
DYRICK HILL WIND FARM LIMITED

DYRICK HILL WIND FARM CO. WATERFORD

VOLUME I NON-TECHNICAL SUMMARY (NTS)

MAY 2023

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1 **NTS.1 INTRODUCTION**

This Non-Technical Summary (NTS) summarises the Environmental Impact Assessment Report (EIAR) which accompanies the application for planning permission for Dyrick Hill Wind Farm which is situated in the townlands of Ballynaguilkee Upper, Broemountain, Corradoon, Dyrick, Lickoran, Lickoranmountain, Lisleagh, Lisleaghmountain, Lyrattin and Scartmountain. The Site is located 43km west of Waterford City, 55km northeast of Cork City, and 12.9km northwest of Dungarvan.

The applicant EMPower is seeking planning permission is Dyrick Hill Wind Farm.

EMPower (EMP) was established in 2015 to serve the growing renewable energy sector internationally. Headquartered in Dublin, their primary business is the development of appropriately positioned and scaled greenfield wind and solar PV assets. EMP's management team have substantial experience in renewable energy development internationally and have applied their combined 95 years' experience to emerging energy markets for renewables. This begins with the identification of suitable wind and solar sites, in line with international best practice in environmental and engineering design followed by the development of these sites in conjunction with local stakeholders.

EMP's vision is to expand the energy sectors in their respective markets, utilising clean, green power which can be deployed in a decentralised, modular configuration. EMP aims to be a market leader in renewable energy deployment globally, thereby reducing dependence on fossil fuels.

Permission is being sought by the applicant for the construction of 12 No. wind turbines, a meteorological mast, an on-site substation and all ancillary works, works along the turbine delivery route and the construction of an underground Grid Connection to Dungarvan 110kV substation, Co. Waterford.

The Environmental Impact Assessment Report (EIAR) presents information on the identification and assessment of the potential significant environmental effects of the Development and reports the findings of the Environmental Impact Assessment (EIA) which has been undertaken in accordance with the Planning and Development Act 2000, as amended, and the Planning and Development Regulations 2001, as amended. The EIAR comprises the following documents:

- This Non-Technical Summary (Volume I)
- The Main EIAR Report (Volume II)

- Supporting Figures (Volume III)
- Supporting Appendices (Volume IV)

These documents inform the readers of the nature of the development, likely environmental effects and measures proposed to protect the environment during each phase of the development.

The development will comprise the following phases:

- Construction of the Development
- Operation of the Development
- Decommissioning of the Development

2 NTS.2 ENVIRONMENTAL IMPACT ASSESSMENT

EIA is required where there are likely to be significant effects on the environment due to the nature, size or location of a new development. Windfarms of the scale of the Development typically legally require an EIA to be carried out.

This EIAR has been prepared following a systematic approach to an EIA and project design, with knowledge of the potential effects being used to change the design so as to reduce those effects. The main EIA stages are:

- Scoping consultation (process of asking relevant organisations what they think should be included in the EIA) and how these topics are addressed
- Technical environmental assessments - baseline studies (understanding what the existing environmental conditions are), asking what potential significant environmental effects might occur, informing the design evolution and identification of measures to reduce undesirable effects
- Writing up the findings to include in the EIAR
- Submission of the planning application and EIAR

Scoping and pre-application consultation is important to the development of a comprehensive and balanced EIAR. Requests for Scoping Opinions were submitted to the prescribed bodies and key consultees in September 2021. The request was accompanied by a Description of the Project, a Site Location Map, an Overall Masterplan Drawing and a Scoping Letter. Scoping Opinions received are included as **Appendix 1.1 of Volume IV**. This included agreement on excluding from the EIAR, assessment of effects on certain receptors or features, where it was agreed there was no potential for significant effects.

The Applicant undertook a number of public consultation events. Public consultation took place in 7 stages as follows:

A report on the public consultation process has been prepared and can be found in **Appendix 1.3** in **Volume IV**. Public consultation was generally supportive of the project with the main concern raised being about impacts on the road network during construction.

Environmental effects have been assessed in chapters of the EIAR, broadly with one chapter per technical discipline, generally representing a type of receptor of potential effects (e.g. birds). The assessments in each chapter follow a similar, systematic approach, to identify any effects that may be significant in the context of the EIA Regulations. The approach includes establishing the “baseline”, this being the current state of the environment, to which the Development will be added. This identifies the key receptors, including how sensitive they are to the sort of change that might be caused by the Development. The potential size (or magnitude) of change caused by the Development is then assessed, and the sensitivity and magnitude are considered together to form a conclusion on significance. Effects can be desirable (or “positive”, or “beneficial”), or undesirable (or “negative”, or “adverse”). Mitigation is proposed where possible to prevent significant undesirable effects. The final, proposed effects are those after mitigation has been applied, and are the “residual effects”.

In accordance with the EIA Regulations, the assessment has considered 'cumulative effects'. These are effects that result from cumulative changes caused by past, present or reasonably foreseeable actions together with the Development.

3 NTS.3 PROPOSAL FOR THE DYRICK HILL WINDFARM

The layout of the Development is shown on **Figure NTS 1 & 2**. The Development will be comprised of the following main components:

- Erection of 12 no. 6.0-7.2 MW wind turbines (Note* this is the current output available for turbines of this size. It is possible that with improvements in technology, the output may increase at the time of construction.) with an overall ground tip height of 185m. The candidate wind turbines will have a 162m rotor diameter and a hub height of 104m.
- Construction of Crane Hardstand areas and Turbine Foundations.
- Construction of new internal site Access Tracks and upgrade of existing site roads, to include passing bays and all associated drainage.
- Construction of a new wind farm site entrance with access onto the R671 regional road in the townlands of Lickoran.

-
- Improvement of existing site entrance with access onto local roads in the townlands of Broemountain.
 - Improvements and temporary modifications to existing public road infrastructure to facilitate delivery of abnormal loads and turbine delivery.
 - Construction of one Temporary Construction Compound with associated temporary site offices, parking area and security fencing.
 - Development of on-site Borrow Pit.
 - Installation of one Permanent Meteorological Mast with a height of 104m.
 - Development of a site drainage network.
 - Construction of one permanent 110 kV Substation.
 - All associated Wind Farm Internal Cabling connecting the wind turbines to the wind farm substation.
 - All works associated with the connection of the wind farm to the national electricity grid, which will be via 110 kV underground cable connection approximately 16km in length to the existing Dungarvan 110 kV Substation.
 - Upgrade works on the Turbine Delivery Route from Waterford Port.
 - Ancillary forestry felling to facilitate construction and operation of the Development.

A 15-year planning permission and 40-year operational life from the date of commissioning of the entire wind farm is being sought.

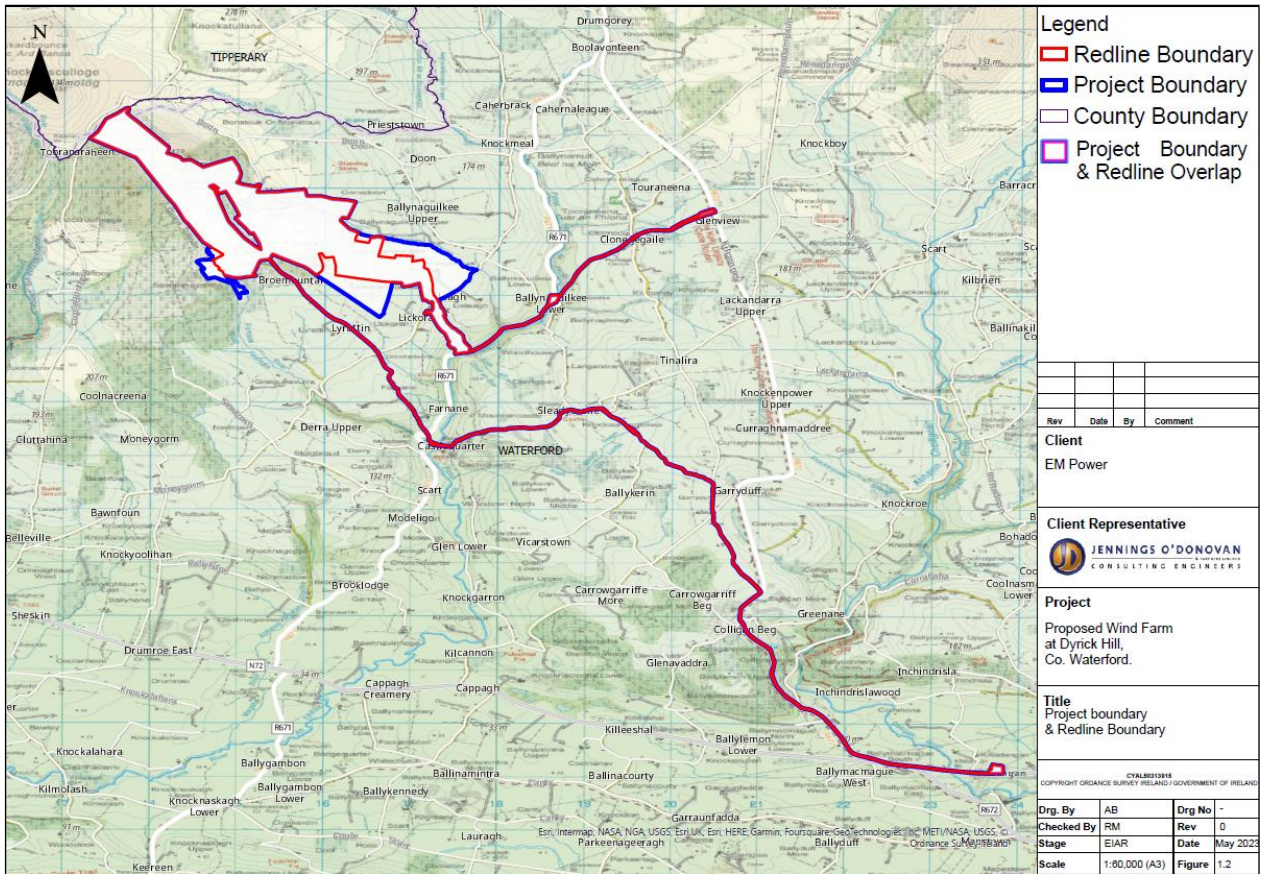


Figure NTS 1 Dyrick Hill Project Boundary

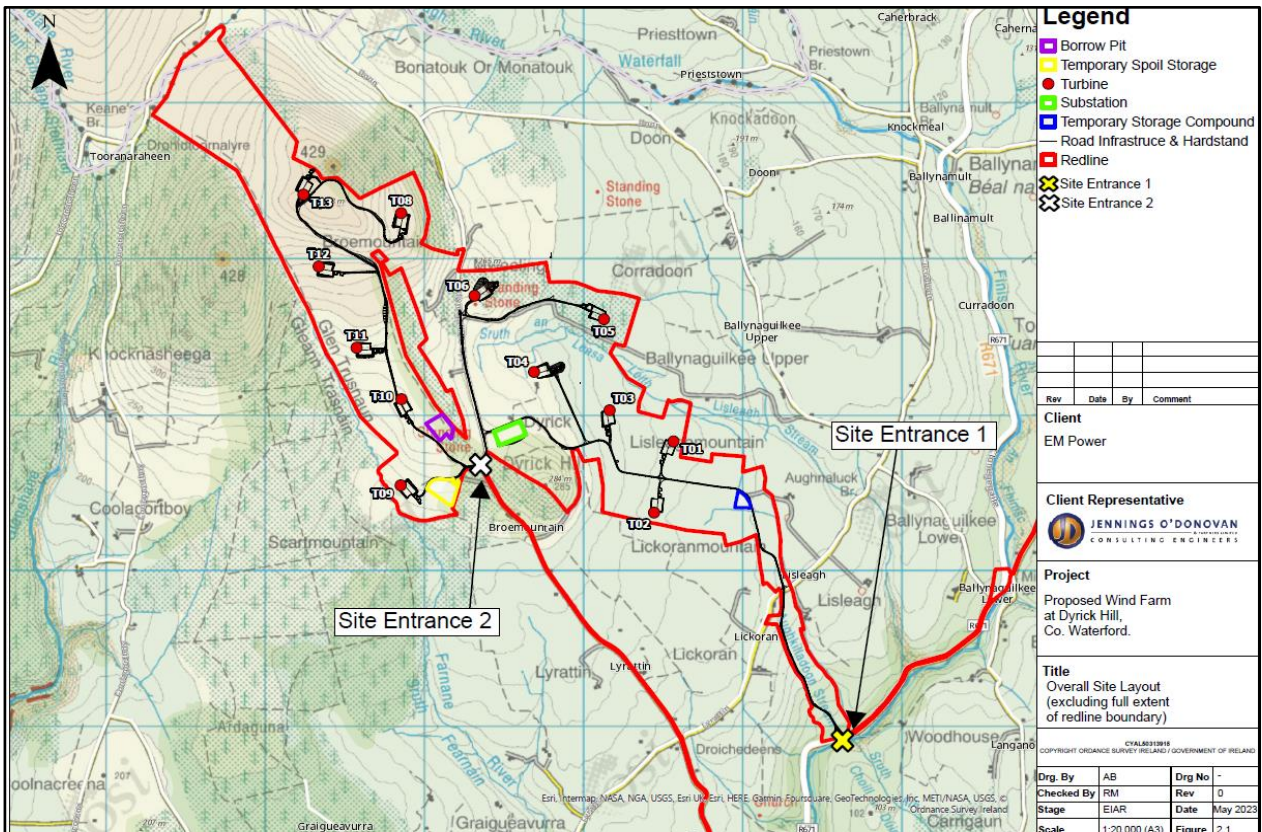


Figure NTS 2 Dyrick Hill Project Layout

3.1 Wind Turbines

The 12 No. turbines will have a height from base to tip 185m. The turbines will be of a typical modern, three blade, horizontal axis design, white or light grey in colour and the finish of the tower and blades will be semi-gloss and semi-matt respectively.

The final MW choice of turbines will be guided by an assessment of the wind conditions and will take account of the available technology at the time of construction. The turbines which will be installed will have a range of 6.0 to 7.2 MW capacity. For the purposes of the assessments, a range of turbine parameters has been assessed as can be seen in **Table 3.1**.

Table 3.1: Turbine Parameters assessed.

Turbine Parameter	Assessment Envelope
Turbine Blade Tip Height	185m
Rotor Diameter	162m
Hub Height	104m
Output	6.0 to 7.2MW

Turbines are typically of a variable speed type, so that turbine rotor speed will vary according to the energy available in the wind. Turbines of the size proposed typically have a rotational speed of between 11.2 and 12.6 times per minute, depending on variations in wind speed, generating power for all wind speeds between c. 4 metres per second (m/s) (approximately 8 miles per hour) and c. 25m/s (approximately 50 miles per hour). At wind speeds greater than c. 25m/s, which are very unusual, the turbines will temporarily turn off to prevent any damage occurring.

The turbines are computer controlled to ensure that at all times, the turbine faces directly into the wind to ensure optimum efficiency. The rotors of all turbines will rotate in the same direction relative to the wind direction.

Each wind turbine needs an area of compacted stone adjacent to the turbine base, known as a hardstanding. This is used principally by the crane when erecting the turbine.

3.2 Access to the Development

There are two proposed Site entrances associated with the Development; Site Entrance 1 is an existing site entrance located in the southeast of the Site located off R671 road and Site entrance 2 is an existing site entrance located in the southwest corner of the Site off the L1027 Local Road. The Turbine Delivery Route and the Construction Haul Routes will utilise Site Entrance 1. This is to aid with traffic management. The site entrances are shown on **Figure NTS-2**.

It is proposed that the turbine nacelles, tower hubs and rotor blades will be landed in Belview Port (Port of Waterford). From there, they will be transported to the Site via the N29, N25, N72, and R671 as shown on **Figure NTS-3**. The potential effects of transporting them and other materials is set out in section NTS-14 and EIAR Chapter 14: Traffic and Transportation.

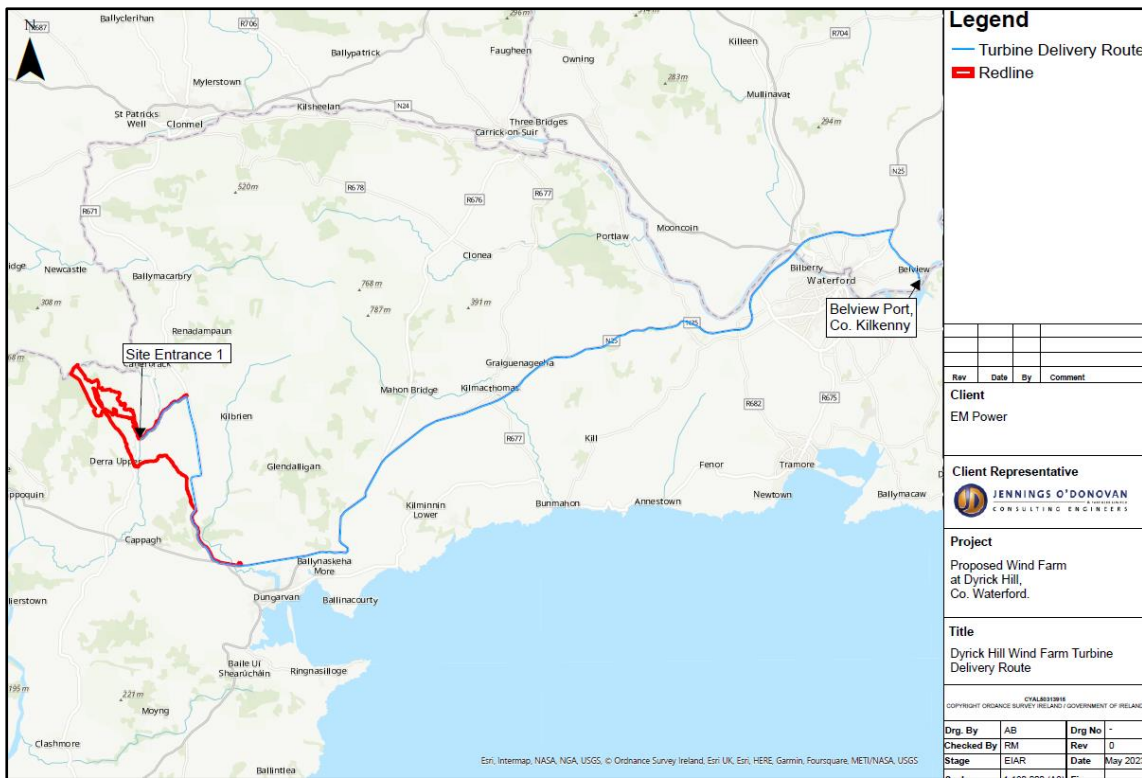


Figure NTS-3 Turbine Delivery Route and Redline Boundary including third party lands.

There are 3 areas on the haul route that will require works in third party lands R672 / L5071 Junction, L5071 North East of Clooncogaile and River Finisk Bridge / R671 Junction. These areas are included in the redline boundary as shown on **Figure NTS-3**.

The existing Site Access Roads in the forestry will be kept, utilised and upgraded as necessary to access the proposed turbine locations. There will be 11.3km of new site access roads required to allow access within the site. These site access roads will be retained throughout the operational life of the development to enable maintenance of the turbines and replacement of any turbine components.

3.3 Grid Connection

Underground cabling will link the turbine transformers to the proposed onsite substation. This will provide a connection point between the wind farm and the grid connection point at the existing Dungarvan Substation. The overall length of the underground grid connection between the onsite substation and the existing Dungarvan substation is 16.1 km. This will be located along public roads and third-party lands. The grid connection route can be seen in **Figure NTS-4**.

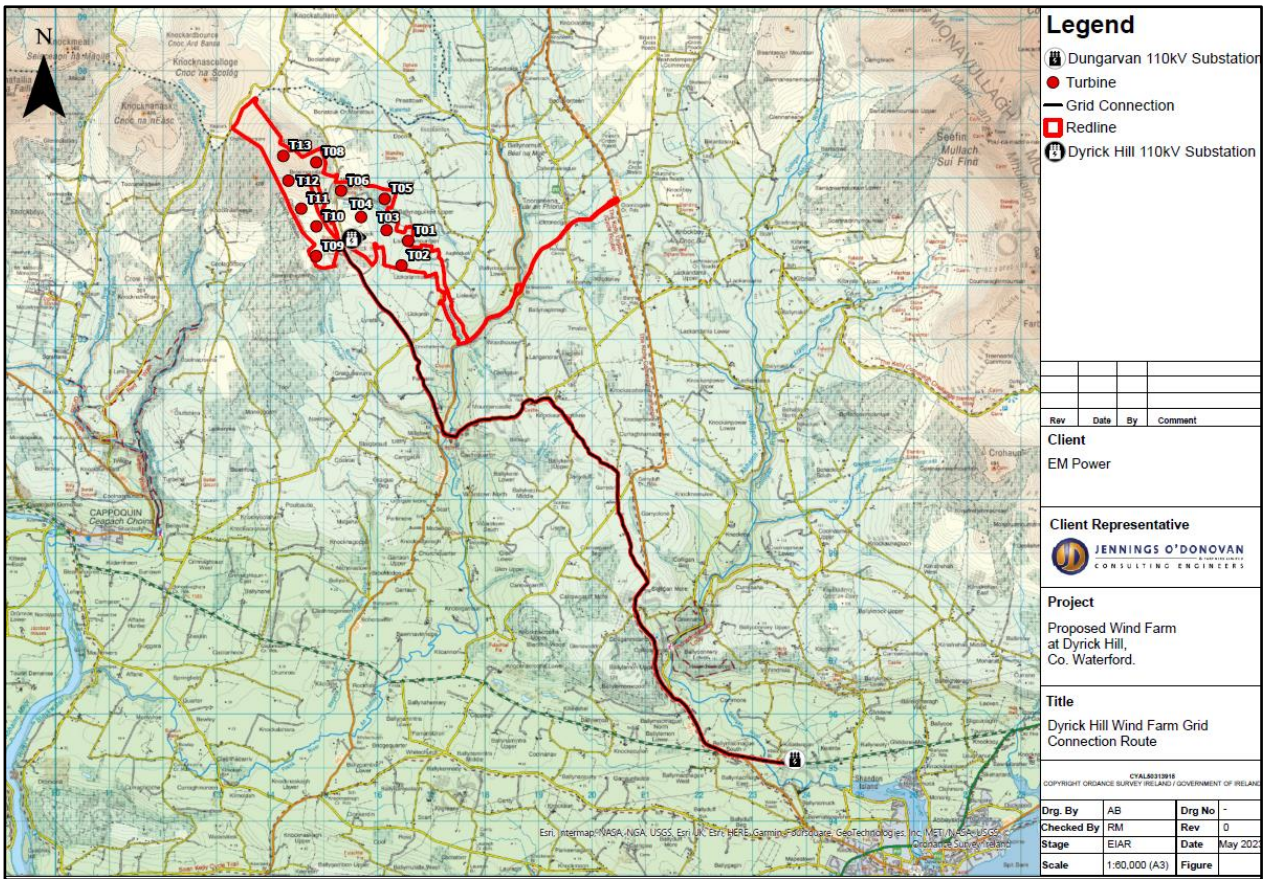


Figure NTS-4 Underground Grid Connection Route to Dungarvan 110kV Substation

3.4 Construction Phase

The construction phase of the Development will take approximately 20 months in total. In general, working hours for construction activity will be from 07:00 to 19:00 throughout the week, with reduced working hours at weekends.

The turbines will be located across a wide area of hillside and agricultural land, however the land taken by the turbines and other infrastructure is a very small proportion of this, and efforts have been made to use existing infrastructure rather than using new land. The Site extends to 463ha, the majority of which is agricultural land used for grazing sheep and other livestock. During the construction phase, the total land-take required for the development will be 7.3 ha.

The applicant will appoint a Civil Contractor who will have overall responsibility for management, including environmental management on the construction site. The Civil Contractor will ensure that construction activities are carried out in accordance with the mitigation measures outlined in the EIAR and as required by the planning permission, such as the Outline Construction Environmental Management Plan (CEMP) included in **EIAR**

Appendix 2.1. The services of specialist advisors will be retained as appropriate, such as an archaeologist and ecologist, to be called on as required to advise on specific environmental issues.

3.5 Site Restoration

A draft Habitat Enhancement/Management Plan, included in the EIAR as **Appendix 6.2**, has been prepared to mitigate for the ecological effect of habitat loss as a result of the project. The plan sets out measures for spoil management and restoration. Site restoration will involve the restoration of Site Access Track and Turbine Hardstanding verges and the temporary decommissioning and construction compound to provide a natural ground profile. Restoration will be undertaken at the earliest opportunity to minimise storage of turf and other materials.

Figure NTS-5 shows the areas designated for ecological enhancement around the Spoil Storage Areas to the west of the main wind farm site.

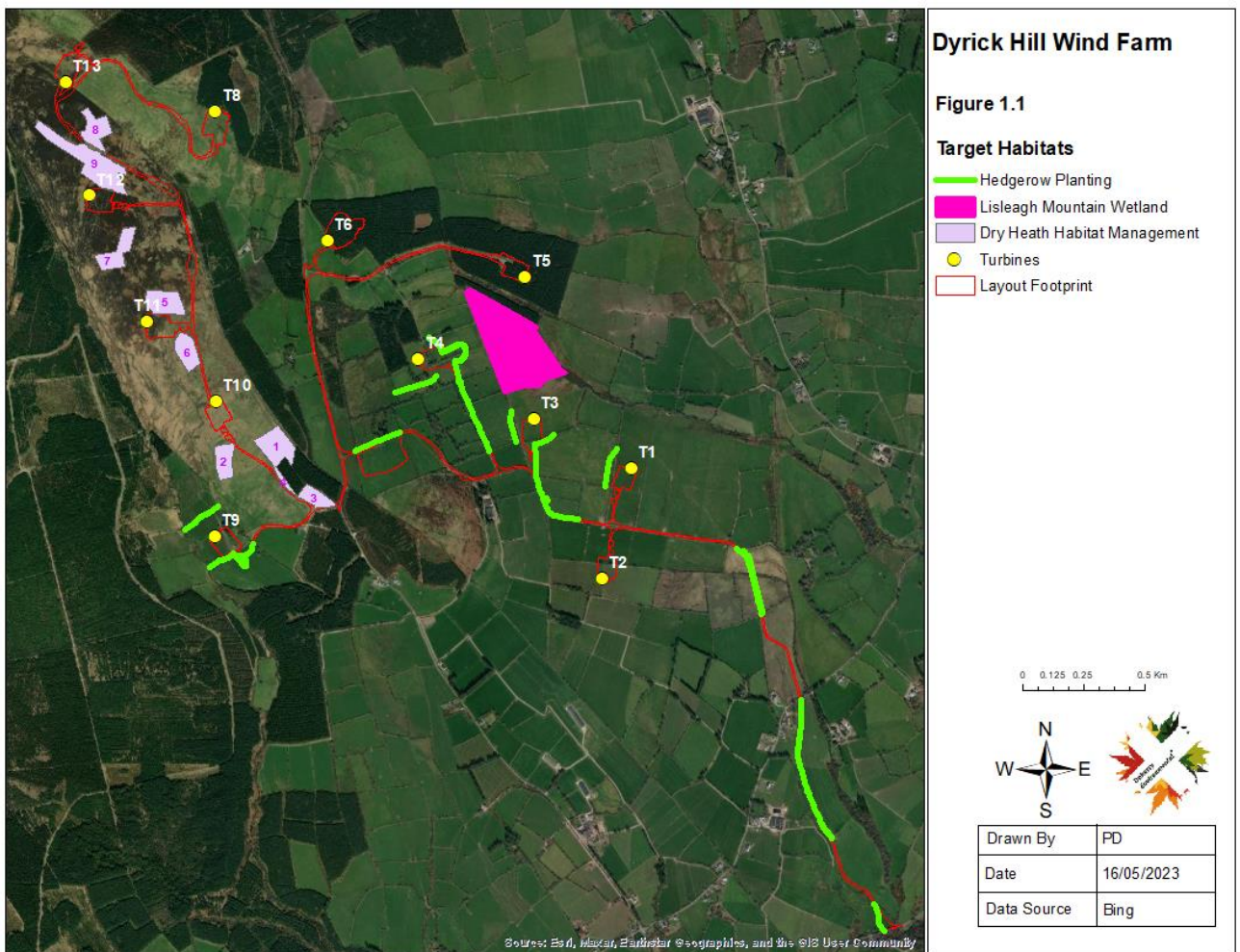


Figure NTS-5 Target habitats for ecological enhancement.

3.6 Operational Phase

The operational lifespan for the development is 40-years. During the operational phase of the development, turbine and infrastructure maintenance will be ongoing and regular. This is expected to continue to employ approximately 1 or 2 people on a permanent basis for regular operational and maintenance activities.

4 NTS.4 SITE SELECTION AND DESIGN

The Site layout design has evolved through a series of iterations, to avoid or minimise potential effects, including effects on views, hydrology, peat, ecology and fisheries, ornithology and noise. Technical criteria such as wind speed, prevailing wind direction, existing infrastructure, topography and ground conditions were considered during the design process, in response to guidance documents, survey findings and responses from consultees. Overall, it is considered that the proposal represents an optimum fit within the technical and environmental parameters of the project.

5 NTS.5 LEGAL AND POLICY FRAMEWORK

Chapter 4 of the EIAR sets out the relevant planning policy and legislative background to the planning application. The Development has had regard to The National Planning Framework, The Regional Spatial and Economic Strategy (RSES) for The Southern Regional Assembly Area and the Waterford County Development Plan 2022-2028. These documents are relevant to the determination of the planning application by the planning authority.

The Climate Action Plan 2021 set out ambitious and legally binding targets for Ireland. The goal is that Ireland will achieve net-zero greenhouse gas emissions no later than 2050 and a reduction of 51% by 2030. The Development will contribute towards meeting those targets.

6 NTS.6 POPULATION AND HUMAN HEALTH

The potential effects of the construction and operation phases of the Development on socio-economics, tourism and recreation and land use were identified and assessed in **EIAR Chapter 5** following desk-based collection of data and consultation with local stakeholders. Five geographical Study Areas were outlined for this assessment, namely:

- The Development and Environs – Ballynamult and Modelligo
- Waterford County
- Tipperary County
- Southern region
- The Republic of Ireland

Overall effects of the development with regards to tourism are considered to be short-term, slight, negative during both construction and decommissioning phases due to temporary closures and diversions of walking and cycling routes.

The majority of existing land use is agriculture and/or commercial forestry. This will not be altered significantly by the construction, operation and decommissioning of the development as these activities can continue alongside the development.

In advance of the construction phase, the applicant will hold a series of 'Meet the developer / Contractor' events as early as possible, allowing local contractors to learn about opportunities to bid for contracts, time to upskill, and time to prepare prior to bidding. The applicant has significant experience in organising these events.

Effects on the economy during both the construction phase and the operational phase would be minor, both direct and indirect, and positive, due to the creation of job opportunities and subsequent spending of income in the local area and within Ireland as a whole. It is estimated that turnover generated by the operation and maintenance of the development could directly support 29-35 jobs in County Waterford. The overall impact is predicted to be a **moderate, positive, short-term** impact during the construction and decommissioning phases and moderate, positive and long-term during the operational phase.

Cumulatively, together with other proposed wind farm developments in the region, if these are progressed, the effects would be positive and of minor significance. There is predicted to be a **short-term, positive impact** in terms of employment from the development, if construction periods overlap.

7 NTS.7 BIODIVERSITY

Chapter 6 of the EIAR assesses the potential impact of the Development on terrestrial and aquatic ecology. Surveys were undertaken within and adjacent to the site, in order to ascertain the status of ecological features, including habitats, birds, terrestrial mammals, bats, fish and aquatic invertebrates.

The likely impacts on biodiversity associated with the Development have been assessed as part of the EIAR. A detailed understanding of the baseline conditions at the proposed development site has been gained following the collation of desktop information, relevant data sources and ecological field surveys. The ecological field surveys completed at the proposed development site include terrestrial and freshwater habitat surveys, terrestrial mammal surveys and bat surveys.

habitats occurring at the proposed development site have been evaluated to be of low local and high local conservation value, whilst heathland habitat in the form of dry heath within the proposed development site and wet heath bounding the proposed development site are representative of habitats listed under Annex 1 of the Habitats Directive and have been evaluated to be of national importance.

No breeding or resting sites for protected ground dwelling mammals are supported by the proposed development site. The site is used by a range of bat species with eight of the nine species native to Ireland being recorded during baseline bat surveys. Bats have been found to use derelict structures in the forms of houses and shed within and adjacent to the proposed wind farm site for roosting. Five bat roosts have been identified as occurring in this area and these comprise one maternity roost and four other day and/or night roosts.

Three minor stream tributaries drain the proposed wind farm site and these discharge into the Finisk River. The Finisk River forms part of the Blackwater River SAC. The Finisk River section of the SAC is also crossed by the proposed grid connection route for the wind farm as well as the construction phase haul route. There are no NHAs or pNHAs occurring within the proposed development site.

The principal potential impacts that could arise during the Construction and Decommissioning Phase and the Operation Phase of the development relate to:

- Indirect impacts to European Sites and pNHAs occurring downstream of the proposed development site;
- Direct loss of habitat
- Disturbance and degradation of terrestrial and freshwater habitats and
- Disturbance to protected species

Detailed mitigation measures have been outlined in the Biodiversity Chapter that aim to avoid or minimise to an insignificant effect the potential for the Development to result in the various impacts that are set out in the chapter. These mitigation measures include:

- The management and design measures to avoid the discharge of contaminated surface water from the site. The Construction and Environmental Management Plan (CEMP) and the Surface Water Management Plan (SWMP) that accompany the EIAR will represent key documents that will in-combination with these mitigation measures protect the surrounding aquatic environment and the Blackwater River SAC and Dungarvan Harbour SPA downstream of the proposed wind farm site, grid connection route and haul route.

- The timing of works to minimise disturbance to fauna;
- The implementation of measures to minimise the footprint of the works associated with the Construction and Decommissioning Phase; and
- Habitat Management Plan (HMP) which sets out commitments for the establishment, restoration and/or enhancement of dry heath and hedgerow habitat within the proposed development site such that there will be no long-term net loss of these habitats and over the operation phase of the development there will be a net gain in the extent of these habitats occurring within the proposed development site.

8 NTS 8 ORNITHOLOGY

Chapter 7 of the EIAR assesses the potential effects of the development on ornithology. The construction, operational and decommissioning phases of the development, have the potential to result in three main effects on birds:

- Habitat loss
- Collision with turbines
- Displacement

Qualified ornithologists undertook bird surveys to record data to establish the site baseline, the distribution, and abundance of bird populations around the site, including review of any surrounding designated sites for the wider hinterland. These surveys followed widely recognised best practice guidance on the methods, timings and species that are recorded. This information was used to inform the design of the wind farm layout and the assessment of potential effects. This design is predicted to limit the potential for direct effects for most bird species from habitat loss and collision.

The proposed project is not located within any European site. There are two key considerations when identifying ecological pathways - the first is the distance from which potential sources for effects can radiate known as the zone of influence (Zoi) and the second is the potential for sensitive receptors (QIs/SCIs) to interact with the Zoi which is a further pathway consideration zone (PCZ). It is understood that sites designated for vagile species are known to utilise isolated resources across the landscape could intersect with the localised zone of influence; however, beyond 15km potential effects to such species at this scale are not identified to be significant due to the broad home range available to these species and the availability of alternate resources. Therefore, a radius of up to 70km has been adopted as the Zoi and a 15km radius was adopted as the PCZ.

The potential for effects on designated sites is fully described in the Natura Impact Statement that accompanies this application. The Natura Impact Statement presents an analysis of the potential for the project to result in adverse impacts to six European Sites and their relevant qualifying features of interest as set out in the NIS in full detail. An evaluation of the potential impacts that could arise as a result of the project to these qualifying features of interest and their conservation objectives has been completed.

During the evaluation of potential impacts associated with the project it was found that the project will not have the potential to undermine the conservation objectives of four SPAs and their relevant special conservation interests occurring within the zone of influence of the development.

The project has been identified as having the potential to result in adverse effects to the relevant qualifying features of interest of the Blackwater River SAC and Dungarvan Harbour SPA occurring within the zone of influence of the development.

A range of mitigation measures have been prescribed that, once implemented in full, will remove the risk of adverse effects posed by the proposed development to these qualifying features of interest.

Based upon the information provided in this NIS, it is the considered view of the authors of this NIS that it can be concluded by Waterford County Council that the project will not, alone or in combination with other plans or projects, result in adverse effects to the integrity and conservation status of European Sites in view of their Conservation Objectives and on the basis of best scientific evidence and there is no reasonable scientific doubt as to that conclusion.

The implementation of mitigation measures as presented in this report, the Decommissioning/ Construction Environmental Management Plan and a Habitat Management Plan the potential impacts are reduced to the level of not significant, while providing wide ranging benefits to species found on the site. There are considered to be no specific cumulative operational effects on individual species or territories as a result of the development. The ornithological assessment is based upon the observed field data and findings, published information and research and best practice guidance. Overall, it is considered that the significance of the predicted effects on birds as a result of the proposed Development will range from Imperceptible to Slight Reversible Residual Effect and in the local context for most species. The residual effect for golden plover will be an **Imperceptible to Slight Effect** in the Local

context. In relation to habitat loss a Moderate Residual Effect at a Local Level is envisaged, reduced to a **Slight Effect** at a **County Level** for the species.

9 **NTS.9 SOILS AND GEOLOGY**

Chapter 8 of the EIAR evaluates the effects of the Development arising from the construction/decommissioning and operational phases on the soils and geology resource within and surrounding the Site. The assessments for the Development were based on desk studies and Site surveys. The desk study assessment included consultation with the following organisations via online map viewers websites and databases:

- Environmental Protection Agency (EPA)
- Geological Survey of Ireland (GSI)
- National Parks & Wildlife Services (NPWS)
- Ordnance Survey of Ireland (OSI)

The presence of peat/topsoil/soft soils on site were measured by peat probing at a total of 347 locations and ranged in depth between 0.1m and 0.4m. The depth classification within the study area is therefore exclusively shallow. No peat was observed at any locations on the site.

The site investigation, which included trial pits, gouge cores and peat probes, carried out by Garne Geotechnical Services, concluded that the risk of a movement of peat soils occurring within the footprint of the Development Infrastructure is therefore negligible. As no peat soils were recorded, a Peat Stability Risk Assessment is not required for the site.

The bedrock comprises sandstone, mudstone, siltstone and conglomerate. The detailed geological mapping for the site shows that the bedrock within and to the north of Dyrick Hill comprises medium grained pink-purple sandstone and conglomerate of the Knockmealdown Sandstone Formation while the bedrock to the south of Dyrick Hill comprises dusky-red to purple mudstones with subordinate pale-red sandstones of the Ballytrasna Formation. Glacial till underlies the majority of the site with minor areas of shallow bedrock in the west and northwest and minor areas of alluvium along the rivers.

The topography of the site slopes gently downwards from a high point on Broemountain at the northwest corner of the site (maximum elevation 429mOD) down to a low point of approximately 150mOD in the southeast corner of the site. Dyrick Hill forms an elevated area close to the centre of the site which rises rapidly to an elevation of 286mOD. Structurally, there are no known faults or folds affecting the site.

Standard, good-practice measures will be implemented to minimise the potential for effects of excavation, stockpiles and contamination of soil and rock. These established and effective measures are described in **Chapter 8: Lands, Soils and Geology – Section 8.5 Mitigation Measures**.

With mitigation measures in place, the Development has been assessed as having the potential to result in effects of varying significance, however many are considered avoidable with the exception of the following unavoidable effects:

- There will be a change in ground conditions at the Site with the replacement of natural materials such as topsoil, subsoil and bedrock by concrete, subgrade and surfacing materials. This is a localised, negative, moderate significance at a local scale, moderate weighted significance at the Site, direct permanent change to the materials composition at the Site.

Other potential effects have the potential to be significantly adverse, for example, a significant fuel spill, however applying the precautionary principal, mitigation measures, and proper planning, the likelihood and significance of such potential effects can be dramatically reduced.

During the construction/Initial Decommissioning and operational phases of the Development, a number of established good practice measures will be put in place to minimise soil/rock disturbance, and loss and compaction of soils. With effective and well managed mitigation measures in place, **no significant** residual effects on land, soils and geology are predicted as a result of the Development.

10 NTS.10 HYDROLOGY AND HYDROGEOLOGY

Chapter 9 of the EIAR evaluates the effects of the Development arising from the construction, decommissioning and operational phases on the hydrology and hydrogeology resources within and surrounding the Site. This assessment for the Development was based on desk studies and Site surveys. The desk study assessment included consultation with the following organisations via online map viewers, websites and databases:

- Environmental Protection Agency (EPA);
- Geological Survey of Ireland (GSI);
- Met Éireann (MET);
- National Parks & Wildlife Services (NPWS);
- Office of Public Works (OPW);
- Ordnance Survey Ireland (OSI);

- Waterford County Council
- The Local Authority Waters Programme (LAWPRO)
- Inland Fisheries Ireland (IFI)
- Department of Housing, Planning and Local Government

At a regional scale, the proposed Site and grid connection route are located within the Blackwater (Munster) and Colligan Mahon catchment areas in Hydrometric Areas 18 and 17 respectively. The proposed wind farm Development and grid connection to Dungarvan Substation at Killadangan are located within three Water Framework Directive (WFD) sub-catchments. These include the Blackwater (Munster) (SC_140), Finisk (SC_010) and Colligan (SC_010) subcatchments.

The water quality in the majority of the rivers upstream and downstream of the Site has in general been historically classified as “*Good*” to “*High*” with some “*Moderate*” Q-value scores also having been recorded. To assist in further characterising the watercourses surrounding the proposed Site, field investigations including multiple rounds of water quality monitoring and surveying were carried out. The monitoring rounds included analysis of parameters requiring laboratory analyses and field hydrochemistry measurements on unstable parameters. In total, 11 different water quality monitoring locations were analysed throughout the monitoring programme for a wide variety of laboratory and field measured water quality parameters.

There are statutory designated sites located downstream of the study area that are hydrologically connected to the Development. The proposed Site and its surrounds are located upstream of the Finisk River, into which all rivers and streams within the Site boundary ultimately drain. The Finisk River is a large tributary of the Blackwater River which is part of a designated Special Area of Conservation (SAC), namely as the Blackwater River (Cork/Waterford) SAC. As one of the larger tributaries of the Blackwater River, the Finisk River is therefore also designated as a part of the Blackwater River (Cork/Waterford) SAC. As a result, the rivers and streams which drain the Site, including the Farnane River, the Lisleagh Stream and the Aughkilladoon Stream, are considered to have tenuous hydrological connectivity to the Blackwater River (Cork/Waterford) SAC as tributaries of the Finisk river.

A Flood Risk Assessment (Stage 1) was carried out and indicates that the estimated net increase of surface water runoff during the average wettest month of December (0.42% relative to the area of the Site) is imperceptible, in turn, the risk of increased flood risk arising as a product of the Development is imperceptible. The flood risk identification has not identified any significant flood risk at the Site and the potential for exacerbating existing recurring flood events along the grid connection route is considered to be negligible.

There are no mapped wells, springs or boreholes within the Site boundary, there are a number of mapped wells located in close proximity to the Site boundary and the grid connection route. It has been conservatively assumed that all dwellings located in close proximity to the EIAR Site boundary have the potential to maintain a groundwater well for abstraction. However, the potential for such wells to be impacted by the Development is low considering that excavations will occur in a moderate to low permeability environment which will have a containment effect on the localised groundwater. The potential for any possible contaminants to leach or migrate across long distances or to alter the localised groundwater chemistry will therefore be limited.

Field investigations included excavation of trial pits, extensive peat probing and the use of gouge cores to characterise the underlying soils, subsoils and bedrock characteristics of the site. The presence of groundwater at or very near the surface was not observed when gouge cores were advanced at each of the turbine locations. The underlying groundwater body is composed mainly of poorly permeable sandstones, where only moderate recharge rates occur. The nature of the anticipated groundwater flow directions and the absence of near proximity to the closest known or assumed well locations further restricts the likelihood of any adverse impacts on groundwater.

11 **NTS.11 NOISE**

Chapter 10 of the EIAR presents an assessment of the noise effects of the Development. This Section has assessed the significance of the potential effects of the Development during operation, construction, and decommissioning.

The effects of noise from the operation of the Development have been assessed using 2006 Guidelines with the methodology described in ETSU-R-97 and the IOA Good Practice Guide. Noise levels during operation of the Development have been predicted using the best practice of calculation technique. They have been compared with the noise limits in the 2006 Guidelines and recent 2021 An Bord Pleanála limits and found to be compliant.

For this assessment background noise levels were carried out at seven residential locations in the vicinity of the site between 3 and 27 June 2022. The background noise levels measured at these locations were deemed representative of the background noise levels in the vicinity of the site. The predicted noise levels at each dwelling in closest proximity to the proposed wind farm site were calculated in accordance with ISO9613-2:1996 under a range of operating wind speeds standardised to 10m AGL.

The predicted noise levels have been compared with the appropriate noise limits based on the 2006 Guidelines and taking into consideration the recent 2021 An Bord Pleanála decision. No exceedances of the limits from the operation of the development in isolation were noted at any third-party properties. There was one additional single turbine within 5km that was considered as part of the cumulative assessment, and with this site operating, the noise levels at the residential properties in the vicinity of the proposed development resulted in a marginal change in the predicted noise level. The predicted noise levels did not exceed the limits when the cumulative noise levels were considered.

To assist with conditioning of the proposed development, Appendix 10.3 includes a set of predicted noise levels at all neighbouring receptors for the development in isolation and in combination with the other wind turbine operating. All non-assessed sites further from the wind farm will experience worst-case noise levels lower than the residential properties assessed in this report and therefore will also comply with the lower limits.

There has been a consultation process in relation to the revision of the 2019 Wind Energy Development Guidelines. This document provided the basis for a discussion on amendments of the noise limits applicable to wind turbine developments. It is understood that there will be revisions to the draft consultation documents, however a mitigation strategy to incorporate a reduction in sound power level outputs with respect to directionality can be put in place to comply with any specific variation in noise limit levels if new more restrictive guidelines are adopted. All turbines have software incorporated so that the sound power levels can be reduced by direction and energy output.

The noise levels predicted at the nearest receptors are orders of magnitude below the level at which risk of hearing damage, or indeed negative health effects are possible. Noise during construction of the Development and decommissioning will be managed to comply with best practice, legislation and guidelines current at that time so that effects are **not significant**.

12 NTS.12 LANDSCAPE AND VISUAL

Chapter 11 of the EIAR presents a Landscape and Visual Impact Assessment for the Development. This has been carried out by a qualified and experienced landscape architect to identify significant effects predicted to arise as a result of the Development. It considers separately the effects on landscape and visual receptors, as well as the cumulative effect of the Development in combination with other wind farm developments.

The proposed development is located along the foothills of the Knockmealdown Mountains south of the Waterford – Tipperary County boundary. The proposal site is situated across the eastern and southern extents of Broemountain (430m AOD) and Knocknasheega Hill (430m AOD) on sloping lands that drain in an east/south-easterly direction. The Farnane River Flows directly through the site in a southerly direction, whilst the Glenshelane River flows through a broad valley just over c.1km west of the site. Both of these watercourses empty into the River Blackwater, which is one of the most prominent rivers within the Study Area and is located some c. 6km southwest of the site. The principal land use within the central and wider Study Area is pastoral farmland bound by mixed hedgerow vegetation, however, the site itself is cloaked in a mix of conifer forest plantations, moorland and area of pastoral farmland. Pastoral farmland is the dominant land use in much of the low-lying and transitional parts of the Study Area, whilst blocks of conifer forest tend to cloak the foothills of the mountain ranges within the Study Area. Much of the elevated mountainous parts of the Study Area are cloaked in extensive areas of moorland and upland heath. The nearest and only notable settlement within the central Study Area is the small rural village of Tooraneena, which is situated east of the River Finisk and just under 3km east of the nearest turbine. Whilst the central Study Area comprises a modest rural population, the only other notable population centres include small linear clusters of residential dwellings and cross-road settlements. Due the complex terrain and high degree of contrasting landscape features within the study area, a broad array of tourism and amenity features occur throughout its 20km extent and include waymarked trails, local walks, cycling trails, in addition to numerous heritage features.

The Study Area for the Development covers a radius of 20km in accordance with the Wind Energy Development Guidelines (2006). The landscape assessment considers potential effects on the receiving and surrounding landscape with reference to a range of landscape character areas (LCAs) and criteria published in various technical documents. The visual assessment considers effects upon visual receptors (as agreed with consultees through the EIA Scoping process) including scenic amenity designations, centres of population, transport routes and local community views using 30 viewpoints from representative / sensitive visual receptor locations. Photomontages have been prepared for the viewpoints and the figures also include a wireline of the Development on its own and a wireline with all other cumulative developments.

In respect of landscape sensitivity designations, the site straddles three landscape sensitivity classifications. The most elevated parts of the site to the west in the surrounds of the summit of Broemountain have been classified with the 'Most Sensitive' designation, whilst the less elevated eastern parts of the site are cloaked in a 'Low Sensitivity' designation. A small area

classified with a 'High Sensitivity' is also located between 'Most' and 'Least' sensitive designation, however, it is unclear as to what this relates to.

In terms of landscape effects, there will be physical impacts on the land cover of this already modified Site during the construction stage, but many of these will be reversible upon decommissioning of the site. The main landscape impacts relate to changes in landscape character during the operational stage principally from the presence of the proposed turbines. In this regard, the proposed wind farm is well assimilated within the context of the Central Study Area. This is due to the broad scale of the landform, landscape elements and land use patterns. These attributes prevent the height and extent of the proposed wind farm causing the type of scale conflict that can occur in more intricate landscape areas. The broad hills and ridges in the immediate surrounds of the wind farm site comprise a notable utilitarian character due to the presence of working rural land uses such as agriculture and commercial scale forestry. Although the proposed development represents a stronger human presence and level of built development than currently exists on the site, it will not detract significantly from the production rural character of this foothill landscape.

Visual impacts were assessed at 30 visual receptor locations that represent a wide range of angles, elevations, distances, and receptor types within the Study Area. The most notable visual impacts occur at local community receptors, which account for all 5 of the 'Substantial-moderate' visual impact significance classifications and principally relate to their close proximity to the proposed development. Nonetheless, in all instances where the proposed turbines are viewed at a close distance, they do not present with any strong sense of overbearing, nor do they appear over-scaled or incongruous in this robust foothill landscape setting that comprises broad landscape features and land uses patterns. In relation to susceptible scenic designations in the surrounds of the proposed development, the proposed development will be clearly visible from some of the nearest scenic route designations to the site. Nevertheless, the proposed turbines are often viewed in the opposite direction to the main aspect of scenic amenity from these routes and do not block or obstruct other sensitive viewing aspects. Even where clearly visible from some of the highly scenic view designations in the wider surrounds of the Study Area, the proposed turbines appear well accommodated in terms of their scale and function in this foothill landscape and will not result in a notable detracting in the scenic amenity of the wider landscape, which is currently influenced by a range of other anthropogenic land uses including existing wind energy development, major routes and extensive areas of commercial conifer forestry.

With regard to cumulative impacts, due to the considerable offset from the proposed development to the nearest existing or consented wind farm development (Woodhouse Wind Farm located c. 10.8km south of the site), there is limited potential for any notable cumulative impacts. As the majority of existing and permitted developments are contained within the southern half of the study area, the most notable potential for cumulative views of the proposed, permitted and existing developments occurs in the southern half of the 20km Study Area. Only 31.6% of the study area has the potential to afford views of the proposed development in combination with other consented and existing wind farm development, which is likely to be considerably less once existing vegetation and other forms of screening are accounted for. Overall, the magnitude of cumulative effect in relation wind farms within the 20km Study Area is deemed Low. This is principally a consequence of the limited number of existing/permitted developments within the central Study Area (1 single turbine development) in addition to the considerable offset distance between all other existing and permitted development within the wider study area.

Based on the landscape, visual and cumulative assessment detailed within the chapter, it is considered that there will **not be any significant** effects arising from the proposed Dyrick Hill Wind Farm.

13 NTS.13 MATERIAL ASSETS AND OTHER ISSUES

Chapter 12 of the EIAR considers a number of other issues associated with the windfarm development, including potential effects on fisheries, agriculture, telecommunications, grid connections, shadow flicker, aviation and radar and air and climate.

13.1 Agriculture

The Site, located c.14km North of Dungarvan, is characterised as being generally improved grassland and upland heathland landscape which is currently being used for intensive agriculture, forestry and livestock grazing. There are also a number of residential properties in a one-off settlement pattern and established wind farms in the region. The Development as a whole is characterised by elevation of between 150m and 430m AOD and a spatial area of approximately 450.9ha.

The agricultural land is predominantly utilised for cattle grazing, sheep grazing and silage. The commercial forestry is mainly made up of Sitka Spruce and is further detailed in **Appendix 2.2**.

13.2 Telecommunications

Operators of microwave communication links were contacted during the EIA. Mitigation measures were adopted during the layout design to avoid impacting communication links. Disruption to television reception is considered unlikely following the switchover to digital broadcasting, as the signals are less susceptible to interference from turbines.

The implementation of mitigation measures will ensure no interference with communication links. Therefore, **no significant** effects are predicted on telecommunications or radio reception as a result of the Development.

13.3 Electricity Networks

This section describes the transmission network and the anticipated Grid Connection option. It is not proposed to utilise any elements of the existing distribution network.

However, in consultation with ESB Networks to accommodate construction works onsite some realignment of existing low voltage distribution network lines will be required, This work will be accommodated in advance of commencement of construction of the development.

The nationwide electricity transmission system allows for the transport of large volumes of electricity from generation stations, including wind farms, to bulk supply points near the main population centres where it interconnects with the distribution system. The Grid Connection will be 16.8km in length and will be along public roads.

Connection will be sought from the grid system operator by application to EirGrid. The substation will connect via underground 110kV cables. At the existing Dungarvan 110kV substation, the cable will connect into existing infrastructure within the confines of the substation and its compound. The Grid Connection will be constructed to the requirements and specifications of EirGrid (CDS-GFS-00-001-R1).

13.4 Air Navigation

Operating wind farms have the potential to cause a variety of effects on aviation. Rotating wind turbine blades may impact on radar operations, although it is not likely at Dyrick Hill Wind Farm. The physical height of turbines can cause obstruction to aviation and the overall performance of communications, navigation and surveillance equipment. All structures over 150 m in height are required to have lighting to warn aviation traffic.

Consultation with aviation operators was undertaken and the Irish Aviation Authority responded. They requested an obstacle warning light system for the Development, the provision of coordinates of each turbine and tip height, and to notify them 30 days prior to any crane operations commencing.

The turbine locations will be added to aviation maps prior to construction, and all requests from the Aviation Authority and Department of Defence will be carried out to ensure aviation safety protocols are followed. Therefore, effects on aviation as a result of the development will be **negligible**.

13.5 Utilities (gas, water, waste)

It is likely that waste will be generated onsite during the construction and decommissioning phases of the Development. All rubbish and waste/excess materials will be removed from Site to an appropriate licenced facility from where it will be reused/recycled, where possible, or disposed of accordingly.

There are no gas mains located within the Site Boundary. There is therefore no potential for impact on the domestic or commercial gas supply network. Gas Networks Ireland have responded to a consultation request illustrating there are no existing services along the Grid Connection Route or Turbine Delivery Route and there does not appear to be any visible gas infrastructure along the route.

Given that no detailed information has been provided by Irish Water or Waterford City and County Council in relation to water services within the Site Boundary, it has been assumed that there is the potential to encounter local water services within the Development.

TLI Group conducted a survey of the Grid Connection Route, the locations of watermains, fire hydrants, metres and sluice valves were recorded and can be found in **Appendix 12.1**.

Mitigation measures will be implemented during each phase of the Development. Therefore, the residual effects of waste produced as a result of the construction, operational and decommissioning phases of the Development are considered to be **not significant**.

13.6 Quarries

While sub-base and base course materials for the Access Track and Turbine Hardstand construction will be sourced on site from an onsite borrow pit, crushed stone will be imported for the final running layer. The crushed stone (20,000m³) for construction of the Development will come from licenced quarries in the locality such as:

- Roadstone Cappagh, Cappagh
- Kereen Quarry, Laffansbridge
- Gleeson Quarries, Laffansbridge
- Corbett Concrete, Mooneraha
- Lagan products, Middleton

Concrete for the Turbine Foundations will also be sourced from one of the local providers listed above.

14 NTS.14 CULTURAL HERITAGE

Chapter 13 of the EIAR presents a baseline study of and impact assessment on, the cultural heritage of the Development and the surrounding region. Site visits and desk studies were undertaken to identify and record any archaeological, architectural and other cultural heritage assets which may be affected by the Development. The significance of effect on a cultural heritage asset is considered by establishing the asset's value/sensitivity, and how that may be impacted based on the proposed design of the Development.

There are four recorded archaeological sites located within the Site and each of these will be preserved *in situ* as part of the Development. There are an additional fifteen recorded archaeological sites located within 1km of the Site and, of these, the Archaeological Survey of Ireland have recorded that thirteen retain little or no surviving surface traces. All are located within private lands not accessible to the public and none have been designated as National Monuments in State Care. One previously unrecorded feature of archaeological potential, which comprises a small stone cairn located c.60m to the southwest of the Turbine 13 hardstand, was identified during field surveys carried out as part of the assessment and this feature, as well as a number of derelict 19th century farm buildings within the Site, will be also retained *in situ*. While there are a number of archaeological and architectural heritage constraints located within the environs of the grid connection route, and within the wider environs of localised work areas to facilitate the delivery of turbines of the Site, no direct impacts on any of these constraints are predicted. There are no known archaeological, architectural or cultural heritage constraints within the footprint of the Development, and as such there will be no direct physical effects on any known archaeological or architectural heritage features during any phase of the Development.

The Site has the potential for the presence of unknown sub-surface archaeological remains and should the presence of such remains be revealed during the construction phase, they

would be likely to suffer a high magnitude of impact. As such, the mitigation for potential effects on unknown archaeological remains will entail archaeological monitoring of topsoil stripping during the Construction phase under licence by the National Monuments Service and this will be carried out by a suitably qualified archaeologist. In the event that any sub-surface archaeological features are identified during monitoring they will be recorded and securely cordoned off while the National Monuments Service are consulted to determine further appropriate mitigation measures, which may include preservation *in situ* (by avoidance) or preservation by record (archaeological excavation).

The Operational phase will result in a range of long term, indirect negative impacts of a visual nature on the wider settings of archaeological sites within the environs of the Site which will range from imperceptible to moderate in significance. Given the nature of the wind farm turbines there are no mitigation measures that can address these visual impacts, but it is noted that they will be reversed following the decommissioning phase.

The Construction and Operational phases will not result in any predicted significant effects on the cultural heritage resource.

The assessment does not predict any likely cumulative or residual effects on the cultural heritage resource that are significant in terms of the EIA Regulations.

15 NTS.15 ACCESS, TRAFFIC AND TRANSPORT

Chapter 14 of the EIAR presents an assessment of the effects of Traffic associated with the proposed Development on the public road network and associated junctions during the operation, construction, and decommissioning of the wind farm. The chapter assesses the significance of effects of development traffic on people, businesses and communities in the vicinity of the Development and at isolated locations on the public road network where works are required to enable the development. The chapter identifies whether there is potential for significant effects to arise (both in isolation and in combination with other developments) and outlines any mitigation measures required.

During the construction phase of the wind farm, traffic will include HGV's delivering construction materials to and from site, abnormal load vehicles transporting turbine components from Belview Port to site, HGV's removing unsuitable material from site, HGV's and plant involved with grid connection works on the public road and construction operatives visiting the site in cars and light goods vehicles (LGV). During the operations phase of the wind farm, traffic will include cars and light goods vehicles involved with site maintenance, servicing,

and repair. Traffic during the decommissioning of the wind farm will be similar to the construction phase and will consist of HGV's and abnormal load vehicles removing turbine components and electrical installations from site and HGV's importing materials for landscaping.

The effects of traffic from the construction, operation and decommission of the wind farm have been assessed primarily using Traffic Infrastructure Ireland (TII) guidelines and the Environmental Protection Agency (EPA) guidelines for EIA reports. The capacity of existing Junction to accommodate development traffic has been assessed using TRLJunctions 9 analysis software.

Traffic counts to determine baseline traffic volumes were carried out at three locations in the vicinity of the development. The traffic counts were carried out in October 2022 at the R671 / R672 junction, N72 / R671 junction and the N72 / R672 junction. The selected junctions represent the nodes on the wind farm haul routes through which all development may pass.

The proposed development is expected to generate approximately 5,944 HGV deliveries during the 20-month construction period. Peak traffic generated by the development will correspond to the construction of turbine foundations and will occur during twelve days within the 20-month construction period when the development will generate a maximum of 141 HGV trips (282 HGV movements) and 60 LGV (120 traffic movements) at the R671 site entrance. Outside these times, daily construction traffic will typically consist of 39 HGV trips (78 HGV movements) and 60 LGV (120 traffic movements) at the R671 site entrance. Development traffic will be distributed throughout the day with morning, afternoon and evening peaks.

Traffic analysis carried out at the study junctions on the haul route show that the junctions are operating within capacity in 2022 and can accommodate wind farm construction traffic. The junctions will continue to operate within capacity during the construction, operation and decommissioning of the wind farm when development traffic is combined with forecast traffic growth on the public road network.

Works on the turbine supply route will be required at a number of locations along the public road network from Belview Port to the Site. These works may have a slight, negative, temporary effect on residents, businesses and road users due to increased noise and vibration resulting from construction activities and increased journey times and delays due to temporary traffic management. However, these effects will be confined to a very short period during the construction phase of the wind farm and are not predicted to have a significant effect on the public road network.

The construction of the 16.013km long 110kV grid connection linking the wind farm to the national electricity grid at the ESB Dungarvan 110kV GIS Substation may have a slight, negative, temporary effect on residents, businesses and road users due to increased noise and vibration resulting from construction activities and increased journey times and delays due to temporary traffic management. However, these effects will be confined to a very short period during the construction phase of the wind farm and are not predicted to have a significant effect on the public road network.

The operation of the wind farm development will generate low volumes of LGV traffic and the effects of operational traffic will be imperceptible on the public road network.

Decommissioning of the wind farm could last approximately 4 months, during which time materials will be transported off-site for reuse/recycling, during decommissioning the effects of traffic movements associated with the development are predicted to have a slight negative temporary effect on residents, businesses and road users due to increased noise and vibration from HGV traffic and increased journey times and delays due to slow moving HGV traffic.

This Traffic and Transport assessment has identified no potentially significant effects, given the design and the mitigation measures recommended for the implementation of the Development.

16 NTS 16 SHADOW FLICKER

Chapter 15 of the EIAR contains a Shadow Flicker analysis. Shadow Flicker is the effect of light levels in a sunlit room noticeably varying as a result of the shadow of a turbine blade passing a window, causing a nuisance. Industry standard software was used to model the potential for shadow flicker to occur, based on the proposed turbine locations and dimensions and the locations of residential properties. The defined study area was based on the 2006 Guidelines which is for properties within 10 Rotor Diameters (1,8500m).

The Development has been assessed as having the potential to result in effects of imperceptible, long-term impact overall with regards to electromagnetic interference. Cumulative effects are predicted as unlikely.

This assessment has identified that cumulative impact of the closest surrounding wind farms Tierney Single Turbine which is situated 3.5km east of the site boundary, will have an Neutral/imperceptible cumulative impact to the dwellings identified in the Shadow Flicker study.

17 **NTS. 17 AIR AND CLIMATE**

This section assessed the effect of the Development on air quality, given the potential for dust emissions, and the likely carbon dioxide reduction effects of the Development in operation. Mitigation measures for the reduction of dust are outlined in the **EIAR Chapter 16: Air and Climate** Section 10.3.7. All turbines are situated greater than 700m away from inhabited dwelling houses. After mitigation, the residual effects were assessed as having the potential to result in a short-term imperceptible, negative impact on climate during construction. There will be long-term moderate, positive impact on climate as a result of reduced greenhouse gas emission during the operational phase.

The layout of the Development has been designed to minimise the potential environmental effects of the wind farm while utilising the maximum energy yield from the site's wind resource. The selection of breaking new ground and impacting on natural habitat has been kept to a minimum.

The Development does not contain any element, which will produce GHG emissions or odorous emissions in operation. Indeed, the Development will contribute to a net national reduction in the emissions of greenhouse and other gases resulting from the combustion of fossil fuels.

Savings of carbon dioxide arise principally from the generation of electricity from the Development, such that generation from other sources (which emit carbon dioxide) are offset. The estimated savings depend on the assumption of which source of electricity is displaced and the savings range from 84,106.5 to 92,853.6 tonnes of carbon dioxide per annum.

Ireland has set a target to achieve a 51% reduction in overall greenhouse gas emissions by 2030, setting a path to reach net-zero emissions by no later than 2050. The target for 2030 is to generate 80% of the country's electricity from renewable sources. The Development will contribute between 78.4 MW and 92.4 MW of installed capacity. The cumulative effect with other Irish renewable generation is considered to be a fundamental change in the climate effects of Ireland's energy supply, which is a major, positive effect, that is significant under the EIA Regulations and will contribute to Ireland's binding emission reduction targets. The Development has been assessed as having a slight, positive, long-term effect in terms of helping Ireland meet its international obligations to reduce GHG emissions.

18 NTS.18 SUMMARY

Chapter 17 of the EIAR provides a summary of the significant effects from each EIAR chapter and also summarises the mitigation measures proposed to reduce either the likelihood or magnitude of these effects to an acceptable level, for ease of reference.