

Chapter 18: Population and Human Health





ORIEL WIND FARM PROJECT

Environmental Impact Assessment Report Chapter 18: Population and Human Health

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EIAR – Chapter 18
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ORIEL WIND FARM PROJECT – POPULATION AND HUMAN HEALTH

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18 CHAPTER 18 – POPULATION AND HUMAN HEALTH

18.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) provides an assessment of the potential impacts of the Oriel Wind Farm Project (hereafter referred to as “the Project”) on population and human health. The assessment considers the potential impact of both the onshore and offshore infrastructure during the construction, operational and maintenance, and decommissioning phases. Potential land use and economic / employment impacts of the Project are considered along with potential impacts on human health.

The assessment presented is informed by the following chapters:

- Chapter 12: Commercial Fisheries (see volume 2B);
- Chapter 16: Infrastructure, Marine Recreation and Other Users (see volume 2B);
- Chapter 17: Climate;
- Chapter 23: Air Quality;
- Chapter 24: Risk of Major Accidents and Natural Disasters;
- Chapter 25: Noise (Airborne) and Vibration;
- Chapter 27: Seascape, Landscape and Visual Amenity; and
- Chapter 28: Traffic and Transport.

Appendix 18-1: Population and Human Health Baseline Information provides supporting information on the baseline environment.

For the sake of brevity, this chapter does not seek to repeat text or replicate data from other EIAR chapters but rather cross-refers to the relevant sections of those chapters.

The details and competencies of the specialists who prepared this chapter can be found in volume 2A, chapter 1: Introduction.

18.2 Purpose of this chapter

The primary purpose of the EIAR chapter is to provide an assessment of the likely direct and indirect significant effects of the Project on population and human health. In particular, this EIAR chapter:

- Presents the existing environmental baseline established from desk studies and consultation (section 18.7);
- Identifies any assumptions and limitations encountered in compiling the environmental information (section 18.7.4);
- Presents an assessment of the potential for likely significant effects on population and human health arising from the Project (section 18.10), based on the information gathered and the analysis and assessments undertaken. An assessment of potential cumulative impacts is provided in section 18.11 and an assessment of transboundary effects is outlined in section 18.12; and

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- Highlights any necessary monitoring (section 18.10.4) and/or mitigation (section 18.10.3) measures to prevent, minimise, reduce or offset the possible likely significant environmental effects identified in the assessment (section 18.10).

18.3 Study Area

18.3.1 Population study area

For population-specific impacts, this chapter considers two Local Population Study Areas in addition to a Wider Population Study Area.

Local Population Study Areas

There are two Local Population Study Areas: The Construction Local Population Study Area, which is the area where there is potential for impacts arising from the onshore construction activities and the Operational Local Population Study Area, which is the area where there is potential for impacts during the operational and maintenance phase of the Project.

The Construction Local Population Study Area has been defined based on the eight Electoral Divisions (EDs) within which the onshore infrastructure (including the onshore substation) is located, and the adjacent Ardee Urban ED as shown on Figure 18-1 below. The Construction Local Population Study Area concerns the community that will be most directly impacted by the Project during the construction phase of the onshore infrastructure of the Project (above the HWM). It is comprised of the following eight EDs:

- Ardee Rural;
- Ardee Urban;
- Castlebellingham;
- Dromin;
- Drumcar;
- Dunleer;
- Dysart; and
- Stabannan.

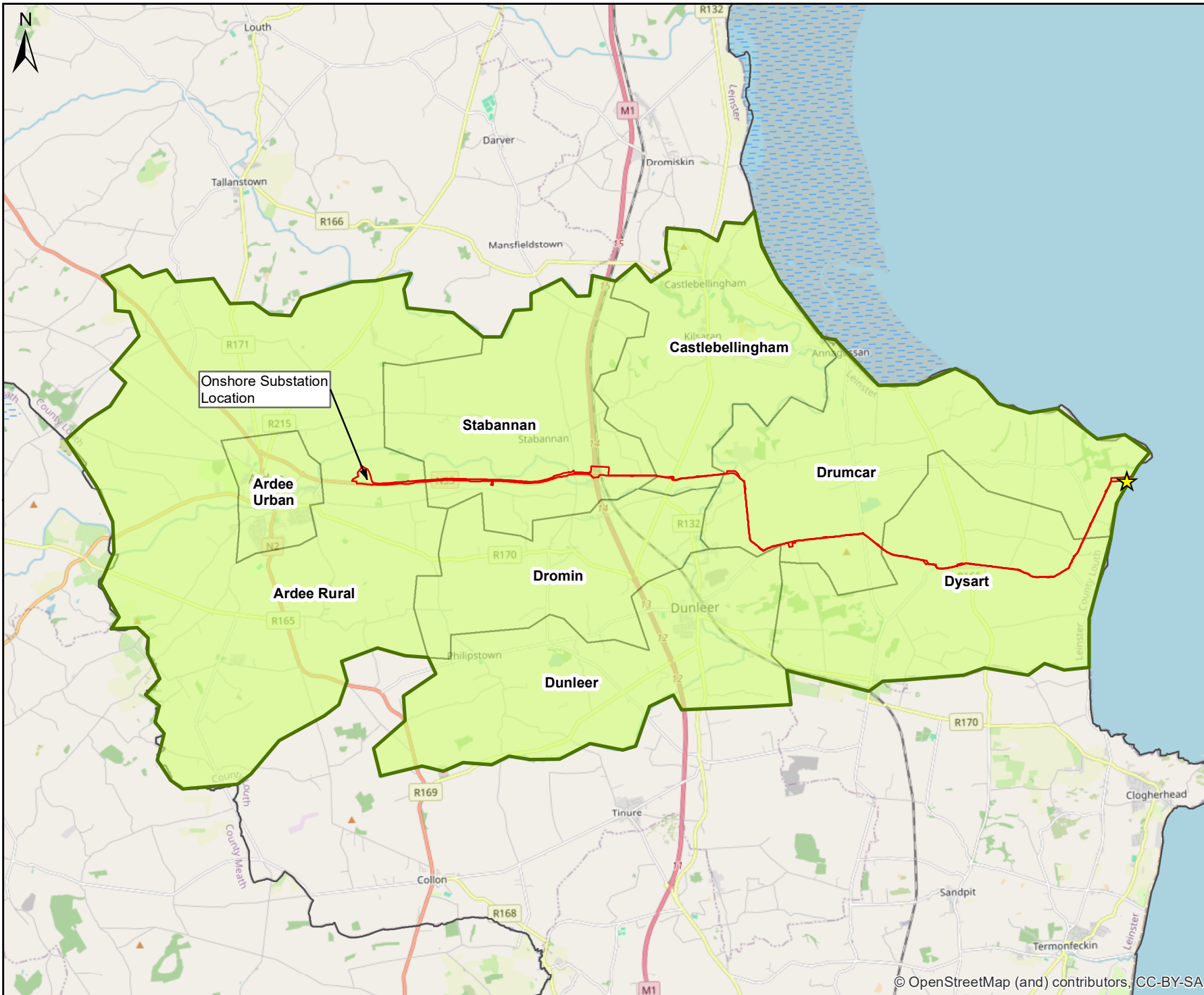
The Construction Local Population Study Area is shown in Figure 18-1.

Offshore operational and maintenance activities will be planned, controlled and monitored at an onshore operations and maintenance base. These offshore activities will operate from an existing port in County Louth or County Down as outlined in volume 2A, chapter 5: Project Description. There are several suitable ports within a one-hour sailing time to the offshore wind farm area including Kilkeel, Warrenpoint and Greenore. The Operational Local Population Study Area has been defined as those areas within an approximate commuting time of 35 minutes from Greenore, Warrenpoint or Kilkeel. This journey time is based on a 25% uplift on the average journey time for commuters (as detailed in Census 2016) within Co. Louth.

The Operational Local Population Study Area comprising EDs in the Republic of Ireland and District Electoral Areas / Wards in Northern Ireland is shown in Figure 18-2.

Wider Population Study Area

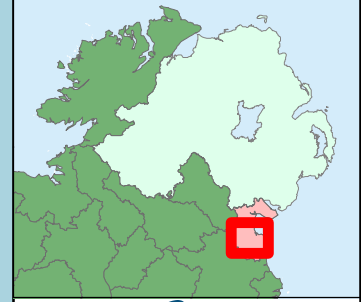
The Wider Population Study Area takes in the whole of County Louth, the Newry, Mourne and Down District Council area (southern parts of Co. Armagh and large parts of Co. Down) in addition to south Monaghan, east Cavan and northwest Meath. The extent of the Wider Population Study Area has been based on a robust consideration of the zone of turbine visibility (ZTV) and the location of employment during construction and operation. The Wider Population Study Area is illustrated in Figure 18-3.



Legend

- Planning Application Boundary
- ★ Landfall Location
- Construction Local Population Study Area

Data Sources: OWL, CSO, OSI



Client



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OFFSHORE RENEWABLE ENERGY

Project

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Title

**Figure 18-1
Construction Local
Population Study Area**



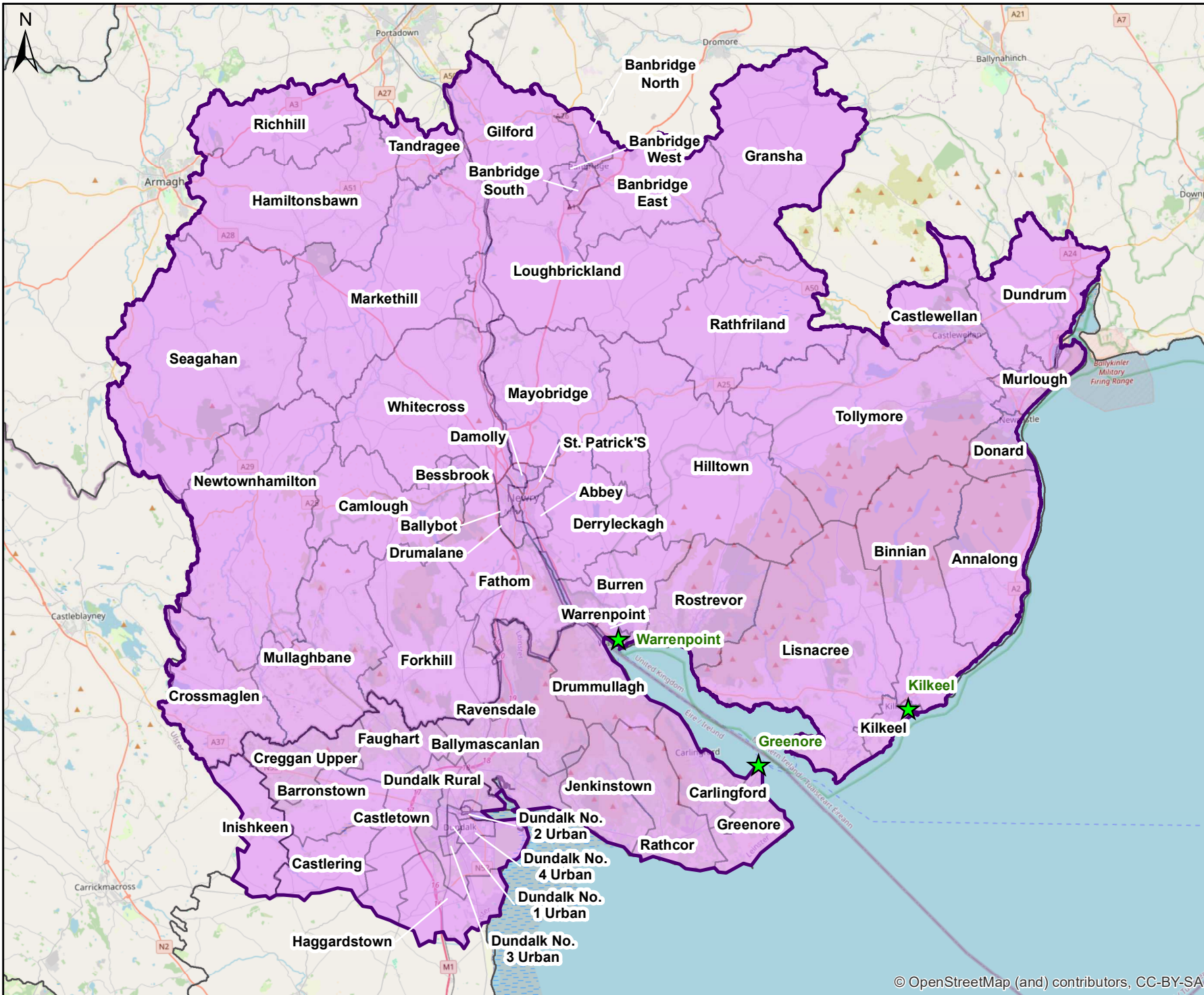
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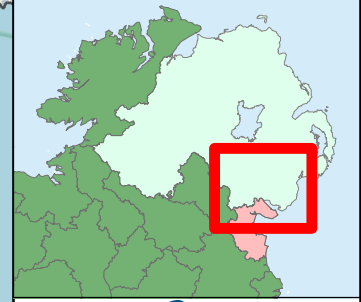
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Legend

- Operational Local Population Study Area
- Ports

Data Sources: OWL, CSO, OSI, OSNI



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Project

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**Figure 18-2
Operational Local
Population Study Area**

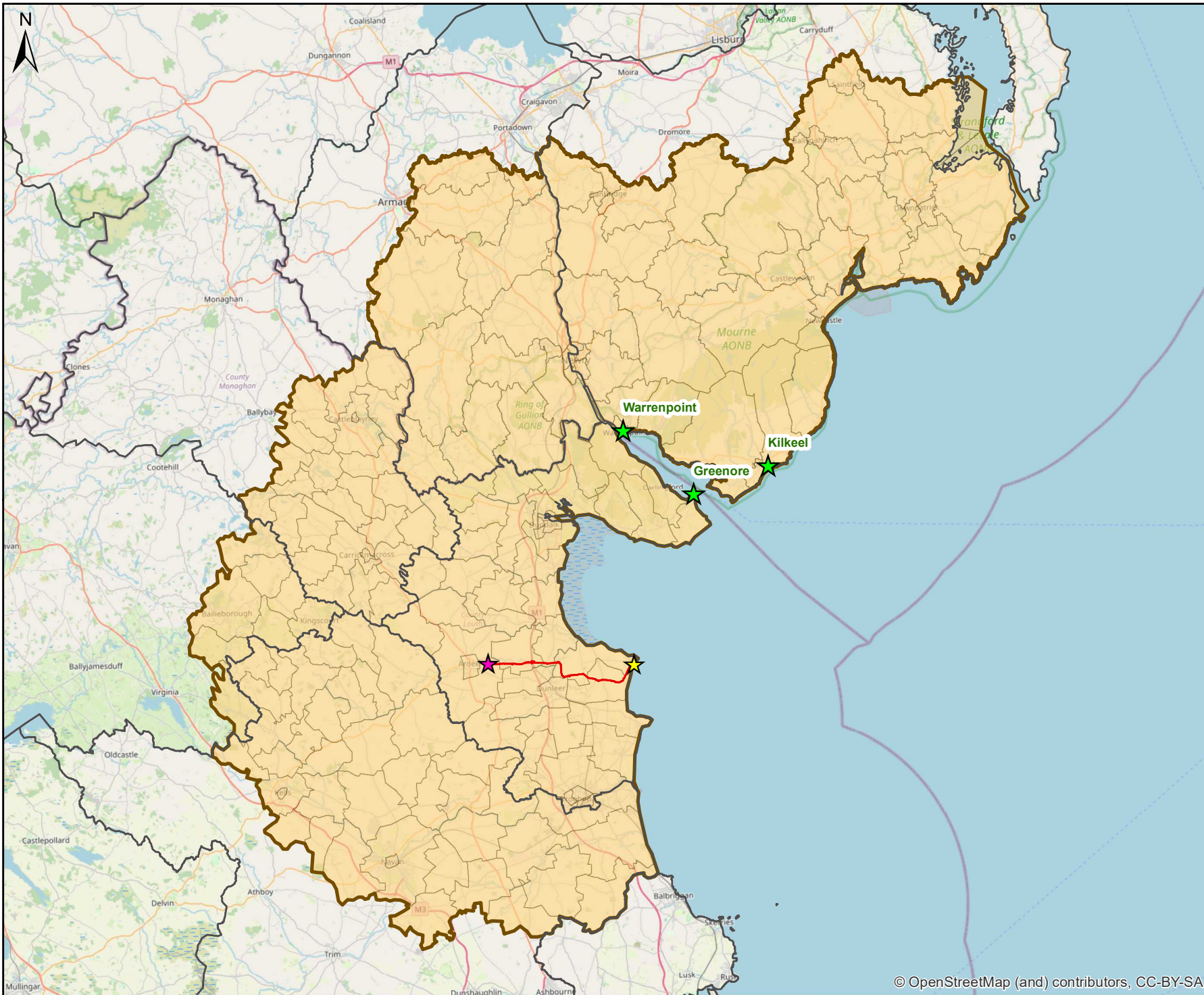
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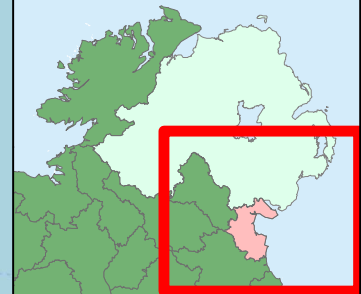
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- Legend**
- Planning Application Boundary
 - ★ Onshore Substation Site
 - ★ Landfall Location
 - Wider Population Study Area
 - ★ Ports

Data Sources: OWL, CSO, OSI, OSNI



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**Figure 18-3
Wider Population Study Area**



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Oriel Wind Farm Project – Population and Human Health

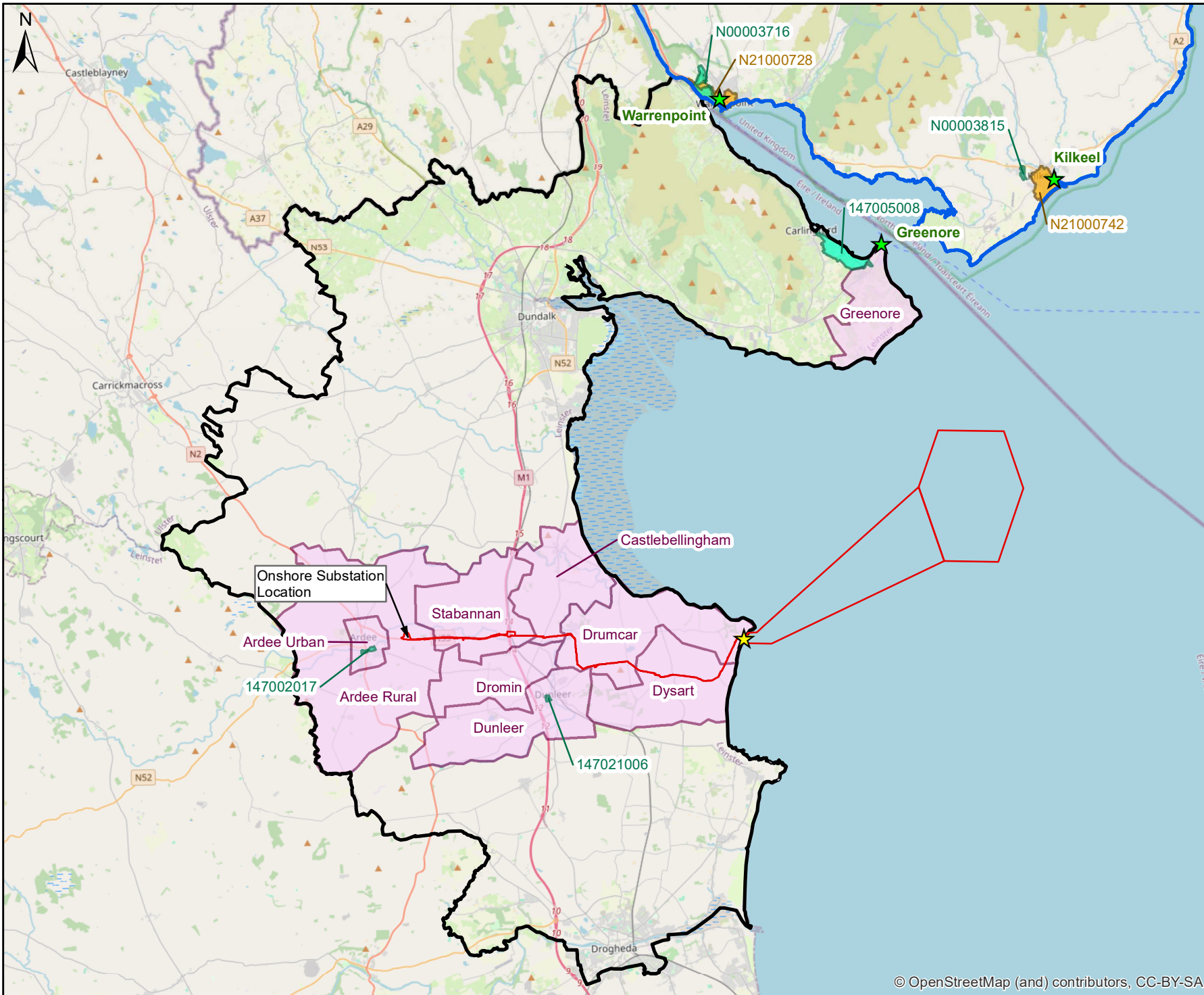
18.3.2 Human Health Study Area

The offshore wind farm area is located in the Irish Sea, off the coast of County Louth (approximately 22 km east of Dundalk town centre and 18 km east of Blackrock). The closest wind turbine will be approximately 6 km from the closest shore on the Cooley Peninsula. The offshore cable corridor extends approximately 11 km southwest from the offshore wind farm area to the landfall south of Dunany Point. The offshore infrastructure is remote from the nearest population receptors. Onshore and nearshore infrastructure are located in County Louth, including: the landfall location; onshore cable route and onshore substation site (3 km east of Ardee, in the townland of Stickillin).

Offshore operations and maintenance will be planned, controlled and monitored from an onshore operations and maintenance base, which will operate from an existing port in County Louth or County Down. There are several suitable ports within a one-hour sailing time to the offshore wind farm area including Kilkeel, Warrenpoint and Greenore.

For most offshore determinants of health there is not a localised population impact around which a study area can be defined. Local populations in County Louth and County Down are relevant for onshore activities associated with the Project, including employment and educational opportunities, transport disruption and recreation and leisure. Wider impacts of the Project are relevant to national public health and climate change related effects extend to the global population. In order to be proportionate, the Human Health Study Area (see Figure 18-4) is therefore comprised of:

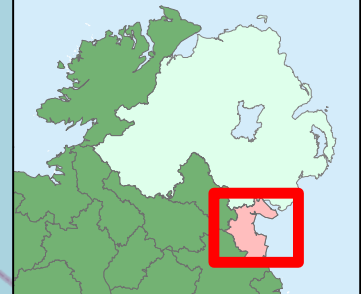
- The 'site specific' population for the landfall location at Dunany and the onshore cable route between Drumcar and Ardee Rural, the sensitivity of which is based on the most deprived small area within close proximity (147021006 within Dunleer);
- The 'site specific' population for the onshore cable route and substation is the townland of Stickillin, the sensitivity of which is based on the most deprived small area within close proximity (147002017 within Ardee Urban); and
- The 'site specific' population for operation and maintenance port activities is Kilkeel (represented by The Mournes_P super data zone), Warrenpoint (represented by Crotlieve_K super data zone) and Greenore. The sensitivity of the site-specific populations is based on the most deprived small area within close proximity for Kilkeel (Kilkeel South 2 (N00003815)), Warrenpoint (Clonallan 1 (N00003716)) and Greenore (147005008 within Carlingford).



Legend

- Planning Application Boundary
- ★ Ports
- ★ Landfall Location
- Small Area Boundaries
- Electoral Division Boundaries
- Super Data Zones
- Louth County Boundary
- Down County Boundary

Data Sources: OWL, CSO, NINIS



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**Figure 18-4:
Human Health Study Area**



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18.4 Policy context

Planning policy on renewable energy infrastructure is presented in volume 2A, chapter 2: Policy and Legislation. This section presents planning policy that specifically relates to population and human health, which is contained in the Offshore Renewable Energy Development Plan I and II (OREDP) (DECC, 2022), the National Marine Planning Framework (NMPF) (Department of Housing, Local Government and Heritage (DHLGH), 2021) and other policy documents. The OREDP and NMPF include guidance on what matters are to be considered in the preparation of an EIAR assessment. These are summarised in Table 18-1 and Table 18-2. Other policy relevant to population and human health is summarised in Table 18-3.

In February 2023, the ‘OREDP II – National Spatial Strategy for the transition to the Enduring Regime’ was published in draft and subject to consultation. The draft OREDP II does not define specific provisions similar to OREDP I. The key objectives of OREDP II are:

- “Assess the resource potential for ORE in Ireland’s maritime area;
- Provide an evidence base to facilitate the future identification of Broad Areas of Interest most suitable for the sustainable deployment of ORE in Ireland’s maritime area; and
- Identify critical gaps in marine data or knowledge and recommend prioritised actions to close these gaps.”

The OREDP II will provide an evidence base to facilitate the future identification of Broad Areas of Interest most suitable for the sustainable deployment of ORE in Ireland’s maritime area, to be assessed in greater detail at regional scale. This assessment will subsequently inform the identification of more refined areas as part of the designation process for Designated Maritime Area Plans (DMAP).

When published, the OREDP II will update the original OREDP published in 2014.

Table 18-1: Summary of OREDP provisions relevant to population and human health.

Summary of OREDP provision	How and where considered in the EIAR
<p>Employment</p> <p>The Offshore Renewable Energy Development Plan I and II (OREDP) explicitly recognises the potential for job creation by the development of a significant offshore wind energy sector and there are a number of policy initiatives outlined to promote such development.</p>	<p>The potential of the construction, operational and maintenance, and decommissioning phases of the Project to improve access to direct employment, and indirect employment and wider economic benefits are discussed in section 18.10.1.</p> <p>Direct and indirect health effects of employment on human health, including opportunities to enhance benefits for local and vulnerable groups are considered in section 18.10.2. This includes health effects from wider indirect economic impacts, and any potential unemployment or adverse economic implications as a result of the Project (e.g. commercial fisheries).</p>
<p>Recreation and tourism – suggested project level mitigation measures</p> <p>Access restrictions – undertake construction, where possible, outside peak tourist seasons (June to September) to minimise disruption to visitors and local people; identify and avoid popular routes for sailing or other water sports such as kayaking; where possible, facilitate safe access through arrays for sailing or other water sports.</p> <p>Noise – avoid key recreational periods for installation works; identify and avoid popular recreational areas when possible.</p> <p>Safety and collision risk – avoid popular cruising routes, diving areas and key water sports locations; incorporate suitable safety features (e.g. lighting); provide suitable information for the public</p>	<p>The potential of the construction, operational and maintenance, and decommissioning phases of the Project to impact (i) marine and land use and (ii) recreational, amenity and community facilities is discussed in section 18.10.1.</p> <p>Safety and collision risk are assessed in volume 2B, chapter 13: Shipping and Navigation and chapter 24: Risk of Major Accidents and Natural Disasters.</p>

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Summary of OREDP provision	How and where considered in the EIAR
regarding safety; restrict access to construction sites; observe good practice during construction, removal and maintenance.	
Disturbance to wildlife – avoid areas that are popular with tourists and wildlife tour operators.	

Table 18-2: Summary of NMPF provisions relevant to population and human health.

Summary of NMPF provision	How and where considered in the EIAR
Overarching social policy – engagement with the sea	
Access Policy 1: Proposals, including in relation to tourism and recreation, should demonstrate that they will, in order of preference, a) avoid, b) minimise, or c) mitigate significant adverse impacts on public access.	Impacts of the Project on infrastructure and other users of the sea are assessed in volume 2B, chapter 16: Infrastructure, Marine Recreation and Other Users. This chapter considers potential changes to marine and land use and recreational and community facilities as a result of the Project (section 18.10).
Access Policy 2: Proposals demonstrating appropriate enhanced and inclusive public access to and within the maritime area, and that consider the future provision of services for tourism and recreation activities, should be supported, subject to the outcome of statutory environmental assessment processes and subsequent decision by the competent authority, and where they contribute to the policies and objectives of this NMPF.	
Employment Policy 1: Proposals should demonstrate contribution to a net increase in marine related employment in Ireland, particularly where the proposals are (i) in line with the skills available in Irish coastal communities adjacent to the maritime area; (ii) improve the sustainable use of natural resources; (iii) diversify skills to enable employment in emerging industries.	Effects of the Project on employment and the socio-economic status of the population are assessed in section 18.10.1. Direct and indirect health effects of employment, including opportunities to enhance benefits for local and vulnerable groups are considered in section 18.10.2. This includes health effects from wider indirect economic impacts, and any potential unemployment or adverse economic implications as a result of the Project (e.g. commercial fisheries).
<i>“Marine planning has a role to play in facilitating growth in new and existing industries which bring associated socio-economic benefits including employment. Marine planning can encourage sustainable economic growth that supports local jobs and contributes to strong local economies through integration with terrestrial planning and engagement with rural coastal and island communities. Barriers to employment may include low quality of local jobs, skills deficit and poor transport connectivity”.</i>	
<i>“Appropriately planned and sited development and associated supply chains can help encourage investment and stimulate demand for marine products and services. In turn, investment can create job opportunities which bring primary and secondary socio-economic benefits through improved levels of employment and spending of wages, which may be particularly important to areas currently experiencing deprivation”.</i>	
Rural Coastal and Island Communities Policy 1: Proposals contributing to access, communications, energy self-sufficiency or sustainability of rural coastal and / or island communities should be supported. Proposals should ideally be inclusive of continual education, skills development and training in marine sectors, thus improving the sustainability, social benefits and economic resilience of rural and island communities.	Effects of the Project on employment and the socio-economic status of the population (i.e. increased affluence) are assessed in section 18.10.1. Section 18.8.2 considers opportunities for education and training, through upskilling and career development in relation to its workforces.
Social Benefits Policy 1: Proposals that enhance or promote social benefits should be supported. Proposals unable to enhance or promote social benefits should demonstrate that they will, in order of preference: a) minimise, or b) mitigate significant adverse impacts which result in the displacement of other existing or authorised (but yet to be implemented) activities that generate social benefits.	

ORIEL WIND FARM PROJECT – POPULATION AND HUMAN HEALTH

Summary of NMPF provision	How and where considered in the EIAR
<p>Social Benefits Policy 2: Proposals that increase the understanding and enjoyment of the marine environment (including its natural, historic and social value), or that promote conservation management and increased education and skills, should be supported</p>	
<p>Key sectoral / activity policies</p>	
<p>Tourism Policy 1: Where appropriate, proposals enabling, promoting or facilitating sustainable tourism and recreation activities, particularly where this creates diversification or additional utilisation of related facilities beyond typical usage patterns, should be supported.</p>	<p>The Project does not include provision of tourism facilities. However, the Project comprises significant development within view of the coastline, an important tourist amenity.</p>
<p>Tourism Policy 2: Proposals must identify possible impacts on tourism. Where a potential significant impact upon tourism is identified it should be demonstrated how the potential negative consequences to tourism in communities will be minimised. This must include assessment of how the benefits of proposals are not outweighed by potential negative impacts.</p>	<p>Impacts of the Project on employment growth (and associated reduction to unemployment), including potential impacts on tourism, is assessed in section 18.10.1.</p>
<p>Tourism Policy 3: Proposals for tourism development should seek to optimise facilities and use of space by taking a cross-sectoral development approach that provides for multiple activities, whilst minimising the extent to which the proposal is likely to adversely impact on the natural environment.</p>	<p>It is noted, however, that study of the impact of offshore windfarms on tourism is an evolving field with research ongoing. Currently the balance of the research finds that the impact of tourism on offshore windfarms is largely benign and of low significance.</p>
	<p>This may change in the future: <i>“Visitor perceptions of the impacts of OWFs, both generally and for particular locations, may change overtime with perhaps the waning of the innovative attraction of OWFs. There may be potential for future enhancement initiatives which link OWF promotions with other activities, including for example nature-based tourism and supply chain businesses.”</i> (Glasson <i>et al.</i>, 2022).</p> <p>Given the generally positive view and noting the absence of clear data on the impacts of offshore windfarms on tourism it is considered that the Project accords with these policies.</p>
<p>Safety at Sea policies 1 to 4: these policies aim to ensure that offshore wind farms will:</p> <ul style="list-style-type: none"> • Minimise navigational risk to commercial and recreational vessels; • Minimise the need for and impact of reduce under-keel clearance; • Ensure that temporary or permanent fixed marine infrastructure has appropriate navigational marking and is charted where applicable; • Any actions pertaining to aids to navigation are sanctioned by the Commissioner of Irish Lights; and that • Proposals avoid, minimise or mitigate the potential impacts of maritime emergency response and maritime casualty and pollution response operations. 	<p>Safety at sea is considered in volume 2B, chapter 13: Shipping and Navigation and chapter 24: Risk of Major Accidents and Natural Disasters.</p>
<p>Sport and Recreation Policies:</p> <p>These policies aim to promote <i>“increased participation in a range of water-based sports and recreation activities for the benefit of public health and wellbeing, as well as developing our tourism offering.”</i></p> <p>Sport and Recreation Policy 2:</p> <p>Proposals should demonstrate the following in relation to potential impact on recreation and tourism:</p> <ul style="list-style-type: none"> • The extent to which the proposal is likely to adversely impact sports clubs and other recreational users, including the extent to which proposals may interfere with facilities or other physical infrastructure; and 	<p>While the nature and scope of the Project does not include provision of sports and recreation facilities, the human health assessment does consider the Project’s impact on access to open space, leisure and play (see section 18.10.2). This includes temporary construction disruptions to public open spaces (e.g. beaches) and nearshore recreation (e.g. water sports, swimming).</p>

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Summary of NMPF provision	How and where considered in the EIAR
<ul style="list-style-type: none"> The extent to which any proposal interferes with access to and along the shore, to the water, use of the resource for recreation or tourism purposes and existing navigational routes or navigational safety. <p>The extent to which the proposal is likely to adversely impact on the natural environment.</p>	

In addition to the policies described in Table 18-2, the NMPF calls for the consideration of several environmental factors such as including air quality, climate change, and underwater noise as result of marine renewable energy proposals. These factors are explicitly considered in their respective EIAR chapters, and to avoid repetition, are not stated here. In particular, the human health assessment considers changes to environmental factors with the potential to affect human health, including (above ground) noise from onshore/nearshore activities during all three phases of the Project, and health co-benefits of climate change adaptation during operation (see section 18.10.2).

Table 18-3: Summary of other policy provisions relevant to population and human health.

Summary of provision	How and where considered in the EIAR
Population and human health	
Ireland National Planning Framework (NPF)	
<p>Adopted in 2018, an overarching aim of the NPF is “Creating a clean environment for a healthy society” through three main objectives:</p> <ul style="list-style-type: none"> Promoting Cleaner Air – Addressing air quality problems in urban and rural areas through better planning and design; Noise Management – Incorporating consistent measures to avoid, mitigate and minimise or promote the pro-active management of noise; and Social Inclusion – Plan for a more diverse and socially inclusive society that targets equality of opportunity and a better quality of life for all citizens, through improved integration and greater accessibility in the delivery of sustainable communities and the provision of associated services. <p>National Policy Objective 64 addresses air quality, and states: “Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions.” (p.129)</p> <p>National Policy Objective 65 addresses noise, and states: “Promote the pro-active management of noise where it is likely to have significant adverse impacts on health and quality of life and support the aims of the Environmental Noise Regulations through national planning guidance and Noise Action Plans” (p.129)</p> <p>National Policy Objective 28 addresses social inclusion, and states: “Plan for a more diverse and socially inclusive society that targets equality of opportunity and a better quality of life for all citizens, through improved integration and greater accessibility in the delivery of sustainable</p>	<p>Effects of the Project on recreational, amenity and amenity facilities, including as a result of noise, dust and traffic, are assessed in section 18.10.1.</p> <p>Effects of the Project on human health, including effects from noise and vibration and from climate change and adaptation, have been assessed in section 18.10.2.</p> <p>Effects of the Project on human health from air quality as well as from social participation, interaction and support were scoped out of the assessment (see Table 18-12 for justification).</p>

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Summary of provision	How and where considered in the EIAR
<p>communities and the provision of associated services” (p.84)</p> <p>With specific reference to population the National Planning Framework Implementation Roadmap set out transitional regional and county population projections to 2031. This document provides for a population of 144,000 – 151,500 in County Louth by 2031.</p>	
<p>Healthy Ireland Framework (2019 – 2025): Adopted in April 2019. This is the latest HSE strategy on addressing public health issues in Ireland, states that health is an essential resource for everyday life and that healthy people contribute to the health and quality of the society in which they live, work and play.</p> <p>The framework includes four goals that have informed the health assessment: increase the proportion of people who are healthy at all stages of life; reduce health inequalities; protect the public from threats to health and wellbeing; and create an environment where every individual and sector of society can play their part in achieving a healthy Ireland.</p>	<p>Effects of the Project on human health have been assessed in section 18.10.2.</p>
<p>Louth County Council Local Economic and Community Plan 2016 – 2022: Includes health goals informed by the aforementioned HIF.</p>	<p>Effects of the Project on human health have been assessed in section 18.10.2</p>
<p>Louth County Development Plan 2021 – 2027: Adopted in November 2021. The Core Strategy of the Louth County Development Plan (CDP) 2021 – 2027 supports the population growth of County Louth. In this specific respect it is noted that the Louth CDP seeks to support the population growth of County Louth to “148,375 (increased to 149,966 to reflect the life of the Plan)”.</p> <p>The Louth CDP defines Ardee and Dunleer as Self-Sustaining Growth Towns as these towns are expected to continue to grow steadily in population. It projects that the population of Ardee will be grow by 7.9% between 2021-2027 to 6,583 and that Dunleer will grow by 4.4% over the same period to 2,757.</p>	<p>Effects of the Project on population have been assessed in section 18.10.1.</p>
<p>Draft Marine Plan for Northern Ireland: ‘Proposers’ are strongly encouraged to consider the lifetime noise impacts of proposals during exploration, pre-construction, construction, operation and decommissioning; and take measures to minimise any adverse impact. In addressing any potentially adverse impacts of noise, the proposer should consider mitigation measures and the use of alternative technologies which can reduce the impacts of noise.</p> <p><i>“Objective 1: to promote the sustainable development of productive activities, which support employment at all skill levels while fully considering the requirements of other marine interests.”</i></p> <p>With regard to ports and harbours the draft plan states: <i>“When assessing port and harbour proposals, public authorities must consider the contribution that the proposal would make to the national, regional or local need for the infrastructure, against expected adverse effects including cumulative impacts.”</i></p>	<p>The effects of the Project on airborne noise and vibration throughout all Project phases are assessed in chapter 25: Noise (Airborne) and Vibration.</p> <p>Effects of the Project on human health, including the health effects of noise and employment have been assessed in section 18.10.2.</p> <p>Effects of the Project on employment and economic wellbeing are assessed in section 18.10.1.</p> <p>The cumulative effects of the Project on population and human health are considered in section 18.11.</p>
<p>The Strategic Planning Policy Statement for Northern Ireland (SPSS): Planning authorities may engage with relevant bodies in order to understand and take account of health issues and the needs of local communities where appropriate. This may include consideration of potential health and health equity impacts, expected future changes,</p>	<p>Effects of the Project on human health, including the health effects of open space, have been assessed in section 18.10.2.</p> <p>Effects of the Project on marine and land use are assessed in section 18.10.1.</p>

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Summary of provision	How and where considered in the EIAR
<p>and any information about relevant barriers to improving health and well-being.</p> <p>The aim of the SPPS in relation to renewable energy is to facilitate the siting of renewable energy generating facilities in appropriate locations within the built and natural environment in order to achieve Northern Ireland's renewable energy targets and to realise the benefits of renewable energy without compromising other environmental assets of acknowledged importance.</p>	
<p>Making Life Better Plan: A strategic framework for Public Health 2013-2023 (Northern Ireland): Health inequalities result from social inequalities. Reducing health inequalities that are preventable by reasonable means is a matter of fairness and social justice requiring action across society. This aligns with the PFG priority of addressing the challenges of disadvantage and inequality that afflict society, and working to close the gap in health between those who are least and most disadvantaged.</p>	<p>Effects of the Project on different population groups including people living in social disadvantage are considered throughout section 18.10.2.</p>
<p>Newry, Mourne and Down Labour Market Partnership Action Plan 2023 – 2024: Through its vision, aims and values NMD'S Corporate Plan focuses its efforts and resources firmly on Accountable, Collaborative and Transparent working with others, with tailored priorities to support business development and growth, developing workforce and employment skills, progressing regeneration plans and enhancing the health and wellbeing of its residents thus improving their quality of life.</p>	<p>Effects of the Project on human health, including the health effects of employment, have been assessed in section 18.10.2.</p> <p>Effects of the Project on employment and economic wellbeing are assessed in section 18.10.1.</p>
<p>Newry, Mourne, and Down Local Development Plan 2030 Preferred Options Paper: The Newry, Mourne, and Down Development Plan Regional Development Strategy supports population growth in the district council, particularly in hubs and in clusters of hubs. In this specific respect, it is projected that the council's population is expected to increase by 9.7% to 194,994 between 2016 and 2030 (the lifetime of the plan).</p> <p>The plan also states that <i>"Estimates for the growth in employment in the Newry, Mourne and Down district over the period 2015-2030 range from 9,066 to 9,213 jobs based on 2012 NISRA population projections."</i></p>	<p>Effects of the Project on population employment are assessed in section 18.10.1.</p>

The requirement to carry out an assessment of potential impacts on population and human health is set out in the EIA Directive (2014/52/EU). The recitals to the 1985 and 2011 Directives refer to 'Human Health' and include 'Human Beings' as the corresponding environmental factor. The 2014 Directive changes the title of this factor to 'Population and Human Health'.

The EPA *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (2022) provide some commentary on relevant matters with regard to the scope of assessment under the 'Population and Human Health' environmental heading. The guidelines note relevant topics as follows:

- Employment (see section 18.10.1 and 18.10.2 for assessment of the Project on employment);
- Land use patterns (see section 18.10.3 for assessment of the Project on marine and land use);
- Amenity (see section 18.10.1 for assessment of the Project on recreational, amenity and community facilities); and
- Human Health (considered with reference to the social, economic and bio-physical environment (see Table 18-9) and assessed in section 18.10.2).

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The guidelines further clarify that:

“The transposing legislation does not require assessment of land-use planning, demographic issues or detailed socioeconomic analysis. Coverage of these can be provided in a separate Planning Application Report to accompany an application for planning permission. This should be avoided in an EIAR, unless issues such as economic or settlement patterns give rise directly to specific new developments and associated effects (ref. section 3.5.7). The main purpose of such identification and assessment is to provide the CA with a context for their determination. (Examples would include future warehousing beside a new port, transmission lines in the vicinity of a new electrical substation or commercial developments on zoned land beside a new road).”

The *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* (2018) consider the scope of assessment of human health matters in EIA. They state that:

“There is a close interrelationship between the SEA Directive and the 2014 EIA Directive. The term “human health” is contained in both the SEA and EIA Directives and a common interpretation should be given. Accordingly, consideration of human health effects resulting from the construction and operation of a project should focus on health issues arising in the context of the other environmental factors listed in Article 3 of the Directive/ Section 171A of the Act, namely:

- Population;
- Biodiversity, with particular attention to protected species and habitats;
- Land, soil, water, air and climate;
- Material assets, cultural heritage and the landscape; and
- Interaction between the above factors.”

The guidelines further add that:

“European Commission guidance relating to the implementation of the 2014 Directive, in reference to “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 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”.

Furthermore, the EPA Guidelines (which also refer to the Commission’s SEA Implementation Guidance) advise that *“in an EIAR, the assessment of impacts on population & human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g. under the environmental factors of air, water, soil etc.”*

The following health specific guidance has also informed the health assessment:

Table 18-4: Health impact assessment guidance.

Guidance	Description
Institute of Environmental Management and Assessment (IEMA) 2022 guidance on health in EIA series, effective scoping (Pyper, <i>et al.</i> , 2022a) and determining significance (Pyper, <i>et al.</i> , 2022b).	EIA practitioner guidance on assessing human health, applicable to Republic of Ireland and Northern Ireland. Guidance sets out principles and methods of assessment.

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Guidance	Description
Institute of Public Health (IPH), Guidance, Standalone Health Impact Assessment and health in environmental assessment, 2021 (Institute of Public Health, 2021).	Sets current good practice for the assessment of human health in EIA, including assessment methods. This updates the 2009 guidance from the IPH.
International Association for Impact Assessment (IAIA) and European Public Health Association. A reference paper on addressing Human Health in EIA (2020), and academic discussion of the same (Cave, <i>et al.</i> , 2021).	This international consensus piece informed the IPH 2021 guidance. The publication explains EIA for public health stakeholders and sets out transparent assessment approaches adopted by the IPH.
International Association for Impact Assessment. Health Impact Assessment International Best Practice Principles, 2021 (Winkler, <i>et al.</i> , 2021).	Confirms the relationship between HIA and EIA. Confirms the application of HIA principles when undertaking health in EIA.
Environmental Protection Agency. Guidelines on the information to be contained in Environmental Impact Assessment Reports, 2022 (Environmental Protection Agency, 2022).	The EPA present a health protection position statement on the coverage of health in EIA. The wider public health remit is covered by the IPH 2021 guidance.

18.5 Consultation

Table 18-5 summarises the issues identified during consultation activities undertaken to date, which are relevant to population and human health, together with how these issues have been considered in the production of this EIAR chapter. Further detail is presented within appendix 18-1: Population and Human Health Baseline Information. Volume 2A, chapter 6: Consultation provides details on the types of consultation activities undertaken for the Project between 2019 and 2024 and the consultees that were contacted. Consultation with regard to commercial fishing, an employment sector within the Wider Population Study Area, is described in volume 2B, Chapter 12: Commercial Fisheries.

Table 18-5: Summary of key issues raised during consultation on population and human health.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
September 2019	Fáilte Ireland – EIA scoping response.	Fáilte Ireland provided a copy of their Guidelines for the Treatment of Tourism in an Environmental Impact Statement. The purpose of these Guidelines is to provide guidance for those conducting EIA and compiling an EIARs, or those assessing EIARs, where the project involves tourism or may have an impact upon tourism. No issues were raised. These guidelines are non-statutory and act as supplementary advice to the EPA EIAR Guidelines.	The Fáilte Ireland Guidelines have been considered in the assessment of potential impacts in section 18.10.
2023 public consultation	Members of the public during public consultation	Concerns raised regarding the safety of electromagnetic fields (EMF) and whether they would be safe for residents of nearby homes.	The Project will adopt the International Commission on Non-ionizing Radiation Protection (ICNIRP) guidelines. In addition, as relevant occupational safeguards will be followed, EMF exposures within ICNIRP guidelines levels are not considered to pose a risk to public health. This issue has therefore been scoped out of the assessment (see Table 18-12).
2023 public consultation	Members of the public during public consultation	Queries regarding job creation, namely number of jobs created and the job type and skill level involved.	The majority of jobs will occur during construction; however, the Project will also comprise an operational and

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Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
			<p>maintenance team, and indirect employment opportunities during operation and maintenance will also increase (e.g. at ports, vessel crews, fuel and engineering providers). There will be a range of employment opportunities for different skills levels, however most opportunities will require skills and training.</p> <p>Employment growth from the Project is assessed in section 18.10.1. Potential effects on public health from increased education and training and from increased employment and income are assessed in section 18.10.2.</p>

18.6 Methodology to inform the baseline

18.6.1 Desktop study

Information on population and human health within the study areas identified in section 18.3 was collected through a detailed desktop review of existing studies and datasets. The key sources (i.e. data and reports) used to inform the baseline characterisation of the population and human health study areas are summarised in Table 18-6 below. These sources provide the most up to date data for this assessment.

Table 18-6: Summary of data sources.

Title	Source	Year	Author
Building our Potential Ireland's Offshore Wind Skills and Talent Needs	Commissioned by Green Tech Skillsnet in partnership with Wind Energy Ireland	2024	BVG Associates in collaboration with Gavin & Doherty Geosolutions and Beauchamps
Census Results	Census of Population Republic of Ireland	2011, 2016, 2022	CSO
Census Results	Census of Population Northern Ireland	2011, 2021	NISRA
Demography	Small Area Population Map (SAPMAP)	2011, 2016	CSO
Fáilte Ireland	Fáilte Ireland -Research / Insights / Accommodation	2023	Fáilte Ireland
Google Earth/Maps	Google Earth/Maps	2023	Google
Healthy Life Expectancy (HLE)	Eurostat	2016	Eurostat
Life expectancy	Statbank (VSA30)	2011	CSO
Lifestyle (obesity, physical activity, alcohol and drug related hospital admissions, smoking prevalence)	Public Health Well Community Profiles	2007, 2015	HSE
Louth CDP	Louth County Council	2021	Louth County Council
Mental health (anxiety and depression)	Public Health Well Community Profiles	2015	HSE
Myplan.ie	Myplan.ie	2023	Myplan.ie

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Title	Source	Year	Author
Ordnance Survey Ireland (now known as Tailte Éireann)	OSI	2023	OSI
Physical health (hospital admissions)	Public Health Well Community Profiles	2015	HSE
Physical health (mortality)	Statbank (DHA12)	2013	CSO
List of primary schools, post primary schools, creches and childcare facilities	Education Authority UK (NI)	2023	EANI
Pobal HP Deprivation Index	Census of Population Republic of Ireland	2023	Pobal

18.6.2 Site-specific surveys

In order to inform the EIAR, site-specific surveys were undertaken. A summary of the surveys undertaken to inform the population and human health impact assessment is outlined in Table 18-7.

As set out in Table 18-7, a site-specific ‘drive-by survey’ was undertaken to inform the assessment for population and human health. Drive-by surveys are systematic observations made from a moving vehicle and are particularly useful when, as in this case the study area is quite large. In the subject survey the physical environment, including land uses, amenities, schools, creches, services and facilities and their operation were key items observed.

Table 18-7: Summary of site-specific survey data.

Title	Extent of survey	Overview of survey	Survey contractor	Date	Reference to further information
The Project land use and existing human environment survey	Drive-by survey on public roads including landfill, onshore cable route and onshore substation site	To confirm general land uses, understand the existing human environment and note local amenities. No consultations were undertaken as part of the survey. The survey did not require access onto private lands (i.e. where the onshore cable route traverses private lands).	RPS	2019, 2023	N/A

18.7 Baseline environment

18.7.1 Population

This section provides a summary of the population baseline including the local land-use and socio-economic circumstance of the communities surrounding the Project. The full population baseline is available in appendix 18-1: Population and Human Health Baseline Information.

Data has been collected for both the Local Population Study Areas and the Wider Population Study Area. This data provides the most recent available information in respect of the principal status of the inhabitants of the Local and Wider Population Study Areas and it is used to identify how the Local Population Study Areas and the Wider Population Study Area have been performing in relative terms compared to State / Northern Ireland averages.

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Demographic trends

Population growth trends

Data in relation to population trends has been sourced from the Central Statistics Office (CSO) Census that was undertaken in 2011, 2016 and 2022. It should be noted that the Republic of Ireland Census that was due to take place in 2021 was postponed until 2022 due to operational issues arising from the COVID-19 pandemic. Data from the 2022 census is being processed and published on an ongoing basis and 2022 census data as available in September 2023 has been used to inform the population growth trends.

Data in relation to population trends has also been sourced from the Northern Ireland census. A census is undertaken in Northern Ireland every ten years, with the most recent having taken place in 2021 and is reported by Northern Ireland Statistics and Research Agency (NISRA). It should be noted that the Northern Ireland 2021 census results are not yet published in full, with the final release of the results including small settlements such as wards, towns and villages scheduled to be released in autumn 2023. Data from the Northern Ireland 2011 census has therefore been used for the calculation of the wider study area and the local operational study area.

Table 18-1 as set out in appendix 18-1: Population and Human Health Baseline Information sets out the population data and growth trends in the Republic of Ireland, Northern Ireland and over the Wider Study Area, which includes County Louth and parts of counties Armagh, Cavan, Down, Meath and Monaghan and the Local Population Study Areas between 2011 and 2022.

The population of the Operational Local Population Study Area has been increasing to a greater extent than that of the Republic of Ireland and Northern Ireland over the period from 2011 to 2021 / 2022 with population growth of 26% compared to 13% for Northern Ireland and 21% for the Republic of Ireland. This was greater than the Wider Study Area, which recorded a 15.1% increase. Population growth across the Local Population Study Areas was quite consistent, being between 25% and 26%. Two out of three of the study areas showed a percentage growth rate greater than that of the Republic of Ireland. The rate of population growth within all of the study areas is greater than the rate of population growth in Northern Ireland.

Within the study areas there have been very significant changes in population at some locations between 2011, 2016, and 2021 / 2022. For example in Carlingford the population grew by 60% between 2011 and 2016, and 22.8% between 2011 and 2022. Some EDs close to or within towns such as St Mary's (Drogheda) and Mullagh (Virginia) there were very high levels of population growth (80%+) between 2011 and 2016. Equally within some EDs population growth has been very low or even marginally negative.

Age profile trends

Data on the age profile trends of the population of the State, County Louth, Newry, Mourne and Down and Northern Ireland are reported in appendix 18-1: Population and Human Health Baseline Information. This provides information on the age profile within the Wider Population and Local Population Study Areas.

The Local Population Study Area population are set out in Tables 2-2 and 2-3 of appendix 18-1: Population and Human Health Baseline Information. Tables 2-4 and 2-5 show that between 2011 and 2022 there has been an increase in the proportion of the population in the older age cohorts generally in Louth and Ireland. Within Louth there was a significant drop in the proportion of 0–4-year-olds (8.5% to 5.9%) and some growth in the proportion of 5–19-year-olds (21% to 22%) a drop in the proportion of 20–39-year-olds (29.9% to 24%). In the age cohort aged 40 years or more there has been an increase in the population proportion from 40.6% to 47%.

Within the State there was a significant drop in the proportion of 0–4-year-olds (7.7% to 5.7%) and some growth in the proportion of 5–19-year-olds (19.8% to 20.6%) a drop in the proportion of 20–39-year-olds (30.7% to 25.5%). In the age cohort aged 40 years or more there has been an increase in the population proportion from 41.7% to 48%.

The age profile trends within Newry, Mourne and Down and Northern Ireland are set out in table 18-6 of appendix 18-1: Population and Human Health Baseline Information. The table shows a growing percentage of people in all of the older age cohorts from 50-54 upwards within Newry, Mourne and Down and within Northern Ireland.

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Employment trends

To establish the baseline for employment trends, CSO and NISRA data was examined to determine trends in relation to the number of persons at work, unemployment levels and the sectoral composition of the population, based upon principal economic status. Table 3-2 in appendix 18-1: Population and Human Health Baseline Information demonstrates that, in 2016, the unemployment rate had decreased significantly within the State and within County Louth, compared to 2011 data. More specifically, the unemployment rate for Louth reduced to 16.7% in 2016 compared to 23.8% in 2011.

Table 3-2 and Figure 3-10 in appendix 18-1: Population and Human Health Baseline Information illustrate that, in 2016, the unemployment rate of 11.2% in the Construction Local Population Study Area was lower than the average of 16.7% for County Louth and 12.9% for the State in 2016. It is noted that the percentage of people who were unable to work due to permanent illness in the Construction Local Population Study Area was higher than that of the State, however, for most other categories the employment trends were similar to that of the State in both County Louth and the Construction Local Population Study Area. Therefore, with the exception of people who are unable to work due to permanent illness, the population of County Louth and the Local Population Study Areas performs well in terms of employment trends.

The Quarterly Labour Force Survey (QLFS) are designed to produce quarterly labour force estimates that include the official measure of employment and unemployment in the State (International Labour Organisation (ILO) and provide more recent data on employment than that provided in Census 2016. Table 3-3 in appendix 18-1: Population and Human Health Baseline Information illustrates the unemployment rate within the State in the years 2016 – 2022. In this period the Covid-19 pandemic had a profound impact on the unemployment rate. However, it can be seen that unemployment is now lower than the pre-2017 period.

Within Northern Ireland the unemployment rate fluctuating between 3.1% and 6.1% in the period September 2016 to September 2022 is set out Table 3-4 in appendix 18-1: Population and Human Health Baseline Information with the changes appearing to track the negative impacts of the Covid-19 pandemic. The rate of unemployment is now similar to that obtaining pre-Covid-19. The employment rate in Newry Mourne and Down as per the Labour Force Survey January to December 2020 was 74.8%. The comparable percentage for Northern Ireland is 70.9%.

Socio-economic trends

The CSO and NISRA provide a breakdown of socio-economic groupings in terms of employment which is a useful statistic considering the diverse range of employment within the Local Population Study Areas and how that compares with the County and State. Figure 4-1 in appendix 18-1: Population and Human Health Baseline Information shows the data on such employment groupings of population.

The CSO data shows that, at 28.7% of persons aged over 15 years, the highest proportion of workers in the Construction Local Population Study Area is comprised of 'Non-Manual and Manual Skilled' workers. This is consistent with County Louth and the State where the same category also accounts for the highest proportion of workers at 30.2% and 27% respectively. The proportion of 'Employers / Managers' and 'Higher / Lower Professional' in the Construction Local Population Study Area (i.e. 14.2% and 17.5%) is also similar level to that of the County and the State for both of these categories (i.e. 14.4%, 15% and 16.4%, 19%). The lowest category of population for the Construction Local Population Study Area is 'Own Account Workers' who comprised 6.2% of the workforce in 2016.

While the proportion of 'Farmers / Agricultural Workers' is low in the Construction Local Population Study Area at 7.5%, it is noteworthy that relative to both the County (2.8%) and the State (5%), there is a much higher percentage of these types of workers in the Construction Local Population Study Area. This variance is representative of the fact that the Construction Local Population Study Area concerns a rural setting surrounded by quite a number of farms and agricultural related uses.

Within Northern Ireland the largest portion of the workforce is employed in 'Public administration, education and health' (34.4%). Other significant employment sectors are 'distribution, hotels and restaurants' (17.9%) and 'banking and finance' (14.2%) as reported in Table 4-1 of appendix 18-1: Population and Human Health Baseline Information.

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Affluence and deprivation trends

Figure 4-2 of appendix 18-1: Population and Human Health Baseline Information is from the Pobal Deprivation Index which is the Republic of Ireland's most widely used social gradient metric and scores each small area (50 – 200 households) or ED in terms of affluence or disadvantage. The index uses information from Ireland's census, such as employment, age profile and educational attainment, to calculate this score.

According to this data, within the Construction Local Population Study Area, five of the eight ED's are 'Marginally Below Average' in terms of affluence. Stabannan scored the highest out of the eight ED's, with a score of 3.81, or 'Marginally Above Average'. In contrast, Drumcar scored the lowest with a score of -3.35, or 'Marginally Below Average'. However, none of the Construction Local Population Study Area has been classified as being either an Affluent or a Disadvantaged area according to the 2016 data.

Within Northern Ireland the Northern Ireland Multiple Deprivation Measure (NIMDM) 2017 is used to measure deprivation and includes income and employment, health and disability, education, skills and training, access to services, living environment and crime and disorder. Table 4-2 of appendix 18-1: Population and Human Health Baseline Information provides a summary of key data for Northern Ireland and for Newry, Mourne and Down. The data indicates deprivation in Newry, Mourne and Down is broadly in line with the average for Northern Ireland.

Marine and land use

The Project includes a grid connection routing across a 20.1 km of largely rural countryside. The onshore cable route commences at the laneway that runs along the southern boundary of Dunany Demesne and follows local roads heading south through the townlands of Roadstown, Mitchelstown and Port before heading westwards on local roads through Boycetown, Togher and Clonmore. At Keenan's Cross, it continues westwards through Tullydonnell before heading northwards through Corstown.

The route then crosses under the River Dee at Drumcar Bridge and continues along local roads, heading in a westerly direction. At Mullincross, the route crosses the R132, and then at Charleville the route passes under the M1 motorway and Dublin to Belfast Rail Line. It then follows the N33 and crosses under the River Dee for a second time before continuing westwards to tie-in to the existing overhead line in the townland of Stickillin. The onshore substation site will be located in an agricultural field in the townland of Stickillin. The agricultural field is approximately 9.7 hectares in area. The onshore substation site is approximately 3.1 hectares in size.

Offshore operational and maintenance activities will be planned, controlled and monitored at an onshore operations and maintenance base. These offshore activities will operate from an existing port in County Louth or County Down. The existing port will have the consents necessary for the proposed activities. There are several suitable ports within a one-hour sailing time to the offshore wind farm area including Kilkeel, Warrenpoint and Greenore.

The Wider Population Study Area is predominantly rural with several larger urban areas; notably Newry, Navan, Dundalk and Drogheda each of which has a population of greater than 27,000 people in addition to a large number of smaller towns and villages. Dundalk is the county town in Louth, while Navan is the Meath county town. Newry is the administrative centre of the Newry, Mourne and Down district council area.

The offshore wind farm area is located in the Irish Sea, off the coast of County Louth (approximately 22 km east of Dundalk town centre and 18 km east of Blackrock). The closest wind turbine will be approximately 6 km from the closest shore on the Cooley Peninsula. The offshore cable corridor extends approximately 11 km southwest from the wind farm area to the landfall south of Dunany Point.

The offshore wind farm area covers approximately 27.7 km² and is broadly hexagonal in shape with a length of approximately 5.3 km west to east and 6.6 km north to south. The Project will have 25 wind turbine generators (WTGs) located within the offshore wind farm area.

Amenity, recreation and community facilities

There are a wide variety of amenity, recreation and community facilities located in the Population Study Areas including crèche facilities, national and secondary schools, churches, and sports facilities. Within the Wider Population Study Area there are facilities of national / regional importance including Dundalk Institute

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of Technology, Our Lady's Hospital Navan and Our Lady of Lourdes Hospital Drogheda. The town of Ardee and the village of Dunleer provide many local amenities for the Construction Local Population Study Area, while the towns of Carlingford, Warrenpoint or Kilkeel provide many local amenities for the Local Operational Population Study area. Key school, sports, childcare and health facilities are as set out in Tables 5-1 to 5-9 included in appendix 18-1: Population and Human Health Baseline Information.

The human environment in the Population Study Areas outside the urban centres consists mainly of farmland interspersed with one-off residential properties along a network of national, regional and local roads.

Notable amenity, recreation and community facilities that are located close to the onshore cable route are:

- Seagrave House / Barn, Dunany, Togher – a wedding venue;
- Carrons of Togher, Togher – an auto repair, fuel and newsagent business;
- Freedom Studios, Mullinscross – a venue for training small groups;
- Dorians Bar, Mullinscross – a public house;
- Dunany Equestrian Centre; and
- Fishing on the River Dee.

Notable amenity, recreation and community facilities that are located close to Greenore Port (where operations and maintenance activities may occur) include:

- Various shops, hotels, restaurants and bars located in Carlingford;
- Various community facilities within Carlingford, including churches, post office, garda station, playground, library;
- Greenore golf club;
- Carlingford marina;
- Carlingford sailing club; and
- Carlingford Lough Greenway.

Notable amenity, recreation, and community facilities that are located close to Kilkeel (where operations and maintenance activities may occur) include:

- Various shops in Kilkeel such as Hilltop Variety Store, Bargain Buys, and Northern Ireland Fish Producers' Organisation (NIFPO) Chandlery & Hardware Store Kilkeel;
- Various community facilities in Kilkeel such as Kilkeel Post Office, Kilkeel library, Newry Street Unite Community Centre, Police station, and several banks and Christian churches;
- Kilkeel Harbour;
- Kilkeel Leisure Centre;
- Kilmorey Arms Hotel Kilkeel; and
- Silvercore Holiday Park.

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Notable amenity, recreation, and community facilities that are located close to Warrenpoint (where operations and maintenance activities may occur) include:

- Warrenpoint Port and ferry crossings;
- Various bars and restaurants in Warrenpoint;
- Warrenpoint Fire and Rescue Station;
- Warrenpoint Town Hall;
- The Whistledown Hotel; and
- Warrenpoint Golf Club.

Within the Wider Population Study Area there is a very wide variety of amenity, recreation and community facilities including:

- Large number of secondary and primary schools;
- Dundalk Institute of Technology;
- Our Lady's Hospital, Navan;
- Our Lady of Lourdes Hospital, Drogheda;
- Downe Hospital, Downpatrick;
- Daisy Hill Hospital, Newry;
- Horse racing tracks: Navan, Dundalk, Downpatrick;
- League of Ireland football grounds: Oriel Park, Dundalk and United Park, Drogheda; and
- GAA county grounds: Páirc Esler Newry, Drogheda Park Louth, Páirc Tailteann Meath.

Visiting community amenities

Tourism contributes a large share to Ireland's economy with the Fáilte Ireland report 'Key Tourism Facts 2019' (published in March 2021) stating that expenditure by tourists visiting Ireland was estimated to be worth approximately €5.6 bn in 2019. Combining spending by international tourists with Irish residents taking trips here, the total tourism expenditure in 2019 was estimated to be €9.5 bn. County Louth had a reported 172,000 overseas tourists and Irish residents took 179,000 trips in 2017, generating €85 million to the County Louth economy.

As explained previously the onshore elements of the Project lie in a rural area. Tourism attractions in the Local Operational Study Area include:

- Carlingford and the Cooley Peninsula: This is a key tourism attraction in County Louth. It offers guided walking tours, walking or cycling along the Carlingford Lough Greenway, hill walking in the Cooley Mountains, horse trekking, sailing, canoeing and a variety of water sports alongside a rich variety of hospitality;
- County Museum in Dundalk. This is a historic museum and cultural arts centre;
- Slieve Gullion Forest Park. A forest park including walking trails, a scenic drive, children's areas and amenity facilities;

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- **Narrow water keep and castle:** The narrow water keep and castle is an example of a tower-house and bawn that was built in approx. 1568 and is located at the point where the Newry River meets Carlingford Lough. It is a site seeing attraction, originally built by Hugh de Lacy, first Earl of Ulster, to prevent attacks on Newry via the river, as part of the area's Norman fortifications;
- **The Boulevard Banbridge:** The Boulevard Banbridge is a retail outlet village south of Banbridge town with high street and designer retail brands as well as a range of other amenities such as coffee shops, restaurants and cinema. Seagrave House / Barn which is a destination venue that can be rented out for specific uses;
- **Newry and Mourne Museum:** Newry and Mourne Museum is a museum located in Begenals castle, in Newry City. Some key exhibitions include prehistoric material, Newry as a merchant town, the working life of the area, and modern experiences of living in a Border area.

There is a wide variety of existing and planned tourism attractions in the Wider Population Study Area. The main tourist attractions situated within the Wider Population Study Area include:

- **The Mourne Mountains:** This area offers a rich variety of outdoor pursuits and attractions including Kilbroney Park and the Slieve Donard Resort and Spa;
- **Battle of the Boyne/Oldbridge Estate in County Meath:** According to Fáilte Ireland, this attracted 427,148 visitors in 2019;
- **The Bru na Boinne Visitor Centre (Newgrange and Knowth) in County Meath:** This is situated approximately 11 km south of Ardee. The site at Newgrange draws thousands of visitors for the annual summer solstice on 21 June of every calendar year;
- **The planned redevelopment of Ardee Castle:** This is located on the Main Street in the town. According to the Louth County Development Plan (CDP), funding was received to redevelop the Castle under the Rural Regeneration and Development Fund. This is considered to be an important tourism project for both County Louth and Ardee, as it has the potential to significantly increase visitor numbers to the area; and
- **St Colman's Well** which is situated in a little village called Corker in the ED of Drumcar. This holy well is surrounded by a little house, surmounted by a small cross. In the middle of this house is the well, and on many old trees around the well which are supposed to be holy and about thirty feet from the well, is a small cross which marks where St. Colman was born.

There are also a number of beaches with the Wider Population Study Area including:

- Benberg Bay;
- St. Michael's Park Beach;
- Coney Island;
- Tyrella Beach;
- Downpatrick Bay Beach;
- Murlough Beach;
- Kilkeel Bay Beach;
- Cranfield Beach;
- Templeton Beach;
- Ballynamaghery Beach;

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- Rathcor Bay Beach;
- Castlecaragh Beach;
- Gyles Quay Bay Beach;
- Blackrock Bay Beach;
- Castlebellingham Bay Beach;
- Lurganboy Beach;
- Clogher Bay Beach;
- Ganderstown Bay Beach;
- Barnhill Bay Beach;
- Tubbertoy Bay Beach;
- Meagsland Bay Beach;
- Seapoint Bay Beach;
- Newtown Bay Beach;
- Baltray Beach; and
- Mornington Bay Beach.

18.7.2 Human health

Human health trends

The following information presents a summary of the human health baseline including the local health circumstance of the communities surrounding the Project, drawing from available statistics. The full human health baseline, including relevant figures, is available in appendix 18-1: Population and Human Health Baseline Information.

Evidence suggests that different communities have varying susceptibilities to health impacts and benefits as a result of social and demographic structure, behaviour and relative economic circumstance. Data has been collected for the Republic of Ireland and Northern Ireland, using County and Small Area level data (which together represent the Human Health Study Area) to compare against the respective national averages.

Republic of Ireland

Life expectancy and physical health

Statistics for life expectancy and Healthy Life Expectancy (HLE) (i.e. proportion of life spent in “good” health), are only available at the national level. Male and female life expectancy has increased, with male life expectancy consistently lower than female life expectancy. Both male and female HLE is also increasing since 2020, again with male HLE consistently lower than female HLE.

Overall, the all-age all-cause mortality rate in the Human Health Study Area (643 per 100,000 population) is lower than the national average (654 per 100,000 population). Mortality from circulatory diseases is consistently lower than the national average and is decreasing. Mortality from respiratory diseases has fluctuated and is decreasing in most recent figures (2021), though it remains higher in the Human Health Study Area than the national average. Cancer mortality rate has fluctuated over the years in the Human

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Health Study Area, but has been decreasing since 2019, and most recent figures (2021) show a lower rate in the Human Health Study Area (182.8 per 100,000) compared to the national average (188.3 per 100,000).

Mental health and lifestyle

Self-reported mental health status is only reported at the regional and national levels. The Eastern and Midland Region to which the population in County Louth belongs, performs similar to the national comparator. In 2019, the percentage of people that reported to have experienced moderately severe to severe depression is 2% in the Eastern and Midlands Region as well as in Ireland.

Mortality rates from suicide and intentional-self harm have been consistently higher in males than in females and have been increasing for both since 2019. In 2021, the standardised suicide rate in the Human Health Study Area was 8.6 per 100,000 population for females and 14.7 per 100,000 for males.

Lifestyle indicators are only reported at the national level, and statistics show that there is a higher percentage of non-smokers than smokers in Ireland. Conversely, there is a higher percentage of those that drink alcohol than those that do not. Positively, there is a higher proportion of people who consume five or more portions of fruit and vegetables per day, than those who consume less or none per day.

There is no available trend analysis for participation in physical activity; however, a slightly higher proportion of the population in the Human Health Study Area are physically inactive (29.2%) compared to the national average (28.4%).

Deprivation

The Human Health Study Area uses the most deprived small area within close proximity to the Project as representative of sensitive populations. Near landfall at Dunany and the onshore cable route between Drumcar and Ardee Rural, the most deprived small area is within Dunleer (147021006)¹. This area has an unemployment rate of 32.7% for males and 29.3% females. The lone parent ratio is 41%, 41.8% of the population lives in local authority rented housing, and 34% of the population has only primary education. Near the development area for the onshore cable route and substation site, the most deprived small area is within Ardee Urban (147002005). This area has an unemployment rate of 27.0% for males and 11.5% for females. The lone parent ratio is 22% and 14% of the population has primary education only. For port activities near Greenore, the most deprived small area is within Carlingford (147005008). This area has an unemployment rate of 18.4% for males and 17.9% for females. The lone parent ratio is 40% and 54.9% of the population live in local authority rented housing.

Northern Ireland

Based on the latest census data (NISRA, 2021) self-reported general health in the Human Health Study Area for Northern Ireland is very good, though slightly lower than the national rates of very good health. The percentage of people with a long-term health problem or disability who reported that their activities are not limited was similar in the Human Health Study Area are similar to the national results. People who reported having three or more long-term health conditions was slightly higher in Kilkeel and Warrenpoint than the national results.

In terms of socio-economic conditions relevant to health, educational attainment in the Human Health Study Area for Northern Ireland is lower than the national averages. The percentage of people with no qualifications is higher in Kilkeel and Warrenpoint than the national percentage. Similarly, the percentage of people 16 and over achieving the highest level qualifications is lower in Kilkeel and Warrenpoint than nationally. The percentage of people in employment is lower in Kilkeel and Warrenpoint than nationally, however unemployment rates are similar.

¹ Pobal, 2016. Pobal HP Deprivation Index. Available at: <https://maps.pobal.ie/WebApps/DeprivationIndices/index.html> [Accessed January 2023].

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The NIMDM (2017), the official measure of spatial deprivation in Northern Ireland, ranks 890 Super Output Areas (SOAs) from one (most deprived) to 890 (least deprived). The NIMDM also provides seven distinct domains of deprivation. According to the NIMDM, Clonallan 1 which is representative of Warrenpoint is ranked highly for overall deprivation: 133 out of 890 SOAs. Most notable, the area is ranked as highly deprived for crime and disorder and income. Kilkeel South 2 is representative of Kilkeel and ranks 113 most deprived out of 890 SOAs. The area is ranked as more deprived for income and employment.

Conclusion

Both the Local Population Study Areas and the Wider Population Study Area have seen strong levels of population growth between 2001 and 2022. The age profile of County Louth is also quite youthful when compared to that of the State, while the baseline data shows trends of people moving to larger urban centres coupled with an aging population trend generally at a local, county and national level.

In general, the communities within the Human Health Study Area in the Republic of Ireland have better health status than the national average for physical health indicators. Mental health and lifestyle indicators show a more mixed picture, with statistics available at county level showing worse health status than national averages, and indicators that are only available at regional and national level showing both positive and negative health status. Coupled with this, there is evidence of low unemployment levels in the Local Population Study Areas and County Louth and in terms of affluence and deprivation, this appears to be broadly balanced across the six EDs concerned.

The communities within the Human Health Study Area in Northern Ireland have relatively good health though this is slightly worse than the national average for health indicators. Similarly, socio-economic indicators for education and employment are slightly worse in Kilkeel and Warrenpoint than nationally. There is also evidence of high deprivation, particularly for crime and disorder, within the Human Health Study Area within Northern Ireland.

As a result, the communities surrounding the Project may be more sensitive to environmental changes affecting mental health and/or lifestyle related indicators (e.g. physical activity) and may also be sensitive to changes in employment and educational opportunity. It should be noted that the statistics provided in this population and human health baseline do not exclude the possibility that there will be some individuals or small groups of people who do not conform to the overall profile.

18.7.3 Future baseline scenario

The European Union (Planning and Development) (EIA) Regulations 2018 (hereafter the EIA Regulations 2018) require that *“a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge”* is included within the EIAR.

In the event that the Project is not constructed, an assessment of the future baseline conditions has been carried out and is described within this section. The same key population and human health parameters are considered in the future baseline scenario.

The Core Strategy of the Louth CDP seeks to support the population growth of County Louth in accordance with the population projections as specified in the National Planning Framework Implementation Roadmap. In this specific respect it is noted that the Louth CDP seeks to support the population growth of County Louth to *“148,375 (increased to 149,966 to reflect the life of the Plan)”*. The Louth CDP also seeks to prioritise the targeted and economic growth of Drogheda and Dundalk (defined as Regional Growth Centres) to 50,000 by 2031. It projects that between 2021 and 2027, the population of Drogheda will grow by 32.8% and the population of Dundalk will grow by 36.3%.

The Louth CDP defines Ardee and Dunleer as Self-Sustaining Growth Towns as these towns are expected to continue to grow steadily in population. It projects that the population of Ardee will be grow by 7.9% between 2021-2027 to 6,583 and that Dunleer will grow by 4.4% over the same period to 2,757. It is therefore likely that the population of County Louth will continue to see strong levels of growth in Regional Growth Centres and steady growth levels in Self-Sustaining Towns. It is expected that the population of the

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Construction Local Population Study Area, being predominantly rural in nature, will continue to remain below the growth rates of the County.

As it is challenging to predict future local health circumstance with high confidence, trends are analysed as part of the current baseline to provide insight into likely future local community circumstance. For the purposes of the human health assessment, the present-day baseline health data is considered representative of future populations.

18.7.4 Data validity and limitations

The population and human health assessment partially draws from and builds upon outputs from the relevant inter-related technical disciplines, and as a consequence is bound by the same limitations and assumptions therein applied. It is worth noting that due to the fact that the CSO conducts a Census of Population every five years, much of the most up-to-date baseline CSO data available dates from 2016 (which is now approximately seven years old). Where 2022 Census results were available, these were included in the baseline. It is however, considered that the information available provides a suitable basis for a robust assessment of population and human health for EIA purposes.

The transboundary nature of the Wider Population Study Area has required the obtaining of data for Northern Ireland in addition to the Republic of Ireland. Differing census years and intercensal periods and variation in the data, which is gathered in the two jurisdictions differ, make consistent analysis more difficult. In all cases the assessment has sought to utilise data that is as consistent as possible and identified where there are inconsistencies.

The guidance documents (section 18.9) considered in the preparation of this assessment do not define a specific timeframe for data used to inform an assessment on population and human health. However, RPS have obtained the most up to date data (section 18.6) and consider the data to be valid to describe the current baseline environment for the purposes of this assessment.

18.8 Key parameters for assessment

18.8.1 Project design parameters

The Project Description is provided in volume 2A, chapter 5: Project Description. Table 18-8 outlines the project design parameters that have been used to inform the assessment of potential impacts on the construction, operational and maintenance, and decommissioning phases of the Project on population and human health. As the assessment on population and human health is informed by a number of technical chapters of the EIAR, Table 18-8 and Table 18-9 reference out to the project design parameters of the relevant technical chapters where applicable (the project design parameters for each specialist assessment are set out within the relevant technical chapter).

Table 18-8: Project design parameters used for the assessment of potential impacts on population.

Potential impact	Phase ¹			Project design parameters	Justification
	C	O	D		
Employment growth (and associated reduction to unemployment) arising from the Project	✓	✓	✓	<p>Construction and decommissioning phases:</p> <p>Construction and decommissioning of all Project infrastructure, including offshore and onshore elements (see volume 2A, chapter 5: Project Description).</p> <p>Construction phase of 33 months creating 240 no of jobs.</p> <p>Operational and maintenance phase:</p> <p>Operation and maintenance of the Project and presence of infrastructure.</p> <p>The design life of the Project is 40 years creating 30 jobs.</p>	<p>The construction / decommissioning of the Project will require 140 onshore and 100 offshore jobs, some of which will require a particular level of specialist expertise.</p> <p>During operation, 30 jobs will be required, some of which will require a particular level of specialist expertise.</p>

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Potential impact	Phase ¹			Project design parameters	Justification
	C	O	D		
Changes to the socio-economic status of the population in addition to increased affluence	✓	✓	✓	<p>Construction and decommissioning phases: Construction and decommissioning of all Project infrastructure, including offshore and onshore elements (see volume 2A, chapter 5: Project Description). Construction phase of 33 months.</p> <p>Operational and maintenance phase: Operation and maintenance of the Project and presence of infrastructure. The design life of the Project is 40 years.</p>	<p>The Project may result in an increase to the volume of Non-Manual / Manual Skilled, Higher / Lower Professionals and Employers / Managers in County Louth and the Local Population Study Areas.</p> <p>New employment opportunities, new businesses being developed and increased economic activity will increase affluence levels.</p>
Changes to marine and land use	✓	✓	✓	<p>Construction and decommissioning phases: Construction and decommissioning of all Project infrastructure, including offshore and onshore elements (see volume 2A, chapter 5: Project Description). Construction phase of 33 months.</p> <p>Operational and maintenance phase: Presence of offshore infrastructure in the marine. Presence of onshore infrastructure on land. The design life of the Project is 40 years</p>	<p>The presence of the infrastructure will change the marine and land use.</p> <p>The majority of the onshore cable is in the public road, so changes will occur during construction phase only as the road will be reinstated.</p> <p>The onshore substation will result in a change of land use from agricultural land.</p> <p>There will be restrictions on agricultural practices on lands traversed by the onshore cable route away from the public road network.</p>
Changes to recreational, amenity and community facilities	✓	✓	✓	<p>Construction and decommissioning phases: Construction and decommissioning of all Project infrastructure, including offshore and onshore elements (see volume 2A, chapter 5: Project Description). Construction phase of 33 months.</p> <p>Operational and maintenance phase: Operation, maintenance and location of the Project and presence of infrastructure.</p>	<p>All phases of the Project have potential to impact on recreational, amenity and community facilities.</p>

1. C= Construction, O = Operation, D = Decommissioning.

Table 18-9: Project design parameters used for the assessment of potential impacts on human health.

Potential impact	Phase ¹			Project design parameters	Justification
	C	O	D		
Social environment					
Public health effects from changes to transport modes, access and connections – onshore	✓	✗	✓	<p>Increase in traffic arising from construction and decommissioning of Project infrastructure (see chapter 28: Traffic and Transport).</p>	<p>There is the potential that construction works (construction site activities as well as vehicle traffic associated with construction activities) may disrupt local vehicle traffic</p>

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Potential impact	Phase ¹			Project design parameters	Justification
	C	O	D		
					(private and public transport) as well as active travel (pedestrians and cyclists). Effects to active travel are scoped in.
Public health effects from changes to community identity, culture, resilience and influence	x	✓	x	As stated in chapter 27: Seascape, Landscape and Visual Amenity, the Project's operational phase may produce visual impact on the zone of influence, including impacts from both moving and static Project components (e.g. rotating WTGs, service vessels/aircraft).	Offshore: The visual impact of the Project during operation is scoped in to consider the potential for the introduction of visual changes to influence community identity to an extent that could significantly affect population mental health and wellbeing. This includes negative associations with changes to visual impact (i.e. disruption of views) and positive associations (i.e. the Project representing societal adaptation to climate change or new job opportunities). During construction/ decommissioning, the visual impact is not going to be of a duration, scale or nature sufficient to result in population level effects on community identity, therefore this has been scoped out.
Public health effects from changes to open space, leisure and play	✓	x	✓	As stated in volume 2B, chapter 16: Infrastructure, Marine Recreation and Other Users, construction works and activities associated with the operational and maintenance phase may affect nearshore recreation.	Nearshore/onshore: Onshore works may lead to temporary disruption of public open spaces (including beaches) potentially affecting recreational activities. Consideration has also been given to the influences on nearshore recreation (e.g. bathing, sailing and other water sports). Temporary construction disruption of access to green and blue open space is scoped in. This includes considering the need for any temporary or permanent provision for alternative space or access. During operation, the Project is not anticipated to influence access to open space and recreation facilities, therefore this has been scoped out (see Table 18-12).
Economic environment					
Public health effects from changes to education and training	✓	✓	✓	As stated in section 18.10.1 the Project will provide employment opportunities during the construction, operational and maintenance, and decommissioning phases.	Offshore/onshore: The Project could support upskilling and career development in relation to its workforces. This may include apprenticeships and adult learning. Such effects are scoped in to consider how benefits, including for local and vulnerable groups, could be enhanced.

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Potential impact	Phase ¹			Project design parameters	Justification
	C	O	D		
Public health effects from changes to employment and income	✓	✓	✓	<p>As stated in section 18.10.1 the Project may provide employment growth and changes to socio-economic status of the population.</p> <p>As stated in volume 2B, chapter 12: Commercial Fisheries, the project may displace commercial fishing activity.</p>	<p>Offshore/onshore: The Project provides opportunities for good quality employment, which are scoped in. Direct and indirect health effects of employment, including opportunities to enhance benefits for local and vulnerable groups are scoped in. Health effects from wider indirect economic impacts will also be considered. Any potential unemployment or adverse economic implications are also scoped in, for example, the Project's effects on commercial fisheries.</p>
Bio-physical environment					
Impact of noise and vibration on human health	✓	✓	✓	<p>As stated in chapter 25: Noise (Airborne) and Vibration, the Project may produce noise and vibration effects in relation to construction/decommissioning activities and operations and maintenance.</p>	<p>Nearshore/onshore: The noise effects from onshore and nearshore construction activities are scoped in. Consideration will be given to population health effects, for example related to annoyance and sleep disturbance from daytime and night-time construction works. The potential operational noise effects of the substation are scoped in to consider the potential for a population health effect.</p>
Public health effects from changes to climate change and adaptation	✗	✓	✗	<p>As stated in chapter 17: Climate, the Project may directly and indirectly affect greenhouse gas emissions.</p>	<p>Offshore: Health effects of climate change are scoped in. The generating assets of the operation of the Project would be part of the wider energy sector transition that reduces the severity of climate change. The benefits to population health will be discussed, including reducing adverse physical and mental health effects of climate change for deprived populations, particularly in low- and middle-income countries globally.</p>
Public health effects from changes to wider societal infrastructure and resources	✗	✓	✗	<p>As stated in chapter 17: Climate, the Project may indirectly contribute towards renewable energy generation.</p>	<p>Offshore: During operations, the generating aspects of the Project would provide energy infrastructure that supports many aspects of public health. A reliable supply of electricity is required in relation to health-supportive factors including, population food safety, thermal comfort, healthcare, learning, income generation and social support.</p>

1. C= Construction, O = Operation, D = Decommissioning.

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18.8.2 Measures included in the Project

As part of the project design process, a number of measures have been proposed to reduce the potential for impacts on population and human health (see Table 18-10). These measures include project design and management measures (controls). As there is a commitment to implementing these measures, they are considered inherently part of the design of the Project and have therefore been considered in the assessment presented in section 18.10 below (i.e. the determination of magnitude assumes implementation of these measures). These measures are considered standard industry practice for this type of development. Measures included in the Project for the relevant topics including chapter 17: Climate, chapter 23: Air Quality and chapter 25: Noise (Airborne) and Vibration are considered in the relevant EIAR chapters. These measures have also been considered in the assessments presented in this chapter.

Table 18-10: Measures included in the Project.

Measures included in the Project	Justification
The proposal to put the grid connection cable infrastructure primarily underground and primarily along the route of existing road infrastructure is a measure that in itself will significantly reduce the potential for impacts on the population and human health of the Local Population Study Areas or the Human Health Study Area, particularly during the operational period of the Project.	Once constructed, the existence of the approximately 20.1 km of underground cable infrastructure will not be noticeable to the population of the Local Population Study Areas or the Human Health Study Area.
A Construction Environmental Management Plan (CEMP) (see volume 2A, appendix 5-1: Construction Environmental Management Plan) outlines measures to be followed in order to avoid, minimise or mitigate disruption to the environment and surrounding area during the construction phase, specifically.	Measures within the CEMP focus on limiting environmental precursors to potential adverse population and human health outcomes. As a result, the measures applied work to preclude adverse population and human health effects.
A Construction Traffic Management Plan (CTMP) (see volume 2A, appendix 5-9: Construction Traffic Management Plan) outlines measures to be followed in order to avoid, minimise or mitigate disruption to traffic in the surrounding area during the construction phase, specifically.	Measures within the CTMP focus on ensuring adequate localised traffic management during the construction phase and ensuring that safe access to all dwellings, businesses and schools is retained during the construction phase (see volume 2A, appendix 5-9: Construction Traffic Management Plan).

18.8.3 Impacts scoped out of the assessment

On the basis of the baseline environment and the project description outlined in volume 2A, chapter 5: Project Description, a number of impacts are proposed to be scoped out of the assessment for population and human health. These impacts are outlined, together with a justification for the scoping out decision, in Table 18-11 and Table 18-12.

Table 18-11: Impacts scoped out of the assessment for population.

Potential impact	Justification
Impact to household size	The Project is not likely to have any impact on household size within either the Wider or the Local Population Study Areas.

Table 18-12: Impacts scoped out of the assessment for human health.

Potential impact	Justification
Health related behaviours	
Physical activity	Construction and decommissioning phases: <ul style="list-style-type: none"> Offshore: Health promotion within the Project workforces will be considered as a good practice enhancement measure that will be encouraged through a workforce management

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Potential impact	Justification
	<p>plan but is otherwise scoped out. Community physical activity is not affected by offshore works or port operations.</p> <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> As for construction and decommissioning phases.
Risk taking behaviour	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Issues of community health behaviours being detrimentally affected by the presence of the workforce are scoped out. The workforces comprise those based aboard vessels and those based at ports. Those aboard vessels may be multinational professionals, travelling back to their usual place of residence on a rotational basis. This may involve temporary accommodation (e.g. in a hotel close to the port or other travel hub) the night following disembarking and the night prior to reembarcking. This is usual practice. Extended periods of leave spent within port or other Irish communities are not expected. The port workforces are assumed to be predominantly existing residents within the regional area, commuting to work and returning home between shifts. Healthy workforce behaviour will be encouraged through a workforce management plan (see section 18.10.3). There is not considered to be the potential for a likely significant population health effect associated with risk taking behaviour by the workforces afloat or ashore, therefore this issue is scoped out. The issue of communicable illness, including in relation to COVID-19 is noted but scoped out. The Project will operate appropriate measures to safeguard the Project workforce and the public in line with Government guidance of the day, including in relation to vessel crews. Risks are similar to other routine construction and shipping activities. Nearshore/onshore: Issues of community health behaviours being detrimentally affected by the presence of the workforce are scoped out. This reflects a workforce of professionals who are assumed to return to their usual place of residence during periods of leave. The workforce is unlikely to be sufficiently large in number to affect local markets (e.g. for alcohol, cigarettes or gambling, to an extent which could significantly affect community health). Healthy workforce behaviour will be encouraged through a workforce management plan. There is not considered to be the potential for a likely significant population health effect, therefore this issue is scoped out <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: The same conclusions are reached for the operational workforce. The workforce is expected to be smaller in number and more locally resident. Healthy workforce behaviour will be encouraged through a workforce management plan. There is not considered to be the potential for a likely significant population health effect associated with risk taking behaviour by the workforces afloat or ashore, therefore this issue is scoped out. Nearshore/onshore: Minimal operational workforce numbers are anticipated to check and maintain the onshore infrastructure. There is not considered to be the potential for a likely significant population health effect, therefore this issue is scoped out.
Diet and nutrition	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: There are no effects on agricultural lands. Port activities are neither expected to require agricultural land take, nor disrupt food related production or transport. Effects on diet due to impacts to commercial fisheries have been considered. Any potential effects are not considered to be on a scale that could affect availability or price of food and therefore there is no affect to diet and nutrition from the Project. Wider economic effects to health associated with commercial fisheries are discussed under 'transport modes, access and connections'. Nearshore/onshore: Construction may require some temporary reduction in availability or quality of agricultural land. This is however not considered to be on a scale that could change population diet or food prices and therefore significantly affect population health. This issue is scoped out. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: As for construction and decommissioning. Nearshore/onshore: No effects on diet and nutrition are expected from operation of the onshore infrastructure, as there would be no, or minimal, further disturbance of agricultural lands. This issue is scoped out.

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Potential impact	Justification
Social environment	
Housing	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Housing related issues are scoped out. The workforce will have housing requirements, but it is expected that a high proportion will be resident in the regional area or would be based aboard their vessels unless traveling to their usual place of residence. Any temporary accommodation requirements would be met through usual capacity for such activities around ports. There is not considered to be the potential for a likely significant population health effect associated with changes in the availability of housing. Nearshore/onshore: As stated in Table 18-11, the Project is not likely to have any impact on household size within either the wider or the Local Population Study Areas. The majority of workers are assumed to be based in the regional area, returning to their usual place of residence when not working. Where temporary accommodation is required, this would be existing B&B/hotel bed spaces, as is typical for the construction industry. It is not expected that use of temporary accommodation would be on a scale to significantly displace local residents, adversely affect seasonal tourism or otherwise affect housing availability. There is not expected to be a loss of residential housing or permanent loss of outdoor spaces associated with dwellings. Housing effects are scoped out. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: The same conclusions are reached for the operational workforce. The workforce is expected to be smaller in number and more locally resident. The onshore infrastructure, including the substation, is relatively low impact in terms of its built form, limiting the potential for any widespread adverse effect on housing value or affordability. This issue is scoped out. Nearshore/onshore: Minimal operational workforce numbers are anticipated to check and maintain the onshore infrastructure. There is not considered to be the potential for a likely significant population health effect, therefore this issue is scoped out.
Relocation	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Neither offshore works nor port activities would involve compulsory land purchases of homes or community facilities. This issue is scoped out. Nearshore/onshore: Onshore works would not involve compulsory land purchases of homes or community facilities. This issue is scoped out. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: As for construction and decommissioning. Nearshore/onshore: As for construction and decommissioning.
Open space, leisure and play	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Offshore and port activities are not expected to affect access to areas of open space that could significantly affect population health. This reflects use of existing port areas and designated shipping routes near ports. Furthermore, offshore activities would be a considerable distance from land, so have limited potential to effect marine leisure on a scale that could be influential to public health. This issue is scoped out. Nearshore/onshore: Temporary land take for the majority of the onshore infrastructure, including the substation, is not within, or adjoining, land that is publicly accessible. Therefore, the project change is unlikely to significantly affect physical, mental or social health aspects of community recreation. This issue is scoped out. The Transition Joint Bay and the section of the offshore cable at Dunany Beach will be located in publicly accessible lands, and access will be restricted during the construction phase for these works. This is examined in section 18.10.2. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: As for construction and decommissioning. Nearshore/onshore: Permanent land take for the majority of the onshore infrastructure, including the substation, is not within, or adjoining, land that is publicly accessible. Therefore, the project change is unlikely to significantly affect physical, mental or social health aspects of community recreation. This issue is scoped out.
Transport modes, access and connections	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Vehicle transport is expected to predominantly relate to the movement of goods, materials, people and plant to and from the port location associated with the offshore

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Potential impact	Justification
	<p>works. Port expansion is not part of the scheme being proposed. Vehicle movements to the port are not expected to be on a scale that could be influential to public health.</p> <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: As for construction and decommissioning. Nearshore/onshore: The onshore infrastructure is expected to have minimal implications for road transport, with activity limited to checks and maintenance. It is unlikely that there would be the potential for significant population health effects due to changes in routine or emergency health related journey travel times, access to health promoting goods and services, community severance or road safety.
Community safety	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: The Project workforce requires skilled technical roles. There are not anticipated to be community safety or security issues associated with worker behaviour in ports or communities. The Applicant will operate appropriate safeguarding and modern slavery policies. The potential for widespread actual or perceived crime that could affect population health is unlikely. This issue is scoped out. Nearshore/onshore: Where surface excavations are undertaken these would be within controlled work areas, including use of appropriate fencing and notifications as required. Best practice measures would be secured through a construction environmental management plan (see volume 2A, appendix 5-1: Construction Environmental Management Plan). The risk to the public from accidental injury (e.g. falls or drowning is scoped out). The project workforce requires skilled technical roles. There are not anticipated to be community safety or security issues associated with worker behaviour in ports or communities. The project will operate appropriate safeguarding and modern slavery policies. The potential for widespread actual or perceived crime that could affect population health is unlikely. Electrical risks to the public would be avoided through the design, including fencing of above ground electrical infrastructure. These issues are scoped out. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: As for construction and decommissioning. Nearshore/onshore: As for construction and decommissioning.
Community identity, culture, resilience and influence	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Demographic changes that could affect community identity are not anticipated, as there would not be a large in-migration or out-migration of workers to local communities. Visual impacts of offshore activities are expected to be limited due to their distance offshore. Temporary employment opportunities are not expected to have a strong influence on community identity. These issues are scoped out. Nearshore/onshore: Transient effects along the onshore cable route, including due to temporary lighting and temporary changes in views, are not expected to influence community identity or disrupt community gatherings to an extent that could affect population health. This issue is scoped out. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Nearshore/onshore: Visual impacts of onshore infrastructure, including the onshore substation, are not expected to be of a scale that could affect population health outcomes. This issue is scoped out.
Social participation, interaction and support	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: The Project will not directly affect land used for community interaction (e.g. meeting places, village greens, community centres, etc.) that promote community voluntary, social, cultural or spiritual participation. This issue is scoped out. Whilst project wide consultation for the Project is likely to support community capacity and control, this is not considered to be of a scale that would result in significant population health effects. This issue is scoped out. Nearshore/onshore: As for offshore. These issues are scoped out. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: As for construction and decommissioning. Nearshore/onshore: As for construction and decommissioning.

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Potential impact	Justification
Economic environment	
Education and training	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: A large influx for workers, including those bringing families, is not expected, therefore changes to educational capacity or quality are unlikely. This issue is scoped out. Nearshore/onshore: The potential to adversely affect access to schools is limited by the use of trenchless techniques in sensitive locations. A large influx of workers, including those bringing families, is not expected, therefore changes to educational capacity or quality are unlikely and are scoped out. Furthermore a CTMP will be implemented which will minimise traffic impacts on local schools. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: As for construction and decommissioning. Nearshore/onshore: Operational education and training opportunities associated with the onshore infrastructure are not expected to be on a scale that could influence population health, even with benefits targeted to vulnerable groups. No effects on educational outcomes are expected due to noise. This issue is scoped out.
Employment and income	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Any international supply chain would be expected to operate appropriate policies that safeguard equality, health and safety for both workers and, as appropriate, the public. These issues are scoped out. The project will operate appropriate employment equality policies but is not expected to influence how employment affects family structures and relationships in local populations. Occupational working conditions include particular risks, which are appropriately managed through health and safety policies and practices. Project activities are not expected to differ from industry norms. These issues are scoped out. The Project is not expected to affect recreational and community facilities to an extent that would affect population health. Nearshore/onshore: As for offshore. These issues are scoped out. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: As for construction and decommissioning. Nearshore/onshore: Operational employment associated with the onshore infrastructure is not expected to be on a scale that could influence population health, even with benefits targeted to vulnerable groups. This issue is scoped out.
Bio-physical environment	
Climate change and adaptation	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Embodied carbon and climate altering pollutant emissions are not of a scale to have the potential for population level effects associated with climate change. This issue is scoped out. Nearshore/onshore: As for offshore. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Nearshore/onshore: The onshore electrical infrastructure facilitates the benefits accrued from the renewable energy generating assets. This issue is addressed under 'Offshore climate change and adaptation'. To avoid double counting this is not separately assessed and is scoped out.
Air quality	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: On the basis of the baseline environment and the project description outlined in volume 2A, chapter 5: Project Description, offshore air quality impacts have been scoped out. Nearshore/onshore: Dust and road traffic emissions generated by onsite construction and decommissioning activities have been assessed in chapter 23: Air Quality as having at most a slight adverse significance with standard mitigation measures included as part of the Project. This issue would therefore not be expected to affect population health. This issue is scoped out. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: As for construction and decommissioning.

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	<ul style="list-style-type: none"> Nearshore/onshore: Operational nearshore and onshore air quality effects (e.g. maintenance vehicle emissions) are not anticipated to be of a scale, even accounting for non-threshold effects, that could affect population health. This issue is scoped out.
Water quality or availability	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Offshore pollutant spills have potential to affect coastal bathing water quality, which can result in toxin exposures through dermal contact and injection. However, an Environmental Management Plan (EMP) has been prepared and will be implemented during the construction, operation and maintenance and decommissioning phases of the Project (see volume 2A, appendix 5-2: Environmental Management Plan). The EMP includes Project specific measures and commitments and a Marine Pollution Contingency Plan (MPCP). These plans include planning for accidental spills, address all potential contaminant releases and include key emergency contact details. It will also set out industry good practice and OSPAR (Oslo-Paris), International Maritime Organisation (IMO) and MARPOL (International Convention for the Prevention of Pollution from Ships) guidelines for preventing pollution at sea. This issue is scoped out on the basis of the anticipated effectiveness of such measures. Nearshore/onshore: Bathing water quality may be temporarily affected by landfall works that create or mobilise pollutants, including potential toxin exposures through dermal contact or injection. Similarly, onshore pollution of surface water or groundwater bodies used as potable sources could affect the quality or availability of drinking water. Furthermore, the onshore cable route is along an existing public road adjacent to agricultural land and food safety could also be compromised by contamination of agricultural water sources. However, as stated in chapter 22: Hydrology and Flood Risk, both onshore and nearshore the Project would adopt standard best practice spill avoidance and response measures including the adoption and implementation of best practice surface water management measures (see chapter 22: Hydrology and Flood Risk and volume 2A, appendix 5-1: Construction Environmental Management Plan). Based on the effectiveness of such measures pollution risk issues are scoped out. Temporary increases in non-harmful suspended sediment are scoped out. Effects to public drinking water infrastructure is scoped out on the basis that disruption of the existing water utilities network would be avoided, including through diversions if appropriate, see discussion under 'built environment'. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: As for construction and decommissioning. Nearshore/onshore: Checks and maintenance activities are unlikely to result in any water related risks to public health. Any risks would be managed through standard best practice spill avoidance and response measures that would be secured through the Environmental Management Plan. This issue is scoped out.
Land quality	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Offshore works would not affect land quality. Port activities are unlikely to result in public exposures to contaminated soils. Any new or historic contamination that may be mobilised by activities will be managed by standard best practice contamination avoidance and response measures secured through the MPCP, including to mitigate against dust and aerosol exposure pathways. This issue is scoped out. Nearshore/onshore: Ground condition and soil effects are scoped out. Risks of new or historic pollutant mobilisation, including direct exposure and food contamination, are highly likely to be addressed by standard good practice mitigation measures that would be secured through the CEMP. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: As for construction and decommissioning. Nearshore/onshore: Checks and maintenance activities are unlikely to require excavations or result in land quality related risks to public health. Any risks would be managed through standard best practice contamination avoidance and response measures that would be secured through the CEMP. This issue is scoped out.
Noise and vibration	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Consistent with chapter 25: Noise (Airborne) and Vibration, noise effects to offshore human receptors are scoped out. Port activities would generate noise but this is

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	<p>not expected to be of a scale, timing or character that differs from existing operational port levels. This issue is scoped out.</p> <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: As for construction and decommissioning. Nearshore/onshore: Checks and maintenance activities are not expected to result in noise and vibration levels that could affect population health. This issue is scoped out.
Radiation	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Non-ionising electro-magnetic field (EMF) effects are scoped out. Offshore electrical infrastructure, including offshore substations, are not located in proximity to communities. Relevant occupational safeguards would be followed. No EMF risk is therefore likely for offshore aspects of the Project. No ionising radiation sources are proposed. These issues are scoped out. Nearshore/onshore: Works would not include using, or making changes to, active major electrical infrastructure producing EMF. Relevant public and occupational safeguards, secured through management plans, would be followed for the temporary electrical equipment used. The strength of electric and magnetic fields reduces rapidly with distance, often requiring only a few meters separation between the source and receptor, to reach background levels. In addition, electrical fields within armoured cables are shielded by the steel armouring of the cables acting as a Faraday cage. No ionising radiation sources are proposed. As separation distances and/or electrical shielding would avoid public health risks, these issues are scoped out. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: As for construction and decommissioning. Nearshore/onshore: For onshore electrical infrastructure, including the onshore substation, EMF risks are scoped out on the basis that the Project would adopt the International Commission on Non-ionizing Radiation Protection (ICNIRP) guidelines. Such considerations are inherent to the detailed engineering considerations of cable specification and routing. These guidelines are long standing and have a high safety margin. The levels of exposure that they require would not pose a risk to public health. As stated in the Oriel Wind Farm Cable Rating Report (volume 2A, appendix 5-14: Cable Rating Report), cable circuits have been calculated to be below the reference value per ICNIRP guidelines. The strength of electric and magnetic fields reduces rapidly with distance, often requiring only a few meters separation between the source and receptor, to reach background levels. In addition, electrical fields within armoured cables are shielded by the steel armouring of the cables acting as a Faraday cage. No ionising radiation sources are proposed. As separation distances and/or electrical shielding of underground cables would avoid public health risks, these issues are scoped out. All Project phases: Public understanding of risk of operational EMF may differ from actual risk. This effect on population mental health and wellbeing is relevant to all electrical infrastructure including the onshore substation. This issue is scoped out on the basis that the Project will provide reassurance on the safety of the electrical infrastructure and avoid / reduce any widespread community concern that could affect mental health through provisions of timely and non-technical information on how actual health risks are mitigated.
	<p>Institutional and built environment</p>
Health and social care services	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Effects on health and social care are scoped out. The Project workforce is assumed to include a high proportion of people who are resident in the regional area. The Irish workforce would have access to healthcare irrespective of place of residence. The expectation is that the great majority of healthcare needs of the offshore workforce will be met either by occupational provision aboard their vessel or by their usual healthcare provider when they return to their usual place of residence during rotation. The multinational workforce is assumed to be covered by health insurance provisions that would allow local healthcare providers to recoup costs to an extent that avoids any significant adverse effect on healthcare services. This is routine practice across industries and sectors. The Project will operate appropriate occupational health services. It is not expected that a high proportion of workers would move to the area with dependants requiring social care. Health protection measures such as screening and immunisations are expected to continue from the workers' usual place of residence. Similarly routine

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	<p>dental appointments are assumed to be with the worker's dental practice close to their usual place of residence. Other health services are not expected to be affected as no largescale in-migration is expected and the workforce of skilled technical roles would return to their usual places of residence when ashore.</p> <ul style="list-style-type: none"> Nearshore/onshore: As for offshore. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: The same conclusions are reached for the operational workforce as for the construction and decommissioning phases. The operational workforce is expected to be smaller in number and more locally resident than the construction and decommissioning workforces. This issue is scoped out. Nearshore/onshore: Minimal operational workforce numbers are anticipated to check and maintain the onshore infrastructure. There is not considered to be the potential for a likely significant population health effect, this issue is scoped out.
Built environment	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: Offshore utilities disruption is unlikely and there are no known power, telecommunication cables or pipelines in the offshore wind farm area. Appropriate waste management practices would be used, including regard to the MARPOL regulations on waste at sea. Significant population health implications are not anticipated and are scoped out. Nearshore/onshore: The potential for the Project to affect existing features of the built environment that are supportive of population health has been considered and scoped out. The Project would have a relatively low impact, including due to the use of trenchless techniques to avoid surface disruption at sensitive features, such as road crossings. Similarly, the position of existing services, such as water and sewer systems will be taken into account in planning the onshore cable route and techniques used. Appropriate diversions would occur to avoid disruption to such services. This issue is scoped out. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Offshore: The Project would introduce new elements in the built environment. This is assessed in section 18.10.2. The distance offshore means there is very limited direct impacts on human receptors. Port or offshore operational activities are not considered to have waste management, land use or infrastructure use implications on a scale that could affect population health. These issues are scoped out. Nearshore/onshore: The project's onshore infrastructure would have a very limited long-term impact on land use patterns, with the main change relating to the substation. Appropriate buffer zones would be maintained between infrastructure and communities and the design is resilient to accidents and disasters. These issues are scoped out.
Wider societal infrastructure and resources	<p>Construction and decommissioning phases:</p> <ul style="list-style-type: none"> Offshore: The Project's energy infrastructure would not generate public health benefits at this stage. This issue is scoped out. Nearshore/onshore: As for offshore. This issue is scoped out. <p>Operational and maintenance phase:</p> <ul style="list-style-type: none"> Nearshore/onshore: The onshore electrical infrastructure facilitates the benefits accrued from the renewable energy generating assets. This issue is assessed under 'Public health effects from wider societal infrastructure and resources'. To avoid double counting this is not separately assessed and is scoped out.

18.9 Impact assessment methodology

18.9.1 Population

Overview

The population and human health assessment has followed the methodology set out in volume 2A, chapter 3: Environmental Impact Assessment Methodology and the national Guidelines and European Directives that

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are described in section 18.4. In addition, and specific to the population and human health assessment, the following guidance documents have also been considered:

- Environmental Protection Agency. Guidelines on the information to be contained in Environmental Impact Assessment Reports, 2022 (Environmental Protection Agency, 2022); and
- Fáilte Ireland (undated) EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects.

The population and human health assessment has considered the legislative framework as defined by EU Directive 2009/28/EC.

Impact assessment criteria

Determining the significance of effects is a process that involves defining the magnitude of the impacts and the sensitivity of the receptors. This section describes the criteria applied in this chapter to assign values to the magnitude of potential impacts and the sensitivity of the receptors. The terms used to define magnitude and sensitivity are based on those which are described in further detail in volume 2A, chapter 3: Environmental Assessment Methodology.

The criteria for defining impact magnitude in this chapter are outlined in Table 18-13 below.

Table 18-13: Definition of terms relating to the magnitude of an impact.

Magnitude of impact	Definition
High	Change in environmental or socio-economic factor sufficient to result in a major change in baseline population health or socio-economic circumstance (adverse or beneficial)
Medium	Change in environmental and socio-economic factor sufficient to result in a moderate change in baseline population health or socio-economic circumstance (adverse or beneficial)
Low	Change in environmental and socio-economic factor sufficient to result in a minor change in baseline population health or socio-economic circumstance (adverse or beneficial)
Negligible	Change in environmental and socio-economic factor below that for which it is possible to result in any manifest health outcome at a population level but may impact at an individual level (adverse or beneficial)

The criteria for defining receptor sensitivity in this chapter are outlined in Table 18-14 below.

Table 18-14: Definition of terms relating to the sensitivity of the receptor.

Sensitivity	Definition
High	High importance and rarity, national scale and limited potential for substitution
Medium	High or medium importance and rarity, regional scale, limited potential for substitution
Low	Low or medium importance and rarity, local scale
Negligible	Very low importance and rarity, local scale

For the population and human health assessment, on the basis that within a defined population, individuals will range in level of sensitivity, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied by assuming that the population within the Human Health Study Area is of uniformly high sensitivity.

The significance of the effect upon population and human health is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The particular method employed for this assessment is presented in

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Table 18-15. The final assessment for each effect is based on calculated assessment and professional judgement.

For the purposes of this assessment, any effects with a significance level of slight or less have been concluded to be not significant in terms of the EIA Regulations.

Table 18-15: Matrix used for the assessment of the significance of the effect.

		Magnitude of impact			
		Negligible	Low	Medium	High
Sensitivity of receptor	Negligible	Imperceptible	Imperceptible or slight	Imperceptible or slight	Slight
	Low	Imperceptible or slight	Imperceptible or slight	Slight	Slight or moderate
	Medium	Imperceptible or slight	Slight	Moderate	Moderate or major
	High	Slight	Slight or moderate	Moderate or major	Major or Profound

18.9.2 Human health

Overview

Volume 2A, chapter 3: Environmental Impact Assessment Methodology provides a summary of the general impact assessment methodology applied to the Project. The following sections outline the methodology used to assess the potential impacts on human health.

Regard has been had to the EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. The guidelines provide generic definitions for significance, but also note that when more specific definitions exist within a specialised factor or topic, these should be used in preference to the generalised definitions. In the case of Human Health, specific definitions are set out by the Institute of Public Health (IPH) (2021), which informed IEMA (2022).

The health assessment methodology uses best practice, as published by IEMA 2022 guidance on health in EIA series, effective scoping (Pyper, *et al.*, 2022a) and determining significance (Pyper, *et al.*, 2022b). This guidance references out to further information in:

- IPH Health Impact Assessment Guidance, Standalone HIA and health in environmental assessment (Institute of Public Health, 2021); and
- International Association for Impact Assessment and European Public Health Association (2020) ‘Human Health: Ensuring a high level of protection’, a reference paper on addressing Human Health in EIA.

The human health assessment is a qualitative analysis, following the IEMA 2022 guidance approach, which draws on qualitative and quantitative inputs from other EIA topic chapters. This is considered the most appropriate methodology for assessing wider determinants of health proportionately, consistently and transparently.

As set out in guidance the assessment methods allow a consideration of the effect on population health outcomes and what this means for public health, drawing on, as relevant, the: scientific literature; health baseline change; local health priorities; health policy context; compliance with regulatory or statutory standards; and consultation.

Determinants of health, risk factors and health outcomes

The health assessment uses the World Health Organization (WHO) definition of health, which states that health is a “*state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity*” (World Health Organization, 1948).

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The assessment also uses the WHO definition for mental health, which is a “*state in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community*” (World Health Organization, 2022).

Health and wellbeing are influenced by a range of factors, termed the ‘wider determinants of health’. Determinants of health span environmental, social, behavioural, economic and institutional factors. Determinants therefore reflect a mix of influences from society and environment on population and individual health.

Impacts of the Project that result in a change in determinants have the potential to cause beneficial or adverse effects on health, either directly or indirectly. The degree to which these determinants influence health varies, given the degree of personal choice, location, mobility and exposure.

A change in a determinant of health affects does not equate directly to a change in population health. Rather the change in a determinant alters risk factors for certain health outcomes. The assessment considers the degree and distribution of change in these pathways. The analysis of health pathways focuses on the risk factors and health outcomes that are most relevant to the determinants of health affected by the Project. As there are both complex and wide-ranging links between determinants of health, risk factors and health outcomes, it would not be proportionate or informative for an assessment to consider every interaction.

Typically, the change in a risk factor may need to be large, sustained and widespread within a population for there to be a significant influence on public health outcomes.

Impact assessment criteria

Scoring significance

The human health chapter conclusions are presented in both EIA categories of significance, such as major, moderate, minor or negligible; and a narrative explaining this ‘score’ with reference to evidence, local context and any inequalities. The approach follows that set out in the guidance in section 18.4.

The assessment of significance is based on the indicative matrix set out in Table 18-18 below.

Where the matrix offers more than one significance option, professional judgement is used to decide which option is most appropriate.

Effects of moderate and above are considered significant in terms of the EIA Regulations.

Table 18-16, Table 18-17, and Table 18-19 together summarise the assessment criteria. The approach uses professional judgement, drawing on consistent and transparent criteria for sensitivity and magnitude. It also references relevant contextual evidence to explain what significance means for human health in public health terms.

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Definitions of sensitivity and magnitude

Table 18-16: Definitions of sensitivity for human health.

Sensitivity	Definition
	Indicative criteria (judgment based on most relevant criteria, it is likely in any given analysis that some criteria will span score categories) The narrative explains that the population or sub-population's sensitivity is driven by (select as appropriate):
High	High levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the project); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern ; people who are prevented from undertaking daily activities; dependants ; people with very poor health status; and/or people with a very low capacity to adapt.
Medium	Moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care ; people with poor health status; and/or people with a limited capacity to adapt.
Low	Low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily activities; people providing or requiring some care ; people with fair health status; and/or people with a high capacity to adapt.
Negligible	Very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependant); people with good health status; and/or people with a very high capacity to adapt.

Table 18-17: Definitions of magnitude for human health.

Magnitude	Definition
	Indicative criteria (judgment based on most relevant criteria, it is likely in any given analysis that some criteria will span score categories) The narrative explains that the project change has (select as appropriate):
High	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications.
Low	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications.
Negligible	Negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life ; very few people affected; immediate reversal once activity complete; no service quality implication.

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Significance in public health terms

Table 18-18: Matrix used for the assessment of the significance of the effect.

		Magnitude of impact			
		Negligible	Low	Medium	High
Sensitivity of receptor	Very Low	Negligible	Negligible	Negligible or Minor	Minor
	Low	Negligible	Minor	Minor	Minor or Moderate
	Medium	Negligible or Minor	Minor	Moderate	Moderate or Major
	High	Minor or Negligible	Minor or Moderate	Moderate or Major	Major

Table 18-19: Definition of impact significance.

Significance score	Definition
Major	<p>Indicative criteria (judgment based on most relevant criteria, it is likely in any given analysis that some criteria will span score categories)</p> <p>The narrative explains that this is significant for public health because (select as appropriate): Changes, due to the project, have a substantial effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size (magnitude and sensitivity scores), and as informed by consultation themes among stakeholders, particularly public health stakeholders, that show consensus on the importance of the effect.</p> <p>Change, due to the project, could result in a regulatory threshold or statutory standard being crossed (if applicable).</p> <p>There is likely to be a substantial change in the health baseline of the population, including as evidenced by the effect size and scientific literature showing there is a causal relationship between changes that would result from the project and changes to health outcomes.</p> <p>In addition, health priorities for the relevant study area are of specific relevance to the determinant of health or population group affected by the project.</p>
Moderate	<p>The narrative explains that this is significant for public health because (select as appropriate): Changes, due to the project, have an influential effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size, and as informed by consultation themes among stakeholders, which may show mixed views.</p> <p>Change, due to the project, could result in a regulatory threshold or statutory standard being approached (if applicable).</p> <p>There is likely to be a small change in the health baseline of the population, including as evidenced by the effect size and scientific literature showing there is a clear relationship between changes that would result from the project and changes to health outcomes.</p> <p>In addition, health priorities for the relevant study area are of general relevance to the determinant of health or population group affected by the project.</p>
Minor	<p>The narrative explains that this is not significant for public health because (select as appropriate): Changes, due to the project, have a marginal effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by effect size of limited policy influence and/or that no relevant consultation themes emerge among stakeholders.</p> <p>Change, due to the project, would be well within a regulatory threshold or statutory standard (if applicable); but could result in a guideline being crossed (if applicable).</p> <p>There is likely to be a slight change in the health baseline of the population, including as evidenced by the effect size and/or scientific literature showing there is only a suggestive relationship between changes that would result from the project and changes to health outcomes.</p> <p>In addition, health priorities for the relevant study area are of low relevance to the determinant of health or population group affected by the project.</p>
Negligible	<p>The narrative explains that this is not significant for public health because (select as appropriate):</p>

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Significance score	Definition
	<p>Indicative criteria (judgment based on most relevant criteria, it is likely in any given analysis that some criteria will span score categories)</p> <p>Changes, due to the project, are not related to the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by effect size or lack of relevant policy, and as informed by the project having no responses on this issue among stakeholders.</p> <p>Change, due to the project, would not affect a regulatory threshold, statutory standard or guideline (if applicable).</p> <p>There is likely to be a very limited change in the health baseline of the population, including as evidenced by the effect size and/or scientific literature showing there is an unsupported relationship between changes that would result from the project and changes to health outcomes.</p> <p>In addition, health priorities for the relevant study area are not relevant to the determinant of health or population group affected by the project.</p>
No change	No impact, therefore, no change in population health.

The following terminology is also used to consistently classify effects:

- Beneficial – effects that have a positive influence on population health;
- Adverse – effects that have a negative influence on population health;
- Direct – effects that arise from the impact of activities that form an integral part of the project (e.g. direct employment and income generation);
- Indirect – effects that arise from the impact of activities that do not explicitly form part of the scheme (e.g. off-site infrastructure upgrades to accommodate the project);
- Secondary – effects that arise as a consequence of an initial effect of the project (e.g. induced employment elsewhere); and
- Cumulative – effects that can arise from a combination of different effects at a specific location or the interaction of different effects over different periods of time.

Temporal scope

The temporal scope of the human health assessment uses the following summary terms:

- ‘Very short term’ relates to effects measured in hours, days or weeks;
- ‘Short term’ relates to effects measured in months;
- ‘Medium term’ relates to effects measured in years; and
- ‘Long term’ relates to effects measured in decades (e.g. the long-term health effects from long-term employment).

Vulnerable groups

For each determinant of health, the human health chapter identifies relevant inequalities through consideration of the differential effect to the ‘general population’ of the relevant study area and effects to the ‘vulnerable population group’ of that study area. The vulnerable population group is comprised of relevant sensitivities for that determinant of health.

That there is variation between people is widely acknowledged in public health. Public health frames this variation in terms of a likely distribution of effects within a population. This distribution can be applied conceptually or statistically as a way of describing how most individuals are likely to be affected. This links to the ‘general population’ analysis.

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Because there are invariably people towards the extremes of the distribution (e.g. experiencing much smaller or larger effects), it is relevant to also consider sub-populations who may be more likely to experience such extremes because of certain characteristics. This links to the ‘vulnerable group’ analysis.

The methods draw on the list of vulnerable population groups set out in guidance. The following six broad population groups are used to inform a consistent narrative on potential health inequalities across the assessment. These groups are broadly defined to facilitate a consistent discussion across health issues. People falling into more than one group may be especially sensitive:

- Young age: Children and young people (including pregnant women and unborn children);
- Old age: Older people (particularly frail elderly);
- Low income: People on low income, who are economically inactive or unemployed/workless;
- Poor health: People with existing poor health; those with existing long-term physical or mental health conditions or disability that substantially affects their ability to carry out normal day-to-day activities;
- Social disadvantage: People who suffer discrimination or other social disadvantage, including relevant protected characteristics under the Irish Human Rights and Equality Commission Act 2014 (Government of Ireland, 2014)² or groups who may experience low social status or social isolation for other reasons; and
- Access and geographical factors: People experiencing barriers in access to services, amenities and facilities and people living in areas known to exhibit high deprivation or poor economic and/or health indicators.

The following general characterisations of how the ‘general population’ may differ from ‘vulnerable group populations’ were considered when scoring sensitivity. These statements are not duplicated in each assessment and apply (as relevant) to the issues discussed for both construction and operation.

- In terms of life stage, the general population can be characterised as including a high proportion of people who are independent, as well as those who are providing some care. By contrast, the vulnerable group population can be characterised as including a high proportion of people who are providing a lot of care, as well as those who are dependant;
- The general population can be characterised as experiencing low deprivation. However, the professional judgment is that the vulnerable group population experiences high deprivation (including where this is due to pockets of higher deprivation within low deprivation areas);
- The general population can be characterised as broadly comprised of people with good health status. Vulnerable groups, however, tend to include those parts of the population reporting bad or very bad health status;
- The general population tends to include a large majority of people who characterise their day-to-day activities as not limited. The vulnerable group population tends to represent those who rate their day-to-day activities as limited a little or limited a lot;
- Based on a professional judgement the general population’s resilience (capacity to adapt to change) can be characterised as high whilst the vulnerable group population can be characterised as having limited resilience;
- Regarding the usage of affected infrastructure or facilities, the professional judgement is that the general population are more likely to have many alternatives to resources shared with the Project. For the

² For example, disadvantage by reference to the following factors: gender; civil status; family status; sexual orientation; religious belief; age; disability; race, including colour, nationality, ethnic or national origin; or membership of the Traveller community.

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vulnerable group population, the professional judgement is that they are more likely to have a reliance on shared resources; and

- The general population includes the proportion of the community whose outlook on the Project includes support and ambivalence. The vulnerable group population includes the proportion of the community who are uncertain or concerned about the Project.

As all development has the potential for adverse effects to some particularly vulnerable individuals, the role of EIA significance conclusions is not to set a threshold of ‘no harm’ from development, but to show where, at a population level, the harm should weigh strongly in the balance alongside the development’s benefits for health and other outcomes.

As stated by guidance: “Where the effect is best characterised as only affecting a few individuals, this may indicate that a population health effect would not occur. Such individuals should still be the subject of mitigation and discussion, but in EIA and public health terms the effect may not be a significant population health change” (Pyper, et al., 2022b).

18.10 Assessment of significance

18.10.1 Population

The potential impacts arising from the construction, operational and maintenance and decommissioning phases of the Project are listed in Table 18-8, along with the project design parameters against which each impact has been assessed.

The proposed sequence of construction activity and duration for the Project is outlined in volume 2A, chapter 5: Project Description. The construction phase will generate:

- Direct economic impacts through employment in the design, construction and installation of the Project;
- Indirect economic impacts (e.g. employment and gross value added (GVA) generated in the economy of the Local Population Study Areas by the supply chain related to the direct activities (e.g. construction, installation, operation and final decommissioning));
- Induced economic impacts (e.g. employment and GVA created by direct and indirect employment spending in the region and wider Irish economy); and
- Wider economic impacts (e.g. employment and income generated in the economy resulting from the associated wind farm influencing economic activities and wider effects on inward investment).

A description of the potential effect on population receptors caused by each identified impact is given below.

Employment growth (and associated reduction to unemployment) arising from the Project

The Project has the potential to positively impact on economic activity and employment in the construction, operational and maintenance, and/or decommissioning phases. The report Building our Potential Ireland’s Offshore Wind Skills and Talent (Greentech and Wind Energy Ireland, 2024) considers 42 private sector job roles which will be key in helping to develop the emerging Irish offshore wind industry. Applying the estimates set out in the report, a project of this magnitude would generate 1,653 full time equivalent jobs (One FTE year is the equivalent of one person working full time for one year) over the project lifecycle. Potential impacts on tourism are also considered under this heading as they are intrinsically linked to economic activity and employment.

The Project also has the potential to negatively impact on existing economic activity such as fisheries. An assessment of the potential impacts of the Project on commercial fisheries and aquaculture is presented in volume 2B, chapter 12: Commercial Fisheries. The impacts assessed include:

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- Displacement of fishing activity;
- Potential changes to fishing activity due to presence of infrastructure;
- Potential for snagging of gear; and
- Reduction in available seabed due to the presence of infrastructure.

The assessment concludes that there will be no significant effects arising from the Project during the construction, operational and maintenance or decommissioning phases. A Fisheries Management and Mitigation Strategy is included in volume 2A, appendix 5-6: Fisheries Management and Mitigation Strategy. This sets out the Applicant's approach to fisheries liaison and to facilitating co-existence. Consultation with the fishing industry is ongoing and will continue throughout the lifetime of the Project.

As no significant impacts are predicted, there is no potential for negative impacts on employment associated with fisheries.

Construction phase

Magnitude of impact

The impact is predicted to be primarily of local spatial extent with some potential for it to be of regional spatial extent, short term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor both directly and indirectly through the creation of both direct and indirect employment. The magnitude is therefore, considered to be positive and medium during the construction phase.

Sensitivity of the receptor

In terms of the Project having the potential to create new employment opportunities during the construction phase, the population is deemed to be of low vulnerability, medium recoverability and high value. The sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

Overall, the magnitude of the impact is deemed to be medium and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight beneficial significance**, which is not significant in EIA terms.

Operational and maintenance phase

Magnitude of impact

The impact is predicted to be primarily of local spatial extent with some potential for it to be of regional spatial extent, long term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is considered to be low during the operational and maintenance phase.

Sensitivity of the receptor

In terms of the Project having the potential to create new employment opportunities during the operational and maintenance phase, the population is deemed to be of low vulnerability, medium recoverability and medium value. The sensitivity of the receptor is considered to be low.

Significance of the effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight beneficial significance**, which is not significant in EIA terms.

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Decommissioning phase

Magnitude of impact

The impact is predicted to be primarily of local spatial extent with some potential for it to be of regional spatial extent, short term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor both directly and indirectly through the creation of both direct and indirect employment. The magnitude is therefore, considered to be low during the decommissioning phase.

Sensitivity of the receptor

In terms of the Project having the potential to create new employment opportunities during the decommissioning phase, the population is deemed to be of low vulnerability, medium recoverability and medium value. The sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

Overall, the magnitude of the impact is deemed to be medium and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight beneficial significance**, which is not significant in EIA terms.

Changes to the socio-economic status of the population and increased affluence

Construction phase

Magnitude of impact

The impact is predicted to be primarily of local spatial extent with some potential for it to be of regional spatial extent, short term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor both directly and indirectly through the creation of both direct and indirect employment and the purchase of goods and services. The magnitude is therefore, considered to be low during the construction phase.

Sensitivity of the receptor

In terms of the Project having the potential to create new employment opportunities during the construction phase, the population is deemed to be of low vulnerability, medium recoverability and high value. The sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight beneficial significance**, which is not significant in EIA terms.

Operational and maintenance phase

Magnitude of impact

The impact is predicted to be primarily of local spatial extent with some potential for it to be of regional spatial extent, long term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is considered to be low during the operational and maintenance phase.

Sensitivity of the receptor

In terms of the Project having the potential to create new employment opportunities during the operational and maintenance phase, the population is deemed to be of low vulnerability, medium recoverability and medium value. The sensitivity of the receptor is considered to be low.

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Significance of the effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight beneficial significance**, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

The impact is predicted to be primarily of local spatial extent with some potential for it to be of regional spatial extent, short term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor both directly and indirectly through the creation of both direct and indirect employment. The magnitude is therefore, considered to be low during the decommissioning phase.

Sensitivity of the receptor

In terms of the Project having the potential to create new employment opportunities during the decommissioning phase, the population is deemed to be of low vulnerability, low recoverability and low value. The sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

Overall, the magnitude of the impact is deemed to be medium and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight beneficial significance**, which is not significant in EIA terms.

Changes to marine and land use

The Project, including construction works, is described in volume 2A, chapter 5: Project Description. The site of the proposed onshore substation will result in a change of land use from existing agricultural use. The onshore cable route is predominantly routed along public roads, however it also traverses agricultural land at major river/road/rail crossings. Once reinstated, the road will return to its former use, however there will be restrictions on agricultural practices over the cable (see chapter 20: Land and Agriculture). In the marine environment, the use will change as a result of the offshore infrastructure on the seabed.

Construction phase

Magnitude of impact

The construction impact is predicted to be of local spatial extent, short-term and high reversibility. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be adverse and low.

Sensitivity of the receptor

The onshore cable route is largely along local roads. Where the onshore cables are required to pass under obstructions such as the River Dee or M1 motorway the onshore cable route diverts to agricultural fields adjacent to the road. The works will at these locations impact on agricultural activities. The onshore substation is to be built on existing agricultural lands.

The operation and maintenance of the Project will provide for maritime and port uses consistent with the existing land uses at Greenore, Kilkeel or Warrenpoint Ports.

Marine and land use are deemed to be of low vulnerability and the sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight adverse significance**, which is not significant in EIA terms.

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Operational and maintenance phase

Magnitude of impact

Operational and maintenance activities may be based in Greenore, Warrenpoint or Kilkeel Ports. This will provide an improvement to the waterfront zone; generating employment and optimising an underutilised area of the harbour for maritime and port related uses. Agricultural lands through which the onshore cable routes will revert to agricultural use in the operational and maintenance phase. The onshore substation will remove a small area of land from agricultural activity.

The impact is predicted to be primarily of local spatial extent, long term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is considered to be low during the operational and maintenance phase.

Sensitivity of the receptor

The operational and maintenance element of the Project to be located in Greenore, Warrenpoint or Kilkeel is in accordance with the marine and land use for the site. Marine and land use are deemed to be of low vulnerability and the sensitivity of the receptor is therefore, considered to be low. The onshore elements including cable and substation are largely located on local roads or agricultural lands. The vulnerability and the sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight beneficial significance**, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

Decommissioning may involve the removal of some of the infrastructure that as outlined in volume 2A, chapter 5: Project Description.

The impact is predicted to be local. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be negligible.

Sensitivity of the receptor

The decommissioning of Project infrastructure has limited capacity to impact on marine and land use within the Population Study Areas.

Marine and land use are deemed to be of low vulnerability and has a high degree of recoverability. The sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

The magnitude of the impact is deemed to be negligible and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **imperceptible significance**, which is not significant in EIA terms.

Changes to recreational, amenity and community facilities

Construction phase

The construction activity associated with the Project will generate noise, dust, additional traffic movements, all of which have the potential to impact on aspects of residential amenity in the vicinity of the onshore elements of the Project.

Noise, dust, traffic movements and visual impacts are described in chapter 28: Traffic and Transport, chapter 23: Air Quality, chapter 25: Noise (Airborne) and Vibration and chapter 27: Landscape, Seascape and Visual

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Amenity. The assessments conclude overall that there will be no significant effects on traffic and transport, air quality, and noise and vibration. The landscape and visual assessment identified likely significant effects on seascape, landscape and visual receptors during all phases of the Project, which has the potential to have an impact on amenity.

There may be some short term limitation on recreational fishing on the River Dee at Drumcar bridge.

Magnitude of impact

The impact is predicted to be of local spatial extent, short-term and intermittent. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be negligible.

Sensitivity of the receptor

Recreational, amenity and community facilities are an important determinant of population. Project construction activities have limited capacity to impact on residential amenity and community facilities, given the nature, scale and location of the Project within an existing commercial harbour, offshore and along roads and in agricultural lands.

Recreational, amenity and community facilities are deemed to be of low vulnerability and the sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

The magnitude of the impact is deemed to be low and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight adverse significance**, which is not significant in EIA terms.

Operational and maintenance phase

Activities associated with the operation of the Project will generate minimal noise and traffic, and impact on aspects of amenity within and in the immediate area around Greenore, Warrenpoint or Kilkeel Ports.

Noise, traffic movements and visual impacts are described in chapter 28: Traffic and Transport, chapter 25: Noise (Airborne) and Vibration and chapter 27: Seascape, Landscape and Visual Amenity.

Magnitude of impact

The impact is predicted to be of local spatial extent, long-term and intermittent. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be negligible.

Sensitivity of the receptor

Recreational, amenity and community facilities are an important determinant of population. The operation of the Project has limited capacity to impact on residential amenity and community facilities.

Residential amenity and community facilities are deemed to be of low vulnerability and the sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

The magnitude of the impact is deemed to be negligible and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **imperceptible significance**, which is not significant in EIA terms,

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Decommissioning phase

Magnitude of impact

Decommissioning may involve the removal of some of the built infrastructure and similar skills and contractors to those used in the installation and commissioning of the Project will be employed. The decommissioning activities will involve the procurement of employment, goods and services.

The impact is predicted to be local, short-term and continuous. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be beneficial and negligible.

Sensitivity of the receptor

Recreational, amenity and community facilities is a determinant of population. The decommissioning of the Project has limited capacity to impact on residential amenity and community facilities within the study areas.

Recreational, amenity and community facilities are deemed to be of low vulnerability and have a high degree of recoverability. The sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

The magnitude of the impact is deemed to be beneficial and negligible and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **imperceptible significance**, which is not significant in EIA terms.

18.10.2 Human health

Public health effects from changes to transport modes, access and connections – onshore

There is the potential that construction and decommissioning works associated with the Project may disrupt local vehicle traffic (private and public transport) as well as active travel (pedestrians and cyclists). This includes road works, temporary diversions and traffic volumes required due to the onshore cable route or in relation to the construction of the onshore substation site. This has the potential to affect active travel and physical activity.

Active travel has many beneficial health effects for physical health (e.g. cardiovascular health) and mental wellbeing (e.g. reduced stress and anxiety) and is associated with higher levels of physical activity and decreased rates of obesity. The scientific literature supports an association between transport changes, road safety and accessibility and does not identify particular thresholds for effects. Certain population groups may be particularly sensitive to road safety and access. For example, children, pregnant women and cyclists (particularly older cyclists) are generally more vulnerable in terms of road safety. People with lower socio-economic status typically face more transportation barriers in accessing health care.

This section has been informed by chapter 28: Traffic and Transport which sets out relevant assessment findings and mitigation measures that have been considered. Chapter 28: Traffic and Transport concludes:

- The effects due to additional construction vehicles (for construction and decommissioning phases) on existing traffic volumes on each of the roads impacted by the onshore cable route and the onshore substation are slight at most;
- Overall, the effects of the temporary works on the local roads are slight at most during construction and decommissioning phases;
- The effects of the advisory temporary diversions on St Finian's National School and the St Colmcille National School are considered moderate during the construction and decommissioning phases. Mitigation measures (programming works to be done during school holidays) have been proposed to reduce this effect to slight. The effects on other local schools are slight or imperceptible;

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- Overall, the effect of the onshore substation site access is considered to be slight at most during construction and decommissioning phases; and
- Overall, the significance of the effects of construction port traffic is considered to be slight at most during construction and decommissioning phases.

A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- The source is disruption and disturbance to roads, cycle routes and footpaths;
- The pathway is behavioural change in physical activity, transport delay, and road accidents and safety; and
- Receptors are coastal and inland residents and visitors.

Furthermore, the potential effect is considered probable as no highly unusual conditions are required for the source-pathway-receptor linkage.

The population groups relevant to this assessment are:

- The 'site specific' populations as set out in section 18.3.2 ('Human Health Study Area').
- The 'local' populations as set out in section 18.3.1 ('Local Population Study Area').
- Sub-populations with vulnerable characteristics (young age, old age, low income, poor health, social disadvantage or access and geographical factors).

Construction and decommissioning phases

Magnitude of impact

In relation to road safety the scale of change in accidents would be small to negligible. The frequency of any incidents would be one-off or occasional, with severity related to a very minor change in risk of injury or mortality. The expectation is that very few people would be affected, with no or slight implications for healthcare services.

In relation to health-related travel times and accessibility the scale of change in delays is expected to be low. The frequency with which health related journeys may be affected is likely to be occasional for most people though for a few people, severity could relate to a small change in risk for morbidity or mortality associated with time to critical treatment. Ambulance services (and the recipients of their care) are particularly sensitive to delays in response times (time taken to arrive and stabilise the patient). Even with the delays described in chapter 28: Traffic and Transport, the priority given to ambulances travelling under blue lights would be expected to reduce any changes in journey times.

Mitigation in terms of early and ongoing information sharing with emergency and healthcare services is secured within construction management plans. Due to the temporary nature of the work and ability for people to adapt to known planned diversions or delays means there is unlikely to be a significant change in population health outcomes associated with access to social infrastructure such as shops, employment and educational facilities.

The scale of change is therefore considered small, and medium-term, though there would be limited duration at any given location due to the transitory nature of construction works to lay cables. There is the potential for minor adverse changes in morbidity for a small minority of the population. Most adverse effects on health behaviours and outcomes would be expected to reverse on completion of the construction works. Outcome reversal may be rapid once services are reinstated, with slight service quality implications.

It is predicted that the impact will affect the receptor directly and indirectly. The magnitude is therefore considered to be low.

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Sensitivity of receptor

Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 18.10.2.

Most residents are unlikely to make regular use of footpaths and cycle routes affected by the Project and would likely have a high capacity to adapt by selecting alternative routes or physical activity opportunities to avoid any temporary disruption or disturbance. The general population comprise those members of the community with a high capacity to adapt to changes in access, including changes in healthcare access, for example due to greater resources and good physical and mental health.

The sensitivity of the general population is therefore considered to be low.

The vulnerable sub-population includes a high representation of dependants including children, elderly and those receiving care due to poor health. This sub-population may have fewer resources and less capacity to adapt to changes. The population may therefore be more reliant on the affected routes with greater likelihood that any disruption or disturbance could affect physical activity behaviours. Vulnerability is linked to mode of travel, including pedestrians and cyclists being more sensitive to road safety changes. It also relates to age (young people and older people) being more vulnerable to accident severity, as well as to those who are reliant on services accessed on affected sections of the road network (e.g. traveling to schools). Vulnerability may be increased in areas of moderate deprivation. Deprived populations may already face more access barriers compared to the general population and therefore be more sensitive to access changes. Low incomes may compound access barriers by limiting adaptive response. Vulnerability also includes those accessing health services (emergency or non-emergency) at times and locations affected by congestion. Ambulance services (and the recipients of their care) are particularly sensitive to delays in response times. Ambulances are generally less affected by congestion due to the priority given to them travelling under blue lights. People in poor or very poor health may be more frequent users of healthcare service and therefore be more sensitive to access changes.

The sensitivity of the vulnerable group population is considered to be high.

Significance of effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the vulnerable group population is considered to be high.

The professional judgment is that there would, at most, be a slight adverse change in health. This conclusion reflects that physical activity is a specific public health priority and there is causal association of the benefits of physical activity to health that is supported by the scientific literature. However, the level of change due to the Project is small and is appropriately mitigated by standard good practice measures that minimise disruption and disturbance. The change is unlikely to result in significant differential or disproportionate effects between the general population (low sensitivity) and the vulnerable sub-population (high sensitivity). Consequently, no widening of health inequalities would be expected, and no influence is expected on the ability to deliver local or national health policy.

The effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.

Public health effects from changes to community identity, culture, resilience and influence

The operations and maintenance of the Project's offshore activities may lead to effects on visual impact and community identity. Impact will result from visibility of both moving and static project components occupying the offshore wind farm area (e.g. rotating wind turbines and service vessels/aircraft) which have the potential to affect peoples' appreciation of the surrounding seascape/landscape.

Community identity as a determinant of health has a strong subjective dimension that varies between individuals. The visibility of the wind farm can be interpreted differently and includes beneficial effects such as reminding people that the local economy supports employment opportunities and renewable electricity generation, as well as potential adverse effects where people feel the coastal setting is adversely affected.

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Health effects may be associated with mental health conditions (e.g. stress, anxiety or depression) due to underlying social determinants influencing community identity and wellbeing.

This assessment has been informed by chapter 27: Seascape, Landscape and Visual Amenity which sets out relevant assessment findings and mitigation measures that have been taken into account. The chapter concludes that there will be changes to landscape, seascape and visual amenity ranging from substantial to negligible adverse during construction, operations, maintenance and decommissioning phases.

A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- The source is visual change associated with the operational wind farm and perceived benefits of the Project which influence community identity;
- The pathway is factors that contribute to behaviour and a sense of identity, including: changes in visual environmental cues; and economic and prosperity cues that influence social status; and
- Receptors are residents in the local coastal communities.

Furthermore, the potential effect is probable as no highly unusual conditions are required for the source-pathway-receptor linkage.

The population groups relevant to this assessment are:

- The 'site specific' populations as set out in 18.3.2 ('Human Health Study Area');
- The 'local' populations as set out in 18.3.1 ('Local Population Study Area');
- The 'regional populations' set out in 18.3.1 ('Wider Population Study Area'); and
- Sub-populations with vulnerable characteristics (young age, old age, low income, poor health, social disadvantage or access and geographical factors).

Operations and maintenance

Magnitude of impact

The impact is predicted to be of local and regional spatial extent, long-term duration, continuous and low reversibility. However, the scale of visual change of the Project would be small with frequent views during clear weather conditions. The change is likely to have a very minor influence on quality of life and morbidity risk factors linked to wellbeing for a small minority of the population. No healthcare services implications are anticipated.

It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be low.

Sensitivity of receptor

Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 18.10.2. This reflects that for most people in the local area the Project would not be a strong driver of community identity given many other influences on the local social, economic and environmental landscape. For most people there would be no regular views of the wind farm.

The sensitivity of the general population is therefore, considered to be low.

Vulnerability in this case is linked to the proportion of people who have expectations that their community or way of life would be changed to a large degree, positively or negatively, by visual change caused by the

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Project. This includes those with frequent views of the offshore wind farm area, for whom uninterrupted natural seascape views are highly valued as a component of community identity.

The sensitivity of the vulnerable group population is therefore considered to be high.

Significance of effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the vulnerable population group is considered to be high.

The effect is characterised as being both beneficial and adverse in direction, reflecting the subjective nature of community identity. The level of change in sense of place and community cohesion is unlikely to influence health policy delivery or inequalities. Any change to the local population health baseline would be slight and comprised of both beneficial and adverse influences.

Across both the general population and vulnerable group population there are expected to be **both minor adverse and minor beneficial effects**, which is not significant in EIA terms. The inclusion of both positive and negative outcomes from the same impact reflects the likelihood of a range of subjective responses to the visual change.

Public health effects from changes to open space, leisure and play

There is the potential that onshore works associated with construction for the Project may lead to temporary disruption of public open spaces (including part of the beach at Dunany Point) and public rights of way potentially affecting recreational activities. This may include disturbance or disruption in nearshore recreation (e.g. bathing, sailing and other water sports).

The health benefits of recreation and leisure include physical activity as well as mental wellbeing. Health outcomes include physical health (e.g. cardiovascular health) and mental health (e.g. decreased stress, anxiety or depression). Use of places of recreation may be affected by not only physical barriers but also changes in the amenity or setting of the destination.

This assessment has been informed by volume 2B, chapter 16: Infrastructure, Marine Recreation and Other Users which sets out relevant assessment findings and mitigation measures that have been taken into account. The chapter concludes:

- It is anticipated that recreational sailing, motor cruising, boat angling and diving vessels will be able to transit past installation activities and/or advisory clearance distances during construction. There are other locations available for sailing, motor cruising, boat angling and diving activities within and around Dundalk Bay such that alternatives are available. During construction, information and notices will be posted at the landfall location, ensuring that recreational activities can be planned accordingly. This impact is deemed to be a slight adverse effect during construction.
- Offshore cable corridor installation within the nearshore may displace recreational activities. There are suitable alternative locations for shore angling and beach activities including sea swimming, and various other water sports such as kite surfing and wind surfing. Information and notices will be posted at the landfall location advising of the nature, timing and location of cable installation activities, ensuring that recreational activities can be planned accordingly. The impact is deemed to be a slight adverse effect during construction.
- Increases of suspended sediments and associated sediment deposition are predicted to occur during the construction and decommissioning phases. This may affect recreational divers and anglers. The impact is deemed to be an imperceptible adverse effect.

A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- The source is disruption and disturbance including to public rights of way and nearshore spaces;

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- The pathway is behavioural change in use of leisure and recreational activities affecting physical activity and mental wellbeing; and
- Receptors are coastal and inland residents and visitors.

Furthermore, the potential effect is probable as no highly unusual conditions are required for the source-pathway-receptor linkage.

The population groups relevant to this assessment are:

- The 'site specific' populations as set out in 18.3.2 ('Human Health Study Area')
- The 'local' populations as set out in 18.3.1 ('Local Population Study Area')
- Sub-populations with vulnerable characteristics (young age, old age, low income, poor health, social disadvantage or access and geographical factors).

Construction and decommissioning

Magnitude of impact

There is likely to be a small scale change over the medium-term from construction activities, including shipping movements and land access, affecting marine, nearshore and onshore recreational and leisure activities. Any such effect is likely to be characterised as an occasional effect on opportunities to be active at a given location, (e.g. due to transitory cable laying). It is likely there would be rapid reversal of any effect once the given construction activity concluded, with limited potential to cause lasting behavioural change. The outcome is likely to be a minor change in quality of life and/or cardiovascular related morbidity for a small minority of the affected population. No effect on healthcare services would be expected.

The magnitude of change due to the Project is therefore considered to be low.

Sensitivity of receptor

Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 18.10.2. Most people in the local area would only make occasional use of the affected marine and coastal recreational and leisure opportunities. The general population also includes those with access to many alternatives that are not affected. The general population comprise those members of the community with a high capacity to adapt to changes, for example due to greater resources and good physical and mental health.

The sensitivity of the general population is considered to be low.

Vulnerability in this case is linked to having fewer resources and less capacity to adapt to changes. The population may be more reliant on the affected recreational and leisure opportunities with greater likelihood that any additional disruption or disturbance could affect use and behaviours.

The sensitivity of the vulnerable group population is therefore considered to be high.

Significance of effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the vulnerable group population is considered to be high.

The effect is characterised as being adverse in direction, temporary and indirect. Although the scientific literature supports a clear association between recreational and leisure activities and health outcomes, there is likely to be at most a slight change in the population health baseline. This would have at most a marginal effect on health policy delivery and is not expected to change population health inequalities.

The effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.

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Public health effects from education and training

The Project can support upskilling and career development for its workforces. Increased educational attainment is associated with improved health outcomes and delayed mortality. Education supports other health determinants (such as income, employment and health behaviours) and is a fundamental cause of health inequities.

A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- The source is educational opportunities and support;
- The pathway is good quality education supporting socio-economic status and other outcomes, which are influential for health; and
- Receptors are the local population, particularly young adults commencing employment.

Furthermore, the potential effect is probable as no highly unusual conditions are required for the source-pathway-receptor linkage.

The population groups relevant to this assessment are:

- The 'local' populations as set out in section 18.3.1 ('Local Population Study Area');
- The 'regional populations' set out in section 18.3.1 ('Wider Population Study Area'); and
- Sub-populations with vulnerable characteristics (young age, old age, low income, poor health, social disadvantage or access and geographical factors).

Construction, operational and maintenance, and decommissioning phases

Magnitude of impact

As offshore wind is a new sector for the Louth region and within County Down it is expected that training and education opportunities will result from the Project in all project phases. Training and education opportunities could vary with some being one-off and others being continuous learning opportunities, (e.g. apprentices). The health effect is characterised as a minor change in morbidity for risk factors related to educational attainment for a small minority of the population. The impact is predicted to be of local and regional spatial extent and medium-term duration. It is predicted that the impact will affect the receptor directly and indirectly.

The magnitude is therefore assessed to be low.

Sensitivity of receptor

Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 18.10.2. This reflects that most people in the local area would make use of alternative educational or training opportunities or have existing educational attainment appropriate to their vocation and career progression.

The sensitivity of the general population is therefore considered to be low.

Vulnerability in this case is linked to young adults in relation to apprenticeship opportunities, and children or young people in relation to educational support initiatives. Both these groups, and those who are from disadvantaged backgrounds, would be particularly sensitive to educational interventions that provide knowledge, new skills or personal development. Young people leaving education or early-career people may have the most to gain from an increase in training opportunities as a pathway into good quality local employment.

The sensitivity of the vulnerable group population is therefore, considered to be high.

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Significance of effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the vulnerable group population is considered to be high.

The effect is characterised as being beneficial in supporting ongoing future career progression. The scientific literature supports a clear association between educational outcomes and health outcomes, with the potential for a slight positive change in the population health baseline due to the potential for lasting effects over the life-course due to educational attainment. This change is likely to marginally support delivering health policy, including narrowing inequalities where vulnerable groups participate in the training opportunities.

The effect will, therefore, be **minor beneficial significance**, which is not significant in EIA terms.

Public health effects from employment and income

The Project may increase employment and economic benefits as described in section 18.10.1. The Project also has the potential to adversely affect the livelihoods of those who conduct commercial fishing in the offshore wind farm area.

Employment is an important determinant of health and well-being both directly and indirectly through income making health-promoting resources accessible to employees and their dependants. Employment status and income have socio-economic benefits associated with improved living conditions, health-promoting behaviours and mental well-being. Decreased unemployment and underemployment is also associated with physical health and psychological well-being and can generate indirect economic activity.

This assessment has been informed by section 18.10.1 of this chapter, and volume 2B, chapter 12: Commercial Fisheries which set out relevant assessment findings and mitigation measures that have been taken into account.

Section 18.10.1 of this chapter concludes:

- For employment growth arising from the Project there will be a slight beneficial effect during all stages; and
- For changes to the socio-economic status of the population and increased affluence there will be a slight beneficial effect during all stages of the Project.

Volume 2B, chapter 12: Commercial Fisheries concludes:

- The effect of displacement of fishing activity during construction and decommissioning is judged to be imperceptible to slight adverse;
- The effect of potential changes to fishing activity due to the presence of infrastructure during the operational and maintenance phase is deemed to be slight adverse;
- The effect of the potential for snagging of gear during the operational and maintenance phase is deemed to be slight adverse; and
- The effect of a reduction in available seabed due to the presence of infrastructure during the operational and maintenance phase is considered to be slight adverse.

A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- The source is changes in direct and indirect jobs and economic activity;
- The pathway is good quality employment and income providing more health supporting resources; and

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- Receptors are people of working age (and their dependants).

Furthermore, the potential effect is probable as no highly unusual conditions are required for the source-pathway-receptor linkage.

The population groups relevant to this assessment are:

- The 'local' populations as set out in 18.3.1 ('Local Population Study Area');
- The 'regional populations' set out in 18.3.1 ('Wider Population Study Area'); and
- Sub-populations with vulnerable characteristics (young age, old age, low income, poor health, social disadvantage or access and geographical factors).

Construction, operation and maintenance and decommissioning

Magnitude of impact

There is expected to be a very small scale of change in employment and socio-economic status in the context of the local labour market. These opportunities would be of long-term duration and reflect employment that is on a continuous basis, whether full-time or part-time. Such jobs are likely to be associated with minor changes in morbidity and quality of life for a small minority of the population (including effects to dependants to those employed, as well as those receiving indirect economic benefits) due to improved socio-economic status and increased spending on health supporting resources and activities. It is predicted that the impact will affect the receptor directly and indirectly. The magnitude is therefore, considered to be low.

There is also the potential for adverse effects associated with reduced commercial fishery productivity. This has been assessed in volume 2B, chapter 12: Commercial Fisheries, where effects are concluded to be minor adverse or lower. For population health the effects are judged to relate to a very small scale of change over the long-term. A frequent or continuous effect may occur for a very small minority of the population. This is likely to relate to minor changes in physical and mental health morbidity associated with income and job insecurity. At most there may be slight healthcare service implications. The magnitude of the adverse change is also rated as low.

Sensitivity of receptor

Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 18.10.2. This reflects that most people would already be within stable employment that would be unaffected by the Project (or being a dependant of such a person).

The sensitivity of the general population is therefore, considered to be low.

Vulnerability in this case relates to people and their dependants who are on low incomes, have poor job security, poor working conditions or who are unemployed. Future young or older people may also come to rely on those employed.

The sensitivity of the vulnerable group population is therefore, considered to be high.

Significance of effect

The effect is characterised as being beneficial and adverse in direction, permanent and indirect. Employment has a clear association with positive health outcomes supported by the scientific literature. The Project is likely to make a limited beneficial contribution to the local health baseline (in relation to increased job opportunities) or limited negative effect on the local health baseline (in relation to effects on commercial fishing). Such effect are likely to have at most, a marginal effect on delivering health policy and on health inequalities.

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The significance of the population health effect is **minor beneficial** in relation to employment and socio-economic opportunities and **minor adverse** in relation to potential job or income insecurity in relation to commercial fishing.

Impact of noise and vibration on human health

There is the potential for noise and vibration effects from onshore and nearshore activities. There is also the potential for operational noise effects associated with the onshore substation.

The literature highlights cardiovascular effects, annoyance and sleep disturbance (and consequences arising from inadequate rest) as being the main pathways by which population health may be affected by noise and vibration. The literature also notes the potential for chronic noise to have a detrimental effect on learning outcomes (e.g. noise distracting and affecting communication within classrooms). Whilst the literature supports there being thresholds at which effects (such as annoyance and sleep disturbance) are likely, it also acknowledges the subjective nature of responses to noise. In this regard noise effects can be considered to have non-threshold effects, with characteristics other than sound levels also determining the influence on health outcomes. The health assessment has regard to the population groups identified in the literature that may be particularly sensitive. For example, children, the elderly, the chronically ill, people with a hearing impairment, shift-workers and people with mental illness (e.g. schizophrenia or autism).

This assessment has been informed by chapter 25: Noise (Airborne) and Vibration which sets out relevant assessment findings and mitigation measures that have been taken into account. The chapter concludes:

- Construction noise and vibration impacts are considered to be slight adverse at most for all potential impacts except noise impacts from construction of the onshore cable which is judged to be significant;
- The operational noise and vibration impacts are considered to be slight adverse at most for all potential impacts except for noise impacts from the operations of the onshore substation which is judged to be significant; and
- No construction at the onshore substation site or the onshore cable route will be carried out at night. Noise control measures will be adopted and included in the Construction Environmental Management Plan (CEMP) (Appendix 5-1 in volume 2A) (such as the use of temporary noise barriers during construction or system design for the onshore substation). Based on such measures the residual effect for the noise impacts from construction of the onshore cable is deemed to be slight adverse. The residual effect for noise impacts of the operation of the onshore substation is deemed to be not significant.

A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- The source is noise and vibration generated by construction activities and vehicle movements and noise generated by operation of the onshore substation;
- The pathway is pressure waves through the air and ground vibrations; and
- Receptors are residents and long-term occupiers of nearby properties and community buildings.

Furthermore, the potential effect is probable as no highly unusual conditions are required for the source-pathway-receptor linkage.

The population groups relevant to this assessment are:

- The 'site specific' populations as set out in section 18.3.2 ('Human Health Study Area');
- The 'local' populations as set out in section 18.3.1 ('Local Population Study Areas'); and
- Sub-populations with vulnerable characteristics (young age, old age, low income, poor health, social disadvantage or access and geographical factors).

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Construction, operational and maintenance, and decommissioning phases

Magnitude of impact

Construction along the onshore cable route would involve activities that are mobile (i.e. only temporarily taking place at a given location during the construction period), such as trenching for cable laying; and activities that are static such as construction of the onshore substation. Noise associated with operation and maintenance of the substation would be static. Mobile works will impact receptors for short periods of time, whereas static works will last longer.

In terms of population health, the small scale of change in noise and vibration levels is likely to predominantly relate to a minor change in quality of life and/or cardiovascular and mental wellbeing morbidity for a small minority of the population along the onshore cable route and near the substation. The changes would be medium-term duration in relation to frequent construction related noise exposures, and long-term for noises from the substation. The greatest potential for effects is likely for the few people living close to either the landfall or the onshore substation. Prolonged periods of construction noise at night or daytime disruption of educational activities at schools are not anticipated.

The magnitude of change due to the proposed construction works and operations and maintenance of the substation is therefore considered to be low.

Sensitivity of receptor

Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 18.10.2. The general population comprise those members of the community in good physical and mental health and with resources that enable a high capacity to adapt to change. Additionally, most people live, work or study at a distance from the onshore transmission works and substation where noise and vibration would be unlikely to be a source of concern (see chapter 25: Noise (Airborne) and Vibration).

The sensitivity of the general population is considered to be low.

The sub-population includes a high representation of dependants including children, elderly and those receiving care due to poor health. This sub-population may experience existing widening inequalities due to living in areas with increased noise and elevated deprivation, with limited capacity to adapt to changes. Vulnerability particularly relates to those living close to the construction activities and substation, including those spending more time in affected dwellings (e.g. due to low economic activity, shift work or poor health). People who are concerned or have high degrees of uncertainty about noise and its effect on their wellbeing may be more sensitive to changes in noise. The small population living at the coastal edge may experience nearshore noise (noise can travel longer distances across water than land) as well as landfall noise. Occupants of dwellings with less acoustic insulation, such as caravans, may be more sensitive to noise effects.

The sensitivity of the vulnerable group population is high.

Significance of effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the vulnerable population group is considered to be high.

Noise and vibration from construction activities and construction traffic will be managed through the use of appropriate construction hours and best practice measures agreed through a CEMP, as detailed in chapter 25: Noise (Airborne) and Vibration and volume 2A, appendix 5-1: Construction Environmental Management Plan.

Noise impacts from operation and maintenance of the onshore substation will be managed through system design of the onshore substation, as detailed in chapter 25: Noise (Airborne) and Vibration.

Based on these measures included in the Project, the effect is characterised as being adverse in direction, temporary to long-term and direct. Although the scientific literature indicates a clear association between

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elevated and sustained noise and vibration disturbance and reduced health outcomes, the changes would result in a very limited effect in the health baseline of the population. The distribution of effects is not expected to affect health inequalities. The level of effect is not expected to affect the ability to deliver local or national health policy.

The effects are considered to be of **minor adverse significance**, which is not significant in EIA terms.

Public health effects from climate change and adaptation

The Project may contribute towards wider energy sector transition to renewable energy which reduces the severity of climate change.

Renewable energy generation and subsequent reduced greenhouse gas emissions supports avoiding adverse health effects associated with climate change. These include extreme temperature and climatic effects related to infectious diseases occurrence, food insecurity, injury and death. These effects are relevant to the national populations, but also the global population, particularly deprived populations in low- and middle-income countries.

There are important global inequalities in the effects of climate change, with the greatest adverse effects on health expected in the some of the poorest and least economically developed populations. In contrast, populations that benefit from rapid social and economic development are expected to experience reduced (but not eliminated) adverse effects to health from climate change. Changes in health outcomes related to climate change are therefore expected to be relatively small in the Republic of Ireland. When considering health and well-being, there is a global responsibility to reduce the effect of climate-altering pollutants that are expected to reduce health outcomes in low- and middle-income countries. The Intergovernmental Panel on Climate Change (IPCC) states that there are opportunities to achieve co-benefits from actions that reduce emissions of climate altering pollutants and at the same time improve health.

Key health outcomes (globally) relate to heat-related disorders (e.g. heat stress and lower work capacity), respiratory disorders (e.g. worsened asthma), infectious diseases, population displacement, water and food insecurity (e.g. lower crop yields) and injury, death and mental stress associated with natural disasters.

The assessment has been informed by chapter 17: Climate which sets out relevant assessment findings and mitigation measures that have been taken into account. The chapter concludes:

- The impact on indirect GHG emissions during the operational and maintenance phase is considered a beneficial impact on climate and more than offsets the direct carbon losses reported for the construction stage.

A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- Source: renewable energy created during the operation of the wind farm;
- Pathway: reduction in climate-altering pollutants that contribute to climate change, which is associated with global changes in temperature, crop yields, productivity and disease prevalence; and
- Receptor: international global population, particularly vulnerable populations in low and middle-income countries.

Furthermore, the potential effect is probable as no highly unusual conditions are required for the source-pathway-receptor linkage.

The population groups relevant to this assessment are:

- The 'national' populations of the Republic of Ireland and Northern Ireland;
- The 'international' population globally; and

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- The sub-population vulnerable due to less capacity to adapt to climate change including young and old people, people with low incomes, people with poor health (physical and mental), people experiencing social disadvantage including gender disparities and people with access and geographical vulnerability (such that they may be unable to adopt climate change mitigation strategies).

Operational and maintenance phase

Magnitude of impact

Whilst the scale of change would be very small within the national energy sector emissions context, it would be continuous and long-term. The health effect likely represents a minor change in the risk of mortality and morbidity linked to a range of health determinants influenced by a changing climate for a large minority of the global population and a small minority of the national populations. Relevant effects include population displacement, food insecurity, infectious disease occurrence and exposure to extreme climatic events.

The impact is predicted to be of national and international spatial extent with the impact affecting the receptor directly and indirectly. The magnitude is therefore, considered to be low.

Sensitivity of receptor

Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 18.10.2. This reflects that the Republic of Ireland and Northern Ireland are developed economies and have comparatively high resilience and capacity to adapt, so in general the national populations can be considered to be of low sensitivity.

The sensitivity of the general population is therefore, considered to be low.

Adverse effects of climate change would be disproportionately experienced by the most vulnerable members and regions of society (globally). Such effects are likely to widen health inequalities. Although the general population are likely able to get support to cope with the effects of climate change, some vulnerable population groups are at greater risk (e.g. people with socio economic disadvantage or old age making it harder to cope with heatwaves or flooding).

The sensitivity of the vulnerable group population is therefore, considered to be high.

Significance of effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the vulnerable population group is considered to be high.

The scientific literature supports a causal relationship between climate altering pollutants, climate change and population health outcomes. Although the change due to the Project would have a very limited effect on the global or national health baseline even accounting for long-term inter-generational effects, the Project makes an influential contribution to delivering national climate change policy, including public health related climate policies.

The effect will, therefore, be of **minor beneficial significance**, which is not significant in EIA terms.

Public health effects from wider societal infrastructure and resources

The electricity produced by the Project will be exported to the National Grid thereby supporting a supply of renewable energy that would enable many aspects of everyday life that either protect or promote good health.

Energy security is important for maintaining continuous and affordable electricity which supports many aspects of public health. This includes power to safely cook and refrigerate food, regulate the temperature and lighting of homes and schools, operate health and social care services, maintain economic productivity and employment, and operate technologies that improve quality of life and social support. Sustained interruption of supply or rapid increases in costs would both be expected to result in reductions in health and well-being outcomes. Increases in the cost of electricity, particularly in the context of rising costs of living,

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can cause some people to prioritise essential costs (e.g. food, shelter) over electricity demands (e.g. heating a home).

Energy insecurity is a public health concern particularly for vulnerable populations (low-income, children, elderly). It is associated with hazardous exposures, heat stress, cold stress, asthma, chronic disease, poor mental health, parental fear and stigma, family disruption and residential instability. In children, energy insecurity has been shown to affect development, hospitalisation and overall child health.

The Project will generate a maximum 375 MW of energy.

The potential health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- Source: renewable electricity generation;
- Pathway: energy security; and
- Receptor: population connected to the national power grid.

Furthermore, the potential effect is probable as no highly unusual conditions are required for the source-pathway-receptor linkage.

The population groups relevant to this assessment are:

- The 'national' population of the Republic of Ireland; and
- The sub-population vulnerable due to less capacity to adapt to energy insecurity including young and old people, people with low incomes, people with poor health (physical and mental), people experiencing social disadvantage including gender disparities and people with access and geographical vulnerability (such that they may be unable to adopt energy insecurity mitigation strategies).

Operational and maintenance phase

Magnitude of impact

Project generation of renewable electricity would have continuous public health benefits to energy security (subject to weather conditions and maintenance), despite the scale of contribution being relatively small within the national energy generation context. The effects are likely to provide a minor reduction in risks for population mortality (e.g. reducing excess winter deaths) and morbidity of physical and mental health outcomes related to standard of living and access to health supporting infrastructure. Such an effect may extend via the national grid to a large minority of the national population. Such effects may bring small benefits to healthcare service quality by reducing capacity burdens.

The impact is predicted to be of national spatial extent, with direct and indirect effects to population health. The magnitude is therefore considered to be medium.

Sensitivity of receptor

Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 18.10.2. The general population comprise those members of the community in good physical and mental health and with greater resources to respond to the costs of energy or to interruptions in supply.

The sensitivity of the general population is therefore, considered to be low.

The sub-population on low incomes, for whom energy security and interruption of energy supplies are more sensitive, pose a greater risk. This is particularly the case for dependants at risk during temperature extremes, including heatwaves and cold weather, as well as people in poor health, including when accessing healthcare.

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The sensitivity of the vulnerable group population is therefore, considered to be high.

Significance of effect

Overall, the magnitude of the impact is deemed to be medium and the sensitivity of the vulnerable population group is considered to be high.

The Project provides a protective effect on the health baseline that is important for public health. This conclusion reflects the scientific literature which establishes a clear association between energy security and health outcomes. The Project is likely to be influential in delivering health policy, including narrowing inequalities that are at risk of widening due to reduced national energy security and rising costs of living.

The effect will therefore be of **moderate beneficial significance**, which is significant in EIA terms.

18.10.3 Mitigation and residual effects

For impacts where there are no significant adverse effects it is considered that no measures over those included in the Project (as outlined in section 18.8.2) are required.

The following mitigation measures will be implemented to enhance the public health opportunity for education and training, and employment and income benefits of the Project:

- In order to enhance the public health benefits of increased education and training, training opportunities will be offered through a workforce management plan. Specifically, as far as reasonably practicable (e.g. subject to standards and security checks) provide a targeted scheme of access to construction, operation and maintenance and decommissioning training schemes and apprenticeships targeted to vulnerable groups in the Local Population Study Areas (see section 18.3.1) including site-specific areas of the Human Health Study Areas (see section 18.3.2). Notable groups to target will include young people not in education employment or training (NEET). This measure will as far as reasonably practicable be cascaded within supply chain procurement terms to maximise the benefit of indirect as well as direct roles associated with the Project.
- In order to enhance the public health benefits of good quality employment, employment opportunities will be offered through a workforce management plan. Specifically, as far as reasonably practicable (e.g. subject to standards and security checks) provide a targeted scheme of access to construction, operation and maintenance and decommissioning employment targeted to vulnerable groups in the Local Population Study Areas (see section 18.3.1) including site-specific areas of the Human Health Study Areas (see section 18.3.2). Notable groups to target will include people who are unemployed, on low incomes, or who have high job instability, including young adults early in their careers. This measure will as far as reasonably practicable be cascaded within supply chain procurement terms to maximise the benefit of indirect as well as direct roles associated with the Project.
- The Community Benefit Fund will assist in the delivery of enhanced amenity and community facilities which will be of benefit to the local population and their health in the long term.

Residual effects

With the implementation of the measures included in the Project (section 18.8), the residual effects are as outlined in the assessment provided in section 18.10 with the following exceptions:

- With the implementation of the above mitigation, residual effects of “public health effects from changes to education and training” will be **moderate beneficial** (significant in EIA terms). This reflects the potential to achieve long-term benefits from a targeted training intervention at a critical stage in the life course of local vulnerable groups.
- With the implementation of the above mitigation, residual effects of “public health effects from changes to employment and income” are **moderate beneficial** (significant in EIA terms). This reflects the potential to achieve long-term benefits from a targeted employment access intervention for local vulnerable groups, with benefits for both those employed and their dependants.

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18.10.4 Future monitoring

The following monitoring will be undertaken during construction, operation and maintenance and decommissioning:

- Monitoring of the proportion of local people with long-term unemployment, high job instability or low income who enter good quality stable employment with the Project in order to confirm the expected benefit and further tailor the targeting of local vulnerable groups; and
- Monitoring of the proportion of NEETs taking up, and completing, training opportunities with the Project in order to confirm the expected benefit and further tailor the targeting of local vulnerable groups.

18.11 Cumulative Impact Assessment

18.11.1 Methodology

The Cumulative Impact Assessment (CIA) takes into account the impact associated with the Project together with other projects. The projects selected as relevant to the CIA presented within this chapter are based upon the results of a screening exercise (see volume 2A, appendix 3-1: Cumulative Impact Assessment Screening Annex). Each project has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

The approach to CIA examines the effects of the Project alongside the following projects if they fall within the Zone of Influence (Zoi) (as defined in volume 2A, appendix 3-1: Cumulative Impact Assessment Screening Annex) for population and human health:

- Other projects with consent but not yet constructed/construction not completed;
- Other projects in a consent application process but not yet determined (including planning applications, foreshore lease/licence applications, Dumping at Sea Permit applications);
- Other projects currently operational that were not operational when baseline data were collected, and/or those that are operational but have an ongoing impact; and
- Projects, which satisfy the definition of 'relevant maritime usage' under the Maritime Area Planning Act (2021) (i.e. wind farm projects designated as 'Relevant Projects' or 'Phase 1 Projects') including Arklow Bank II, Bray Bank and Kish Bank; North Irish Sea Array, Codling Wind Park (I and II).

18.11.2 Assessment of significance on population

No specific projects were screened into the CIA for population as there is no potential for significant cumulative effects. The potential for cumulative impacts from the Project and any one of the projects listed in volume 2A, appendix 3-1: Cumulative Impact Assessment Screening Annex would not of themselves give rise to discernible cumulative impacts. If the residential developments included in the list of projects (see volume 2A, appendix 3-1: Cumulative Impact Assessment Screening Annex) proceed, then there is the potential for a not significant increase in the overall residential population. If construction of the projects listed proceed, there is also the potential for temporary to short-term, negligible positive cumulative impacts on employment and on the socio-economic status of the local population, however these are not considered significant. Negligible impacts on recreational, amenity and community facilities are anticipated to arise from the projects listed in volume 2A, appendix 3-1: Cumulative Impact Assessment Screening Annex.

18.11.3 Assessment of significance on human health

A description of the significance of cumulative effects upon population health arising from each identified impact is given below.

Cumulative health assessment extends the analysis of each determinant of health. This means for each determinant of health the relevant reasonably foreseeable cumulative projects are listed and a professional judgement is made as to the combined level of effect and its implications for public health. Following IEMA

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2022 guidance for human health, sensitivity of the relevant populations is unchanged from the main assessment in section 18.10.2. Magnitude is however appraised in light of the combined effect of multiple projects.

As set out in IEMA 2022 guidance, a combined public health effect is most likely where a population is affected by multiple determinants of health and a large proportion of the same individuals within that population experience the combination of effects.

A high degree of spatial proximity is required for there to be the potential for cumulative effects for localised changes in determinants of health (e.g. dust from a construction site). In contrast, where there are more far-reaching effects in a determinant of health (e.g. job creation or noise along shared transport corridors), there is greater opportunity for cumulative interactions between projects.

For each of the determinants in the Project assessment (see section 18.10.2) the cumulative assessment considers the potential for pathways to the same population from other large-scale developments that are similar in location and timing. The assessment is qualitative, following the approach set out in section 18.10.2, and considers the potential for combined magnitudes of effect to the same populations.

This chapter is informed by cumulative assessment conclusions set out in other chapters (as listed in section 18.1). The health assessment does not duplicate detail set out in those chapters. The conclusions from other chapters of cumulative effects relevant to the health assessment are summarised within each of the identified impacts below.

The following sections provide a CIA on issues with sufficient information and the potential for likely significant human health cumulative effects.

Transport modes, access and connections

This section has been informed by chapter 28: Traffic and Transport which sets out relevant cumulative assessment findings and mitigation measures that have been taken into account. Table 28-34 within chapter 28: Traffic and Transport identifies two schemes as having potential cumulative impacts with the Project and regard has been given to this scheme for the health assessment. Chapter 28: Traffic and Transport concludes that the projected increase in traffic from the Project along with the projected increases from the works associated with the two schemes will have a cumulative slight effect on prevailing traffic conditions.

The cumulative magnitude is predicted to be similar to the individual level magnitude described in section 18.10.2. The magnitude of impact is considered to be low. Sensitivity of the general and vulnerable populations groups is unchanged in the cumulative assessment. As described in section 18.10.2, the sensitivity is low for the general population, and high for the vulnerable group population.

The overall cumulative significance of effect remains unchanged at **minor adverse**, which is not significant in EIA terms.

Community identity, culture, resilience and influence

This section has been informed by chapter 27: Seascape, Landscape and Visual Amenity, which sets out relevant cumulative assessment findings and mitigation measures that have been taken into account. Table 27-82 within chapter 27: Seascape, Landscape and Visual Amenity identifies other projects with the potential to have cumulative impacts with the Project and regard has been given to these for the health assessment. The chapter concludes that changes to seascape and landscape as a result of the developments identified are predicted to result in a minor adverse effect. Cumulative effects are identified for visual amenity are predicted as negligible to major .

The cumulative magnitude is predicted to be similar to the individual level magnitude described in section 18.10.2. The magnitude of impact is considered to be low. Sensitivity of the general and vulnerable population groups is unchanged in the cumulative assessment. As described in section 18.10.2, the sensitivity is low for the general population, and high for the vulnerable group population.

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The overall cumulative significance of effect remains unchanged at **minor adverse** and **minor beneficial**, which is not significant in EIA terms.

Open space and leisure

This section has been informed by volume 2B, chapter 16: Infrastructure, Marine Recreation and Other Users, which sets out relevant cumulative assessment findings and mitigation measures that have been taken into account. Table 16-11 within volume 2B, chapter 16: Infrastructure, Marine Recreation and Other Users identifies other projects with the potential to have cumulative impacts with the Project and regard has been given to these in the health assessment. Volume 2B, chapter 16: Infrastructure, Marine Recreation and Other Users concludes that displacement of recreational fishing and other nearshore recreational activities (kayaking, kite surfing, surfing, windsurfing, beach users) as a result of the identified developments are predicted to result in slight adverse cumulative effects.

The cumulative effect is predicted to be similar to the individual level magnitude described in section 18.11.2. The magnitude of impact is considered to be low. Sensitivity of the general and vulnerable population groups is unchanged in the cumulative assessment. As described in section 18.10.2, the sensitivity is low for the general population, and high for the vulnerable group population.

The overall cumulative significance of effect remains unchanged at **minor adverse**, which is not significant in EIA terms.

Education and training

The cumulative effect on education and training opportunities will depend on the commitments of other projects to such activities. It is presumed that other proposed developments will set out training and education plans similar to those proposed within this chapter which can have a cumulative beneficial effect on population health. However, without the details of these schemes a cumulative assessment cannot be conducted. Therefore, no cumulative effects are assessed for education and training.

The overall cumulative significance of effect remains unchanged at **moderate beneficial**, which is significant in EIA terms.

Employment and income

This section has been informed by volume 2B, chapter 12: Commercial Fisheries and section 18.11.2 which sets out relevant cumulative findings and mitigation measures that have been taken into account. Section 18.11.2 states that there is potential for a cumulative low level temporary positive impact on employment.

Table 12-12 within volume 2B, chapter 12: Commercial Fisheries identifies other projects with the potential to have cumulative impacts with the Project and regard has been given to these in the health assessment. The chapter concludes that displacement of fishing activity during construction and decommissioning may have an imperceptible to slight adverse effect and displacement of fishing activity during operations and maintenance may have a slight adverse effect.

The cumulative effect is predicted to be similar to the individual level magnitude described in section 18.10.2. The magnitude of effect for increased employment and economic activity is deemed to be low and the magnitude of effect for displacement of commercial fisheries is considered to be low. Sensitivity of the general and vulnerable population groups is unchanged in the cumulative assessment. As described in section 18.9.2, the sensitivity is low for the general population, and high for the vulnerable group population.

The overall significance of effect remains unchanged. For impacts to employment and socio-economic opportunities the effect is **moderate beneficial**, which is significant in EIA terms. For impacts to commercial fisheries the effect is **minor adverse**, which is not significant in EIA terms.

Noise and vibration

This section has been informed by chapter 25: Noise (Airborne) and Vibration, which sets out relevant cumulative findings and mitigation measures that have been taken into account. Table 25-36 in chapter 25: Noise (Airborne) and Vibration identifies other projects with the potential to have cumulative noise impacts

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with the Project. Potential cumulative effects identified in the chapter include those from the construction at the landfall and site investigation projects, which are not significant.

The cumulative effect is predicted to be similar to the individual level magnitude described in section 18.10.2. The magnitude of effect is considered to be low. Sensitivity of the general and vulnerable population groups is unchanged in the cumulative assessment. As described in section 18.9.2, the sensitivity is low for the general population, and high for the vulnerable group population.

The overall significance of effect remains unchanged at **minor adverse**, which is not significant in EIA terms.

Climate change

This section has been informed by chapter 17: Climate, which sets out relevant cumulative assessment findings and mitigation measures that have been taken into account. Table 17-36 in chapter 17: Climate identifies other projects with the potential to have cumulative climate change impacts with the Project and regard has been given to these in the health assessment. The chapter concludes that cumulative indirect reduction of GHG emissions during operations and maintenance would result in major beneficial (significant) cumulative effects, which would more than offset the adverse effects of the construction phase.

Cumulatively the projects identified in chapter 17: Climate have a greater magnitude of effect. In the context of effects on global atmospheric conditions, rather than localised effects, the cumulative effect is arguably inclusive of all energy projects currently being consented, and likely much broader than just this one sector. Such a broad cumulative assessment is not within the scope of project level EIA. Therefore, the magnitude is predicted to be similar to the individual level magnitude described in section 18.10.2 and is judged to be low. Sensitivity of the general and vulnerable population groups is unchanged in the cumulative assessment. As described in section 18.9.2, the sensitivity is low for the general population, and high for the vulnerable group population.

The cumulative significance of effect remains unchanged at **minor beneficial**, which is not significant in EIA terms.

Wider societal infrastructure and resources

This section has been informed by chapter 17: Climate, which sets out relevant cumulative assessment findings and mitigation measures that have been taken into account. Table 17-36 in chapter 17: Climate identifies other projects with the potential to have cumulative climate change impacts with the Project and regard has been given to these in the health assessment.

In combination with the other projects identified in chapter 17: Climate, the Project will provide enhanced energy security. The context of national energy security has been considered and the magnitude of effect is not expected to be greater than the individual effects described in section 18.10.2. The magnitude is considered to be medium. Sensitivity of the general and vulnerable population groups is unchanged in the cumulative assessment. As described in section 18.9.2, the sensitivity is low for the general population, and high for the vulnerable group population.

The cumulative significance of effect remains unchanged at **moderate beneficial**, which is significant in EIA terms.

18.12 Transboundary effects

18.12.1 Population

The Wider Population and Local Operational Study Areas extend into Northern Ireland and therefore the potential for transboundary effects in Northern Ireland are assessed in section 18.10. Overall there is no potential for significant adverse transboundary effects with regard to population and human health from the Project upon the interests of other EEA States or the United Kingdom.

18.13 Interactions

A description of the likely interactions arising from the Project on population and human health is provided in volume 2C, chapter 32: Interactions.

18.14 Summary of impacts, mitigation measures and residual effects

The Project will have no significant adverse impacts on population and human health within the Local or Wider Population Study Area. Following mitigation measures stated in section 18.10.3, there is the potential for the Project to provide minor to moderate beneficial effects which are significant in EIA terms.

Table 18-20 presents a summary of the potential impacts, mitigation measures and residual effects in respect to population and human health.

No specific projects were screened into the CIA for population as there is no potential for significant cumulative effects. The CIA for human health considers the potential for pathways to the same population from other large-scale developments that are similar in location and timing. The overall cumulative significance of effect remains unchanged as a result of the Projects assessed.

No potential transboundary impacts have been identified in regard to effects of the Project.

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Table 18-20: Summary of potential environment effects, mitigation and monitoring.

Description of impact	Phase			Measures included in the Project	Magnitude of impact	Sensitivity of receptor	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Employment growth arising from the Project	✓	✓	✓	None	C: Medium O: Low D: Low	Low	C: Slight beneficial O: Slight beneficial D: Slight beneficial	None	Slight beneficial	None
Changes to the socio-economic status of the population and increased affluence	✓	✓	✓	None	C: Low O: Low D: Low	Low	C: Slight beneficial O: Slight beneficial D: Slight beneficial	None	Slight beneficial	None
Changes to marine and land use	✓	✓	✓	None	C: Low O: Low D: Negligible	Low	C: Slight adverse O: Slight beneficial D: Imperceptible	None	Slight adverse and slight beneficial	None
Changes recreational, amenity and community facilities	✓	✓	✓	None	C: Negligible O: Negligible D: Negligible	Low	C: Slight adverse O: Imperceptible D: Imperceptible	None	Slight adverse	None
Public health effects from changes to transport modes, access and connections – onshore	✓	✗	✓	Implementation of CTMP and CEMP	C: Low D: Low	For general population: Low For vulnerable population: High	C: Minor adverse D: Minor adverse	None	Minor adverse	None
Public health effects from changes to community identity, culture, resilience and influence	✗	✓	✗	Grid connection cable infrastructure being primarily underground.	O: Low	For general population: Low For vulnerable population: High	O: Minor adverse and minor beneficial	None	Minor adverse and minor beneficial	None
Public health effects from changes to open space, leisure and play	✓	✗	✓	Implementation of CEMP	C: Low D: Low	For general population: Low For vulnerable population: High	C: Minor adverse D: Minor adverse	None	Minor adverse	None

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Description of impact	Phase			Measures included in the Project	Magnitude of impact	Sensitivity of receptor	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Public health effects from education and training	✓	✓	✓		C: Low O: Low D: Low	For general population: Low For vulnerable population: High	C: Minor beneficial O: Minor beneficial D: Minor beneficial	Further training opportunities focussed on vulnerable population groups	Moderate beneficial (significant in EIA terms)	Monitor for uptake of NEETs in training opportunities
Public health effects from employment and income	✓	✓	✓		C: Low O: Low D: Low	For general population: Low For vulnerable population: High	C: Minor beneficial for employment and socio-economic opportunities; Minor adverse for commercial fisheries. O: Minor beneficial for employment and socio-economic opportunities; Minor adverse for commercial fisheries. D: Minor beneficial for employment and socio-economic opportunities; Minor adverse for commercial fisheries.	Employment opportunities targeted at vulnerable groups	Minor adverse relating to commercial fisheries and moderate beneficial (significant in EIA terms) relating to employment and socio-economic opportunities.	Monitor for people with vulnerable characteristics who enter employment with the Project
Impact of noise and vibration on human health	✓	✓	✓	Implementation of CEMP and design measures	C: Low O: Low D: Low	For general population: Low For vulnerable population: High	C: Minor adverse O: Minor adverse D: Minor adverse	None	Minor adverse	None
Public health effects from climate change and adaptation	✗	✓	✗		O: Low	For general population: Low For vulnerable population: High	O: Minor beneficial	None	Minor beneficial	None
Public health effects from wider society infrastructure and resources	✗	✓	✗		O: Medium	For general population: Low For vulnerable population: High	O: Moderate beneficial (significant in EIA terms)	None	Moderate beneficial (significant in EIA terms)	None

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