Bracklyn Wind Farm

Chapter 13: Material Assets

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13.0 Introduction

Material assets are *"resources that are valued and that are intrinsic to specific places"* which can be of human or natural origin[1]. While the meaning is less clear than other factors, Material Assets are taken to mean "*built services and infrastructure*"[2]. The majority of assets of natural origin are assessed elsewhere within this EIAR such as biodiversity, water quality, air quality and landscape. This chapter addresses, therefore, Material Assets which are of human origin, including transport, access, aviation, telecommunications, and resources & utility infrastructure. Another Material Asset of human origin, archaeology and cultural heritage, is addressed in **Chapter 10**.

13.0.1 Description of the Proposed Development

In summary, the proposed development comprises the following main components:-

- 9 no. wind turbines with an overall tip height of 185m, and all associated ancillary infrastructure;
- Upgrades to the turbine component haul route;
- Construction of a 110kV electricity substation and installation of 6.3km of underground electricity line between the proposed substation and the existing Corduff-Mullingar 110kV overhead electricity line; and
- All associated and ancillary site development, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure.

The majority of the proposed development is located within the administrative area of County Westmeath; while approximately 2.5km of underground electricity line and the proposed end masts will be located within County Meath. Additionally, candidate quarries which may supply construction materials are also located within County Meath.

The indicative turbine component haul route is also located within the counties of Waterford, Kilkenny, Carlow, Kildare and Dublin.

A full description of the proposed development is presented in **Chapter 3**.

13.1 Transport & Access

13.1.1 Introduction

13.1.1.1 Background and Objectives

Jennings O'Donovan & Partners Limited ('JOD'), Consulting Engineers, has undertaken an assessment of the likely significant effects on transport and access resulting from the construction, operation and decommissioning of the proposed development. Full details of the proposed development are provided in **Chapter 3**.

This chapter provides an assessment of the local road network for construction, operational and decommissioning traffic, including the turbine component haul route and reviews the site access arrangements for the construction, operational and decommissioning phases of the proposed development. The relevant sections of this chapter should be read in conjunction with the Route Access Survey ('RAS') presented in **Annex 3.9**.

[1] *Draft Advice Notes for preparing Environmental Impact Statements* (EPA, 2015)

[2] *Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (EPA, 2017)

13.1.1.2 Statement of Authority

JOD has extensive experience in the development of wind farms from planning and development through to construction. JOD has been active in the wind energy industry in Ireland since 1998 as engineering consultants for numerous completed wind farm projects varying from single wind turbine installations to large scale developments, which totals to in excess of 2,000MW.

This chapter has been prepared by Mr. David Kiely of JOD, who has prepared numerous EIS/EIARs for wind farms throughout Ireland. Mr. Kiely has over 38 years' experience in the civil engineering and environmental sector. He has obtained a Bachelor's Degree in Civil Engineering and a Masters in Environmental Protection, has overseen the construction of over 40 no. wind farms and has carried out numerous transport assessments for EIS/EIARs.

13.1.2 Methodology

13.1.2.1 Assessment Methodology

This assessment used the following method, further details of which are provided in the following sections:-

- Legislation and guidance review;
- Desk study, including review of available maps and published information;
- Site walkover, including review of road network to be used;
- Evaluation of likely effects;
- Evaluation of the significance of these effects; and
- Identification of measures to avoid and mitigate any likely effects.

13.1.2.2 Planning Policy & Guidelines

This assessment has been prepared and carried out in accordance with guidance contained in the following published documents:

- Environmental Protection Agency (September 2015): Draft - Advice Notes on Current Practice (in the preparation on Environmental Impact Statements);
- Environmental Protection Agency (August 2017): Draft – Revised Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- Environmental Protection Agency (2003): Advice Notes on Current Practice (in the Preparation on Environmental Impact Statements);
- Environmental Protection Agency (2002): Guidelines on the Information to be Contained in Environmental Impact Statements;
- The Westmeath County Council Development Plan 2021-2027 ('the CDP');
- The Meath County Development Plan 2013-2019 ('the Meath CDP');
- The Draft Meath County Development Plan 2021 – 2027 ('the Draft Meath CDP');
- The Design Manual for Urban Roads and Streets ('DMURS')[3];
- The Design Manual for Roads and Bridges ('DMRB') published by Transport Infrastructure Ireland ('TII'); and
- Traffic and Transport Assessment Guidelines'[4].

The Westmeath County Development Plan (CDP) 2021-2027 was adopted on 3 May 2021. An assessment of the relevant transport policies and objectives of the CDP are set out in **Table 13.1**, below.

[3] https://assets.gov.ie/11220/b5029e9eb129473d917b66e467f1eefd.pdf

[4] https://www.tiipublications.ie/library/PE-PDV-02045-01.pdf

Planning Policy / Objective	Assessed	Comment
CPO 10.1: Promote and deliver a sustainable, integrated and low carbon transport system with ease of movement throughout County Westmeath by enhancing the existing transport infrastructure in terms of road, bus, rail, cycling and pedestrian facilities.	No	Not considered relevant to the proposed development.
CPO 10.2: Support the development of a low carbon transport system by continuing to promote modal shift from private car use towards increased use of more sustainable forms of transport such as cycling, walking and public transport.	No	Not considered relevant to the proposed development.
CPO 10.2: Support the implementation of the following national and regional transport policies as they apply to Westmeath: - The National Planning Framework - The RSES for the Eastern and Midland Region - Smarter Travel, A Sustainable Transport Future 2009 – 2020 - Design Manual for Urban Roads and Streets (DMURS) - Spatial Planning and National Roads - Guidelines for Planning Authorities 2012 - National Cycling Policy Framework and National Cycle Manual - Strategy for the Future Development of National and Regional Greenways, 2018. - Local Link Rural Transport Programme Strategic Plan 2018 - 2022. The Council also supports the implementation of sustainable transport solutions.	No	Not considered relevant to the proposed development.
CPO 10.4: Seek to ensure primacy for transport options that provide for unit reductions in carbon emissions. This can most effectively be done by promoting public transport, walking and cycling, and by actively seeking to reduce car use in circumstances where alternative options are available.	No	Not considered relevant to the proposed development.
CPO 10.45: Maintain and protect the safety, capacity and efficiency of National roads and associated junctions in accordance with the Spatial Planning and National Roads Guidelines for Planning Authorities, DECLG, (2012) and the Trans-European Networks (TEN-T) Regulations.	Yes	No new entrance onto the National Road network is proposed. Traffic management has been assessed in this chapter (see **Sections 13.1.4 and 13.1.5**).

Planning Policy / Objective	Assessed	Comment
CPO 10.46: Protect national roads from inappropriate access in order to protect the substantial investment in the national road network, to preserve the carrying capacity and safety of the National Road Network and to prevent the premature obsolescence of the network.	Yes	Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
CPO 10.48: Prevent, except in exceptional circumstances, the creation of additional access points from new developments or the generation of increased traffic from existing accesses to national roads, to which speed limits greater than 60 km/h apply.	Yes	Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
CPO 10.52: Safeguard the carrying capacity and safety of the County's regional and local road network.	Yes	Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development. Traffic management has been assessed in this chapter (see **Sections 13.1.4 and 13.1.5**).
CPO 10.53: Continue to engage, at an early stage, with TII in respect of any plans or projects that are located in proximity to national road infrastructure.	Yes	TII consulted as part of the EIA scoping process and their comments have been incorporated.
CPO 10.54: Implement the recommendations of the Design Manual for Urban Roads and Streets (DMURS) and relevant 'TII Publications' in relation to urban streets and roads within the 50/60 km/h zone.	Yes	Traffic management has been assessed in this chapter (see **Sections 13.1.4 and 13.1.5**).
CPO 10.55: Improve the standards and safety of our Regional and Local roads and to protect the investment of public resources in the provision, improvement and maintenance of this public road network.	Yes	Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
CPO 10.56: Seek the reduction of through-traffic passing through town centres.	Yes	The haul routes have been chosen to minimise passing through built up areas.

Planning Policy / Objective	Assessed	Comment
		Traffic management has been assessed in this chapter (see **Sections 13.1.4 and 13.1.5**).
CPO 10.60: Protect strategic regional roads listed in Table 10.2, against development where a maximum speed limit applies, except in exceptional circumstances, in order to protect the carrying capacity and safety of such roads.	No	There will be no access onto regional roads from the proposed development.
CPO 10.62: Require all applications for significant development proposals affecting Regional or Local Roads to be accompanied by a Traffic and Transport Assessment (TTA) and Road Safety Audit (RSA), carried out by suitably competent persons, in accordance with the TII's Traffic and Transport Assessment Guidelines.	Yes	This chapter, along with the accompanying autotrack analysis of the haul route serves as a Traffic and Transport Assessment.
The CDP also includes requirements for sightlines. "it is an objective to ensure that appropriate sight distances, as set out below, are provided from vehicular entrances on the road network. The prescribed site distances are as follows: • Local Roads: 90m • Regional Roads: 150m • National Roads: 230m"	Yes	Sightlines are assessed in **Section 13.1.3. 3**.

Table 13.1: Westmeath County Development Plan (2014-2020) Transport Policies and Objectives

The CDP outlines that TII has committed to providing a schedule of road improvements for national and regional roads within Ireland, as outlined in chapter 10 of the Westmeath CDP a number of roads along the haul route have been identified for improvements in the schedule.

The N52 realignment from Cloghan to Billistown is part of the proposed haul route, this road is a new bypass that is being constructed and will be used as part of the haul route if it is constructed prior to construction of the wind farm commencing (unlikely). The N4 Mullingar Bypass north westwards to the Longford county boundary is also another route that is scheduled to be improved, part of the N4 is to be used as part of the proposed haul route.

Thresholds relating to traffic impact assessments for new developments are detailed in the TII publication 'Traffic and Transport Assessment Guidelines'. The thresholds for the mandatory preparation of a traffic impact assessment, set out at Tables 2.1, 2.2 and 2.3 of the guidelines, have not been exceeded by the proposed development.

As part of the grid route is located in County Meath **Table 13.2** outlines the relevant policies from the Meath CDP 2013-2019.

Planning Policy / Objective	Assessed	Comment
TRAN SP 3: To provide for the efficient movement of goods and people in the interest of commerce and enterprise.	Yes	The haul routes have been chosen to minimise passing through built up areas. Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
TRAN SP 4: To promote land use planning measures which facilitate transportation efficiency, economic returns on transport investment, minimisation of environmental impacts and a general shift towards the use of public transportation throughout the county.	Yes	Traffic management has been assessed in this chapter (see **Sections 13.1.4 and 13.1.5**).
TRAN SP 7: To support the Road Safety Authority in the implementation of the 'Road Safety Strategy 2007-2013' in conjunction with the National Roads Authority, An Garda Síochana and other relevant agencies.	Yes	Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
TRAN SP 14: To ensure the protection of the existing roads infrastructure while improving the capacity and safety of the road network to meet future demands.	Yes	Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
TRAN SP 15: To protect investment in the capacity, efficiency and safety of national roads by applying the guidance contained in the 'Spatial Planning and National Roads - Guidelines for Planning Authorities' and collaboration with the NTA and the NRA.	No	Not considered relevant to this development.
TRAN POL 24: To promote road and traffic safety measures in conjunction with Government Departments, the Road Safety Authority and other agencies through the provision of appropriate signage, minimising or removing existing traffic hazards and preventing the creation of additional or new traffic hazards.	No	Not considered relevant to this development.
TRAN POL 29: To provide for and carry out improvements to sections of national, regional and county roads that are	Yes	Traffic management has been assessed and a haul route analysis has been undertaken. Specific

Planning Policy / Objective	Assessed	Comment
deficient in respect of alignment, structural condition or capacity, where resources permit, and to maintain that standard thereafter.		traffic management measures will be agreed with the Local Authority prior to the commencement of development.
TRAN POL 31: To promote the carrying out of Road Safety Audits on new road schemes, road and junction improvements and traffic management schemes in accordance with the NRA Design Manual for Roads and Bridges and advice contained in the DTO Traffic Management Guidelines.	Yes	Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
TRAN POL 32: To ensure that all road plans and project proposals in the County which could, either individually or in combination with other plans and projects, have a significant effect on a Natura 2000 site, undergo an Appropriate Assessment in accordance with Article 6 (3) of the EC Habitats Directive.	No	Not considered relevant to this chapter. Effects on Natura 2000 designated sites have been assessed in Chapter 5: Biodiversity and in the Natura Impact Statement which accompanies the planning application.
TRAN POL 40: To avoid the creation of any additional access point from new development / intensification of traffic from existing entrances onto national roads outside the 60 kph speed limit, except as indicated on Maps No 6.4.1 - 6.4.7 which identifies a number of locations close to and within designated Economic Growth Towns or existing / proposed developments of a regional significance.	Yes	There will be no additional access points onto a National roads.

Table 13.2: Meath County Development Plan (2013-2019) Transport Policies and Objectives

The new Meath CDP is currently at draft stage. **Table 13.3** outlines the relevant policies from the Draft Meath CDP 2021-2027.

Planning Policy / Objective	Assessed	Comment
RPO 8.3: 'That future development is planned and designed in a manner which maximises the efficiency and protects the strategic capacity of the metropolitan area transport network, both existing and planned and to protect and maintain regional accessibility.'	Yes	Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
RPO 8.3: To promote the use of mobility management and travel plans to bring about behaviour change and more sustainable transport use.'	No	Not considered relevant to this Development.

Planning Policy / Objective	Assessed	Comment
MOV OBJ 11: To require Mobility Management Plans and Traffic Assessments for proposed trip intensive developments, as appropriate. Please refer to Chapter 11 Development Management Standards and Land Use Zoning Objectives.	Yes	Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
MOV POL 24: To safeguard the capacity and safety of the National road network by applying the provisions of the Department of Environment Community and Local Governments – 'Spatial Planning and National Roads-Guidelines for Planning Authorities, 2012'.	Yes	Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
MOV POL 28: To promote the carrying out of Road Safety Audits on new road schemes, road and junction improvements and traffic management schemes in accordance with the TII Publication TII-GE-STY-01024 and advice contained in the DTTAS (DTO) Traffic Management Guidelines 2012.	Yes	No new entrance onto the National Road network is proposed. Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
MOV OBJ 53: To utilise, where appropriate, the provisions of Section 48 and 49 of the Planning and Development Act, 2000 (as amended) to generate financial contributions towards the capital costs of providing local and strategic transport infrastructure, services or projects in the county. This will be done in conjunction with adjoining Local Authorities, where appropriate.	No	Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
MOV POL 32: To ensure the protection of the existing roads infrastructure while improving the capacity and safety of the road network to meet future demands.		Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
MOV POL 33: To avoid the creation of any additional access point from new development/intensification of traffic from existing entrance onto national roads outside the 60kph speed limit, except at the following locations:	No	The Development does not contain any entrances onto national roads.

Planning Policy / Objective	Assessed	Comment
1. N52 south of Balrath Cross to facilitate bioenergy manufacturing plant and CHP plant(Map 5.3.1); 2. Navan North (Junction 9) to Mullaghboy Roundabout on N51 (New Junction Only) (Map 5.3.2); 3. Navan South (Junction 8) to Kilcarn Roundabout on R147 (New Junction Only) (Map 5.3.3); 4. N2 at Slane in the vicinity of the existing Grasslands Fertilizers facility (Seveso Site) (Map 5.3.4); 5. N51 at Slane Distillery and Castle (Map 5.3.5); 6. N2 at Knockharley in the vicinity of existing regional landfill facility (Map 5.3.6); 7. N2 at Rath Roundabout to junction of Curragha Road (Map 5.3.7).		
MOV POL 35: To co-operate with and support the NTA and TII (where appropriate) on measures designed to improve freight transport in and throughout the County.	Yes	Traffic management has been assessed and a haul route analysis has been undertaken. Specific traffic management measures will be agreed with the Local Authority prior to the commencement of development.
MOV OBJ 56: To assess the potential for, and, if appropriate, introduce, HGV management measures in town centres.	Yes	It is not proposed to pass through any towns in County Meath on the haul routes.

Table 13.3: Draft Meath County Development Plan (2021-2027) Transport Policies and Objectives

13.1.2.3 Desk Study

A desk study of the proposed development site, haul route and the surrounding area was undertaken. The sources of information included documentary sources, such as those outlined at **Section 13.1.2.2** and an evaluation of aerial imagery and visualisations (e.g. Google Maps and Streetview) to assess the nature and condition of the local road network.

13.1.2.4 Evaluation of Likely Effects

Following the assessment of the baseline environment, the available data was used to identify and categorise likely effects to affect the local road network used for the turbine delivery route and construction materials haul route.

The statutory criteria (EPA, 2017; EPA, 2003) for the assessment of impacts require that likely impacts are described with respect to their magnitude, nature (i.e. negative, positive or neutral), transboundary nature (if applicable), intensity and complexity, probability, duration, frequency, reversibility, cumulation and possibility of reducing the effects. The descriptors used in this chapter are those set out in EPA (2002)

'Glossary of Impacts'.

Impacts may be categorised as follows:-

- Direct: where the existing traffic and transport environment in proximity to the proposed development is altered, in whole or in part;
- Indirect: where the traffic and transport environment beyond the proposed development is altered by activities related to the construction or operation of the proposed development; and
- No Impact: Where the proposed development has neither negative nor a positive impact upon the traffic and transport environment.

Sensitivity

The sensitivity of the local transport infrastructure has been identified using the criteria outlined within the TII Guidance. These criteria are outlined in **Table 13.4** below.

Importance	Criteria
Very High	Attribute has a high quality, significance or value on a regional or national scale.
High	Attribute has a high quality, significance or value on a local scale.
Medium	Attribute has a medium quality, significance or value on a local scale.
Low	Attribute has a low quality, significance or value on a local scale.

Table 13.4: Criteria for Rating Site Attributes

Magnitude

The magnitude of likely effects has been defined in accordance with the criteria provided in the 2017 EPA publication *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports* as outlined within **Table 13.5** below.

Magnitude of Impact	Description
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Profound	An effect which obliterates sensitive characteristics

Table 13.5: Impact Assessment Criteria

Significance Criteria

The significance of the likely effects of the proposed development have been classified by taking into account the sensitivity of receptors and the magnitude of the effects on them, combined with the likelihood of an event occurring as defined in **Table 13.6**.

	Magnitude of Impact				
Importance of Attribute		Negligible	Small	Moderate	Large
	Extremely High	Imperceptible	Significant	Profound	Profound
	Very High	Imperceptible	Significant/ Moderate	Profound/ Significant	Profound
	High	Imperceptible	Moderate/ Slight	Significant/ Moderate	Severe/ Significant
	Medium	Imperceptible	Slight	Moderate	Significant
	Low	Imperceptible	Imperceptible	Slight	Slight/ Moderate

Table 13.6: Rating of Significant Environmental Impacts

13.1.3 Description of Existing Environment

13.1.3.1 Site Location, Context and Construction Phase Haul Routes

The proposed development is located in the townlands of Bracklin, Ballynacor, Billistown, and Ballagh Co. Westmeath and Coolronan, Co Meath. The proposed development site covers an area of approximately 275ha, the majority of which is currently in agricultural use, with small pockets of deciduous woodland and conifer tree plantations.

The likely turbine delivery haul route is described in the Route Access Survey (RAS) at **Annex 3.9** (see also **Annex 13.1**). While the selection of a precise port of entry will be determined by the selected turbine manufacturer, it is likely that Waterford Port will be utilised in this case. The general turbine delivery haul route to the proposed development will likely be via the N29, N25, N9, M9, M50, N4, M4, N52 and the L1504 and L5508.

The RAS provides further details of both permanent and temporary works which will be required along the proposed turbine delivery haul route. This study should also be read in conjunction with **Chapter 3**.

The undertaking of civil engineering works during the construction phase, including the construction of the 4 no. site entrances (main site entrance and 3 no. secondary site entrances to facilitate access to grid connection route; see **Section 13.1.3.3** below), access tracks, crane hardstands, turbine foundations and 110kV substation will require the importation of aggregates and other general construction materials to the subject site. Due to the general absence of rock within the site, it is predicted that rock and hardcore materials will be sourced from approved and licensed local quarries, subject to the availability of appropriate material and quantities. Ready-mix concrete, for turbine foundation construction and substation foundations, will also be sourced from local licensed quarries, subject to a competitive tendering process.

The selection of material suppliers will be subject to a competitive tendering process prior to construction and, therefore, it is not possible to confirm the precise source of

these materials at this stage. However, a number of candidate quarries have been identified as potential suppliers and are identified at **Annex 2.5**. In addition, the likely haul routes from these suppliers to the main site entrance are also identified. While the haul routes do not always represent the most direct route to site, these routes have been selected to ensure that all movements occur on national and regional roads and, insofar as possible, avoid local roads which may not be suitable to accommodate HGVs.

It is likely that all hardcore material and concrete will be sourced from local suppliers and will be delivered using standard HGVs. Other material deliveries will also use standard HGVs and use the local, regional and national road network, as necessary. Staff employed on the site will use the site entrance closest to the temporary construction compound but, as they majority of associated vehicular movements will comprise light goods vehicles (LGVs) or cars, they will not be restricted to the use of specific roads.

13.1.3.2 Local Road Network

The road network in the vicinity of the proposed development generally comprises regional and local roads. In addition, the N52 National Secondary Road is located approximately 2km to the west of the proposed development site and 1.7km from the proposed site entrance and, as outlined above, the N52 will be used for the transportation of turbine components. The N51 National Secondary Road is located approximately 3.4km north west of the proposed development site.

The L1504 and L5508 local roads will be used to access the proposed development site from the N52. The L1504 is a double-carriageway local road which would appear to have been subject to substantial upgrade works in recent years with safety barriers present along parts of the route. The L5508 is a narrow single carriageway road with grass verges.

The proposed grid connection route, between the proposed electricity substation and the existing 110kV overhead line, will be partially located within the L80122. Materials for the construction of the proposed grid connection will be delivered to the works locations using the L80122. The L80122 is a local road which extends from the L1504 to Coolronan (Co. Meath). The carriageway is approximately 4m wide but has numerous passing bays along its length allowing vehicles to pass each other. The speed limit is 80km/hr and there are no road markings.

13.1.3.3 Road Access to the Proposed Development Site

Access to the proposed wind farm and 110kV electricity substation site will be provided by an existing site entrance from the L5508. The site entrance will be upgraded in accordance with turbine manufacturer's specifications.

An additional section of access track will be required for the construction of the proposed grid connection, which will be accessed via 2 no. newly constructed site entrances, one from the L5508 and one from the L80122, to provide access to EirGrid operatives during the operational phase. A further site entrance will be required from the L80122 to facilitate access to the location of the proposed end masts.

In relation to the provision of vehicle visibility splays (sightlines), all site entrances have been carefully designed to ensure compliance with the requirements of the

respective County Development Plans of County Westmeath[5] and County Meath[6].

13.1.3.4 Delivery Vehicle Specification

The delivery of wind turbine components will be carried out by specialised HGVs. The largest vehicles to be used will facilitate the delivery of the wind turbine blades. **Figures 13.1-13.3** illustrate the typical suite of transportation vehicles which will be used in the delivery of components, including a transportation vehicle used to transport the 81m blade component.

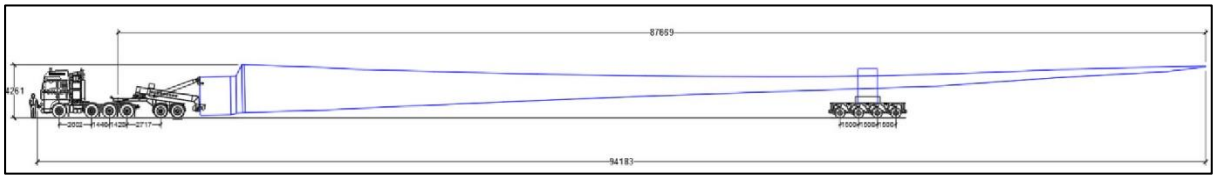

Figure 13.1: Typical Blade Section Transporter

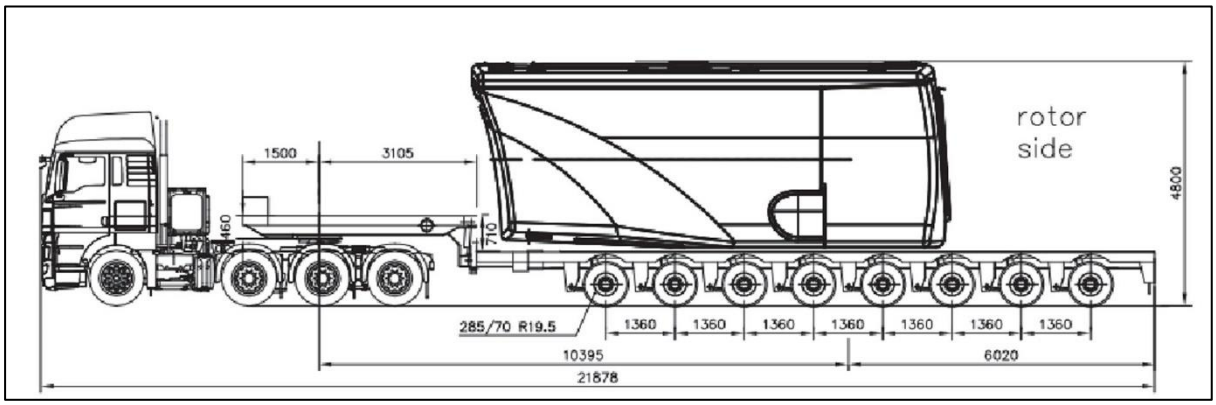

Figure 13.2: Typical Nacelle Transporter

Figure 13.3: Typical Tower Section Transporter

Delivery of general construction materials and aggregates to site for the construction of the proposed wind farm will be undertaken using standard HGVs, cement mixer trucks, and dump trucks (see **Figure 13.4**), the largest of which is anticipated to be a 16.5m articulated vehicle as shown in **Figure 13.5** below.

[5] All site entrances, being located off local roads, provide for visibility splays of 90m in each direction in accordance with Section 14.4.4 of the Westmeath County Development Plan 2021-2027.

[6] All site entrances, being located off local roads, provide for visibility splays of 90m in each direction in accordance with Section 2.1.3 (Appendix 15) of the Meath County Development Plan 2013-2019.

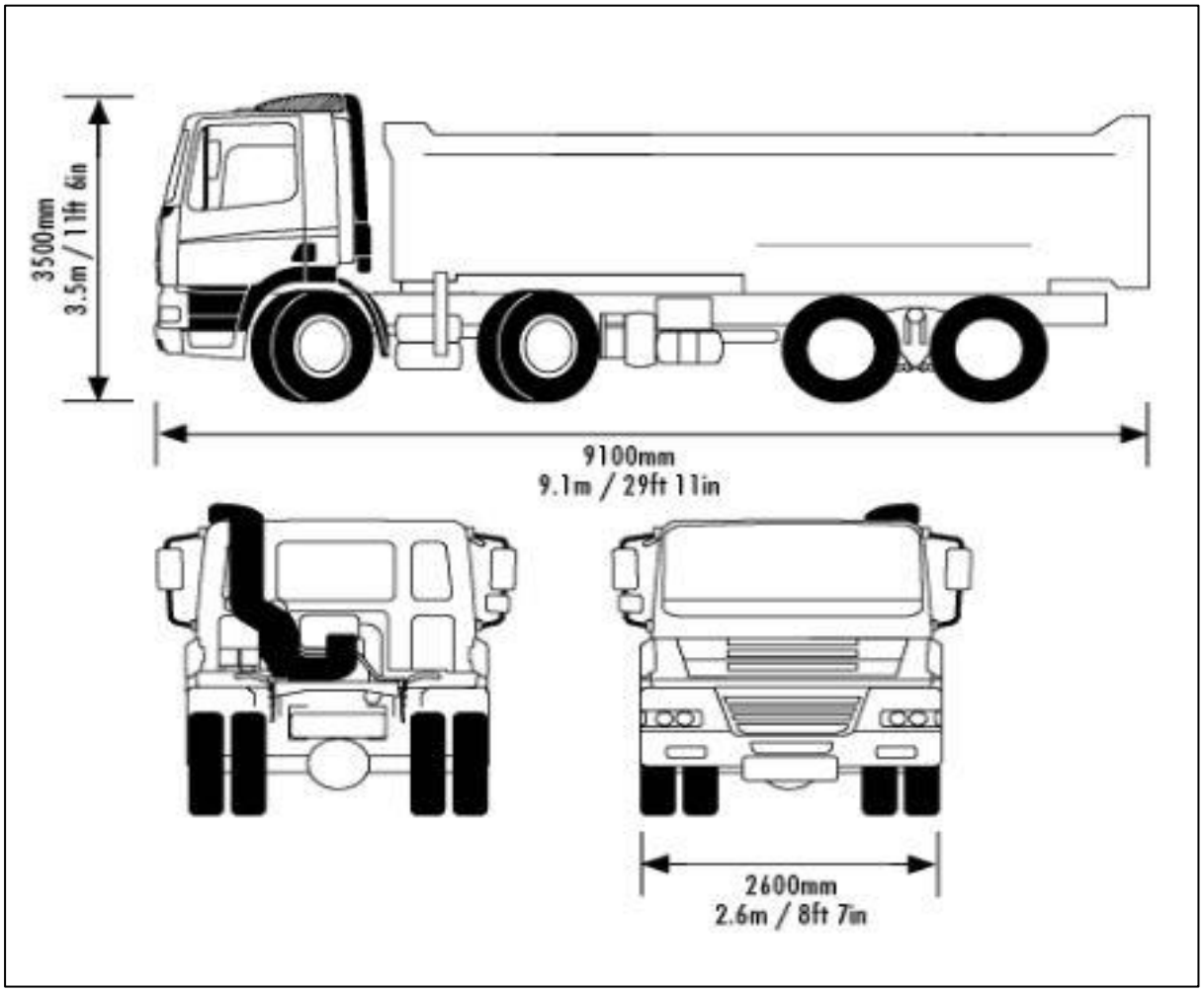

Figure 13.4: Standard Rigid Tipper Truck

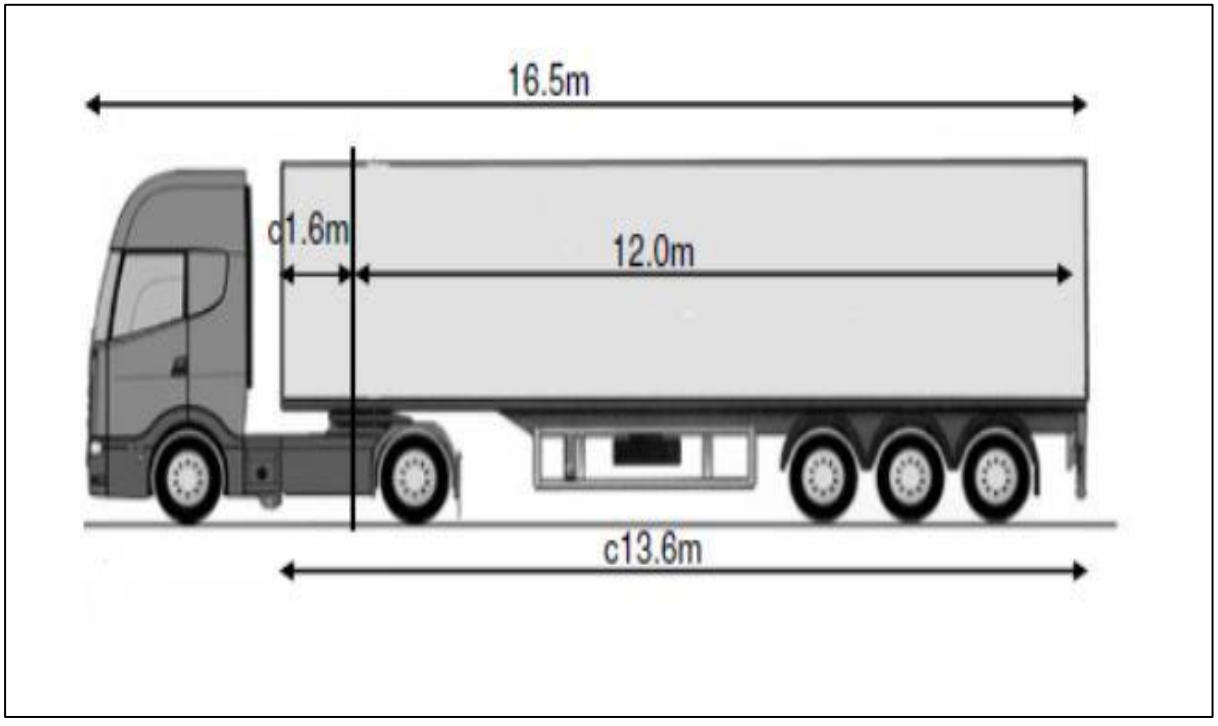

Figure 13.5: Standard HGV

13.1.4 Description of Likely Effects

13.1.4.1 Construction Phase

The construction period of the proposed development is estimated to take approximately 15-18 months, with the majority of traffic movements being associated with the construction of access tracks, hardstands and turbine foundations. During this period, there will be trips associated with the arrival and departure of construction staff and with the delivery of aggregates, reinforcing steel and ready-mix concrete. Staff trips will mainly be made using cars and vans, while deliveries of steel, concrete, and rock and other general construction materials will be made by HGV.

In order to facilitate HGV movements associated with the construction phase, works (permanent and temporary) will be required at a number of locations along the proposed turbine delivery haul route.

The construction phase of the development will comprise a 6-day week with normal working hours from 07.00 to 19.00 Monday to Friday and 07.00 to 13.00 on Saturdays. It may be necessary to undertake works outside of these hours to avail of favourable weather conditions (e.g. during times of low wind speeds to facilitate turbine erection etc.) or during extended concrete pours (e.g. turbine foundation pours must be completed within 24 hours etc.). Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification.

Haul Route for Abnormal Loads

While the proposed turbine delivery haul route is assessed to be generally capable of accommodating abnormal loads. works will be required at a total of 12 no. locations, with 1 of these locations requiring permanent works and 11 temporary upgrade works or removal of road signs and/or street furniture, to facilitate turbine component deliveries, as discussed at **Annex 3.9**.

The permanent works location will be along the L5508 local road between its junction with the L1504 and the proposed wind farm site entrance. Along this section, the carriageway will be widened, and strengthened, to ensure its suitability to accommodate the delivery of turbine components and construction materials. Works on the balance of the haul route from Waterford Port to the junction of the L1504/L5508 are temporary and relatively minor in nature, and will include, for example, temporary hardcoring of roundabout islands and roadside verges and temporary removal of street furniture and signage

The carrying out of the proposed temporary upgrade works are assessed as likely to result in a negative, slight, direct, short-term and high probability effect. Permanent works are assessed as likely to be slight, positive, direct, long-term and high probability.

HGV Deliveries

The estimated timescale for the completion of the construction phase is approximately 15-18 months, inclusive of all works related to the construction of the wind farm, 110kV substation, haul route upgrade works and erection and commissioning of turbines. This allows approximately 12 months for civil construction and approximately 3-6 months for erection and commissioning of the turbines.

As shown in **Table 13.7**, it is estimated that during civil construction, approximately 6,346 no. loads will be delivered to site. Assuming a 12 month civil works construction

phase, this equates to approximately 529 no. loads per month or an average of 21 no. loads per day excluding Sundays and public holidays.

The peak number of deliveries per day will occur during the concrete pours for turbine foundation construction. An estimated 100 no. ready-mix trucks and other truck deliveries will be required per turbine foundation. Other materials are also likely to be delivered on such days, and therefore a realistic estimation of peak deliveries during the nine days of foundation pours is approximately 110 to 120 no. deliveries per day. These pours will take place from 07:00 and typically take 12 hours to complete and involve approximately 9 no. trucks per hour.

The majority of civil construction material, such as aggregates and concrete, will be delivered to site using standard rigid trucks, HGVs and ready-mix trucks. Due to the absence of rock available at the site for use in the construction phase, the majority of rock will be imported for use in the construction of hardstands, access tracks, site entrances, construction compound area and substation compound. Aggregates will also be imported to the locations of permanent or temporary road upgrades, as relevant.

An estimated 922m^3 of rock will be excavated at turbine foundations and this will be re-used in turbine hardstand and/or access track construction. It is estimated that a total of 107,935 tonnes (49,061m^3; 4,088 no. loads) of rock will be imported to site. In the event that additional rock material is encountered during excavations, it will be utilised during construction, as appropriate, to reduce the volume of importation. There will be an estimated 85,556m^3 (102,668m^3 including a 20% bulking factor) of spoil material excavated for the construction of the turbine foundations, 110kV substation, hardstands, access tracks, meteorological mast and control building, with the majority of this material being used on-site is the reinstatement or landscaping purposes, or being disposed of at the spoil deposition areas.

Excavated material arising from the proposed haul route upgrade works, estimated to be approximately 2,544m^3 (including bulking factor; 212 no. loads) will, where excess material arises and cannot be used for reinstatement, be stored in the designated spoil deposition areas or used for reinstatement of clear-felled areas on site. While it is considered that the majority of this material will be re-used, for the purposes of this assessment it is assumed that such material will be removed from the works location.

The grid connection is not assessed as likely to give rise to significant volumes of vehicle movements. Due to the linear nature of the grid connection, vehicle movements will be spread out across the route and will result in a likely minor short-term effect on transport and access.

Turbine components will be delivered to site over a period of approximately 4–6 weeks after civil works are completed. It is estimated that approximately 100 no. loads of turbine components and crane parts will be delivered during this period. Some of these loads (turbine tower sections, nacelles and blades) will be classified as oversized abnormal loads and the relevant approvals and permits will be obtained by the turbine supplier, or its appointed haulage contractor, before deliveries take place.

Following completion of the construction works, it is estimated that approximately 40 loads will be needed to remove all temporary equipment, plant and machinery and materials used on site e.g. temporary compound, fencing, cabins, storage containers etc. **Table 13.7** details the estimated amount of deliveries to the proposed development site.

Material	Quantity	No. of Deliveries
Concrete & Reinforcing Steel	8,623m³	1,078
Substation Building electrical equipment	-	25
Other – Geotextile Mats, Tools, Fencing etc.	-	25
Grid Connection Materials	-	68
Met Mast Materials	-	4
Steel Tower Sections	-	27
Nacelles	-	9
Rotor Blades	-	54
Transformers, Panels and Cabling	-	9
Crane Deliveries to site, including ballast, booms, etc.	2 Cranes	10
Imported rock for road and hardstands	32,788m³	2,732
Imported Rock for 110kV Substation	5,014m³	418
Imported materials for grid connection (Clause 804, sand etc.)	9,950m³	829
Rock for Haul Route Upgrades	1,309m³	109
Grid connection cable ducting	6,770m x 4 (110mm Ducts)	14
Export of excess spoil material from grid connection works in public roads	4,056m³	338
Tree Felling	28ha	345
Movement of excavated material at Road widening locations	2,544m³	212
Removal of all temporary on-site equipment and materials	-	40
Total	-	**6,346**

Table 13.7: Estimated Construction Materials and No. of Deliveries (based on Manufacturer's Specifications)

The expected number of HGV deliveries is based on best estimates of trips generated by similar sized wind farms, previous experience in wind farm planning and civil construction, and based on the design of the project to date. Subject to planning permission being granted, these figures will be subject to refinement following the detailed design process, detailed pre-construction site investigations and consultation

with the appointed contractor.

Based on the above estimated vehicular movements, the predicted effect on the road network as a result of the increase in HGV movements associated with the entire proposed development is moderate, negative, direct, high probability but short term. This assessment has been reached in consideration of the temporary duration of the proposed construction phase and the modest estimated daily increase in vehicular movements.

Works on Proposed Development Site

As discussed in **Chapter 3**, there will be 1 no. site entrance to the wind farm and 110kV substation site. There will be 3 no. subsidiary site entrances from the L5508 and L80122 local roads to facilitate access to the grid connection infrastructure (located within private lands) and proposed end masts. Appropriate visibility splays will be provided at each site entrance.

During the construction phase, all works related to the construction of these entrances will be undertaken from private lands which will ensure that there are no significant direct transport and access effects on the local road network through disruption or delay to traffic flows. As a result, effects are assessed to be moderate, negative, short-term and of a high probability.

Grid Connection

The grid connection cable ducting, from the 110kV substation to the proposed end masts, will be located within private agricultural lands and along the L80122. The excavation of trenches and installation of the ducting along this local road will cause some minor disruption to traffic movements, although this will be temporary in duration. Following the delivery of grid connection materials to the proposed temporary site compound, vehicular movements would only be associated with personnel accessing the works locations on a daily basis, the removal of any excess material which may arise, and the transport of aggregates for the reinstatement of the excavated trench.

Due to the narrow profile of the L80122, it is highly likely that a full road closure will be implemented during construction activities; which will necessitate the implementation of diversions and other traffic management measures to maintain traffic flows. However, given that the overall extent of works within the L80122 is c. 1.9km and an anticipated rate of 100m of trenching & ducting installation per day, the effect on transport and access will be of a short-term duration.

Therefore, the overall likely effect on transport and access is assessed to be direct, moderate negative of high probability but short-term in nature.

Construction Personnel

The number of staff employed at the proposed development site will vary according to the phase of works, likely peaking at up to approximately 120 no. It is expected that the majority of workers will arrive on site in LGVs and crew vehicles. Vehicle sharing, subject to public health guidance, will be actively encouraged to reduce vehicular movements. It is expected that c. 30 no. vehicles will visit the site on a daily basis during the peak construction period.

Parking for staff will be provided at the temporary construction compound. No parking will be allowed for construction workers on the public road network. The additional vehicular movement associated with staff travelling to site are not assessed as likely

to result in significant effects on transport and access. Effects are assessed to be imperceptible/slight, negative, short-term and of high probability.

Overall Classification of Effects

The above sections have assessed the effects of the proposed development on transport and access which may arise as a result of the construction phase. Overall, the effects are not assessed to be significant and are concluded to be a slight, negative effect of short-term duration and high probability.

13.1.4.2 Operational Phase

During the operational phase, the proposed development will generally be unmanned. Operational and remote monitoring activities will be carried out on an ongoing basis. However, regular visits to the site will be undertaken for routine inspections and maintenance. Under normal circumstances, the operation of the wind farm would require an average of 1-2 no. visits to the site per week by maintenance personnel. Parking will be provided at the on-site substation or at the turbine hardstands during maintenance visits. In the case of a major fault; e.g. breakdown of a turbine component; larger machinery may require access to the site.

Overall, the volume of traffic predicted to be generated during the operational phase is very low. Therefore, the effect of traffic associated with the operation of the proposed development on the existing public road network will be imperceptible as a result of the type of traffic and the low volumes generated.

13.1.4.3 Decommissioning Phase

During the decommissioning phase of the proposed development, the total volume of HGV traffic will be significantly reduced compared to the construction period. This phase could be expected to last approximately three months. Overall, the impact of the decommissioning phase is assessed to be slight and negative of short-term duration and high probability.

13.1.4.4 Cumulative Effects

The above assessment has included consideration of the likely in-combination effects which may arise from the construction, operation and decommissioning of the overall proposed development. In addition, it is necessary to assess the likelihood for the development to result in cumulative effects with other existing, permitted or proposed developments, including other wind farms.

Cumulative effects are assessed as only likely to occur during the construction and decommissioning phases of the proposed development. Cumulative effects are unlikely to occur during the operational phase as wind farms do not generate a significant amount of traffic during operation as outlined in **Section 13.1.4.2**.

Other developments which have been included within the cumulative assessment are listed at **Chapter 1**. The majority of developments listed, for example one-off rural dwellings and agricultural developments, do not generate significant volumes of traffic during either the construction or operational phases such that would have the likelihood to result in cumulative effects.

In relation to other wind energy developments that are located in close proximity to the proposed development, the closest operational wind farm, as per the SEAI wind atlas, is the Mountlucas Wind Farm located c. 35km to the south.

The permitted, not yet constructed, 29 no. turbine Yellow River Wind Farm is located

c.19km to the southwest in Co. Offaly. Given that the construction phase of this wind farm is highly unlikely to coincide with that of the proposed development, the low likelihood of each development utilising the same civil construction haul routes and the intervening separation distance; it is assessed as unlikely that cumulative impacts with the Yellow River Wind Farm will occur.

The permitted 15 no. turbine Coole Wind Farm in Co. Westmeath is located approximately 23km to the northwest of the proposed development. Given that the construction phase of this wind farm is highly unlikely to coincide with that of the proposed development, the low likelihood of each development utilising the same civil construction haul routes and the intervening separation distance; it is assessed as unlikely that cumulative impacts with the Coole Wind Farm will occur.

The Ballivor Wind Farm is proposed to be located on peatlands adjacent to the subject proposed development. If this development and Bracklyn Wind Farm were to be constructed concurrently, then cumulative effects during the construction phase of the proposed development on the local road network could, in the absence of appropriate mitigation and traffic management measures, be predicted to be significant, direct, high probability but of short-term duration with an increased number of HGVs using the local road network.

There is also the possibility of the 2 no. developments utilising similar haul routes; thus giving rise to a scenario where works carried out could be of a positive benefit for the other and negating the requirement for works to be carried out at multiple locations. However, while it should be noted that no information has been made publicly available regarding the proposed haul route(s) for the Ballivor Wind Farm; given the likely implementation of comprehensive mitigation measures for that proposed development, and those described at **Section 13.1.5** below, it is assessed that any likely significant effects can be appropriately managed and mitigated.

13.1.5 Mitigation & Monitoring Measures

13.1.5.1 Mitigation

The likely effects of the proposed development have been identified as being slight to moderate and temporary in nature and associated with short-term construction and decommissioning activities. Cumulative effects could, in the absence of mitigation, rise to 'significant' if the proposed development is constructed at the same time as the proposed Ballivor Wind Farm on adjacent lands. Likely effects during the operational phase have been assessed as being imperceptible and hence mitigation measures are not deemed to be necessary.

In order to avoid significant effects and reduce the predicted magnitude of effects to the greatest possible extent, a suite of mitigation measures are available which will further reduce any likely effects during the construction phase. The following mitigation measures will be implemented:-

- Traffic movements will be limited to 07:00-19:00 Monday to Friday and 07:00–13:00 on Saturdays with no movements on Sundays or public holidays. It may be occasionally necessary to undertake works outside of these hours to avail of favourable weather conditions or during extended concrete pours. Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification;
- A wheel washing facility will be provided, as necessary, to prevent any debris being transferred from site to the adjacent public roads. All drivers will be

required to ensure that their vehicle is free from dirt and stones prior to departure from the construction site. Where conditions exist for dust to become friable, techniques such as damping down of the affected areas will be employed and vehicles/loads will be covered to reduce dust emissions;

- A Traffic Management Plan shall be agreed as part of the Construction Environmental Management Plan (CEMP) with the Local Authority prior to the commencement of development. The Traffic Management Plan shall include *inter alia* confirmed details of construction material haul routes; confirmed details of vehicle specifications; a materials delivery programme; traffic management measures including details of 'Stop/Go' systems, signage, road closures and diversionary routes; and road reinstatement details;
- All works to the public road shall be undertaken in consultation with, and agreed in advance with, the Local Authority;
- All reasonable steps shall be taken to ensure that only national and regional routes are used to transport all materials to the site, in so far as is possible;
- Prior to, and post, construction; pavement condition surveys and bridge surveys will be undertaken along all non-national access routes. Given the high-quality and well-maintained nature of motorways and national routes, it is not assessed as necessary to carry out surveys of these carriageways or structures along these routes. Following the completion of the pre-construction survey, any works which are assessed as necessary to facilitate the delivery of components and materials to the proposed development site shall be undertaken, while any deterioration of carriageways or structures identified in the post-construction survey shall be put right at the expense of the developer and to the satisfaction of the Planning Authority;
- Adequate signage shall be provided at entrances providing access, safety and warning information;
- Speed limit compliance; particularly along the L1504, L5508 and L80122; will be emphasised to all staff and contractors prior to the commencement of construction during site induction, and will be strictly enforced throughout the construction phase;
- Sufficient car parking spaces will be available at the contractor's temporary depot/storage area during the construction phase. No parking of cars by persons associated with the proposed development will be permitted on any part of the public road that is not closed to traffic. All staff will be instructed to ensure that private entrances remain unobscured (particularly along the grid connection route);
- Traffic restrictions shall be kept to minimum duration and extent;
- Appropriate traffic management; including maintenance of local access, pedestrian access (where safe to do so) and diversions; shall be implemented to facilitate continued public use of roads where temporary traffic restrictions have to be put in place. Precise details of these measures will be detailed in the Traffic Management Plan to be agreed with the Planning Authority prior to the commencement of development;
- The timing of oversized loads shall be agreed with the relevant local authorities and An Garda Síochána, and all relevant licenses and permits shall be obtained in advance;
- Maximum axle loadings for abnormal/oversized loads shall be strictly enforced in accordance with the Road Traffic (Construction and Use of Vehicles) Regulations 2003 (S.I. No. 5 of 2003);

- A designated contact point and coordinator will be put in place to manage all access arrangements and to interface with the public and the Local Authority;
- No hedgerows or potential breeding habitats to be removed during the summer breeding season; and
- The site shall be closed, and strictly secured, to the public during the construction phase.

13.1.5.2 Monitoring

The proposed turbine delivery and construction material haul routes will be monitored during construction to identify any damage which may have been caused by construction traffic. Where any damage has been caused by traffic associated with the proposed development, it shall be repaired by the appointed contractor as soon as possible.

A post-construction pavement and bridge survey will be undertaken to determine if any deterioration has occurred as a result of construction related vehicles. If a deterioration is identified, repair work shall be undertaken to the satisfaction of the Local Authority.

13.1.6 Residual Effects

13.1.6.1 Construction Phase

There are no significant residual effects, positive or negative, assessed as likely to occur during the construction phase. Mitigation measures have been proposed to offset any likely effects, including cumulative with the proposed Ballivor Wind Farm, and any residual effects are assessed to be slight, negative and short-term. The residual negative effects are likely to arise as a result of upgrade works along the turbine component haul routes, increases in traffic volumes on local roads in the vicinity of the proposed development site and direct construction activities along the L80122. Positive residual effects are likely to accrue as a result of permanent upgrades and improvements to the carriageway condition and width of the L5508.

13.1.6.2 Operational Phase

There will be no residual effects during the operational phase as only occasional light vehicles are envisaged to visit the site during operation for routine checking and maintenance. Positive residual effects are likely to accrue as a result of permanent upgrades to local roads and improvements to the pavement condition and width of the L5508.

13.1.6.3 Decommissioning Phase

Decommissioning phase effects are assessed to be similar to those of the construction phase but of a reduced scale. In particular, the public road upgrades and improvements will be retained thus eliminating any likelihood of significant effects. Similarly, access tracks and some ancillary wind farm infrastructure is likely to be retained resulting in a reduction in vehicular movements associated with the decommissioning phase. Much of the site infrastructure such as tracks and turbine hardstands may simply be covered in topsoil and allowed to revegetate without removing the structures, which would significantly reduce the amount of HGV movements during this phase.

13.1.7 Summary

This section has assessed the likelihood of significant effects arising from the proposed development on transport and access. The proposed development has generally

been assessed as having the likelihood to result in likely effects of a negative, slight/moderate, direct, short-term, and high probability. After mitigation, the likely residual effects have been assessed as imperceptible/slight, negative and short-term in nature. In addition, there will also be a likely positive residual effect from permanent upgrades to the public road network including the resurfacing of local roads in the vicinity of the wind farm

Likely cumulative effects, with the attendant grid connection and other developments in the vicinity, have been assessed as being potentially significant but short-term should the adjacent Ballivor Wind Farm be granted permission and constructed at the same time as the proposed development; however, with the implementation of appropriate traffic management measures for the subject proposed development, the magnitude of effects can be substantially reduced.

Overall, this assessment has identified no likelihood of significant effects on transport and access which could arise as a result of the construction, operation or decommissioning of the proposed development either individually or in combination with other existing, permitted or proposed developments.

13.2 Aviation

13.2.1 Introduction

This section assesses the likelihood of effects on aviation arising from the construction, operation or decommissioning of the proposed development. The requirement for an assessment of the likely effects on aviation is set in the *Wind Energy Development Guidelines for Planning Authorities 2006* which state:-

> *"The siting of wind turbines may have implications for the operations of communications, navigation and surveillance systems used for Air Traffic Control for the separation and safety of aircraft. Wind turbine siting may also have implications for the flight paths of aircraft."*

13.2.2 Methodology

The assessment involved consultation with various stakeholders including the Irish Aviation Authority (IAA) and Department of Defence. In addition, publications issued by the IAA and the Department were reviewed to determine if the proposed development site was assessed as being of significance or if significant effects were likely. A desktop study was also undertaken to determine the presence of aerodromes or airstrips within 20km of the subject site.

This assessment has also had regard to the *Draft Air Corps Wind Farm/Tall Structures Position Paper* (August 2014) (**Annex 13.2**) which sets out the Air Corps position on the appropriate siting and management of wind farms and tall structures. This assessment includes a detailed review of this position paper, a comparison of the proposed development site with identified 'Danger Areas', 'Restricted Areas' and 'Low Level Flying Areas'.

13.2.3 Consultation

Consultation was undertaken with the IAA and Department of Defence to establish if any effects on aviation were likely. A consultation letter was issued to both in March 2020, and again in January 2021 (see **Chapter 1**), which included a Scoping Report, a general description of the proposed development and site location drawings.

Correspondence received from the IAA (see **Annex 1.6**), advised of a licensed aerodrome located c. 15km north east of the proposed development at Athboy, Co. Meath and requested that the licensee be consulted directly. A consultation letter and scoping report was duly furnished to the licensee, however, a response has not been received.

A consultation response was received from the Department of Defence on 5 February 2021 advising of the specification of aviation warning lighting to be installed on the proposed wind turbines.

13.2.4 Description of Existing Environment

There are no major airports in the vicinity of the proposed development and the site is therefore assessed as being unconstrained. The proposed wind turbines are located c. 55km west of Dublin Airport and c. 130km south of Belfast International Airport.

According to the IAA, the nearest aerodrome is at Athboy in County Meath at an approximate distance of 15km; while Trim Aerodrome is located c. 22km to the east, Clonbulloge Aerodrome is located c. 36m to the south and the Abbeyshrule Aerodrome in Longford is located c. 37km to the west.

The proposed development site is not located within any 'Danger', 'Restricted' or 'Military Operating' area as identified at Annex A, B or C of the *Draft Air Corps Wind Farm/Tall Structures Position Paper*. Similarly, the subject site is not located within 3 no. nautical miles of any critical low level route identified at para. 2(2)(c) and illustrated at Annex D of the Paper.

Air traffic control radar is of two types. Primary Surveillance Radar (PSR) equipment sends out pulses of electromagnetic energy which will reflect off objects in their path. The radar's receiver antenna detects the returning 'echoes' and these are displayed on the radar screen. The time taken for the pulse to travel out to the target and back gives an indication of the range of the object from the radar

Secondary Surveillance Radar (SSR) is the second type of radar equipment used for air traffic control. Like primary radar, SSR relies on an antenna rotating continuously through 360°. However the radar does not transmit raw pulses of energy; it transmits an interrogation signal. The signal is received at the SSR antenna, decoded, and the height and location of nearby aircraft are presented on the radar screen. This enables controllers to positively identify radar returns on their screens and (after verbal confirmation from the pilot) to confirm the aircraft's height.

Rotating wind turbine blades within radar range can impart a Doppler shift to any radar energy reflecting off the blades. The radar's processor could detect this as a non-static target and therefore display the turbines as objects on the radar screen.

13.2.5 Description of Likely Effects

13.2.5.1 Construction Phase

Due to the general 'low level' of activity during the construction phase, it is assessed that there will be no likely impact on aviation. During the erection of wind turbines, cranes will be fitted with appropriate aviation warning lighting to alert pilots to the presence of tall structures.

13.2.5.2 Operational Phase

Following the completion of the construction phase, no significant effects are assessed as likely to occur. The installation of aviation warning lighting is inherent to the project design; and its operation during the operational phase will ensure that any civil and military aviation activities occurring then the vicinity of the proposed development are sufficiently aware of the presence of the proposed development.

The proposed development site is not located within any low flying areas, restricted areas, danger areas, military operating areas or low level routes identified within the *Draft Air Corps Wind Farm/Tall Structures Position Paper*. It is concluded, therefore, that the operation of the proposed development will not result in any likely significant effect on the Air Corps or associated activities.

13.2.5.3 Decommissioning Phase

The likely effects during the decommissioning phase are assessed to be similar to those during the construction phase with no significant effects assessed as likely to occur.

13.2.5.4 Grid Connection

No significant effects on aviation are assessed as likely as a consequence of the construction, operation or decommissioning of the proposed grid connection and electricity substation. Infrastructure associated with the proposed grid connection will have a maximum height of 16m (110kV overhead line end masts). At these low

elevations, there is no likelihood for effects on, or interactions with, aviation.

13.2.6 Cumulative Effects

Due to the absence of other tall structures in the wider vicinity of the proposed development site, and the presumptive installation of appropriate warning lighting on wind turbines at the proposed Ballivor Wind Farm as would be standard practice, it is assessed that there is no likelihood of the proposed development resulting in any significant effects on aviation, in combination with other existing, permitted or proposed developments.

13.2.7 Mitigation & Monitoring Measures

13.2.7.1 Construction Phase

Due to the absence of likely effects, there are no specific mitigation measures proposed during the construction phase. As requested by the IAA in its consultation response, a minimum of 30 no. days prior notification will be provided regarding the commencement of crane operations at the proposed development site. Additionally, as is best practice and implemented as standard, warning lights will be fitted to cranes during the erection of the proposed wind turbines.

13.2.7.2 Operational Phase

The proposed wind turbines will, as requested by the IAA and Department of Defence in their respective consultation responses, be fitted with aviation warning lighting in accordance with the specification to be agreed with the IAA and the Planning Authority.

At a maximum of thirty days following the installation of all proposed turbines, 'as-constructed details' will be provided to the IAA to allow for the updating of mapping charts, including:-

- The number of wind turbines;
- WGS-84 coordinates of each turbine;
- Ground elevation of each turbine (Malin Head OD);
- Blade tip elevation of each turbine (Malin Head OD);
- Height of Turbine;
- Contour maps at the requisite scale; and
- A note of which turbines have been fitted with obstacle warning lights.

In the event that the obstacle warning lights fail or if there are plans to withdraw them from use for a period of time, the IAA will be contacted, via AISOPs@iaa.ie, as a matter of urgency, to request that a NOTAM (Notice to Airmen) is issued concerning the absence of obstacle lights. The following information will be provided to the IAA:-

- Obstacle ID;
- Obstacle type;
- Obstacle Position;
- Elevation; and
- Colour of Light.

The Department of Defence shall also be notified in the event of a failure of the installed warning lights.

It should also be noted, however, that the proposed wind turbines will be fitted with an uninterruptable power supply (UPS) to ensure that the aviation warning lights remain operational even in the event of a power outage. This UPS is sufficient for a

period of twelve hours; after which, the warning lights can be powered by a small generator should the power outage continue.

13.2.7.3 Decommissioning Phase

Mitigation measures proposed during the construction phase will also be implemented during the decommissioning phase.

13.2.7.4 Grid Connection

Given that no significant effects are assessed as likely to occur as a result of the construction, operation or decommissioning of the proposed grid connection, no specific mitigation measures are proposed, or required.

13.2.8 Residual Effects

No significant residual effects are assessed as likely to occur.

13.2.9 Summary

This assessment concludes that the proposed development, including grid connection, is unlikely to result in any significant effect on aviation. The proposed development site is not located within an area identified as being of particular sensitivity or importance in the *Draft Air Corps Wind Farm/Tall Structures Position Paper* on military aviation or located close to any civilian aerodrome, airfield or airport. Accordingly, with the installation of appropriate aviation warning lighting, no significant effects are assessed as likely to occur. Therefore, it is assessed that significant effects on aviation are unlikely to arise as a result of the proposed development, either individually or in combination with other existing, permitted or proposed developments; including the proposed Ballivor Wind Farm.

13.3 Telecommunications

13.3.1 Introduction

As noted in the *Wind Energy Development Guidelines for Planning Authorities 2006*, wind turbines, like all electrical equipment, produce electromagnetic radiation, and this can interfere with broadcast communications. This section considers the likely effects of the proposed development upon a range of communications infrastructure, including telecommunications networks, broadcast radio and television and fixed infrastructure such as telecommunication masts. In theory, interference could affect all electromagnetic communications including:-

- Satellite Communications;
- Cellular Radio Communications; and
- Television Broadcasting Signalling.

13.3.2 Methodology

The methodology employed in assessing the likelihood for significant effects on telecommunication networks consisted of desk based research and consultation with various telecommunication companies and relevant authorities. Desk based research was undertaken to identify:-

- Locations of known telecommunications facilities;
- Known telecommunication fixed links; and
- Known television broadcast and re-broadcast facilities;

During the EIAR scoping process (see **Chapter 1**), the following telecommunication service providers and authorities were consulted with;-

- An Garda Síochana;
- Broadcasting Authority of Ireland;
- BT Communications Ireland;
- Commission for Communications Regulation;
- Eir Ltd;
- Imagine Group;
- Irish Aviation Authority;
- Mosaic Net;
- National Ambulance Service;
- Netshare Ireland;
- Open Eir;
- Ripplecom;
- 2rn (RTE Transmission Network Ireland);
- Tetra Ireland Communications Ltd;
- Three (3) Ireland;
- Towercom;
- Virgin Media Ireland; and
- Vodafone Ireland Ltd.

The responses received from these organisations are summarised at **Chapter 1** and can be viewed at **Annex 1.6**.

Consultation responses received from service providers generally confirmed that there would be no significant impact on the telecommunications network in the area of the proposed development. Open Eir had, in March 2020, advised that a microwave link passed through the proposed development site; however, given that

it was anticipated to be removed in the short-term due to the availability of alternative telecommunication options in the area, no concerns were raised. In January 2021, Open Eir advised that the proposed development would not give rise to impacts on any telecommunications network.

2rn (RTE Transmission Network) has advised that there is potential for localised interference to the terrestrial television network. 2rn have requested that the Applicant enter into a protocol arrangement to ensure the appropriate remediation of any adverse effects which may be experienced.

13.3.3 Description of Existing Environment

The consultations undertaken illustrate that the proposed development site is not a significant location for telecommunication links. While there are telecommunication masts located within the wider environs of the subject site[7], on the basis of the consultations undertaken, there are no telecommunication links located within the proposed development site which are likely to be affected by the proposed development.

13.3.4 Description of Likely Effects

13.3.4.1 Construction Phase

No significant effects are assessed as likely to occur during the construction phase.

13.3.4.2 Operational Phase

Interference of Wind Turbines with Electromagnetic Transmissions

The operation of wind turbines can affect electromagnetic transmissions in two ways: by blocking or deflecting line of sight radio or microwave links or by 'scattering' transmission signals.

Analogue and Digital Television Signals

The United Kingdom's Office of Communications (OFCOM) document *"Tall structures and their impact on broadcast and other wireless services"*[8] provides an overview for developers and planning authorities on how tall structures such as wind turbines may affect reception of wireless services.

There are two potential problems that can occur due to interference from tall structures: (1) signal blocking, and (2) reflection. Signal blocking can occur when a tall structure is situated between the transmitter and receiver. This causes a shadow behind the structure that can reduce signal levels. The severity of the reduced signal can vary depending on a number of factors such as the height of the structure.

Signal reflection can occur when wireless signals are reflected from the sides of structures. In the case of wind turbines, because the blades are rotating, the reflections can fluctuate and be quite complex. Reflections from turbines can also vary depending on the speed at which the blades are rotating and the angles of the blades. According to OFCOM, digital television signals are much better at coping with signal reflections, and pictures do no experience ghosting.

As analogue television has been phased out in Ireland, problems with ghosting and signal reflection due to interference from turbines will be reduced. The digital television

[7] http://siteviewer.comreg.ie/#explore

[8] OFCOM: Tall structures and their impact on broadcast and other wireless services, August 2009, http://licensing.ofcom.org.uk/binaries/spectrum/fixed-terrestrial-links/wind-farms/tall_structures.pdf

signal is much better at coping with signal reflection. Since the digital switchover, the power of transmitters emitting the digital signal has been increased to deal with the demand. This higher output is likely to overcome any signal interference and is not likely to effect the reception received on televisions. Overall, the likely extent of any potential problems is much less significant with digital television than with analogue television.

While 2rn have confirmed that there is no fixed link traversing the proposed development, it has been identified that there is a risk of interference to local digital terrestrial television viewers in the vicinity of the proposed development; however, the effects are not assessed as likely to be significant.

Mobile Phone & Broadband Signals

Notwithstanding the presence of a number of telecommunication (mobile phone & broadband) masts in the wider area, the consultation process has not identified the likelihood for significant interference to occur and no service provider has raised any concerns and, therefore, significant effects on mobile phone signals are not assessed as likely.

13.3.4.3 Decommission Phase

No significant effects are assessed as likely to occur during the decommissioning phase.

13.3.5 Cumulative Effects

Given that the proposed development is not assessed as likely to give rise to significant adverse effects on telecommunications, it is assessed that there is no likelihood for the proposed development to act in combination with other existing, permitted or proposed developments.

13.3.6 Mitigation & Monitoring Measures

13.3.6.1 Construction Phase

As significant effects are not assessed as likely to occur during the construction phase, no specific mitigation measures are proposed.

13.3.6.2 Operational Phase

Extensive consultation with telecommunications providers has confirmed that significant adverse effects on existing telecommunication links are unlikely to arise from the operation of the proposed development. While the proposed development is assessed as unlikely to interfere with any microwave links, all operators will be kept informed of any changes to the layout (e.g. micrositing) should these occur to ensure that compliance with telecommunications constraints is maintained.

In their consultation response, 2rn recommended that a protocol agreement be entered into to ensure that any complaints received from the local public concerned are appropriately remediated. This is a standard protocol for such development proposals and has been agreed between the parties and is enclosed at **Annex 13.3**.

While assessed to be unlikely, if significant signal interference in any form is identified and is directly attributed to the proposed development, appropriate remedial measures will immediately be undertaken. A range of technical measures are available to mitigate any instances of interference including signal amplifiers, active deflectors and relay transmitters, repeater stations, booster units, realignment of domestic aerials, installation of higher quality aerials and the installation of suppression

equipment. Remedial works will be promptly undertaken to ensure uninterrupted telecommunication, broadcasting and mobile phone service provision.

13.3.6.3 Decommissioning Phase

As no significant effects are assessed as likely to occur during the decommissioning phase, no specific mitigation measures are proposed or required.

13.3.7 Residual Effects

No likely significant residual effects are assessed as likely to occur.

13.3.8 Summary

It can be concluded that, on the basis of this desktop assessment and extensive consultation with stakeholders, the proposed development will not result in likely significant effects on the telecommunications network. The implementation of mitigation measures will ensure that any likely effects on telecommunication signals or links are appropriately managed and mitigated in accordance with an agreed protocol. Therefore, it is assessed that significant effects on telecommunications are unlikely to occur as a result of the proposed development, either individually or in combination with other existing, permitted or proposed developments.

13.4 Resources & Utility Infrastructure

13.4.1 Introduction

This section provides details of the likelihood of significant effects on or interactions with existing renewable and non-renewable resources and existing utility infrastructure. Within the wider environs of the proposed development site there is evidence of the extraction and use of resources; particularly in relation to the milling of peat from surrounding peatlands.

There is also the presence of utility infrastructure, with overhead electricity lines connecting to the majority of dwellings, medium and high voltage electricity lines traversing the landscape and telecommunication lines located adjacent to the majority of local roads.

13.4.2 Description of Existing Environment

13.4.2.1 Renewable Resources

An existing meteorological mast has been measuring wind speed on the proposed development since June 2020 and has, to date, recorded a mean wind speed of c. 7.1m/s at 104m (adjusted).

There are currently no operational wind farms in County Westmeath. Coole Wind Farm was granted planning permission by An Bord Pleanála[9] in 2018 but has not yet been constructed. Planning permission has also been granted for the development of a number of ground mounted solar developments throughout County Westmeath.

13.4.2.2 Non-Renewable Resources

There are a number of extant quarrying activities within County Westmeath. There are no quarries located within the proposed development site or in its immediate vicinity. The nearest quarry, Shay Murtagh Precast, is located c. 6km south of the proposed development site; however, this quarry does not provide aggregate material to for construction projects. As there are no borrow pits proposed as part of the proposed development, aggregates for the construction phase will be imported from authorised quarries in the vicinity of the proposed development. A range of alternative construction material sources are provided at **Chapter 2** while further details on the importation of such materials are provided at **Section 13.1**.

The landscape to the east and southeast of the proposed development is characterised by peatland which has been extensively worked by Bord na Móna for a prolonged period of time. However, as confirmed by Bord na Móna in January 2021, all peat harvesting has no ceases on its bogs.

13.4.2.3 Utilities Infrastructure

The electricity transmission network in County Westmeath predominately comprises 38kV and 110kV electricity transmission lines; with lower voltage distribution lines connecting individual properties to the distribution network. The network, however, is weaker in more northern and western areas of the county. **Figure 13.6**, below (reproduced at **Annex 13.4**), illustrates the existing electricity transmission network in the wider region of the proposed development site.

EirGrid is the transmission system operator (TSO) responsible for both the planning and operation of Ireland's high voltage national grid (≥110kV) while ESB Networks are

[9] An Bord Pleanála Reference ABP-300686-18

responsible for the development of medium and low voltage lines (≤38kV). Given the overall electrical output of the proposed Bracklyn Wind Farm, a connection to the transmission network, at 110kV, is considered the most appropriate connection method. **Figure 13.6** illustrates the proximity of the 110kV network to the proposed development site.

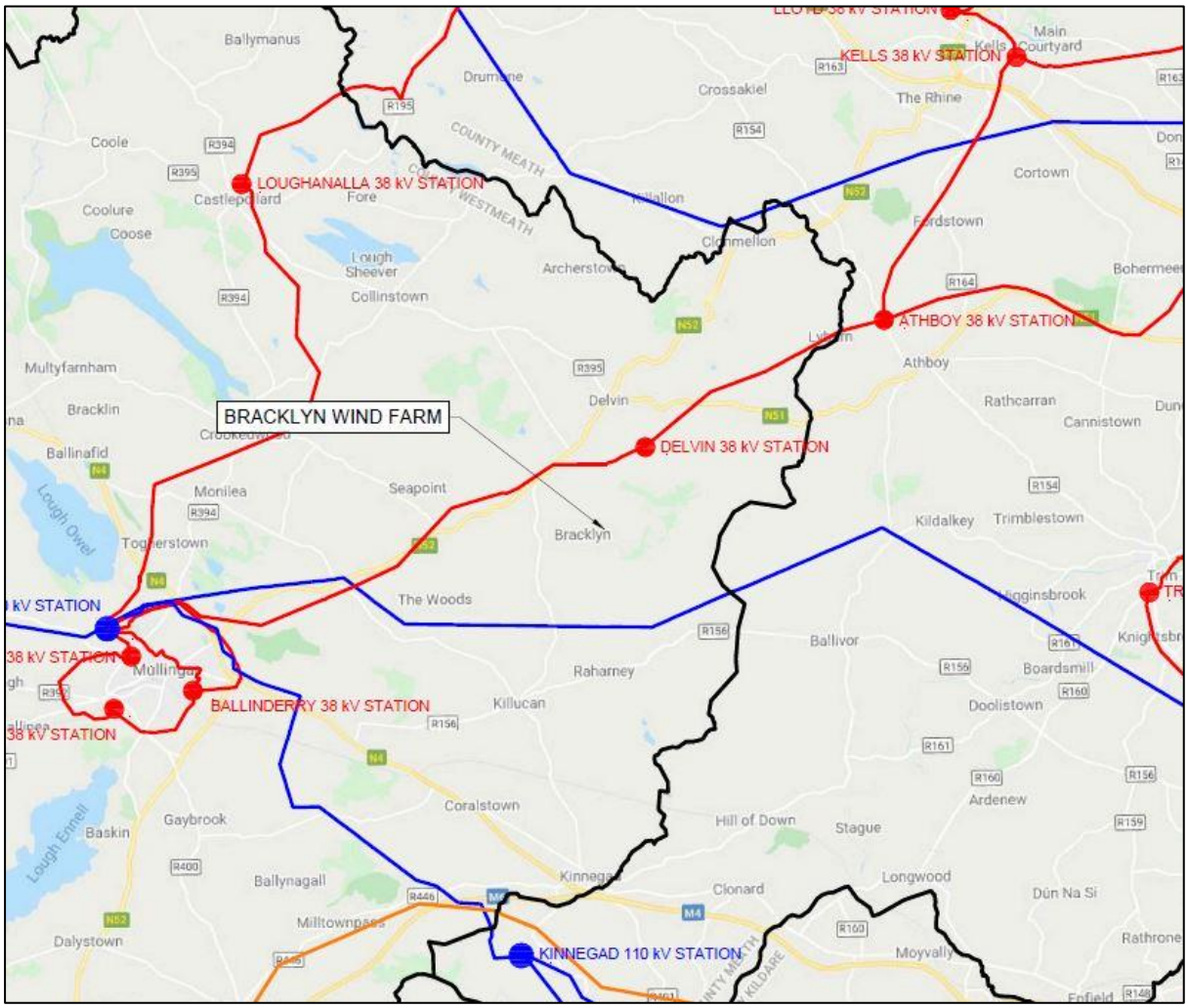

Figure 13.6: Electricity network in County Westmeath and surrounding counties

Note: 38kV network indicated in red; 110kV network indicated in blue

In addition to the microwave telecommunications network discussed at **Section 13.3** above, there is an extensive physical telecommunications network in the wider environs of the proposed development site with poles and wires running along the majority of local and regional roads; while local services such as water schemes and local authority roadside drainage infrastructure is also present along local roads.

13.4.3 Description of Likely Effects

13.4.3.1 Construction Phase

The construction phase of the proposed development is not likely to have any significant effect on existing renewable or non-renewable resources, or utilities infrastructure. The construction phase will not inhibit the export of renewable energy generated from other sources, inhibit the development of other renewable energy projects, nor will it affect existing utility services. While there is a potential for interaction

with utility services (e.g. accidental collision with overhead wires during the construction phase), this can be mitigated through good construction practices.

During the process of connecting the proposed development to the national grid, some minor, temporary disruption to electricity supply, at a local level, may occur. However, during this process, EirGrid will balance the loading on the network to ensure that no significant disruption occurs and significant effects do not arise.

The construction phase will result in the extraction of non-renewable resources in the form of aggregates for the construction of access tracks and areas of hardstanding and concrete for turbine foundations and substation construction. However, aggregates will only be sourced from quarries with full planning permission and have been subject to EIA, and therefore the effects of this extraction have already been fully assessed.

Construction activities associated with the completion of haul route upgrades and felling/re-planting operations are not assessed as likely to impact on resources or utility infrastructure. Where an interaction may occur; e.g. utility infrastructure proximate to upgrade works along the proposed haul route or present within the selected re-plant lands; appropriate best-practice construction methodologies will be followed to avoid any significant effect occurring.

As a result, it is assessed that significant effects on the environment are unlikely to occur as a result of the proposed development, either individually or in combination with other existing, permitted or proposed developments.

13.4.3.2 Operational Phase

The operational phase of the proposed development will not result in any likely effect on existing utility infrastructure or renewable or non-renewable resources. The connection of the proposed development to the national grid will further strengthen the electricity infrastructure in the wider region through the construction of a 110kV substation which will serve the national network.

It may be necessary to occasionally import aggregates to the site during operations to maintain access for service vehicles; however, materials will again be sourced from authorised quarries with full planning permission and no likely significant effects will occur.

The proposed development will have no likely operational phase effects on existing renewable resources. It is assessed that the proposed development will have a likely overall positive effect in terms of carbon reduction and climate change (see **Chapter 8**). It is assessed, therefore, that significant effects on the environment are unlikely to occur in respect of resources and utility infrastructure during the operational phase as a result of the proposed development, either individually or in combination with other existing, permitted or proposed developments.

13.4.3.3 Decommissioning Phase

No significant effects are assessed as likely to occur during the decommissioning phase in respect of resources and utility infrastructure.

13.4.3.4 Grid Connection

The construction and operation of the proposed grid connection is likely to result in an improvement and strengthening of the electricity/utility network in the wider region of the proposed development. The proposed development will significantly increase the volume of renewable electricity generated in Co. Westmeath without resulting in any

likely adverse effects on resources or utility infrastructure.

13.4.3.5 Cumulative Effects

The proposed development is not assessed as likely to result in any cumulative effects on resources or utility infrastructure, either individually or in combination with other existing, permitted or proposed developments.

13.4.4 Mitigation & Monitoring Measures

13.4.4.1 Construction Phase

No specific mitigation measures are proposed or required during the construction phase.

13.4.4.2 Operational Phase

No specific mitigation measures are proposed or required during the construction phase.

13.4.4.3 Decommissioning Phase

No specific mitigation measures are proposed or required during the construction phase.

13.4.5 Residual Effects

No likely significant residual effects are assessed as likely to occur.

13.4.6 Summary

This assessment concludes that the proposed development is unlikely to result in any significant adverse effect on renewable and non-renewable resources or on utilities infrastructure. The operation of the proposed development will bring about a benefit in terms of electricity generated from renewable sources and a strengthening of national electricity grid infrastructure in the wider region of the proposed development site. This assessment similarly concludes that the proposed development is unlikely to result in any significant adverse cumulative effects in combination with existing, permitted or proposed developments.