BALLYKETT GREEN ENERGY LIMITED

BALLYKETT WIND FARM

CO. CLARE

VOLUME I

NON-TECHNICAL SUMMARY (NTS)

February 2024

Ballykett Green Energy Limited,
C/O Greensource,
Station Road,
Adare,
Co. Limerick.

Jennings O'Donovan & Partners Limited,
Consulting Engineers,
Finisklin Business Park, Sligo.
Tel.: 071 - 916 1416
Fax: 071 - 916 1080
e mail: info@jodireland.com

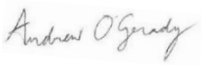
JENNINGS O'DONOVAN & PARTNERS LIMITED.
Project, Civil and Structural Consulting Engineers,
FINISKLIN BUSINESS PARK,
SLIGO,
IRELAND.

Telephone (071) 91 61416
Fax (071) 91 61080

Email info@jodireland.com
Web Site www.jodireland.com

DOCUMENT APPROVAL

PROJECT	Ballykett Wind Farm	
CLIENT / JOB NO	Ballykett Green Energy Limited	6777
DOCUMENT TITLE	Non-Technical Summary	

	Prepared by	**Reviewed / Approved by**
Document **Draft Rev 0**	Name Andrew O'Grady	Name David Kiely
Date 20th February 2023	Signature 	Signature 

	Prepared by	**Reviewed / Approved by**
Document **Final**	Name Sarah Moore	Name David Kiely
Date 29th February 2024	Signature 	Signature 

6777/SM

BALLYKETT GREEN ENERGY LIMITED
BALLYKETT WIND FARM, CO. CLARE

VOLUME I
NON-TECHNICAL SUMMARY REPORT

CONTENTS

1 INTRODUCTION

This document presents the Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) which accompanies the application for planning permission for the proposed windfarm at Ballykett, County Clare. The wind farm Site, as shown in **Figure NTS-.1**, is located in south-west county Clare 3.5km north-east of the town of Kilrush and 3km south-west of Cooraclare village. The Development is located within the townlands of Ballykett, Tullabrack East, Tullabrack West, Tullabrack and Gower South. It is located within an area comprised of agricultural livestock grazing farmland, cutaway bog and conifer forestry plantation. The location of the Project is shown in **Figure NTS-1**.

Figure NTS-1: Site Location

Ballykett Green Energy Limited (referred to as 'the Developer'), is a subsidiary of Greensource Sustainable Developments Limited. Greensource is an Irish renewable energy group that focuses on sustainable power generation. They have a strong and proven track record for renewable energy development and operation.

Greensource is a leader in the promotion, operation and maintenance of renewable energy facilities. They have developed their own projects which they oversee from concept, creation to asset management.

Permission is being sought by the Developer for the erection of 4 no. wind turbines with an overall ground to blade tip height of 150m with a rotor diameter of 136m and a hub height of 82m, the construction of crane hardstand areas and turbine foundations, the creation of a new site entrance onto the L6132, construction of 1 no. temporary construction compound with associated temporary site offices, parking areas and security fencing, installation of 1 no. permanent meteorological mast of 82m overall height, construction of new internal site access tracks and upgrade of existing site track, to include all associated drainage including new clear span bridge crossing of the Moyasta River, development of a site drainage network, biodiversity enhancement measures, construction of 1 no. permanent 38kV electrical substation, 2 no. permanent spoil storage areas, all associated underground electrical and communications cabling connecting the wind turbines to the wind farm substation and to the existing Tullabrack 110kV Substation, all ancillary forestry felling to facilitate construction including the development of one no. borrow pit, and vertical realignment of an existing crest curve on the L6132. The EIAR also assesses temporary localised works along the TDR that are not included in the red line Boundary.

The entire Project is located within county Clare and it will have an installed capacity range of 16MW to 20MW. The Site layout is shown in **Figure NTS-2**.

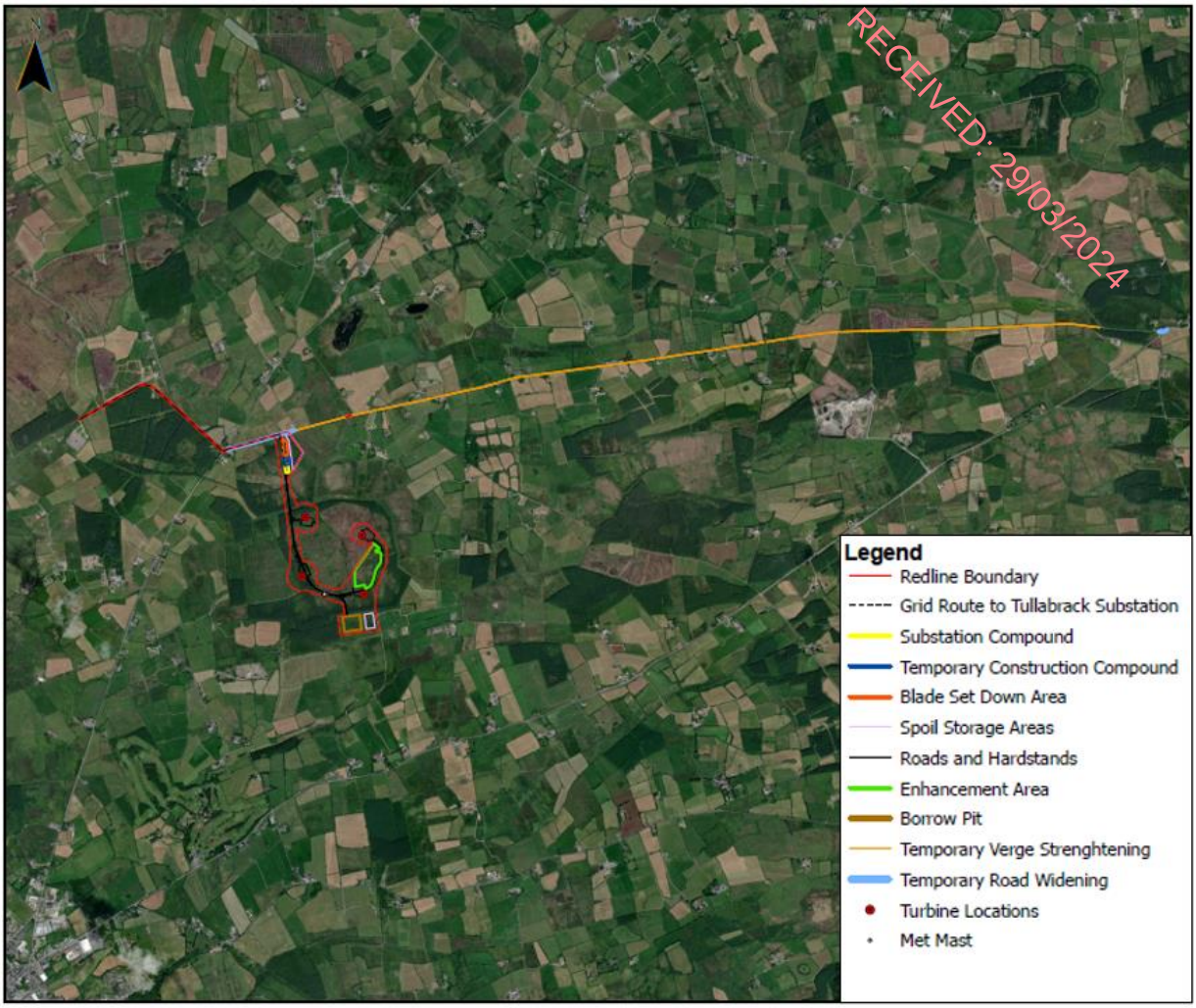


Figure NTS-2: Site Layout

The EIAR presents information on the identification and assessment of the potential significant environmental effects of the Project 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 and Drawings (Volume III)
- Supporting Appendices (Volume IV)

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

The Project will comprise the following phases:

- Construction of the Project
- Operation of the Project
- Decommissioning of the Project

1.1 Planning History

In August 2023, Clare County Council refused planning permission for a wind farm development at this Site, siting six reasons. The Developer has prepared a new EIAR, NIS and planning application for the proposed wind farm development in Ballykett, having regard for the reasons set out in the refusal for planning permission by Clare County Council. In EIAR **Chapter 1 Introduction**, **Table 1.2** outlines the reason for the planning refusal by Clare County Council and outlines where these have been addressed in this EIAR and NIS.

2 ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

An 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 proposed Project typically legally require an EIA.

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 statutory bodies and key consultees in September 2022. The request was accompanied by a Scoping Report which included a Description of the Project, a Site Location Map, and an outline of the baseline environment and proposed methodology for the various proposed assessments for the EIAR. Scoping Opinions received are included as **Appendix 1.3 of Volume IV**.

The Developer undertook and completed a number of public consultation events., in four stages as follows:

Stage 1, July 2022

- Project Website launched www.ballykettgreenenergy.ie – July 2022
- Press release in the Clare Champion newspaper announcing the commencement of the community engagement process, July 2022

Stage 2, July 2022

- Letter and Brochure posted to each household within 1km of the project site.
- Letter and Brochure posted to each household within 2km of the project site.
- Door to door visits to 33 occupied households within 1km of the project site.

Stage 3, August - September 2022

- Follow up calls in response to phone calls, emails.
- Consultation with local Councillors and politicians.

Stage 4, January – May 2023

- January 2023 Project Website Update and additional information 1.
- May 2023 Project Website Update and additional information 2.

A report on the public consultation process has been prepared and can be found in **Appendix 1.5** in **Volume IV**. Public consultation was generally supportive of the project with the main concern raised being about impacts on the road network during the construction phase. 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. 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 Project will be added. This identifies the key receptors, including how sensitive they are to the sort of change that might be caused by the Project. The potential size (or magnitude) of change caused by the Project 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 Project.

3 PROPOSAL FOR THE BALLYKETT WINDFARM

Planning permission is being sought by the Developer for the construction of four wind turbines, permanent Met Mast, Electrical Substation and all ancillary works.

The Development will include the following main components:

- Erection of 4 no. 4-5MW wind turbines with an overall ground to blade tip height of 150m. The candidate wind turbine will have a rotor diameter of 136m and a hub height of 82m.
- Construction of site access tracks, Turbine Hardstand areas and Turbine Foundations.
- Construction of new site entrance with access onto the adjoining local road network (L6132).
- Construction of 1 no. Temporary Construction Compound with associated temporary site offices, parking areas and security fencing
- Installation of 1 no. permanent Met Mast of 82m overall height.
- Construction of new internal site access tracks and upgrade of existing site track, to include all associated drainage including new clear span bridge crossing of the Moyasta 27_010 watercourse.
- Development of a site drainage network and biodiversity enhancement measures.
- Construction of 1 no. Electrical Substation.
- 2. no permanent spoil storage areas.
- All Wind Farm Internal Cabling connecting the wind turbines to the Electrical Substation.
- Ancillary forestry felling to facilitate construction of the Development.
- All works associated to facilitate the permanent connection of the wind farm to the national electricity grid comprising a 38kV underground cable in permanent cable ducts from the proposed, permanent, on-site substation and to the existing Tullabrack 110kV ESBN Substation.
- Vertical realignment of an existing crest curve on the L6132 local road in order to prevent grounding of abnormal load vehicles during delivery of turbine components.

A 10-year planning permission and 35-year operational life from the date of commissioning of the entire wind farm is being sought.

In addition, the EIA also assesses localised improvements and temporary modifications to the existing public road infrastructure to facilitate delivery of abnormal loads and turbine delivery. Development works within the Redline Boundary and the works along the Turbine Delivery Route which are outside the redline and landholding boundary are defined as the Project.

3.1 Wind Turbines

The proposed turbines will be of typical modern design and will be a three-bladed, rotor up wind of the tower, variable speed, pitched blade regulated machine. Turbine appearance will be a matt non-reflective finish in a white, off-white or grey colour. The foundation-to-tip height will be 150m.

The turbine will have a circular based tower, sitting on a reinforced concrete foundation. The tower will support the nacelle, rotor hub, and rotor blades. Commercial wind turbine towers are typically made of steel or a hybrid of steel and concrete. The nacelle is mainly metal (steel, copper, aluminium, etc.) with a metal/plastic/glass-reinforced plastic (GRP) body, while the blades can be made of a matrix of glass-fibre reinforced polyester or wood-epoxy or similar composite materials.

Each turbine will have a generator with a maximum capacity of 5MW giving an overall capacity up to 20MW. The turbines may be direct drive machines or may contain a gearbox. The final turbine will be chosen in a competitive tendering process as part of the Project financing process, after all necessary consents have been secured.

The final choice of turbine model has not been decided at this stage, but for the purposes of EIA and planning approval the candidate turbine model used for assessment is identified as a Vestas V136 wind turbine.

For the purposes of the assessments, the dimensions of the candidate turbine are presented in Table 3.1.

Table 3.1: Turbine Parameters

Turbine Parameter	Assessment Envelope
Turbine Blade Tip Height	150m
Rotor Diameter	136m
Hub Height	82m

3.2 Site Access and Turbine Delivery Route (TDR)

The Site access will be from a new entrance on the L6132 Gowerhass – Tullabrack road which continues west for 300m before joining the R483. A new site entrance will be created which will allow abnormal load turbine delivery vehicles to safely access and exit the wind farm Site as well as achieve the required sightlines. This entrance will be used for delivery of both turbine components and building materials such as rock and concrete. The site entrance is shown on **Figure NTS-3.**

Figure NTS – 3: Site Entrance

It is proposed that the turbine components including rotor blades, towers, nacelles, hubs and drivetrains will be landed by ship and stored for transportation at Foynes Port, Co. Limerick. From Foynes Port, they will be transported to the Site using specialised abnormal load vehicles. Turbine delivery vehicles will travel eastbound on the N69 towards Limerick City and join the N18, delivery vehicles which satisfy the 4.65m height restriction in Limerick tunnel will continue on the N18 northbound through the tunnel. Delivery vehicles with high loads will join the R510 at junction 2 on the N18, cross the River Shannon on the R527, join the R445 at Coonagh roundabout and re-join the N18 at junction 4. On the N18 / M18 delivery vehicles will travel northbound towards Ennis and join the N85 at Junction 9. Vehicles will travel westbound on the N85 to the N68 junction where they will join the N68 and continue southbound towards Kilrush to the L6132 junction. Delivery vehicles will travel westbound on the L6132 to the wind farm site entrance. The Turbine Delivery Route for turbine delivery and general wind farm construction traffic will use the national and regional road network to access the Site via the L6132. The verges of the L6132 will be strengthened to withstand wheel loading from abnormal load vehicles.

The delivery of the turbines will require co-ordination with a number of statutory bodies including Clare County Council, and An Garda Síochána. An agreed programme of work and Traffic Management Plan which will be prepared by the Contractor ahead of any construction work commencing on the wind farm Site. The proposed Turbine Delivery Route is shown on **Figure NTS-4.**

Figure NTS-4: Proposed Turbine Delivery Haul Route

3.3 Grid Connection Route (GCR)

Connection will be sought from the grid system operators by application to ESB Networks Limited. The Developer has assessed possible connection options for the Project and found that a 1.84km 38kV connection to Tullabrack 110kV substation is the most expedient one, both environmentally and economically, subject to the substation having grid offtake capacity. The Grid Connection can be summarised as follows:

- **Underground Grid Connection** (UGC) single 38kV circuit from Tullabrack substation to Ballykett WF utilising sections of UGC primarily public roads, regional roads, and private lands (approx. 1.84km).

The proposed Grid Connection Route (GCR) is presented in **Figure NTS-5**. The GCR assessment report carried out by BFA Consulting can be found in **Appendix 2.2** in EIAR **Volume IV**.

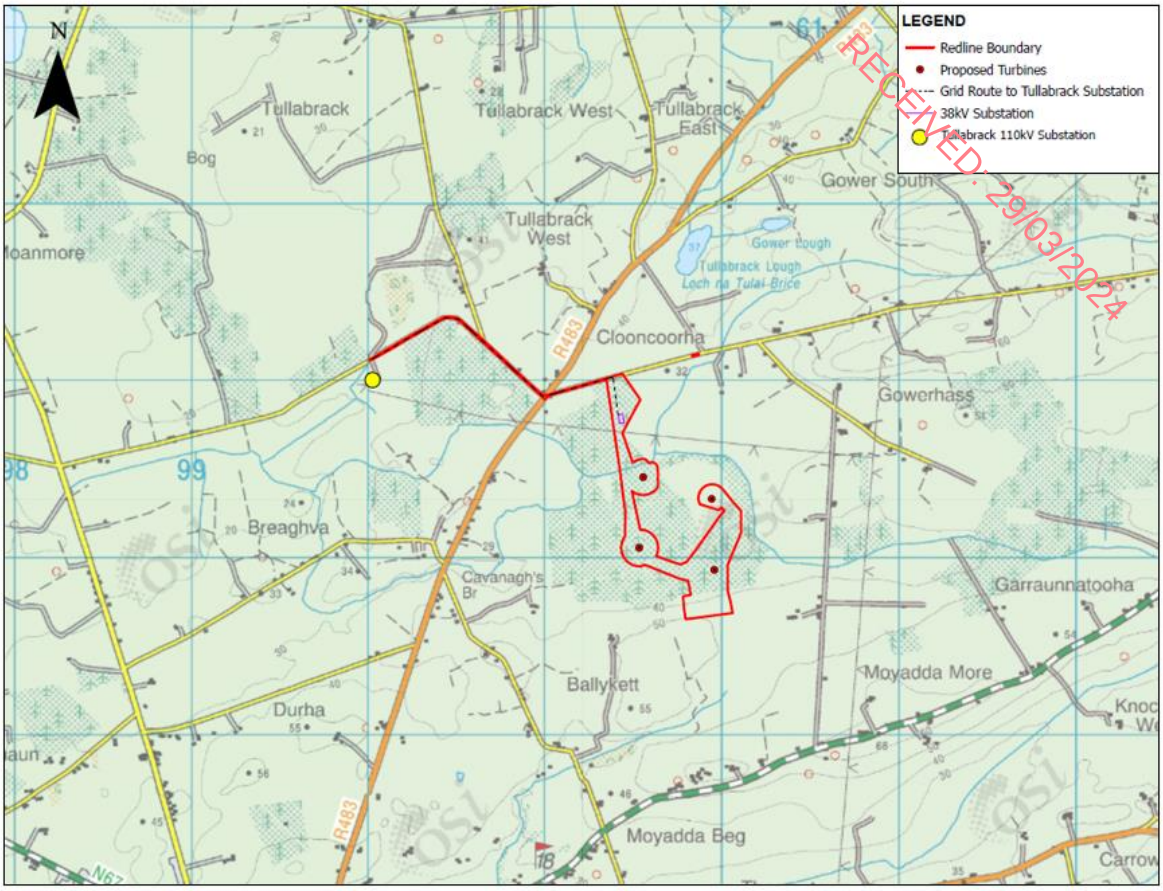


Figure NTS-5: Proposed Grid Connection Route

3.4 Construction Phase

Subject to planning consent, the construction phase will begin with site preparation works and will be complete when the turbines are erected and ready for commissioning, and when all wastes have been removed from the Site. For this Project, the duration of the construction phase is expected to be 28-40 weeks. An indicative construction programme is set out at **Table 3.2**.

Table 3.2: Indicative Construction Programme

Proposed Works	Timetable
Mobilise on Site	1
Construction of L6132 site entrance	1-2
Construction of Temporary Construction Compound	1-2
Construction of floating Site access roads leading to the borrow pit	2-8
Clause 804 material for surfacing Site access tracks, Turbine Hardstands and staging area	6-10
Construction of 0.4km road widening (site entrance to Tullabrack Cross)	2-8

Proposed Works	Timetable
Construction of L6132 verge strengthening on Turbine Delivery Route 5.6km (site entrance to N68)	8-16
Site drainage and fencing	8-16
Ready mix concrete for Turbine Foundations	12-20
Steel reinforcement for Turbine Foundations	8-16
Foundation bolts	8-16
Substation building materials	8-20
Electrical switchgear	20-38
Electrical cables	4-20
Grid Connection works	20-28
Wind turbine components	20-28
Crane	20
Reinstatement and demobilisation	28-40

A Construction & Environmental Management Plan (CEMP) is appended to the EIAR in **Appendix 2.1**. The CEMP includes all the mitigation measures proposed within the EIAR. A Summary of the mitigation measures is included in **Appendix 17.1** of the EIAR.

In the event planning is granted for the Development, the CEMP provides a commitment to mitigation and monitoring, and reduces the risk of pollution whilst improving the sustainable management of resources. The environmental commitments of the Project will be managed through the CEMP and will be secured in contract documentation and arrangements for construction and later phases, such that there will be a robust mechanism in place for their implementation. The CEMP addresses the construction phase, through to the commissioning, operation and final Decommissioning phases (refer to Decommissioning Plan in EIAR **Appendix 2.1**).

An Ecological Clerk of Works (ECoW) with experience in overseeing wind farm construction projects will be appointed by the Developer for the duration of the construction phase so that the CEMP is effectively implemented. The contractor will be required to appoint an Environmental Manager.

The whole Project, from construction to commissioning to Reinstatement and demobilisation, will take approximately 40weeks. 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, 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 forestry access track infrastructure rather than using new land. The Site extends to 31.09ha, the majority of which is forestry with some cutover peatland and is in the ownership of local landowners. During the construction phase, the total land-take required for the development will be 2.72ha.

The Developer 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 conditions of planning and the mitigation measures outlined in the EIAR, including the Construction Environmental Management Plan (CEMP) included as **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 Biodiversity Enhancement & Management Plan (BEMP), included in the EIAR as **Appendix 6.6**, has been prepared to mitigate for the ecological effect of habitat loss as a result of the project. The plan sets out measures for peat management and restoration. Site restoration will involve the implementation of a Biodiversity Enhancement Plan to achieve a net gain of 2.86 ha of peatland habitat. The primary objective is to rehabilitate an area of bog which had been planted with conifers. The total area of the BEMP is 3.4 ha, which will provide a net gain in the area of unplanted cutover bog at this site and enhance the biodiversity of the Site. Restoration will be undertaken at the earliest opportunity to minimise storage of turf and other materials. **Figure NTS-2** shows the areas designated for habitat enhancement (Enhancement Area).

3.6 Operational Phase

The proposed operational lifespan for the Development is 35-years. During the operation of the wind farm, the turbine manufacturer, the wind farm operator, or a service company will carry out regular maintenance of the turbines. 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.

In addition, operation and monitoring activities will be carried out remotely with the aid of computers connected via a telephone broadband link. Routine inspection and preventative maintenance visits will be necessary to provide for the smooth and efficient running of the wind farm and Electrical Substation.

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, human health, amenities, 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, see **Chapter 3** – **Section 3.5 - Strategic Site Selection** for more detail.

5 LEGAL AND POLICY FRAMEWORK

Chapter 4 of the EIAR sets out the relevant planning policy and legislative background to the planning application. The Project has had regard to The National Planning Framework, The Regional Spatial and Economic Strategy (RSES) for The Southern Regional Assembly Area and the Clare County Development Plan 2023 - 2029. These documents are relevant to the determination of the planning application by the planning authority.

The Climate Action Plan 2023 set outs 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 Project will contribute towards meeting those targets.

6 POPULATION AND HUMAN HEALTH

The potential effects of the construction, operational and decommissioning phases of the Project on socioeconomics, tourism and recreation and land use were identified and assessed in **Chapter 5** of the EIAR following desk-based collection of data and consultation with local stakeholders. The entire Project falls under the Municipal District (MD), west Clare and District Electoral Divisions (ED) Clooncoorha, Cooraclare, Tullycreen and Kilrush Rural that can be separated into the distinct townlands Ballykett, Tullabrack West, Tullabrack East, Tullabrack, Gower South, Gowerhass, Tullagower and Derreen.

The Site is located within an area comprised of agricultural livestock grazing farmland, cutaway bog and conifer forestry plantation and is in the ownership of four local landowners. The land use will not be altered significantly by the construction, operation and decommissioning of the Project as current activities can continue alongside the development on the lands that have not been taken by the Project.

In advance of the construction phase, the Developer 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 Developer has significant experience in organising these events.

Effects on the economy during both the construction and operational phases 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.

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 Project, if construction periods overlap.

The Project will contribute to the offset of the burning of fossil fuels which has the potential to positively impact human health.

Overall effects of the Project with regards to tourism are considered to be short-term, slight, negative during both construction and decommissioning phases.

7 BIODIVERSITY

The likely impacts on biodiversity associated with the Project have been assessed in **Chapter 6** of the EIAR. A detailed understanding of the baseline conditions at the Site has been gained following the collation of desktop information and data sources and ecological field surveys. The ecological field surveys completed at the Site include surveys for habitats, terrestrial mammals, bats and ornithology.

Seven European designated sites occur within a 15km distance of the proposed wind farm site (these are fully assessed in the AA Screening report and NIS which accompanies the application). The Project area has hydrological connectivity with two sites, the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA. One Natural Heritage Area (NHA) occurs within a 15km radius of the Site, along with a total of 12 proposed Natural Heritage Areas (pNHAs).

The Site of the proposed wind farm is dominated by coniferous plantation on peat. The Site supports an area of unplanted cutover raised bog, which is rated as Local Importance (higher value). Other habitats recorded include improved agricultural grassland and lowland rivers. There are no habitats on Site that are examples of those listed on Annex I of the EU Habitats Directive as amended. No nationally rare or legally protected plant species listed in the Flora (Protection) Order 2022 were recorded from within the Site.

The Site supports a mammalian fauna typical of bog and conifer plantation habitats. All mammal species recorded are listed as 'Least Concern' on the Irish Red List. Otter, pine marten and deer species are protected under the Wildlife Acts, as are other species likely on Site or in the immediate environs, namely pygmy shrew and badger. Otter is also listed on Annex II of the EU Habitats Directive as amended. The common frog and the common lizard are protected under the Wildlife Acts, though both are listed as 'Least Concern' on the Irish Red List.

The bat landscape association model suggests that the proposed wind farm Site is situated within a landscape of medium to high bat importance, particularly for four species: soprano pipistrelle, brown long-eared, Leisler's bat and Natterer's. During static surveys, a total of nine species of bats were recorded, with Soprano Pipistrelle and Common Pipistrelle the most common species followed by Leisler's bat. All bats recorded are classified as 'Least Concern' on the Irish Red List and protected under the EU Habitats Directive as amended Annex IV and Wildlife Acts as amended. One species, Lesser Horseshoe, is listed as 'Annex II' under the EU Habitats Directive as amended.

The habitats on Site are of relatively low interest for birds. Meadow pipit (Red-listed) and skylark (Amber-listed) breed on the cutover bog, while snipe (Red-listed) was recorded in autumn. The habitats within the Redline boundary are suitable for foraging by hen harrier (one individual recorded foraging off-site but locally) and merlin (one bird recorded on Site), both listed on Annex I of EU Birds Directive as amended. Kestrel (Red-listed) occurs regularly in the area and hunts within the Site. Sparrowhawk and buzzard also have a regular presence in the area. A range of Amber-listed species occur within the conifer plantations, including goldcrest, willow warbler and starling. On the basis of providing breeding and foraging habitat for several bird species of conservation importance, the Site is rated as of Local Importance (higher value) for birds.

Potential impacts that could arise during the Construction, Operation and Decommissioning are assessed for designated sites and biodiversity interests within the Site and surrounding

areas. For designated sites, there is potential for effects on the European sites and the proposed Natural Heritage Areas associated with the River Shannon system as a result of contaminants originating within the project area, and especially during the construction phase, reaching the relevant designated site and causing harmful effects on the interests of the designated site. The significance of any effect would be dependent on the magnitude and duration of a pollution event. Mitigation is therefore required to minimise this risk.

Impacts on terrestrial habitats and flora are considered under:

- permanent loss of habitat
- temporary loss of habitat
- disturbance to habitats
- changes to existing habitats

The principal impact is from the construction of turbine T4, which will result in the permanent loss of 0.54 ha of cutover bog, which is rated as a Significant Adverse effect of Permanent duration. Mitigation or compensation for loss of cutover bog will be provided through a Biodiversity Enhancement and Management Plan (BEMP). Some disturbance to cutover bog will also occur around the location of turbine T4 during the construction phase. Mitigation to minimise disturbance of cutover bog as a result of construction works will be implemented.

The principal impact on terrestrial mammal species would be on the local otter population associated with the Moyasta River and the Shannon system if contaminants generated during the construction phase were to enter the local watercourses and affect the prey items of the otter. Mitigation to maintain water quality during the construction and operational phases of the Project will minimise the risk to the otter population.

For bats, due to the levels of nightly activity at each of the static bat detector locations, the four turbines are considered a medium risk for all the 'at risk' bat species, *i.e.*, common and soprano pipistrelle and Leisler's bat. No significant collision related risk is likely. However, mitigation to minimise the risk of bat collision will be implemented. The surveys did not record any bat roosts within the Site.

For birds, predicted or potential impacts are considered in detail under the following:

- Loss of habitats
- Potential disturbance to birds during construction
- Potential displacement of birds during operation

- Potential barrier effect by presence of turbines
- Predicted collision risk to birds
- Potential effects on birds in hinterland

Where potential adverse impacts are identified, mitigation will be implemented to minimise the effects of the project. Pre-construction surveys for identified breeding bird species, including merlin and kestrel, will take place as required to establish the status of localised breeding species at the time of construction. Where necessary, restrictive zones will be established around identified nesting locations to prevent disturbance to breeding birds from construction activities.

With the implementation of mitigation measures as described, all of which are proven techniques that if applied as proposed will avoid or minimise adverse effects, and with rigorous monitoring from the pre-construction through to the post-construction phases of the project, predicted adverse effects on biodiversity as a result of the project can be eliminated or reduced to the levels of Slight to Moderate Significance. Of particular relevance from a local biodiversity perspective is that the Biodiversity Enhancement and Management Plan (BEMP) will increase the net area of cutover bog at the site by the removal of conifer plantation and subsequent management of the plot.

8 Aquatic Ecology

Chapter 7 of the EIAR assesses the significant effects of the Project on Aquatic Biodiversity. Baseline surveys at watercourses near the site and at watercourses on the proposed grid connection route were carried out. A desktop study review was carried out of existing data and records for fish, protected aquatic species and habitats, and invasive species, on watercourses at or hydrologically connected to the development on the National Biodiversity Data Centre and National Parks and Wildlife Service websites.

There are three watercourses within/ draining the Site which could potentially be affected by the development, i.e., the Moyasta (EPA Code: 27M04), Gowerhass (EPA code: 27G13) and Ballykett (EPA Code: 27B52). The Turbine Delivery Route (TDR) includes three watercourse crossings which may potentially be affected by the transport of turbines on heavy load vehicles along this route. The Tullagower River and the Brisla East Stream are located to the East of the proposed Development Site and are part of the Doonbeg river catchment. The third crossing is on the GOWERHASS, upstream of the Site and connected to the Moyasta catchment. The preferred Grid Connection Route (GCR) connects the Development to the existing Tullabrack 110KV Substation and does not cross any watercourses

Additional surveys were undertaken to investigate the presence of Freshwater Pearl Mussels (FPM) in the Doonbeg River and its tributaries on the 9th and 10th of October 2023 as the catchment is considered a sensitive area for the species. The survey (Appendix 7.1) covered approximately 40 m at site 1, 118 m at site 2 and 130 m at site 3; however, surveys were not possible at sites 4, 5 and 6 because they were inaccessible due to local conditions. No live mussels were encountered and there was no evidence recorded of mussels (e.g., empty shells) during stage 1 surveys. While FPM are known to exist in the Doonbeg catchment, none were recorded as part of this EIAR and the related aquatic and FPM surveys carried out (see Chapter 7 and Appendix 7.1 for more details).

Site surveys and water sampling confirmed the surface water quality in watercourses in proximity to the Project Site is moderate to poor. Macroinvertebrate biodiversity is low and characterised by pollution tolerant species. The most likely source of the degraded water quality is diffuse pollution from agricultural run-off. Some of the survey stations displayed characteristics of eutrophication (deterioration of water quality and the depletion of dissolved oxygen). All streams are subject to seasonal fluctuations in discharge, velocity, temperature, species richness and abundance, but eutrophication and agricultural pollution are a persistent issue degrading water quality in the area.

None of the watercourses surveyed were identified as suitable habitats for Annex II listed species or species of high conservation value. The fine sediments on the streambed are unsuitable for freshwater pearl mussel (*Margaritifera margaritifera*) or spawning salmonids. There was no sign of otter tracks or spraint, river lamprey (*Lampetra fluviatilis*) or white-clawed crayfish (*Austropotamobius pallipes*). The streams are considered to be of low value local importance. The flora and fauna present in the streams are widespread, of low ecological significance and relatively tolerant to pollution.

The application lands for is the Project are not designated as a Special Area of Conservation, Special Protected Area nor a National Heritage Area. The Moyasta River is ecologically connected to two Natura 2000 sites, The Lower River Shannon SAC (site code: IE002165) and the River Shannon and River Fergus Estuaries SPA (site code: IE004077). These sites are located approximately 7.8km downstream of the proposed site. They are of international importance and have very high conservation value. The Moyasta River is hydrologically linked to Poulnasherry Bay a designated shellfish water body under the Quality of Shellfish Water Regulations (S.I. 208 of 2008).

The Zone of Influence (ZOI) differs for different habitats and species. Within terrestrial habitats, the ZOI may be confined to the study area, whereas for aquatic habitats, the ZOI will be much more extensive, and the surveys undertaken were scoped accordingly. In view of hydrological connectivity, this entailed establishing the baseline conditions in aquatic habitats at a range of points downstream in the various watercourses draining the Site and is reflected in the range and extent of surveys undertaken. The ZOI for aquatic ecology therefore is considered to be the watercourses in proximity to the Site. An Appropriate Assessment Screening Report and Natura Impact Statement (BioSphere Environmental Services, 2024) have been prepared for the proposed development which assesses significant likely effects on European designated sites (the Natura 2000 network), a number of which are hydrologically connected via surface water flow.

The principal potential construction phase effects of the Development relate to the release of sediments into the drainage network arising from construction related Site works including the access track network, turbine foundations and associated hardstands, drainage network, electrical sub-station building and borrow pits or spoil storage areas. These are considered to be short-term and localised to the zone of Influence (ZOI). There is a low risk of nutrient release from the clear-felling of conifers required for the Development; however, this is of a minor scale in comparison to the normal forestry activities taking place at the Site.

Water quality degradation in surface and groundwater from siltation or other forms of pollutants causing potential decrease in biodiversity of flora and fauna in the area, especially regarding the more sensitive species present, is the main result of the potential effects listed above. Release of suspended solids into watercourses can result in eutrophication and reduced oxygen levels due to minerals and nutrients such as phosphorus and nitrogen, which can adversely affect the local ecosystem. However, water quality degradation is considered to be short term during the Construction phase and not permanent.

There is the potential for negative effects during maintenance events at the turbine site or grid connection, during which the risks would be similar to the construction phase such as water quality degradation and eutrophication from the release of suspended solids.

Mitigation measures are outlined in Chapter 9, Section 9.5 and Appendix 2.1 CEMP-Appendix B SWMP include:

- No works will take place within the 50m buffer zone of watercourses except for the watercourse crossing, road alignment works and drainage measures as detailed on the **Appendix 2.1 CEMP**.

- All site drainage, as described in the surface water management plan (Appendix 2.1, CEMP, sub-Appendix B SWMP) and shown on associated drawings, will be directed through either sediment traps, settlement ponds and/or buffered drainage outfalls to ensure that total suspended solid levels in all waters discharging to any watercourse will not exceed 25mg/l (IFI, 2016). All construction site run-off will be channelled through a stilling process to allow suspended solids to settle out and through a spill-containment facility prior to discharge.
- Daily monitoring of all sediment traps and settlement ponds will be undertaken by the Ecological Clerk of Works to ensure satisfactory operation and/or maintenance requirements.
- During the culvert installation and associated construction work, double silt fences shall be installed immediately downgradient and downstream of the construction area for the duration of the construction phase.

For more extensive mitigation measures see **Chapter 7: Aquatic Ecology** and **Appendix 2.1 CEMP** of the EIAR.

The Decommissioning phase poses a similar suite of risks of potential significant effects on the aquatic environment as listed above the construction phase, with the risk of pollution in the waterways causing a reduction in biodiversity of flora and fauna.

A number of mitigation measures for the construction, operational and decommissioning stages of the Project have been proposed that will negate the risk of significant adverse effects caused by the proposed development to the aquatic ecology of the area.

In order to verify the efficacy of pollution prevention and mitigation works during construction, water quality monitoring will be undertaken prior to, during, and post completion of construction works. Monitoring will be undertaken in all suitable watercourses within the catchment of the construction area. Monitoring will be overseen by a qualified and experienced Ecological Clerk of Works.

The specific monitoring requirements including frequency and parameters, are detailed in the **Chapter 9: Hydrogeology and Hydrology** and **Appendix 2.1 – CEMP - Appendix B - SWMP** of the EIAR.

There are currently 17 operational and proposed wind farms within a 20km radius of the Site. There is the potential for cumulative negative effects to the Moyasta river due to the

proposed construction of a second, three turbine wind farm located at Moanmore, downstream from the Ballykett site. The Moyasta River is ecologically connected to two Natura 2000 sites, The Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA. The Moyasta river is also classified as 'Moderate' status under the Water Framework Directive. The potential for indirect negative effects to the downstream Natura 2000 sites, or a drop in water quality in the Moyasta river is limited to the construction phase of the project and can be curtailed by implementing the proposed mitigation measures.

A list of all other proposed or permitted developments larger than a once-off house within 10km of the proposed Ballykett Wind Farm Site were identified (see Chapter 2, Table 2.2). Each of these projects have been thoroughly assessed by the relevant statutory planning agency for environmental and ecological impacts and where such impacts are identified mitigation has been incorporated into the planning. This along with the mitigation in place for this project should result in slight to imperceptible effects in-combination.

The sources for potential negative significant short-term environmental effects of the construction, operational and decommissioning phases have been identified in **Chapter 7 – Section 7.4** of the EIAR. These sources have the potential to lead to a decrease in local biodiversity of flora and fauna in the watercourses surveyed, especially in regard to any more sensitive species present. However, as the baseline surveys did not indicate any particularly sensitive fauna present in the watercourses, this is unlikely. The Project is likely to cause significant, adverse, short-term effects on the aquatic environment at the local scale in the absence of mitigation. Additionally with mitigation measures in place along the turbine delivery route, significant effects on the watercourses to be crossed upstream of Doonbeg FPM sites is unlikely. Any cumulative or in-combination effects to Natura 2000 sites within the ZoI, have been ruled out with the proposed mitigation in place, in the accompanying NIS.

Although there is deemed to be a potential for negative significant short-term environmental effects as listed in this document, from the project, it is considered that with the proposed mitigation successfully implemented, the Project will result in an overall negligible to low significance residual effect upon the aquatic ecological features that lie within the Zone of Influence for the duration of the construction, operational and decommissioning phases.

There is expected to be no negative residual effect on any aquatic species, habitats or on water quality at a local or catchment level as a result of the Project

9 LAND, SOILS & GEOLOGY

Chapter 8 Soils & Geology, of the EIAR evaluates the effects of the Project arising from the construction/decommissioning and operational phases on the land, soils and geology within and surrounding the red line boundary. The assessment is based on desk studies and Site surveys.

The Project is situated within an area comprised of agricultural livestock grazing farmland, cutaway bog and conifer forestry plantation.
Subsoils underlying the Site are characterised generally as cutover peat. Peat depth across the Site is generally shallow to moderately deep with isolated pockets of deeper peat. The bedrock underlying the proposed wind farm and grid connection route include the sandstones and siltstones of the Central Clare Group and the Gull Island formation. There are no karst features located within or near the vicinity of any elements as part of the proposed Project.

The risk of landslides occurring on the proposed site under worst case scenario conditions has been determined to be generally very low to low and is mapped as low risk in terms of landslide susceptibility in all areas apart from the borrow pit which is mapped as moderate risk of landslide. There were no indications of stability issues or mass movement observed on the Site during site surveys. There is a report of a peat slide in this area (c. 27 years ago) with associated pollution into the Moyasta River, the exact location of which is unknown. There were no indications of stability issues or mass movement observed on the Site during site surveys.

The wind farm site is considered to be of 'Low Risk' to landslide susceptibility. A small portion to the south, at the proposed borrow pit and spoil storage area, is mapped as having 'Moderately Low' to 'Moderately High' Risk.

The likely significant effects on land, soils and geology arising during the construction phase as a product of the Project are identified as follows;

- Land take (temporary and permanent)
- Forestry felling
- Compaction, degradation and erosion of soils.
- Soil or land sealing
- Subsoil and bedrock removal
- Stability issues (excavation, vehicular movements, stockpiles)
- Soil contamination

The likely significant effects arising during the operational phase as a product of the Project are identified as follows:

- Land take (permanent).
- Soil compaction and subsidence

No new significant effects are anticipated during the decommissioning phase and are anticipated to be similar to those associated with the construction phase but at a reduced magnitude.

The potential effects to land soils and geology are considered localised, direct effects. However, there is the potential for soils and geology to intercept downstream receptors such as surface water and groundwater or ecology as indirect or secondary effects.

The cumulative effects of the soils and geology of the Project must consider the importance of soils and peatlands in particular in terms of ecological value and carbon value. Aim and objectives for soil quality and soil health have been outlined in the EU Soil Strategy (EC, 2021) which includes protecting and reducing degradation of soils. The proposed project would help some of the actions by limiting drainage of wetlands and organic soils and restoring managed and drained peatlands, reducing erosion and restoring degraded soils.

Mitigation measures presented and described address the likely effects identified and include key design and management principals in line with cited industry Best Practice and Guidance. Mitigation in summary includes:

- Mitigation by design, including mitigation by avoidance and reduction
    - Infrastructure designed to avoid potentially hazardous areas such as areas with deeper peat or shallow bedrock as far as possible and within the constraints of other environmental receptors.
    - Floating tracks where suitable and geotechnically feasible to reduce the excavation of peat.
    - Minimising the amount of soils and bedrock to be excavated / disturbed through design
- Mitigation by best practice
    - Minimising disturbance of soils by limiting vehicular movements and storage and arising outside of the footprint of the development.
    - Minimising the potential for stability issues by limiting vehicular movements and storage and arising outside of the footprint of the development.

- Spoil management: excavated material will be appropriately segregated for reinstatement and stored appropriately to reduce the potential of erosion and degradation of soils.

- Mitigation by reuse
  - Spoil management: whenever possible, soil and rock will be reused immediately or stored at a temporary stockpile location to be used during reinstatement works.
  - Excavated bedrock will be reused for access tracks or hardstand fill material.

Mitigation measures outlined in **Chapter 8** are embedded into the CEMP which will be updated by the civil engineering contractor and agreed with relevant statutory agencies, prior to any works commencing on Site.

The residual effect on the geological receiving environment resulting from the construction phase of the Project remains slight for land take. There also remains a slight residual effect of soil contamination which is considered a localised effect, however if hydrocarbon contamination is intercepted by surface water features the effect is potentially regional.

The unavoidable residual effects on the soils and geology environment as a function of the Development is that there will be a change in ground conditions at the Site with natural materials such as peat, subsoil and bedrock being replaced by concrete, subgrade and surfacing materials.

The residual effects associated with Decommissioning includes waste generation, hydrocarbon leakage and erosion of soil and rock.

Following the reinstatement works, it is expected that the wind farm site will be returned as close to its present condition as possible. In particular, areas of peat and current drainage regimes will be reinstated and left to revegetate naturally with the passage of time and the Site will revert over time to a more natural drainage regime. It is expected that the long-term residual effects associated with the Project will therefore be negligible.

10 HYDROLOGY, HYDROGEOLOGY AND THE WATER ENVIRONMENT

Chapter 9 Hydrology & Hydrogeology, of the EIAR assesses all elements of the Project and potential effects arising from the construction/decommissioning and operational phases. Both assessments for the Project were based on desk studies and Site surveys.

The topography of the proposed development site is relatively flat. There is one River running through the site, namely the Moyasta River, which is classified as "Moderate" WFD status. The TDR works crosses three waterbodies namely; the Gowerhass, which feeds into the Moyasta and the Tullagower and the Brisla East which feed into the Doonbeg River, which are classified as "Poor" WFD status. Also, there is extensive man-made forestry drainage which was mapped on site.

The Site is not within or adjacent to, but is upstream of designated areas. There are statutory designated sites that are hydrologically connected to the Site, including Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA. The Carrowmore Dunes SAC and the Mid-Clare Coast SPA via the Brisla east and Tullagower rivers (Doonbeg_030) are connected to the TDR works. Some of these designated areas are downstream of the Site and are important to consider in terms of potential secondary, downstream impacts of the Project.

There are no mapped wells within the Site. However, there are a number of mapped wells (no. 6) located within 2km of the EIAR boundary. The Site is not within a groundwater source protection area. The Kilrush groundwater body has been assigned "Good Status" and all WFD groundwater bodies have been identified as Drinking Water Protected Areas (DWPA).

Present day and future scenarios of fluvial flooding have been identified on site associated with the Moyasta River. Flood Risk Assessments conclude that the likelihood of exacerbating flood risk or behaviours at the Site is very low, and the potential to exacerbate effects on local receptors including dwellings is very low.

The likely significant effects on hydrology, hydrogeology arising during the construction phase as a product of the Project are identified as follows;

- Release of Suspended Solids (Through various activities)
- Release of other contaminants.
- Impacts to hydrologically designated sites.
- Drilling and releases.
- Local Groundwater Supplies and Bog Water Levels.
- Excavation Dewatering and Construction Water
- Surface Water Crossings, including through probable flood zones.
- Forestry felling
- Increased runoff from the site due to earthworks
- Ground Disturbance and diffuse sediment laden runoff;

The likely significant effects arising during the operational phase as a product of the Project are identified as follows:

- Increased hydraulic loading; and
- Other impacts arising from drainage including drying and wetting of adjacent peat / soils.

No new significant effects are anticipated during the decommissioning phase and are anticipated to be similar to those associated with the construction phase but at a reduced magnitude as no peat excavations are expected and the turbine foundations and hardstands will remain in-situ during decommissioning.

The potential effects to hydrology and hydrogeology considered localised to regional, direct effects. There is the potential for effects to intercept downstream receptors such as designated protection areas or ecology as indirect or secondary effects. The cumulative effects of the hydrology and hydrogeology of the Project must consider the importance of downstream receptors as well as the aims outlined in the WFD objectives. Standard, good-practice measures will be implemented to minimise the potential for effects such as pollution, erosion or changes to groundwater and surface water flows to occur.

Mitigation measures outlined below and detailed in **Appendix 2.1 CEMP** and **Chapter 9 Hydrology and Hydrogeology – Section 9.5** address the likely effects identified and include key design and management principals in line with cited industry Best Practice and Guidance. Mitigation in summary includes:

- Mitigation by design. That is, avoiding potentially hazardous and sensitive areas.
- Minimising disturbance of soils and material, including limiting vehicular movements.
- Limiting or ceasing activity during unfavourable conditions.
- Precautionary and emergency response measures, particularly in relation to potential contaminants.
- Following details set out in management plans including Construction and Environmental Management Plan (CEMP).
- Include appropriate measures to mitigate secondary effects, namely, to receiving surface water network (**Chapter 9 Hydrology & Hydrogeology**).
- Important design considerations are prescribed and will be incorporated into detailed assessment and design for the bridge and associated access track within the flood zone.
- Nature Based Solutions including Sustainable Drainage Systems. This will include check dams, stilling ponds, improvement areas and promotion of peatland health.

- Passive and Active Construction Water management.
- Proper design and construction of watercourse crossings and any works associated with the drainage network, including bridge/culvert design, and practical measures such as over pumping during any required instream works.
- Monitoring, including continuous monitoring of water quality downstream of the Site.

Elements of the design, construction and operation of the Project that may potentially impact on the hydrogeological and aquatic environment receptors have been identified and their pathways for impacts have been assessed in **EIAR Chapter 7** – **Section 7.4** and Chapter **9 – Section 9.4**. It has been determined that without mitigation, the Project would likely cause adverse effects ranging from moderate to profound significance due to the sensitivity of the designated sites hydrologically linked to elements of the Development.

The residual impact on the surface water receiving environment resulting from the construction phase of the Development is anticipated to be a limited temporary decrease in water quality. A limited temporary decrease in water quality may arise due to a release of suspended solids and sediments to surface waters during excavations at the Site. The potential for release of elevated suspended solids is likely to be exacerbated following heavy rainfall events which occur after sustained dry periods. Any localised reduction in water quality is likely to be mitigated against by the extensive control measures outlined in **Chapter 9 – Section 9.5** and also by natural dilution as distance from the point or diffuse source of contamination increases with distance from the Site.

In order to reduce the likely potential effects on the hydrological environment, the following mitigation measures will be adopted as part of the construction works on site:

- Implementation of a Construction & Environmental Management Plan (CEMP);
- Surface water management (SWMP) during construction using sediment fencing and avoiding established drainage networks;
- Earthworks limited to seasonally dry periods;

Implementation of the control measures will result in a robust environmental management plan which will target and mitigate likely sources and pathways of contaminant arising at the site, and to actively manage and monitor systems on site to achieve no effect to the receiving surface water network. Short term minor releases are still possible. However, with the monitoring and management proposed, any potential issue arising will be addressed immediately and remedied in good time.

A combination of the underlying bedrock geology, the associated aquifer potential, low permeability soils/peat and low recharge rates has resulted in the risk posed to groundwater quality by the Project being considered as low risk. Nevertheless, mitigation measures (**Chapter 9 – Section 9.5.2.13**) to reduce potential risks to groundwater will be implemented as a precautionary approach. The principal residual risk to groundwater posed by the Project is the use, storage and transfer of hydrocarbons (fuel) on site for plant equipment. In the unlikely event of a spill, the contaminant will be contained, managed and removed immediately.

Mitigation by avoidance and the implementation of physical control measures will ensure that contaminant concentrations, particularly elevated suspended solids entrained in run-off are reduced to below the relevant legislative screening criteria. The Project will not impact upon any surface water or groundwater body as it will not cause a deterioration of the status of the body and/or it will not jeopardise the attainment of a WFD 'Good' status. The Project will not cause it to deteriorate and will not in any way prevent it meeting the biological and chemical characteristics for WFD 'Moderate' status. There will be some local changes to how water flows at the Site, this is considered a likely, neutral to negative, slight to moderate significance, localised impact of the Project which conforms to baselineThe overall impact is anticipated to be a direct, adverse, neutral to slight with some beneficial potential.

11 NOISE

This Section provides a summary of the detailed assessment of the potential noise effects for the Project, as described in **Chapter 10** of the EIAR. The effects of noise from the operation of the Project have been assessed using Wind Energy Development Guidelines (DoHLG, 2006) 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 a residential location in the vicinity of the site between 28th June and 28th July 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 Wind Energy Development Guidelines (WEDGs, DoHLG, 2006). No exceedances of the limits from the operation of the development in isolation were noted at any third-party properties. There were two additional wind farms within 3km that were 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.

The current WEDGs (DoHLG, 2006) remain valid until the revised draft WEDGs (DoHLGH, 2019) are finalised and published. 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 potentially revised noise limit levels. 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 LANDSCAPE AND VISUAL

Chapter 12 of the EIAR presents a Landscape and Visual Impact Assessment for the Project, carried out by a competent professional. The assessment identifies potentially significant effects as a result of the Project. It considers separately the effects on landscape and visual receptors, as well as the cumulative effect of the Project in combination with other windfarm developments.

The Study Area for the Development covers a radius of 20km in accordance with the WEDGs (DoHLG, 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 26 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.

The site is contained within a slightly-sloping, low lying area approx. 6km to the north of the mouth of the River Shannon. This estuary serves as a transition between the intricate Atlantic coastline on the outer edge of the Study Area to the west and southwest, and the more elevated, upland areas to the north and east. The landscape within the Study Area is intermittently punctuated with small loughs and connecting waterways, as well as estuary bays such as Clonderalaw Bay and Poulnasherry Bay. Aside from the river Shannon, there are multiple watercourses in the Study Area.

The vegetation and land use follows the varied topography of the Study Area, which can be divided into quadrants for the purposes of describing it. Throughout the north-western coastal context, shoreline farmland mixes with riparian scrub and woodland and is dotted with rural residences and holiday homes vying for coastal views. The Slievecallan uplands in the north-eastern quadrant contain significant portions of mountain moorland on its elevated slopes and ridges, alongside dense patches of conifer plantations. Less commonly, there are some areas of upland grazing, which give way to valley farmland in lower-lying areas.

The settlements of Kilrush, Kilkee, Doonbeg, and Cooraclare, County Clare, and Tarbert, County Kerry account for the only notable urban land cover within the Study Area. Industrial and energy related land use is one of the defining features of this area due to its proximity to the River Shannon, which is used to access the busy Foynes Port and large Aughinish Alumina Plant, upriver to the east of the Study Area. The Tarbert and Moneypoint power stations, which lie on opposite sides of the Shannon within the Study Area, are the key electrical infrastructure nodes for the west of Ireland. Aside from being substantial industrial facilities in their own right, they provide hubs for numerous high voltage electricity lines which converge on them. At over 200m tall, the twin chimneys at Moneypoint are the second tallest structures in the country. Adding to this energy related land use, is a busy container shipping lane through the centre of the estuary that serves the industrial port of Foynes, east of the Study Area, as well as the presence of a number of operational wind farms which are situated throughout the central and Wider Study Area. The nearest of these, Moanmore Wind Farm and Tullabrack Wind Farm, are located within 2km to the northwest of the proposed wind farm.

In respect of landscape sensitivity designations within the Clare County Development Plan (2017-2023), which contains a Landscape Character Assessment, the Site is contained within two Landscape Character Types (LCT) and two Landscape Character Areas (LCA). The majority of the Site lies within 'LCT9 – Farmed Rolling Hills', whilst a small portion to

the northwest of the site is within 'LCT4 – Coastal Plain and Dunes'. Correspondingly, the majority of the Site is contained within 'LCA19 – Kilrush Farmland', with a small portion to the northwest within 'LCA21 – Loop Head' and a small section to the south bordering 'LCA18 – Shannon Estuary Farmland.' Landscape policy is driven by determining which of three categories a particular landscape falls into and these are based around the various LCAs. The landscape of County Clare is subdivided into:

- Settled landscapes' - areas where people live and work;
- Working Landscapes – intensively settled and developed areas within Settled Landscapes or areas with a unique natural resource; and
- Heritage Landscapes: areas where natural and cultural heritage are given priority and where development is not precluded but happens more slowly and carefully.

In terms of landscape effects, there will be physical impacts on the land cover of the site and GCR as result of the Project during the operational phase, but these will be relatively minor in the context of this productive rural landscape. The scale of the proposed development will be well assimilated within its landscape context without undue conflicts of scale with underlying land form and land use patterns where wind energy development is already a familiar feature. For these reasons the significance of the landscape impact is deemed to be Moderate-slight within the site and its immediate environs. Beyond the central study area, the significance of landscape impact is deemed to reduce further as the wind farm becomes a proportionately smaller and more integrated component of the overall landscape fabric. Consequently, significant landscape impacts are not considered to occur.

The visual impact assessments for each of the 26 selected viewpoint locations are contained in **Appendix 11.1** and are summarised within Chapter 11 based on receptor type.

Eleven of the viewpoints are from within approximately 5km of the Site and represent Local Community Views as well as other receptor types in some instances. Four of these experienced the highest likely visual impact recorded for the Project; that of 'Moderate' Visual Impact Significance. This is primarily owing to the proximity of these four receptors to the proposed turbines (i.e., all less than 1.2km distance), but also the lack of substantial roadside hedgerows or trees at those sections. A further three viewpoints recorded a Moderate-slight Visual Impact Significance, for similar reasons, while tending to be generally 2-5km from the Site, with the remaining four viewpoints likely to experience either Slight or Imperceptible visual impact significance.

Five viewpoints were selected to represent designated scenic routes / views. Four of these are considered to experience 'Imperceptible' visual impact significance and the remaining one, 'Slight-imperceptible'. Thus, there is a very low degree of impact on scenic designations.

There are two settlements within the Central Study Area, being Kilrush and Cooraclare and they registered visual impact significance of 'Slight' and 'Moderate-slight' respectively. Of those settlements within the wider study area (i.e. beyond 5km) that have some potential visibility of the proposed wind farm, none registered greater than 'Slight-imperceptible' visual impact significance.

For the major route receptor category, the highest visual impact assessed is 'Moderate' (VP3) along the R483, followed by 'Moderate-slight' along the N68. This is primarily owing to the proximity of these two receptors to the proposed turbines (i.e., all less than 1.2km distance), but also the lack of substantial roadside hedgerows or trees at those sections. Of the remaining eight viewpoints along major routes that were also assessed, none registered greater than 'Slight' visual impact significance.

In respect of views from tourism, recreational and heritage features, nine representative viewpoints were selected for the visual impact assessment. Notably, 7 of these 9 viewpoints are from the Wild Atlantic Way, the highest visual impact along which is deemed to be 'Slight' at two locations, where both viewpoints are less than 6km from the Development. Further receptors such as the Tullaher Loop Walk, the Shannon Way and the Glin Heritage Trail also recorded a visual impact significance of no higher than 'Slight.' Notably, two viewpoints (i.e. VP14 & 15) were captured from the dismantled South Clare Rail Line, which is proposed to be potentially developed, at some point in the future, as a public greenway. In spite of both viewpoints being within 6km of the nearest proposed turbine, the likely visual impact significance is deemed to be 'Imperceptible' at both.

In terms of the potential for cumulative impacts, there are 17 existing, permitted and in-planning wind farms contained within the Study Area. These are arranged in three distinct clusters within relatively discrete landscape settings and there are also three somewhat isolated developments. It is considered that the proposed wind farm will contribute to cumulative impacts in a very minor way at the scale of the Study Area where turbines are already a familiar feature and the Development represents marginal intensification. Within the central Study Area, there is a greater potential for cumulative impacts with two existing wind farms (Tullabrack and Moanmore) and a single in-planning wind farm development

(Moanmore South). However, there is a reasonable degree of cohesion between these modest scale developments where they either appear as a single larger entity or a series of discrete smaller developments, but seldom with clutter or scale confusion or a strong sense of being surrounded by turbines.

13 AIR AND CLIMATE

This section assessed the effect of the Project on air quality, given the potential for dust emissions, and the likely carbon dioxide reduction effects of the Project in operation. Mitigation measures for the reduction of dust are outlined in the EIAR **Chapter 12: Air and Climate**. The turbines are situated greater than 600m away from inhabited dwelling houses not connected with the Project. 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 Project 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 Project, such that generation from other sources (which emit carbon dioxide|) are offset. The Project would result in a total installed capacity range of 16 to 20 Megawatts (MW). approximately 10,234 (lower range) or 12,792 (higher range) tonnes of CO_2 will be displaced per annum from the largely carbon-based traditional energy mix by the Project. In total, it is estimated that 358,177 tonnes (lower range) or 447,721 tonnes (higher range) of CO_2 will be displaced over the proposed 35 year lifetime of the wind farm.

Ireland has set a target to achieve a 75% 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 Project will contribute within a range of 16MW to 20MW 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.

In isolation, the Project will have a significant positive effect on carbon savings and cumulatively, a significant positive effect when considered with Ireland's renewable energy deployment.

14 SHADOW FLICKER AND ELECTROMAGNETIC INTERFERENCE (EMI)

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 WEDGs (DoHLG, 2006) which is for properties within 10 Rotor Diameters (1,360m) extended to 1.5km for completeness. This resulted in 89 properties being included in the assessment see **Chapter 13** Section 13.2.4.

An estimated 69 of the 89 identified receptors are predicted to experience some degree of shadow flicker and the remaining 20 receptors are predicted to experience no shadow flicker, even in the worst-case scenario which assumes the sun is always shining, there is no cloud cover or vegetative screening and the dwelling is always occupied. The assessment showed that six houses will be affected by the operational Moanmore and Tullabrack wind farms and not the proposed Development in Ballykett.

The model also assessed a realistic scenario, or "expected values". In this scenario, the only change in assumptions is that the statistically likely monthly sunshine frequency and wind direction frequency data is assessed. Although the predicted levels of shadow flicker were substantially reduced for each of the 69 receptors, they were not entirely eliminated with 35 properties estimated to experience a maximum shadow flicker over 30 minutes per day.

Each turbine will be fitted with a shadow detection system which will shut down the turbine when the conditions for shadow flicker to occur are present and this will eliminate the occurrence of shadow flicker at all properties to comply with the thresholds set out in the WEDGs (DoHLG, 2006), and the Draft revised WEDGs (DoHLGH, 2019).

The assessment has not identified any likely significant effects from the development on population and human health.

15 CULTURAL HERITAGE

Chapter 14 of the EIAR presents a baseline study of and impact assessment on, the cultural heritage of the Site and the surrounding region. The assessment was based on a series of site inspections and a programme of desktop research which were carried out to identify and record any archaeological, architectural and cultural heritage assets that may be affected by the Development. The significance of effect on an asset is considered by establishing the asset's value/sensitivity, and how (and to what extent) it may be impacted based on the proposed design of the Development.

There are no known archaeological, architectural or cultural heritage constraints located within the footprint of the Development and no unrecorded examples were identified during field surveys and desktop research carried out as part of the assessment. There are 33 recorded archaeological sites, two of which are redundant records, located in private lands within a 2km Study Area around the Site and a review of historic mapping and aerial/satellite imagery indicates that 14 of these no longer retain above ground remains. The nearest archaeological site to the Site is a levelled earthwork (CL057-058) located 285m to the southwest of the borrow pitand the nearest extant example is a ringfort (CL057-026) located 920m to the west of Turbine T1. The majority of the extant archaeological sites within the Study Area comprise ringforts or enclosures and the area does not contain any monument types with visually sensitive alignment attributes, such as megalithic tombs or stone circles. In addition, none of the archaeological sites within the Study Area are National Monuments in State care.

There are no Protected Structures located within the Site, but there are two examples located within 2km of its boundary. These comprise two houses (RPS 593 and RPS 529) which are located at distances of 1.22km and 2km outside the redline boundary. The National Inventory of Architectural Heritage does not list any structures or historic gardens within the Site or within 2km of the Site. No potential undesignated features of cultural heritage interest, such as demesne lands or vernacular structures, were identified within the Site during the desktop study and field surveys carried out as part of the assessment.

There are no recorded archaeological sites or designated architectural heritage structures located within a 100m wide corridor centred on the Grid Connection Route to Tullabrack 110kV substation.

As there are no known archaeological, architectural or cultural heritage constraints within the footprint of the Development, no direct physical effects on any known archaeological or

architectural heritage constraints will occur during any phase of the Project. The Project has the potential to contain 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 medium to high magnitude of effect. As such, the mitigation for potential effects on unknown archaeological remains will entail archaeological monitoring of ground works 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 remains 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).

16 MATERIAL ASSETS AND OTHER ISSUES

Chapter 15 of the EIAR considers a number of other issues associated with the Project, including potential effects on Land Use – Agriculture and Forestry, Telecommunications, Electricity Networks, Air Navigation, Quarries and Utilities (gas, water, wastes).

16.1 Land Use

The Site is predominantly utilised for commercial forestry, livestock grazing and cutover peat. There are also a number of residential properties and established wind farms in the region. The Project, given its nature, is unlikely to result in indirect effects within its immediate footprint, and therefore effects on agriculture are considered imperceptible and not considered any further.

16.2 Forestry

The Site contains 28.5ha of forestry which is classified as commercial forestry. The proposed wind farm infrastructure layout (i.e., tracks, Turbine Hardstands, etc.) affects forestry and 3 No. turbines are located within forestry. A summary of the forestry affected is provided in Table 16.1 with Site access tracks and the Temporary Construction Compound also cutting through some of these plots.

Table 16.1: Summary of Removal of Forestry to facilitate the Development

Infrastructure	Area of forestry lost (Ha)	Species present
Turbines 1, 2, 3,	14.89	Sitka spruce
Temporary Construction Compound		
Blade set down area		
Site access tracks		

Infrastructure	Area of forestry lost (Ha)	Species present
Bio Enhancement Area	2.69	Sitka spruce
Totals:	**17.58**	

The associated afforestation of alternative lands equivalent in area to those lands being permanently clear-felled is also subject to licensing ('afforestation licensing'). The Forest Service of the Department of Agriculture, Food & the Marine is Ireland's national forest authority and is responsible for all forest licensing. In light of the foregoing and for the purposes of this Project, the Developer has committed that the location of any replanting (alternative afforestation) associated with the Project will be greater than 10km from the wind farm site and also outside any potential hydrological pathways of connectivity i.e., outside the catchment within which the proposed project is located. On this basis, it is reasonable to conclude that there will be no more than imperceptible, indirect, or in-combination effects associated with the replanting.

16.3 Telecommunications

Operators of microwave communication links were contacted during the EIA process. 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 result in no interference with communication links. Therefore, no effects are predicted on telecommunications or radio reception as a result of the Development. The potential effects of the Development with regard to telecommunications and electromagnetic interference are therefore considered not significant.

16.4 Electricity Networks

There is one Grid Connection Route assessed in the EIAR:

- The on-site substation will connect via a 38Kv underground cable to the existing Tullabrack 110Kv substation. There the cable will connect into existing infrastructure within the confines of the substation and its compound.

The proposed Grid Connection Route will be located entirely along public roads/verges, and will therefore have no effect on the overhead electricity network. Further details of the grid connection route can be found in EIAR **Appendix 2.2.**

The Development will contribute directly and in the long term to the electricity network by strengthening it through additional renewable energy generation.

When connected to the Tullabrack 110kV substation, the underground cable will connect into existing structures within the confines of the substation and its compound. An update of the existing transformer of the Tullabrack substation is likely to be required and thus will have a slight, short-term effect.

16.5 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 Ballykett. The physical height of turbines can cause obstruction to aviation and the overall performance of communications, navigation and surveillance equipment. All structures over 150m in height are required to have lighting to warn aviation traffic.

The closest international airport is Shannon Airport, approximately 35km to the east of the Project. The closest regional airport is Kerry Airport, 53km to the south of the Project. The closest aerodrome is the Abbeyfeale Airfield, 30km to the south/south-west of the Development. Note these distances are direct distances and not driving distances.

Consultation with aviation operators was undertaken and the Irish Aviation Authority responded.

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

16.6 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.

A desk study of available information from the EPA did not identify any waste facilities, illegal waste activities, chemical monitoring points or industrial EPA licensed facilities within a 2km radius of the Site. The nearest waste facility to the Development is a site at Creegh to the north. The closest, authorised municipal waste facility is located approximately 7.4km north of the Development in the townland of Ballynagun West, Co. Clare.

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.

16.7 Quarries

There will be approximately 43,870m^3 of rock required during the construction phase. A borrow pit will be developed on-site to extract rock (32,280m^3) for most of the site infrastructure requirements; this will help to limit the volume of HGV traffic associated with wind farm construction on the local road network. Rock (c. 11,590m^3 or 11.59tonnes) will be imported to construct the L6132 site entrance, temporary construction compound, access road from the L6132 site entrance leading to the onsite borrow pit, site access road and turbine hardstand surface layers and temporary and permanent works along the L6132 as detailed in **Chapter 16 Traffic and Transport**.

The crushed stone (11,590m^3 or 11.59 tonnes) for construction of the Development will come from licenced quarries in the locality such as:

- Derrynalecka Quarry, Derrynalecka
- Glenmore Quarry, Glenmore
- Hehir Quarry, Bollyneaska
- Letterkelly Quarry, Letterkelly
- Liscormick Quarry, Liscormick
- Nagle Stone Quarry, Liscannor
- Luogh and Lisacannor Stone Company Ltd. Luogh Quarry, Doolin
- Ryans Quarry (Roadstone Ltd), Ennis
- Bunratty Quarry (Roadstone Ltd), Bunratty
- Bobby O'Connell and Sons Ltd Ballycar Quarry, Ardnacrusha
- Esker Readymix, Athenry

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

17 ACCESS, TRAFFIC AND TRANSPORT

Chapter 16 of the EIAR sets out the effect that construction traffic would have on the road network, and the consequent effects that that could have on people and communities nearby.

Potential effects associated with windfarm development are presented in two key forms: those from the transport of wind turbine components, and those as a result of the import of construction material, equipment and personnel and the transport of excavated spoil from the main wind farm site to the designated Spoil Storage Areas.

A computer model of the turbine delivery vehicles is used to identify locations along the Turbine Delivery Route (TDR) where road improvements will be required to facilitate delivery of the largest turbine components from the N68 national secondary road to the site entrance on the L6132 local road. This is considered suitable, subject to minor alterations to street furniture (such as signs, bollards, etc.). These components would be transported with an escort vehicle as standard practice, to help ensure safe passage.

It is proposed that the turbine components including rotor blades, towers, nacelles, hubs and drivetrains will be landed by ship and stored for transportation at Foynes Port, Co. Limerick. From Foynes Port, they will be transported to the Site using specialised abnormal load vehicles. Turbine delivery vehicles will travel eastbound on the N69 towards Limerick City and join the N18, delivery vehicles which satisfy the 4.65m height restriction in Limerick tunnel will continue on the N18 northbound through the tunnel. Delivery vehicles with high loads will join the R510 at junction 2 on the N18, cross the River Shannon on the R527, join the R445 at Coonagh roundabout and re-join the N18 at junction 4. On the N18 / M18 delivery vehicles will travel northbound towards Ennis and join the N85 at Junction 9. Vehicles will travel westbound on the N85 to the N68 junction where they will join the N68 and continue southbound towards Kilrush to the L6132 junction. Delivery vehicles will travel westbound on the L6132 to the wind farm site entrance.

For the civils works during construction, it is envisaged that hardcore materials to construct the L6132 site entrance, temporary construction compound, access road from the L6132 site entrance leading to the onsite borrow pit, site access road and turbine hardstand surface layers and temporary and permanent works along the L6132 will be sourced from a local quarry subject to quantity and quality of rock being available. It is also envisaged that ready-mix concrete for Turbine Foundation construction and Substation foundations will be sourced from a local authorised quarry.

The route for wind farm construction traffic will use the national and regional road network to access the site via the L6132. Road widening, verge strengthening and vertical realignment of the L6132 required to facilitate the delivery of turbine components using abnormal load vehicles. The use of local roads for construction traffic will be prohibited unless the local road is part of an agreed construction haul route or provides access to a licenced suppliers facility such as an existing quarry or concrete batching plant.

There will be approximately 43,870m^3 of rock required during the construction phase. A borrow pit will be developed on-site to extract rock (32,280m^3) for most of the site infrastructure requirements; this will help to limit the volume of HGV traffic associated with wind farm construction on the local road network. Rock (c. 11,590m^3 or 11,59tonnes) will be imported to construct the L6132 site entrance, temporary construction compound, access road from the L6132 site entrance leading to the onsite borrow pit, site access road and turbine hardstand surface layers and temporary and permanent works along the L6132.

It is also envisaged that ready-mix concrete for Turbine Foundation construction and Substation foundations will be sourced from a local authorised quarry located along the N68 road corridor (Roadstone Cappagh). The location of aggregate suppliers, concrete suppliers and waste disposal facilities in the vicinity of the proposed wind farm are shown in **Figure NTS-7.** Distances to concrete and aggregate suppliers from the wind farm site are shown in **Table 17.1.** Construction workers will use the Site entrance on the L6132 to access the site but will need to have flexibility in the roads they use to reach the Site.

Table 17.1: Distances to local Quarry's and Concrete Suppliers.

Quarry	Distance
Derrynalecka Quarry	11.2km
Glenmore Quarry	16.4km
Hehir Quarry	20.8km
Letterkelly Quarry	22.3km
Liscormick Quarry	22.7km
Nagle Stone Quarry	31.5km
Luogh and Lisacannor Stone Company Ltd. Luogh Quarry	35.0km
Ryans Quarry (Roadstone Ltd.)	38.0km
Bunratty Quarry (Roadstone Ltd.)	42.0km
Bobby O'Connell and Sons Ltd. Ballycar Quarry	55.0km
Esker Readymix, Athenry	86.0km
McGraths Quarry	54.0km

It is estimated that during the wind farm construction, an approximate total of 2,472 loads of material and building supplies will be delivered and removed from the Site. The majority of granular materials for access track and Turbine Hardstand construction will be sourced

from site excavations and the on-site borrow pit and processed on site. The majority of HGV movements to and from site will occur during the first four months of the construction period and will be associated with site access track and hardstand construction and turbine foundation construction and verge strengthening on the L6132.

Increased volumes of traffic will be generated by the proposed development during the construction period. The Project will generate a maximum of 113 HGV trips (226 HGV movements). Peak traffic generated by the development will correspond to the construction of turbine foundations and will occur during four days within the 10 month construction period. Outside these times, construction traffic will typically consist of 28 HGV trips (56 HGV movements) at the site entrance. Project traffic will be distributed throughout the day with morning, afternoon and evening peaks.

The Project has generally been assessed as having the potential to result in effects of a negative, slight/moderate, direct, short-term, high probability effect or lower during the construction and Decommissioning phase only. After mitigation, the residual effects have been assessed as imperceptible/slight, negative and short-term in nature. There will be a slight positive residual effect from road strengthening, widening and surfacing works along the Haul Route if Clare County Council require these improvement works to be left in-situ following construction.

A detailed Traffic Management Plan (**Appendix 16.2**) will be agreed with the relevant authorities and will detail the measures to be implemented during the construction phase.

No significant effects related to operational phase traffic will occur due to the minimal traffic that would be generated during that phase of the Development.

18 INTERACTIONS OF THE FOREGOING

Any potential impact on one element of the environment as a result of the Project may also impact on another. **Chapter 17** of the EIAR provides a summary of the interactions and interrelationships between environmental aspects of the Project. This includes 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.

Table 18.1 below outlines the different environmental aspects which have potential to interact because of the Project. Interactions have been clearly identified in the early stages of the Project and where the potential exists for interaction between environmental impacts,

the EIAR specialists have taken the interactions into account when making their assessment. Potential interactions (both positive and negative) have been considered for the construction, operational and decommissioning phases of each of the different environmental aspects of the Project.

All environmental factors are interrelated to some extent. Having studied the interaction of potential impacts during the construction, operational and decommissioning phases of the Project, it has been determined that no amplification effect is anticipated. The Project will have some positive impacts on an international, national, regional and local level. It is important to note that the landscape and visual impacts are almost entirely reversible upon decommissioning of the Development.

Table 18.1: Summary matrix of Interactions of Negative Impacts during Construction and Operational Phases (Source: Adapted from EIAR Guidelines, 2022)[1]

	Population & Human Health		Biodiversity		Soils & Geology		Hydrology and Hydrogeology		Noise		Landscape & Visual		Material Assets		Cultural Heritage		Traffic & Transportation		Air and Climate	
	Const & Decom	Oper	Const & Decom	Oper	Const & Decom	Oper	Const & Decom	Oper	Const & Decom	Oper	Const & Decom	Oper	Const & Decom	Oper	Const & Decom	Oper	Const & Decom	Oper	Const & Decom	Oper
Population & Human Health																				
Biodiversity																				
Soils & Geology																				
Hydrology and Hydrogeology																				
Noise																				
Landscape & Visual																				
Material Assets																				
Archaeology and Cultural Heritage																				
Traffic & Transportation																				
Air and Climate																				

Note: Const & Decom = Construction & Initial Decommissioning phase; Oper = Operational phase

Interaction or inter-relationship

No interaction or inter-relationship

[1]. Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Available online at: https://www.epa.ie/publications/monitoring--assessment/assessment/guidelines-on-the-information-to-be-contained-in-environmental-impact-assessment.php [Accessed on 27/02/2024]