5 POPULATION AND HUMAN HEALTH

This chapter has been reviewed and updated where necessary considering any subsequent modifications, updates and additional information acquired for the Further information Request issued by Louth County Council (LCC) on the 6th February 2025 (Reference No: 2460766). It is noted that for ease of reference all changes from the original chapter are shown in orange. Where text has been removed it is shown as ~~strikethrough~~.

Following a review of the proposed development based on the Request for Further Information, it has been determined that site entrance 4 is not required for the construction, operation and decommissioning of the proposed development, as all works can be accommodated via the proposed site entrances 1-3. Therefore, it is proposed that entrance 4 will not be taken forward as part of the proposed development, and the initially proposed use of entrance 4 will instead be accommodated at entrance 2. The author of this chapter has reviewed the revision, and no implications for the assessment presented in this chapter have been identified.

5.1 INTRODUCTION

5.1.1 Background and Objectives

This Chapter of the EIAR assesses the impacts of the Project (**Figure 1.2**) on population and human health. The Project refers to all elements of the Kellystown Wind Farm project as a whole, including the Proposed Development and all additional works outside the Redline Boundary which are functionally and technically interdependent with the Proposed Development but will be subject to separate consent applications. Additional works include temporary street furniture removal, hedge trimming and laydown of temporary road surface. These additional works are described in full **Chapter 2: Description of the Proposed Description** in **section 2.3** refers to all elements of the application for the construction of Kellystown Wind Farm. Where significant adverse effects are predicted, the chapter identifies appropriate mitigation strategies therein. The assessment will consider the potential effects during the following phases of the Proposed Development:

- Construction of the Proposed Development
- Operation and maintenance of the Proposed Development
- Decommissioning of the Proposed Development

This chapter of the EIAR is supported by figures provided in **Volume III**. A glossary of common acronyms can be found in **Appendix 1.3** in Volume IV of this EIAR.

5.1.2 Statement of Authority

This section has been prepared by Environmental Scientists of Jennings O'Donovan & Partners Ltd; Mr. Ryan Mitchell (Bachelors' Degree in Animal Conservation and Biodiversity obtained from Greenwich University) and Ms. Angelika Thiel (Bachelors' Degree in Geography from the Leibniz University of Hannover, Germany) and reviewed by Mr. David Kiely, Director of Jennings O'Donovan & Partners Ltd. Further details and biographies/CVs of the authors and reviewer of this chapter have been included in **Appendix 1.1: Author Qualifications**.

This Chapter was reviewed considering any subsequent modifications, updates and additional information acquired for the Further information Request issued by Louth County Council (LCC) on the 6th February 2025 (Reference No: 2460766) by Mr. Ryan Mitchell an Environmental Scientists at Jennings O'Donovan & Partners Ltd.

5.1.3 Relevant Legislation and Guidance

The population and human health assessment has been carried out in accordance with legislation and guidance contained in **Chapter 1: Introduction** and **Chapter 4: Planning Policy** (schedule 6 of the Planning and Development Regulation, 2001 (as amended)).

The distance of receptor from the proposed turbines complies with Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (WEDG) (2006) and DoHPLG, Draft Revised Wind Energy Development Guidelines (2019).

The design, construction, operation and decommissioning of the Proposed Development including the installation of associated equipment such as switchgear and substations is governed by the Safety, Health and Welfare at Work Act 2005 (as amended), The Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2023.

The EPA 2015[1] report produced entitled the *'Investigation into the Assessment of Health Impacts within National Environmental Regulation Processes*' that outlines how human health impacts are dealt with, throughout the European Union (EU) by environmental regulators with an emphasis on the role at the planning / environment interface was complied with.

European Commission guidance relating to the implementation of the 2014 Directive,

[1] Golder Associates (2015) *Investigation into the Assessment of Health Impacts within National Environmental Regulation Processes*. Available online at: https://www.epa.ie/publications/research/environment--health/assessment-of-health-impacts-report.php [Accessed: 29th May 2024]

in reference to "human health" states "human health" states "Human health is a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population.[2]"

5.1.4 Assessment Structure

In line with the EIA Directive, as amended and current EPA guidelines (2022) the structure of this chapter is as follows:

- Assessment Methodology and Significance Criteria – a description of the methods used in desktop surveys and in the assessment of the significance of effects;
- Baseline Description – a description of the socio-economic profile of the local area of the Proposed Development, i.e., of local electoral areas and of County Louth, County Meath and Ireland, and based on a desk-based study using Central Statistics Office (CSO) data;
- Assessment of Potential Effects – including the "Do Nothing" scenario (accounts for likely changes in the baseline due to natural changes and nearby projects) and identifying the ways in which the population and human health of the area could be affected by the Proposed Development during the construction, operational and decommissioning stages;
- Mitigation Measures and Residual Effects – a description of measures recommended to avoid, prevent, reduce or, if necessary, offset any potential significant adverse effects and a summary of the significance of any residual effects of the Proposed Development after mitigation measures have been implemented;
- Cumulative Effects – identifying the potential for effects of the Proposed Development to combine with those from other existing, permitted and/or proposed projects as listed in **Chapter 2: Project Description** of this EIAR, to affect the population and human health;
- Summary of Significant Effects, and
- Statement of Significance.

[2] Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report, European Commission, 2017 http://ec.europa.eu/environment/eia/eia-support.htm

As outlined in the section 3.7.6 of the EPA Guidelines (2022), there is need to assess the potential interactions of human health and population effects with other effects arising as a result of the Proposed Development. Potential interactions with the effects identified in the following chapters have been assessed:

- Chapter 10: Soils and Geology
- Chapter 11: Hydrology and Hydrogeology:
- Chapter 13: Noise and Vibration:
- Chapter 16: Traffic and Transport:
- Chapter 17: Shadow Flicker:
- Chapter 18: Air and Climate:
- Chapter 19: Major Accidents and Natural Disasters
- Chapter 20: Interactions of the Foregoing

5.1.5 Scope of the Assessment

The effect of a development on population and human health includes the following broad areas of investigation:

- Population and Settlement Patterns
- Economic Activity and Tourism
- Employment
- Topography and Land Use
- Health Impacts of Wind Farms
- Property Value / Residential Amenity and
- Natural Disaster and Major Accidents.

This assessment considers the following criteria:

- Sensitive receptors in the area
- Existing land use in the area
- General amenities in the area
- Potential effects from water, noise, air quality and traffic

This chapter is an EIA of the Proposed Development on the outlined Population and Human Health factors. A full description of the Proposed Development is outlined in **Chapter 2: Description of Proposed Development**, **Section 2.3** and includes one TDR (the Proposed TDR) and one GCR (the proposed GCR). Other viable GCR/TDRs have also been assessed as part of the EIAR. Although planning permission is not being sought for these viable routes (GCR option 2 and TDR option 2 and TDR option 3) they have been

fully assessed. All EIA aspects of GCR option 2 and TDR option 2 and 3 are documented in Appendix 3.1. Refer to section 4 of Appendix 3.1 for the Population and Human Health assessment of GCR option 2 and TDR option 2 and 3.

5.2 ASSESSMENT METHODOLOGY

Baseline conditions: A desk study was undertaken to describe the baseline conditions of the receiving environment across a range of Population and Human Health factors and are presented in **Section 5.3** of this chapter. Where Central Statistics Office (CSO) data is available, these data are assessed by Study Area; within the locality of the Wind Farm Site and compared with both the County and National CSO data. These Study Areas are described in **Section 5.2.2** of this chapter. This assessment has been carried out using latest available Central Statistics Office (CSO) data, information and maps from the current Louth County Development Plan 2021-2027; and Meath County Development Plan 2021-2027 and other relevant studies.

Do Nothing Impact Assessment: This section outlines the impact if the Proposed Development were not to go ahead and the likely evolution thereof without the Proposed Development as far as natural changes from the baseline scenario.

Assessment of Potential Effects: The potential impacts of the Proposed Development, are assessed as documented in **Section 5.4**. The potential impacts are classified as outlined in Table 1.6 of the Introduction Chapter (as prescribed in the EPA Guidelines, 2022). Typically, for each impact assessed the quality of the impact, for example, positive or negative, the significance of the impact, for example, slight or moderate and the duration of the impact, for example, short-term, medium-term, long-term are assigned. If potentially significant adverse effects are identified, the proposed practical mitigation measures assessed to prevent, reduce, avoid or, if necessary, offset such effects are documented in **Section 5.5**.

Mitigation measures: The mitigation hierarchy approach, as outlined in Chapter 1 Introduction of Avoidance, Reduction/ Elimination and Remedy aims to avoid significant impact through embedded mitigation (avoidance), and where avoidance is not possible, through mitigation measures. Remedy, the lowest rung of the mitigation hierarchy is only considered where mitigation measures are not feasible or possible.

Cumulative Assessment: Other large developments (operational and in the planning process) within a 20km of the Proposed Development (shown in **Appendix 2.4**), in

conjunction with the Proposed Development, are assessed to determine the potential cumulative effects on Population and Human Health.

Information regarding human beings and general socio-economic data were sourced from the following websites:

- Central Statistics Office (www.cso.ie);
- Louth County Development Plan 2021-2027;
- Meath County Development Plan 2021-2027;
- The Eastern and Midland Regional Assembly (EMRA
- Regional Spatial & Economic Strategy (RSES) 2019-2031 https://www.emra.ie/rses/
- Fáilte Ireland (www.faillteireland.ie);
- National Parks and Wildlife Services (www.npws.ie);
- Sustainable Energy Authority of Ireland (www.seai.ie);
- Louth County Council (www.louthcoco.ie)
- Meath County Council (https://www.meath.ie/council)
- County Louth Local Economic and Community Plan 2016-2022
- Louth Local Economic and Community Plan (LECP) 2023-2029 (draft)
- Meath Local Economic and Community Plan (LECP) 2023-2029
- The National Planning Framework Ireland 2040 (www.npf.ie)

County Meath was included in the assessment due its proximity to the Proposed Development, in particular the UNESCO sites of Newgrange, Knowth and Dowth. At the closest point, county Meath is located c. 6.3km south-west of the Wind Farm Site.

The Wind Farm Site is located within the following townlands: Brownstown, Cartanstown, Drumshallon, Gallstown, Groom, Kearneystown, Keeverstown, Piperstown, Stonehouse and Swinestown. These townlands are within the Rural Policy Zone 2 area, refer to the Rural Policy Zone Map (volume 1A – Book of Maps) in the Louth CDP. Rural Policy Zone 2 refers to an area under strong urban influence. This area is outside any Tentative World Heritage Sites and Buffer zones of World Heritage Sites.

Rural areas in County Louth under strong urban influence and of significant landscape value are classed as Rural Policy Zone 1. All townlands within the vicinity of the Wind Farm Site are outside this zone.

5.2.1 Design Flexibility

As described in **Chapter 2 Description of Proposed Development, section 2.6.2,** Louth County Council has confirmed that it is appropriate for certain details of the Proposed Development to be confirmed after the decision on the application has been made. The parameters of the proposed turbines are as follows:

- Turbine tip height range of 179.5m – 180m
- Rotor diameter range of 149m – 163m
- Hub height range of 98m to 105m

As outlined in **Table 1.3** of **Chapter 1 Introduction,** the following is assessed within this chapter:

- MW output (28.5MW to 36MW range) is assessed for potential effects on socioeconomics and the Community Benefit Fund.
- the maximum potential development footprint (hardstand and foundation) for potential effects on Population & Human Health, socioeconomics and recreation. The maximum potential development footprint is outlined in **Table 1.2** of **Chapter 1 Introduction.**

The assessment identifies if there are any changes in the significance of effects between the maximum and minimum scenarios, allowing for consideration to a range of scenarios which may arise within the flexibility.

5.2.2 Definition of Study Areas

Four geographical Study Areas have been outlined for this assessment. Data from Study Area 1 (District Electoral Divisions which include the townlands in the vicinity of the Wind Farm Site) are used to assess local impacts within this chapter, as it is these areas that will be impacted the most by the Proposed Development. The local Study Area 1 lies within Study Area 2 (County Louth). County Meath (Study Area 3) has been included is this assessment due to the proximity to the site boundary (approximately 6.3km) and presence of sensitive archaeological features. Study Area 4 (Republic of Ireland) provide national baseline statistical data for this chapter.

The four Study Areas are described in more detail below:

Study Area 1: **The Wind Farm Site and Environs –Electoral Divisions (EDs) Mullary and Clogher (49.6km²).** In order to make inferences about the population and other

statistics in the vicinity of the Wind Farm Site, District Electoral Divisions were analysed. The Wind Farm Site falls under two Electoral Divisions (ED):

Mullary[3] which is separated into distinct townlands Bankerstown, Brownstown, Carricknashanagh, Cartanstown, Castlelumny, Castletown, Drumshallon, Fieldstown, Groom, Hamlinstown, Kearneystown, Keeverstown, Kircock, Longstone, Piperstown, Priest Town, Rathdaniel, Rathgory, Roxborough, Stirue, Stonehouse, Tinure; and

Clogher[4] which is separated into distinct townlands of Almondstown, Ardbolies, Baggotstown, Brittas, Callystown, Carrickbaggot, Clogher, Cloghlea, Cruisetown, Drumgooter, Gallstown, Garrolagh, Glaspistol, Glebe East, Glebe South, Glebe West, Killartery, Marlay, Mayne, Parsonstown, Rathdrumin, Reynoldstown, Rinkinstown, Rokeby, Swinestown, Walshestown.

The EDs and townlands that have the potential to be affected as a result of the various elements of the Proposed Development are set out in **Table 5.0**.

Parts of the Turbine Delivery Route (TDR) and the Grid Connection Route (GCR) also fall within the Study Area 1 (Mullary).

[3] CSO, 2002 Electoral Division, Mullary, Co Louth https://visual.cso.ie/?body=entity/ima/cop/2022&boundary=C04167V04938&guid=2ae19629-1913-13a3-e055-000000000001 [Accessed 30 Jul 2024]

[4] CSO, 2002 Electoral Division, Clogher, Co Louth https://visual.cso.ie/?body=entity/ima/cop/2022&boundary=C04167V04938&guid=2ae19629-1972-13a3-e055-000000000001 [Accessed 30 Jul 2024]

Table 5.0: EDs and Townlands that will potentially be affected as a result of the Proposed Development and all associated works.

Element of the Proposed Development	Electoral Division (ED)	Townlands
Grid Connection	Mullary Termonfeckin St. Peter's Monasterboice	Tullyallen Killineer Mell Brownstown Tullyeskar Carntown Ballymakenny Piperstown Tullyard Carstown New Town - Monasterboise
Turbine Delivery Route	Mullary Dunleer	Gallstown Keeverstown Stonehouse Castletown Athclare Drumlin Windmill Woodland Haynestown Gibstown
Wind Farm Site	Mullary Clogher	Gallstown Groom Stonehouse Brownstown Cartanstown Keeverstown Kearneystown Drumshallon Piperstown Swinestown

Study Area 2: **County Louth** (826km^2)

The Wind Farm Site, Grid Connection Route (GCR) and sections of the Turbine Delivery Route (TDR) fall within County Louth. A full description of the GCR and TDR as is detailed in **Chapter 2: Description of Proposed Development**. As all these elements of the Project have the potential to impact upon the population and human health, County Louth was

chosen as a study area to conclude the extent of effects (if any) on the population and human health within the county as a result of The Project.

Study Area 3: **County Meath** (2,342km²)

County Meath is included as a study area in this assessment due to the proximity of the Wind Farm Site (c.6.3km) to sensitive archaeological sites situated within the County including Newgrange, Knowth and Dowth passage tombs. Although sections of the Turbine Delivery Route also fall within County Meath, including sections of the M1, as described in **Chapter 2: Description of Proposed Development**, the inclusion of County Meath as a Study Area is primarily due to the proximity of the sensitive archaeological sites.

Study Area 4: **Ireland** (70,273km^2).

Study area 4, Ireland, provides a national baseline of statistical data for this chapter.

5.2.3 Impact Assessment Methodology

Descriptive terminology for impact assessment follows the systematic method of description of the EPA Guidelines (2022), as outlined in **Chapter 1: Introduction**, **Table 1.6**. The sensitive receptors in this Population and Human Health study are primarily people and where they reside. This is best measured by using habitable dwellings and community areas. A total of 375 sensitive receptors were identified, this consists of dwellings and one local school which are all situated within 2km of the proposed turbines.

In accordance with Section 6.18.2 of the Draft 2019 Guidelines, 4 no. properties are owned by landowners involved with the Project and have agreed to a reduced setback distance with the Applicant. It is worth noting that the properties availing of the exception are all in excess of the mandatory minimum setback of 500 meters, with the closest dwelling located 552m from Turbine 05. The remaining 3 no. dwellings are setback in excess of 500m, with a setback of 563m, 686m and 689m from Turbine 02. All receptors located within 2km of the proposed turbines are shown on **Figure 1.3** of **Chapter 1 Introduction.**

5.2.4 Consultation

Consultation with relevant organisations was carried out during the initial stage of the EIA to identify any effects that could be initiated by the Proposed Development. A summary of the findings is detailed in **Table 5.1**.

Table 5.1: Summary of Consultation response on Population and Human Health

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
Health Service Executive, Environmental Health Service	Letter in Response to Scoping Report received on 11/08/2023:	**Population and Human Health** The EHS recommends that potential impacts on human health are assessed in each of the three phases of the proposed development, construction, operations, and decommissioning. **Climate Change and Opportunity for Health Gain** The EIAR should clearly illustrate how the Proposed Development contributes to obligations under the Climate Action and Low Carbon Development Act 2015 and amendment of 2021 and the most recent Climate Action Plan 2023. Under Mitigation of Green House Gas emissions, the HSE recommends that the EIAR assess the effects of the Proposed Development at every phase, construction, operation, and decommissioning. The construction phase is likely to generate the most emissions and the EIAR should demonstrate how the construction phase will aim to minimise green-house gas emissions. Minimisation of greenhouse gas emissions should extend to 'green procurement'. The EIAR should further assess the potential health gains the Proposed Development offers. For example, does the development intend to create recreational space for the local	Items raised have been addressed within **Chapter 5** (Population and Human Health), **Chapter 18** (Air and Climate) and **Chapter 17** (Shadow Flicker).

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
		population providing health and well-being benefits? Will the development enable locals and staff to engage in active travel thereby impacting positively on cardiovascular health? **Shadow Flicker** It is recommended that a shadow flicker assessment is undertaken to identify any houses/dwellings and sensitive receptors which may be impacted by shadow flicker. The assessment must include all proposed mitigation measures. Dwellings should include all occupied properties and any existing or proposed properties for which planning consent has been granted for construction or refurbishment. It is recommended that turbine selection will be based on the most advanced available technology that permits shut down during times when residents are exposed to shadow flicker. As a result, no dwelling should be exposed to shadow flicker.	
Broadcasting Authority of Ireland, and communication Regulator	Email responses were received. Further details can be found in **Chapter 1 Introduction Table 1.7:** Scoping Responses Received on The Project	Responses were received from Broadcasting Authority of Ireland, 2rn Broadcasting, Commission for Communications Regulation, Eir Limited, RTE Transmission Network, Tetra Ireland Communications and Vodafone Ireland. Vodafone highlighted that one Fresnel zone could potentially be affected by the Proposed Project. Full details are provided in Section 14.6 of the	Items raised have been addressed within **Section 14.6 of Chapter 14: Material Assets** of the EIAR

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
		EIAR in **Chapter 14: Material Assets**.	
Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media	Scoping response received 28th July 2023 *Planning matters in general fall within the remit of the Department of Housing, Local Government and Heritage. Please note that following the coming into force of the Planning and Development, Heritage and Broadcasting (Amendment) Act 2021 (Act 11 of 2021) all Heritage functions previously held by the Department of Culture, Heritage and the Gaeltacht are now held by that Department.* *The **Development Applications Unit** may be contacted at Manager.DAU@housing.gov.ie (copied above).* ***Gaeltacht Areas*** *The Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media is a notice party under section 28(1) of the Planning and Development Regulations 2001 in relation to any planning application in an area where the proposed development could – in the view of the local Planning Authority – have a material impact on the linguistic and cultural heritage of the Gaeltacht, including the promotion of Irish as the community language. Such developments must be brought to the attention of the Department. Relevant documentation in relation to such planning applications should be submitted to pleanailteanga@tcagsm.gov.ie (copied above).*	N/A	N/A
Department of Housing, Local	Scoping response received 22nd February 2024	All items considered during the design process.	Items raised have been addressed

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
Government and Heritage	*It is noted that the proposed development is large in scale and located within the proximity of a number of Recorded Monuments, which are subject to statutory protection in the Record of Monuments and Places,* *established under section 12 of the National Monuments (Amendment) Act 1994.* *Given the extent and location of the proposed development it could also impact on previously unrecorded subsurface archaeological remains.* *In line with national policy, see Section 3.6 of Framework and Principles for the Protection of the Archaeological Heritage 1999, the Department recommends that an Archaeological Impact Assessment (AIA) be carried out that includes the results of an archaeological geophysical survey and archaeological test excavations, as described below, this should be prepared to assess the impact on the archaeological heritage. This assessment should be submitted with any future planning application. This will enable the Planning Authority and this office to prepare an informed archaeological recommendation before a planning decision is taken.* *Archaeological Impact Assessment;* *1. The applicant is required to engage the services of a suitably qualified archaeologist to carry out an archaeological impact assessment (AIA) of the development site, in relation any Recorded Monument. No subsurface work should be undertaken until an*		within Chapter 15 Cultural Heritage

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
	archaeological assessment has been completed and commented on by this office. *2. The archaeologist should carry out any relevant documentary research and inspect the development site. This assessment shall also define a buffer area or area contiguous with the any recorded monuments which will preserve the setting and visual amenity of the site. No sub-surface work should be undertaken in the absence of the archaeologist without his/her express consent including ground investigations works.* *3. A geophysical survey and a programme of test excavations should be carried out at locations chosen by the archaeologist (licensed under the National Monuments Acts 1930-2004), having consulted the site drawings and the National Monuments Service of this Department. The results of which should be included within the archaeological impact assessment (AIA)* *4. Having completed the work, the archaeologist should submit a written report stating their recommendations to the National Monuments Service. Where archaeological material/features are shown to be present, preservation in situ, preservation by record (excavation) or monitoring may be required.* *Reason: To ensure the continued preservation (either in situ or by record) of places, caves, sites, features or other objects of archaeological interest.*		

5.3 BASELINE DESCRIPTION – RECEIVING ENVIRONMENT

5.3.1 Population and Settlement Patterns

Study Area 1: The Site and Environs (EDs Mullary and Clogher)

The most recent 2022 census data was deemed most appropriate for the purpose of this study. Tinure, the nearest settlement to the Wind Farm Site, is located approximately 2.5km west of the Wind Farm Site and has a population of 530[5]. According to the 2022 census, two settlements with a population greater than 2,500 people located within a 10km radius of the Proposed Development are Drogheda (44,135 persons) and Laytown-Bettystown-Mornington-Donacarney (15,642 persons). The nearest centre of population to the Wind Farm Site is Drogheda, which is located approximately 8.3km south.

The surrounding area is largely rural, with a mixture of agricultural grassland, commercial forestry plantations, a quarry, scrub and wet grassland habitats, private roads and public roads. Isolated residences and farmsteads are also scattered throughout the area.

Over the last five years, Louth County Council have granted planning permissions in the Mullary and Clogher electoral division areas which include one off housing, alterations to existing dwelling houses, development of new housing, agricultural buildings, and commercial developments[6]. The 2022 Census statistics note 1,870 occupied residences in the Mullary Electoral Division (ED) and 3,446 occupied residences in the Clogher ED.

In 2022, the total population in the Mullary ED was 1,870, of which males numbered 954 and females were 916. The population density of the Mullary ED is 76.3 persons per square kilometre. The total population in the Clogher ED was 3,446, of which males numbered 1,698 and females were numbered 1,748. The population density of Clogher ED was 68.8 persons per square kilometre.

The Landscape Character Assessment (LCA) of the windfarm area itself is under the umbrella of the Muirhevna Plain Landscape Character Area and Uplands of Collon, Monasterboice. The importance of Muirhevna Plain LCA is considered 'Local' while the Uplands of Collon, Monasterboice LCA is considered 'Regional'. The 2002 Landscape Character Assessment from Louth County Council describes the Muirhevna Plain Landscape as *"by far the largest landscape area in the county"* and *"is identified for its flat undulating features drained by the meandering lazy rivers of Fane, Glyde, White and Dee*

[5] CSO, 2022 https://visual.cso.ie/?body=entity/ima/cop/2022&boundary=C04160V04929&guid=b0b44301-a792-4132-9af5-69a8342343b0 [Accessed 15/08/2024]
[6] Louth County Council. *Planning Map Search* Available online at: https://louthco.maps.arcgis.com/apps/webappviewer/index.html?id=3ca4a87364a84ff4b011006b3ac87779 [Accessed 15/08/2024]

rivers. It contains the most fertile agricultural land in the county". The landscape quality of Uplands of Collon is described as *"quite high with a variety of landcover elements".*

Turbine Delivery Route (TDR)

As outlined in **Section 5.2.2**, parts of the TDR fall within Study Area 1 (Mullary) namely, the townlands of Keeverstown and Stonehouse. To assess potential effects on human beings and human health along the Turbine Delivery Route, a review of developments and any approved planning applications in the vicinity of the eleven areas outlined in **Chapter 2 Project Description,** which are planned to be the subject of temporary widening works along the Haul Route was carried out. The majority of developments along the Turbine Delivery Route comprise one-off houses. The land-use along the Turbine Delivery Route is comprised mainly of agriculture land, suburban areas such as towns and villages and small pockets of forestry.

Grid Connection Route (GCR)

As outlined in **Section 5.2.2**, part of the GCR fall within Study Area 1 (Mullary), namely the townlands of Piperstown and Brownstown. The Grid connection from onsite substation to Drybridge 110kv) is 12.65km. 900m is located within the site and the remaining 11.75km is located in the public road.

Study Area 2: County Louth

The total population in the 2022 CSO for County Louth was 139,703 of which males numbered 68,907 and females were 70,796. There has been an 8% increase in the population since 2016. The population density is 169 persons per km^2. The total number of households was 49,424 in 2022, an 8% increase since 2016. Average size of households (in persons) has generally remained the same at approximately 2.8 persons per household over the past two census reports (2016 & 2022).

County Louth is the smallest county in Ireland with a land mass of 826km^2. There are a number of medium sized towns and villages geographically spread throughout County Louth. These settlements number 30 and provide essential services for the local communities and the rural hinterlands. The different settlement tiers perform differing roles with the result that no area in the county is significantly peripheral or isolated. This provides a reasonable platform upon which to build an integrated Local Economic and Community Plan and strong sustainable communities. County Louth had the two largest towns in the county, Drogheda with 44,135 people and Dundalk with 43,112 people.

While the population living in rural areas decreased over a 5-year period from 2011 to 2016 in County Louth, the urban population increased by 6,107. The most populated town in County Louth, besides Dundalk and Drogheda, is Ardee (4,928 in 2016).

Drogheda, the largest town in County Louth, is significant for health, social and cultural activities. The town is located on the east coast of Ireland; approximately 56km north of Dublin.

Study Area 3: **County Meath**

The total population in the 2022 CSO results for County Meath was 220,826 of which males numbered 109,988 and females were 110,838. There has been a 13% increase in the population since 2016. The population density is 94 persons per km^2. The total number of households was 72,977 in 2022, a 13.6% increase since 2016. Average size of households (in persons) has generally remained the same at approximately 3 persons per household over the past two census reports (2016 & 2022).

County Meath is the 14th largest county in Ireland with a land mass of 2,342km^2. There were 15 urban area settlements with populations greater than 1500 persons in 2016. The remaining 20 settlements comprised of villages with populations <1,500 persons. These medium sized towns and villages are geographically spread throughout County Meath. Both the population living in urban (9,362) and rural (1,547) areas increased over a 5-year period from 2011 to 2016 in County Louth. These settlements provide essential services for the local communities. This provides a reasonable platform upon which to build an integrated Local Economic and Community Plan and strong sustainable communities.

The most populated towns in County Meath are Navan (33,886), Ashbourne (15,680), Ratoath (10,077) and Trim (9,563). Navan is the largest town in County Meath and the fourth largest in the Republic of Ireland. It is an attractive town that retains many of its historic streetscapes and features in the town centre. The River Blackwater and Boyne also contribute to its character and setting. It is the county town, or administrative capital of County Meath. Navan is the principal employment centre in County Meath with almost 9,000 jobs located in the town which equates 21.5% of the total jobs in the County. The RSES has designated Navan as a Key Town. The IDA Business and Technology Park within Navan is one of the key strategic employment sites within the County. [7]

[7] Meath County Development Plan 2021-2027: Volume 2 Written Statement - Navan [Accessed: 29/05/2024]

Study Area 4: Ireland

Ireland has experienced rapid population growth in recent years with an improved standard of living and infrastructure growth resulting in a net inflow of population. The country has seen a population increased by 8% since 2016 from 4,761,865 to 5,149,139 as per the 2022 census[8]. The Irish population is at its highest figure since 1841, and it is the first time the population has been recorded over 5 million since 1851[9].The National Planning Framework (NPF) (2018) has set out its intention to facilitate a significant growth in Ireland's population by 2040. Full achievement of the targets set out in the 'Project Ireland 2040 National Planning Framework' would accommodate around 1.1 million additional people residing in Ireland by 2040.

5.3.2 Economic Activity

The primary sectors of economic activity on a County level are presented (Study Areas 2 and 3). An overview of the most prominent sectors in these Counties highlight the main areas of local employment in the general area, the townlands, County and the surrounds.

5.3.2.1 Primary sectors - Study Area 2: County Louth

The economy of County Louth is broadly based and diverse with the most prominent sectors include bio-pharma, food and beverage production, manufacturing, financial services and ICT. The professional services and Commerce and trade sectors are the largest sector of employment providing 25.3% each of employment in County Louth. Health and education are also prominent employment sectors, with two hospitals (in Drogheda and Dundalk) and a third level education facility (Dundalk Institute of Technology, (DkIT) and Drogheda Institute of Further Education, (DIFE)) located in the County[10].

5.3.2.2 Primary sectors - Study Area 3: Meath County

The economy of County Meath is broadly based and diverse with strengths in the areas of financial services, tourism, hospitality and heritage, retail, agriculture and food industry, manufacturing, logistics, and professional services. The most common sector is Commerce and trade with 25% of the working population in this while 23% of the working population work in the Professional Services sector. The county is home to a number of multinational

[8] Central Statistics Office (CSO), 'Census 2022 Reports'. Available at: https://www.cso.ie/en/statistics/population/censusofpopulation2022/censusofpopulation2022-summaryresults/ - [Accessed 15/07/24]
[9] The Department of Housing Planning and Local Government, on behalf of the Government, 'Project Ireland 2040 - The National Planning Framework' published February 2018. Available at: https://npf.ie/project-ireland-2040-national-planning-framework/ - [Accessed 15/07/24]
[10] Louth County Development Plan 2021-2027: Volume 1 Written Statement – Chapter 5 [Accessed: 29/05/2024]

companies, such as MSD, Meta and Amazon as well as many innovative small and medium-sized enterprises[11].

5.3.3 Employment

Employment statistics (Principal Economic Status) for Electoral Division Area (Study Area 1) and County (Study Area 2 and 3) are presented in this section and compared with the national employment statistics (Study Area 4).

5.3.3.1 Employment Analysis

In **Table 5.2**, the Principal Economic Status for each study area are shown for the total population of people aged over 15 years. For comparative purposes, the same data is shown as percentages in **Table 5.3**.

A comparison between the local area (Study Area 1 Mullary & Clogher) and the Study Area 2 (County Louth), show the percentage of people of over the age of 15 years old, that are in employment is approximately 5% higher. (Study Area 1 Mullary & Clogher) is very comparable to the national (Study Area 4 Ireland) percentage of people in employment. (Study Area 1 Mullary & Clogher) has a higher percentage of working population and student population and a lower percentage of people in retirement than Study Area 2, **Table 5.3**.

Study Area 1: Mullary

The number of employed people (over the age of 15) in Mullary in 2022 is 861; an increase of 13.4% from 2016 (759). There are 175 people retired; an increase of 24.1% from 2016 (141). Those in short-term/ long-term unemployment has decreased from 52 in 2016 to 32 in 2022, a decrease of 38.4%.

Study Area 1: Clogher

The number of employed people (over the age of 15) in Mullary in 2022 is 1544; an increase of 16% from 2016 (1331). There are 306 people retired; an increase of 24.4% from 2016 (246). Those in short-term/ long-term unemployment has decreased from 144 in 2016 to 113 in 2022, a decrease of 21.5%.

[11] Meath – Economic Development Strategy Roadmap. Available at https://www.meath.ie/system/files/media/file-uploads/2023-07/Meath%20Economic%20Development%20Roadmap.pdf [Accessed: 29/05/2024]

Study Area 2: County Louth

The number of employed people (over the age of 15) in County Louth is 59,140; an increase of over 17.5% between 2016 (50,317) and 2022. There are 17,245 people retired, 12,583 students (over 15) and 7,888 people (over 15) looking after the home/family.

Study Area 3: County Meath

The number of employed people (over the age of 15) in County Meath is 101,189; an increase of over 21.5% between 2016 (83,259) and 2022. There are 22,441 people retired, 19,188 students (over 15) and 12,243 people (over 15) looking after the home/family.

Table 5.2: Labour Force Status (2022)

Principal Economic Status	Population over 15 years old (number)				
	Study Area 1 Clogher	Study Area 1 Mullary	Study Area 2 Louth	Study Area 3 Meath	Study Area 4 National
At work	1544	861	59,140	101,189	2,320,297
Looking for first regular job	19	9	1,265	1,373	34,526
Short/Long Term unemployed	113	32	5,977	6,751	176,276,
Student	320	242	12,583	19,188	459,275
Looking after home/family	197	103	7,888	12,243	272,318
Retired	306	175	17,245	22,441	657,790
Unable to work due to permanent sickness or disability	113	60	5,740	6,325	189,308
Other	19	8	771	1,084	27,062
Total	**2631**	**1490**	**110,609**	**170,594**	**3,960,576**

Table 5.3: Labour Force Percentage Status (2022)

Principal Economic Status	Percentage (%)				
	Study Area 1 Clogher	Study Area 1 Mullary	Study Area 2 Louth	Study Area 3 Meath	Study Area 1 National
At work	58.68	57.79	53.47	59.32	58.58
Looking for first regular job	0.72	0.60	1.14	0.80	0.87
Short/Long Term unemployed	4.29	2.15	5.40	3.96	4.45
Student	12.16	16.24	11.38	11.25	11.60
Looking after home/family	7.49	6.91	7.13	7.18	6.88
Retired	11.63	11.74	15.59	13.15	16.61
Unable to work due to permanent sickness or disability	4.29	4.03	5.19	3.71	4.78
Other	0.72	0.54	0.70	0.64	0.68
Total	100.00	100.00	100.00	100.00	100.00

5.3.4 Land Use and Topography

Land use and Topography is assessed in this section for the Electoral Division Area (Study Area 1), as this land in this area will be most affected due to the Proposed Development. There will minimal or no long-term impact on land use from the TDR and GCR work, therefore Study Area 2 and 3 will not be assessed in this section.

5.3.4.1 Study Area 1: The Site and Environs (Eds Mullary and Clogher)

County Louth is located in the Eastern and Midland Region and is bordered by counties Armagh, Down, Meath and Monaghan. There are 9 landscape character types across the county. According to the Landscape Character Assessment (LCA) 2002[12] for Louth, the Proposed Wind Farm Site is located within the following landscape character types:

- Muirhevna Plain (local importance); and,
- Uplands of Collon, Monasterboice [13] (regional importance)

[12] Louth County Council December 2002 – Landscape Character Assessment https://www.louthcoco.ie/en/services/heritage/resource_centre/heritage-designation-advice/landscape-and-amenity/louth-landscape-character-assessment-2002.pdf [Accessed: 29/05/2024]
[13] Louth County Development Plan 2021 - 2027 Chapter 8. Section 8.10.1 Landscape Assessment

Landscape Values

"Are judgmental in nature and will include environmental and cultural benefits including services and functions. Stakeholders should normally be involved at this judgmental stage (The term stakeholders describes the whole range of individuals and groups who have an interest in the landscape)."

Sensitivity Value

"Of a landscape is the measure of its ability to accommodate intervention without suffering an unacceptable or detrimental loss or alteration of landscape character type."

(above are extracts from; Louth County Council, Landscape Character Assessment, December 2002)

The majority of existing land use in the environs of the Wind Farm Site is agriculture, tillage commercial forestry, Exposed Rock/ Disturbed Ground (Kilsaran Quarry) and largely rural with isolated residences and farmsteads and ribbon development. The Wind Farm Site is currently used mainly for agricultural use and forestry. Kilsaran Quarry is located adjacent to the northern portion of the Wind Farm Site, outside of the Redline Boundary. The shortest distance between the quarry boundary and proposed turbine locations is approximately 100m. The Wind Farm Site is situated on relatively high ground, at elevations ranging between 90m and 120m AOD. The highest point of the Wind Farm Site is located between the Townlands of Piperstown towards the southern portion of the Site.

5.3.5 Tourism

Tourism is one of Ireland's most important economic sectors and is a significant source of full time and seasonal employment. County Louth and County Meath have a wide range of tourist attractions. Tourism information for Electoral Division Area (Study Area 1) and County (Study Area 2 and 3) are presented in this section, as these areas will potentially be most impacted by the Proposed Development.

5.3.5.1 Louth County Development Plan 2021-2027

Louth has a strong tourism industry with significant growth potential. There are several objectives and preferred development options outlined in the Louth County Development Plan (2021-2027) which seek to promote tourism in the county.[14]

[14] Louth County Development Plan 2021 - 2027 Chapter 6 Tourism https://www.louthcoco.ie/en/publications/development-plans/louth-county-development-plan-2021-2027/chapter-6-web-.pdf [Accessed: 29/05/2024]

Chapter 6: Tourism, Policy Objective TOU 4

"To promote and facilitate tourism as one of the key economic pillars of the County's economy and major generator of employment and to support the provision of necessary significant increase in facilities, visitor attractions and improvement in public spaces to promote attractive and vibrant town centres as key places for tourists."

5.3.5.2 Tourist Attractions

Study Area 1: The Site and Environs (EDs Mullary and Clogher)

There are several notable tourist attractions within the vicinity of the Proposed Development. The nearest is the Monasterboice Dolmen along the R132, approximately 2.3km west of the Proposed Development, just outside the ED of Mullary. The Dolmen is part of the Monasterboice Monastic site, these ancient ruins of an early Christian monastic settlement are located approximately 2.6km west of the Wind Farm Site. The Monasterboice has two of the best preserved Celtic high crosses in Ireland. It also includes a 110 feet high round tower and two small, ruined 9th and 13th century churches on the site in a graveyard. Approximately 3km north of the Wind Farm Site is the Barmeath Castle, a county house east of Dunleer, County Louth.

County Louth has a diverse coastline, which stretches from the mouth of the River Boyne to the Cooley Mountains. There are two Blue Flag beaches, namely Port Beach and Clogherhead Beach within 7km of the Wind Farm Site (within the ED of Clogher). These beaches provide a safe environment for locals and visitors alike to enjoy swimming, water sports and a great family day at the beach. In addition, Seapoint Beach, Termonfeckin has again been awarded a Green Coast Award for 2023. The award is a symbol of environmental excellence and has been established to acknowledge, promote and protect the environment of beaches all over Ireland.[15]

The village of Termonfeckin is located approximately 5.5km southeast of the Proposed Development. The ED area of Termonfeckin is adjacent (to the south) of the ED of Clogher Tourist attractions in Termonfeckin include the Termonfeckin Castle, Termonfeckin High Cross and An Grianán. An Grianán (the sunny place) is a stately home built in the late 18th century, and it still reflects the splendour of those years in its manicured grounds, ornate ceilings and domed central stairway.

[15] Blue Flag Beaches & Green Coast Awards – visitlouth.ie https://www.visitlouth.ie/explore-and-do/do/enjoy-our-coast/blue-flag-beaches-green-coast-awards.html [Accessed: 29/05/2024]

Within the area surrounding the Wind Farm Site, there are several trails and walks, such as the Rathescar Lakeside Walk (approximately 5km northwest of the Wind Farm Site) and the Clogherhead Cliff Walk (approximately 8km east of the Site).

Approximately 8km southwest of the Proposed Development are two further tourist attractions. One of which is the Irish Military Museum and the other one the Old Mellifont Abbey.

The town of Drogheda (within Study Area 2) located approximately 8.3km south of the Wind Farm Site, has several tourist attractions such as:

- Boyne Greenway. This walking and cycling facility extends from St. Dominic's Park near the 'Bridge of Peace' in Drogheda, along the south bank of the River Boyne to the site of the Battle of the Boyne Visitor Centre at Oldbridge. A number of heritage signs are placed along the boardwalk are with information about Irish Mythology relevant to the Boyne Valley.
- Millmount Cultural Quarter. The quarter offers a wide-ranging experience including the museum, martello tower and an array of craft shops, artists' studios and a café.
- Several trails and walks, e.g. Boyne Valley Trails, Urban Art Trail, Historic Walking Tours through Drogheda Town.
- Boyne Boats. Guided tours across the River Boyne and Boyne canal, combining historical facts, myths and legends with a modern boating experience.
- County Louth Golf Club.
- Leisure Centre, Waterpark and Theme Park

Study Area 2: County Louth

Tourism in County Louth is an important industry based on its unspoilt natural environment, rich and varied heritage, and numerous cultural attractions. The county has many picturesque towns and villages, tranquil countryside, beautiful coastline, visitor attractions. Drogheda is recognised as the gateway to the Boyne Valley Region and has significant tourism potential both within and beyond the town. Louth has a selection of festivals and various activities which take place throughout the year which attract tourists from across the country and further afield. County Louth includes an array of tourism amenities and attractions, which span the entire county, from the Mourne /Cooley/ Gullion to the Boyne Valley Region.[16]

[16] Louth County Development Plan 2021 - 2027 Chapter 6 Tourism https://www.louthcoco.ie/en/publications/development-plans/louth-county-development-plan-2021-2027/chapter-6-web-.pdf [Accessed: 24/09/2024]

The Boyne Valley tourism region of County Louth and Meath contains the greatest concentration of national heritage assets in Ireland. The area is home to the Brú na Bóinne UNESCO World Heritage site. A strategy (Boyne Valley Tourism Strategy 2016-2020) was developed to identify key projects that will act as a stimulus for tourism development and support the Boyne Valley tourism brands growth.

Besides the many areas of outstanding natural beauty and areas of high scenic quality, there are several archaeological sites and monuments including Mellifont Abbey and the Tentative World Heritage Site of Monasterboice across the County.

In addition to the above touristic attractions, County Louth offers a number of other opportunities:

- Dundalk Stadium
- Inland and sea fishing
- High quality range of independent and multi-national retailers
- Excellent hotels and conference facilities
- Arts, crafts and food festivals
- Places of recreation including cinemas, pubs, restaurants and theatres
- Ornithological opportunities.

Study Area 3: County Meath

County Meath has much to offer as a tourist destination, in particular its rich heritage, quality rural landscape, attractive towns and villages, and its appealing coastline. Tourism and recreation are noted as key sectors in both the economic and social development of the County, providing opportunities for employment and wealth generation, and also facilities and infrastructure that enhance the quality of life for residents.[17]

"The Boyne Valley is identified as the birthplace of Ireland's Ancient East and the County in particular is the gateway to this destination, with its unique collection of pre-historic sites and monuments in particular the Brú na Bóinne UNESCO World Heritage Site. The County is marketed by Fáilte Ireland as a destination to tell the story of Ireland through a diverse range of authentic and exciting visitor experiences."[18]

[17] Meath County Development Plan 2021 – 2027 Volume 1 Volume 1 Written Statement .pdf (meath.ie)https://www.tipperarycoco.ie/sites/default/files/Volume 1 Written Statement.pdf [Accessed: 12/09/2024]
[18] Meath County Development Plan 2021 – 2027 Volume 1 Volume 1 Written Statement .pdf (meath.ie)https://www.tipperarycoco.ie/sites/default/files/Volume 1 Written Statement.pdf [Accessed: 12/09/2024]

Newgrange, Knowth and Dowth Megalithic Passage Tombs, located in County Meath c. 10.2km southwest of the Proposed Development, form the Boyne Valley Mounds (Brú na Bóinne) which were built around 3,200BC. Newgrange is best known for the illumination of its passage and chamber by the winter solstice sun. Knowth has two passages and is surrounded by seventeen satellite cairns. Dowth, the Fairy Mound of Darkness, also has two shorter passages, however, it has experienced significant damage and is inaccessible to the public. The passages have clear astronomical alignments, and it is likely that these temples were places of astrological, spiritual, religious and ceremonial importance.

Tourism: Numbers and Revenue

Study Area 2 and 3: County Louth and County Meath

The national tourism promotion board Fáilte Ireland oversees both national and regional tourism development and monitors key tourism performance indicators in each of the Irish regions; Counties Louth and Meath are categorised as being part of the Mid East/Midlands Region, which includes the Counties of Kildare, Laois, Longford, Meath, Offaly, Westmeath and Wicklow. Regional tourism performance figures for 2019 show the Mid East/Midlands Region overseas tourist numbers totalled 954,000 and tourist revenue from overseas visitors accounted for €348,000,000 in the region. Domestic visitors from Ireland and Northern Ireland accounted for 1,682,000 visits to the region in 2019, with €292,000,000 in revenue generated from domestic visitors[19]. The Brú na Bóinne sites attract 200,000 visitors per year.

5.3.5.3 Tourist Attitudes to Windfarms

The first wind farm in Ireland was completed in 1992 at Bellacorrick, County Mayo and since then wind farms have elicited a range of reactions from Irish people (Failte Ireland, 2012). In 2012, 91% of overseas holidaymakers to Ireland rated scenery as an important part of a destination with natural/unspoilt environment also rated highly at 91%. The future sustainability of Ireland's tourism industry is therefore inextricably linked to the maintenance of the character and scenic qualities of the Irish landscape.[20] Furthermore, Fáilte Ireland carried out research on Overseas Holidaymakers Attitudes to Ireland in 2018. Responses

[19] Key Tourism Facts 2019, Failte Ireland, March 2021, https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/KeyTourismFacts_2019.pdf?ext=.pdf, [Accessed 28/08/2024]

[20]Failte Ireland, 2012, Visitor Attitudes On The Environment – Wind Farms Available at: https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/WindFarm-VAS-(FINAL)-(2).pdf?ext=.pdf [Accessed 28/08/2024]

showed that holiday makers choice is based largely on '*beautiful scenery* (93%), followed closely by *plenty to do and see* (91%) and *friendly people* and *natural attractions* (88%)'[21].

Fáilte Ireland Surveys 2007 and 2012

A study carried out by Fáilte Ireland, in association with the Northern Ireland Tourist Board (NITB), in 2007 surveyed both domestic and overseas holidaymakers to Ireland to determine their attitudes to wind farms[22]. In 2007, there were 67 wind farms connected to the national grid. The survey drew on many aspects of an earlier SEAI survey (carried out in 2002) including the photomontages of wind farms, and in particular, the landscape types that were used to elicit a reaction from respondents. The purpose of the survey was to assess whether or not the development of wind farms would impact on the visitors' enjoyment of Irish scenery. In 2012, this research was updated by Millward Browne Landsdowne on behalf of Fáilte Ireland to determine if there was any change in visitor attitudes during this period[23].

The 2012 research carried out on behalf of Failte Ireland to update/ compared to the findings of the 2007 research,[24] indicated that 47% of visitors felt an increased positive impact on landscape, compared to 32% in 2007. Negative responses also increased, showing 30% in 2012 against 17% in 2007. However, 49% of visitors felt that wind farms had no impact on the landscape in 2007 in comparison to 23% in 2012. It was notable that those interviewed who did not see a wind farm during their trip held more negative perceptions and opinions on wind farms to those that did. Of the wind farms viewed, the majority (59%) contained less than ten turbines in 2012, which was quite similar to 2007 (63%). Despite the fact that there has been an increase in the number of visitors who have seen at least one wind farm on their holiday, there was also a slight increase (from 45% in 2007 to 48%) in the number of visitors who felt that this had no impact on their sight-seeing experience. Importantly, and as has been seen in the previous research, the type of landscape in which a wind farm is sited can have a significant impact on attitudes. Although 21% feel that wind farms have a

[21] Failte Ireland, 2018, Overseas Holidaymakers' Attitudes to Ireland 2018, Available at: https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/Overseas-Holidaymakers;-Attitudes-to-Ireland-2018.pdf?ext=.pdf [Accessed 28/08/2024]

[22] Failte Ireland, 2008, Visitor Attitudes On The Environment – Wind Farms Available at: https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/Visitor-Attitudes-on-the-Environment.pdf?ext=.pdf [Accessed 28/08/2024]

[23] Millward Browne Landsdowne 2010, Visitor Attitudes Survey 2010 Executive Summary https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/Visitor-Attitudes-Survey-Exec-Summary.pdf?ext=.pdf [Accessed 28/08/2024]

[24] Failte Ireland, 2012, Visitor Attitudes On The Environment – Wind Farms Available at: https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/WindFarm-VAS-(FINAL)-(2).pdf?ext=.pdf [Accessed 28/08/2024]

fairly or very negative impact on sight-seeing, this figure increases substantially for wind farms in coastal areas (36%).

In this study, visitors were again asked to rate the beauty of five different yet typical Irish landscapes: coastal, mountain, farmland, bogland and urban industrial land, and then rate the scenic beauty of each landscape and the potential impact of siting a wind farm in each landscape. As in 2007, the results indicate that each potential wind farm and site must be assessed on its own merits, due to the scenic value placed on certain landscapes by the visitor and the preferred scale/ number of wind turbines within a wind farm. Looking across all landscapes, wind farms are seen to have an enhancing effect on the landscapes seen as less beautiful, particularly urban/ industrial and bogland.

Coastal areas (91%) followed by mountain moorland (83%) and fertile farmland (81%) continue to be rated as the most scenic, and unsurprisingly resistance is greatest to wind farms in these areas. For instance, there was a greater relative negativity expressed about potential wind farms on coastal landscapes (40%), followed by fertile farmland (37%) and mountain moorland (35%). On the other hand, less than one in four were negatively disposed to the construction on bogland (24%) or urban industrial land (21%). The majority of visitors also still favour large turbines (47%) over small turbines (28%), and in smaller numbers, with the option of five turbines proving the most popular, followed by two clusters of ten and finally wind farms of 25 turbines.

Seven out of ten (or 71%) visitors claim that potentially greater numbers of wind farms in Ireland over the next few years would have either no impact or a positive impact on their likelihood to visit Ireland (**Graph 4.1**). Of those who feel that the potentially greater number of wind farms would impact positively on future visits, the key driver is support for renewable energy, followed by potential decreased carbon emissions. Given the scenario where more wind farms will be built in Ireland in the future, the most widely held view is that this will not impact their likelihood to visit the area again, with a slightly greater majority saying that this would have a positive rather than a negative impact.

Wind Farms & Tourism Trends

In 2021, BiGGAR Economics published research findings, on research carried out in Scotland on 44 wind farms and tourism trends[25]. This research also re-examined 28 wind

[25] BiGGAR 2021, Wind Farms & Tourism Trends in Scotland: Evidence from 44 Wind Farms, Available at: https://biggareconomics.co.uk/wp-content/uploads/2021/11/BiGGAR-Economics-Wind-Farms-and-Tourism-2021.pdf [Accessed 28/08/2024]

farms constructed between 2009 and 2015 that had been analysed in a previous study by BiGGAR Economics published in 2017, finding that the localities in which they were based had outperformed Scotland and their local authority areas in the majority of cases. This research has analysed trends in tourism employment in the localities of the 44 wind farms developed in recent years, providing a substantial evidence base. The study found no relationship between tourism employment and wind farm development, at the level of the Scottish economy, across local authority areas nor in the locality of wind farm sites.

5.3.6 Public Perception of Wind Energy

SEAI National Survey 2022

Several studies to assess the public perception and visitor perception of wind farms have been carried out over the last 2 decades. The most recent of these studies, was carried out in 2022, by Sustainable Energy Authority of Ireland (SEAI). In-person doorstep interviews were conducted across all of rural Ireland, encompassing 1,764 households. This included 1,116 households within 5km of a new commercial wind or solar project sites, of which 219 live within 1km of a project site[26]. The results indicated very positive views and strong support for Wind Farms in Ireland, in summary:

- 67% of respondents hold positive or very positive views towards wind energy
- 73% of respondents who live <1km of a Renewable Electricity Support Scheme 1 (RESS1) wind project hold positive or very positive attitudes towards wind energy,
- 59% of respondents feel Ireland has too few wind farms
- 65% of respondents <1km from a RESS1 wind project feel Ireland has too few wind farms
- Few respondents feel Ireland has too many wind farms, regardless of how close they live to a new wind farm

IWEA Interactions Opinion Poll on Wind Energy

Interactions Research have conducted omnibus research commissioned by Wind Energy Ireland (WEI), formerly the Irish Wind Energy Association (IWEA), in October 2017, November 2018, November 2019 and again in November 2020 with the objective to *"measure & track perceptions and attitudes around wind energy amongst Irish adults."*

[26]SEAI, 2023 Irish national survey of households near new commercial wind and solar farms, Available at: https://www.seai.ie/publications/SEAI-RESS-National-Survey.pdf [Accessed 28/08/2024]

The most recent survey, conducted online in November 2020 and published in January 2021[27] sampled a representative sample of 1,004 Irish adults nationwide, together with a supplementary booster sample of 203 rural dwellers. The key findings from the survey included:

- 82 per cent in favour of wind energy with 50 per cent strongly in favour
- Opposition to wind energy at 4 per cent
- Majority in rural Ireland – 52 per cent – would support a wind farm in their area while opposition is at 15 per cent.
- The top five reasons for supporting wind energy were identified as:
  - Good energy source
  - Good for the environment
  - Creates jobs.
  - No reason to be against wind energy.
  - Cheaper energy.

As a result of the ongoing research, trends in the attitudes of windfarms over the past four years can be assessed. The survey showed that the trend in attitude amongst the nationally representative sample is increasingly positive. Despite very consistent overall satisfaction, some movement can be seen over time within the rural sample from being 'strongly in Favour' towards 'tending to favour' wind power.

Public acceptance of new renewable electricity survey 2021

A study was carried out to survey Irish public opinion, specifically in relation to wind farms and their associated grid connections[28]. The study found that over 75% of the people surveyed are positively disposed to wind turbines but just 36% are willing to accept the development of wind farms within 5km of their homes. The findings of these results are encouraging from a tourism perspective as many tourists who visit Louth are from the domestic market which accounted for 366,000 visits in 2022[29]. Per the findings of the referenced study, over three quarters of participants are positively disposed to windfarms in Ireland. Interpreted on a broader level the results of the study would appear to suggest the development of windfarm infrastructure in County Louth is unlikely to have a significant impact from a tourism related perspective.

[27] https://windenergyireland.com/images/files/2032-wei-version-2020-for-media.pdf [Accessed: 15/08/2024].
[28] Public acceptance of renewable electricity generation and transmission network developments: Insights from Ireland, Manuel Tong, Koecklin,GenaroLongoria, Desta Z.FitiwiabJoseph, F.DeCarolisc, JohnCurtis , Energy Policy, Volume 151, April 2021, 112185
[29]Irish Resident Travel by County 2022, May 2023 https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/Publications/domestic-trips-and-revenue-by-county-2022.pdf?ext=.pdf [Accessed: 15/08/2024].

The study results indicate there are regional variations in preferences. The results showed, the highest share of outright opposition to wind farms is in the Midlands, at 21% of respondents, and the lowest is in the Border region at 9%. The opposition to new transmission lines is highest at 44% in the South-West and lowest in the West at 18%. In respect to Kellystown Wind Farm, the grid connection is to be accommodated within the public road infrastructure as recommended per the ESBN functional specifications for the installation of 38kV underground power cables for contestable projects[30].

5.3.7 Human Health

Common concerns around wind farms in terms of human health are generally associated with electromagnetic fields, shadow flicker and noise. These topics are considered in this EIAR in addition to air quality and water contamination in **Chapters 11: Hydrology and Hydrogeology, Chapter 13: Noise** and **Chapter 17: Shadow Flicker.**

5.3.7.1 General Health of Population

Human health of communities can vary greatly owing to a number of factors including susceptibility to disease, location, income inequality, access to health care etc. In 2019 the Department of Health published "Health in Ireland – Key Trends 2019" which shows population health at the national level presents a picture of decreasing mortality rates and high self-perceived health over the past ten years. Ireland has the highest self-perceived health status in the EU, with 82.9% of people rating their health as good or very good.

The 2016 census data for the general health of the national population (Study Area 4), and 2022 census data for the Study Area 1 to Study Area 3 inclusive, were used as shown in **Table 5.4**. These statistics indicate a "Very Good" or "Good" health status of 82-90% across all of the study areas, the highest being 90% in the ED area of Mullary and the lowest being 82% in County Louth. The "Very Good" health status for County Louth at 52% is below the national average of 60%, while the status of County Meath at 57% is closer to the national average.

[30] FUNCTIONAL SPECIFICATION FOR THE INSTALLATION OF 38KV UNDERGROUND POWER CABLES FOR CONTESTABLE PROJECTS Network Assets, Underground Networks SPEC-171213-AXS , Dan Giustini/ESBi [Accessed: 12/09/2024]

Table 5.4: Population by General Health

General Health	Study Area 1: Mullary (CSO, 2022)	Study Area 1: Clogher (CSO, 2022)	Study Area 2: County Louth (CSO, 2022)	Study Area 3: County Meath (CSO, 2022)	Study Area 4: Ireland (CSO, 2016)
	Percentage (%)				
Very good	64	57	52	57	60
Good	26	30	30	30	28
Fair	6	8	10	8	8
Bad	1	1	2	1	1
Very bad	0	0	0	0	0
Not stated	2	3	7	4	3

5.3.7.2 Electromagnetic Interference

Electromagnetic fields ("EMF") are invisible lines of force that surround electrical equipment, power cords, wires that carry electricity and outdoor power lines. Electric and magnetic fields can occur together or separately and are a function of voltage and current. When an electrical appliance is plugged into the wall, an electric field is present (there is voltage but no current); when that appliance is turned on, electric and magnetic fields are present (there is both voltage and current). Both electric and magnetic fields decrease with distance. Electric fields are also dissipated by objects such as building materials. On a daily basis, people are exposed to extremely low frequency ("ELF") EMF as a result of using electricity.

National and international health and scientific agencies have reviewed more than 35 years of research including thousands of studies. None of these agencies has concluded that exposure to ELF-EMF from power lines or other electrical sources is a cause of any long-term adverse effects on human, plant, or animal health. The International Commission on Non-Ionising Radiation Protection (ICNIRP) Guidelines give a limit of 100 µT for sources of AC magnetic fields. This compares to 0.13 µT that arises from a 110 kV underground cable when directly above it; 1.29 µT that arises from a 220 kV underground cable when directly above it and 11.4 µT that arises from a 400 kV AC underground cable that is one metre deep and measured directly above it. This is detailed in information booklet published by

ESB in 2017 called "EMF & You" which provides information about Electric & Magnetic Fields and the electricity network in Ireland[31].

This indicates that any baseline EMF in the receiving environment from existing cable and electrical infrastructure is minimal.

5.3.7.3 Shadow Flicker

Shadow Flicker is the effect caused by the sun shining behind the rotating blades of a turbine relative to a nearby sensitive receptor which causes a momentary shadow on a window of that sensitive receptor. Currently there are no turbines in place at the proposed Wind Farm site. As the nearest windfarm is over 11km from the Wind Farm Site, there are no potential Shadow Flicker issues in the vicinity of the Wind Farm Site.

5.3.7.4 Noise

The main source of noise from the receiving environment is from Kilsaran Quarry. The quarry is located within the vicinity of the Wind Farm Site, with the nearest quarry boundary being approximately 100m from the closest proposed turbine location. The quarry lies within Study Area 1, with the southern part lying within the ED of Mullary and the northern part lying within the ED of Clogher. For the prevention of noise pollution, the planning conditions (specified in the notification of grant of permission from Louth County Council, dated 27/11/2022) for the operation of Kilsaran Quarry specified that noise shall;

- Not exceed 55 dBA (30 minutes LAR) when measured at the nearest noise sensitive receptor, between 08:00 hours and 18:00 Monday to Friday and 08:00 hours and 14:00 hours om Saturdays.
- Not exceed 45dBA (15-minute LAR) at any other time.
- Blasting operations (which generate the most noise) are only permitted to take place between 11:00 hours and 17:00 Monday to Friday.

Note: LAR: The Rated Noise Level, equals to the LAeq during a specified time interval (T). Baseline noise of the receiving environment has been discussed in **Chapter 13: Noise and Vibration**.

[31] EMF & You, ESB, 2017 - https://esb.ie/docs/default-source/default-document-library/emf-public-information_booklet_v9.pdf?sfvrsn=0, [Accessed: 12/09/2024]

5.3.7.5 Air Quality

Environmental Protection Agency (EPA, 2016), EU and World Health Organisation (WHO, 2014) reports estimate that poor air quality accounted for premature deaths of approximately 600,000 people in Europe in 2012, with 1,200 Irish deaths attributable to fine particulate matter ($PM_{2.5}$) and 30 Irish deaths attributable to Ozone (O_3)[32] [33]. A more recent study of air pollution across Europe[34] has shown that despite ongoing overall improvements in air quality, levels of air pollutants above EU standards are seen across Europe and air pollution remains a major health concern for Europeans. Air pollution concentration in 2021 remained well above the levels recommended by the World Health Organization (WHO). A key finding (EEA 2023) indicated that reducing air pollution to the guideline levels would prevent a significant number of attributable deaths in EU Member States (EU-27); 253,000 from exposure to fine particulate matter ($PM_{2.5}$); and 52,000 from exposure to nitrogen dioxide (NO_2). Furthermore, reducing the short-term exposure to ozone (O_3) would have avoided 22,000 attributable deaths. **Chapter 18: Air and Climate** provides a baseline assessment of air quality in the area.

The main source of air pollution from the receiving environment is likely to be from Kilsaran quarry. The location of this quarry in relation to the Wind Farm Site is described in the previous sub- section.

- For the prevention of air pollution, the planning conditions (specified in the notification of grant of permission LCC Reg. Ref. 22190 from Louth County Council, dated 27/11/2023) for the operation of Kilsaran Quarry specified:
- Proposals for the suppression of dust on site and on the access road
- Proposals for the cleaning of the public road.
- Monitoring of air emissions (including a monthly survey of dust and particulate emissions)
- Dust levels at site boundary shall not exceed 350mg per m^2/day averaged over a continuous period of 30 days.

[32] WHO 2014, News release 25 March 2014, Available at: https://www.who.int/europe/news/item/25-03-2014-almost-600-000-deaths-due-to-air-pollution-in-europe-new-who-global-report [Accessed 29/08/2024]

[33] EPA 2016, Irelands Environment An Assessment 2016, Available at: https://epawebapp.epa.ie/ebooks/soe2016/files/assets/basic-html/page-1.html [Accessed 28/08/2024]

[34] EEA 2023, Harm to human health from air pollution in Europe: burden of disease 2023, Available at:https://www.eea.europa.eu/publications/harm-to-human-health-from-air-pollution [Accessed 29/08/2024]

5.3.7.6 Water Contamination

A potential source of water contamination from the receiving environment is from Kilsaran Quarry. For the prevention of water pollution, the planning conditions for the operation of Kilsaran Quarry (in the notification of grant of permission (LCC Reg. Ref. 22190) from Louth County Council, dated 27th November 2023) specified monitoring of ground and surface water quality, levels and discharge, submission of monitoring results to the planning authority on a monthly basis.

Consultation with GSI well database indicates there are no mapped wells within the Wind Farm Site boundary. However, subsequently two springs have been identified in the redline boundary from historical mapping and site visits. Governing industry guidelines stipulate a buffer zone of 250m is required of from boreholes used for drinking water abstraction. None of these springs are used for drinking water, a 100m buffer has been incorporated for the turbine foundations only. The closest mapped wells are more than 1500m from the boundary of the Wind Farm Site.

Chapter 11: Hydrology and Hydrogeology provides an assessment of the baseline water quality conditions of the receiving environment.

5.3.7.7 Traffic

Traffic generated from Kilsaran Quarry is limited to the operational hours of the quarry. Traffic from the quarry will leave the quarry eastward via L-6274 and R132/ M1 and westwards via L-6274, L-2275 and R170. **Chapter 16: Traffic and Transport** provides description/ traffic count at key locations.

5.3.8 Property Value

There is currently only one study within the context of Ireland detailing the effect of wind farms on property values. This section provides a summary of this paper by the Centre for Economic Research on Inclusivity and Sustainable (CERIS), as well as summaries on the largest and most recent studies from the United States and Scotland.

In 2023 CERIS published a working paper entitled '*Wind Turbines and House Prices Along the West of Ireland: A Hedonic Pricing Approach'*.35 This paper looked at wind turbine developments in Donegal, Leitrim, Sligo, Mayo, Galway, Kerry and Cork and associated property values. This working paper utilised satellite imagery to identify individual turbines

[35] Centre for Economic Research on Inclusivity and Sustainability (2023) Wind Turbines and House Prices Along the West of Ireland: A Hedonic Pricing Approach. <https://www.universityofgalway.ie/media/researchsites/ceris/files/WP-2023-01.pdf>

and sourced its housing data from www.daft.ie. In total, this working paper studied 1,342 individual turbines and 90,469 housing listings from www.daft.ie, with an average of 74 houses per studied electrical division. While the published price on Daft is not equivalent to the final agreed sale price, it was assumed that the listing and transaction prices are correlated. The findings demonstrate the rural nature of wind farms in Ireland as the distance from turbine bands (0-5km and 5-15km bands) shows the uneven distribution of houses, with respect to proximity of the nearest turbine, with a limited number of houses within 2-3km of an individual turbine, and even fewer numbers found within 1km of a turbine location. While the results of this study identified a potential negative price effect of -14.7% on property values within 0-1km of a wind turbine, this was only in comparison to houses located between 5-15km distance from the same turbine location and is only seen for properties whose housing listing is updated within 5-10 years of the turbines connection date into the national grid. As well, this effect was found only on a limited subset of studied houses and these effects were not persistent and diminished over the operational lifetime of the turbines.

The largest study of the impact of wind farms on property values has been carried out in the United States. '*The Impact of Wind Power Projects on Residential Property Values in the United States: A multi-Site Hedonic Analysis*', December 2009, was carried out by the Lawrence Berkley National Laboratory (LBNL) for the U.S Department of Energy. This study collected data on almost 7,500 sales of single-family homes situated within ten miles of 24 existing wind farms in nine different American states over a period of approximately ten years. The conclusions of the study are drawn from eight different pricing models including repeat sales and volume sales models. Each of the homes included in the study was visited to demonstrate the degree to which the wind facility was visible at the time of the sale, and the conclusions of the report state that "The result is the most comprehensive and data rich analysis to date on the potential impacts of wind energy projects on nearby property values."

The main conclusion of this study is as follows:

"Based on the data and analysis presented in this report, no evidence is found that home prices surrounding wind facilities are consistently, measurably, and significantly affected by either the view of wind facilities or the distance of the home to those facilities. Although the analysis cannot dismiss the possibility that individual or small numbers of homes have been or could be negatively impacted, if these impacts do exist, they are either too small and/or too infrequent to result in any widespread and consistent statistically observable impact."

This study has been updated by LBNL who published a further paper entitled 'A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States', in August 2013. This study analysed more than 50,000 home sales near 67 wind farms in 27 counties across nine U.S. States yet was unable to uncover any impacts to nearby home property values. The homes were all within 10 miles of the wind energy facilities - about 1,100 homes were within 1 mile, with 331 within half a mile. The report is therefore based on a very large sample and represents an extremely robust assessment of the impacts of wind farm development on property prices. It concludes that: "Across all model Specifications, we find no statistical evidence that home prices near wind turbines were affected in either the post-construction or post announcement/pre-construction periods."

Both LBNL studies note that their results do not mean that there will never be a case of an individual home whose value goes down due to its proximity to a wind farm – however if these situations do exist, they are considered to be statistically insignificant. Therefore, although there have been claims of significant property value impacts near operating wind turbines that regularly surface in the press or in local communities, strong evidence to support those claims has failed to materialise in all the major U.S. studies conducted thus far.

A further study was commissioned by RenewableUK and carried out by the Centre for Economics and Business Research (Cebr) in March 2014. The findings of the study were produced in a report titled 'The Effect of Wind Farms on House Prices' and its main conclusions are:

- Overall, the analysis found that the county-wide property market drives local house prices, not the presence or absence of wind farms.
- The econometric analysis established that construction of wind farms at the five sites examined across England and Wales has not had a detectable negative impact on house price growth within a five-kilometer radius of the sites.

A study issued in October 2016 'Impact of wind Turbines on House Prices in Scotland' (2016) was published by Climate Exchange. Climate Exchange is Scotland's independent centre of expertise on climate change which exists to support the Scottish Governments policy development on climate and the transition to a low carbon economy. A copy of the report is included as Appendix 5-2 of this EIAR.

The report presents the main findings of a research project estimating the impact on house prices from wind farm developments. It is based on analysis of over 500,000 property sales in Scotland between 1990 and 2014.

The key findings from the study are:

- No evidence of a consistent negative effect on house prices: Across a very wide range of analyses, including results that replicate and improve on the approach used by Gibbons (2014), we do not find a consistent negative effect of wind turbines or wind farms when averaging across the entire sample of Scottish wind turbines and their surrounding houses. Most results either show no significant effect on the change in price of properties within 2km or 3km or find the effect to be positive.
- Results vary across areas: The results vary across different regions of Scotland. Our data does not provide sufficient information to enable us to rigorously measure and test the underlying causes of these differences, which may be interconnected and complex.

In September 2023, the Energy Policy Journal published 'Commercial wind turbines and residential home values: new evidence from the universe of land-based wind projects in the United States.'36 This study targeted urban counties in the United Stated with populations over 250,000 persons, and found that on average, after a commercial wind energy project is announced, houses located within 1mile of a proposed wind energy project experience a decrease in value of 11% relative to homes located within 3-5miles of the proposed wind energy project. The decline in property values was found to recover post construction with property value impacts becoming relatively small (~2%) and statistically insignificant 9 years or more after project announcement (roughly 5 years after operation begins). This suggests that the housing market is reacting negatively to the expectation of likely impacts (after announcement) and the heightened activity during construction, but after operation begins, those negative perceptions and related home price impacts appear to fade.

Although there have been no empirical studies carried out in Ireland on the impacts of wind farms on property prices, the literature described above demonstrates that at an international level, wind farms have potential to impact property values in local areas; however, it is important to note that this impact is proven to reduce throughout the operational phase of a wind farm.

[36] Energy Policy (2023) Commercial wind turbines and residential home values: new evidence from the universe of land-based wind projects in the United States. Available at: https://www.sciencedirect.com/science/article/pii/S0301421523004226

It is a reasonable assumption based on the available international literature, that the provision of a wind farm at the proposed location would not impact on the property values in the area.

5.3.8.1 Property Values

As noted in **Section 5.3.8** above, the conclusions from available international literature indicate that the presence of wind farms will result in a short-term imperceptible negative effect on property values. It is on this basis that it can be concluded that there would be a short-term imperceptible negative cumulative impact from the proposed Project.

5.3.9 Major Accidents and Natural Disasters

The baseline condition of the receiving environmental with respect to Major accidents and Natural Disasters has been discussed in a separate chapter, **Chapter 16: Major accidents and Natural Disasters**

5.3.10 Electromagnetic Interference

To gather information on communication networks in the area, the Broadcasting Authority of Ireland, 2rn Broadcasting, Commission for Communications Regulation, Eir Limited, RTE Transmission Network, Tetra Ireland Communications and Vodafone Ireland, were consulted. Responses are found in **Chapter 1: Introduction, Table 1.8:** Scoping Responses Received on The Project.

5.4 ASSESSMENT OF POTENTIAL IMPACTS

As outlined in **Section 5.2.3**, the potential impacts of the Project on the Population and Human Health factors, is measured from the perspective of the receptors. The receptors for this study are habitable dwellings and community area. In this study **sensitive receptors** are those dwellings and amenities/ communities (107 dwellings and 1 school) with 1km of a proposed turbine location and receptors within 100m of GCR works.

Turbine Delivery Route: The active construction areas for the road works along the Turbine Delivery Route outside the redline will involve only surface-level earthworks (removal of soil and unconsolidated rock) and will be temporary in nature. The proposed Turbine Delivery Route works associated with the Proposed Development are **negligible** and will not have any long-term negative effects on the factors considered in this section.

Grid Connection Route: The Grid Connection works associated with the Proposed Development will potentially impact on the Human Health and Population factors considered

within this section, both by means of the construction phase and the operation phase, where general maintenance of the grid connection infrastructure such as Junction Boxes will be carried out when required over the life span of the Wind Farm. For these works, a traffic management plan will be agreed with the Local Authority and access priorities given to local residents where possible. The effect of the proposed Grid Connection works has been included in the assessment of the construction and operational phase of the Proposed Development within the following subsection. Viewed independently however, the Grid works are considered **negative, long-term and not significant/ imperceptible.**

5.4.1 'Do-Nothing' Scenario

If The Project was not to proceed, the existing uses of the site for agricultural practices and commercial forestry would continue. The opportunity to capture a renewable green energy supply would be lost, as would the opportunity to contribute to Ireland's 2050 target of net-zero emissions. The opportunity to generate local employment would also be lost.

5.4.2 Population and Settlement Patterns

The Proposed Development does not contain a housing or services element and is not considered to have any direct positive or negative impact on the local or regional population levels. However, construction workers who are not based locally may temporarily relocate to the region. For the construction and decommissioning phase the impact on the population is considered to be **positive, short-term, not significant/ imperceptible**. For the operational phase, the impact is considered to be **imperceptible** in terms of population.

The settlement patterns and social patterns may be of benefit to the region in terms of the ability to provide electricity to industry and business in a high-quality supply. This will lead to the region becoming more attractive to business with the subsequent benefit of increased employment opportunities in the region. A renewable energy supply could potentially be attractive for companies looking to develop in County Louth and be located in the vicinity of the Site. The predicted effect on the immediate settlement patterns and social patterns during the construction and decommissioning phase is **short-term, slight/ not significant/ imperceptible**. For the operational phase, the impact is considered to be **neutral, long-term, slight.**

The overall impact is considered to be **neutral and imperceptible** in terms of population and settlement patterns.

5.4.3 Economic Activity

During the construction phase, there would be economic effects resulting from the expenditure on items such as site preparation, site Access Roads, purchase and delivery of materials, plant, equipment, and components. Based on information provided by the Developer and on the estimated construction activities expected on this site due to the site size and characteristics, there is expected to be a peak on site workforce of up to approximately 61workers. Some of these workers would be sourced from the local labour market in Study Area 2 and Study Area 3, and professional and skilled personnel may be required to be sourced from areas inclusive of Study Area 4 or even further afield.

It is envisaged that materials will be sourced from the local area during construction where possible (Please refer to subsection 5.4.3.1 for a more detailed description on the embedded measures). Ready-mix concrete and crushed stone will also be sourced from a local supplier, again subject to authorisation, and to quality and quantity being available.

BVG Associates carried out extensive assessments on the economic benefits from eight onshore wind farms in Southwest Scotland[37]. Each contract value was assigned to one or more relevant elements of a supply chain. Capital expenditure (CAPEX) was found to relate to turbine, civil works and electrical works supply chains, whereas the operational expenditure (OPEX) relates to transmission operations, Maintenance and Service (OMS) supply chain, the windfarm OMS and also the decommissioning supply chain.

Based on this research and the largest capacity being installed, the CAPEX for the Proposed Development is estimated to be approximately € 81- 109 million. This expenditure will result in economic benefit at a national, regional and local level. The OPEX (based on a conservative 24-year period) in nominal terms is estimated to be €105 million. The BVG report found, for the eight projects studied, that 66% of the total project spend (CAPEX & OPEX) was retained within the National economy, 17% of the total was retained in the local region hosting the project.

Louth County Council will benefit from payments under both the Proposed Development Contribution Scheme and from the annual rate payments. The Applicant is also committed to a 'Community Benefit Fund'. The Community Benefit Fund belongs to the local community. The premise of the fund is that it should be used to bring about significant, positive change in the local area. To make this happen, the first task will be to form a benefit

[37] Economic Benefits from onshore wind farms, September 2017, BVG Associates [Accessed 24/09/2024]

fund development working group that clearly represents both the close neighbours to the project as well as nearby communities. This group will then work on designing the governance and structure of a community entity that would administer the Community Benefit Fund. The types of projects and initiatives that could be supported by such a Community Benefit Fund could include youth, sport and community facilities, schools, educational and training initiatives, and wider heritage, and environmental projects. The number and size of grant allocations will be decided by a Community Fund liaison committee with various groups and projects benefiting to varying degrees depending on their funding requirement, further details can be found in **Appendix 1.4 Community Report**.

During the construction and decommissioning phase of the Proposed Development, the overall impact is predicted to be **positive, moderate and short-term** impact and **positive, moderate and long-term** during the operational phase.

The overall impact is considered to be **positive and moderate** in terms of economic activity.

5.4.3.1 Embedded measures

The Developer has a long track record of developing renewable energy projects and experience from previous wind farm construction projects is that expenditure in local goods and services is widely spread and makes a difference to existing businesses. The Developer is committed to employing good practice measures with regard to maximising local procurement and will adopt measures such as those set out in the 'Renewable Energy Good Practice Guide', (2023)[38] and 'Local Supply Chain Opportunities in Onshore Wind' (2014)[39].

The Developer will work with a variety of contractors who will be actively encouraged to develop local supply chains throughout the local area, and work with subcontractors to invest in training and skills development.

At this stage in the development process, it is not possible however, to quantify economic benefits in respect of individual supply chain companies, as contracts would not be let until consent is granted. Though, it is expected, on the basis of previous renewable

[38] Local Partnerships 2023 Renewable Energy Good Practice Guidance 2023 https://www.local.gov.uk/publications/renewable-energy-good-practice-guidance-2023 [Accessed 02/09/2024]
[39] Renewables UK, 2014 Local Supply Chain Opportunities in Onshore Wind https://www.renewableuk.com/news/304404/Local-Supply-Chain-Opportunities-in-Onshore-Wind.htm [Accessed 02/09/2024]

developments in Ireland that local and regional suppliers of a wide range of goods and services will benefit from such a development (in this case, Louth and Ireland as a whole).

5.4.4 Employment

In addition to the economic benefits outlined in the previous section, there will be employment effects that are attributable to the Proposed Development. These will be direct, indirect and induced throughout the phases of the Proposed Development.

Direct: Employment and other economic outputs that are directly attributable to the delivery of the Proposed Development. These include any new jobs that are created to manage and supervise the construction phase, operational and decommissioning phases of the Proposed Development and that are filled by employees of the Developer or the appointed Contractor (or sub-contracted employees).

Indirect: Employment and other outputs created in other companies and organisations that provide services to the Proposed Development, (i.e. procurement and other supply chain effects). Most manufactured materials like towers, blades and subcomponents are assumed to be imported (import intensity of 66%) with major infrastructure delivery through Galway Port; fewer indirect manufacturing jobs will be generated domestically in Ireland.

Induced: Additional jobs and other economic outputs that are created in the wider economy, as a result of the spreading employee incomes and other ripple effects that occur as a result of the direct and indirect effects of the Proposed Development.

The Proposed Development will create local employment opportunities throughout the construction, operational and decommissioning phases. These opportunities include local contractors being employed, local suppliers being sourced when possible and employment due to increased activity in local businesses, such as restaurants, hotels and accommodation, shops and delicatessens.

Sustainable Energy Authority of Ireland (SEAI) researched the flow of investment and sales revenue from onshore wind and the transmission grid through the different industrial sectors in the supply chain required for input–output macro-analysis (**Table 5.5**).

Table 5.5: Capital Investment breakdown for onshore wind supply (Source SEAI, 2015)

€192 million average annual capital investment to reach 2020 NREAP/NEEAP targets	**Industrial Sectors**
	Manufacturing (70%): turbines, blades, towers, gearbox, generator, electrical equipment, transformer etc.
	Construction (12%)
	Electricity Supply Services (10%)
	Transport (2.5%)
	Finance (2.5%)
	Professional Services (3%)

In terms of its capacity to capture capital investment domestically, Ireland has strong indigenous feasibility, planning, foundations, and engineering expertise, with the skills and knowledge base to potentially supply niche markets in controls and instrumentation, albeit the bulk of heavy manufacturing (blades, towers) is imported. Similarly, the Irish supply chain is very well positioned in all of the preliminary design and operational aspects of the electricity grid, providing a significant boost to local employment. However, some manufactured materials such as cables, underground pipes, insulators, and conductors are sourced from abroad.

According to SEAI, there are approximately 0.34 new long-term jobs per MW, which falls in line with European Wind Energy Association (EWEA) estimates for direct employment in Europe. In the case of the Proposed Development, this translates to 10-12 new long-term jobs for a 28.5-36MW powered installation.

According to Institute for Sustainable Futures document (2015)[40], 3.2 jobs are created per MW of wind energy development during the construction and installation phase, the report assumes a 2-year construction period. Based on this employment estimate and an approximate two-year construction phase, between 44 and 61 jobs could be created during the construction phase (although the capacity of the Project is not fixed, this is based on an estimate of a range of likely capacity of between 28.5-36MW).

[40] Institute for Sustainable Futures, Calculating Global Energy Sector Jobs – 2015 Methodology Update, 2015. Available:https://opus.lib.uts.edu.au/bitstream/10453/43718/1/Rutovitzetal2015Calculatingglobalenergysectorjobsmethodology.pdf [Accessed 24/09/2024]

According to the European Wind Energy Association's (EWEA) Report 'Wind at Work' (2009)[41], 1.2 jobs per MW are created during installation of wind energy projects based on 1 year construction period. Using this figure, a projection of between 34 and 43 jobs could be created as a result of the construction of the Proposed Development (although the capacity of the Project is not fixed, this is based on an estimate of a range of likely capacity between 28.5-36 MW and a construction period of 2 years).

The Sustainable Energy Authority of Ireland' 2015 report 'A Macroeconomic Analysis of Onshore Wind Deployment to 2020'[42] puts direct construction jobs from wind farm developments at 1.07 jobs per MW based on 1 year of construction. Using this figure, a projection of between 30 and 39 jobs could be created as a result of the construction of the Proposed Development (although the capacity of the Project is not fixed, this is based on an estimate of a range of likely capacity between 28.5 – 36MW).

Therefore, considering the estimated construction periods and possible capacity range', it is estimated that between 44 and 61 direct and indirect jobs could be created during the construction phase of the proposed project. It is not expected that all of these jobs will be based at the wind farm Site, however, the employment of tradespeople, labourers, and specialised contractors for the construction phase will have a direct, short-term significant, positive impact on employment in the study area.

An estimated breakdown of the potential construction employment is as follows:

Table 5.6: Estimated Employment breakdown during the construction phase of the Proposed Development

Occupation/Task	No. of People	Employment Period
Foundation team	8	12 weeks
Tracks & Hardstands (truck drivers)	8	36 weeks
Plant drivers	4	45 weeks
Foreman	1	50 weeks
Engineer	1	50 weeks
Engineer	2	10 weeks
Electrical Substation (Civils)	10	10 weeks

[41] European Wind Energy Association (EWEA) (2009), Wind at Work, - Wind Energy and Job Creation in the EU, Available at: http://www.ewea.org/fileadmin/files/library/publications/reports/Wind_at_work.pdf [Accessed 24/09/2024]

[42] Sustainable Energy Authority Ireland (SEAI) (2015), A Macroeconomic Analysis of Onshore Wind Deployment to 2020. Available at: https://www.seai.ie/publications/A-Macroeconomic-Analysis-of-Onshore-Wind-Deployment-to-2020.pdf [Accessed 24/09/2024]

Occupation/Task	No. of People	Employment Period
Electrical Substation (Electrical)	9	16 weeks
Foreman	2	16 weeks
Turbine Delivery, Installation and Commissioning	10	8 -10 weeks
Turbine Commissioning	3	8 weeks
General operatives	3	45 weeks

As outlined in **Table 5.6**, 44 and 61 direct are estimated to be employed during the peak of the construction phase of civil engineering of access roads, crane hardstand, turbine foundation, and substation construction. These numbers will be less for the turbine delivery, assembly and commissioning activities. A mixture of skills will be required, including unskilled/semi-skilled/skilled manual (construction labour and machine operators), non-manual (administration roles), managerial and technical (civil, electrical, mechanical technical and engineering) and professional roles (legal, business and accounting). The manual roles will be Site-based with the other roles being predominately office-based, with Site visits as and when required. During construction, personnel will be at the Site over a number of months and during these times will likely use local accommodation and restaurants and other facilities.

The benefits of increased business, although temporary, can allow businesses to invest in improvements that would not otherwise be affordable, leading to a long-term enhancement.

Whilst overall effects on the tourism economy are considered to be negligible and not significant, the benefits to individual businesses will be substantial and significant.

The Proposed Development will create approximately 10-12 jobs during the operational phase, across several disciplines. During the operation phase of the wind farm, the operation and reliability, maintenance (turbines, civil works and electrical infrastructure) finance, ongoing compliance with permissions and permits, safety, security, community relations and benefits and land-owner agreements must be continually managed. These requirements are widely distributed over various employment sectors and are an integral part of the ongoing operation of the Proposed Development and will provide continuous employment for the lifetime of the wind farm. A general outline of the employment associated with the operational phase of the wind farm is outlined in **Table 5.7.**

Table 5.7: Parties involved during the operational phase[43]

Maintenance Contracts	Financial and Services Contracts	Other Stakeholders
Project Manager	Lenders	Local Community
Asset Management	PPA Provider	Local Authority (incl. rates payments)
Turbine Contractor • Transport Companies • Crane Hire • Plant and Vehicle Hire • Site Facilities	Landowner contractual agreements	Construction and Maintenance material suppliers: • Local shops • Food providers • Accommodation providers
Electrical Works Contractor	Insurance	Plant Hire companies
Civil Works Contractor	Accountancy	Telecom provider
Utility	Safety Consultants	
	Community Liaison Officer	
	Environmental Monitoring • Noise • Ornithology • Habitat Management	

The persons fulfilling these roles may live and work anywhere in Ireland, visiting the Site as and when required, to operate and maintain the plant and equipment. During major service operations, personnel may be at the Site over several days and during these times may use local accommodation and restaurants.

The impact is predicted to be a **moderate, positive, short-term** impact during the construction and decommissioning phase of the Proposed Development and **slight, positive long-term** during the operational phase.

Overall, there is expected to be a **slight, positive, long-term** impact on employment in the area.

5.4.5 Land Use and Topography

The majority of existing land use in the environs of the Wind Farm Site is agriculture, tillage and commercial forestry, Exposed Rock/ Disturbed Ground (Kilsaran Quarry) and one-off dwellings and ribbon development. The Proposed Development will result in a change of land use. To facilitate the construction of access tracks, civil works and turbine hardstands

[43] Irish Wind Energy Association (2019) *Life-cycle of an Onshore Wind Farm.* Ionic Consulting. Available online at: https://www.iwea.com/images/files/iwea-onshore-wind-farm-report.pdf [Accessed 24/09/2024]

and to implement the required ecological buffers, 9.39 ha of forestry will need to be permanently clear-felled, subject to a felling licence. The rest of the Wind Farm Site is currently predominantly used for agricultural. There will be no impact on land use outside the redline boundary (including Kilsaran Quarry). There will be no long-term impact on the TDR. Similarly, there will not be any long term impact on the GCR, as it is outside the Wind Farm Site the GCR will remain as road. Prior to the grid connection installation works within public roads, it is proposed that all access points (domestic, business, farm) are considered when finalising the temporary road closures and diversions to maintain local access as much as possible and avoid impacts on various land uses.

New afforestation area outside the ecological zone of Influence of the Proposed Development will be identified. An afforestation licence will be required to this ensure the afforested lands are identified, assessed and licenced appropriately by the relevant consenting authority.

The impact is predicted to be **negative, long-term and slight** throughout construction, operational and decommissioning phase of the Proposed Development.

With reference to **Chapter 10: Soils and Geology**, isolated areas of moderately high landslide susceptibility indicated by the mapping database midway between WTG03 and WTG04. A review of local ground slopes within the landholding indicates that the isolated moderately high susceptibility coincides with steeper slopes associated with outcropping rock. The isolated areas of cut-over peat coincide with slope gradients of <5 degrees to the horizontal and landslide susceptibility of low / moderately low. An Emergency Response Plan has been included in **Appendix 2.1: Construction Environmental Management Plan**.

5.4.6 Tourism

Fáilte Ireland published guidelines in 2011 for the treatment of tourism in an EIAR, which describes the effects of projects on tourism. Many of the issues covered in the report are similar to those covered in this EIAR, for example, scenery is assessed in **Chapter 12: Landscape and Visual Amenity**.

Fáilte Ireland published a study on 'Visitor Attitudes on the Environment' in 2012[44] to assess the perceived impacts of windfarms on potential future visits to an area. The study found that 12% of those surveyed, responded that windfarms would have 'a strong positive impact' on their decision to visit Ireland, with 27% responding it would have a 'slight positive impact', whilst 38% said it would have 'no impact'. 7% of respondents stated it would have a 'strong negative impact' and 15% stated it would have a 'slight negative impact'. The survey also found that windfarms were noted as more favourable than other forms of development such as housing, mobile phone masts or electricity pylons.

Based on historical examples and findings of the BiGGAR Economics report (mentioned in Section 5.3.5.3) there is not expected to be any direct relationship between the tourism sector growth and this development.

A small section of the forestry track (413m) is located on site at T01 this section of track has public access, during the construction and decommissioning works along this section will take up to several weeks to complete. Temporary closure for a small section of this route is required. Pedestrian access will be maintained where possible during the construction and decommissioning phases of the wind farm. The forest track will benefit from improved tracks, information boards and waymarking. Due to the small-scale and temporary nature of the works there will be a **short-term, slight, negative impact** on tourism during the construction and decommissioning phases.

The Boyne Valley tourism region of County Louth and Meath contains Brú na Bóinne UNESCO World Heritage site. A Heritage Impact Assessment was undertaken June 2025 **Appendix 15.4** to assess the potential impact of the development on the site. The assessment concluded that the Proposed Development would result in a negligible degree of change to two attributes of the World Heritage Property ("Views into and out of the property" and "Ambiance of the ritual centre") resulting in a **minor negative impact** on OUV. Further details are outlined in **Appendix 15.4.**

Based on the findings of the collective assessments, it is considered that the Proposed Development will not give rise to any significant effects. Due to the results from the Heritage Impact Assessment, the overall effects of the Proposed Development with regards to tourism are considered to be **short-term, slight, negative** during both construction and

[44] Fáilte Ireland (2012) Visitors Attitudes on the Environment – Wind Farms - https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/WindFarm-VAS-(FINAL)-(2).pdf?ext=.pdf [Accessed 24/09/2024]

decommissioning phases and **long-term**, **slight** ~~**positive**~~ **negative** impact during operation. This is a slight change from the previous assessment carried out in the original EIAR.

5.4.7 Human Health

5.4.7.1 Electromagnetic fields

In 2014 a study was undertaken in Canada[45], measuring electromagnetic fields around wind farms and the impact on human health. The study found that:

"there is nothing unique to wind farms with respect to EMF exposure; in fact, magnetic field levels in the vicinity of wind turbines were lower than those produced by many common household electrical devices and were well below any existing regulatory guidelines with respect to human health".

As outlined in section 5.3.7.2, the International Commission on Non-Ionising Radiation Protection (ICNIRP) Guidelines give a limit of 100 µT for sources of AC magnetic fields. Given the limit of 100 µT for sources of AC magnetic fields, a comparison of between 0.02 µT and 0.41 µT arises when turbines operate under "high wind" scenarios, indicating that electromagnetic activity from wind turbines are extremely low. Refer to section 5.4.7.8 (Health Impact studies), which includes references to effects of Electromagnetic fields on Human Health.

Electromagnetic fields from other sources will also occur during the construction, operation and decommissioning of the Kellystown Wind Farm. Sources include power tools used during construction and decommissioning and from wind farm infrastructure, including the Grid Connection and Electrical Substation. These EMFs are very localised and are considered to have an **imperceptible, negative and short-term** effect during the construction and decommissioning phases and **imperceptible, negative and long-term** during the operational phase.

5.4.7.2 Shadow flicker

Shadow Flicker will only occur during the operational phase of the wind farm development. The Department of Energy and Climate Change for England stated in its report Update of UK Shadow Flicker Evidence Base (2011) that it is considered that the frequency of the flickering caused by the wind turbine rotation is such that it should not cause a significant

[45] Lindsay C McCallum, *et al*. (2014) *Measuring electromagnetic fields (EMF) around wind turbines in Canada: is there a human health concern?* [Accessed 24/09/2024]

risk to health. Refer to section 5.4.7.8 (Health Impact studies), which includes references to effects of Shadow Flicker on Human Health.

EDF have committed that the Proposed Development will not generate any Shadow Flicker. The implementation of mitigation to cease operation of the turbines during periods of potential shadow flicker will ensure that no shadow flicker effects are experienced at any sensitive receptor within 1the Study Area. It is therefore considered that Kellystown Wind Farm will comply with the Draft 2019 Guidelines

The scope of the assessment has been updated to include 4 existing buildings includes the following: 1 x Main Office Building, 1 x Shipping Office, 1 x Welfare Facility plus office, 1 x Security Hut within Gallstown (Kilsaran) Quarry as sensitive receptors to address the Further Information Request submitted by Louth County Council submitted on the 6th February 2025, the details of the request are outlined below:

Shadow Flicker

1. *The Shadow Flicker Analysis undertaken by Jenning O'Donovan & Partners Ltd. does not include the existing office building with Gallstone Quarry as a sensitive receptor. The applicant is requested to include this sensitive receptor in its assessment and to submit a revised shadow flicker analysis report, so that an assessment can be made on the impact, if any, of the proposed development on that receptor.*

For the Shadow Flicker assessment, a total of 379 sensitive receptors were assed. The additional sensitive receptors included the main office building is identified as No. 1 below but both Nos. 2 (shipping office) and 3 (welfare facilities), respectively are also smaller office facilities. In addition, there is a small security hut located beside the site weighbridge (west of location No. 2).

The Shadow Flicker Chapter Analysis with the inclusion of the four additional sensitive receptors the results remain unchanged.

As such, shadow flicker considered to have a **neutral, imperceptible, long-term effects** effect during the operational phase.

Chapter 17: Shadow Flicker provides an impact assessment of the potential for shadow flicker from the Proposed Development.

5.4.7.3 Noise

A study by the EPA in South Australia on low frequency noise near wind farms and in other environments found that 'Overall, the study demonstrates that low frequency noise levels near the wind farms in the study are no greater than levels in urban areas at comparable rural residences away from wind farms. Refer to section 5.4.7.8 (Health Impact studies), which includes references to effects of Noise on Human Health.

The construction process associated with wind farms is not considered intensive and any noise emitted within the construction phase is intermittent and temporary and mostly carried out a considerable distance from receptors. The main noise sources will be associated with the construction of the turbine foundations, turbine hardstands, grid connection, with lesser sources being site access roads, construction of a 38kV substation and associated BESS, compound and works at turbine delivery nodes. The main construction traffic to Site will be over a short period where trucks will deliver stone around the Site and ready-mix trucks deliver concrete for the turbine bases. The delivery of turbines by large trucks travelling at very low speed will generate very low levels of noise.

The recent RFI requested the applicant is to provide predicted noise levels expected during the simultaneous operation of every component in the proposed facility including the BESS and the wind turbines. The assessment presented in Section **13.4.6.2** of **Chapter: 13 Noise and Vibration** contains specific assessments for each of these against the relevant standards and it is not appropriate for the BESS to be compared to limits derived in accordance with the WEDG 2006 as they are specific to wind turbine noise and likewise it is not appropriate for wind turbine noise to be assessed against BS4142 limits. Both elements of the proposed development comply with the relevant limits they were assessed against and as such, **no significant effects** are predicted.

In relation to the existing sources of potential noise from Kilsaran Quarry), the nearest receptors (dwellings) to the quarry, lie north of the quarry. The nearest proposed turbine locations are close to the southern end of the quarry, at a significantly greater distance from the same receptors.

With setback distance aligning with the draft WEDG (2006) and WEDG (2019), no significant impact on Population and Human Health is anticipated. **Chapter 13: Noise and Vibration** provides an impact assessment of the potential for Noise from the Proposed Development.

5.4.7.4 Air Quality

There are no such emissions associated with the operation of wind turbines. However, additional traffic and minor traffic delays or disruption to the public is likely at specific times during the construction and decommissioning phases, resulting in a slightly higher portion of pollutants in the atmosphere. **Chapter 18: Air and Climate** provides an assessment of air quality in relation to the Proposed Development.

The effect of the Project on air quality during the construction and decommissioning phases will be **slight, negative** and **temporary/short-term** and **slight, positive and long-term,** during the operation phase. Overall, the air quality impacts of the Project on Human Health are considered **slight positive** and **long term**.

5.4.7.5 Water Contamination

Consultation with GSI well database indicates there are no mapped wells within the Wind Farm Site boundary. However, subsequently two springs have been identified in the redline boundary from historical mapping and site visits. Governing industry guidelines stipulate a buffer zone of 250m is required of from boreholes used for drinking water abstraction. None of these springs are used for drinking water. The closest mapped wells are more than 1500m from the boundary of the Wind Farm Site. All houses are over 500m from the Wind Farm Site, therefore can be considered outside the 250m buffer.

Contaminants such as sediments arising from the Proposed Development have the potential to contaminate water bodies designated for drinking water purposes, impacting on human health. Mitigations as set out in **Chapter 11: Hydrology and Hydrogeology** will prevent and reduce risk of contamination of waterbodies. The drainage design and surface water network are considered in terms of assimilative capacity, that is to dilute contaminants in receiving waterbodies as a 'last line of defence'. Any contaminants will be treated when water is abstracted for drinking water purposes.

Chapter 11: Hydrology and Hydrogeology provides an assessment of the hydrological impacts in relation to the Proposed Development, including the potential for water contamination. The significance of the potential effects of the Proposed Development on water contamination is specified in **Table 11.1** of **Chapter 11: Hydrology and Hydrogeology**. The range of possible effects are all graded below major or moderate significance and are therefore not considered to be 'significant' in accordance with the EPA Guidance 2022. Furthermore, there is no likelihood of significant cumulative effects over and above any pre-existing effect caused by existing, proposed or consented projects.

5.4.7.6 Traffic

It is proposed that the turbine nacelles, tower hubs and rotor blades will be landed at Galway Port, County Galway and will be transported on the N6 and M6, then M4 east towards Dublin. The route will then follow the M50, M1, local road infrastructure until it meets private tracks and on to the Wind Farm Site entrance. It is expected that the impact of increased traffic on Population and Human Health due to delivery of turbine parts will be minimal as for the most part, turbine component transport will take place during the night hours.

During the construction phase, there will be increased traffic to and from the Proposed Development, as detailed in **Chapter 16: Traffic and Transport.** A revised Traffic Management Plan has been included in **Appendix 2.1.** Traffic Management Plans will be agreed in advance with the Local Authority and where possible, access priorities given to local residents. There is expected to be a minimal amount of traffic delays or disruption to the public, at specific times during the construction and decommissioning phases.

Chapter 16: Traffic and Transport provides a detailed assessment of the traffic impacts in relation to the Proposed Development. The summary of effects as referenced in **Section 16.7** and include:

- The quality of effects has been assessed as neutral with increased traffic flows during the construction and decommissioning of the project with no permanent changes to the geometry of the public road network and its associated junctions.
- The duration of effects relating to grid connection works, enabling works on the turbine delivery route and delivery of turbine components have been assessed as short term lasting less than one year. Grid connection works on the local road network requiring road closures have been assessed as negative due to the short term disruption for public road users.
- The significance of the effects has been assessed as slight on the public road network where traffic management / two way traffic flows can be maintained during enabling works and moderate / significant on local roads where road closures will be required to carry out the grid connection works.

In addition to the above, sightline requirements of 4.5m x 75m over a height of 0.6-1.05m above road level have been achieved at site entrances 1-3 to the proposed development. This is to meet the Louth County Council sightline requirements (**Planning Drawings: 203**

-205). This will facilitate safe access and exiting the wind farm development during construction, operation and decommissioning. An RSA safety audit **Appendix 15.4** was also conducted on all site entrances which did include entrance no.4, this site entrance was proposed at the time of the assessment. However, as outlined in **Chapter 2: Description of the proposed development** Site Entrance No. 4 will no longer be used for site access. The Road Safety audit highlighted road users exceeding the speed limit around the site and proposed engagement with the local roads authority to try implement traffic calming measures.

This chapter did include analysis of the increased use of entrance no.2 and concluded that no additional effects or P&HH / safety impacts were identified of the Proposed Development in May 2025 and the results are outlined in **Appendix 15.4**.

This assessment has identified that the overall potential effects of the Project on traffic and transport are considered to be **Slight to Moderate**, given the mitigation measures embedded in the design and proposed for the implementation of the Project.

5.4.7.7 Accidents/Disasters (incorporating Health & Safety)

The design of the Project has considered the susceptibility to natural disasters. The proposed site drainage will mitigate against any potential flooding risk due to run off with the use of Sustainable Drainage Systems (SuDS). Construction drainage will be left in-situ for the lifespan of the project through to decommissioning.

The Contractor's fire plans are reviewed and updated on a regular basis. A nominated competent person shall carry out checks and routine maintenance work to ensure the reliability and safe operation of firefighting equipment and installed systems such as fire alarms and emergency lighting. A record of the work carried out on such equipment and systems will be kept on site at all times.

Chapter 19: Major Accidents and Natural Disasters provides an assessment of the vulnerability of the Project to major accidents and natural disasters. Possible risks associated with the Project during the construction, operation and decommissioning phases are outlined and assessed. These risks have the potential to directly or indirectly impact Population and Human Health. The consequence ratings assigned to each potential risk assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster. All scenarios when assessed were considered "low risk".

5.4.7.8 Health Impact Studies

While there are anecdotal reports of negative health effects on people who live near wind farms there is no peer reviewed scientific research in support of these views. Several peer reviewed scientific research publications are outlined below.

Frontiers in Public Health published a study[46] in 2014 on wind turbines and human health. This review completed a bibliographic-like summary and analysis of the science around this issue specifically in terms of noise (including audible noise, low-frequency noise, and infrasound), EMF, and shadow flicker. The study noted that:

"*Based on the findings and scientific merit of the research conducted to date, it is our opinion that the weight of evidence suggests that when sited properly, wind turbines are not related to adverse health effects. This claim is supported (and made) by findings from a number of government health and medical agencies and legal decisions*".

The National Health and Medical Research Council (NHMRC), Australia's leading medical research body, have concluded that there is no reliable or consistent evidence that wind farms directly cause human health problems as part of their Systematic Review of the Human Health Effects of Wind Farms published in December 2013. The review was commissioned to determine whether there is a direct association between exposure to wind farms and negative effects on human health or whether the association is casual, by chance or bias.

Objectors to wind farms often refer to 'Wind Turbine Syndrome' as a condition that can be caused by living in close proximity to wind farms. The symptoms allegedly include sleep deprivation, anxiety, nausea and vertigo. It has been rejected by the wind industry and is further refuted by a review carried out by the NHMRC that wind turbines cause these sorts of symptoms.

The review began in late 2012 and included a literature and background review of all available evidence on the exposure to the physical emissions produced by wind turbines. These emissions were noise, shadow flicker and electromagnetic radiation produced by wind turbines. The review concludes that the evidence considered does not support any direct association between wind farms and human health problems and that bias and confounding could be possible explanations for any reported association.

[46] L. D. Knopper, *et al*. (2014) *Wind turbines and human health*.

A study by the EPA in South Australia on low frequency noise near wind farms and in other environments found that *'Overall, the study demonstrates that low frequency noise levels near the wind farms in the study are no greater than levels in urban areas at comparable rural residences away from wind farms'.* The Department of Energy and Climate Change for England stated in its report Update of UK Shadow Flicker Evidence Base (2011) that it is considered that the frequency of the flickering caused by the wind turbine rotation is such that it should not cause a significant risk to health.

There are no specific health and safety considerations for local populations in relation to the operation of a wind turbine. Noise and Shadow Flicker are operational Health and Safety issues and have been addressed in **Chapter 13:** Noise and Vibration and **Chapter 17: Shadow Flicker**.

5.4.7.9 Turbine Safety

Turbines pose no threat to the health and safety of the general public. The Department of the Environment, Heritage and Local Government (DoEHLG)'s '*Draft Revised Wind Energy Development Guidelines December 2019'* state that there are no specific safety considerations in relation to the operation of wind turbines. Fencing or other restrictions are not necessary for safety reasons. People or animals can safely walk up to the base of the turbines. The DoEHLG Guidelines state that there is a very remote possibility of injury to people from flying fragments of ice or material from a damaged blade. However, most blades are composite structures with no bolts or separate components and the danger is therefore minimised. The build-up of ice on turbines is unlikely to present problems. The wind turbines will be fitted with anti-vibration sensors, which will detect any imbalance caused by icing of the blades. The sensors will prevent the turbine from operating until the blades have been de-iced.

Turbine blades are made of fibre-reinforced polymer (FRP's) or unsaturated polyester, a non-conducting material which will prevent any likelihood of an increase in lightning strikes within the Wind Farm Site or the local area. Lightning protection conduits will be integral to the construction of the turbines. Lightning conduction cables, encased in protection conduits, will follow the electrical cable run, from the nacelle to the base of the turbine. The conduction cables will be earthed adjacent to the turbine base. The earthing system will be installed during the construction of the turbine foundations. In extremely high wind speed conditions, (usually at Beaufort Storm Force 10 or greater) the turbines will shut down to prevent excessive wear and tear, and to avoid any potential damage to the turbine components.

5.4.8 Property Value

The effects to Property values have been reviewed and assessed within **Section 5.3.8**. Based on the evidence from a number of these published studies, the operation of a wind farm at the Site is considered to not significantly affect property values in the area. The Proposed Development will have a **medium-short-term imperceptible** impact on property values.

5.4.9 Electromagnetic Interference

An assessment of the existing communication networks in the receiving environment showed that one Vodafone Fresnel zone (receive antenna) could potentially be affected by the Proposed Project. This has the potential to impact on Population and Human Health by obstructing communication networks. Full details are provided in **Section 14.6** of the EIAR in **Chapter 14: Material Assets**. However, this has been considered in the design of the wind farm the proposed turbine coordinates will not impact the Fresnel zone.

Electromagnetic fields from the wind farm infrastructure and power tools used during construction and decommissioning of the wind farm, are very localized and are considered to have a **negative, imperceptible, short-term effects.**

As there are potential effects on the Population due to the possibility of the proposed infrastructure obstructing communication networks the effects are considered to the **negative, slight** and **long term.**

5.4.10 Do-Nothing Scenario

If the Project was not to proceed, the existing uses of the site for agriculture and commercial forestry would continue, there will no additional electro-magnetic interference. There would be no short-term impact on the Population and Human Health in relation to potential increases in noise, increased traffic and minor traffic disruption.

However, in such a scenario, the opportunity to increase economic activity and generate local employment would also be lost. The opportunity to capture a renewable green energy supply would be lost, as would the opportunity to contribute to Ireland's 2050 target of net-zero emissions.

5.5 MITIGATION MEASURES AND RESIDUAL EFFECTS

Although no negative impact of significance has been established, there are a number of measures which may be implemented for the health and safety of the public and the workers during the construction, operational and decommissioning phases. Mitigation measures are additional to the standard / design measures (embedded mitigation) which are considered as part initial assessment of significance.

5.5.1 Embedded Mitigation

The Project, as described in **Chapter 2: Description of the Proposed Development**, incorporates good practice measures for limiting adverse effects of the construction works. The principal potential effects on human health arising from works tend to relate to construction traffic affecting the use of National roads, local primary roads and access roads by the general public and drainage. Measures are set out in **Chapter 16: Traffic and Transport** relating to how delivery of goods and services will be managed during works to minimise impacts and details of mitigations and the use of Sustainable Drainage Systems can be found in **Chapter 11: Hydrology and Hydrogeology**. The proposed mitigation measures have been further developed in the **Construction and Environmental Management Plan (CEMP)** (**Appendix 2.1**).

5.5.2 Construction Traffic

The principal potential effects arising from works tend to relate to construction traffic affecting the use of National Roads, local primary roads and access roads by the general public. Measures are set out in **Chapter 16: Traffic and Transport** relating to how delivery of goods and services would be managed during works to minimise impacts. The proposed mitigation measures have been outlined in **Chapter 16: Traffic and Transport - Section 16.4**.

5.5.3 Population and Settlement Patterns

Given that no negative impacts have been identified, no mitigation measures are proposed.

5.5.4 Economic Activity

Allowing for the implementation of embedded mitigation, no significant effects have been identified in respect of socio-economic receptors arising from the construction, operational and decommissioning phase of the Proposed Development and therefore no mitigation measures are required to reduce or remedy any adverse effect.

5.5.5 Employment

Given that potential impacts of the Proposed Development at construction, operation and decommissioning phases are predominantly positive in respect of socioeconomics, employment and economic activity, no mitigation measures are considered necessary.

5.5.6 Land Use and Topography

Mitigation measures for land use have been incorporated into the preliminary design stage. This has allowed for the prevention of unnecessary or inappropriate ground works or land use alterations to occur.

In this regard, the construction and operational footprint of the Project has been kept to the minimum necessary to avoid impact on existing land uses. Furthermore, existing forestry tracks have been incorporated into the design to minimise the construction of new Site Access Roads and minimise the removal of forested areas. New Site Access Roads have been sensitively designed to minimise impact on forestry. Electricity cables will be installed underground in or alongside Site Access Roads to avoid and minimise negative impact. The construction and decommissioning works will be planned and controlled by a Construction and Environmental Management Plan (CEMP). This provides details on day to day works and methodologies. As part of these works, the public and other stakeholders will be provided with updates on construction activities which will affect access to lands. This will be communicated to members of the public through a community liaison officer employed for the duration of the construction period.

Chapter 16: Traffic and Transport will be referred to for all proposed works and deliveries along the turbine delivery route to avoid undue impact to adjacent land uses.

5.5.7 Tourism

Mitigation measures for recreation, amenity and tourism are primarily related to the preliminary design stage of the Project, which has allowed for the prevention of unnecessary or inappropriate development to occur that will significantly affect any recreational or tourist amenity. In designing the Project, careful consideration was given to the potential impact on landscape amenity and setback distances from sensitive receptors.

There is one existing walkway/ trail located on the Wind Farm Site along the forestry track located at T01. Pedestrian access will be maintained where possible during the construction and decommissioning phases. For public safety, appropriate signage and safety measures

will be put in place during construction and decommissioning activities. The post mitigation potential effects, of the Project on tourism are considered to be **not significant**.

5.5.8 Human Health and Safety

5.5.8.1 Construction and Decommissioning

To maintain safety and avoid health impacts on construction workers and the general public, best practice site safety and environmental management will be maintained. The Proposed Development will be designed, constructed, operated and decommissioned in accordance with the following:

- Safety, Health & Welfare at Work (Construction) Regulations 2013 as amended
- Safety, Health & Welfare at Work Act 2005 As amended, and
- Safety, Health & Welfare at Work (General Applications) Regulations 2007 as amended

All construction staff will be adequately trained in health and safety and will be informed and aware of potential hazards.

All activities carried out by the appointed Contractor on the Proposed Development will be in accordance with the requirements of the Safety, Health and Welfare at Work Act 2005 as amended and Regulations made under this Act.

All hazards will be identified, and risks assessed prior to any construction. The Health and Safety Manager will monitor the construction phase of the project and ensure works are being carried out in accordance with the agreed method statements, safety procedures and pollution control measures, as outlined in the **Construction Environmental Management Plan (CEMP), Appendix 2.1** to the EIAR. The CEMP is a live document that is reviewed and updated as required throughout the life cycle of the project works.

Safe Pass (a mandatory safety awareness training programme for construction workers) registration cards are required for all construction, delivery and security staff. Construction operatives will hold a valid Construction Skills Certificate Scheme card where required for activities such as Scaffolding, Tower crane operation etc. The Developer is required to ensure a competent contractor is appointed to carry out the construction works. The Contractor will be responsible for the implementation of procedures outlined in the Safety & Health Management Plan.

Where elimination of the risk is not feasible, appropriate mitigation and/or control measures will be followed. A summary of all pre-empted mitigation measures has been outlined in **Chapter 20: Interactions of the Foregoing, Appendix 20.1** of the EIAR. The contractor will be obliged under the construction contract and current health and safety legislation to adequately provide for all hazards and risks associated with the construction phase of the project.

Public safety will be addressed by restricting access to the public in the vicinity of the site works during the construction and decommissioning stage. The construction site will be temporarily closed in sections to the public for the eighteen months construction period as well as the decommissioning period. This measure aims to avoid potential injury to members of the public as a result of construction activities.

Appropriate warning signage will be posted at the construction site entrance, directing all visitors to the site manager. Appropriate signage will be provided on public roads approaching site entrances and along haul routes.

In relation to the turbine delivery route, extra safety measures will be employed when large loads are being transported, for instance, Garda escort will be requested for turbine delivery and a comprehensive turbine delivery plan will be utilised to avoid potential impact to human safety for road users and pedestrians.

All pre-empted mitigation measures have been outlined in **Chapter 20: Interactions of the Foregoing, Appendix 20.1** of the EIAR. Once mitigation measures, including health and safety measures are implemented and followed, the potential for impact on human health for members of the public and construction workers during construction and decommissioning of the proposed project is expected to be **not significant and temporary to short-term**.

5.5.8.2 Operation

For operation and maintenance staff working at the proposed wind farm, appropriate site safety measures as detailed in this section will be utilised during the operational phase by all permitted employees. All personnel undertaking works in or around the turbines will be fully trained and will use appropriate Personal Protective Equipment (PPE) to prevent injury.

Equipment within high voltage substations presents a potential hazard to health and safety. The proposed substation will be enclosed by palisade fencing and equipped with intruder and fire alarms in line with ESB and EirGrid standards.

All electrical elements of the Project are designed to ensure compliance with electro-magnetic fields (EMF) standards for human safety. At pre-construction phase, an Electrical Interference Assessment shall be carried out.

All on-site electrical connections are carried by underground cable and will be marked out above ground where they extend beyond the track or hardstanding surface. Details of cables installed in the public road will be available from ESBN.

Lightning conductors will be installed on each turbine as all structures standing tall in the sky require this protection. Turbines specifically require this to prevent power surges to electrical components. Turbines will be fitted with ice detection systems which will stop the turbine from rotating if ice is forming on a turbine blade. This aims to prevent ice throw.

Rigorous statutory and engineering safety checks imposed on the turbines during design, construction, commissioning and operation will ensure the risk posed to humans is negligible. 24-hour remote monitoring and fault notifications are included as standard in the Turbine Operations and Maintenance Contracts. A Supervisory Control and Data Acquisition ("SCADA") system will monitor the Proposed Development's performance. If a fault occurs, then a message is automatically sent to the operations personnel preventing emergency situations.

In addition to scheduled maintenance, the maintenance contracts will allow for call out of local engineers to resolve any issues as soon as they are picked up on the remote monitoring system.

Access to the turbines inner structure will be locked at all times and only accessed by licenced employees for maintenance.

In line with the Health Service Executive's Emergency Planning recommendations, any incident which may occur at the site which requires emergency services, incident information will be provided in the 'ETHANE' format:

- Exact location;

- Type of incident;
- Hazards Access and egress;
- Number of casualties (if any) and condition, and
- Emergency services present and required

All pre-empted mitigation measures have been outlined in **Chapter 20: Interactions of the Foregoing, Appendix 20.1** of the EIAR. Once mitigation measures, including health and safety measures are implemented and followed, the potential for impact on human health for members of the public and construction workers during the operational phase of the proposed project is expected to be **not significant**.

5.5.9 Human Health

5.5.9.1 Accidents/Disasters (incorporating Health & Safety)

Accidents to Personnel

Potential risks to personnel were identified in **Chapter 19: Major Accidents and Natural Disasters.** Current legislation relating to the Health and Safety, outlined in section 5.5.8.1 are designed to assist in the management of risks associated with the construction, operation, maintenance and decommissioning phase of windfarm projects.

As required under the Safety, Health, and Welfare at Work (Construction) Regulations 2013, the Client shall appoint a Project Supervisor for the Design Process (PSDP) and a Project Supervisor for the Construction Stage (PSCS). The PSDP shall compile a Preliminary Safety and Health Plan (PSHP), which details general information about the project and envisaged health and safety risks. The PSHP shall be made available to the PSCS. The PSCS shall develop a Construction Stage Health and Safety Plan (CSHSP) which incorporates the information contained in the PSHP and details how safety and health will be managed during the construction of the project. The PSCS may also develop the following documents for the construction stage:

- Construction and Environmental Management Plan
- Emergency Response Plan
- Detailed Traffic Management Plan

Accidents to Infrastructure

The PSDP shall ensure the General Principles of Prevention are taken into account for all designs relating to the project.

On very rare occasions, the structural integrity of wind turbines has failed. This is an extremely rare occurrence and, given that the turbines will be designed and installed by an experienced turbine contractor and are located well away from public roads and dwellings in line with the DoEHLG Draft Revised Wind Energy Development Guidelines (2019), it is not considered that, in the unlikely event of an accident of this type, any significant impacts to population or human health would result.

In relation to the adjacent blasting quarry and the structural integrity of wind turbines a study was carried out by WSP confirming the wind turbines are situated at a safe distance from the Gallstown (Kilsaran) quarry and expansion plans, further details are outlined in **Appendix 13.4 - Ground Vibration and Air Overpressure Blast Report.** Furthermore, a detailed analysis of the safety standards was undertaken by Gavin and Doherty Geosolutions Ltd. (GDG) (**Appendix 13.5: Kellystown Wind Farm Planning Support: FI Request Related to Vibration Effects from Blasting**). It concluded that there are no likely significant effects anticipated. A synopsis of the finding is outlined in **Chapter 19: Major Accidents and Natural Disasters** in **Section 19.3.5: Industrial Accident**.

Potential accidents, such as a risk of incident during haulage, a fire on site or the risk of a turbine structural failure is assessed to be a **slight, negative, long-term effect.**

5.5.9.2 Construction and Decommissioning

A summary of all pre-empted mitigation measures for the protection of Human Health (EMI, noise, shadow flicker, air quality, water contamination and traffic) have been outlined in **Chapter 20: Interactions of the Foregoing, Appendix 20.1** of the EIAR and discussed in individual chapters; **Chapter 11: Hydrology and Hydrogeology, Chapter 13: Noise and Vibration**, **Chapter 18: Air Quality and Climate**, **Chapter 17: Shadow Flicker**, **Chapter 14: Material Assets** and **Chapter 16: Traffic and Transport.**

5.5.9.3 Operation

All measures outlined in section 5.5.8.2 also apply directly to Human Health operational phase mitigation measures. In addition, the design of the Proposed Development has considered the susceptibility to natural disasters. The proposed Site drainage will mitigate against any potential flooding risk due to run off with the use of Sustainable Drainage Systems (SuDS). Construction drainage will be left in-situ for the lifespan of the Project through to Decommissioning.

The Contractor's fire plans are reviewed and updated on a regular basis. A nominated competent person shall carry out checks and routine maintenance work to ensure the reliability and safe operation of firefighting equipment and installed systems such as fire alarms and emergency lighting. A record of the work carried out on such equipment and systems will be kept on site at all times.

Shadow flicker detection systems will be installed on all turbines to mitigation and cease operation of the turbines during periods of potential shadow flicker will ensure that no shadow flicker effects are experienced at any sensitive receptor

The wind farm system shall include a kill switch that can be operated at any time with an overriding manual shutdown system in case of an emergency.

All pre-empted mitigation measures have been outlined in **Chapter 20: Interactions of the Foregoing, Appendix 20.1** of the EIAR and discussed in individual chapter, as outlined in previous section. Once mitigation measures, including health and safety measures are implemented and followed, the potential for impact on human health for members of the public and construction workers during operational phase of the proposed project is expected to be **not significant.**

5.5.9.4 Residual Risk

Once the mitigation established for the construction, operation and decommissioning stages of the project, as detailed in this Chapter of the EIAR and other EIAR Chapters, namely **Chapter 11: Hydrology and Hydrogeology, Chapter 13: Noise**, **Chapter 18: Air Quality and Climate**, **Chapter 17: Shadow Flicker**, **Chapter 14: Material Assets and other issues** and **Chapter 16: Traffic and Transport** are taken into account, the residual risk on human health is assessed to be an **imperceptible, long-term** effect.

5.5.10 Cumulative Effects

An assessment of the potential cumulative effects of the Project in combination with other existing, approved or proposed plans and projects has been carried out in line with Annex IV of the EIA Directive as amended which provides that the EIAR must contain a description of the likely significant effects of the project on the environment resulting from the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.

A radius of 20km for larger scaled projects for cumulative impact assessment was used as the study area as derived from the Wind Energy Development Guidelines (2006)[47] and Draft Wind Energy Guidelines 2019[48].

All existing and approved large-scale projects and large-scale projects in the public domain pre planning a decision from a planning authority within 20km of the Development were considered for potential Cumulative Assessment in all other chapters of this EIAR. This measurement was taken from the outermost turbines of the Development. A 20km distance was considered appropriate due to the size and extent of the proposed wind farm and the nature of the potential effects as detailed throughout the EIAR. All of the relevant projects with potential to create cumulative impacts have been included in **Chapter 2: Description of the Proposed Development** in **Section 2.4.4**.

Wind Farms

The nearest operational wind farm to the Wind Farm Site is Dunmore Wind Farm comprising of four turbines located 11.4km to the west of the site. The next nearest is Collon Wind Farm Wind Farm comprising 1 no. wind turbines located 12.9km to the west of the Site Boundary. Meade Potato Company has a single turbine 17km to the west of the site. WuXi Biologics was recently granted planning permission in July 2024 for a single turbine located 19.5km North of the project.

The Proposed Development will contribute to the offset of burning of fossil fuels which has the potential to positively impact human health. The cumulative impact of the Proposed Development can be predicted to be an **Imperceptible, long-term positive** impact on Human Health reducing fossil fuel consumption locally. Further details can be found in **Chapter 18: Air and Climate**. The cumulative impact of the Proposed Development can be predicted to be an **Imperceptible, short-term negative** impact on tourism and amenity during construction. There is predicted to be a **short-term**, **low to moderate positive** impact in terms of employment from the Proposed Development.

There are no proposed or operational wind farms within a 2km range of the turbines that may cause cumulative effects to Electromagnetic fields (**negative, imperceptible, short-term)** effects**.**

[47] Wind Energy Development Guidelines (2006) https://www.gov.ie/en/publication/f449e-wind-energy-development-guidelines-2006/ [Accessed 24/09/2024]
[48] Draft Wind Energy Development Guidelines (2019) https://www.gov.ie/en/publication/9d0f66-draft-revised-wind-energy-development-guidelines-december-2019/ [Accessed 24/09/2024]

Kilsaran Quarry

The Kellystown wind farm is located next to the Kilsaran Quarry (Reference Number: 22190), covering about 37.5 hectares. The proposed expansion of the quarry by approximately 10 hectares to a depth of +60 meters above sea level aligns with current permissions. Quarry operations will continue at a rate of 750,000 tonnes per year. However, the proximity of the wind farm to the quarry raises concerns about increased noise pollution and dust levels, which could affect the health of nearby residents. As part of the planning permission for Kilsaran Quary there are certain conditions that the company must comply with. The noise and dust conditions attached to the planning permission for Kilsaran Quary are as follows:

Planning condition 14: Dust levels at the site boundary will not exceed 350 milligrams per square meter per day averaged over a continuous period of 30 days (Bergerhoff Gauge)[49]. *Planning condition 10: The noise levels generated during the operation of the quarry shall not exceed 55dBA (30 Minutes LAR) when measured at the nearest noise sensitive receptor between 0800 hour to 1800 Hours, Monday to Friday and between 0800 hours and 1400 hours on Saturdays, excluding public holidays and bank holidays. Noise levels shall not exceed 45dBA* (15 Minute Leg) at any other time. *When measuring specific noise, the time shall be any one period during which the sound emission for the quarry is at maximum level*[50].

For the prevention of water contamination and to comply with their planning conditions Kilsaran Quarry has a monthly monitoring programme, as outlined 5.3.7.5 of this chapter. The mitigation measures Kilsaran Quarry has installed to comply with their planning conditions to reduce the impact of noise and dust are outlined in sections 5.3.7.3 and 5.3.7.4 of this chapter.

The combination of the mitigation measures Kilsaran Quarry has installed to comply with their planning conditions combined with the Proposed Project mitigation measures to reduce the impact of Noise and Dust as outlined in **Chapter: 13 Noise and Vibration** and **Chapter 18: Air Quality and Climate.** The cumulative impact of development on noise, dust and water contamination is outlined in **Chapter 13: Noise and Vibration, Chapter 18: Air Quality and Climate** in **Section 18.4.9** and **Chapter 11: Hydrology and Hydrogeology.**

[49]Kilsaran Quarry Planning Application: 22190 - Final Grant iDocs Web (louthcoco.ie)
[50] Kilsaran Quarry Planning Application: 22190 - Final Grant iDocs Web (louthcoco.ie)

For air quality, the cumulative impact of the development is predicted to have a **slight, negative** and **short-term** impact during construction and decommissioning.

For water, the cumulative impact of the development is predicted to have a **not significant, negative** and **short-term** impact on the water during construction and decommissioning and an **Imperceptible, neutral and long-term** impact during the operational phase. Refer to **Chapter 18: Air and Climate** and **Chapter 11: Hydrology and Hydrogeology** for further details**.**

Any electromagnetic interference from the quarry infrastructure and power tools used in combination with construction and decommissioning of the wind farm will be very localized and are considered to have imperceptible**, negative and short-term** effects**.**

Furthermore, blasting activities in quarries, though relatively small in scale, can have significant cumulative effects, with the potential for severe injury and loss of life this is assessed in detail in **Chapter 19: Major Accidents and Natural Disasters.** The cumulative impact of blasting around the Development and the surrounding area can be predicted to have an **Imperceptible, short-term negative** impact.

The cumulative impact of the Development can be predicted to be an **Imperceptible, short-term negative** impact on tourism and amenity during construction. There is predicted to be a **short-term**, **low to moderate positive** impact in terms of employment from the Development.

Gas Network

The presence of underground gas networks directly east of Kellystown Wind Farm could potentially pose cumulative effects. For instance, the construction and maintenance of the gas infrastructure might disrupt the surrounding environment, including the land used for the wind farm. Additionally, there could be safety concerns if there's any interaction between the gas infrastructure and the wind turbines. Furthermore, environmental impacts could arise from any leaks or emissions associated with the gas networks, affecting air and water quality in the area this has been assessed in detail in **Chapter 19: Major Accidents and Natural Disasters**.

The risk of working in close proximity to the gas line was taken into consideration when designing the project, the required setback distances outlined by Gas Networks Ireland

were adhered too for all site infrastructure[51]. The cumulative impact of gas lines around the Development and the surrounding area can be predicted to be an **Imperceptible and likely to be neutral.**

5.6 Summary of Significant Effects

The significant effects of all aspects of the construction, operation and decommissioning of the Proposed Development (Wind Farm Site, TDR and GCR) on the receiving environment in terms of Population and Human Health, namely, economic activity, employment, land use, tourism and human health (EMI, noise, shadow flicker, air quality, water contamination and traffic) has been assessed individually and cumulatively, with respect to the sensitive receptors. Sensitive receptors are defined as dwellings and amenities/ communities (107 dwellings and 1 school) within 1km of a proposed turbine location and within 100m of GCR works. The assessment has not identified any likely significant effects from the Proposed Development on population and human health.

5.7 Statement of Significance

This chapter has assessed the significance of potential effects of the Proposed Development on population and human health. There are no likely significant effects for the Project, alone or cumulatively. Through the implementation of mitigation measures, the cumulative effects associated with the Proposed Development are predicted to be not significant.

[51] Gas Networks Ireland: Code of Practice for Working in the Vicinity of the Transmission Network - Procedure No: AO/PR/127- Rev 3 Date: May 2021