

The development description for the planning application as appears in the public notices is as follows:

- i. Removal of 28 no. existing turbines and relevant ancillary infrastructure permitted under Kerry County Council and An Bord Pleanála Planning References; 02/124, 03/2176, 03/2306, 07/1605, 07/4364, Pl. 08.209629, 07/4515, 07/4701, Pl. 08.232259 and 05/1351;*
- ii. Erection of 11 no. wind turbines with a blade tip height range from 199.5m to 200m, a hub height range from 118m to 125m and a rotor diameter range from 149m to 163m, along with associated foundations and hard standing areas;*
- iii. A thirty-five year operational life from the date of full commissioning of the wind farm;*
- iv. Underground electrical 33kV and communication cabling connecting the proposed turbines and meteorological mast to the existing 110kV Coomagearlahy substation in the townland of Inchee;*
- v. Upgrade of and the continued use of the existing onsite Coomagearlahy 110kV substation in the townland of Inchee, permitted under Kerry County Council References 07/3648, 04/1648, 06/1143, 06/2660;*
- vi. Upgrade of existing tracks, hardstand areas and provision of new site access roads and junctions;*
- vii. The extension and reuse of the 1 no. existing borrow pit;*
- viii. 2 no. temporary construction compounds;*
- ix. Meteorological mast, with a height of 100m and upgrade of existing associated foundation and hard standing area;*
- x. Forestry felling;*
- xi. Site drainage;*
- xii. Biodiversity Enhancement measures;*
- xiii. Operational stage site signage; and,*
- xiv. All ancillary works and apparatus*

The application is seeking a ten-year planning permission.

Modern wind turbine generators currently have a typical generating capacity in the 4 to 7 MW range, with the generating capacity continuing to evolve upwards as technology improvements are achieved by the turbine manufacturers. For the purposes of this EIAR it is assumed that the wind turbine model installed as part of the Proposed Development will have an output of 6.6MW. Therefore, on this basis, the proposed 11 no. wind turbines would have a combined generating capacity of 72.6MW. The actual turbine procured as part of a competitive tender process may have a power output that is marginally lower or greater than the 6.6MW turbine described in the EIAR. Irrespective of the power output of the actual turbine procured, the conclusions of the EIAR will not be materially affected.

## Need for the Proposed Development

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 Development represents an opportunity to further harness Ireland's significant renewable energy resources, with valuable benefits to air quality and climate and in turn to human health. The consumption of fossil fuels for energy results in the release of particulates, sulphur dioxide and nitrogen dioxide to our air. The use of wind energy, by providing an alternative to electricity derived from coal, oil or gas-fired power stations, results in emission savings of carbon dioxide (CO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>), and sulphur dioxide SO<sub>2</sub>, thereby resulting in cleaner air and associated positive health effects.

## Economic Benefits

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

Commercial rate payments from the Proposed Development will be provided to Kerry County Council each year, which will be redirected to the provision of public services within Co. Kerry. These services include provisions such as road upkeep, fire services, environmental protection, street lighting, footpath maintenance etc. along with other community and cultural support initiatives.

It is estimated that the Proposed Development has the potential to create up to 80-100 jobs during the construction and decommissioning phases and 2-3 jobs during operational and maintenance phases of the Proposed Development. During construction, additional indirect employment will be created in the region through the supply of services and materials to the renewable energy development. 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 Development are presented in Section 5.9 of this EIAR.

Should the Proposed Development receive planning permission, there are substantial opportunities available for the local area in the form of Community Benefit Funds. The value of this fund will be directly proportional to the installed capacity and/or energy produced at the site and will support and facilitate projects and initiatives including youth, sport and community facilities, schools, educational and training initiatives, and wider amenity, heritage, and environmental projects. As part of the Existing Kilgarvan Wind Farm, there has been an annual sum of €85,000 provided to the local community via the Community Benefit Fund. This fund has been distributed to local sporting organisations and community groups and has provided funding for key services in the local community.

## 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 Development 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 Development.

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 this EIAR are as follows:

1. *Introduction*
2. *Background to the Proposed Development*
3. *Considerations of Reasonable Alternatives*
4. *Description of the Proposed Development*
5. *Population and Human Health*
6. *Biodiversity (Terrestrial)*
7. *Biodiversity (Aquatic Ecology)*
8. *Land, Soils and Geology*
9. *Water*
10. *Air Quality*
11. *Climate*
12. *Noise and Vibration*
13. *Landscape and Visual*
14. *Cultural Heritage*
15. *Material Assets (including Traffic and Transport, Telecommunications and Aviation)*
16. *Major Accidents and Natural Disasters*
17. *Interactions of the Foregoing*
18. *Schedule of Mitigation Measures*

A Natura Impact Statement has also been prepared in line with the requirements of the Habitats Directive and this EIAR and the NIS will accompany the planning application to the Board for the Proposed Development under Section 37E of the Planning and Development Act 2000, as amended.

## 1.2

# Background to the Proposed Development

This section of the EIAR sets out the energy and climate change related policy and targets along with the strategic, regional, and local planning policies relevant to the Proposed Development. It also summarises EIA scoping undertaken, and the cumulative impact assessment process undertaken.

The policies and targets which have been put in place at the various levels of Government in relation to renewable energy and climate change illustrate the urgent need for renewable energy developments such as the Proposed Development to assist Ireland in meeting its national targets and European commitments in relation to climate change and decarbonisation.

The Proposed Development will involve the removal of the existing 28 no. turbines and replacement with 11 no. wind turbines, and all other ancillary and associated site works and infrastructure on the existing Kilgarvan Wind Farm site in the townlands of Inchincoosh, Lettercannon, Inchee, Coomacullen, and Cloonkeen in County Kerry.

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 (CAP) published by the Government in December 2023 sets out the detail for taking action to deliver the decarbonisation required under the carbon budgets and sectorial emissions ceilings. Central to this is the set of measures set out to increase the proportion of renewable electricity to up to 80% by 2030 and a target of 9GW from onshore wind. The CAP places front and centre the facts that without urgent action, global warming is likely to be more than 2°C above pre-industrial levels, threatening the health and livelihoods of people across the globe. Urgency of action is also a key focus of the CAP. All sectors will have to further their efforts if the core and further measures are to be achieved.

A gradual shift towards increasing our use of renewable energy is no longer viable. There is an urgency now to ensure real change happens. Renewable energy development is recognised as a vital component of Ireland's strategy to tackle the challenges of combating climate change and ensuring a secure supply of energy. Ireland is heavily dependent on the importation of fossil fuels to meet its energy need. 81.6% of energy used in Ireland is imported from abroad, higher than the EU average of almost 57.5% (National Energy Security Framework 2023). This high dependency on energy imports is highly risky

and Ireland is currently extremely vulnerable both in terms of meeting future energy needs and ensuring price stability. As such, expanding indigenous renewable energy supply is critical for energy security and price stability.

### **Local Planning Policy**

#### **Kerry County Development Plan 2022 – 2028**

The site of the Proposed Development is located in the administrative area of Kerry County Council. As such the Kerry County Development Plan 2022 – 2028 (CDP) which was adopted by Elected Members of Kerry County Council on the 4<sup>th</sup> July 2022 and came into effect on the 15<sup>th</sup> August 2022 is the relevant County Development Plan, which provides the planning framework within which the planning application is assessed.

#### **Local Authority Renewable Energy Strategy**

The Kerry County Development Plan 2022-2028 (KCDP) sets out that ‘Climate Action and Renewable Energy’ is a principle of the core strategy. The KCDP sets out in Policy **KCDP 3-1** that it is an objective of the Council to “*Promote the Sustainable Development of the County in line with the Strategic Core Principles of the Core Strategy*”. It further supports this in **Chapter 12: Energy**, stating in **KCDP 12-1** that the Council seeks to facilitate a sustainable, renewable, and reliable energy supply for the County that respects the existing natural and built heritage and amenity of the county. The provision of sustainable, reliable energy infrastructure is supported in the chapter by **Section 12.3: Transmission Grid** which supports the maintenance, upgrade, and creation of high voltage electrical infrastructure. Further, policy **KCDP 12-6** states that it is the Council’s objective to “*facilitate sustainable energy infrastructure provision, so as to provide for the further physical and economic development of the County*”. It is noted that, as an existing wind farm is located on this subject site, the Proposed Development is considered a repowering application. Relating specifically to Repower Areas, Policy **KCDP 12-21** sets out that it is an objective of the Council to facilitate the replace and repowering of energy projects. The KCDP states within section 12.5.4.1.7 that “*For the purposes of this plan and related development objectives, repowering includes wind farm upgrades, renewal, repowering or extension to permitted operational duration.*”

#### **Cork County Development Plan 2022-2028**

The EIAR Site Boundary is primarily located within the administrative boundary of County Kerry and is, therefore, governed by Kerry County Council’s local planning policy. However, as a portion of the access road is located within the administrative boundary of County Cork. While there are **no proposed works within County Cork**, the EIAR boundary traverses the administrative boundaries of Cork and Kerry. It is considered that the presence of the existing wind farm demonstrates that the Proposed Development would be suitable in this area of County Cork. There is policy support at local level for the development of renewable energy projects in County Cork, in accordance with the Cork County Development Plan 2022-2028.

#### **Wind Energy Development Guidelines**

The relevant considerations under the ‘Wind Energy Development Guidelines for Planning Authorities’ (Department of the Environment, Heritage and Local Government (DOEHLG, 2006) hereafter referred to as ‘the Guidelines’, have been taken into account during the preparation of this EIAR.

The aim of the Guidelines is to assist with the proper planning of wind energy projects in appropriate locations around Ireland. The Guidelines highlight general considerations in the assessment of all planning applications for wind energy. They set out advice to planning authorities on planning for wind energy through the development plan process and in determining applications for planning permission. They contain guidelines to ensure consistency of approach throughout the country in the identification of suitable locations for wind energy development. Each wind project has its own characteristics and



defining features, and it is therefore impossible to write specifications for universal use. Furthermore, the Guidelines should be applied practically and do not replace existing national energy, environmental and planning policy. While the Guidelines remain the relevant guidelines in place at the time of lodgement, and decision makers (An Bord Pleanála and Local Authorities) are required to have regard to them, they are not bound to apply their provisions and they can (and do), where there is sufficient justification, consider updated standards/requirements/specifications in assessing impacts and the proper planning and sustainable development of the area.

The Proposed Development adheres to the Guidelines in its design and preparation. In this regard this EIAR considers all relevant potential environmental impacts that could arise (Chapter 5 of the Guidelines), and the design of the Proposed Development has followed the design principles established in Chapter 6 of the Guidelines.

The Department of Housing, Planning and Local Government published the Draft Revised Wind Energy Development Guidelines (draft Guidelines) in December 2019 and they remain in draft at the time of writing. The Draft Guidelines note that potential impacts of wind energy development proposals on the landscape, including the natural and built environment, must be considered along with the legitimate concerns of local communities. The design of the Proposed Development has been designed in accordance with the Guidelines and has also been developed with the provisions of the Draft Guidelines in mind (for example in relation to 4 times turbine tip height set back distance from sensitive receptors).

### **Planning History**

The planning history of the Proposed Development site is outlined in Section 2.5 of this EIAR. A planning search was carried out through the national planning application database and An Bord Pleanála's online planning portal in April 2024 for relevant planning applications lodged within the planning application boundary of the Proposed Development. There have been 21 no. applications made within the Proposed Development planning application site boundary. These applications comprise of the existing wind farms, telecommunications infrastructure and ancillary development.

### **Scoping and Consultation**

Section 2.6 presents detail of the EIA Scoping undertaken with regards the Proposed Development. A scoping report, providing details of the Proposed Development, was prepared by MKO, and circulated in July 2022. MKO requested the comments of the relevant personnel/bodies in their respective capacities as consultees with regards to the EIAR process. As part of the constraints mapping process, which is detailed in Chapter 3 of this EIAR, telecommunications operators were contacted in February 2022 to determine the presence of telecommunications links either transversing the site or in close proximity to the Proposed Development site. Chapter 2 includes a list of scoping consultees and responses received, with full copies of all scoping responses received set out in Appendix 2-2 of the EIAR.

Community engagement has been undertaken by the Applicant, details of which can be found in Appendix 2-1 of this EIAR. In summary, the report was prepared to record the consultation carried out with the local community in respect of the Proposed Development. The applicant has carried out consultation in relation to the Proposed Development with local residents surrounding the Proposed Development and interested parties in the wider community. The objective of the consultations was to ensure that the views and concerns of all were considered as part of the Proposed Development design and EIA process.

The Proposed Development has the potential to have significant benefits for the local economy, by means of job creation, landowner payments and commercial rate payments. An important part of any renewable energy development, which Orsted has been at the forefront of developing, is its Community Benefit Package as discussed in detail in Appendix 2-1.

Section 2.6.4 of this EIAR includes details of the pre-planning meetings undertaken prior to the planning application being lodged, including engagement with An Bord Pleanála under the provisions of Section 37B (and 182E) of the Planning and Development Act 2000, as amended.

### **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 a proposed development or project (all of which are considered in the various chapters of this EIAR), the description of likely significant effects should include an assessment of cumulative impacts that may arise. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to a proposed development or project. The factors to be considered in relation to cumulative effects include population and human health biodiversity, ornithology, land, soil and, water, air, climate, , material assets, landscape, cultural heritage, etc and as well as the interactions between these factors.

To gather a comprehensive view of cumulative impacts on these environmental considerations and to inform the EIA process being undertaken by the consenting authority, each relevant chapter within this EIAR includes a cumulative impact assessment where appropriate.

The potential for cumulative impacts arising from other plans and/or projects has therefore been fully considered within this EIAR. The cumulative impact assessment of projects has three principle aims:

- To establish the range and nature of existing and approved plans and/or projects within the cumulative impact study area of the Proposed Development.
- To summarise the relevant plans and/or projects which have a potential to create cumulative impacts.
- To identify the plans and/or projects that hold the potential for cumulative interaction within the context of the Proposed Development and discard plans and/or projects that will neither directly or indirectly contribute to cumulative impacts.

Assessment material for this cumulative impact assessment was compiled on the relevant developments within the vicinity of the Proposed Development. The material was gathered through a search of relevant online Planning Registers, reviews of relevant EIAR (or historical EIS) documents, Planning Registers and EIA Portal, planning application details and planning drawings, and served to identify past and future plans and/or projects, their activities and their environmental impacts.

Geographical boundaries within which there may be potential for cumulative impacts to arise, relative to each individual EIAR topic (i.e. each chapter) is set out within the Chapter. To gather a comprehensive view of cumulative impacts within the cumulative study areas for each discipline and to inform the EIA process being undertaken by the competent authority, each relevant chapter within the EIAR addresses the potential for cumulative effects where appropriate and within the context of their identified cumulative study area. 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.

## Consideration of Reasonable Alternatives

This section of the EIAR contains a description of the reasonable alternatives that were studied by the developer, which are relevant to the Proposed Development 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 project, connection to the national grid and transport route options to the site. This section also outlines the design considerations in relation to the renewable energy development, including the construction compounds and Grid Connection. It provides an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects. The consideration of alternatives is an effective means of avoiding environmental impacts. As set out in the ‘*Guidelines on The Information to be Contained in Environmental Impact Assessment Reports*’ (Environmental Protection Agency, 2022), the presentation and consideration of reasonable alternatives investigated is an important part of the overall EIA process.

### Alternative Locations

The site selection process for the Proposed Development has been fully informed by national, regional and local policy at a macro level (see Chapter 2: Background to the Proposed Development), as well as site specific factors that influence the turbine layout and the project design on the site at a micro level (see Section 3.2.6, Chapter 3).

The key policy, planning and environmental considerations for the selection of a potential wind farm site included:

- Site location relative to the Kerry County Development Plan (2022 – 2028).
- Low potential for impact on Designated Sites
- Consistent wind speeds
- Available set back distance from sensitive receptors
- Access to the National Grid
- Protection of visual amenity
- Low population density
- Sufficient area of unconstrained land that could potentially accommodate wind farm development and turbine spacing requirements.

The Development 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 and facilitators led. Facilitators are factors that give an advantage to a Proposed Development, while constraints are restrictions that inform the location and design of a project by highlighting sensitivities. A constraints analysis was undertaken and included avoidance of environmental designations (Natura 2000 sites), review of national, regional, and local policies and objectives, suitable wind speeds, adequate setbacks from sensitive receptors, proximity to national grid nodes, avoidance of direct impacts on known cultural heritage assets, access and constructability.

### Alternative Renewable Energy Technologies

Both onshore and offshore wind energy development will be required to ensure Ireland reaches the target set in the Climate Action Plan 2024 to source 80% of our electricity from renewable energy by 2030. It is not a case of ‘either’ ‘or’.

The Proposed Development is located on the site of the Existing Kilgarvan Wind Farm. The site of the existing wind farm also hosts small areas of forestry and some low-intensity agriculture. The Proposed Development will be located entirely within the footprint of the Existing Kilgarvan Wind Farm. It would not be suitable based on the existing site already being utilised for a wind farm, to consider alternative technologies, such as solar. It was deemed at an early stage in the project development that

replacing the existing turbines with solar PV array would not be an environmentally sensitive option for this site.

Solar energy would require a larger development footprint. It was the aim of the Applicant to utilise as much of the existing wind farm footprint as possible in order to facilitate the Proposed Development. The larger footprint required for solar energy would lead to additional environmental effects due to the presence of Annex 1 habitats and the nature of other peaty habitats that are present onsite. In addition, a solar development would have a higher potential environmental effect on Traffic & Transport (construction phase) and Biodiversity and Birds (habitat loss) at the site.

For the reasons set out above, the proposal for a wind energy development at the Proposed Development site was considered to be the most efficient method of electricity production with the lesser potential for significant environmental effects.

### Alternative Turbine Numbers and Model

The proposed turbines will have a potential power output in the 5 – 7MW range. It is proposed to remove the existing 28 no. turbines and install 11 no. turbines at the site of the Proposed Development which could achieve approximately 6.6 MW output (mid-range capacity). Such a wind farm could be achieved on the site of the Proposed Development by replacing the existing turbines with turbines of the same dimensions. However, this would necessitate the construction of 28 no. turbines to achieve a similar output. Furthermore, the use of smaller turbines would not make efficient use of the opportunity to reduce the footprint of the Proposed Development. The turbine models and their associated technologies are now deemed outdated; they are also no longer available on the commercial market as they have been superseded by more efficient and advanced models. The use of more efficient turbine models for the Proposed Development is also allowing the developer to significantly reduce the number of turbines to be constructed, while also achieving a similar generation output.

The proposed number of turbines takes account of all site constraints and the distances to be maintained between turbines and features such as roads and houses, while maximising the wind energy potential of the Proposed Development. The 11-turbine layout selected for the Proposed Development has the smallest development footprint of the other alternatives considered and makes use of existing infrastructure from the Existing Kilgarvan Wind Farm as much as possible.

### Alternative Turbine Layout and Development Design

The design of the Proposed Development has been an informed and collaborative process from the outset, involving the designers, developers, engineers, landowners, environmental, hydrological and geotechnical, archaeological specialists and traffic consultants. The aim being to reduce potential for environmental effects while designing a project capable of being constructed and viable.

Following the mapping of all known constraints, detailed site investigations were carried out by the project team, which allowed for the identification of viable development areas. The ecological assessment of the Site encompassed habitat mapping and extensive surveying of birds and other fauna. This assessment, as described in Chapter 6 Biodiversity and Chapter 7 Aquatic Ecology of this EIAR, optimised the decision on the siting of turbines and the carrying out of any development works, such as the construction of roads. The hydrological assessment of the Proposed Development included detailed drainage mapping of the site, surface water sampling, field hydrochemistry assessments and grab sampling. The hydrological assessment of the Proposed Development utilised the results of the site surveys and outputted a detailed assessment of the potential impacts on the Zone of Impact due to the Proposed Development. This assessment, as described in Chapter 9 of this EIAR on Water, optimised the decision on the siting of turbines, roads and the onsite substation.

The final proposed layout takes account of the results of all onsite investigations and baseline assessments that have been carried out during the EIAR process, including noise, landscape and visual.

The final chosen layout is considered the optimal layout given it has the least potential for environmental effects.

### Alternative Grid Connection Cabling Route Options

In this case, it was deemed that there was no requirement for alternative grid route options to be considered, as it was deemed more appropriate to re-use the existing 110kV onsite substation with its existing connection to the national grid. The existing grid infrastructure is of a standard that it can be re-used with no major upgrades needed. As detailed in Chapter 3, this was deemed the most environmentally sensitive approach as all of the necessary infrastructure is existing and will not require additional groundworks or construction which could give rise to environmental impacts.

### Alternative Transport Route and Site Access

Wind turbine components (blades, nacelles and towers) are not manufactured in Ireland and therefore must be imported from overseas and transported overland to the Proposed Development. With regard to the selection of a transport route to the Proposed Development, alternatives were considered in relation to turbine components, general construction-related traffic, and site access locations.

The alternatives considered for the port of entry of wind turbines into Ireland for the Proposed Development include the Port of Shannon Foynes. Shannon Foynes Port is the principal deepwater facility on the Shannon Estuary and caters for dry bulk, break bulk, liquid and project cargoes. The primary chosen point of entry is Ringaskiddy Port due to its connection to the National Road Network namely the N22, on which the site entry for the Existing Kilgarvan Wind Farm is located.

### Alternative Mitigation Measures

Mitigation by avoidance has been a key aspect of the Proposed Development's evolution through the selection and design process. Avoidance of the most ecologically sensitive areas of the site limits the potential for environmental effects. As noted above, the layout aims to avoid any environmentally sensitive areas. Where loss of habitat occurs on the Site, this has been mitigated with the proposal of a habitat enhancement plan and a biodiversity net gain proposal. Any forestry felled within the footprint of the Proposed Development will be replaced offsite, with no net loss. The alternative to this approach is to construct new wind farm infrastructure and to encroach on environmentally sensitive areas of the site and accept the potential environmental effects and risk associated with this.

The best practice design and mitigation measures set out in this EIAR will contribute to reducing any risks and have been designed to break the pathway between the site and any identified environmental receptors. The alternative is to either not propose these measures or propose measures which are not best practice and effective and neither of these options is sustainable.

## 1.4

# Description of the Proposed Development

This section of the Environmental Impact Assessment Report (EIAR) describes the development and its component parts which is the subject of a proposed application for planning permission to An Bord Pleanála ('the Proposed Development').

The overall layout of the Proposed Development is shown on Figure 4-1 in Chapter 4 of this EIAR, this includes the removal of 28 no. existing wind turbines, the construction of 11 No. wind turbines with a blade tip height of between 199.5m and 200 metres and all associated works. The Proposed Development will utilise the Existing Kilgarvan Wind Farm onsite 110kV Coomagearlahy electrical substation.

Figure 4-2 illustrates the turbine removal process for the Existing Kilgarvan Wind Farm. The Proposed Development is shown in Figure 4-3. Detailed planning application drawings of the Proposed Development are included in Appendix 4-1 to this EIAR. All elements of the Proposed Development have been assessed as part of this EIAR.

The proposed wind turbine layout has been optimised using wind farm design software to maximise the energy yield from the wind farm site, while maintaining sufficient distances between the proposed turbines to ensure turbulence and wake effects do not compromise turbine performance. The turbine layout was also designed with the existing road network in mind. The Grid Reference coordinates of the proposed turbine locations are listed in Table 4-1 below.

Table 1-1 Proposed Wind Turbine Locations and Elevations

Turbine	ITM Coordinates		Top of Foundation Elevation (mOD)
	Easting	Northing	
T1	510195	576422	434
T2	509471	576080	382
T3	509384	576814	424
T4	508826	577136	429
T5	508211	577367	413
T6	507578	577739	344
T7	506871	577385	301
T8	508469	576459	368
T9	507639	576486	367
T10	507043	576549	366
T11	507822	576004	307

A turbine range is being applied for and assessed within this EIAR as part of the planning application, as laid out in Table 4-2, Chapter 4. Modern wind turbines from the main turbine manufacturers have evolved to share a common appearance and other major characteristics, with only minor cosmetic differences differentiating one from another. The wind turbines that will be installed on the Proposed Development 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.

The Proposed Development makes use of the existing road network insofar as possible. It is proposed to upgrade approximately 17.9 kilometres of existing site roads, and to construct approximately 1.5 kilometres of new access road on the site. There are areas of the existing road network for upgrade which will be wide enough to allow for construction vehicles to safely pass each other on the roads. Some of these areas were constructed as passing bays and formed through the widening of roads to facilitate turbine delivery for the Existing Kilgarvan Wind Farm.

It is intended to utilise the existing onsite 110kV Coomagearlahy electrical substation to connect the Proposed Development to the national grid. There are minor upgrades to the substation proposed as

part of this application to ensure that the existing substation is in compliance with current EirGrid specifications.

One 100m metrological (met) mast is proposed as part of the Proposed Development. The met mast will be constructed on an area of existing hardstanding upon which an existing turbine (which is proposed to be removed as part of the Proposed Development) is situated. This area of hardstanding is sufficiently large to accommodate the equipment that will be used to erect the mast.

There are 2 no. temporary construction compounds proposed as part of this application. Both of these temporary construction compounds are located on areas of existing hardstanding which will be upgraded and extended in order to accommodate the compounds. Temporary Construction Compound 1 is located approximately 325m east of Turbine No. 3 and measures 3,012m<sup>2</sup> in size. Temporary Construction Compound 2 is located approximately 410m northeast of Turbine No. 9 and measures 2,951m<sup>2</sup>. The construction compounds will consist of a bunded refuelling and containment area for the storage of lubricants, oils and site generators, etc, and full retention oil interceptor, waste organic storage area, welfare facilities including temporary site offices, staff facilities and car parking areas for staff and visitors. Temporary port-a-loo toilets and toilets located within a staff portacabin will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered offsite by a permitted waste collector to wastewater treatment plant. There will also be a water supply onsite for hygiene purposes, by way of a temporary storage tank.

As part of the Proposed Development, keyhole felling of forestry will be required within and around the Proposed Development footprint to enable the construction of turbine bases, access roads underground cabling and the other ancillary infrastructure. Felling is also required around turbine bases for the reduction of potential effects on bats (refer to Chapter 6 of this EIAR). A small section of the Proposed Development site is located on commercial forestry, namely Turbine No. 11 and its associated infrastructure. A total of 8.9ha of commercial forestry will be permanently felled within and around Turbine No. 11 and its associated infrastructure, along with existing treeline boundaries as detailed in Chapter 6. Figure 4-12 shows the extent of the commercial forestry to be permanently felled as part of the Proposed Development.

The commercial forestry felling activities required as part of the Proposed Development will be the subject of a Limited Felling Licence (LFL) 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.

It is proposed to develop 1 no. borrow pit as part of the Proposed Development. The proposed borrow pit is an extension to the existing onsite borrow pit which was used to facilitate the existing Kilgarvan Wind Farm. The borrow pit will provide the majority of all rock and hardcore material required during construction of the Proposed Development. Usable rock may also be won from other infrastructure construction, including the turbine base excavations. The borrow pit measures approximately 22,650m<sup>2</sup>. It is located alongside an existing access road leading to T9 in the centre of the site. The estimated volume of crushed stone to be extracted from the borrow pit and required for the construction of the Proposed Development is 369,530m<sup>3</sup>.

The extraction of rock from the borrow pit will be a temporary operation during the construction phase of the Proposed Development. There is a layer of peat and subsoil present at some areas at the borrow pit location, which will be stripped back and temporarily stockpiled using standard tracked excavators.

A drainage design for the Proposed Development, incorporating all principles and measures outlined in this drainage design description, has been prepared, and is included in Appendix 4-4 to this EIAR. The drainage design employs the various measures further described below and is cognisant of a number of guidance documents as detailed in Section 4.6.4 of Chapter 4 of this EIAR.



It is estimated that the construction phase of the Proposed Development will take approximately 18-24 months from starting onsite to commissioning of the electrical system. In the interest of breeding birds, construction will not commence during the Breeding Bird season from April to July inclusive. Construction may commence at any stage from August onwards to the end of March, so that construction activities are ongoing by the time the next breeding bird season comes around and can continue throughout the next breeding season.

The Proposed Development is expected to have a lifespan of approximately 35 years. Planning permission is being sought for a 35-year operation period commencing from the date of full operational commissioning of the wind farm. During the operational period, on a day-to-day basis the wind turbines will operate automatically, responding by means of anemometry equipment and control systems to changes in wind speed and direction.

## 1.5 Population and Human Health

One of the principal concerns in the development process is that human beings, as individuals or communities, should experience no significant diminution in 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 key issues examined in this chapter of the EIAR include population, human health, employment and economic activity, land-use, residential amenity, community facilities and services, tourism, property values, shadow flicker, noise, and health and safety.

The Proposed Development is located at the existing Kilgarvan Wind Farm site, approximately 5.5km northeast of the village of Kilgarvan, Co. Kerry and approximately 6km west of Coolea, Co. Cork. The Proposed Development is located within 4 no DEDs; Kilgarvan, Glanlee, An Sliabh Riabhach, and Clydagh. All four of these DEDs will collectively be referred to hereafter as the Study Area for this chapter. The DEDs which fall in the area of the turbine delivery route have not been considered in this assessment as no permanent works are being proposed along this transport route. The Study Area has a population of 2,084 persons as of 2022 and comprises a total land area of 237.1km<sup>2</sup> (Source: CSO Census of Population 2022).

The Proposed Development site is currently used for small-scale agriculture, and wind energy development, as it is currently in use as the existing Kilgarvan Wind Farm. The predominant surrounding land use within the Population study area is also farmland. The total area of farmland within the DEDs around the Proposed Development site measures approximately 14,488 hectares, comprising approximately 61% of the Study Area land mass, according to the CSO Census of Agriculture 2010. There are 244 no. farms located within the Study Area, with an average farm size of 59.4 hectares.

The removal of the existing turbines, and the design, construction and operation of the Proposed Development will provide employment for technical consultants, contractors and maintenance staff. Up to approximately 100 jobs could be created during the construction, operation and maintenance phases of the Proposed Development. The initial decommissioning and subsequent construction phase of the wind farm will last between approximately 18-24 months.

There is currently no peer reviewed 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 of this EIAR. Although there have been no empirical studies carried out in Ireland on the effects of wind farms on property prices, it is a reasonable presumption based on the available international literature that the provision of a wind farm at the proposed location would not significantly impact on the property values in the area.

Residential amenity relates to the human experience of one's home, derived from the general environment and atmosphere associated with the residence. The quality of residential amenity is



influenced by a combination of factors, including site setting and local character, land-use activities in the area and the relative degree of peace and tranquillity experienced in the residence.

When considering the amenity of residents in the context of a proposed wind farm, there are four main potential effects of relevance: 1) Shadow Flicker, 2) Noise, and 3) Visual Amenity and 4) Telecommunications. Shadow flicker, telecommunications and noise are quantifiable aspects of residential amenity while visual amenity is more subjective.

Shadow flicker is an effect that occurs when rotating wind turbine blades cast shadows over a window in a nearby property. Shadow flicker is an indoor phenomenon, which may be experienced by an occupant sitting in an enclosed room when sunlight reaching the window is momentarily interrupted by a shadow of a wind turbine's blade. Outside in the open, light reaches a viewer (person) from a much less focused source than it would through a window of an enclosed room, and therefore shadow flicker assessments are typically undertaken for the nearby adjacent properties around a proposed wind farm site. The current guidance for shadow flicker in Ireland is derived from the Guidelines and the '*Best Practice Guidelines for the Irish Wind Energy Industry*' (Irish Wind Energy Association, 2012).

The Guidelines set out a threshold of 30 hours per year or 30 minutes per day of shadow flicker at sensitive receptors within 500 metres of a proposed turbine location. As set out in the Guidelines, there is low probability of any shadow flicker effects occurring beyond 10 rotor diameters.

Planning permission is being sought for a range of turbine dimensions. In order to assess this range adequately, 3 no assessments were run which assessed a minimum, median, and maximum turbine tip height within the range that planning consent is being applied for. Under this assumption, the turbine dimensions considered are the following:

- Minimum turbine height: tip height 199.5m, rotor diameter 149m, hub height 125m
- Median turbine height: tip height 199.5m, rotor diameter 163m, hub height 118m
- Maximum turbine height: hub height 200m, rotor diameter 155m hub height 122.5

A significant minimum separation distance of 899m from third party dwellings has been achieved with the project design. The minimum turbine has a rotor diameter of 149m. Therefore, the shadow flicker study area only requires the assessment of 10 no properties ( $10 \times 149\text{m} = 1.49\text{km}$ ). Of the 10 no. properties modelled, when the regional sunshine average (i.e. the mean number of sunshine hours throughout the year) of 32.43% is taken into account, the Guidelines limit of 30 hours per year is not predicted to be exceeded at any of these properties.

The median turbine has a rotor diameter of 163m. Therefore, the shadow flicker study area requires the assessment of all 14 no properties ( $10 \times 163\text{m} = 1.63\text{km}$ ). Of the 14 no. properties modelled, when the regional sunshine average (i.e. the mean number of sunshine hours throughout the year) of 32.43% is taken into account, the Guidelines limit of 30 hours per year is not predicted to be exceeded at any of these properties.

The maximum turbine has a rotor diameter of 155m. therefore, the shadow flicker study area only requires the assessment of 13 no. properties ( $10 \times 155\text{m} = 1.55\text{km}$ ). Of the 13 no. properties modelled, when the regional sunshine average (i.e. the mean number of sunshine hours throughout the year) of 32.43% is taken into account, the Guidelines limit of 30 hours per year is not predicted to be exceeded at any of these properties. However, this is a worst-case scenario where topography and screening are not taken into account.

Where daily or annual shadow flicker exceedances are experienced, suitable mitigation measures as outlined in Chapter 5 will be employed at the potentially affected properties to ensure that the limits set out in the Guidelines are not exceeded at any sensitive receptor within the Shadow Flicker Study Area. It is also noted that the Proposed Development can be brought in line with the requirements of the Draft Guidelines should they be adopted while this application is in the planning system, through an alteration of the implementation of the mitigation measures outlined in Chapter 5.

Impacts on human beings during the construction, operational and decommissioning phases of the Proposed Development are described in Chapter 5 in terms of health and safety, employment and investment, population, land-use, noise, dust, traffic, tourism, residential amenity, renewable energy production and reduction in greenhouse gas emissions, shadow flicker and interference with communication systems. Where a negative impact is identified, appropriate mitigation measures will be put in place to ensure that there will be no significant health effects on sensitive receptors in the surrounding area.

## 1.6 Terrestrial Ecology

Ecology Ireland Wildlife Consultants Ltd. (Ecology Ireland) was commissioned by Orsted Onshore Ireland Midco Ltd. (Ørsted) to prepare the Terrestrial Biodiversity chapter of the EIAR in relation to the Proposed Repowering of the Existing Kilgarvan Wind Farm, Co. Kerry (the Proposed Development).

The Terrestrial Biodiversity Chapter examines potential effects and impact significance during the operation and decommissioning of the Proposed Development. The baseline ecological conditions are described through a combination of desktop and field studies which were carried out to inform this assessment.

The Proposed Development will involve removal of 28 no. turbines and the erection of 11 no. wind turbines.

The field surveys were carried out by a team of experienced specialist ecologists that recorded the flora, habitats and fauna present in the receiving environment. The conservation value of the species and habitats present was assessed. Dedicated surveys were conducted to map the habitats present and to record botanical species of interest. The presence of non-volant mammals was recorded from sightings, field signs and deployment of wildlife trail cameras. Active and passive surveys for bats were conducted over several years and included deployment of passive detectors at height using the existing meteorological masts. Multi-season bird surveys were also conducted over several years, including specialist surveys for Red Grouse, Vantage Point (VP) and Hinterland surveys and general breeding and winter bird surveys. Evidence of collision fatalities (birds and bats) at the existing turbines was assessed by intensive dog-based carcass searches. Surveys to record the presence of other taxa including Kerry Slug and Marsh Fritillary were also undertaken.

The results of the detailed field surveys along with information gathered from desktop studies generated a comprehensive dataset to describe the terrestrial biodiversity present.

The potential effects of the Proposed Development on designated nature conservation sites were assessed. The potential for ecological effects on sites at all distances from the Proposed Development are evaluated using the Source-Pathway-Receptor (S-P-R) model. The Kilgarvan Wind Farm EIAR Site Boundary does not lie within any EU Natura 2000. The closest Natura 2000 site is Killarney National Park, Macgillycuddy's Reeks & Caragh River Catchment SAC (000365) is located within 0.1km of the entrance from the public road at Cloonkeen. The nearest of the proposed turbines is 1.6km from this SAC. There are two SPA sites located within 15km of the EIAR study area, Mullaghanish to Musheramore Mts. SPA (004162) and Killarney National Park SPA (004038).

There are six nationally designated sites located within 5km of the EIAR study area: Killarney National Park, Macgillycuddy's Reeks & Caragh River Catchment pNHA (000365; 0.1km), Roughty River pNHA (001376; 0.3km), Old Domestic Building, Curraglass Wood pNHA (002041; 2.8km), Sillahertane Bog NHA (001882; 3.0km), Kilgarvan Ice House pNHA (000364; 3.6km) and Kilgarvan Wood pNHA (4.7km).

The potential impacts of the Proposed Development on Natura 2000 sites in the surrounding area are considered in the Natura Impact Statement which accompanies the EIAR.

The western section of the Existing Kilgarvan Wind Farm comprises an extensive, open landscape dominated by a mosaic of wet heath, outcropping rock, blanket bog and dry heath habitats which is considered to be of high ecological value. The area is grazed by sheep with localized signs of grazing and poaching however it is clear from observations that sheep mainly graze and congregate along the wind farm road network. Damage due to peat cutting and drainage is absent and the condition of the peatland habitats is considered to be good. The eastern section of the Proposed Development site is dominated by species-poor, rushy wet grassland vegetation which has regenerated on peat soils previously drained and afforested. Smaller areas of tall conifer plantation also occur throughout along with some small areas of open heath and blanket bog. The ecological value of this area is considered to be relatively low due to the afforestation of this area in the past. No Third Schedule Invasive Plant species were recorded in the footprint of the proposed works. There are a variety of habitats present that are linked to habitats listed on Annex I of the EU Habitats Directive. Extensive areas of Annex I North Atlantic Wet heaths with *Erica tetralix* (4010) in mosaic with active Blanket Bog (7130) are present in the western portion of the site in particular.

The habitats present within the Existing Kilgarvan Wind Farm are relatively unattractive for most non-volant mammal species. The peatland and heath dominated habitats, particularly the open habitats in the western portion of the site, have very little potential for burrowing mammals. There are some foraging opportunities for grazing mammals, but the land is exposed in nature and lacks cover for larger mammals. Clearfell and conifer plantation dominate the eastern portion of the site. The walkover surveys recorded signs and occasional sightings of several non-volant mammal species in this area. No breeding or resting places of protected mammals were recorded within the Proposed Development site. Tracks, sightings and droppings of Sika Deer were extremely common at the site. There were direct sightings of two further non-volant mammals from within the existing wind farm study area with both Fox and Irish Hare, *Lepus timidus hibernicus* observed on many occasions. No Badger setts or Otter holts are present within the existing wind farm. Evidence of several other species was recorded locally, including Red Squirrel and Pine Marten.

Active bat surveys recorded very low levels of bat activity at the site and along the access road from Cloonkeen. Long-term deployments of passive bat detectors confirmed generally low levels of bat activity across the site and throughout the year. The species identified as occurring at the Proposed Development site were: Common and Soprano Pipistrelle, Leisler's Bat, Daubenton's Bat, Natterer's Bat, Brown Long-eared Bat and Lesser Horseshoe Bat. The field assessments included an evaluation of the potential for roosting bats within and closely adjacent to the wind farm site. There is a lack of built features with potential for roosting bats located within the site. The conifer plantation within the eastern portion of the existing wind farm has limited potential for roosting bats. The upland and relatively exposed nature of the site means that the site is relatively unattractive for bats. The results of the dedicated dog-based carcass searches recorded very little evidence of significant levels of bat mortality at the Existing Kilgarvan Wind Farm. The searcher efficiency trials confirmed that the recovery rate of even small carcasses such as bats are accomplished with a very high success rate (>90%) using trained dogs and expert handlers. From September 2021 to November 2022, only one bat carcass was recovered from the Existing Kilgarvan Wind Farm. A decomposing Common Pipistrelle was recovered 46m from a turbine base on August 5<sup>th</sup> 2022.

Most of the bird species recorded during breeding and winter bird walkovers were common birds at a local and national level. Species of higher conservation importance including Kestrel, White-tailed Eagle, Redwing, Golden Plover, Grey Wagtail and Meadow Pipit were recorded. As there was evidence of at least occasional occurrence of Red Grouse in the area a dedicated tape-lure playback survey was carried out, but there was no response to the playback at any of the locations on the three survey transects. It is likely the Proposed Development site is used occasionally by non-breeding birds.

Three breeding season and three winter season Vantage Point surveys were conducted at the site using seven VPs to record flightlines of target species (e.g. Raptors, Wading Birds, Waterbirds). Hinterland surveys were carried out to record the presence of target species in the wider receiving environment. Species recorded in flight during the VP surveys included raptors such as White-tailed Eagle and Kestrel, waterbirds such as Lesser Black-backed Gull and Grey Heron and wading birds including

Golden Plover. Due to the occurrence of a number of resident Red-listed species and the occasional occurrence of Annex I bird species in the area and taking into account the overall usage of the habitats at the site by birds, the EIAR Site Boundary was ascribed a local higher to county value for bird species. Only three bird carcasses were recovered during the 14-months of fatality searches. A Blackcap was recovered in September 2021, a Robin in April 2022 and a Mistle Thrush in July 2022.

No adult Marsh Fritillaries were recorded on the wing locally during any of the field surveys carried out in this area. There were limited amounts of Devil's Bit Scabious recorded in the area, mostly confined to areas of Dry Heath. No larval webs of Marsh Fritillary were recorded on these plants during checks of areas with the larval food plant. Common Lizard was recorded at the site on two occasions, in June 2019 and again in March 2022. Kerry Slug was common and widespread at the site. Their distribution appeared to be limited to areas with exposed rock and are particularly common along the edges of tracks within the site and elsewhere where there are exposed boulders. Spot checks along the conifer edge carried out during active bat survey visits failed to record the species in the conifer plantation.

A constraints-led design approach was taken to siting the principal features of the Proposed Development to avoid areas of high sensitivity for key habitats and species occurring or likely to occur at the site. The potential impacts on the Natura 2000 sites and their qualifying interests are considered in detail in the NIS that accompanies the planning application. The assessment concludes that with the implementation of the environmental controls including reinstatement plans in the construction phase, that there will be no significant adverse impacts upon any of the Natura 2000 sites, or their qualifying interests, arising from the Proposed Development.

The potential effects of the construction, operational and decommissioning phases of the Proposed Development on designated sites, habitats and species is assessed in detail. The assessment also considers the potential cumulative and in-combination effects that could occur arising from other projects and plans in the area. These assessments informed the Proposed Development of a mitigation strategy. Mitigation measures were designed to address and minimize the risk of impact arising from each phase of the proposed development. A Construction and Environmental Management Plan (CEMP) has been prepared which describes the general mitigation strategy that will apply during the decommissioning of the existing infrastructure and construction of the Proposed Development. The CEMP captures the mitigation commitments provided in other specialist chapters including measures to protect water quality in the sub-catchments that drain the Proposed Development. Detailed mitigation and monitoring commitments are presented which have been informed by measures implemented at other wind farms in the area. For instance, during the construction phase and in advance of the operational phase of the new turbines, a detailed White-tailed Eagle mitigation strategy will be implemented in accordance with that agreed with Kerry County Council as part of the planning application for the Grousemount Wind Farm, for the purpose of minimising the risk to White-tailed Eagles. The requirement to adhere to this strategy to prevent Eagle mortality is also referenced in Chapter 12 of the Kerry County Development Plan. A suitably qualified ornithologist will be appointed to develop and oversee the implementation of the plan. Measures to minimise the impacts on bats include commitments to monitor bat activity at the site during the construction phase and for the first three years of operation. As a precautionary mitigation measure, in addition to the creation of buffers between the proposed turbines and surrounding vegetation reduced rotation speed will be implemented when turbines are idling. Automatic 'feathering' of idling blades will be implemented to reduce rotation speed of blades to below 2 RPM while idling. Feathering blades has been shown to be effective in reducing fatality rates of bats. The fatality monitoring programme for birds and bats (using dog-based searches) will recommence during the construction phase and will be continued for the first three years of operation. Monthly searches of turbine bases and met mast will be carried out along with associated searcher efficiency and scavenger removal trials. All of the monitoring reports will be made available to the planning authority and to National Parks & Wildlife Service.

The mitigation measures described for the Proposed Repowering of the Existing Kilgarvan Wind Farm have been designed to minimise the impact of the Proposed Development, from the construction of the wind farm infrastructure, through the operational phase and onto decommissioning. With the implementation of mitigation measures the Proposed Development will not contribute to the potential

in-combination impacts of agriculture and silviculture on the hydrologically connected European sites. The residual impacts are likely to be slight negative (local) in the temporary to short-term upon the terrestrial habitats and species that occur in the receiving environment.

## 1.7 Aquatic Ecology

This chapter assesses the effects that the Proposed Development may have on aquatic ecological receptors and sets out the mitigation measures proposed to avoid or reduce any potential likely significant effects that were identified.

The Proposed Development is in the upper reaches of three small tributaries of the Roughty River (Thurehouma, Lettercannon and Glanlee). The access track traverses several small headwater tributaries of sub-catchments of the River Flesk (Laune) and Sullane (Lee).

A large portion of the Proposed Development infrastructure is already in-situ, notably the access roads, drainage network and existing culverts. As such, there is no requirement for large-scale earthworks that would otherwise be associated with a new wind farm development. Earthworks are limited to a small number of new hardstands, cable ducting, drainage upgrades and a short section of new internal track between proposed T8 and T11. One new culvert crossing will be required on a small, ephemeral watercourse in the upper reaches of the Lettercannon tributary.

A comprehensive suite of field surveys was carried out to inform the aquatic ecological impact assessment, including electrofishing, macroinvertebrate sampling (Q-value analysis), freshwater pearl mussel survey, water chemistry sampling and aquatic habitat assessments.

### Roughty River Sub-catchment

Electrofishing at sites on the three tributaries and on the Roughty main channel showed (1) upper reaches of the tributaries within the Proposed Development site have no salmonid value and are generally of low local ecological value owing to ephemeral flows, small size and steep topography, (2) lower reaches of each of the three tributaries have small populations of salmon and trout, (3) mid-reaches of the Glanlee tributary (outside the site boundary) have small numbers of trout only, and (4) Roughty River comprises excellent salmonid habitats (spawning, nursery and holding) with high densities of juvenile salmon and trout of various size classes.

Freshwater pearl mussel survey on the Roughty River covered a total of 9km downstream of the tributary confluences, revealing low numbers and a very patchy distribution related to limited habitat availability. Over 70% of the channel was completely unsuitable for mussels in terms of substrate (bedrock, unstable cobble) and hydrological nature. The remaining 30% of habitat had very limited habitat suitability owing to scouring during high flow. A few scattered adults (n=4) were located 900m downstream of the EIAR Site Boundary, with the nearest significant cluster of large adults located a further 3.2km downstream. Water and macroinvertebrate sampling showed the Roughty River and the three affected tributaries to be “unpolluted” with waters indicative of ‘high’ status according to Surface Water Regulations and aligning with ‘good’ to ‘high’ ecological status according to macroinvertebrate communities under the Water Framework Directive (WFD).

### Flesk and Sullane Sub-catchments (Access Track)

Watercourses crossed by the existing access track are small headwater tributaries of the River Flesk, with one small headwater crossing of the Sullane sub-catchment. Each of the crossings within the Proposed Development area are culverted, with no requirement for further instream works. The access track itself will be subject to superficial repairs (minor resurfacing) where necessary.

The access track tributaries drain to the River Flesk within a reach that is mainly torrential and gorge-like with bare bedrock and boulder chutes and pools. There is little or no salmonid spawning or nursery habitat. Holding pools are common for migrating salmon and older residential trout. The Flesk tributary streams themselves have no fisheries significance in the already culverted reaches, but trout cannot be ruled out in the lower reaches of the Owgarriv Stream that drains to the Flesk. Freshwater pearl mussels were not detected downstream of the Owgarriv tributary as far as the Loo River confluence (1.2km).

A section of the access track nearer the N22 road may require minor levels of widening, involving a small amount of linear forestry felling and one culvert upgrade. The culvert upgrade is on a minor, non-fisheries channel. These works are outside the EIAR Site Boundary but, for completeness, were assessed in combination, as part of this Chapter.

### Potential Impacts and Mitigation

In the absence of mitigations and measures to prevent and control sediment sources and pollutant losses to watercourses, the cumulative construction phase impact on downstream aquatic receptor the three tributaries (trout, salmon, macroinvertebrates) and the Roughty River (salmonids, pearl mussel, macroinvertebrates at high status) may be short-term, significant negative, although it is noted that the possibility of this occurring from a well-managed site where there is existing infrastructure (i.e., internal access tracks and sub-station in-situ) is not likely.

On the access track, the combination of felling and road widening in the Flesk sub-catchment has potential for at least short-term, moderate, negative reversible effects on the Flesk tributaries and the Flesk River, localised to a short distance downstream of the tributary confluences.

A wide range of mitigation measures have been prescribed as part of the Proposed Development to prevent contamination of surface waters during the construction phase; detailed in this chapter, in Chapter 9 (Water) and amalgamated in the CEMP. The existing drainage network will be upgraded to improve on-site attenuation and concomitant treatment. The construction phase discharges will be limited to greenfield run-off rates with measures employed to limit sediment sources and control pathways to prevent suspended solids wash-out. The implementation and efficacy of all mitigation measures will be overseen and monitored by a dedicated Ecological Clerk of Works during the construction phase.

### Residual Effects

Residual effects are predicted to diminish following the early construction period as the development infrastructure settles into the landscape and ceases to give rise to potentially damaging levels of solids export to watercourses. With the implementation of the prescribed mitigation measures around sediment loss prevention and control during the construction phase, adverse in-combination effects on aquatic receptors of the Roughty River, plus the Flesk and Sullane Rivers (access track) are not likely and Not Significant.



## 1.8 Lands, Soils and Geology

This chapter assesses the likely significant effects that the Proposed Development may have on land, soils and geology and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified.

The Proposed Development site is located in an upland setting on the western slopes of the Derrynasaggart Mountain Range. The Proposed Development site is characterised by mountainous terrain with moderate to steep slopes in places. The land is characterised by abundant protruding ridges of bedrock outcrop with blanket peat between the ridges of bedrock. The existing topography of the Proposed Development site is moderate to steeply sloping, ranging from approximately 190 to 500mOD.

The Proposed Development site is the location of the existing Kilgarvan Wind Farm. The site comprises a total of 28 no. operational wind turbines which are supported by a network of access roads, underground cabling, a meteorological mast and the on-site 110kV Coomagearlahy substation.

Based on the peat depth information for the Proposed Development site, the peat varied in depth from 0-6.5m with an average peat depth of 0.79m. Peat depths at the proposed turbine locations range from 0.05 – 2.32m with an average of 0.96m. The deeper peat areas have generally been avoided in the Proposed Development layout. The peat deposits are underlain by weathered sandstone bedrock in the form of silts, sands, gravels and occasional sandstone boulders.

The Proposed Development will typically involve removal of peat, subsoils (spoil) and the excavation of bedrock for the construction of the internal cable network, hardstanding emplacement, turbine foundations, crane hardstands and construction compounds.

Estimated volumes of peat to be excavated are in the region of 60,080m<sup>3</sup>. Excavated peat will be used for reinstatement and landscaping works as close to the extraction point as possible. Any excess peat will be stored in the onsite borrow pit. The handling and storage of peat and spoil will be done in accordance with the Peat and Spoil Management Plan which is included as Appendix 4-2 to the EIAR.

Storage and handling of hydrocarbons/chemicals will be carried out using best practice methods. Measures to prevent peat and subsoil erosion during excavation and reinstatement will be undertaken to prevent water quality effects.

A Geotechnical and Peat Stability Assessment was undertaken for the Proposed Development Site (Appendix 8-1), and it demonstrates an acceptable margin of safety, that the site is suitable for the Proposed Development and is considered to be at low risk of peat failure. A number of control measures are given in the peat stability assessment to manage all risks associated with peat instability.

The Proposed Development has a very small development footprint when compared to the overall area of the Proposed Development site. Therefore no significant effects on land will occur during the construction, operation or decommissioning phases of the Proposed Development.

The peat deposits at the Proposed Development site are thin and degraded in places. For this reason, and with the implementation of the mitigation measures detailed in this EIAR and the best practice measures detailed in the Peat and Spoil Management Plan, no significant effects on peat and soils will occur during the construction, operation or decommissioning phases of the Proposed Development.

The sandstone bedrock at the Proposed Development site will be excavated and used in the construction of the Proposed Development. However, with the implementation of the mitigation measures outlined in this EIAR, no significant effects on the underlying sandstone bedrock geology will occur during the construction, operation, or decommissioning phases of the Proposed Development.

An assessment of potential cumulative effects associated with the Proposed Development and other developments on land, soils and geology has been completed. The Land, Soils and Geology Assessment confirms there will be no significant cumulative effects on land, soil and geology as a result of the Proposed Development.

## 1.9 Hydrology and Hydrogeology

This chapter assesses the likely significant effects that the Proposed Development may have on hydrology and hydrogeology and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified.

Regionally, the majority of the Proposed Development site is located in the Dunmanus-Bantry-Kenmare catchment surface water catchment and drains to the southwest towards the Roughty River. A small area of the Proposed Development site is located in the Lee, Cork Harbour and Youghal Bay surface water catchment and drains to the southeast towards the Sullane River. Meanwhile, the majority of the main access road from the N22 to the Wind Farm site is located in the Laune-Maine-Dingle Bay surface water catchment and drains to the north towards the Flesk River.

The surface of the Proposed Development site is drained by a network of natural headwater streams which follow surface topography and flow rapidly downslope. In places, the existing natural drainage regime is supplemented by roadside drains associated with the existing wind farm. Some areas of the Proposed Development site comprise of coniferous forestry and these areas contain a network of forestry field drains.

The bedrock underlying the Proposed Development site is classified as a Locally Important Aquifer. The bedrock has little or no open cracks which means groundwater movement within the aquifer is very localised. Groundwater at the site can be classed as sensitive in terms of potential effects from the Proposed Development. Depth to bedrock is shallow with large ridges of bedrock outcrop protruding within the site. However, the low potential for pollutant travel within the bedrock groundwater makes surface water bodies such as streams more sensitive to pollution than groundwater. There will be no impact on private wells as a result of the Proposed Development.

Designated sites that receive surface water runoff from the Proposed Development site include the Roughty river pNHA and the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC. These designated sites can be considered very sensitive in terms of potential effects. Following implementation of the appropriate mitigation measures as outlined in the EIAR no significant effects on this designated site will occur as a result of the Proposed Development.

Due to the nature of wind farm developments, being near surface construction activities, effects on groundwater are generally negligible and surface water is generally the main sensitive receptor assessed during impact assessments. The primary risk to groundwater would be from oil spillage and leakages at turbine foundations or during construction plant refueling. These are common potential impacts to all construction sites (such as road works and industrial sites). These potential contamination sources are to be carefully managed at the site during the construction and operational phases of the development and measures are proposed within the EIAR to deal with these potential minor local impacts.

During each phase of the wind farm development (construction, operation, and decommissioning) a number of activities will take place at the Proposed Development site, some of which will have the potential to significantly affect the hydrological regime or water quality at the Proposed Development site or downstream of the site. These significant potential effects generally arise from sediment input from runoff and other pollutants such as hydrocarbons and cement-based compounds.

Surface water drainage measures, pollution control and other preventative measures have been incorporated into the project design to minimise significant effects on water quality and downstream designated sites. A self-imposed 50m stream and lake buffer was used during the design of the



Proposed Development, thereby avoiding sensitive hydrological features. The surface water drainage plan will be the principal means of significantly reducing sediment runoff arising from construction activities and to control runoff rates. The key surface water control measure is that there will be no direct discharge of wind farm runoff into local watercourses or into the existing site drainage network. This will be achieved by avoidance methods (i.e. stream buffers) and design methods (i.e. surface water drainage plan). Preventative measures also include fuel and concrete management and a waste management plan which will be incorporated into the Construction and Environmental Management Plan.

No significant effects to surface water (quality and flows) and groundwater (quality and quantity, and any local groundwater wells) will occur as a result of the Proposed Development provided the proposed mitigation measures are implemented. This EIAR presents proven and effective mitigation measures to mitigate the release of sediment which will reduce the concentration of suspended solids to acceptable levels. The storage and handling of hydrocarbons/chemicals will be carried out using best practice methods which will ensure the protection of surface and groundwater quality. The Proposed Development drainage system will be designed to slow surface water runoff from the site by providing greater attenuation. This will ensure that the Proposed Development does not alter downstream surface water flows and will not contribute to downstream flooding.

A Water Framework Directive (WFD) Compliance Assessment has been completed for all waterbodies (surface water and groundwater bodies) with the potential to be impacted by the Proposed Development. With the implementation of the mitigation measures detailed in this EIAR there will be no change in the WFD status of the underlying groundwater body or downstream surface waterbodies as a result of the Proposed Development. The Proposed Development has been found to be fully compliant with the WFD and will not prevent any waterbody from achieving its WFD objectives.

An assessment of potential cumulative effects associated with the Proposed Development and other developments on the hydrological and hydrogeological environment has been completed. With the implementation of the mitigation measures detailed in this EIAR, the cumulative assessment found that there will be no significant effects on the hydrological and hydrogeological environments.

No significant effects on the water environmental will occur during the construction, operation or decommissioning of the Proposed Development.

## 1.10 Air Quality

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

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 which Directive, Framework Directive and Daughter Directives.

The air quality zone for the Site was selected, followed by a review of EPA collated baseline air quality data namely Sulphur Dioxide (SO<sub>2</sub>), Particulate Matter (PM<sub>10</sub>), Nitrogen Dioxide (NO<sub>2</sub>), Carbon Monoxide (CO) and Ozone (O<sub>3</sub>) for the selected air quality zone to determine the representative levels of such emissions for the Proposed Development. The Site lies within Zone D, which represents rural areas located away from large population centres.

The air quality in the vicinity of the Proposed Development is typical of that of rural areas of Ireland, i.e., Zone D. Prevailing south-westerly winds carry clean, unpolluted air from the Atlantic Ocean onto the Irish mainland. The EPA publishes Air Monitoring Station Reports for monitoring locations in all four Air Quality Zones. The most recent report on air quality in Ireland, 'Air Quality in Ireland 2022' was published by the EPA in 2023. The EPA reports provide SO<sub>2</sub>, PM<sub>10</sub>, NO<sub>2</sub> and O<sub>3</sub> concentrations for areas in Zone D. These are detailed in Section 10.2.4 of Chapter 10 of this EIAR.

Due to the non-industrial nature of the Proposed Development, and the general character of the surrounding environment, baseline air quality sampling was deemed to be unnecessary for this EIAR. It is expected that the air quality in the existing environment is good, since there are no major sources of air pollution (e.g. heavy industry) in the vicinity of the Site.

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 Development will include vehicular and dust emissions.

A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-3 of this EIAR), which includes dust suppression measures. In addition, turbines and construction materials will be transported to the site on specified transport routes only. The agreed transport route roads adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary.

By providing an alternative to electricity derived from coal, oil or gas-fired power stations, the Proposed Development will result in emission savings of carbon dioxide (CO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>), and sulphur dioxide (SO<sub>2</sub>). The production of renewable energy from the Proposed Development will have a long-term significant positive impact on air quality due to the offsetting of approximately 68,982 tonnes of Carbon Dioxide (CO<sub>2</sub>) per annum, further detailed in Chapter 11 Climate.

## 1.11

# Climate

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

The production of energy from wind turbines has no direct emissions as is expected from fossil fuel-based power stations. Harnessing more energy by means of wind farms will reduce dependency on fossil fuels, thereby resulting in a reduction in harmful emissions that can be damaging to human health and the environment.

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.

In June 2023, the Environment Protection Agency (EPA) released 'Ireland's Greenhouse Gas Emissions Projections 2022-2040'. The EPA has produced two scenarios in preparing these greenhouse gas emissions projections: a "With Existing Measures" (WEM) scenario and a "With Additional Measures" (WAM) scenario. These scenarios forecast Ireland's greenhouse gas emissions in different ways. The WEM scenario forecasts Ireland's emissions including all national policies and measures implemented by the end of 2021, the latest inventory year. The WAM scenario has a higher level of ambition and includes government policies and measures to reduce emissions, such as those in Ireland's Climate

Action Plan 2024 (CAP 2024), that are not yet implemented. As implementation of policies and measures occurs, they will be migrated into the WEM Scenario.

The projections show that implemented policies and measures in the WEM scenario can deliver an 11% reduction in greenhouse gas emissions by 2030 compared to the 2018 level. The WAM scenario, including policies and measures from CAP 2024, is projected to deliver a 29% emissions reduction over the same period. This is well short of the legally binding commitment to achieving a 51% reduction in GHG emissions from 2021 to 2030, and to achieving net-zero emissions no later than 2050. Ireland's new 2030 target under the EU's Effort Sharing Regulation (ESR) is to limit its greenhouse gas emissions by at least 42% by 2030. This target was set in April 2023 upon amendment of the Emissions Sharing Regulation. For Ireland to achieve its national and international climate targets, it will require a full and rapid implementation of CAP 2024 measures and further measures to be implemented.

A methodology 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 and is currently available as Version 1.8.1 which was last updated in 2023. The tool provides a transparent and easy to follow method for estimating the impacts of wind farms on the carbon dynamics of peatlands and was used to assess the effects of the Proposed Development in terms of potential carbon losses and savings, taking into account removal of carbon sequestering vegetation, and operation of the Proposed Development. The model calculates the total carbon emissions associated with the Proposed Development including manufacturing of the turbine technology, transport, and construction of the development.

The original EIAR for the Existing Kilgarvan Wind Farm did not include a discussion on carbon losses and savings. The data required to determine the embodied carbon of the Existing Kilgarvan Wind Farm 28 no. existing turbines is not available, therefore only emissions from the removal of the existing 28 no. turbines from the site as part of the construction phase of the Proposed Development are included in the calculations. The full life cycle and embodied carbon of the 11-no. new 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 remaining site infrastructure associated with the Proposed Development are considered using the Transport Infrastructure Ireland (TII) Carbon Tool (TII 2022)<sup>1</sup>. The TII Carbon Tool is customised for road and light rail projects in Ireland, using emission factors from recognised sources during the construction, maintenance, and operation of TII projects in Ireland.

The carbon balance of proposed wind farm developments in peatland habitats has attracted significant attention in recent years. When developments such as wind farms are proposed for peatland areas, there will be direct impacts and loss of peat in the area of the development footprint. There may also be indirect impacts where it is necessary to install drainage in certain areas to facilitate construction. The works can either directly or indirectly allow the peat to dry out, locally, which permits the full decomposition of the stored organic material with the associated release of the stored carbon as CO<sub>2</sub>. It is essential therefore that any wind farm development in a peatland area saves more CO<sub>2</sub> than is released. The Proposed Development is situated on agricultural land and peatland, with small sections being covered by coniferous forestry. For this reason, the carbon balance between the use of renewable energy and the loss of carbon stored in the peat are assessed in Section 11.5.3.1 of the EIAR.

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<sup>1</sup> *Transport Infrastructure Ireland Carbon Tool for Road and Light Rail Projects: User Guidance Document*  
<https://www.tiipublications.ie/library/GE-ENV-01106-01.pdf>

The Proposed Development will result in the loss of 123,504tCO<sub>2</sub>e during the construction phase, the details of these carbon losses are provided in Table 11-6 of Chapter 11 of the EIAR. Please note, that in completion of these calculations a number of assumptions have been made under theoretical precautionary conditions; all assumptions are detailed in Appendix 11-1 Carbon Calculations. Therefore, it can be determined that the actual carbon losses associated with the Proposed Development will likely be less than the values provided in Table 11-6 of Chapter 11.

The Proposed Development will have an export capacity of approximately 72.6MW and therefore will help contribute towards the achievement of national and international emission reduction targets, provide much needed grid infrastructure, and the capacity to offset 69,982tCO<sub>2</sub>e per annum, or 2,449,370tCO<sub>2</sub>e over its operational lifetime, thereby reducing the greenhouse gas effect. Carbon losses to the atmosphere due to changes in soil and ground conditions and due to the construction and operation of the Proposed Development will be offset by the Proposed Development in approximately 21 months of operation. Please see Section 11.5.3.2 for details on carbon savings/offset calculations.

During construction of the Proposed Development, there will be a Permanent Imperceptible Negative 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 Development will have a Direct Long-Term Moderate Positive Effect on climate as a result of reduced greenhouse gas emissions.

## 1.12 Noise and Vibration

A noise assessment was undertaken to determine the likely significant noise effects from the decommissioning, construction and operational phases of the Proposed Development.

Predicted decommissioning and construction noise levels at the nearest noise sensitive receptors during all phases of construction are below the threshold values within BS 5228 and are therefore deemed to be not significant.

A background noise survey was undertaken at five noise monitoring locations. The data was analysed in conjunction with on-site measured wind speed data and operational noise limits have been derived in accordance with the WEDG 2006.

The operational noise assessment was undertaken in three stages, which involved setting the Total WEDG Noise Limits (which are limits for noise from all wind farms in the area) at the nearest noise sensitive receptors, predicting the likely effects (undertaking a cumulative noise assessment where required) and setting Site Specific Noise Limits for the Proposed Development.

A comparison was also undertaken of the predicted output of the Existing Kilgarvan Wind Farm and the Proposed Development. The comparison showed that predicted levels are lower for the Proposed Development at all Noise Assessment Locations considered in the assessment.

Predicted cumulative operational noise levels indicate that for noise sensitive receptors neighbouring the Proposed Development, cumulative wind turbine noise (which considers noise predictions from all nearby operational and consented wind farms and the Proposed Development) exceeds the Total WEDG Noise Limits at a small number of receptors. This is due to the contribution of existing wind turbines in area and Site-Specific Noise Limits have been set to ensure that the Proposed Development has a negligible additional contribution at these locations.

Predictions of wind turbine noise from the Proposed Development have been made in accordance with good practice using three candidate wind turbines. Predicted operational noise levels from the Proposed Development indicate that for noise sensitive receptors neighbouring the Proposed Development, wind turbine noise from the Proposed Development would meet the Site-Specific Noise Limits at all Noise Assessment Locations (NAL) and are therefore deemed to be not significant. In

order to meet the noise limits, noise management would be required for certain wind speeds and wind directions based on the candidate turbines considered in this assessment.

The use of Site-Specific Noise Limits would ensure that the Proposed Development could operate concurrently with other operational wind farm developments in the area and would also ensure that the Proposed Development's individual contribution could be measured and enforced if required.

The wind turbine models were chosen in order to allow a representative assessment of the noise impacts. Should the Proposed Development receive consent, the final choice of wind turbine will be subject to a competitive tendering process. The final choice of wind turbine will, however, have to meet the Site-Specific Noise Limits presented in the noise assessment.

## 1.13 Archaeology and Cultural Heritage

An assessment of the potential effects of the Proposed Development 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 surveys, GIS based mapping, ZTV and was also assisted by photowire images/photomontage from certain assets. A detailed examination of the available baseline data was undertaken in addition to a comprehensive site inspection.

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. Recommended mitigation includes archaeological monitoring of groundworks during the construction stage of the project.

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. Potential visual effects on the Paps archaeological landscape and Mangerton archaeological landscape were also considered.

An assessment of potential cumulative effects was also undertaken taking into consideration other extant planning applications and operational 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 operational 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.

## 1.14 Material Assets

This chapter of the EIAR addresses the likely significant effects of the Proposed Development on transportation infrastructure (Section 15.1 Traffic and Transport), on Telecommunications and Aviation (Section 15.2) and Other Material Assets (Section 15.3), which are economic assets of human origin.

### Roads, Traffic, Transport & Access

#### Introduction

An assessment of the traffic effects on the local highway network was undertaken for the Proposed Development. The assessment considers the likely impacts resulting from the additional traffic movements that will be generated by the Proposed Development during the construction, operational and decommissioning phases on the transport delivery route to the site.

An assessment of the geometry of the delivery route was also undertaken to ensure that the abnormally sized vehicles required to deliver the turbine plant to the Site are accommodated.

The Proposed Development will take 18-24 months to construct during which 28 existing wind turbines will be decommissioned and removed from the site, and 11 new turbines and associated materials will be transported to the site and constructed.

### **Traffic Route & Study Area**

The Proposed Development is located in County Kerry and is situated in the existing Kilgarvan Wind Farm site. The construction and operational phases of the Proposed Development will utilise the existing site access junction which is located on the south side of the N22 at a point approximately 26 kms west of Macroom in County Cork, and 22 kms southeast of Killarney in County Kerry.

The delivery route to the site for the abnormally sized loads transporting the large turbine components commences at the Port of Ringaskiddy, approximately 80.8kms to the east of the existing Kilgarvan Wind Farm access junction. From the Port of Ringaskiddy the route travel west and then north on the N28 to the N40 Cork Southern Ring Road. The route then heads west on the N40 Cork Southern Ring Road to join the N22 to the south of Ballincollig. The route continues west on the N22 through Ovens, Farran, Farnanes, Lissarda to the eastern side of Macroom where it joins the recently opened N22 Macroom to Ballyvourney Road that bypasses Macroom to the north and links back into the former N22 to the west of Ballyvourney. From this point the route continues on the N22 to the Existing Kilgarvan Wind Farm site access junction.

### **Vehicle types and network geometry**

The types of vehicles that will be required to negotiate the local network will be up to 87.5 metres long and will carry a blade 81.5 metres in length.

An assessment of the geometric requirements of the delivery vehicles was undertaken on the delivery route. Locations where it was established that the existing road geometry will not accommodate all of the vehicles associated with the Proposed Development are highlighted, with the extent of remedial works identified. In addition to the assessment presented, it is recommended that a dry run is undertaken by the transport company to check vertical and horizontal clearance on the transport route prior to construction.

### **Traffic impact on local network**

During the 11 days when the concrete foundations are poured, the effect on the surrounding road network will be negative. It is forecast that the increase in traffic volumes will range from +3.7% on the N22 between Lissarda and Macroom, to +4.6% on the N28 just west of Ringaskiddy, to a maximum of +6.1% on the N22 Macroom Bypass. In the event that concrete deliveries travel to the site from the direction of Killarney it is forecast that traffic volumes on the N22 will increase by +5.7%. It is on these 11 days that it is forecast that the Proposed Development will have the greatest impact on the surrounding road network, when the effects will be negative, temporary and slight on the delivery route.

For the remaining 24 months of the proposed construction period for the Proposed Development, the increase in link flows on the delivery route compared to background traffic flows without the Proposed Development are forecast to vary as follows;

- Link 1 – N28 Ringaskiddy, between +0.7% to 1.0%,
- Link 2 – N22 Lissarda to Macroom, between 0.6% to 0.8%,
- Link 3 – N22 Macroom Bypass, between +1.0% to +1.4%, and
- Link 4 – N22 Killarney to Islandmore, between 0.9% to 1.3%.

During this main part of the construction phase, based on the forecast increase in traffic volumes set out above it is forecast that the impact on the delivery routes will be negative, temporary and imperceptible.



Once the Proposed Development is operational the traffic impact created by maintenance staff will be imperceptible.

The residual effect for the decommissioning phase will be less than for the construction stage as set out above and will be slight to imperceptible.

### 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, effecting, for example radio signals. The most significant potential effect occurs where the renewable energy development is 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 Telecoms Operators and the relevant Aviation Authorities 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.

A total of 23 no. telecommunications links and one singular mast was identified within the vicinity of the Site. Appropriate buffer zones, agreed with the telecommunications operators, have been applied to these links. The final turbine layout overlaps with links and setback distances identified by both ESB and Vodafone. Investigations were subsequently completed on the information provided to MKO by the respective telecom's providers by A.I. Bridges, to assess the potential impact to the identified links by the proposed turbines.

A.I. Bridges compiled a report in which they identified that 1 no. proposed turbine had the potential to cause interference to the existing ESB link. The report proposed the provision of a relay mast adjacent to the turbine which has the potential to impact the ESB link. The applicant has committed to constructing this relay mast in order to ensure that no impact is felt on the ESB transmission network.

A.I. Bridges conducted further assessments on the proposed turbine locations and the links supplied by Vodafone. It was found that there was 1 no. proposed turbine which had the potential to impact on the Vodafone link. 2 no. mitigation measure solutions were called out by A.I. Bridges as potential solutions to avoid this issue. The Applicant has committed to employing one of these techniques before the construction of the proposed turbines. This report has been forwarded on to Vodafone for comment and no response has been received to date. The A.I. Bridges report is included within Appendix 15-3, Chapter 15.

The remainder of the telecommunications links identified in proximity to the Proposed Development have no electromagnetic interference impacts for telecommunications assets or operations are associated with the Proposed Development.

The final turbine layout overlaps with links and setback distance identified by both ESB and Vodafone. Investigations were subsequently completed on the information provided to MKO by the respective telecom's providers by A.I. Bridges, to assess the potential impact to the identified links by the proposed turbines.

Scoping responses received from both the Irish Aviation Department and the Department of Defence provided no specific requirements in relation to the completion of the EIAR but provided a number of observations in regard to obstacle lighting and notification of any works.

The closest large international airport to the Proposed Development is Cork Airport, which is located approximately 56.6km southeast of the Proposed Development. Cork Airport is outside the range at which such issues would be expected, and as detailed in Table 15-1 of Chapter 15 of this EIAR, the

Irish Aviation Authority did not submit any observations as detailed in Table 15-1 of Chapter 15 of this EIAR. There will be no significant effect on telecoms and aviation due to the Proposed Development.

### Existing Built Services and Utilities

The Proposed Development does not require the construction of a grid route, as it will be making use of the existing onsite Coomagearlahy 110kV substation. There will be no disturbance to any other electrical infrastructure due to the construction of the Proposed Development.

There are no other overhead cables on the Proposed Development site other than the existing 110kV line running northwards from the onsite Coomagearlahy substation to Cloonkeen 110kV substation. Sufficient setbacks from this line have been maintained as a part of the overall design of the Proposed Development and therefore, there are no impacts on overhead electricity lines as a result of the Proposed Development.

There are no other known existing services (i.e. water supply, sewage, telecommunications) present on the Proposed Development Site.

There will be no upgrades to the existing grid connection, so there will be no impact on existing built services and utilities as a result of the Proposed Development.

All waste generated on site will be contained in waste skips at a waste storage area on site. This waste storage area will be kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein. The expected waste volumes generated on site are unlikely to be large enough to warrant source segregation at the Proposed Development site. Therefore, all wastes streams generated on site will be deposited into a single waste skip. This waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal.

1.15

## Vulnerability of the Project to Major Accidents and Natural Disasters

Chapter 16 of the EIAR describes the likely significant adverse effects on the environment arising from the vulnerability of the Proposed Development as detailed in Chapter 4 to risks of major accidents and/or natural disasters, as well as the potential of the Proposed Development itself to cause potential major accidents and/or natural disasters.

Major accidents or natural disasters are hazards which have the potential to affect the Proposed Development and consequently have potential impacts on the environment. These include accidents during construction and operation 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, ornithology, land, soils & geology, water, air quality, climate, material assets, 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 Chapter 16 of this EIAR.

A wind farm is not a recognised source of pollution. It is not subject to Industrial Emissions Directive regulation or any other Environmental Protection Agency environmental regulatory consent. Should a



major accident or natural disaster occur the potential sources of pollution onsite during the construction, operational and decommissioning phases are limited and of low environmental risk. Sources of pollution with the potential to cause significant environmental pollution and associated negative effects such as bulk storage of hydrocarbons or chemicals, storage of wastes, management of flammable materials etc. are limited and so there is an inherent low level of environmental risk associated with major accident or natural disaster impacting the Proposed Development and causing environmental damage.

As outlined in Section 16.4.1.2 of Chapter 16, the scenario with the highest risk score in terms of the occurrence of major accident and/or disaster during construction was identified as 'Peat Stability' and 'Contamination' and risk of 'Fire/ Gas Explosion'. The risk scores during the operational phase are 'Fire/ Gas Explosion' and, 'Contamination' and Industrial 'Accident-Fire/ Gas Explosion' for the decommissioning stage.

The Proposed Development will be designed and built in line with current best practice and, as such, mitigation against the risk of major accidents and/or disasters will be embedded through the design. In accordance with the provision of the European Commission '*Guidance on the preparation of Environmental Impact Assessment Reports*', a Risk Management Plan will be prepared and implemented on site to ensure an effective response to disasters or the risk of accidents. The plan will include sufficient preparedness and emergency planning measures.

The risk of a major accident and/or disaster during the construction of the Proposed Development is considered 'low' in accordance with the '*Guide to Risk Assessment in Major Emergency Management*' (DoEHLG, 2010).

It is considered that when the above mitigation is implemented, and all mitigation detailed in the EIAR is implemented, there will not be significant residual effect(s) associated with the construction, operation and decommissioning of the Proposed Development.

## 1.16

# Interactions of the Foregoing

Chapters 5 to 16 of the EIAR identify the potential significant environmental effects that may occur in terms of Population and Human Health, Biodiversity (Flora and Fauna), Ornithology (Birds), Land, Soils and Geology, Water (Hydrology and Hydrogeology), Air Quality, Climate, Noise and Vibration, Landscape and Visual, Cultural Heritage (Archaeological, Architectural and Cultural Heritage), Material Assets (Roads and Traffic, Telecommunications, Aviation, Utilities and Waste Management), and Vulnerability to/from Major Accidents and Natural Disasters as a result of the Proposed Development, as described in Chapter 4 of this EIAR. All of the potential significant effects of the Proposed Development and the measures proposed to mitigate them have been outlined in the preceding chapters of this EIAR. Mitigation measures and best practice measures for the construction, operation and decommissioning of the Proposed Development are detailed in the accompanying Construction and Environmental Management Plan (CEMP). 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.

The potential for interaction of effects has been assessed, throughout this EIAR, as part of the Impact Assessment process. While the work on all parts of the EIAR were not carried out by MKO, the entire project and all the work of the sub-consultants was managed and co-ordinated by the company. The EIAR was edited and collated by MKO as an integrated report of findings from the impact assessment process, by all relevant experts, and effects that potentially interact have been assessed in detail in the individual chapters of the EIAR and summarised in Section 17.2 of Chapter 17 of this EIAR.



Where any potential negative effects have been identified during the assessment process, these impacts have been avoided or reduced by design and the proposed mitigations measures, as presented throughout the EIAR.