



Drumlins Park Wind Farm

# Chapter 4: Population and Human Health

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## 4.1 Introduction

This chapter presents an assessment of the likely effects of the proposed development on population and human health. Human beings comprise a significant element of the environment and any likely effects on the status of population and human health must be comprehensively addressed. This includes the existence, activities and wellbeing of people. Whilst most developments will affect other people, the EIAR concentrates on those topics which are manifested in the environment, such as new land uses, more buildings or greater emissions.

This EIAR also addresses the likely impact on population and human health in specific chapters, including, for example, in respect of Air Quality & Climate (**Chapter 8**), Landscape (**Chapter 9**), Noise and Vibration (**Chapter 11**), Shadow Flicker (**Chapter 12**) and Interactions between these environmental issues and population and human health (**Chapter 14**).

Specific issues which are examined under this chapter include *inter alia*:-

- Economic Activity - will the development stimulate additional development and/or reduce economic activity, and if either, what type, how much and where?;
- Social Consideration - will the development change patterns and types of activity and land use?;
- Land-uses - will there be severance, loss of rights of way or amenities, conflicts, or other changes likely to ultimately to alter the character and use of the surroundings?; and
- Health and Safety - will there be risks of death, disease, discomfort or nuisance?

Likely effects may occur as a result of direct interaction between the proposed development and population and human health receptors (e.g. farming operations affected as a result of construction activities) or indirectly such as employment created as a result of the local spending of wages earned by the construction workforce.

### 4.1.1 Statement of Authority

The assessment of likely effects on population and human health, and subsequent EIAR chapter, has been undertaken and prepared by Alan Mitchell, Chartered Town Planner with SLR Consulting. Alan has twenty years experience of planning and socio-economic/population and human health assessment experience predominantly in the energy, utilities and minerals sectors. SLR Consulting is a registered Environmental Impact Assessor and Member of the Institute of Environmental Management and Assessment (IEMA).

### 4.1.2 Summary of the Proposed Development

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

- 8 no. wind turbines with an overall tip height of 180m, and all associated ancillary infrastructure;
- Upgrades to the turbine component haul route; and
- 3 no. grid connection options as follows:-
  - Option G1: C. 5km 38kV Electricity Line to Clones 38kV substation comprising overhead line (OHL) with short sections of underground line (UGL) at either end to facilitate connection to each substation;
  - Option G2: c. 16km 38kV Electricity Line to Shankill 110kV substation comprising OHL with short sections of UGL at either end to facilitate connection to each substation; and

- Option G3: c. 1km of internal wind farm cabling to connect to a 110kV 'loop in – loop out' substation to the south of the site. The substation will include an electrical compound and strain towers.

The majority of the project is located within the administrative area of County Monaghan except for approximately 12km of grid connection Option G2 which will be located within County Cavan. Additionally, candidate quarries which may supply construction materials are also located within County Cavan.

The proposed turbine component haul route is also located within the counties of Dublin and Louth; however, due to the small scale of any works required within these jurisdictions, it is assessed that there is no likelihood of population or human health effects and, therefore, these areas have been screened out from further assessment.

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

#### 4.1.3 Candidate Wind Turbine

As outlined in **Chapter 3**, a specific wind turbine model has not yet been selected and will only be confirmed following a pre-construction tendering process. While turbine selection is unlikely to result in any primary effects on population and human health; the potential for noise & vibration, shadow flicker and landscape & visual effects to impact upon local communities is a key consideration of this assessment. Therefore, and in accordance with the assessments of noise and vibration, shadow flicker and landscape undertaken in subsequent chapters of this EIAR, this assessment utilises the General Electric GE 5.5-158 wind turbine as the basis for assessment (Option TU1).

## 4.2 Policy and Guidance

The following section sets out the policy and guidance which is considered to be of relevance to an assessment of effects on population and human health for a proposed development of this type.

### Wind Energy Development Guidelines for Planning Authorities 2006

These Guidelines offer advice to planning authorities in determining planning applications for wind farm developments. The general considerations set out in the Guidelines include effects on population. The Guidelines are also of assistance to developers in assessing the suitability and appropriateness of wind energy development locations and have been a key consideration of Drumlins Park Limited's (DPL) identification of the site subject of this EIAR.

### Review of the Wind Energy Development Guidelines 2006 "Preferred Draft Approach"

An emerging "preferred draft approach" to the Review of the 2006 Wind Energy Development Guidelines was published in 2017. The preferred draft approach sets out updates to several aspects of wind energy EIA including matters which inter-relate with population and human health effects, namely: noise; visual amenity; shadow flicker; and community dividend.

### Local Policy

Relevant local planning policies are derived from the following:-

- Monaghan County Development Plan 2019-2025; and
- Cavan County Development Plan 2014-2020.

### Monaghan County Development Plan 2019-2025

The Monaghan County Development Plan (MCDP) sets out that there are a number of challenges facing the county over the plan period, some of which are considered to be relevant to the consideration of population and human health in this EIAR, namely:-

- Promoting sustainable economic and community development;
- Facilitating employment generating uses, delivering community facilities and ensuring adequate investment in infrastructure; and
- Protecting the built and natural heritage, recognising the key role these assets have, and other stakeholder's ambitions to promote tourism, in the county.

Potential impacts on the visual and residential amenities of the area including protected views, scenic routes and designated scenic landscapes and public rights of way are set out as key priorities for the county over the lifetime of the MCDP (Section 15.20). The MCDP also sets out, as one of its priorities, to promote the County as a location for industry that is attractive and competitive in terms of inward investment. Furthermore, promoting the renewable energy sector and clean technology usage in existing and proposed industrial developments, including the use of alternative and renewable energy sources, is set out as a priority (Section 4.5)

### Cavan County Development Plan 2014-2020

As set out above, grid connection Option G2 would be partially located within County Cavan. The Cavan County Development Plan (CCDP) sets out a number of strategic aims for the county over the plan period, some of which are relevant to the assessment of effects on population and human health namely:-

- Protecting and enhancing the cultural, built and natural heritage of the county, including water quality and environmental quality;
- Encouraging the development of employment opportunities throughout the county;
- Providing good quality, accessible leisure, social and amenity services and spaces in an equal manner across the county;
- Ensuring that the principles of quality of life and sustainable development informs all decisions which relate to development within the county; and
- Providing good quality services infrastructure including adequate and appropriate drinking water and waste water treatment.

### Draft EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2017)

The Guidelines state that an EIAR does not generally require assessment of land-use planning, demographic issues or detailed socio-economic analysis unless issues such as economic or settlement patterns give rise directly to specific new developments and associated effects.

Whilst the proposed development will not result in any associated development, such as a housing or commercial development, it will lead to the generation of employment during both the construction and operational phases as well as inward investment which may affect the local supply chain. On this basis, the EIAR baseline contains a brief summary of key socio-economic baseline data relating to the wider study area (WSA; see **Section 4.3.1** below) and the likely effects on this baseline environment are considered.

In relation to effects on human health, the Guidelines state that the EIAR should refer to the assessments of those factors under which human health effects might occur

e.g. under the environmental factors of air, water, soil. The importance of avoiding duplication of impacts is highlighted i.e. care should be taken to avoid double counting impacts that are identified in the corresponding chapter of the EIAR, for example noise or air quality effects. As a result, specific effects which may arise from these environmental topics are addressed in their respective chapters.

The Guidelines state that the assessment of other health and safety issues are carried out under other EU Directives, as relevant e.g. reports prepared under the Integrated Pollution Prevention and Control frameworks. In keeping with the requirement of the amended Directive, an EIAR should take account of the results of such assessments without duplicating them.

Whilst there are no other environmental permits required for the proposed development, in addition to the necessary planning permissions, the EIAR does contain detailed consideration of effects on population, most notably in relation to Air Quality and Climate (**Chapter 8**), Landscape (**Chapter 9**), Noise & Vibration (**Chapter 11**) and Shadow Flicker (**Chapter 12**).

As the 2017 Guidelines have not been adopted and remain in draft format, consideration has also been given to the EPA 'Guidelines on information to be contained in Environmental Impact Statements (EIS)' (2002) and accompanying Advice Note insofar as they relate to population and human health.

Fáilte Ireland 'Guidelines on the treatment of Tourism in an Environmental Impact Assessment'

These Guidelines recognise that tourism can be affected both by the structures or emissions of new developments as well as by interactions between new activities and tourism activities; for example, the effects of high volumes of heavy goods vehicles passing through hitherto quiet, scenic, rural areas.

The Guidelines set out that the EIAR should indicate the location of sensitive neighbouring tourism resources that are likely to be directly affected, and other premises which may be the subject of secondary impacts such as alteration of traffic flows or increased urban development. A number of typical assets are listed including accommodation, golf courses, visitor sporting facilities and historical and cultural sites, walking and scenic routes. The EIAR should indicate the numbers of premises and visitors likely to be affected directly and indirectly.

Other advice and guidance reviewed as part of the baseline assessment and in developing the assessment methodology includes:-

- British Horse Society 'Wind Turbine Experiences – 2012 Survey Results' (September 2013);
- British Horse Society 'Wind Turbines and Horses - Guidance for Planners and Developers' (August 2015);
- Dept. of Communications, Climate Action and Environment 'Code of Practice for Wind Energy Development in Ireland' (2017);
- IWEA 'Best Practice Guidelines for the Irish Wind Energy Industry' (2012);
- IWEA 'Best Practice Principles in Community Engagement and Community Commitment' (2013); and
- IWEA 'An Enterprising Wind': An economic analysis of the job creation potential of the wind sector in Ireland (2014).

Key socio-economic data for the baseline has been derived from:-

- Central Statistics Office (CSO);
- Monaghan County Development Plan 2019-2025;

- Cavan County Development Plan 2014-2020;
- Fermanagh and Omagh District Council. Local Development Plan Draft Plan Strategy;
- Pobal Profiling GIS Data;
- Fáilte Ireland data in conjunction with websites of relevant tourism sites and amenities in the area;
- Monaghan County Council Tourism Statement of Strategy and Work Programme 2017-2022;
- Monaghan Local Economic & Community Plan 2015-2021;
- Cavan Local Economic and Community Plan 2016-2021; and
- OSI mapping and aerial photography.

### 4.3 Methodology

#### 4.3.1 Desk Based Research

The majority of effects on population and human health receptors are likely to be experienced during the construction phase. These are likely to include beneficial effects on the local economy, including employment opportunities and increased spend on local services as well as possible adverse effects such as restrictions on farming operations, neighbouring businesses or general disruption to amenity of the local area, which may indirectly impact on its recreation or tourism value. Once operational, effects are likely to be primarily related to the visual impact and potential noise impacts of the wind farm.

In respect of human health, the chapter takes into consideration the results of other assessments in the EIA which have relevance to health, namely: soils; water; air quality; noise; shadow flicker; and radiation (in respect of the proposed grid connection). The findings of these assessments are cross referenced in this chapter but the effects will not be repeated to avoid duplication of coverage or 'double counting' in the EIA.

Employment effects and direct expenditure are quantified using data provided by Drumlins Park Limited and, where necessary using standard industry data. Opportunities for local businesses and the local labour market to be involved in supply chain activities will be identified and where possible quantified. The likely effects of the proposed community ownership model are assessed also.

#### 4.3.2 Study Area

The spatial focus of the assessment is undertaken at two levels. Firstly, effects on specific community, recreation and tourism receptors are assessed at a local level which is defined as 5km from the boundary of the proposed wind farm. This will be referred to as the 'Local Study Area' (LSA). However, it should be noted that the LSA for grid connection Options G1 and G2 is set at 500m.

Economic effects are considered with regard to a wider study area that takes account of a likely 'catchment' for provision of domestically sourced goods and services relating to the construction and operation of the wind farm. This part of the study also takes into consideration the likely benefits which may arise from part community ownership of the wind farm. This study area comprises the counties of Monaghan and Cavan and is referred to as the 'Wider Study Area' (WSA). Given the scale of the proposed development it is not intended to measure effects at a national or international level.

Study Areas	Spatial Extent
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Study Areas	Spatial Extent
Wider Study Area	Counties of Monaghan and Cavan
Local Study Area	5km from the boundary of the proposed wind farm. (500m for the grid connection)

**Table 4.1 - Study Area Details**

A desk-based review of existing conditions in the area has been undertaken, covering the following themes:-

- Wider Study Area
  1. Population;
  2. Labour Market/Education and Skills;
  3. Business Diversity and Supply Chain; and
  4. Visitor Economy.
- Local Study Area
  5. Recreational assets;
  6. Visitor attractions; and
  7. Visitor accommodation and other businesses/services serving the tourism economy.

In addition to these two study areas, data relating to land use within the boundaries of the proposed development site has also been gathered. The sensitivity of each receptor or receptor group is based on its importance or scale and the ability of the baseline to absorb or be influenced by the identified effects.

#### 4.3.3 Consultation

A range of statutory and non-statutory organisations have been consulted as part of the EIA scoping process. The responses which are relevant to likely effects on population and human health are identified in **Table 4.2**.

Consultee	Date of Correspondence	Comments	Reference within EIA
Environmental Health Service (HSE)	28 February 2019	The EIA should assess the wider determinants of health and whether the proposed development can facilitate health gain for local communities for example whether the design of access roads and tracks can facilitate access to recreation land use or whether community benefit funding can be used for increasing connectivity of footpaths or cycle ways or other health enhancing development of the	Health effects of improved access considered in this chapter. Effects arising from noise, air quality, water, shadow flicker considered in other chapters.



		built environment.	
Environmental Health Service (HSE)	29 February 2019	Need for accurate baseline. Need to use recognised health evaluation criteria. Recognise the impact on population and human health is often the change in the environment and not always an absolute exposure level.	Incorporated into methodology.
Faillte Ireland	13 February 2019 and 24 May 2019	Supplied copy of Guidelines on the treatment of tourism in an Environmental Impact Statement	Incorporated into methodology.

**Table 4.2 - Scoping feedback relating to Population and Human Health**

Separately, DPL has also engaged in an extensive public consultation process during the design phase of the proposed development. This process involved 2 no. separate approaches in which DPL consulted with the local community and sought the input of local residents, landowners, business owners and all relevant stakeholders.

Firstly, a representative of DPL visited each occupied dwelling located within 1.8km of a proposed wind turbine. Residents were advised of the details of the proposed development and comments were invited and welcomed.

Secondly, a series of Public Information Meetings were held in Newbliss, c. 2km from the proposed development. These meetings allowed members of the public, who may have resided beyond the 1.8km from a turbine, to discuss the project with members of the DPL project team. A comprehensive overview of DPL's approach to public consultation is provided at **Annex 1.4**.

#### 4.3.4 Approach to Assessment of Effects

The chapter assesses the likely construction, operational and decommissioning effects on:-

- the local economy (employment and economic output);
- the local population;
- opportunities for local involvement in the business supply chain and employment, i.e. how the key construction and operational activities will translate into investment;
- jobs;
- recreation and tourism assets; and
- land use – through possible effects arising from improved access to the countryside.

Decommissioning effects are assessed as very similar to construction effects.

#### 4.3.5 Sensitivity Criteria, Magnitude and Significance Thresholds

Likely effects will be assessed in line with the following parameters:-

- beneficial or adverse (or neutral);
- extent (the area over which the effect occurs);

- duration (the time for which the effect is expected to last prior to recovery or replacement of the resource or feature);
- reversibility (permanent or temporary); and
- timing and frequency.

#### 4.3.6 Sensitivity Criteria

There are no published standards that define receptor sensitivity relating to Population and Human Health assessments. As a general rule, the sensitivity of each receptor or receptor group is based on its importance or scale and the ability of the baseline to absorb or be influenced by the identified effects. In assigning receptor sensitivity, consideration is given to the following:-

- importance of the receptor e.g. local, regional, national, international;
- availability of comparable alternatives;
- ease at which the resource could be replaced;
- capacity of the resource to recover or adapt to identified impacts over a period of time; and
- level of usage and nature of users (e.g. sensitive groups such as people with disabilities).

Based upon expert judgement, four levels of sensitivity are used: High; Medium, Low and Negligible. Proposed sensitivity criteria are set out in **Table 4.3** below.

#### 4.3.7 Magnitude Criteria

The magnitude of impact is evaluated based on the change that occurs with respect to the baseline conditions. Four degrees of magnitude are used: High; Medium; Low and Negligible.

#### 4.3.8 Defining Significant Effects

The level of an effect is assessed by combining the magnitude of the impact and the sensitivity of the receptor as shown in **Table 4.3**. Four levels of effect are used: Negligible, Minor, Moderate or Major.

Where an effect is classified as Major, this is considered to represent a 'significant effect' in terms of the EIA Directive. Where an effect is classified as Moderate, this may be considered to represent a 'significant effect' but is subject to expert judgement and interpretation, particularly where the sensitivity or impact magnitude levels are not clear or are borderline between categories or the impact is intermittent.

Sensitivity or Value of Resource or Receptor	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

**Table 4.3 - Level of Effect Matrix**

#### 4.3.9 Approach to Mitigation

Mitigation measures, additional to those environmental measures incorporated into

the project design, are considered in order to mitigate any significant adverse effects that are identified through the assessment process.

#### 4.3.10 Cumulative Effects

Consideration will be given to the cumulative effect of wind farms and other existing, permitted and proposed developments in the Local Study Area (i.e. within 5km of the site boundary).

#### 4.3.11 Limitations of Assessment

Certain information regarding project design, in particular information regarding capital expenditure and construction employment, will not be available until the normal procurement process has been completed. The following chapter provides estimates, based on experience on other projects, of likely spend and employment during construction sufficient to allow assessment in this EIAR.

Information on inter-related effects is informed by the assessments undertaken on other topics, which are set out in those topic chapters. Any limitations are set out in those chapters.

The status of certain individual receptors, for example, accommodation businesses, may be subject to change. Information reported in this document is based on the baseline survey work described in **Section 4.4**.

### 4.4 Description of Existing Environment

#### 4.4.1 Wider Study Area

##### 4.4.1.1 Population

The most recent estimates show that the current population of County Monaghan stands at 61,386, which is less than 1.3% of Ireland's total population (CSO, 2018); while County Cavan's population is estimated at 76,176, which is less than 1.6% of Ireland's population as a whole of 4.8 million (million).

##### 4.4.1.2 Labour Market/Education and Skills

2016 Census data for County Monaghan indicates that there were 25,549 persons aged 15 years and over whose principal economic status was 'at work', whilst 350 were looking for their first job and 3,481 were unemployed having lost or given up their previous job. The overall unemployment rate stood at 13%.

2016 Census data for County Cavan indicates that there were 30,509 persons aged 15 years and over whose principal economic status was 'at work', whilst 603 were looking for their first job and 4,810 were unemployed having lost or given up their previous job. The overall unemployment rate stood at 15.1%

##### 4.4.1.3 Business Diversity and Supply Chain

Data on an area's business population can be obtained from the CSO census data. This data source can be used to identify the structure of the local business base by sector. This is potentially useful in assessing the capacity of the local area to host supply chain activity for infrastructure and other large-scale construction projects such as the proposed development. **Table 4.4** provides the latest (2016) data on the structure of the local business base, both in absolute and relative terms.

Industry	Monaghan 2016 %	Cavan 2016 %

Managers, Directors and Senior Officials	1,902	6.6%	2,228	6.3%
Professional Occupations	3,861	13.3%	4,492	12.7%
Associate Professional and Technical Occupations	1,855	6.4%	2,651	7.5%
Administrative and Secretarial Occupations	2,607	9.0%	3,241	9.2%
Skilled Trades Occupations	5,945	20.5%	7,661	21.7%
Caring, Leisure and Other Service Occupations	2,293	7.9%	2,761	7.8%
Sales and Customer Service Occupations	1,512	5.2%	1,889	5.3%
Process, Plant and Machine Operatives	3,372	11.6%	3,601	10.2%
Elementary Occupations	2,896	10.0%	3,290	9.3%
Not stated	2,787	9.6%	3,505	9.9%
<b>Total</b>	<b>29,030</b>		<b>35,319</b>	

**Table 4.2 – Persons at work or unemployed by occupation**

*Source: CSO Census Data 2016 (CSO, 2017)*

The data in **Table 4.4** shows that commerce & trade, professional services and manufacturing have the highest percentage of the work force.

#### 4.4.1.4 Visitor Economy

Fáilte Ireland combines counties together to form eight different regions across Ireland for which tourism statistics are produced. The counties of Monaghan and Cavan are part of the Borders regions along with Leitrim, Sligo, Donegal and Louth; which comprises the largest region. The latest data for the Border region was published in 2017 and indicates that:-

- there was a total of 746,000 overseas visitor trips to the region, generating approximately €271million;
- there was a total of 1 million trips by Irish residents to the region generating approximately €189million; and
- there was a total of 648,000 trips by residents from Northern Ireland to the region generating approximately €141million.

This results in the Borders region being the 5<sup>th</sup> highest earning of the eight Irish regions (Fáilte Ireland, 2017).

Within the Borders region, County Monaghan attracts 60,000 overseas visitors (7.42% of the total), with a total revenue of €25million. County Cavan attracts 107,000 overseas visitors (13.24%) with a revenue of €48million.

The MCDP sets out that the County has a wide range of historical, cultural and landscape interests that, if sensitively managed, have the potential to raise the County's profile as a significant tourist destination that will strengthen the County's offering under the Ireland's Ancient East destination brand.

MCDP policies are also focussed on developing the county as a destination with some policies relate to development of tourism trail and festivals. Targeted investment in these projects in future years is likely to form an important part of this overall strategy.

Several looped cycle trails occur to the north west of the WSA. The nearest of these is the Kingfisher Cycle Route which passes along a local road just over 700m north of the proposed development. The route makes use of local roads and connects into the wider 'Kingfisher' network of cycle routes to the west of Clones.

A number of scenic walking trails are located in the WSA most notably within the grounds of Bellamont Forest on the outskirts of Cootehill, just over 7km southeast of the site and in Rossmore Forest Park on the outskirts of Monaghan town. Beyond this, to the north is The Ulster Way just over 14km northwest of the proposed turbines at its nearest point, but outside of the WSA.

Other visitor economy receptors located within the WSA comprise:

1. Hilton Demesne comprises of a stately home dating back to the c. 1800s and is situated north of Hilton Lough just under 4.5km west of the proposed development site; and
2. Castle Saunderson. Located on the banks of the River Erne. It is situated just over 11km west of the proposed development.

#### 4.4.2 Local Study Area

The following section describes the baseline environment for the Local Study Area (LSA) i.e. within 5km of the boundary for the proposed wind farm and 500m of the proposed grid connection options. As set out at **Section 4.3.2**, this component of the baseline covers:-

- Community;
- Recreation;
- Visitor economy assets; and
- Land use.

##### 4.4.2.1 Community

The wind farm is located c. 2km south-west of the village of Newbliss and 5km south-east of Clones.

The settlement of Clones comprises a range of shops and services and is identified as a Tier 3 'Service Town' in the MCDP. The MCDP sets out that the population of Clones has fallen between 2006 (1,767) and 2016 (1,680) a trend which the Local Authority identifies as 'worrying' in the MCDP. The MCDP proposes that as a means of countering population decline, the town "will be encouraged to supply new local employment opportunities". Clones contains a number of historical assets, including 3 no. National Monuments (see **Chapter 10**) which are likely to play a role in the visitor economy of the LSA.

Newbliss is identified as a Tier 4 settlement/village in the MCDP and contains a small number of shops and services. The MCDP acknowledges that Tier 4 settlements:-

*"have the necessary infrastructural capacity to ensure they can continue their function as local growth settlements and serve the needs of their hinterlands."*

##### 4.4.2.2 Recreation

There are several features of recreational interest within the LSA described below.

## Clones Golf Club

Clones Golf Club lies approximately 3km west of the wind farm and comprises a 20-hole golf course laid out over parkland. The golf course is unusual in that it has 20 holes (rather than the typical 18-hole course). The receptor is considered to be of local value and therefore sensitivity is low for the purposes of this assessment.

## Fishing

There are three lakes that fall within the LSA that are identified on the fishing website MyFishMaps (accessed in August 2019) comprising Clonkeen Lough (within 5km of wind farm); Killynenagh Lough (within 5km of wind farm); and Shantemon Lough (within 500m of grid connection Option 2). These lakes are considered to be local value and sensitivity is low.

Based on a review of the background materials identified in the methodology section of this chapter and through consultation with Inland Fisheries Ireland, it is recognised that recreational fishing is likely to take place on other lakes and watercourses in the region.

## Walking Paths, Trails and Cycling

The National Trails Office (NTO) of Sport Ireland is responsible for all Waymarked Trails. There are no national waymarked trails which pass through the LSA, however as noted earlier there are a number of walking routes in the WSA.

As noted earlier in this chapter, the Kingfisher Cycle Trail passes within 700m of the proposed development.

### 4.4.2.3 Tourism

#### Accommodation

Two tourism accommodation businesses have been identified in the LSA (within 5km of the wind farm) comprising:-

- Clones Greenjoy B&B – a bed and breakfast located 3km to the north west of the site boundary; and
- Creighton Hotel – 3 star hotel located in Clones.

In addition, there are a small number of self-catering properties rental properties within the LSA which are marketed via third party marketing sites such as Airbnb.

The accommodation businesses identified are considered to be of local value and their sensitivity of is therefore low.

## Land Use

The proposed development site is predominately used for agriculture and does not provide current recreational uses.

## 4.5 Description of Likely Effects

The following sections assess the effects which are likely to arise during the construction, operational and decommissioning phases.

### 4.5.1 Construction Phase

#### 4.5.1.1 Effects on the WSA

#### Employment and Local Investment

During the 12-18 month construction phase of the proposed development, there would be economic effects resulting from expenditure on items such as site preparation, access roads, purchase and delivery of materials, plant, equipment

and components. Information provided by DPL, based on experience at other wind farms in Ireland, indicates that there is expected to be a peak on-site workforce in excess of 120 workers. It is highly likely that a significant percentage of these workers will be sourced from the local labour market within the WSA, with the remainder being sourced from Ireland as a whole.

The most substantial elements of the proposed development are the 8 no. wind turbines. The indicative investment sums have been set out in **Table 4.5** providing the breakdown of the total development and capital expenditure required to develop and construct the proposed development. Expenditure comprises approximately €50million for the wind farm element, including turbines, civil engineering works, electrical plant and grid connection. Grid connection Option G1 has been used in the calculations provided at **Table 4.5** as, due to its short distance, would result in the lowest level of investment. The construction of Options G2 or G3 would bring about significantly greater levels of investment.

Item	Description	Cost
Development Expenditure	The processes up to the point of financial close or placing firm orders to proceed with wind farm construction, and project management costs incurred by DPL.	€1.5 million
Turbines/Plant	The activity by wind turbine manufacturers and their suppliers, including nacelle/hub component manufacture and assembly and blade and tower manufacture. It includes transport, installation and commissioning but excludes the turbine service agreement	€32 million
Civil Works	The activity by civil contractors and their suppliers; including access tracks and drainage, crane hardstands, turbine foundations, meteorological mast foundations, cable trenches and buildings for electrical switch gear, SCADA equipment and its installation, and a maintenance and spare part facility.	€10.5 million
Electrical Works	The activity by electrical contractors and their suppliers, including cables, electrical switch gear, protection and control system, and grid connection.	€6 million
Total		<b>€50 million</b>

**Table 4.3 - Breakdown of Estimated Capital Investment**

Procurement of goods and services are likely to have a significant positive effect on the local economy. Of the level of expenditure calculated above, local contract spend (within the WSA) could be in the region of €12.5 million (25%) over the development and construction period.

The types of supply chain companies that could benefit from this expenditure are wide ranging, and are likely to include, but not limited to, the following:-

- haulage and transport services;
- traffic management;

- materials supply, e.g. aggregates;
- plant and equipment hire;
- vehicle servicing / tyres;
- fencing;
- fuel;
- security;
- waste management;
- building construction, electrical, plumbing, roofing, flooring, plastering and joinery services;
- signing and lighting;
- telecommunications;
- drainage;
- planting and seeding;
- cleaning;
- catering;
- professional services; and
- accommodation.

The appointed contractors will be actively encouraged to develop local supply chains throughout the area, and work with local subcontractors and service providers.

In addition, local businesses and services are likely to experience indirect benefits during the construction phase works as the workforce spend locally on living costs whilst they are based in the area. These effects are further explored in the following section.

#### Effects on Tourism Economy

The construction period is anticipated to last for 12-18 months and, as stated, is likely to benefit the local economy through expenditure on purchases of accommodation, food, drink, fuel, etc. which will be required to sustain the construction workforce. These beneficial effects would be experienced mainly by businesses already operating within the tourism sector, or those that are partly dependent on tourism for their income, for example the retail sector.

Anecdotal evidence, based on other wind farm construction projects, demonstrates that local businesses such as accommodation providers welcome the enhanced level of occupancy that is achieved due to construction contractors using their accommodation on a year round basis, including periods of the year that are traditionally considered 'low season'. 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.

The positive effects arising during the construction period are assessed to more than offset any likely temporary negative effects to the tourism economy that may occur in the event that tourist visitors were deterred from visiting the local area (for example, if accommodation was in use by construction workers) during this phase.

Whilst overall effects on the tourism economy are considered to be negligible and not significant (beneficial or adverse), the benefits to individual businesses is likely to be substantial and may indeed be significant. However, until such time as contracts are agreed, it is not possible to quantify the precise level of benefit to individual businesses.

#### 4.5.1.2 Effects on the LSA

##### Land Use



The proposed development site forms part of operational farm holdings and is owned by a number of private land owners. DPL is in regular dialogue with each landowner (and where relevant with tenant farmers also) and each one has entered into a legal agreement to allow the developer to utilise the land. The legal agreements include a suite of measures designed to minimise any likely land use effects including the clear identification of lands which may be subject to development, measures to ensure that disturbed lands are reinstated appropriately and returned to agricultural use insofar as possible, and provision for the use of proposed access tracks by landowners during the operational phase of the proposed development. Measures to facilitate the safe continuation of agricultural operations during the construction phase have been developed.

### Tourism and Recreation Assets

Of the 2 no. identified accommodation businesses in the LSA, both are located in excess of 3km from the proposed wind farm site and neither are located on the proposed turbine component haul route to the site. A similar position exists in relation to other recreation and visitor economy receptors identified in the baseline work. No effects on these receptors are anticipated, primarily due to the distance between the proposed wind farm and these receptors and the temporary nature of the construction phase.

The turbine component access route does pass through the village of Newbliss and further east through the town of Monaghan and therefore businesses along this route may potentially be adversely affected during construction, as a result of construction traffic passing the property. Furthermore, the haul routes for construction materials pass through a number of settlements including Clones and Cootehill and may result in an adverse effect due to traffic movements.

An assessment of effects on road users and other sensitive receptors has been undertaken in **Chapter 13**. The assessment takes account of embedded measures to minimise likely impacts of construction traffic on other highway users, including users of these properties. Prior to construction, a Traffic Management Plan (TMP) will be prepared to manage traffic during the construction phase. The assessment concludes that construction traffic would not have a likely significant effect on road safety or on other road users.

As the sensitivity of all receptors within the LSA is low, and the magnitude of adverse effects would also be low, the level of effect on receptors in the LSA would be negligible (adverse) and not likely to be significant. This effect would be further reduced, or may become beneficial overall, if businesses in this area generate additional revenue areas a result of the proposed development.

The impact on businesses within the LSA unaffected by construction traffic would be beneficial although as the sensitivity is low the level of beneficial effect is not expected to be more than negligible. Effects on individual businesses may be higher particularly where they are regularly used by construction staff, as this affords them regular income that is not seasonally dependent. However, until contracts are agreed and construction commences, it is not known which businesses would benefit.

The detailed CEMP, to be prepared prior to the commencement of development, will set out measures to ensure that local residents are informed of the construction work including the location and duration of temporary road closures and the identification of alternative routes during the construction works. Given the temporary nature of the construction works, the measures to be implemented and the low sensitivity of the receptors, the effect would be negligible and not likely to

be significant.

### Accidents or Natural Disasters

As set out within **Chapter 6** and **Chapter 7** of this EIAR, the proposed development is not recognised to be a likely source of pollution during either the construction or operational phases, predominately due to the limited volume of hydrocarbons stored on site and the bunding arrangements to ensure that spillages do not occur. In the event of an accident on-site, mitigation measures set out in the above chapters will ensure that significant environmental effects do not occur.

There is limited likelihood for significant natural disasters to occur at the proposed development site. Ireland is a geologically stable country with a mild temperate climate. The potential natural disasters that may occur are therefore limited to flooding and fire. The risk of flooding is addressed in **Chapter 7**. It is considered that the risk of significant fire occurring, affecting the proposed development and causing it to have significant environmental effects is limited. There are no habitat types located within the site which are particularly susceptible to fire and no tracts of forestry are present. As discussed above, there are no significant sources of pollution in the proposed wind farm development with the potential to cause environmental or health effects. Furthermore, one of the core mitigation by design features of the proposed development, maximising the distance to residential dwellings, further limits any likelihood of significant human health effects as a result of accidents or natural disasters.

Major industrial accidents involving dangerous substances pose a significant threat to human health and the environment. Such incidents can give rise to serious injury to local residents or result in damage to the environment, both within proposed developments sites and in the vicinity. However, the proposed development site is not regulated by, connected or proximate to any site regulated under the Control of Major Accident Hazards Involving Dangerous Substances Regulations (i.e. sites regulated in accordance with the SEVESO Directives) and so there is no likelihood for cumulative effects or interactions with any such site.

#### 4.5.1.3 Cumulative Effects

This assessment has taken into account the cumulative impact of the proposed development including all elements i.e. wind farm and associated ancillary infrastructure, 3 no. grid connection options and upgrade works to the proposed turbine component haul route.

However, there is potential for cumulative effects to arise in relation to the construction of other permitted or proposed developments should the construction phases overlap with the proposed development. While there are a number of developments permitted or currently proposed within the WSA, it is assessed that none of these projects are of a sufficient scale or nature to be likely to result in cumulative socio-economic or population and human health effects.

### 4.5.2 Operational Phase

#### 4.5.2.1 Effects on the WSA

##### Employment and Investment

When the proposed development is operational, the project will require a team of personnel to provide servicing, maintenance, repairs and other operational support. It is estimated that up to 4 no. engineers and technicians (full time equivalent) will be needed to provide operational support to the project. All of these staff are expected to be based within the WSA (i.e. County Monaghan or Cavan).

Further employment is anticipated to be supported directly and indirectly elsewhere in Ireland during the operational phase. Additional to the direct impacts on employment during the construction and operational phases, there would also be indirect effects generated throughout the operational phase. Indirect effects arise from the placing of contracts with other businesses, both in the local area and elsewhere in Ireland, supplying services and materials to the project during its operational phase. Examples of such supply chain activity would include the procurement of:-

- site and building maintenance;
- waste management;
- civil engineering contractors for road maintenance, ditching, crane pad repairs, grass cutting, weed control, road furniture and gate repair etc;
- supply of consumable items (e.g. lubricants and oils, spare parts, office supplies, etc.);
- turbine inspections;
- in addition, local shops, cafes, accommodation providers and hotels often experience an increase in business during the operational phase (e.g. extra technicians onsite for during wind farm maintenance and servicing).

DPL will seek to secure positive benefits for the local economy by encouraging the use of local labour, manufacturers and suppliers where possible during the operational phase.

### Visitor Economy

As identified in the baseline section, landscape quality is an important part of the visitor appeal of the WSA and is one of the reasons why visitors come to the area. The landscape qualities are appreciated from several scenic roads and viewpoints which are set out in **Chapter 9**. Local planning policies refer to managing the landscape sympathetically in order to, amongst other reasons, protect this visitor appeal.

**Chapter 9** of the EIAR assesses in detail the landscape and visual effects of the proposed development. The chapter concludes that the proposed development will be visible from some of these scenic roads and viewpoints of the WSA. However, the highest level of visual impact significance (in this case 'Substantial-moderate') is predicted to occur at a viewpoint just over 300m from the site and the next highest level of significance ('Moderate'), is predicted to occur at local community views, none of which are considered to be important components of the visitor economy baseline. Outside of this inner area the visual impact significance identified in **Chapter 9** generally drops to 'Slight and Imperceptible' which reflects the high degree of screening provided by the rolling vegetated drumlin hills surrounding the proposed development. **Chapter 9** concludes that the proposed development will not give rise to significant landscape and visual effects in EIA terms.

Evidently, whilst the proposed development will be visible from around the WSA, significant visual impacts (as reported in **Chapter 9**) will not occur in this wider area. The more prominent views of the wind farm will occur much closer to the site in areas where there is no evidence of significant visitor economy activity. A negligible impact resulting in a negligible effect on tourism is likely to occur.

Notwithstanding these considerations, it is noted that there is no evidence to suggest that an occasional view of the proposed development from throughout the WSA might adversely affect the visitor appeal of the area. Based on the evidence gathered from previous studies the occasional views of the proposed development

are not expected to act as a deterrent to visitors or discourage repeat visits to the area.

#### 4.5.2.2 Effects on the LSA

##### Community Benefit Funds and Community Investment

The operation of the proposed wind farm will bring about a number of financial benefit packages to both the WSA and LSA. These packages include investment opportunities, community benefit funds, contributions to local resident energy costs, payment of business rates to Monaghan County Council and rental income accrued by involved landowners. Each of these packages is discussed below.

DPL is committed to operating a community benefit fund in accordance with the Irish Wind Energy Association (IWEA) best practice and it will be available to the community at a rate of €2 euro per MWh produced resulting in a investment of approximately €270,000 a year for up to 15 years. There will also be a community investment element available where there will be an opportunity for all local residents to participate if they wish to do so. The structure for the investment scheme will form part of the Renewable Energy Support Scheme (RESS) design; however, the precise arrangements for the RESS have not yet been published.

The fund will be administered by a committee set up by the operations department of DPL. Members of the local community are also likely to be appointed to the committee, thus allowing the local community to prioritise the fund for the projects which matter most. Preference will be given to local projects, thereby contributing to the vitality and viability of the local population, and to projects which are considered to represent an environmental benefit or incorporate a renewable energy element in the project. This fund will be made available, and distributed annually, for up to 15 years.

In addition to the above community fund, DPL has committed to making a €1,000 annual contribution to the electricity/energy costs of all non-involved dwellings located within 1.8km of a wind turbine.

Based on current rates, the proposed development would make an annual business rates payment of €990,000 to Monaghan County Council. This annual payment to the Local Authority would have far reaching benefits across the entirety of County Monaghan.

Additionally, it should also be noted that, over the lifetime of the development, a substantial investment will have been made by DPL to involved landowners. It is highly likely that these landowners will reinvest a significant volume of this sum into the local economy and supply chains through various means which will, in turn, result in further community gains.

Benefits would accrue from this income stream and, depending on the choices made, could have a positive effect on the physical and mental well-being of local residents as well as economic benefits. One area that could be considered is using the community benefit monies to promote public access throughout the local area which is one area that has been identified by the HSE in their scoping response as a positive means of promoting good health and wellbeing.

The long term nature of the income would allow the community to plan ahead, to draw in other sources of match funding to maximise the benefits and investment projects could be designed to match local priorities. Given the population size in the WSA and LSA and the annual contributions which will be made for up to 15 years, the magnitude of impact is assessed to be 'High'. This would result in a positive effect of moderate or major importance on the study area.

### Other effects within the LSA

During the operational phase, there are likely to be both adverse effects due to visual impacts on recreational and tourism receptors. Based on a review of the findings of the assessment in **Chapter 13**, no significant effects are likely as a result of maintenance vehicles accessing the site as this would be on an occasional basis only and would not significantly increase vehicular movements in the local area.

There would also be some minor beneficial effects on local businesses within the LSA, probably most likely around Clones and Newbliss arising from expenditure on goods and services by staff and suppliers employed at the proposed development site. This is expected to benefit local shops, food & drink businesses. Although the expenditure would be intermittent and is difficult to quantify, the benefit would be enhanced by the fact that workers visiting the proposed development would do so all year round, unlike tourism expenditure which tends to be seasonal.

Visual effects on recreational receptors are assessed in **Chapter 9** and the findings have been taken into account in the assessment below, although it is important to note that a significant landscape and visual effect does not necessarily result in a significant effect on Population and Human Health. In assessing effects, there is not a straightforward relationship between users experiencing views of turbines from a point or along a route (for example a passing cyclist) and impacts on usage. Some people may be discouraged from using the receptor due to the presence of turbines, but for others there may be no impact.

Studies undertaken in respect of other wind farm developments where users have been asked if the presence of turbines would discourage them from using a route have found that the majority would not be deterred.

The assessment of landscape and visual effects finds that the greater effects of the proposed development would be contained within a relatively limited area around the site (local community views only), and the magnitude of effects would dissipate with distance. These visual effects would not adversely affect any of the receptors identified in the baseline description.

#### 4.5.2.3 Human Health

##### Noise

During the construction and operational phases of the proposed development, noise levels sufficient to cause noise induced hearing damage or sleep disturbance are not likely to occur. The full results of this assessment are presented in **Chapter 11**, Noise and Vibration.

##### Lighting protection

Appropriate lightning protection measures are incorporated in modern wind turbines to ensure that lightning is conducted harmlessly past the sensitive parts of the nacelle and down into the earth. The rotor blades of the proposed turbine model are equipped with lightning receptors mounted in the blade. The turbine is grounded and shielded to protect against lightning. In the event of a lightning strike or an abnormal increase in voltage (overvoltage), the entire electrical and electronic equipment is protected by built-in energy absorbing components with surge protection in the electrical components.

##### Ice fall

In extremely cold climates or at high altitude ice can potentially build up on blades or other parts of the turbines. Ice can potential fall off and cause injury although there is no experience of any such incident in Ireland. Most modern “turbines are

fitted with anti-vibration sensors, which will detect any imbalance caused by the icing of the blades. The sensors will cause the turbine to wait until the blades have been de-iced prior to beginning operation. All occupied/habitable properties in the vicinity of the proposed wind farm are located well in excess of 500m from a proposed turbine and therefore there is no likely impact in respect of ice throw.

### Electromagnetic (EMF) Interference

All electricity, both natural and man-made, produces two types of fields: electric fields and magnetic fields.

The proposed grid connection cables will comply with the international guidelines for ELF-EMF set by the International Commission on Non-Ionizing Radiation Protection (ICNRP), which is an advisory agency to the World Health Organisation. The cables will also comply with EU guidelines for human exposure to EMF.

The proposed substation options are located well away from any residence with no possible EMF impact. The substation when operational will also comply with ICNRP and EU guidelines relating to exposure to EMF.

The EirGrid document 'EMF & You: Information about Electric & Magnetic Fields and the electricity transmission system in Ireland' (EirGrid, 2014) provides further practical information on EMF

### Shadow Flicker

Shadow Flicker is assessed in detail in **Chapter 12**. The chapter concludes that there will be no residual shadow flicker impacts arising from the proposed development. Mitigation measures will ensure that any residual effects are within the acceptable limits.

#### 4.5.2.4 Cumulative Effects

While there are a number of developments permitted or currently proposed within the WSA, it is assessed that none of these projects are of a sufficient scale or nature to have the likelihood to result in cumulative socio-economic or population and human health effects.

#### 4.5.3 Transboundary Effects

Whilst the majority of local economic effects are anticipated to arise within the WSA area (County Monaghan and County Cavan), it is possible that a small number of supply chain contracts are let to companies within Northern Ireland (NI). If this happens, it is possible that a small number of benefits may arise within local NI supply chain companies, although the effects are expected to be negligible. No other transboundary effects are predicted to arise as a result of the proposed development.

#### 4.5.4 Decommissioning Phase

These effects are anticipated to be the same as the construction phase effects described earlier in this chapter.

### 4.6 Mitigation & Monitoring

#### 4.6.1 Construction Phase

Allowing for the implementation of embedded mitigation set out elsewhere within this EIA, no likely significant adverse effects have been identified in respect of socio-economic receptors arising from construction of the wind farm and therefore no mitigation measures are required to reduce or remedy any adverse effect. In terms of beneficial effects, individual businesses or receptors may experience

substantial effects accruing from the construction phase; however, it is assessed that the overall effect on socio-economic receptors will not be significant.

As identified above, a suite of measures has been agreed with involved landowners regarding the management of agricultural activities during the construction phase. These measures have been incorporated into signed legal agreements and will be implemented in full.

#### 4.6.2 Operational Phase

No likely significant adverse effects have been identified in respect of socio-economic receptors arising from the operation of the wind farm and therefore no mitigation measures are required to reduce or remedy any adverse effect.

#### 4.6.3 Decommissioning Phase

No likely significant adverse effects have been identified in respect of socio-economic receptors arising from the decommissioning of the wind farm and therefore no mitigation measures are required to reduce or remedy any adverse effect.

### 4.7 Residual Effects

#### 4.7.1 Residual Construction Effects

No residual adverse construction effects are assessed as likely to occur.

#### 4.7.2 Residual Operational Effects

No residual adverse construction effects are assessed as likely to occur.

#### 4.7.3 Residual Decommissioning Effects

No residual adverse construction effects are assessed as likely to occur.

### 4.8 Summary

This assessment has considered data from a diverse range of sources to determine the likely effects of the proposed development on population and human health, together with local effects on tourism and recreation assets. The likely effects on assets identified in the baseline description take account of good practice embedded measures to be adopted. No specific mitigation has been identified to be required and therefore residual effects of the proposed development are effectively the same as the predicted effects. Predicted adverse and beneficial effects have been assessed as likely not to be significant during both the construction, operational and decommissioning phases.

## References

- British Horse Society 'Wind Turbine Experiences – 2012 Survey Results' (September 2013).
- British Horse Society 'Wind Turbines and Horses - Guidance for Planners and Developers' (August 2015).
- Cavan County Council. Cavan County Development Plan 2014-2020.
- Cavan Local Economic and Community Plan 2016-2021.
- CSO (2018) Census County Snapshots. 2018.
- CSO (2017) Census 2016 Results. Area Profiles.
- Dept. of Housing, Planning, Community and Local Government and the Dept of Communications, Climate Action and Environment. Review of the Wind Energy Development Guidelines 2006 "Preferred Draft Approach" (2017)
- Dept. of Communications, Climate Action and Environment 'Code of Practice for Wind Energy Development in Ireland' (2017).
- Eirgrid. 'EMFs and You' (2014).
- Fáilte Ireland (2017) 2017 Topline Tourism Performance by Region.
- Fáilte Ireland, various. Data in conjunction with websites of relevant tourism sites and amenities in the area.
- Fermanagh and Omagh District Council. Local Development Plan Draft Plan Strategy.
- IWEA 'Best Practice Guidelines for the Irish Wind Energy Industry' (2012).
- IWEA 'Best Practice Principles in Community Engagement and Community Commitment' (2013).
- IWEA 'An Enterprising Wind': An economic analysis of the job creation potential of the wind sector in Ireland (2014).
- Monaghan County Council (2017). Tourism Statement of Strategy and Work Programme 2017-2022.
- Monaghan Local Economic & Community Plan 2015-2021.
- Monaghan County Council. Monaghan County Development Plan 2019-2025;
- MyFishMaps (2019) Fishing Destinations. Available at: <http://www.myfishmaps.com/> Accessed 22 August 2019.
- Fermanagh and Omagh District Council. Local Development Plan Draft Plan Strategy;
- Pobal Profiling GIS Data.



