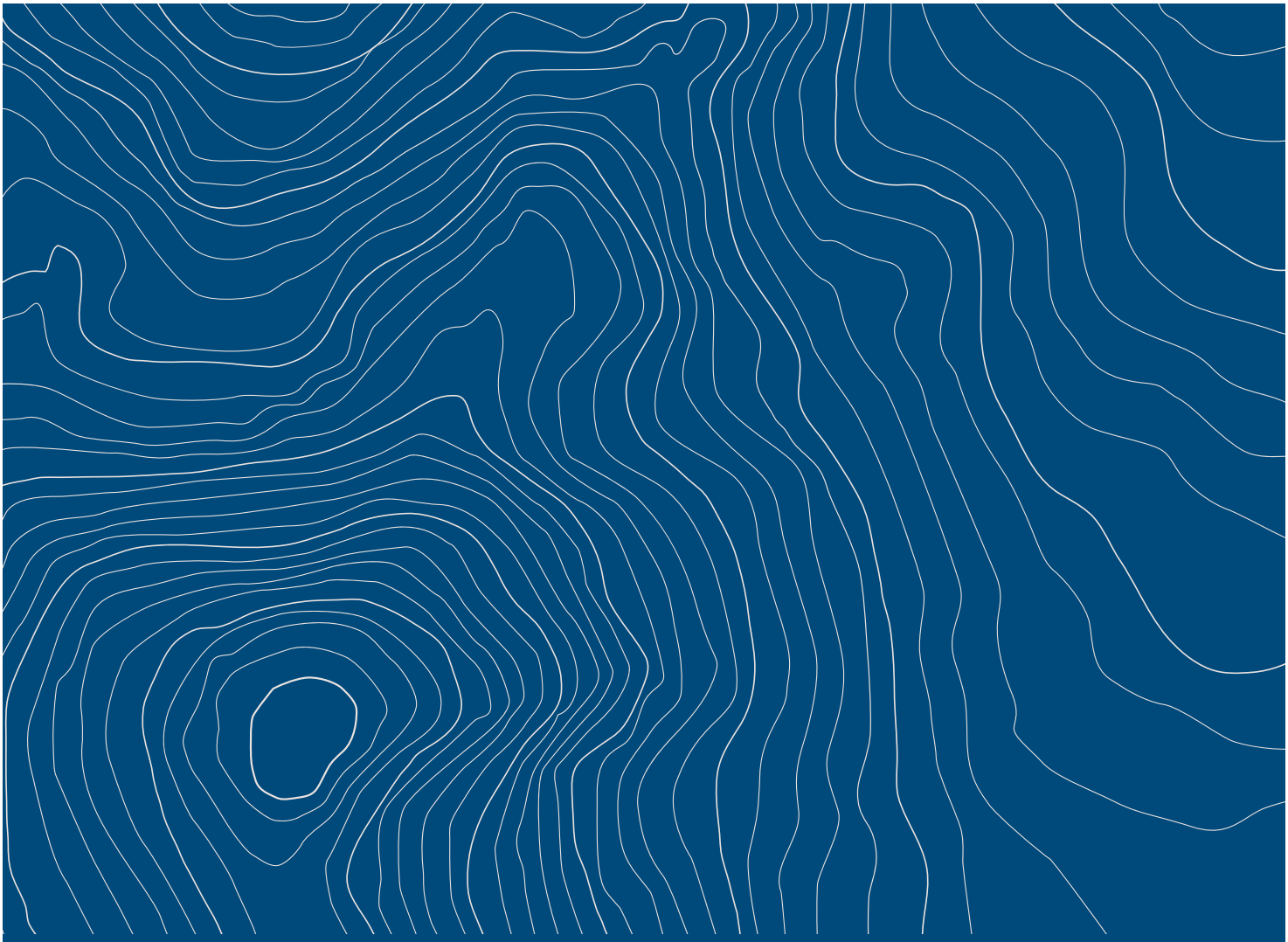

DublinArray
Generation for generations

EIAR Volume 5: Onshore Infrastructure Assessment Chapters
Chapter 9: Human Health

Kish Offshore Wind Ltd

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Dublin Array Offshore Wind Farm

Environmental Impact Assessment Report

Volume 5, Chapter 9: Human Health

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Glossary

Term	Definition
Baseline data	Data collected to establish the existing conditions before a project begins.
Bio-physical conditions	Environmental factors such as air quality, water quality, and land quality that affect health.
Cardiovascular health	Health of the heart and blood vessels.
Cumulative effects	Combined effects of multiple projects or activities over time on the environment or human health.
Determinants of health	Factors that influence health status, including lifestyle, social networks, and living conditions.
Electoral Division (ED)	Smallest legally defined administrative areas in Ireland used for local government and electoral purposes.
Environmental Impact Assessment (EIA)	Assessment of the likely significant effects of a proposed project on the environment. The EIA will be carried out by An Bord Pleanála in this instance.
Environmental Impact Assessment Report (EIAR)	As defined in the Planning and Development Act 2000, as amended: "environmental impact assessment report" means a report of the effects, if any, which proposed development, if carried out, would have on the environment and shall include the information specified in Annex IV of the Environmental Impact Assessment Directive.
Environmental noise	Unwanted or harmful outdoor sound created by human activities.
Health determinants	Factors that influence health, such as air quality, noise, and access to green spaces.
Human health receptors	Individuals or populations that may be affected by environmental changes.
Landfall	The location where the Offshore Export Cable Corridor comes ashore adjacent to the Shanganagh Waste Water Treatment Plant (WWTP).
Magnitude of impact	Measure of the extent, duration, frequency, and probability of an impact.
Mitigation measures	Actions taken to reduce or prevent adverse environmental impacts.
Noise and vibration	Sound and oscillations that can affect human health and well-being.
Onshore Electrical System (OES)	Collective term for all onshore infrastructure from the landfall/TJB to the grid connection point which is likely to be necessary to connect the project to the national grid.
Onshore Export Cable Route (ECR)	The term used to describe the 7.4 km route of the onshore cables and associated infrastructure between the TJBs and the OSS.
Onshore infrastructure	The Onshore Electrical System and the O&M Base.
Onshore Substation (OSS)	Part of the OES, the substation is required to facilitate the connection to the existing national electricity transmission system.
Operations and Maintenance (O&M) Base	The location from where the daily operations and normal repairs, replacement of parts and structural components, and other activities needed to preserve the offshore assets will be conducted.
Pollution Incident Response Plan	Plan outlining actions to be taken in the event of a pollution incident.

Term	Definition
Public Right of Way (PRoW)	Legal right for the public to pass through certain routes or paths.
Sensitivity of receptor	Measure of how susceptible a receptor is to changes in environmental conditions.
Significance of effect	Determination of whether an impact is significant based on its magnitude and the sensitivity of the receptor.
Transition Joint Bay (TJB)	The proposed infrastructure at the Landfall location where the offshore and onshore cables connect.
Vulnerable groups	Populations more likely to experience adverse health outcomes due to specific characteristics or circumstances.
Wider determinants of health	Broader factors such as economic policies, social norms, and environmental conditions that influence health.

Acronyms

Term	Definition
BOBF	Better Outcomes Brighter Future
CEMFAW	Control of Electromagnetic Fields at Work
CEMP	Construction Environmental Management Plan
CSO	Central Statistics Office
CTMP	Construction Travel and Management Plan
DART	Dublin Area Rapid Transit
DECLG	Department of the Environmental, Community and Local Government
DLRCC	Dún Laoghaire-Rathdown County Council
Dublin Array	Dublin Array Offshore Wind Farm
EC	European Commission
ECR	Export Cable Route
ED	Electoral Division
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMF	Electromagnetic fields
EMRA	Eastern and Midland Regional Assembly
EPA	Environment Protection Agency
EU	European Union
GHG	Greenhouse Gas Emission
GIS	Geographic Information System
HP Index	Hasse and Pratschke Deprivation Index
HIA	Health Impact Assessment
ICNIRP	International Commission for Non-Ionizing Radiation Protection
IEMA	Institute of Environmental Management and Assessment
IMO	International Maritime Organisation
LECP	Local Economic and Community Plan
NDIS	National Disability Inclusion Strategy
NPF	National Planning Framework
OES	Onshore electrical system
OSS	Onshore substation
O&M	Operations and maintenance

Term	Definition
RSES	Regional Spatial and Economic Strategy
TCC	Temporary Construction Compound
TJB	Transition Joint Bay
UK	United Kingdom
WHO	World Health Organisation
WTG	Wind Turbine Generator

9 Human Health

9.1 Introduction

9.1.1 This chapter of the Applicant's Environmental Impact Assessment Report (EIAR) presents the results of the Environmental Impact Assessment (EIA) for the potential impacts of the construction, operation and maintenance, and decommissioning phases associated with the onshore infrastructure of the proposed Dublin Array Offshore Wind Farm (hereafter referred to as Dublin Array) on human health.

9.1.2 The chapter includes an assessment of potential impacts, the significance of effects, the requirements for mitigation and the residual and cumulative effects. The assessment has considered the existing baseline and in particular human health effects of Dublin Array on vulnerable and sensitive populations. The assessment has had regard to best practice guidance and statutory legalisation for assessing human health, and where impacts have been scoped out, a justification has been provided.

9.1.3 The Dublin Array onshore infrastructure comprises the following:

- The Onshore Electrical System (OES) which will include the Landfall Site where the transition joint bay (TJB) will be located at Shanganagh; the Onshore Export Cable Corridor Route (Onshore ECR), the Onshore Substation (OSS) and grid connection point; and
- The Operations and Maintenance (O&M) Base which will be located at Dún Laoghaire Harbour.

9.1.4 This chapter should be read in conjunction with Volume 6, Appendix 6.5.9-1: Human Health Baseline Report (hereafter referred to as the Human Health Baseline Report) which provides the full census datasets used to inform the assessment.

9.1.5 The consideration of human health effects is closely linked to a number of the technical assessments presented within this EIAR. The chapter should be read in conjunction with the following chapters:

- Volume 3, Chapter 16: Noise and Vibration (Terrestrial Receptors) (hereafter referred to as the Noise and Vibration (Terrestrial Receptors) chapter;
- Volume 3, Chapter 17: Socio-economic, Tourism, Recreation and Land Use (hereafter referred to as the Socio-economic, Tourism, Recreation and Land Use chapter);
- Volume 3, Chapter 18: Climate Change (hereafter referred to as the Climate Change chapter);
- Volume 3, Chapter 19: Major Accidents and Disasters (hereafter referred to as the Major Accidents and Disasters chapter);
- Volume 5, Chapter 3: Land, Soils and Geology (hereafter referred to as the Land, Soils and Geology chapter);

- Volume 5, Chapter 4: Water (Hydrology, Hydrogeology and Flood Risk) (hereafter referred to as the Water chapter);
- Volume 5, Chapter 5: Noise and Vibration (hereafter referred to as the Noise and Vibration chapter);
- Volume 5, Chapter 6: Traffic and Transport (hereafter referred to as the Traffic and Transport chapter); and
- Volume 5, Chapter 10: Air Quality (hereafter referred to as the Air Quality chapter).

9.1.6 The offshore infrastructure has been scoped out of this assessment as it is outside of the radius of potential human health receptors. Further explanation for this is provided in the Scope of the Assessment (section 9.9).

9.2 Regulatory background

9.2.1 This section outlines the legalisation, policy and guidance that is relevant to the assessment. Where specific Irish guidance is not available regarding the assessment of human health within EIA, other guidance documents specific to the consideration of human health are available from jurisdictions/countries with established offshore renewable energy sectors where comprehensive guidance has been developed.

Legislation

9.2.2 Within the Republic of Ireland, there is no specific human health legalisation relating to EIA.

9.2.3 The Environmental Protection Agency (EPA) Guidelines on the Preparation of EIARs (EPA, 2022) (hereafter referred to as the EPA Guidelines) state that 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..'.

9.2.4 This is consistent with the Directive 2014/52/EU, which states:

'*The notion of human health should be considered in the context of the other issues mentioned in paragraph (f), which lists environmental factors including soils, water, air etc.'*

9.2.5 In addition, there are also several pieces of legislation within Ireland and internationally related to health, but not EIAR specific. These have been considered in the preparation of this chapter and include, for instance:

- Safety, Health and Welfare at Work Act 2005 (sets out the responsibilities of employers, the self-employed employees and various other parties in relation to safety and health at work);
- Health Act 2007 as amended (provides for the regulation of designated centres for older persons (nursing homes), persons with disabilities and children in need of care and protection);

- Air Pollution Act 1987 (requires local authorities to take the necessary measures to prevent or limit air pollution); and
- The revised Bathing Water Directive 2006/7/EC safeguards public health and clean bathing waters (European Parliament and Council of the European Union, 2006). Bathing waters are also protected under the Water Framework Directive 2000/60/EC (European Parliament and Council of the European Union, 2000).

Planning policy

9.2.6 The National Planning Framework (NPF) (under Project Ireland 2040) provides a planning framework to guide development and investment in Ireland over the plan period (Government of Ireland, 2018[1]. The NPF provides a set of national objectives and principles that aim to empower each region in Ireland to lead in the planning and development of their communities. Specific objectives relating to human health are contained with the NPF and are presented in Table 1.

9.2.7 .

9.2.8 The National Marine Planning Framework (NMPF) complements the NPF by providing a comprehensive approach to marine spatial planning, which includes considerations for onshore infrastructure associated with offshore wind farms. Relevant policies from the NMPF that impact human health assessments include sustainable development, climate action, public participation, social benefits, environmental protection, integrated coastal zone management, health and well-being, and infrastructure development. These policies emphasize the importance of minimising environmental and health impacts, engaging with local communities, and ensuring that infrastructure projects contribute positively to public health and well-being.

9.2.9 Regarding local-regional policy, the onshore infrastructure of Dublin Array which this chapter is dealing with (OES and O&M Base) falls entirely within the administrative boundaries of Dún Laoghaire-Rathdown County Council (DLRCC) and the Eastern and Midland Regional Assembly, and therefore the guidance/policy below has been considered in this EIAR:

- Dún Laoghaire-Rathdown County Council
  - County Development Plan 2022-2028; and
  - Dún Laoghaire-Rathdown Health County Plan 2019-2022.
- Eastern and Midland Regional Assembly
  - Regional Spatial and Economic Strategy (RSES) 2019-2031.

1 It is noted that the Draft Revised National Planning Framework was published in 2024. (https://www.npf.ie/consultation-on-the-first-revision-to-the-national-planning-framework/draft-revised-national-planning-framework/) It is recognised, however, that this remains in draft form and that pending its finalisation, the 2018 document remains in place.

9.2.10 The Dún Laoghaire-Rathdown County Development Plan 2022-2028 sets out a comprehensive vision for the council area and includes human health related objectives/policies which are also discussed in Table 1.

9.2.11 Whilst now outside the plan period, the Healthy County Plan 2019-2022 was produced by the Healthy Dún Laoghaire-Rathdown Steering Committee to support Dún Laoghaire-Rathdown in becoming a healthier county, by promoting and encouraging positive health and wellbeing for those that live and work there. The plan is an initiative by Healthy Ireland and sets out several strategic priorities, which are summarised in Table 1.

9.2.12 The Healthy County Plan 2019-2022 (Healthy Dún Laoghaire-Rathdown Steering Committee, 2019) is also one of several Policy documents which has informed the production of the Dún Laoghaire-Rathdown Local Economic and Community Plan (LECP) 2023-2028 which was adopted in April 2024. The LECP sets strategic goals and objectivities related to health including goal 5 which sets out the ambition to *'promote a healthy, inclusive and diverse County that supports good physical health and mental wellbeing across all our communities.'*

9.2.13 The Eastern and Midland Regional Assembly produced a RSES which is made up of principles and objectives which will help guide development in the region (Eastern and Midland Regional Assembly, 2019). Health is a running theme throughout the document as shown in Table 1.

Guidance

9.2.14 Regard has been given to a range of guidance, which has been published by the Institute of Environmental Management and Assessment (IEMA), 2022 'Determining Significance for Human Health in Environmental Impact Assessment' (hereafter referred to as the IEMA Guidance). This has been used to supplement the guidance set out in the EPA Guidelines, which is described fully in Volume 2, Chapter 3: EIA Methodology.

9.2.15 The IEMA guidance provides for the consideration of health as an EIA topic and sets out a framework that supports a proportionate approach that can be applied to all scales of EIA. Whilst the guidance is not statutory, it is noted that the document should be used by all EIA practitioners and is stated to be applicable to the legislative processes within the Republic of Ireland.

9.2.16 The guidance uses the World Health Organisation (WHO) health definition, which explains that health is a means of complete physical, mental and social well-being and not merely the absence of disease or infirmity. WHO define health as:

'a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity.'(Source: Constitution of the World Health Organization 1948, as amended).

9.2.17 The guidance sets out that EIA assessments should focus on health outcomes and that health is influenced by a wider range of factors, defined as wider determinants of health. The IEMA Guidance refers to Danlgren-Whitehead (1991) list of different health determinants, which are as follows:

- Age, sex and constitutional factors (these cannot be influenced by development);

- Individual lifestyle factors;
- Social and community networks;
- Living and working conditions;
- General socio-economic, cultural; and
- Bio-physical conditions.

9.2.18 The IEMA guidance sets out that health should be assessed with regards to the significance of health impacts:

'An EIA must identify, describe and assess the direct and indirect significant effects in an appropriate manner of a proposed development on human health. It must include the information that may reasonably be required for reaching a reasoned conclusion on the significant effects, taking into account current knowledge and methods of assessment. It must include a description of the forecasting methods or evidence used to identify and assess these significant effects, including details of difficulties encountered in compiling the required information.'

9.2.19 Alongside the IEMA Guidance and the guidelines set out in the EPA Guidelines, the following documents below have informed this assessment. The documents do not set out specific guidance/requirements relating to EIARs, however, are relevant to the topic of health.:

- The WHO (2009) Night Noise Guidelines for Europe);
- WHO (1999) Guidelines for Community Noise;
- Institute of Public Health (2021) Health Impact Assessment: A manual;
- Institute of Public Health (2021) Health Impact Assessment: technical guidance;
- An Bord Pleanála (2018) Environmental Impact Assessment;
- WHO (2005) WHO Air Quality Guidelines for particulate matter, ozone, nitrogen dioxide and sulphur dioxide;
- British Standards Institution (2014) 5228-1 and 2:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites. Noise and Vibration;
- Healthy Ireland – A Framework for Improved Health and Wellbeing (2013-2025);
- Get Ireland Active: The National Physical Activity Plan for Ireland (Government of Ireland, 2016);
- Review of the National Physical Activity Plan: Progress and Next Steps (Government of Ireland, 2022);
- Better Outcomes Brighter Futures: The National Policy Framework for Children and Young People (2014-2020) (Government of Ireland, 2014); and

- National Disability Inclusion Strategy (NDIS) 2017-2021 (Government of Ireland, 2017).

9.2.20 Table 1 provides an overview of the key legislation and guidance discussed in this section.

Table 1 Legislation and policy context

Policy/legislation/ publisher	Name/reference/key provisions	What is covered/section where provision is addressed
Statutory		
Legislation		
European Commission, 2014	Article 3(1) of the amended Directive 2014/52/EU.	*'The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors: a) population and human health; b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC; c) land, soil, water, air and climate; d) material assets, cultural heritage and the landscape; e) the interaction between the factors referred to in points (a) to (d).'* The assessment identifies the effects on human health. The methodology is set out in section 9.4.
Planning Policy and Development Control		
Government of Ireland, 2018	National Planning Framework (NPF) (Project 2024) https://espon.public.lu/dam-assets/publications/project-ireland-2040-npf.pdf	Section 6.2 relates to healthy communities and includes the following national policy objectives: ▪ National Policy Objective 26 which aims to support the implementation of public health policy including healthy Ireland; and ▪ National Policy Objective 27 which seeks to prioritise walking, cycling accessibility to both existing and proposed developments.
		Section 6.3 relates to diversity and inclusivity and includes Policy Objective 28 which plans 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.
		Section 6.4 relates to age friendly communities which has a focus on meeting the needs and opportunities of an aging population along with the specific projections, supported by clear proposals in respect of ageing communities.

Policy/legislation/ publisher	Name/reference/key provisions	What is covered/section where provision is addressed
Dún Laoghaire-Rathdown County Council, 2022	Dún Laoghaire-Rathdown County Development Plan 2022-2028	The vision of the plan is to: *'embrace inclusivity and quality of life is underpinned by five strategic County outcomes centered around the ten-minute neighborhood concept which aims to ensure that people can walk, cycle or use public transport to access their day-to-day needs and services such as schools, shops, parks and employment.'*
		Policy Objective PHP3: Planning for Sustainable Communities includes the key objective to: 'Create healthy and attractive places to live consistent with NPO 4 of the NPF and RPO 9.10 of the RSES.'
		Policy Objective PHP9: Health Care Facilities seeks to support the Health Service Executive and other statutory and voluntary agencies in the provision and/or improvement of appropriate healthcare facilities.
		Policy Objective PHP15: Healthy County Plan has the objective of supporting and facilitating the creation of a healthy environment.
		Policy Objective PHP35: Healthy Placemaking has the objective of ensuring development proposals are cognisant of the need for proper consideration of context, connectivity, inclusivity, variety, efficiency, distinctiveness, layout, public realm, adaptability, privacy and amenity, parking, wayfinding and detailed design.
		Policy Objective OSR5: Public Health, Open Space and Healthy placemaking has the overarching objective of supporting public health policy including the Healthy Ireland and National Physical Activity Plan (2016).
Eastern and Midland Regional Assembly, 2019	Eastern and Midland Regional Assembly 2019-2031 Regional Spatial and Economic Strategy	The vision of the plan is *'to create a sustainable and competitive Region that supports the health and wellbeing of our people and places, from urban to rural, with access to quality housing, travel and employment opportunities for all.'*
		Key principle 4: *'Protect and enhance the quality of our built and natural environment to support active lifestyles including walking and cycling, ensure clean air and water for all and quality healthcare and services that support human health.'*
		Regional Policy Objective-Healthy placemaking seeks to create healthy and attractive places and ensure that new development is accessible and inclusive for a range of users who can live healthy lives.

Policy/legislation/ publisher	Name/reference/key provisions	What is covered/section where provision is addressed
		Regional Policy Objective-Social and Economic Opportunity seek to reduce the number of persons in or at risk of poverty or exclusion in the region.
Non-Statutory		
Guidelines and technical standards		
EPA, 2022	The EPA Guidelines	The EPA Guidelines set out that the EIAR *'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...'*
IEMA, 2022a	Institute of Environmental Management and Assessment (2022) Determining Significance for Human Health in Environmental Impact Assessment	Provides guidance regarding the consideration of health as a topic in EIAs and presents a framework that supports a proportionate approach that can apply to all scales on EIA.
IEMA, 2022b	Institute of Environmental Management and Assessment (2022) Effective Scoping of Human Health	Provides guidance regarding the consideration of health as a topic in EIAs during the scoping process of EIAs
Healthy Dún Laoghaire-Rathdown Steering Committee, 2019	Dún Laoghaire-Rathdown Healthy County Plan 2019-2022	The plan sets out 8 priorities as follows: 1. To support and improve the County's population health and wellbeing. 2. To support and promote Dún Laoghaire-Rathdown as a physically active and health community; 3. To achieve a supportive environment, which promotes the positive mental health and wellbeing of the community of the county; 4. To support the population of children and young people to be healthy and active; 5. To support families to enjoy the best possible standard of health and wellbeing and have access to appropriate facilities in their local communities; 6. To support people living with disabilities to lead active healthy lifestyles; 7. To support older people in living healthy active lives; and 8. To promote greater integration and social inclusion in the county.

Policy/legislation/ publisher	Name/reference/key provisions	What is covered/section where provision is addressed
Dún Laoghaire-Rathdown County Council, 2024	Dún Laoghaire-Rathdown Local Economic and Community Plan (LECP) 2023-2028	The document constitutes Dún Laoghaire-Rathdown's Local Economic and Community plan for the 2023 – 2028 period, setting out 6 goals as follows: ▪ Create a climate-resilient County by promoting and delivering best practice in climate action, biodiversity, and the circular economy; ▪ Pursue balanced development of the local economy and enhance the business environment to build a creative, inclusive and robust economy; ▪ Develop pathways to employment through enhancing education and training opportunities for all; ▪ Realise the County's potential as a sustainable tourism destination and protect and support the County's heritage and creative sector; ▪ Promote a healthy, inclusive and diverse County that supports good physical health and mental wellbeing across all our communities; and ▪ Continue to develop connected, vibrant and sustainable towns and villages and promote active participation and civic engagement within the County.
Healthy Ireland, 2013	Healthy Ireland - A Framework for Improved Health and Wellbeing (2013-2025)	The document is the national framework to improve the health and wellbeing of people living in Ireland. The framework guides the development of new polices into the future, which is outcomes driven. The overarching vision for Ireland is *'A Healthy Ireland, where everyone can enjoy physical and mental health and wellbeing to their full potential, where wellbeing is valued and supported at every level of society and is everyone's responsibility.'*
Healthy Ireland, 2016	National Physical Activity Plan 2016 (reviewed in 2022)	The National Physical Activities Plan supports the delivery of the Health Ireland Framework and has the aim of *'improving the health and wellbeing of people living in Ireland, where everybody will be physically active and where everybody lives, works and plays in a society that facilitates, promotes and supports physical activity and an active way of life with less time spent being sedentary.'*
Government of Ireland, 2014	Better Outcomes Brighter Future (BOBF) – National Framework Children & Young People (2014-2020)	The documents align the government commitments to children and young people against the following five national outcomes to ensure children and young people are: ▪ Are active and healthy, with positive physical and mental wellbeing. ▪ Are achieving their full potential in all areas of learning and development.

Policy/legislation/ publisher	Name/reference/key provisions	What is covered/section where provision is addressed
		▪ Are safe and protected from harm. ▪ Have economic security and opportunity. ▪ Are connected, respected and contributing to their world.
Government of Ireland, 2017	National Disability Inclusion Strategy 2017-2021 C:\Users\agailitis\Downloads\162923_96990962-f41f-4844-b784-e9ccf8cbfa42 (1).pdf	Sets out a national strategy to address the real needs of persons with disabilities and is focused on the following themes: ▪ Education; ▪ Employment; ▪ Health and well-being; ▪ Person-centred disability services; ▪ Housing; ▪ Transport and accessible places; ▪ Equality and choice; and ▪ Joined-up services.

9.3 Consultation

9.3.1 As part of the EIA for Dublin Array, consultation has been undertaken with various statutory and non-statutory authorities for the EIA process. The Dublin Array EIA Scoping Report was made publicly available and issued to statutory consultees on 9th October 2020.

9.3.2 The Scoping Report contained a summary of what would be considered in relation to human health. It set out that the EIAR would contain consideration of effects on population, most notably in relation to soils, water, air quality and radiation. It was also stated that human health impacts would be sign-posted in other chapters. However, following completion of the Scoping exercise and upon confirmation of the project design details for the onshore infrastructure it was decided to include human health as a stand-alone chapter in the EIAR. to allow for a comprehensive assessment of health effects.

9.3.3 Health-related consultees were consulted as part of the scoping exercise; however, no responses were made. Therefore, this chapter has followed industry recognised guidance in the absence of any comments.

9.3.4 Table 2 outlines the health-related consultees who were invited to comment on Dublin Array.

Table 2 Summary of consultation relating to human health

Date	Consultation type	Consultation and key issues raised	Section where provision is addressed
November 2020	Health Service Executive Formal Scoping Response	N/A- no response made	
November 2020	Health and Safety Authority Formal Scoping Response	N/A- no response made	
November 2020	Environmental Protection Agency Formal Scoping Response	N/A- no response made	

9.4 Methodology

Study area

9.4.1 Dublin Array will be located on the Kish and Bray Banks, approximately 10 km off the east coast of Ireland. The Kish and Bray Banks are located off the coast of counties Dublin and Wicklow. For the purposes of this EIAR, the human health study area focuses on the onshore infrastructure components of Dublin Array only, given their potential to have an impact on human health. Justification for scoping out potential human health effects arising from the offshore infrastructure is set out in Section 9.9.

9.4.2 The study areas selected for assessing the onshore infrastructure elements of Dublin Array were designed to guide baseline data collection and evaluate potential health impacts, including mental and physical health.

9.4.3 These areas were categorised into the following geographic levels:

- Site-specific Electoral Divisions (EDs):
  - This includes the EDs (smallest legislative geographical areas in Ireland) directly overlapping with the proposed onshore infrastructure (Figure 2);
- City level:
  - The broader urban area, represented by Dublin City and its suburbs (classified as a town by CSO, as shown on Figure 3);
- County Level:
  - This encompasses the entirety of Dublin County, as shown on Figure 3; and
- National Level:
  - The potential impacts across the State of Ireland.

9.4.4 EDs are geographic areas established for local government and electoral purposes. They are the smallest legally defined administrative areas in the Republic of Ireland, which were designated under the 2001 Local Government Act (Government of Ireland, 2001). These areas have been selected as extensive population and health data are available for each one at a level of detail sufficient to inform the baseline study.

9.4.5 All EDs overlapping or near the onshore infrastructure were identified. Deprivation data from Pobal (2022) was then analysed to assess the relative socio-economic status of these areas using indicators such as demographic vitality, social class composition, and labour market data. This review helped identify the EDs that best represent the local population near the onshore infrastructure. By examining deprivation levels, the analysis provides insight into areas of socio-economic disadvantage or affluence, offering a more comprehensive understanding of the local community and potential project impacts.

9.4.6 The decision to use a representative ED for each element of the onshore infrastructure (rather than all overlapping EDs) was made due to the extensive area covered by the Onshore ECR, which spans over 7 km in length. For the purposes of assessing Dublin Array's impacts on human health, narrowing the study area to representative EDs was considered a more practical and focused approach.

9.4.7 Referring to IEMA (2022b) "Effective Scoping of Human Health in Environmental Impact Assessment", Section 7.3 of the guidance states that health effects can vary between geographical areas. It recommends that the scope should of the assessment should consider the relevant geographic zones, including the 'site specific population' and 'local population'. The guidance further explains that if there are clearly distinct localities from which a project's activities occur (e.g. communities along a linear development) it will it be appropriate to present multiple separate site-specific geographic populations.

9.4.8 Therefore, in this context, the 'site-specific population' refers to individuals directly within or immediately adjacent to the project's onshore infrastructure, where the most immediate or direct health effects are likely to occur. The 'local population' encompasses a broader group of individuals residing or working within a defined local area surrounding the project, where secondary or indirect health effects may be experienced. Such populations are where the project will exert most influence and given the geographical scale of EDs, using the boundaries are appropriate. This is as per IEMA (2022b) which states the geographic scope will seek to identify where there are likely and potentially significant site and local area effects that differ from the wider effects and focus on areas where the project will exert most influence.

9.4.9 The guidance also states for each impact, a study area appropriate to the scale of the project's impacts will be identified and will focus on smaller areas where possible. Using EDs aligns with this guidance given such areas are the smallest legislative level of defined administrative areas in Ireland.

9.4.10 The IEMA (2022b) guidance further states that if there are clearly distinct localities from which a project's activities occur (e.g. communities along a linear development) it would be appropriate to present multiple separate site-specific geographic population. This is the case for the Dublin Array onshore infrastructure as it has four different infrastructure components comprising: the O&M Base; the Landfall Site/TJB; the OSS and grid connection and the onshore ECR (and associated temporary construction compounds) situated at different locations.

9.4.11 It should be noted that smaller geographical scales like the site-specific population may be defined conceptually, rather than with reference to hard administrative boundaries. This is because, as per IEMA (2022b), *'An administrative boundary does not necessarily define the boundaries of potential mental and physical health effects.'* This is particularly relevant to human health as effects on mental health and wellbeing are subjective and may not be limited to the area defined in relation to achieving certain regulatory thresholds. Therefore, the EDs approach set out in this chapter uses study areas to broadly define representative population groups rather than to set boundaries on the extent of potential effects.

9.4.12 Table 3 outlines the EDs selected for the baseline environment study. As discussed above, the EDs chosen are considered to be representative of the population groups near Dublin Array's infrastructure components. There are cases where an infrastructure component of the project borders or coincides with multiple EDs. In these scenarios, IEMA's (2022b) preference on seeking *'to assess representative worst case periods during project phases, in terms of how they could influence key wider health determinants'* has been adopted. This is either through selecting the EDs that are most deprived and/or cover the largest geographic scale of where effects may occur.

9.4.13 The deprivation levels of the relevant EDs have been taken from Pobal (2022) which derives deprivation data from the following three objective domains: demographic vitality; social class composition; and labour market situation. The index provides a score for each ED, using the categories shown in Figure 1.

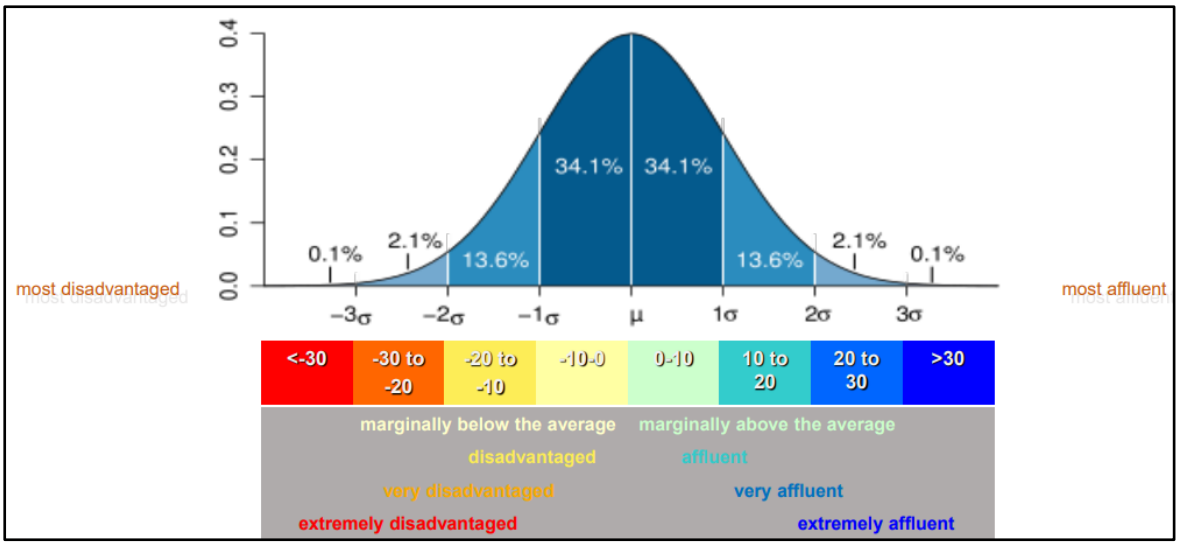


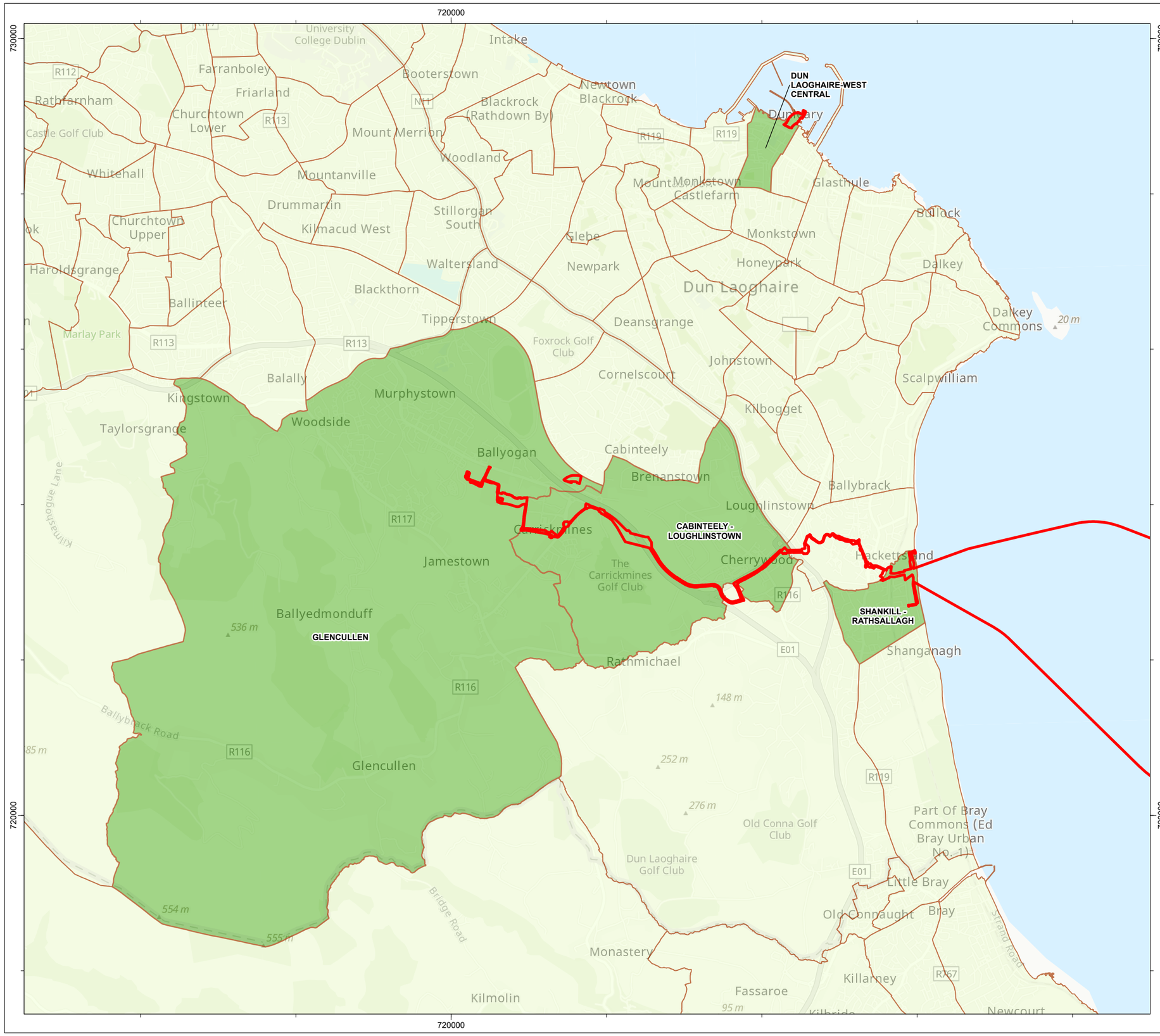
Figure 1 HP deprivation index (Pobal, 2022).

Table 3 EDs that have been selected as being representative of the different onshore infrastructure elements.

Onshore Infrastructure element	ED overlapping or near the onshore infrastructure elements	Representative ED selected (Figure 2)	Justification
O&M Base	▪ Dún Laoghaire-west Central (population of 2,726 and HP index of 5.14); ▪ Dún Laoghaire-east Central (population of 2,604 and HP index of 9.63); and ▪ Dún Laoghaire-salthill (population of 1,758 and HP index of 10.52).	Dún Laoghaire-west Central (ED ID 267077)	Whilst all of the EDs are all above the average in terms of the deprivation score derived from the HP index (see Figure 1), Dún Laoghaire-west Central ED ranks lower in the HP Index in comparison to its neighbouring EDs. The ED is therefore more fitting with the 'worst case' approach set out in the IEMA (2022b) guidance.
Landfall Site/TJB	▪ Shankill-Rathsallagh (population of 3,254 and HP index of -5.04); and ▪ Killiney South (population of 6,386 and HP index of -4.84).	Shankill-Rathsallagh (ED ID 267121)	The Landfall Site/TJB area overlaps two EDs. However, Shankill-Rathsallagh has been selected as the population of this ED ranks lower in the HP Index (see Figure 1) in comparison to its neighbouring EDs. The ED is therefore more fitting with the 'worst case' approach set out in the IEMA (2022b) guidance.
OSS and grid connection	▪ Cabinteely-Loughlinstown (population of 5,362 and HP index of 13.22); and	Glencullen (ED ID 267092)	The OSS falls within the boundary of two EDs. Whilst both EDs are considered to be more affluent within the HP Index, the Glencullen ED ranks lower in the

Onshore Infrastructure element	ED overlapping or near the onshore infrastructure elements	Representative ED selected (Figure 2)	Justification
	▪ Glencullen (population of 23,596 and HP index of 11.63).		HP Index (see Figure 1). The ED is therefore more fitting with the 'worst case' approach set out in the IEMA (2022b) guidance.
Onshore ECR	▪ Shankill-Rathsallagh (population of 3,254 and HP index of -5.04; ▪ Killiney South (population of 6,386 and HP index of -4.84); ▪ Cabinteely-Loughlinstown (population of 5,362 and HP index of 13.22); ▪ Glencullen (population of 23,596 and HP index of 11.63); ▪ Shankill-Rathmichael (population of 5,731 and HP Index of 5.76).	Cabinteely-Loughlinstown (ED ID 267038)	The onshore ECR falls within four EDs. Whilst Cabinteely-Loughlinstown is the most affluent (in terms of the Pobal Index – see Figure 1). It has been selected given this ED represents the largest area covered by the onshore ECR and in light of Shankill-Rathsallagh and Glencullen already being scoped into the assessment due to being representative of the landfall / TJB and OSS respectively. This is in line with the IEMA (2022b) guidance which seeks to identify where the project will exert the most influence. It is noted that Shankill-Rathmichael is the least affluent, however, the onshore ECR only intersects marginally with this ED, and therefore, it is considered more appropriate to use Cabinteely-Loughlinstown as this population is more representative of population affected by the onshore ECR and therefore more likely to be impacted.

9.4.14 Figure 2 and Figure 3 illustrate the boundaries considered in this health assessment.



Application Site Boundary

Electoral Divisions - Assessed

Electoral Division

DRAWING STATUS

PUBLIC

DISCLAIMER

MAP NOTES / DATA SOURCES:

PROJECT TITLE

Dublin Array

DRAWING TITLE

Human Health: Electoral Divisions

DRAWING NUMBER: **2**

PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2024-12-20	FINAL	JK	AB	AE

0 0.5 1 Kilometres

0 0.5 1 Miles

N GRID NORTH

SCALE 1:50,000 PLOT SIZE A3

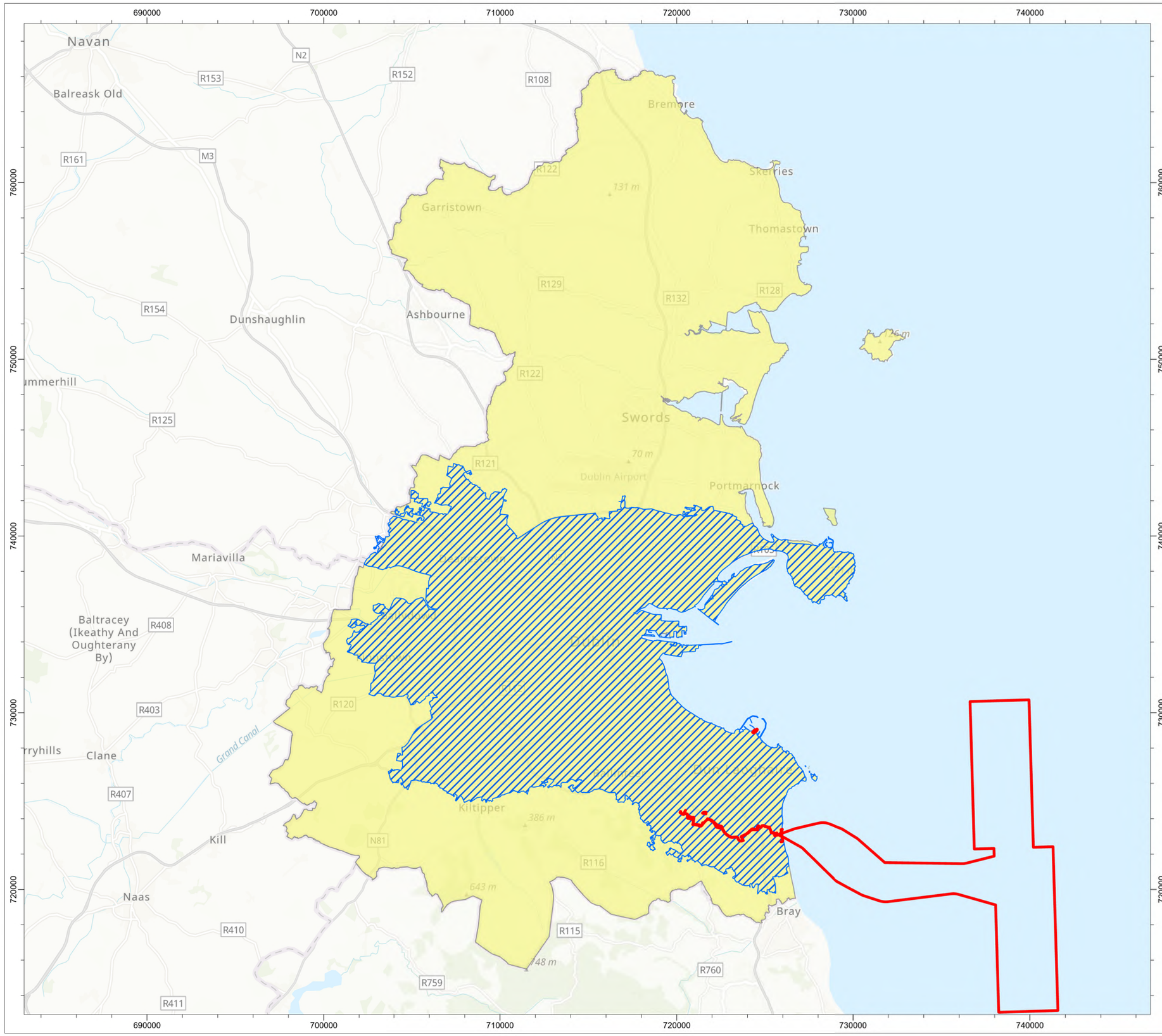
DATUM IRENET95 VERTICAL REF ODN/LAT/MLLW

PRJ IRENET95 Irish Transverse Mercator

SLR

Dublin Array Generation for generations

Kish Offshore Wind Limited - Bray Offshore Wind Limited



Application Site Boundary

Dublin City and Suburbs Boundary (2022)

Country Dublin Boundary

DRAWING STATUS

PUBLIC

DISCLAIMER

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MAP NOTES / DATA SOURCES:

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PROJECT TITLE

Dublin Array

DRAWING TITLE

Human Health:
Administrative Boundaries

DRAWING NUMBER: **Figure 3**

PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2024-12-18	FINAL	JK	AB	AE

0 2.5 5 Kilometres
0 2 4 Miles

SCALE 1:219,910 PLOT SIZE A3
DATUM IRENET95 VERTICAL REF CD/LAT/MLLW
PRJ IRENET95 Irish Transverse Mercator

SLR

Dublin Array
Generation for generations

Kish Offshore Wind Limited - Bray Offshore Wind Limited

Baseline data

9.4.15 A full overview of the baseline data collected, and existing environment is provided within the Human Health Baseline Report. This Report provides an overview of the existing environment and current conditions relating to the human health who live locally to the Dublin Array onshore infrastructure. This includes information relating to age, health issues, disability, income, employment and qualifications.

9.4.16 The sources used to inform the baseline data are as follows:

- Central Statistics Office (CSO, 2022): provides data relating to economic, social and general activities and conditions; and
- Pobal HP Deprivation Index Data: provides a deprivation index for EDs in Ireland, accessible through Geographical Information System (GIS) mapping 2022. (Pobal, 2022)

Population groups

9.4.17 The assessment and data collected is based on 17 defined population groups that have the potential to be impacted by the Dublin Array onshore infrastructure in the context of human health. This assessment adopts a population-based health approach, recognising that drawing conclusions about individual health outcomes will be disproportionate. To ensure the assessment takes account of potential inequalities, where necessary, conclusions for a specific health issue have been reached for one or more population, with an example provided below:

- One conclusion for the general population (for a defined area); and
- A second separate sub-population conclusion for relevant vulnerable groups.

9.4.18 The population groups used in this assessment are defined either as geographic, potentially hard to reach or other target groups that may face disproportionate health effects. A full break down of these groups follows.

Geographic population groups

9.4.19 The majority of the data has been collated from the CSO's Census of Ireland publicly available records. Following the collection of the data, this has been assessed relating to the State, County Dublin, Dublin City (and its suburbs) and the four selected representative EDs to establish an overview of the existing trends relating to health. Overall, seven population groups have been considered in this assessment as follows:

- The ED representative of the O&M Base (site-specific);
- The ED representative of the Landfall Site/TJB (site-specific);
- The ED representative of the OSS and grid connection (site-specific);
- The ED representative of the onshore ECR (site-specific);
- The population of Dublin City and its suburbs (local) – as illustrated in Figure 2, the Dublin Array onshore infrastructure will site entirely within this area;

- The population of County Dublin (county) - as illustrated in Figure 2, the Dublin Array onshore infrastructure will site entirely within this area; and
- The population of Ireland (state).

Potentially hard to reach groups

9.4.20 Hard to reach groups refers to segments of the general population who may be more susceptible to human health impacts due to their age, health or socio-economic background. Hard to reach groups include:

- Children and young adults are more susceptible than others to environmental impacts, such as air pollution and noise. Due to their limited experience, they may lack the judgement needed to navigate traffic and other public spaces safely;
- The elderly and people with physical disabilities are more sensitive than young and middle-aged people. They are likely to have less able, visual or other sensory perception and may have physical mobility problems. Changes to access routes may create anxiety or worry leading to withdrawal or isolation or reduced physical activity such as walking. They may or may not use public transport, depending on accessibility for family or other social visits;
- People with physical and mental health problems, such as sleep disturbance, depression, and anxiety, may be more sensitive than others to the changes in their local environment;
- Cyclists, pedestrians, equestrians, and public transport users are likely to be affected by diversions to their travel routes or road and footpath closures, which may change their exposure to health risks, such as safety, air quality and noise; and
- People in low-income groups (income deprivation) are more likely to live in areas affected by environmental pollution (World Health Organisation, 2010) and face barriers to housing, which may cause stress and anxiety.

Other target groups

9.4.21 Other target groups that may face health impacts disproportionately are:

- Population within 100 m of construction sites;
- Residents affected by construction-related traffic using their roads for a longer period throughout the day;
- Residents affected by other projects that will be built in the area around the same time;
- Employees (in offices or commercial spaces) working within 300 m of the work site; and
- Tourists and visitors (likely to be impacted by construction, road closures, footpath diversion which may impact on stress).

Difference between the general population and vulnerable groups

9.4.22 In the context of health impact assessment (HIA), it is important to differentiate between the general population and vulnerable groups to ensure that health impacts are accurately assessed and addressed. Table 4 summarises the characteristics and definitions of these two groups.

Table 4 Definition of general population and vulnerable groups

Category	Definition	Reference
General population	All individuals within a defined area or community who may be affected by a policy, program, or project. This group includes people of all ages, genders, and socio-economic statuses.	WHO, 2023
Vulnerable groups	Segments of the population more likely to experience adverse health outcomes due to specific characteristics or circumstances, such as age, health status, socio-economic status, or access to resources.	WHO, 2023 IEMA, 2020

Table 5 Characteristics of general population vs. vulnerable groups[2]

Aspect	General population	Vulnerable groups
Life stage	High proportion of independent individuals and those providing some care.	High proportion of individuals providing a lot of care and those who are dependent.
Deprivation	Generally experiences low deprivation.	Experiences high deprivation, including pockets of higher deprivation within low deprivation areas.
Health status	Broadly comprised of individuals with good health status.	Includes those reporting bad or very bad health status.
Day to day activities	Majority characterise their activities as not limited.	Tend to rate their activities as limited a little or a lot.
Resilience	Characterised as having high resilience.	Characterised as having limited resilience.
Usage of infrastructure	Likely to have many alternatives to shared resources.	More likely to rely on shared resources.

9.4.23 Based on best practice guidance and 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.

2 Derived from:
WHO Regional Office for Europe (2023). A place in the public health toolbox: policy brief on health impact assessments and incorporating health into environmental assessments. This document discusses the importance of considering different population groups, including vulnerable groups, in HIA1.
International Association for Impact Assessment. (2020). International Best Practice Principles: Health Impact Assessment (2nd edition). This guide provides principles and practices for conducting HIA, emphasizing the need to assess impacts on both the general population and vulnerable groups.

9.4.24 Regarding the usage of affected infrastructure or facilities, the professional judgement is that the general population is more likely to have many alternatives to resources shared with Dublin Array. For the vulnerable group population, the professional judgement is that they are more likely to have a reliance on shared resources.

9.5 Assessment criteria

Identification of effects

9.5.1 It is firstly necessary to ascertain if the construction, operation or decommissioning of Dublin Array will lead to any discernible effect on human health. This can be established by considering the following key questions:

- **Who is likely to be affected by Dublin Array?** Dublin Array might affect different population groups in different ways, for example the health consequences of a scheme may be different for existing residents, workers on site during construction, and hard to reach groups;
- **What determinants of health may be affected?** Health determinants are the factors that can influence health for example, air quality, noise or access to green spaces and open spaces. The state of the health of individuals and communities is determined by many factors including their circumstances and environment. The assessment aims to forecast changes in health condition as a result of the potential changes to the health determinants due to Dublin Array. The health determinants include community and economic factors as well as the physical environment. The list of determinants is drawn from existing literature and the local profile and are shown in Table 6;
- **What is the current health status of the community?** Baseline information from desktop studies is included in the Human Health Baseline Report;
- **What are the potential positive and negative impacts of Dublin Array against each of the categories identified in the determinants of health checklist?** And if there are any negative effects, how can they be avoided, reduced, or compensated? Impacts often arise in indirect ways or could be unforeseen consequences and can happen at different stages of a causal pathway; and
- Identify whether any further evidence/research is needed to inform the final recommendations of the assessment.

9.5.2 The following steps have been undertaken in order to address these questions:

- Policy reviews were conducted to provide the evidence base for identifying health determinants as well as to understand evidence available on the link between the health determinants and health effects;
- The study area boundary was determined, and health determinants were identified;
- Health characteristics of the population/determinants in the study area were profiled;

- Consultation were held with the technical discipline teams to gather their views on health concerns relating to their EIAR topic; and
- The assessment was conducted, and mitigation measures, if required, were identified and incorporated into the project design, construction activities, and operational procedures.

Health determinants

9.5.3 The health determinants referred to above comprise a range of personal, economic and environmental factors that influence health status, including the physical environment, income levels, employment, education, social support, and housing. The 'wider determinants of health' model is used to conceptualise how human health spans environmental, social, and economic aspects. This is based on the Dahlgren and Whitehead (1991) diagram as amended by Barton and Grant (2006) and advised by Cave et al. (2017) (Figure 4). This model places individuals at the centre, surrounded by various layers of influences on health. These layers include:

- Individual lifestyle factors: These are personal behaviours and choices such as diet, physical activity, smoking, and alcohol consumption that directly impact health;
- Social and community networks: The support and interactions individuals have with family, friends, and the wider community. Strong social networks can provide emotional support, reduce stress, and promote healthier behaviours; and
- Living and working conditions: This includes housing quality, employment status, work environment, access to healthcare services, education, and the availability of healthy food. These factors can significantly influence physical and mental health.

9.5.4 General socio-economic, cultural, and environmental conditions: These are broader factors such as economic policies, social norms, cultural values, and environmental conditions like air and water quality. These conditions shape the overall context in which individuals live and can create health disparities. Influences 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.

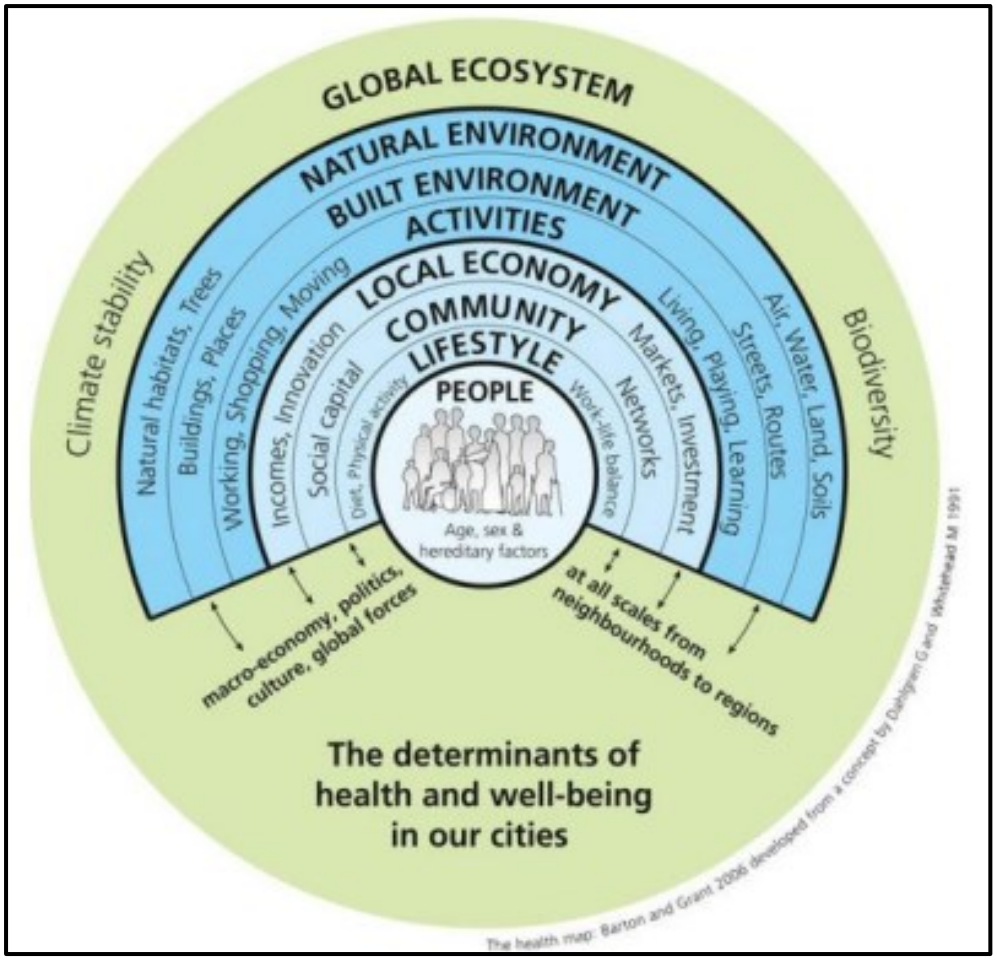

Figure 4 Wider determinants of health and well-being

9.5.5 Regarding specific health impacts, determinants and their association with vulnerable groups, these are listed in Table 6 and are derived from IEMA (2022b) Effective Scoping of Human Health in Environmental Impact Assessment.

Table 6 Health determinants relevant to vulnerable groups (IEMA (2022b).

Vulnerable group	Relevant impacts	Relevant health determinants (relevant to all groups and Dublin Array)
Children and young people	▪ Construction and operational noise; ▪ Construction air quality; ▪ Physical activities affected from construction; ▪ Construction and operational employment; and ▪ Operational wider societal benefits[3].	▪ Human related behaviours ▪ Physical activity; ▪ Risk taking behaviour; ▪ Social environment; ▪ Open space, leisure and play; ▪ Transport modes, access and connections; ▪ Community safety;

3 Operational wider societal benefits: Refers to the long-term positive impacts of the project's operation, including renewable energy production, economic growth, energy security, technological advancements, community benefits, and environmental protection.

Vulnerable group	Relevant impacts	Relevant health determinants (relevant to all groups and Dublin Array)
Older people	▪ Construction and operational noise; ▪ Construction air quality; ▪ Physical activities affected from construction; ▪ Construction and operational employment; and ▪ Operational wider societal benefits.	▪ Community identity, culture, resilience and influence; ▪ Social participation, interaction and support; ▪ Economic environment; ▪ Education and training; ▪ Employment and income; ▪ Bio-physical environment; ▪ Climate change mitigation and adaptation; ▪ Air quality; ▪ Water quality or availability; ▪ Land quality; ▪ Noise and vibration; ▪ Institutional and built environment; ▪ Health and social care services; ▪ Built environment; and ▪ Wider societal infrastructure and resources.
People with poor physical and or mental health	▪ Construction and operational noise; ▪ Construction air quality; ▪ Physical activities affected from construction; ▪ Construction and operational employment; ▪ Operational wider societal benefits; and ▪ Construction journey times and reduced access.	
People who are living under high levels of deprivation	▪ Construction and operational employment; ▪ Construction journey times and reduced access; and ▪ Operational wider societal benefits.	

Sensitivity of receptor criteria

9.5.6 As per EPA guidelines (EPA, 2022), sensitivity of definitions will consider the following:

- Context – the degree to which the receptor will conform or contrast with the established (baseline) conditions. To define the context the following sub-factors will be considered:
  - Adaptability – the degree to which a receptor can avoid or adapt to an impact;
  - Tolerance – the ability of a receptor to accommodate temporary or permanent change without a significant adverse impact; and
  - Recoverability – the temporal scale over and extent to which a receptor will recover following an impact.
- Value – a measure of the receptor's importance, rarity and worth.

9.5.7 The EPA Guidelines contain no published standards on how to define receptor sensitivity for population and human health. IEMA Guidance (IEMA, 2022a) however, provides a methodology for determining sensitivity by means of professional judgement. This methodology is presented in Table 7 which aligns with the EPAs categories of 'high', 'medium' and 'low' categories. However, in IEMA (2022a) guidance, negligible is referred to as 'very low'.

9.5.8 The higher and lower sensitivity characterisations represent instructive positions on a spectrum that will also include more extreme and intermediate positions. Most situations have a mix of higher and lower characterising factors, so a balanced expert view of sensitivity is taken (IEMA, 2022a).

Table 7 Sensitivity of impact adapted from EPA (2022) and IEMA (2022a)

Receptor Sensitivity	Definition
High	**Context** – there are high levels of deprivation (including pockets of deprivation). **Adaptability** – there is a 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. **Tolerance** – people who are prevented from undertaking daily activities; people with very poor health status; and/or people with a very low capacity to adapt. **Recoverability** – the effect on the receptor can be both short and long-term. **Value** – all human health groups are considered to be of a high level of importance.
Medium	**Context** – there are moderate levels of deprivation. **Adaptability** – few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern. **Tolerance** – 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. **Recoverability** – the effect on the receptor can be both short and long-term. **Value** – all human health groups are considered to be of a high level of importance.
Low	**Context** – there are low levels of deprivation. **Adaptability** – many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern. **Tolerance** – 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. **Recoverability** – the effect on the receptor can be both short and long-term. **Value** – all human health groups are considered to be of a high level of importance.

Receptor Sensitivity	Definition
Very Low	**Context** – there are very low levels of deprivation. **Adaptability** – no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern. **Tolerance** – people who are not limited from undertaking daily activities; people who are independent (not a carer or dependent); people with good health status; and/or people with a very high capacity to adapt. **Recoverability** – the effect on the receptor can be both short and long-term. **Value** – all human health groups are considered to be of a high level of importance.

Magnitude of impact criteria

9.5.9 As per EPA guidelines (2022), magnitude is dependent upon:

- Magnitude and extent – the area, the number of sites and/or the proportion of a population affected over which an impact occurs, the nature, transboundary nature, intensity/complexity and probability;
- Duration – the expected onset and time for which the impact occurs;
- Frequency – how often the impact occurs;
- Probability – how likely the impact is to occur; and
- Consequences – the degree of change relative to the baseline level whether it is reversable and the change in character.

9.5.10 As with sensitivity, IEMA guidance has been used to supplement the EPA guidelines (EPA, 2022) as set out in Table 8.

Table 8 Magnitude of the impact adapted from EPA (2022) and IEMA (2022a)

Magnitude	Definition
High	**Magnitude and extent** – high exposure or scale. **Duration** – long-term duration. **Frequency** – continuous frequency. **Probability** – the impact can reasonably be expected to occur. **Consequences** – 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	**Magnitude and extent** – low exposure or medium scale. **Duration** – medium-term duration. **Frequency** – frequent events. **Probability** – the impact has a medium probability to occur.

Magnitude	Definition
	Consequences – 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 implication.
Low	**Magnitude and extent** – very low exposure or small scale. **Duration** – short-term duration. **Frequency** – occasional events. **Probability** – the impact has a low probability to occur. **Consequences** – 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	**Magnitude and extent** – negligible exposure or scale. **Duration** – very short-term duration. **Frequency** – one-off frequency. **Probability** – the impact has a very low probability to occur. **Consequences** – severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication.

Defining the significance of effect

Significance

9.5.11 The IEMA guidance (IEMA, 2022a) sets out that there are two key stages to determining the significance of effects as follows:

- Firstly, the sensitivity of the receptor affected, and the magnitude of the effect upon it are characterised. This establishes whether there is a relevant population and a relevant change in health outcomes to consider; and
- Secondly, a professional judgement is made as to whether or not the change in a population's health is significant. This judgement is based on the collection and presentation of data to evidence reasoned conclusions.

9.5.12 Once a source, pathway and receptor impact has been established to exist, the magnitude/sensitivity methods previously defined are used to consider whether there is a relevant population to consider for health outcomes and a subsequent professional judgement to whether or not the change in a population's health is significant.

9.5.13 The guide questions provided in Table 9.

9.5.14 have been adapted from IEMA guidance (IEMA, 2022a) and will be used to inform professional judgment on the significance of effects.

Table 9 Human health guide questions (IEMA, 2022a)

Evidence sources	Guide questions
Scientific literature	Is there sufficient strength of evidence from sufficiently high-quality studies to support an association between the project change, a relevant determinant of health and a relevant health outcome? Does the literature indicate thresholds or conditions for effects to occur? Are particular population groups identified as being particularly susceptible?
Baseline conditions	Are relevant sensitivities or inequalities identified in the scientific literature present? Does the baseline indicate that conditions differ from relevant local, regional, or national comparators? Are there geographic or population features of the baseline that indicate effects could be amplified?
Health priorities	Have local, regional, or national health priorities been set for the relevant determinant of health or health outcome (e.g. in Joint Strategic Needs Assessments or in Health and Wellbeing Strategies)?
Consultation responses	Has a theme of local, regional, or national consultation responses related to the relevant determinant of health or health outcome?
Regulatory standards (if relevant)	Is the change one that will be formally monitored by regulators? Are there regulatory or statutory limit values set for the relevant context? Has EIA modelling predicted change that exceed thresholds from the scientific literature or set by regulators? Are there relevant international advisory guideline limit values (e.g. by WHO)?
Policy context	Does local, regional, or national government policy raise particular expectations for the relevant project change, determinant of health or health outcome (e.g. levels will be as low as reasonably practicable)? Is there a relevant international policy context (e.g. treaties or conventions)?

9.5.15 Further to the above, IEMA provides further guidance on how to determine the level of significance as shown in Table 10.

Table 10 Significance conclusion and reasoning related to public health within IEMA (2022a)

Category/Level	Indicative criteria[4]
Major (significant)	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 levels), and as informed by consultation themes among stakeholders, particularly public health stakeholders, that show consensus on the importance of the effect. ▪ Change, due to the project, could result in a regulatory threshold or statutory standard being crossed (if applicable).

4 The judgement on indicative criteria is based on most relevant criteria, it is likely in any given analysis that some criteria will span categories

Category/Level	Indicative criteria[4]
	▪ 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 will result from the project and changes to health outcomes. ▪ 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.
Moderate (significant)	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. ▪ Change, due to the project, could result in a regulatory threshold or statutory standard being approached (if applicable). ▪ 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. ▪ 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.
Minor (not significant)	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. ▪ Change, due to the project, will be well within a regulatory threshold or statutory standard (if applicable); but could result in a guideline being crossed (if applicable). ▪ 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 will result from the project and changes to health outcomes. ▪ 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
Negligible (not significant)	The narrative explains that this is not significant for public health because (select as appropriate): ▪ 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.

Category/Level	Indicative criteria[4]
	▪ Change, due to the project, will not affect a regulatory threshold, statutory standard or guideline (if applicable). ▪ 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 will result from the project and changes to health outcomes. ▪ In addition, health priorities for the relevant study area are not relevant to the determinant of health or population group affected by the project.

9.5.16 Using the guide questions and professional judgement guidance described above, this will be applied to the EPA (2022) matrix in Table 11 when determining the significance of effects.

Table 11 Significance of potential effects

Description of Impact - Magnitude			Existing Environment - Sensitivity			
			High	**Medium**	**Low**	**Negligible**
Adverse impact		**High**	Profound or Very Significant (significant)	Significant	Moderate*	Imperceptible
		Medium	Significant	Moderate*	Slight	Imperceptible
		Low	Moderate*	Slight	Slight	Imperceptible
Neutral impact		**Negligible**	Not significant	Not significant	Not significant	Imperceptible
Positive impact		**Low**	Moderate*	Slight	Slight	Imperceptible
		Medium	Significant	Moderate*	Slight	Imperceptible
		High	Profound or Very Significant (significant)	Significant	Moderate*	Imperceptible

*Moderate levels of effect have the potential, subject to the assessor's professional judgement, to be significant. Moderate will be considered as significant or not significant in EIA terms, depending on the sensitivity and magnitude of change factors evaluated. These evaluations are explained as part of the assessment, where they occur.

9.5.17 Considering the above, the assessment section provides a structured discussion that responds to each of these questions and criteria set out in this section for each health issue. The discussion provides reasoned conclusions for the professional judgement as to whether in EIA terms an issue is profound/significant or not. Where appropriate, variation expressed in each evidence source has been reported. This approach is considered proportionate and in line with best practice for the consideration of human health.

9.5.18 Ultimately for human health, a likely significant effect is one that will be brought to the attention of the determining authority, as the effect of Dublin Array is judged to provide, or be contrary to providing, a high level of protection to human health. This may include reasoned conclusions in relation to health protection, health improvement and/or improving services.

9.6 Receiving environment

9.6.1 A detailed characterisation of the receiving baseline is included in the Human Health Baseline Report, which provides a comprehensive level of information related to health and well-being for persons who live within the site-specific locations, including age, health issues, income, employment and qualifications. The Human Health Baseline Report also provides information on community infrastructure that supports the existing populations in respect of recreational assets and space, hospitals, schools and childcare, and health centres and community facilities.

9.6.2 A summary of the key findings from that study has been incorporated into the description of the receiving environment. This section of the EIAR chapter is not intended to repeat or to carry out any additional assessment of impacts within the technical report.

General statistics

9.6.3 The Healthy County Plan 2019-2022 (Healthy Dún Laoghaire-Rathdown Steering Committee, 2019) supports the review of the baseline environment This plan covers the Dún Laoghaire-Rathdown council area of which the entirety of the Dublin Array onshore infrastructure falls under and sets out the following areas of priority:

- For Dún Laoghaire-Rathdown to become a healthy county;
- To support and promote physically active and healthy communities;
- To promote positive mental health and wellbeing;
- To support children and young people in being healthy and active;
- To strive to support families to enjoy the best possible standard of health and wellbeing;
- To support people with disabilities to lead active healthy lives;
- To support older people in living active healthy lives; and
- To promote greater integration and social inclusion in the county.

9.6.4 The Healthy County Plan (Healthy Dún Laoghaire-Rathdown Steering Committee, 2019), which was led by the Dún Laoghaire-Rathdown Steering Committee also provides useful statistics for this assessment as follows:

- Sport and physical activity are important to the people of Dún Laoghaire-Rathdown, with the county having one of the highest rates of participation of any local authority in Ireland (Irish Sports Monitor, 2017);
- The population of Dún Laoghaire-Rathdown are more likely to be in better health than the state average;
- Dún Laoghaire-Rathdown has a high older population with people aged over 65 accounting for 15.9% of the population. Access to local services and amenities as well as opportunities for people to be physically active and engaged in their local community is cited as being increasingly important;
- Dún Laoghaire-Rathdown has a significant number of amenities that are supportive of positive health, well-being and physical activity, with 80% of households within 600 m of a park;
- 52% of those surveyed by Healthy Ireland (2016) nationally reported that they have experience of a mental health problem, either personally or through someone they know; and
- The percentage of those who have a disability in Dún Laoghaire-Rathdown as of 2016 (12.5%) is lower than the Dublin (13.1%) and state (13.5%) averages.

O&M Base

9.6.5 As noted, the Dún Laoghaire-west Central ED was selected to represent the population of the O&M Base. Key findings within the Human Health Baseline Report that characterise the baseline environment are as follows:

- Dún Laoghaire-west Central has a score of 5.14 within the Pobal (2022) HP index and is considered marginally above average in terms of deprivation.
- In Dún Laoghaire-west Central, people aged 65+ accounts for 20.8% of the population, which is higher than Dublin City (13.7%), the wider Dublin County population (13.4%) and the state (15.1%).
- Persons who are unemployed comprises 4.2% (98) of the Dún Laoghaire-west Central population, which is marginally lower than the Dublin City (4.5%), County Dublin (4.3%) and State (4.3%) averages.
- The percentage of the Dún Laoghaire-west Central who are employed as 'Managers, Directors and Senior Officials' constitutes 10.8% (153) of the population, which is higher than the Dublin City (8.3%), County Dublin (8.5%) and state (7.7%) averages.

- A higher proportion of the Dún Laoghaire-west Central population (24.7%) have completed a postgraduate diploma or degree qualification when compared to the Dublin City (16.0%), County Dublin (15.6%) and state (9.17%) averages.
- Within Dún Laoghaire-west Central 84.0% of the of the population consider themselves to have very good or good health, which is higher than the Dublin City (80.7%), County Dublin (81.1%) and state (82.9%) averages.
- Residents in Dún Laoghaire-west Central generally take more healthier and sustainable modes of transport to work, colleague or childcare, specifically by foot which accounts for 19.3% (211) of the population, which is higher than the Dublin City (17.6%), County Dublin (17.3%) and state (12.6%) averages.

Landfall Site

9.6.6 As noted, the Shankill-Rathsallagh ED was selected to represent the population of the Landfall Site/TJB. Key findings within the Human Health Baseline Report that characterise the baseline environment are as follows:

- Shankill-Rathsallagh has a score of -5.04 within the Pobal (2022) HP index and is considered marginally below average in terms of deprivation.
- In Shankill-Rathsallagh, people aged 65+ accounts for 22.2% of the population, which is higher than Dublin City (13.7%), the wider Dublin County population (13.4%) and the state (15.1%).
- The population of Shankill-Rathsallagh residents who are at work (aged over 15 years) constitutes 49.1% (1361) of the population. This is lower than the Dublin City (58.5%), County Dublin (58.8%) and State (56.1%) averages.
- The percentage of the Shankill-Rathsallagh who are employed as 'Managers, Directors and Senior Officials' constitutes 9.0% (134) of the population, which is higher than the Dublin City (8.3%), County Dublin (8.5%) and state (7.7%) averages.
- A lower proportion of the Shankill-Rathsallagh population (12.3%) have completed an Honours bachelor's degree, professional qualification or both compared to the Dublin City (15.8%) and County Dublin (15.7%) average, however, higher than the state average of 10.8%.
- Within Shankill-Rathsallagh 83.4% of the of the population consider themselves to have very good or good health, which is higher than the Dublin City (80.7%), County Dublin (81.3%) and state (82.8%) averages.

- Residents in Shankill-Rathsallagh generally take less healthy and sustainable modes of transport to work, college or childcare. 10.4% (211) of the Shankill-Rathsallagh population travel on foot which is lower than the Dublin City (17.6%), County Dublin (17.3%) and state (12.6%) average. 2.4% (48) of the Shankill-Rathsallagh population travel by bicycle which is lower than the Dublin City (6.8%), County Dublin (6.2%) and state 2.7%).

Onshore substation (OSS)

9.6.7 As noted, the Glencullen ED was selected to represent the population of the onshore substation and grid conection. Key findings within the Human Health Baseline Report that characterise the baseline environment are as follows:

- Glencullen has a score of 11.63 within the Pobal (2022) HP index and is considered affluent in terms of deprivation.
- The proportion of Glencullen who are at the working age is (aged 15-64) is 70.4% (16611). This is higher than the Dublin City average (68.6), the wider Dublin County population at 68.1% and state at 65.3%.
- Persons who are unemployed comprises 3.5% (625) of the Glencullen population, which lower than the Dublin City (4.5%), County Dublin (4.3%) and State (4.3%) averages.
- The percentage of the Glencullen who are employed as 'Managers, Directors and Senior Officials' constitutes 12.0% (134) of the population, which is higher than the Dublin City (8.3%), County Dublin (8.5%) and state (7.7%) averages.
- A higher proportion of the Glencullen population (24.2%) have completed a postgraduate diploma or degree when compared to the Dublin City (16.0%), County Dublin (15.6%) and state (9.17%) averages.
- Within Glencullen 89.8% of the of the population consider themselves to have very good or good health, which is higher than the Dublin City (80.7%), County Dublin (81.3%) and state (82.8%) averages.
- Residents in Glencullen generally take less healthy and sustainable modes of transport to work, college or childcare. 9.4% (1,792) of the Glencullen population travel on foot which is lower than the Dublin City (17.6%), County Dublin (17.3%) and state (12.6%) average. 3.6% (686) of the Glencullen population travel by bicycle which is lower than the Dublin City (6.8%), County Dublin (6.2%) and state 2.7%).

Onshore Export Cable Corridor Route (onshore ECR)

9.6.8 As noted, the Cabinteely-Loughlinstown ED was selected to represent the population of the onshore ECR (however, the onshore ECR also falls within the boundaries of the ED selected for the Landfall Site/TJB and onshore substation).

9.6.9 Key findings within the Human Health Baseline Report that characterise the baseline environment are as follows:

- Cabinteely-Loughlinstown has a score of 13.22 within the Pobal (2022) HP index and is considered affluent in terms of deprivation.
- The proportion of Cabinteely-Loughlinstown who are at the working age is (aged 15-64) is 71.4% (3828). This is higher than the Dublin City average (68.6), the wider Dublin County population at 68.1% and state at 65.3%.
- Persons who are unemployed comprises 3.8% (159) of the Cabinteely-Loughlinstown population, which lower than the Dublin City (4.5%), County Dublin (4.3%) and State (4.3%) averages.
- The percentage of the Cabinteely-Loughlinstown who are employed as 'Managers, Directors and Senior Officials' constitutes 11.8% (362) of the population, which is higher than the Dublin City (8.3%), County Dublin (8.5%) and state (7.7%) averages.
- A higher proportion of the Cabinteely-Loughlinstown population (25.5%) have completed a postgraduate diploma or degree when compared to the Dublin City (16.0%), County Dublin (15.6%) and state (9.17%) averages.
- Within Cabinteely-Loughlinstown 90.2% of the of the population consider themselves to have very good or good health, which is higher than the Dublin City (80.7%), County Dublin (81.3%) and state (82.8%) averages.
- Residents in Cabinteely-Loughlinstown generally take less healthy and sustainable modes of transport to work, college or childcare. 4.4% (191) of the Cabinteely-Loughlinstown population travel on foot which is lower than the Dublin City (17.6%), County Dublin (17.3%) and state (12.6%) average. 2.5% (108) of the Cabinteely-Loughlinstown population travel by bicycle which is lower than the Dublin City (6.8%), County Dublin (6.2%) and the state (2.7%).

Baseline comparisons

9.6.10 Table 12 provides some of the key census-related data collated within the Human Health Baseline Report.

Table 12 Health baseline comparisons (site specific-state levels)

Population group variable	Site specific								Local		County		State	
	Dún Laoghaire-west Central O&M Base		Shankill-Rathsallagh Landfall		Glencullen OSS		Cabinteely-Loughlinstown onshore ECR		Dublin City and suburbs		County Dublin		Ireland	
	No.	%	No.	%	No.	%	No.	%	No	%	No.	%	No.	%
Age structure and population														
Total Population	2,726	100	3,254	100	23,596	100	5,362	100	1,263,219	100	1,458,154	100	5,149,139	100
Aged 0-14 (Children)	381	14	481	14.8	5,488	23.3	1,192	22.2	224,207	17.7	268,943	18.4	1,012,287	19.7
Aged 15-64 (Working age)	1,778	65.2	2,049	63	16,611	70.4	3,828	71.4	866,358	68.6	993,547	68.1	3,360,537	65.3
Aged 65 and over (Older people)	567	20.8	724	22.2	1,497	6.3	342	6.4	172,654	13.7	195,664	13.4	776,315	15.1
General health														
Very good	1,429	52.4	1,647	50.6	15,229	64.5	3,358	62.6	661,766	52.4	770,623	52.8	2,740,994	53.2
Good	862	31.6	1,068	32.8	5,980	25.3	1,481	27.6	356,942	28.3	413,090	28.3	1,527,027	29.7
Fair	283	10.4	364	11.2	1,261	5.3	291	5.4	101,941	8.1	116,257	8.0	444,895	8.6
Bad	53	1.9	75	2.3	184	0.8	32	0.6	18,174	1.4	20,439	1.4	72,556	1.4
Very Bad	13	0.5	25	0.8	32	0.1	8	0.1	4,241	0.3	4,742	0.3	16,843	0.3
Not Stated	86	3.2	75	2.3	910	3.9	192	3.6	120,155	9.5	133,003	9.1	346,824	6.7
Economic status for the population aged over 15 years (principle economic status)														
At work	1,316	56.1	1,361	49.1	12,097	66.8	2,903	69.6	608,252	58.5	698,931	58.8	2,320,297	56.1
Looking for first regular job	20	0.9	25	0.9	133	0.7	37	0.9	9,137	0.9	10,330	0.9	34,526	0.8
Short term unemployed	39	1.7	49	1.8	266	1.5	72	1.7	19,223	1.9	21,889	1.8	70,217	1.7

Population group variable	Site specific								Local		County		State	
	Dún Laoghaire-west Central O&M Base		Shankill-Rathsallagh Landfall		Glencullen OSS		Cabinteely-Loughlinstown onshore ECR		Dublin City and suburbs		County Dublin		Ireland	
	No.	%	No.	%	No.	%	No.	%	No	%	No.	%	No.	%
Long term unemployed	59	2.5	76	2.7	359	2.0	87	2.1	26,914	2.6	30,176	2.5	106,059	2.6
Student	177	7.5	279	10.1	2,401	13.3	453	10.9	118,390	11.4	134,910	11.3	459,275	11.1
Looking after home/family	93	4.0	188	6.8	1,075	5.9	278	6.7	58,555	5.6	68,227	5.7	272,318	6.6
Retired	523	22.3	634	22.9	1,328	7.3	280	6.7	151,526	14.6	171,712	14.4	657,790	15.9
Unable to work due to permanent sickness or disability	102	4.3	142	5.1	386	2.1	50	1.2	40,472	3.9	45,686	3.8	189,308	4.6
Other not in labour force	16	0.7	19	0.7	63	0.3	10	0.2	6,543	0.6	7,350	0.6	27,062	0.7
Highest level of education completed for the population aged over 15 years														
No formal education	28	1.4	65	2.8	136	1.0	20	0.6	16,857	2.0	18,836	2.0	81,280	1.96
Primary education	119	5.9	256	10.9	310	2.2	48	1.5	55,708	6.7	61,625	6.5	251,219	6.07
Lower secondary	175	8.6	372	15.8	848	6.0	144	4.5	86,002	10.3	99,180	10.4	446,007	10.78
Upper secondary	233	11.5	458	19.4	1,794	12.7	380	11.8	130,631	15.7	154,071	16.1	613,478	14.83
Technical or vocational qualification	107	5.3	164	7.0	771	5.4	183	5.7	52,021	6.2	61,361	6.4	253,892	6.14
Advanced certificate/Completed apprenticeship	54	2.7	94	4.0	579	4.1	111	3.4	33,095	4.0	40,157	4.2	190,268	4.60
Higher certificate	87	4.3	123	5.2	778	5.5	201	6.2	39,279	4.7	46,609	4.9	187,488	4.53

Population group variable	Site specific								Local		County		State	
	Dún Laoghaire-west Central O&M Base		Shankill-Rathsallagh Landfall		Glencullen OSS		Cabinteely-Loughlinstown onshore ECR		Dublin City and suburbs		County Dublin		Ireland	
	No.	%	No.	%	No.	%	No.	%	No	%	No.	%	No.	%
Ordinary bachelor degree or national diploma	203	10.0	165	7.0	1,485	10.5	377	11.7	67,134	8.1	78,494	8.2	272,535	6.59
Honours bachelor degree, professional qualification or both	327	16.1	291	12.3	3,123	22.1	746	23.1	131,599	15.8	149,733	15.7	450,523	10.89
Postgraduate diploma or degree	502	24.7	283	12.0	3,418	24.2	824	25.5	133,467	16.0	148,720	15.6	379,416	9.17
Doctorate (Ph.D) or higher	61	3.0	26	1.1	292	2.1	85	2.6	14,531	1.7	15,866	1.7	38,212	0.92
Not stated	137	6.7	61	2.6	613	4.3	114	3.5	72,848	8.7	79,921	8.4	220,311	5.33
Means of travel to work, school, college or childcare														
On Foot	348	19.3	211	10.4	1,792	9.4	191	4.4	159,056	17.6	180,789	17.3	456,291	12.6
Bicycle	110	6.1	48	2.4	686	3.6	108	2.5	61,125	6.8	64,387	6.2	97,212	2.7
Bus, minibus or coach	218	12.1	238	11.7	1,047	5.5	482	11.1	112,900	12.5	127,159	12.2	323,923	9.0
Train, DART5 or LUAS6	296	16.4	339	16.7	3,147	16.5	477	11.0	52,430	5.8	61,401	5.9	85,316	2.4
Motorcycle or scooter	7	0.4	7	0.3	59	0.3	27	0.6	4,656	0.5	5,118	0.5	9,150	0.3
Car Driver	314	17.4	617	30.3	5,570	29.3	1,366	31.6	225,377	25.0	272,279	26.0	1,254,419	34.7

5 Dublin Area Rapid Transit
6 A light rail tram system operating in Dublin

Population group variable	Site specific								Local		County		State	
	Dún Laoghaire-west Central O&M Base		Shankill-Rathsallagh Landfall		Glencullen OSS		Cabinteely-Loughlinstown onshore ECR		Dublin City and suburbs		County Dublin		Ireland	
	No.	%	No.	%	No.	%	No.	%	No	%	No.	%	No.	%
Car passenger	148	8.2	299	14.7	3,387	17.8	910	21.0	102,017	11.3	124,443	11.9	691,044	19.1
Van	22	1.2	55	2.7	277	1.5	48	1.1	17,112	1.9	21,137	2.0	148,823	4.1
Other (incl. lorry)	4	0.2	5	0.2	39	0.2	5	0.1	1,480	0.2	1,837	0.2	14,092	0.4
Work mainly at or from home	273	15.2	161	7.9	2,302	12.1	542	12.5	77,322	8.6	89,359	8.5	266,726	7.4
Not stated	60	3.3	55	2.7	734	3.9	173	4.0	89,003	9.9	98,530	9.4	266,412	7.4
Persons with a disability to a greater extent or less extent as a percentage of the population														
Population with any disability	834	30.6	948	29.1	4,059	17.2	823	15.3	N/A	N/A	N/A	N/A	1,109,557	21.5
Population with a disability to a great extent	365	13.4	395	12.1	1,159	4.9	227	4.2	N/A	N/A	N/A	N/A	407,342	7.9
Population with a disability to some extent	469	17.2	553	17	2,900	12.3	596	11.1	N/A	N/A	N/A	N/A	702,215	13.6
Households with cars														
No motor car	394	36.3	195	17.4	835	11.1	216	11.4	98,052	23.8	103,603	22.0	245,455	14.4
1 motor car	529	48.7	476	42.6	3,385	23.9	955	50.5	181,747	44.1	207,180	43.9	696,979	40.9
2 motor cars	137	12.6	368	32.9	2,663	10.7	606	32.0	107,550	26.1	130,361	27.6	594,716	34.9
3 motor cars	20	1.8	59	5.3	444	0.9	81	4.3	19,210	4.7	23,380	5.0	121,594	7.1
4 or more motor cars	6	0.6	20	1.8	174	0.2	34	1.8	5,615	1.4	7,138	1.5	46,658	2.7

9.7 Defining the sensitivity of the baseline

9.7.1 The sensitivity for the receptors for each potential effect, using the criteria outlined in section 9.5, are presented in section 9.12 to 9.14.

9.8 Uncertainties and technical difficulties encountered

9.8.1 The predominant limitation associated with this human health chapter, is that the baseline data relation to demographics and human health and local residents has been based on desk-top research (secondary data). Whilst this research has provided information on relevant receptors and hard-to-reach groups, it is not possible that all specific cases have been captured. To address this uncertainty, the site-specific locations (EDs) have been selected as those which are most deprived in line with best practice.

9.8.2 Another difficultly/uncertainty is some data sets (e.g. annual income) have not been produced as part of the CSO census data in 2022 for EDs. There is often a lag in the publication of data, meaning the most recent data available may often be one or two years out of date. However, this limitation has not had a material effect on the predictability or accuracy of the impact assessment presented in this chapter. This is because, where a specific dataset is missing, like annual income which was being sought to provide an overview of deprivation, other datasets can be used to show specific health characteristics. In this case, deprivation can also be identified via the Pobal (2022) HP index, social class census data and type of occupation.

9.9 Scope of the assessment

Scoped in

9.9.1 The Human Health impacts described in Table 13 were scoped into the assessment.

Table 13 Human Health Impacts scoped into this assessment

Impact	Potential Human Health impact
Construction	
Impact 1: Noise and vibration (impacts on Human Health)	Environmental noise is defined in the European Communities (Environmental Noise) Regulations, 2018 as amended as 'unwanted or harmful outdoor sound created by human activities, including noise emitted by means of transport, road traffic, rail traffic, air traffic, and from sites of industrial activity'. Population exposure to environmental noise has been linked to adverse health effects. Annoyance and sleep disturbance are the key direct effects on the population. Evidence also suggests that high levels of noise nuisance and vibration caused by traffic and activities associated with construction works can result in indirect effects such as increased aggression, and impaired communication (WHO, 1999).

Impact	Potential Human Health impact
	During the construction phase of the onshore infrastructure, activities such as the construction of the OSS, onshore ECR, and the O&M base have the potential to generate noise and vibration. These impacts could adversely affect human health, particularly in nearby communities and sensitive receptors, through both direct and indirect pathways.
Impact 2: Air quality (impacts on Human Health)	Construction activities associated with the onshore activities have the potential to generate particulates, including dust and exhaust emissions, which may be inhaled by individuals in the vicinity. These emissions can affect air quality and present a potential risk to human health, particularly through exposure to fine particulate matter and other pollutants during activities such as excavation, material transportation, and vehicle operation.
Impact 3: Physical activity	The construction period may temporarily disrupt public footpaths and other public spaces, such as local amenity ground, within the project area. Access to green spaces may be affected due to diversions or restricted entry. However, temporary access arrangements will be implemented to maintain interim connectivity and access where possible. Additionally, construction activities may lead to increased traffic, which could impact safety, connectivity, and accessibility in the affected areas.

Scoped out from further evaluation in this EIAR

9.9.2 Impacts that have been scoped out of this assessment are outlined in Table 14.

Table 14 Impacts scoped out

Impacts scoped out	Justification
General (all phases)	
Offshore elements of Dublin Array	The effects arising from the construction, operation and decommissioning of the Dublin Array offshore infrastructure will be largely concentrated on receptors in the maritime environment such as marine mammals, birds or benthic ecology. Due to the distance between the array area and the nearest human receptors (along the coastline of local authority areas within Dublin, and Wicklow), human health effects will be limited to noise arising from the construction, operation and decommissioning of the wind farm only. The Noise and Vibration (Terrestrial Receptors) chapter assesses these impacts on the nearest noise sensitive receptors and concludes that no significant effects will occur. It is concluded that no human effects will arise as a result of the offshore infrastructure due to the lack of source-pathway-receptor. Human health effects will only arise as a result of the construction, operation and decommissioning of the onshore infrastructure.

Impacts scoped out	Justification
	The proposed location of the offshore infrastructure will be at a minimum distance of approximately 10 km from the coast. This will prevent close range views being experienced by the majority of visual receptors in the study area, with the exception of people at sea. Visual impact is therefore not considered to fall within the scope of the Human Health assessment due to distance between potential onshore receptors and turbines and the geographical extent that it covers.
Electromagnetic Fields (EMFs)	EMFs have been scoped out of the assessment as they are not considered to be significant and to have no-source-pathway-receptor. This is because Dublin Array will not exceed the relevant level of EMF exposure/thresholds identified and is complaint with EirGrid guidance/safety standards, who operate the transmission grid (EirGrid, undated). Several EirGrid recommendations are derived from the International Commission for Non-Ionizing Radiation Protection (ICNIRP) including restricting exposure to 9000 volts per metre and 360 microteslas.
Health impacts due to pests	There are no anticipated nor predicted pathways which will likely result in an increase of pests (such as rodents, insects or other species that may adversely impact human health or wellbeing) as a result of Dublin Array.
Health impacts due to odours	There are no anticipated nor predicted noticeable odours that will arise as a result of Dublin Array.
Employment opportunities during the construction and operational phases and the positive effect this may have on human health	Dublin Array will create jobs during the construction and operational phases. Further details are presented in the Socio-Economics, Tourism, Recreation and Land Use chapter. Whilst these will create opportunities for the local population to secure employment within the renewable energy industry this is not expected to lead to significant health effects given the existing high levels of employment. On this basis the impact is scoped out of the assessment.
Impacts to groundwater and/or water contamination	There are no planned discharges to groundwater or surface during the construction or operation of the onshore infrastructure. As outlined in the Water (Hydrology, Hydrogeology and Flood risk) chapter, and considering the measures set out in the Construction Environmental Management Plan (CEMP), no significant effects on groundwater or water contamination are anticipated. Consequently, human health effects arising from impacts to groundwater and/or surface contamination are not expected.
Impacts from major accidents and disasters	Major accidents and disasters are considered separately within the Major Accidents and Disasters chapter.
Diet and nutrition	Whilst diet and nutrition is listed as a health determinant within IEMA (2022) guidance, this typically applies to residential development and does not apply to offshore wind Projects like Dublin Array. This is because there is no-source-pathway

Impacts scoped out	Justification
	receptor; the project does not involve the delivery of food services or restrict the ability to access healthy foods.
Construction	
Health and safety of construction workers	The health and safety of construction workers will be managed in accordance with the Applicant's policies and procedures, as well as Irish health and safety regulatory requirements. Further consideration of health and safety measures is provided in the Major Accidents and Disasters chapter. These measures will ensure compliance with best practices to mitigate potential risks during the construction phase.
Local road network disruptions, journey times and reduced access to services and amenities during construction	Potential disruptions to the local road network during construction have been addressed through a combination of project design and planned mitigation measures. As detailed in the Socio-economic, Tourism, Recreation and Land Use chapter and the Traffic and Transport chapter, the project has been designed to minimise impacts on sensitive areas, including key transport routes. Additionally, construction traffic management measures are outlined in the CEMP. These measures aim to ensure that the construction phase has minimal effect on road network operations, including access to services and amenities. Consequently, the overall impact on the road network is expected to be negligible, with no significant adverse effects anticipated.
Operations and Maintenance	
Local road network disruptions, journey times and reduced access to services and amenities during operations – impacts on Human Health	There will be no disruption to the local road network during the operation of Dublin Array. This is because once the onshore elements of the project are operational, the number of vehicles likely to travel to the onshore elements of Dublin Array will be significantly lower than that during the construction stage and as such no impacts are predicted nor anticipated.
Air, water, noise and soil emissions impacts during the O&M phase which will lead to human health effects.	No activities during the operational phase of Dublin Array will result in discharges or emissions. Consequently, there are no anticipated impacts on air quality, water or noise, or soil that will affect human health.
Decommissioning	
The decommissioning period has been scoped out of the assessment. It is anticipated that the removal and reinstatement of land use at each of the onshore elements of the Dublin Array will likely have less impacts that the construction period. Nonetheless, the decommissioning methodology will be finalised nearer to the end of the lifetime of the Dublin Array, to be in line with current guidance, policy and legislation. Any such methodology will be agreed with the relevant authorities and statutory consultee.	

9.10 Key parameters for assessment

9.10.1 For each of the impacts 'scoped-in' to the assessment and as described in the preceding section, the relevant design parameter used in assessing the impact are set out in Table 15. For each of the impacts 'scoped-in' to the assessment and as described in the preceding (section 9.9), the relevant design parameter used in assessing the impact are set out in Table 15. For the purpose of environmental assessment, the design parameters that could give rise to the maximum potential adverse impacts, in respect of this receptors, has have been chosen as the design parameter to assess impact against.

Table 15 Key parameters considered for the assessment of effects on human health

Impact	Key parameters assessed	Justification/additional evidence base
Construction		
Impact 1: Noise and vibration (impacts on Human Health)	Core working hours from 07:00 to 19:00 Monday to Friday and 08:00 to 14:00 Saturday. In certain locations there will be a need to undertake works outside normal working hour such as drilling work proposed at the Landfall Site and three trenchless crossings along the onshore ECR. This will be agreed with the DLRCC prior to construction commencing. Noise and vibration effects – as set out in the Noise and Vibration chapter.	Project design details confirmed for the onshore infrastructure – see Project Description chapter. Noise and vibration effects arising as a result of the construction phase as set out in the Noise and Vibration chapter: ▪ Noise impacts from construction activities at Landfall Site, onshore ECR, O&M Base, OSS, and temporary construction compounds; and ▪ Construction vibration impacts from drilling and piling operations and the Landfall Site, and from HDD operations along the onshore ECR.
Impact 2: Air quality (impacts on Human Health)	As per Impact 1 core working hours of 07:00 to 19:00 Monday to Friday and 08:00 to 14:00 Saturday. In certain locations there will be a need to undertake works outside normal working hour such as drilling works proposed at the Landfall Site. This will be agreed with the planning authority prior to construction commencing. Air Quality effects – as set out in the Air Quality chapter.	Project design details confirmed for the onshore infrastructure in the Project Description chapter. Air quality effects arising as a result of the construction phase as set out in the Air Quality chapter: ▪ Fugitive dust generation from construction activities associated with the onshore infrastructure; and ▪ Increased vehicle emissions from traffic associated with Dublin Array.
Impact 3: Physical activity	Proposed construction works which may affect public access and recreation are set out the Socio-economic, Tourism, Recreation and Land Use chapter. Works which may impact on mobility set out in the Traffic and Transport chapter. Several public footpaths, cycle routes and areas of public amenity ground will be affected by construction works. Further details are set out in the Project Description chapter.	Project design details confirmed for the onshore infrastructure – see Project Description chapter. Disruptions to public spaces, public rights of way, and public access during OES construction has the potential to affect physical activity levels, impacting community health.

9.11 Project design features and avoidance and preventative measures

9.11.1 As outlined within Volume 2, Chapter 3: EIA Methodology and in accordance with the EPA Guidelines (2022), this EIAR describes the following:

- Project Design Features: These are features of the Dublin Array project that were selected as part of the iterative design process, which are demonstrated to avoid and prevent potential adverse effects on the environment in relation to physical processes. These are presented within Table 16.
- Other Avoidance and Preventative Measures: These are measures that were identified throughout the early development phase of the Dublin Array project, also to avoid and prevent likely significant effects, which go beyond design features. These measures were incorporated in as constituent elements of the project, they are referenced in the Project Description chapter of this EIAR, and they form part of the project for which development consent is being sought. These measures are distinct from design features and are found within our suite of management plans. These are also presented within Table 16.
- Additional Mitigation: These are measures that were introduced to the Dublin Array project after a likely significant effect was identified during the EIA assessment process. These measures either mitigate against the identified significant adverse effect or reduce the significance of the residual effect on the environment. The assessment of impacts is presented in sections 9.12 to 9.15 of this EIAR chapter

9.11.2 All measures are secured within Volume 8: Schedule of Commitments.

Table 16 Project design features and other avoidance and preventative measures relating to human health

Project design feature/other avoidance and preventative measure	Where secured
Construction	
Careful routing of the onshore ECR and choice of location of the OSS and O&M Base to avoid key areas of sensitivity.	Project Description chapter. Project design outlined in Volume 2, Chapter 5: Consideration of Alternatives.
A CEMP (included at Volume 7) sets out a range of environmental management measures which will be adopted during the construction phase. Measures which are relevant to Human Health include: ▪ Construction Hours Restrictions (to the hours of 07:00 and 19:00 Monday to Friday and 08:00 to 14:00 Saturday); ▪ Inclusion of a Pollution Incident Response Plan;	Project Description chapter. Volume 7, Appendix 8: Construction Environmental Management Plan.

Project design feature/other avoidance and preventative measure	Where secured
▪ A Construction Traffic Management Plan (CTMP) developed for the construction phase; ▪ Adequate security to prevent, where practicable, access to working areas during construction works; ▪ Ensuring that hazardous material used during the construction phase works shall be stored in a safe and secure manner whilst either waiting to be removed from site or waiting to be used; ▪ Ensuring that hazardous material used during the construction phase works shall be stored in a safe and secure manner; and ▪ Provision of temporary alternative paths where Public Right of Ways (PRoWs) are impacted from the development activities.	
Decommissioning	
The decommissioning methodology for the O&M Base will be finalised nearer to the end of the lifetime of the Dublin Array, to be in line with current guidance, policy and legislation at the time. Any such methodology will be agreed with the relevant authorities and statutory consultees.	Volume 7, Appendix 2: Decommissioning and Restoration Plan

9.12 Environmental assessment: Construction phase

9.12.1 This section of the EIAR outlines the impacts on human health that may occur during the construction period of Dublin Array. As discussed in the methodology, in line with IEMA (2022a) guidance, the assessment of human health considers how effects upon the 'general population' and 'vulnerable' group populations separately. This is to ensure the assessment takes account of potential inequalities and any disproportionate effects faced by certain vulnerable groups.

Impact 1: Noise and vibration (construction): impacts on human health

9.12.2 During construction, there is the potential for temporary noise to be generated from the movement of heavy good vehicles across the onshore study areas for the Landfall Site, OSS, O&M Base and onshore ECR works together with general construction works within these areas. The Project Description chapter provides full details of these construction activities, and the Noise and Vibration chapter presents the results of the noise and vibration assessment for the Dublin Array onshore infrastructure.

9.12.3 The population groups who will potentially be affected as a consequence of proximity or other forms of sensitivity include residents, school children, the elderly, people with physical and mental health problems, cyclists, pedestrians, equestrians, public transport users, and people in low income groups, as outlined within paragraphs 9.4.17-9.4.24. As presented in the Noise and Vibration EIAR chapter during certain phases of construction, noise generated from construction activities will be audible at residential receptors within the vicinity of the Dublin Array onshore infrastructure.

9.12.4 The key health outcomes as a determinant of health relevant to noise are:

- Cardiovascular health (only a result of chronic noise effects);
- Mental health (including stress, anxiety, or depression); and
- Cognitive performance in children.

Source-pathway-receptor

9.12.5 The potential for construction noise to have effect is considered likely, as there is a plausible source-pathway-receptor association where:

- The source is categorised as the construction plants/operation base/movement of heavy vehicles;
- The pathway is categorised as pressure waves through the air; and
- Receptors are categorised as the communities of people within residential addressed or within other community facilities.

Magnitude

9.12.6 The magnitude of impact as a result of Dublin Array in terms of construction noise is characterised as low for the reasons set out in Table 17.

Table 17 Determination of magnitude for construction noise

Definition	Justification
Extent	Impacts relating to noise will be localised around: The Landfall Site, where worst-case daytime construction noise and vibration were determined to be Not significant in EIA terms in the Noise and Vibration chapter. The onshore ECR, where worst-case noise effects arising from the construction of the cable (and vibration from HDD operations along the cable) were determined to be Not Significant in EIA terms in the Noise and Vibration Chapter.
Duration	Construction related noise emissions will be intermittent but will last for the full duration of the construction phase: Below is the duration (construction activities) at each location of the project infrastructure (in the case of the onshore ECR this construction time is moving along the route and not aggregate): ▪ Landfall: 24 months. ▪ Onshore ECR: 36 months. ▪ OSS: 39 months. ▪ O&M Base: 30 months.
Frequency	Construction related noise close to particular dwellings or other community receptors will be infrequent, for the same reason above. The Noise and Vibration chapter presents a noise model which assesses the noise impacts predicted to arise at noise sensitive receptors near the construction works. This noise assessment refers to the intermittent nature of the noise emissions.
Probability (how likely is the impact to occur)	Construction noise impacts are likely to occur, but will be infrequent in nature, and will be within the working noise limits for temporary distribution (see source-pathway relationships described in the previous heading, which outlines an effect is probable). Noise impacts are assessed at noise sensitive receptors which are set out in the Noise and Vibration chapter.
Consequence (the degree of change relative to the baseline level and change in character)	There will be a minor change to existing environment, with the noise construction impacts localised to those who live near the onshore elements of Dublin Array. Construction noise impacts will also be reversible once the construction period has concluded.
Overall magnitude	Construction related noise close to particular dwellings or other community receptors will be infrequent and of short duration (being predominantly limited to periods of passing trench work or vehicle traffic). Such receptors are listed earlier in this table within the 'Probability' row. As no significant noise effects are predicted there is no evidence to suggest that there will be changes in the risk of developing a new health condition or of exacerbating an existing condition. Overall, the predicted magnitude of the Impact is predicted to be **Negligible.**

Sensitivity

9.12.7 As outlined in paragraphs 9.4.17-9.4.24, the sensitivity of the general population and vulnerable groups differs with respect to health effects and therefore sensitivity has been determined for both these populations.

9.12.8 Vulnerable groups in relation to construction noise are related to:

- Living close to sources of noise associated with the landfall, onshore ECR, OSS and O&M Base;
- Age (both young people[7] and older people[8]);
- Existing poor health (e.g. Long-term illness);
- Spending more time in affected dwellings (e.g. due to working from home, shift work, low economic activity, or ill health); or
- Vulnerability due to deprivation or health inequalities.

9.12.9 A review of the baseline data presented in the Human Health Baseline Report[9] indicates the local population is varied. For comparison within Dublin City and its suburbs, 80.7% of the population consider themselves to have very good or good health, which is marginally lower than the County Dublin population of 81.3% and the State average of 82.8%. However, each of the selected site-specific locations have a higher percentage of those who considered themselves to have very good or good health; Dún Laoghaire-west Central the proposed O&M Base ranked the lowest which accounted for 84.0% of the population. This infers the local populations have good levels of health.

9.12.10 At the site-specific level, within Dún Laoghaire-west Central (O&M Base) and Shankill-Rathallagh (Landfall Site), 30.6% and 29.1% of the population respectively have a disability which is higher than the state average of 21.0%. This suggests that these populations may be more vulnerable to change. Both these site-specific populations also have a greater population who are unable to work due to permanent sickness/disability, at 4.3% and 5.1% respectively, compared to Dublin City at 3.9%, County Dublin at 3.8%, and the state (4.6%) average. As such, they may be more exposed to noise impacts as they may spend longer periods at home.

7 Whilst IEMA (2022a; 2022b) provides no strict definition of age ranges, CSO (2024a) defines children typically aged 14 yours or younger, with the working aged between 15-64.
8 CSO (2024b) defines older persons typically aged 65 years or more.
9 Baseline data within the Volume 6, Appendix 6.5.9-1: Human Health Baseline Report was derived from CSO (2022) statistics and Pobal (2022) HP deprivation index.

9.12.11 Conversely, the baseline data reveals that Dublin City (and suburbs) has a greater portion of the population at working age (15-64), at 68.6%, compared to County Dublin at 68.1% and the state at 65.3%. These populations are more likely to be absent during the traditional working day and therefore less exposed to the impacts of noise. However, this is not the case for at Dún Laoghaire-west Central (O&M base) and Shankill-Rathallagh (landfall), which have an aging population compared to the county and state averages. In these areas, 20.8% and 22.2% of the population are aged 65+, which is higher than Dublin City at 13.7%, County Dublin at 13.4% and the state at 15.1%. Therefore, they are more likely to spend longer periods at home and be subjected to noise impacts.

9.12.12 In addition, at Dún Laoghaire-west Central (O&M base) and Shankill-Rathallagh (landfall) have a greater percentage of the population who are retired, at 22.3% and 22.9% respectively, compared to Dublin City at 14.6%, County Dublin at 14.4%, and the state at 15.9%. This further suggests that these site-specific populations spend longer periods at home.

9.12.13 Additionally, at the site-specific levels, Glencullen (OSS) and Cabinteely-Loughlinstown (onshore ECR) have a higher percentage of the population who are children aged 0-14 years, at 23.3% and 22.2% respectively, compared to Dublin City at 17.7%, County Dublin at 18.4% and the state at 19.7%. These population are also likely to spend greater periods at home given children typically attend schools for shorter time periods in comparison to working adults who spend greater periods at their place of work.

9.12.14 All of the assessed EDs have a higher percentage of people who work mainly at or from home when compared to the local-state scales, with the exception of Shankill-Rathsallagh (landfall) which accounts for 7.9% of the population. Dún Laoghaire-west Central (O&M base) has the highest percentage of residents who work mainly at or from home, at 15.2%, which is higher than Dublin City at 8.6%, County Dublin at 8.5% and the state at 7.4%.

9.12.15 Deprivation is also associated with health; there is a strong link between poverty and ill health which is evidenced by research (Social Justice Ireland, 2023). When reviewing deprivation, contained within the Human Health Baseline Report, all the site-specific populations have at least above average deprivation levels (i.e. less deprived), with the exception of Shankill-Rathallagh (landfall) which is marginally below average (i.e. more deprived) and therefore suggestive that this population may be greater impacted by construction noise.

9.12.16 In summary, the baseline data indicates that the populations representative of the different onshore infrastructure of Dublin Array (site-specific locations assessed in the baseline) generally have higher levels of health when compared to city-state populations. However, at Dún Laoghaire-west Central (O&M base) and Shankill-Rathallagh (landfall) these populations have an older demographic, long-term illnesses or disabilities, and a higher proportion of retires. This suggests that they are likely to spend longer periods at home, making them more susceptible to noise impacts. In addition, Glencullen (OSS) and Cabinteely-Loughlinstown (onshore ECR have a higher percentage of the population who are children, another group who are likely to spend greater periods at home.

9.12.17 Considering the above, the reasoning for the sensitivity level for the general population and vulnerable groups is set out in Table 18 to Table 25.

Table 18 Determination of sensitivity of the general population to construction noise

General population	Justification
Context	**Adaptability:** The general population have good health levels. **Tolerance:** The general population have good health and are working age, meaning a greater proportion spend less time at home and as such, will be less exposed to the construction noise generated by Dublin Array. **Recoverability:** Once the construction period concludes, the impacts associated with construction noise will cease, and there will be no long-term effects.
Value	As per the approach set out in Section 9.5 all human receptors are considered to be of a high level of importance.
Overall sensitivity	The overall sensitivity of the general population is rated as **High.**

Table 19 Determination of sensitivity of the vulnerable groups to construction noise

Vulnerable groups	Justification
Context	**Adaptability:** Whilst having a high percentage of the population who consider themselves to have very good or good health (as per CSO (2022) census data), populations at site-specific level are also more likely to spend greater periods at home. At a number of site-specific locations, there is a higher percentage of the population classified as disabled or have long-term illness, meaning such groups are more susceptible to noise impacts. The assessed EDs, with the exception of Shankill-Rathsallagh also have a higher percentage of the population who work from or mainly at home and thus greater exposed to noise impacts. **Tolerance:** At the site-specific locations, residents are likely to spend longer periods at home when compared to the general population and as a consequence will be greater exposed to the noise impacts. This is confirmed in the review of the baseline data, whereby the site-specific locations typically have an aging population, young population or due retirement, disability and illness, whereby such health characteristics result in greater periods at home compared to the general population (at the working age who are absent during the working day)

Vulnerable groups	Justification
	Recoverability: Once the construction period is over, impacts associated with construction noise will no longer be presented and have any effects in the long-term.
Value	As per the approach set out in Section 9.5, all human receptors are considered to be of a high level of importance.
Overall sensitivity	The overall receptor sensitivity is **High.**

Significance of effect

9.12.18 In line with IEMA (2022a), the predicted significance level has been informed by the guide questions set out in Table 9.

9.12.19 .The points below provide reasoned conclusions to support how the professional judgement of significance has been reached:

- **Scientific literature:** shows a causal link between chronic noise above certain thresholds and health determinants. The evidence does not indicate a lower threshold at which health effects do not occur;
- **Baseline conditions:** shows that at the site-specific locations, there is a greater percentage of the population who are likely to spend extended periods at home when compared to the county and state averages and therefore greater exposed to noise impacts. At the O&M Base and Landfall Site, this is due to higher levels of disability, higher population who are unable to work due to permanent sickness/disability, an ageing population and higher population who are retired when compared to the local-state averages. At the OSS and onshore ECR, this is due to having a higher percentage of the population who are children and who work from homes when compared to the local- state averages. The O&M base also has higher percentage of the population who work from homes when compared to the local- state average;
- **Health priorities**: Dún Laoghaire-Rathdown County Council adopted the 'Dublin Agglomeration Environmental Noise Action Plan 2018-2023' in December 2018, which has the key objective of to avoid, prevent and reduce, where necessary, on a prioritised basis the harmful effects including annoyance, due to long-term exposure to environmental noise (South Dublin County Council, 2018);
- **Regulatory standards:** No statutory limits with respect to noise will be exceeded as a result of Dublin Array. Reference should be made to the Noise and Vibration chapter and noise model contained therein; and
- **Policy Context:** objective 65 of the NPF promotes the pro-active management of noise to avoid adverse impacts on health.

9.12.20 Overall, the magnitude of the impact has been assessed as **Negligible**, with the maximum sensitivity of the receptors being High sensitivity. Therefore, the significance of effect from changes in construction noise is **Slight Adverse**, which is not significant in EIA terms.

Proposed additional mitigation

9.12.21 No further mitigation is proposed beyond the preventative and avoidance measures set out in section 9.11.

Residual effect assessment

9.12.22 **No significant adverse residual effects** have been predicted in respect of construction noise both on the general population and vulnerable groups.

Impact 2: Air quality (impacts on human health)

9.12.23 During construction, there is the potential for air quality to be temporarily impacted by dust and fine particulate from construction, and emissions from construction vehicles.

9.12.24 The population groups who will potentially be affected as a consequence of proximity or other forms of sensitivity include residents, school children, the elderly, people with physical and mental health problems, cyclists, pedestrians, equestrians, public transport users, and people in low-income groups, as outlined within paragraphs 9.4.17-9.4.24.

9.12.25 With regards to impacts on health, key health outcomes relevant to air quality as a determinant of health are related to:

- Increased risk of cardiovascular diseases (Meo and Suraya, 2015); and
- Asthma exacerbation (Orellano et al. 2017).

Source-pathway-receptor

9.12.26 The potential for changes to air quality to have effect is considered likely, whereby there is a plausible source-pathway-receptor association where:

- The source is categorised as the construction plants/operation base/movement of heavy vehicles;
- The pathway is categorised as pressure waves through the air; and
- Receptors are categorised as the communities of people within residential areas or within other community facilities.

Magnitude

9.12.27 The magnitude of impact as a result of Dublin Array in terms of changes to air quality is characterised as low for the reasons set out in Table 20.

Table 20 Determination of magnitude for changes to air quality during construction

	Justification
Extent	The Dublin Array onshore construction phase has the potential to generate dust and construction vehicle emissions. These will occur immediately adjacent to sensitive receptors. However, adopting the avoidance and preventative measures set out in section 10.9 in the Air Quality chapter, the extent of emissions are expected to be Low.
Duration	Effects that will be intermittent but will last for the full duration of the construction works. In terms of nuisance-type dust effects, these are expected to be occasional and limited and avoidance and preventative measures set out in the Air Quality chapter will ensure that emissions to air are not significant. Below is the duration (construction activities) at each location of the project infrastructure (in the case of the onshore ECR this construction time is moving along the route and not aggregate): ▪ Landfall: 24 months; ▪ Onshore ECR: 36 months ▪ OSS: 39 months; ▪ O&M Base: 30 months.
Frequency	The impact will occur frequently throughout the construction.
Probability (how likely is the impact to occur)	Adopting the avoidance and preventative measures set out in the Air Quality chapter the probability of emissions are expected to be Low.
Consequence (the degree of change relative to the baseline level and change in character)	Adopting the avoidance and preventative measures set out in the Air Quality chapter, the probability of emissions are expected to be Low.
Overall magnitude	The predicted magnitude is rated as **Negligible**.

Sensitivity

9.12.28 Vulnerable groups in relation to air quality are related to:

- Living within/close to area with sources of air pollution (populations near the proposed onshore infrastructure);
- Age (both young people and older people);
- Existing poor health (e.g. long-term illness);
- Spending more time in affected dwellings (e.g. due to working from home, shift work, low economic activity, or ill health); or
- Vulnerability due to deprivation or health inequalities.

9.12.29 As with the baseline data presented for noise, people who reside near the onshore infrastructure elements of Dublin Array and spend longer periods at home, are more likely to be exposed to extended periods of air pollution, when compared to those who are absent during the working day. Taking this into account, the baseline data presented for noise can also be used to determine the sensitivity of general population and vulnerable groups to air pollution, as shown in Table 21 and Table 22.

Table 21 Determination of sensitivity of the general population to air quality during construction

General population	Justification
Context	**Adaptability:** The general population have good health levels and are able to withstand change associated with changes to air quality which will be localised in nature over a short duration and will be within statutory thresholds for health protection. **Tolerance:** The general population have good health and are predominantly at working age, meaning a greater proportion are less likely to be spending long-periods at home during the daytime when the majority of construction work is taking place. As such, they are less likely to be subjected to the air emissions generated by Dublin Array. **Recoverability:** Impacts associated with air quality are reversible and temporary in nature.
Value	As per the approach set out in section 9.5, all human receptors are considered to be of a high level of importance.
Overall sensitivity	The potential sensitivity on the general population is rated as **High.**

Table 22 Determination of sensitivity of the vulnerable groups to poor air quality during construction

Vulnerable groups	Justification
Context	**Adaptability:** Whilst having a high percentage of very good or good health, census data reveals populations at site-specific level are more likely to spend greater periods at home. At a number of site-specific locations (the O&M Base and Landfall), there is a higher percentage of the population classified as disabled or have long-term illness, meaning such groups are more susceptible to changes in Air Quality. The assessed EDs, with the exception of Shankill-Rathsallagh also have a higher percentage of the population who work from or mainly at home and thus greater exposed to air quality impacts. **Tolerance:** At the site-specific locations, residents are likely to spend longer periods at home when compared to the general population and as a consequence will be greater exposed to air pollution. This is due to

Vulnerable groups	Justification
	having an aging population, young population or due retirement, disability and illness. **Recoverability:** Impacts associated with air quality are reversible and temporary in nature.
Value	As per the approach set out in section 9.5, all human receptors are considered to be of a high level of importance
Overall sensitivity	The potential sensitivity on vulnerable groups is rated as **medium**.

Significance of effect

9.12.30 In line with IEMA (2022a), the predicted significance level has been informed by the guide questions set out in Table 9.

9.12.31 . The bullet points below provide reasoned conclusions to support how the professional judgement of significance has been reached:

- **Scientific literature:** As detailed in paragraph 9.12.24, scientific literature shows a causal link between air pollution due to dust, particulate, and various gases (including internal combustion engines) with health impacts on populations. Whilst the literature supports there being thresholds set for health protection purposes; it also acknowledges that for some air pollutants there are non-threshold health effects (i.e. when there is no known exposure threshold level below which adverse health effects may not occur). The assessment has identified population groups that may be particularly sensitive to air quality effects;

- **Baseline conditions**: Shows that at the site-specific locations there is a greater percentage of the population who are likely to spend extended periods at home when compared to the county and state averages and therefore greater exposed to air pollution. At the O&M Base and Landfall Site, this is due to higher levels of disability, higher population who are unable to work due to permanent sickness/disability, an ageing population and higher population who are retired when compared to the local-state averages. At the OSS and onshore ECR, this is due to having a higher percentage of the population who are children and who work from homes when compared to the local- state averages. The O&M base also has higher percentage of the population who work from homes when compared to the local- state average;

- **Health priorities**: The populations who are likely to spend greater periods ay home (old people, young people/children and those with long-term illness/disability) aligns with the priorities of the Dún Laoghaire-west Central Health County Plan 2019-2022, which seeks to support such populations in living active healthy lives;

- **Regulatory standards:** No statutory limits with respect to air quality have been identified to have been exceeded as a result of the Project as demonstrated in the Air Quality chapter. The Air Quality in Ireland 2017 – Indicators of Air Quality (EPA, 2018) noted that Ireland's overall air quality was good and compares favourably with other member states and all the parameters were below the EU limit and target values. However, when compared to the tighter WHO Air Quality Guideline values, Ireland exceeded the WHO Guideline values in 2017 for PM10, O3 and PAH. PM2.5 has been highlighted by the EPA as being predominantly responsible for most of the 1,180 estimated premature deaths. The Air Quality Index for Health (AQIH) map on the EPA website, shows that the current air quality within the proposed development site is classed as 1 – Good; and

- **Policy Context:** within the NPF, National Policy Objective 64 seeks to improve air quality and help prevent people being exposed to unacceptable levels of pollution. The NPF also has the aim to of addressing air quality problems in urban and rural areas through better planning and design.

9.12.32 Overall, the magnitude of the impact has been assessed as **Negligible**, with the maximum sensitivity of the receptors being **High** sensitivity. Therefore, the significance of effect from changes to air quality is **Slight Adverse**, which is not significant in EIA terms.

Proposed additional mitigation

9.12.33 No further mitigation is proposed beyond the preventative and avoidance measures set out in Section 9.11.

Residual effect assessment

9.12.34 **No significant adverse residual effects** have been predicted in respect of air quality both on the general population and vulnerable groups.

Impact 3: Physical activity

9.12.35 During construction, there is the potential for physical activity to be temporarily affected due to the potential for temporary diversions to existing routes including cycle paths and walking paths to facilitate the construction works.

9.12.36 The potential impacts as a result of the onshore construction of Dublin Array will be the severance of the land which reduces the amenity, the disruption of normal activities of the land, the impedance of access to the recreational usage of the land and restrictions to the usage.

9.12.37 The population groups who will potentially be affected as a consequence of proximity or other forms of sensitivity include residents, school children, the elderly, people with physical and mental health problems, cyclists, pedestrians, equestrians, public transport users, and people in low income groups, as outlined within paragraphs 9.4.17-9.4.24. The temporal scope of effects is short term; during the construction period there will be a change in the tranquillity and perceived quality of physical activity opportunities.

9.12.38 The key health outcomes as a determinant of health, determinants as a result of physical activity relate to:

- Physical health conditions (e.g. cardiovascular health); and
- Mental health conditions (e.g. stress, anxiety or depression) associated with levels of physical activity and obesity levels.

Source-pathway-receptor

9.12.39 The potential for there to be an effect on outdoor activities is considered likely. This is because, there is a plausible source-pathway-receptor link between Dublin Array on cycling facilities and walking routes (inclusive of recreational onshore and offshore amenities):

- The source is trenching activity and vehicles/plant operations increasing emissions and disturbance on the public footpaths and cycle ways (including recreational use of open space and coastal waters/beaches);
- The pathway is gases and dust particulates travelling through the air reducing amenity; and
- Receptors are users of the public footpaths and cycle ways, resulting in a lower level of active travel or outdoor recreation.

9.12.40 It should be noted that the potential effect is probable as there are no unusual conditions required for the source-pathway-receptor linkage.

Magnitude

9.12.41 The magnitude of impact as a result of Dublin Array in terms of impacts to physical activity is characterised as low for the reasons set out in Table 23.

Table 23 Determination of magnitude for physical activities during construction

Vulnerable groups	Justification
Extent	Impacts relating to physical activities will be localised in the areas where the onshore infrastructure elements are located through temporary diversions.
Duration	Impacts on physical activity will be temporary in nature during the construction period associated with Dublin Array.
Frequency	Diversions to cycle paths and walking routes will be temporary in nature and will have minimal impact on the distance travelled by users

Vulnerable groups	Justification
Probability (how likely is the impact to occur)	The proposed temporary diversions are unlikely to affect population physical activity levels to the extent of changes in the risk of developing new health conditions or of exacerbating existing conditions.
Consequence (the degree of change relative to the baseline level and change in character)	Any short-term changes in physical activity levels will be localised and unlikely to have a lasting influence on population health and are also reversible.
Overall magnitude	The potential magnitude is rated as **low**

Sensitivity

9.12.42 With regards to impacts on health, determinants as a result to impacts on physical activity are related to:

- Living close to the onshore infrastructure on Dublin Array (populations near the O&M Base and OES);
- People with existing poor health (physical and mental health);
- Children and young people; and
- Older people (particularly those suffering with dementia).

9.12.43 At the site-specific populations, the EDs representative of the O&M Base in Dún Laoghaire-west and Landfall Site in Shankill-Rathallagh have a higher percentage of children aged 0-14, at 14% and 14.8% respectively, compared to Dublin City at 17.7%, the County Dublin average of 18.4% and the state average of 19.7%. In the context of vulnerability, these site-specific locations may be affected, as physical activity is important for children and adolescents in improving cardiorespiratory fitness and reducing the likelihood of developing into inactive adults with long-term life-threatening diseases.

9.12.44 This may particularly be the case for the population representative of the landfall in Shankill-Rathallagh, which is ranked marginally below average in the HP Pobal (2022) deprivation index. Low levels of deprivation may result in greater difficulty/capacity in seeking alternative recreational amenities. This is not the case for site-specific location representative of the O&M base in Dún Laoghaire-west which is marginally above average in terms of deprivation.

9.12.45 In addition, the proposed O&M Base in Dún Laoghaire-west and the proposed landfall proposed at Shankill-Rathallagh both have a higher percentage of the population who are disabled, at 30.6% and 29.1% respectively, compared to the state average of 21.5%. These groups are considered vulnerable as people with disability may be dependent on existing recreational facilities and have less capacity to seek alternatives.

9.12.46 In terms of the EDs representative of the OSS in Glencullen and the onshore ECR at Cabinteely-Loughlinstown, these areas have a higher percentage of older persons aged 65+, at 70.4% and 71.4% respectively, compared to Dublin City at 68.6%, County Dublin at 68.1% and the state at 65.3%. This group is considered vulnerable to changes resulting in a loss of opportunities for physical activity, as such populations may rely on recreational amenities for health benefits to reduce the onset of health problems associated with age. Older people may also be more reliant on public transport modes to access physical activity opportunities which can be impacted via construction activities including the movement of heavy vehicles and associated increased traffic. However, both these populations are regarded as affluent on the Pobal HP Pobal (2022) deprivation index and therefore may have greater capacity to seek alternative physical activity opportunities.

9.12.47 Households with access to motor vehicles can use this means of transport to reach wider physical activity opportunities. In Dublin City and its suburbs, 23.8% of the population have no motor vehicles per household, which is higher when compared to the County Dublin average of 22.0% and the state average of 14.4%. Levels of car ownership are also prevalent within the population's representative of the O&M base in Dún Laoghaire-west Central and the landfall in Shankill-Rathallagh, which equates to 36.3% and 17.4% of these populations respectively.

9.12.48 Considering the above, the reasoning for the sensitivity level for the general population and vulnerable groups is set out in Table 24 and Table 25.

Table 24 Determination of sensitivity of the general population to impacts on physical activity during construction.

General population	Justification
Context	**Adaptability:** The general population has good health levels. However, Shankill-Rathallagh (Landfall Site) is below average in terms of deprivation and therefore, likely to be greater impacted. **Tolerance:** The general population have good health, are of the working age, have means to access alternative opportunities for recreation and less likely to develop new health conditions or have existing health conditions exacerbated as a consequence of Dublin Array. **Recoverability:** Changes to physical health opportunities will be short-term and will be unlikely to have a lasting influence on population health and are also reversible.
Value	In terms of human health, physical activity is considered of high value at the local to national levels. Physical activity in a running theme throughout Project Ireland 2040 NPF including Policy Objective T11: walking and cycling which seeks to secure the development of high quality, fully connected and inclusive walking and cycling networks across the state. Physical health and activity is also a key priority within the Dún Laoghaire-west Central health county plan 2019-2022 which aims to *'improve information provision, raise awareness and advocate for greater access to existing facilities for the whole population.'*
Overall sensitivity	The potential sensitivity on the general population is rated as **low**.

Table 25 Determination of sensitivity of the vulnerable groups to impacts on physical activity during construction.

Vulnerable groups	Justification
Context	**Adaptability:** Whilst having a high percentage of very good or good health, census data reveals populations at site-specific level are either have an ageing or young population and a greater population who are disabled, whom are groups more vulnerable to the loss of physical health opportunities. At the O&M Base and Landfall are higher percentage of the population are children and disabled compared to the city- state averages. At the OSS and onshore ECR, a higher percentage of the population are older people. Additionally, the landfall is ranked marginally below average in the HP Pobal (2022) deprivation index.

Vulnerable groups	Justification
	Tolerance: Specific location representative of the onshore elements of the project have lower levels of car ownership, are more deprived and/or have disability, making it difficult to seek alternative opportunities for recreation and exercise. This is particularly the case for the ED representative of the O&M base (Dún Laoghaire-west Central). **Recoverability:** Changes to physical health opportunities (use of public footpaths, cycleways, recreational uses including open space, coastal waters and beaches) will be short-term and will be unlikely to have a lasting influence on population health and are also reversible.
Value	In terms of human health, physical activity is considered of high value at the local to national levels. Physical activity in a running theme throughout Project Ireland 2040 NPF including Policy Objective T11: walking and cycling which seeks to secure the development of high quality, fully connected and inclusive walking and cycling networks across the state. Physical health and activity are also a key priority within the Dún Laoghaire-west Central health county plan 2019-2022 which aims to *'improve information provision, raise awareness and advocate for greater access to existing facilities for the whole population.'*
Overall sensitivity	The potential sensitivity on vulnerable groups is rated as **high.**

Significance of effect

9.12.49 In line with IEMA (2022a), the decided significance level has been informed by the guide questions set out in Table 9.

9.12.50 The bullet points below provide reasoned conclusions to support how the professional judgement of significance has been reached:

- **Scientific literature:** indicates a strong link between levels of physical activity and physical and mental health outcomes. The evidence also indicates that nearly half of people aged over 60-years may be inactive;
- **Baseline conditions**: shows that at the ED representative of the O&M base and landfall are vulnerable due to having a young population and a higher percentage of persons who are disabled and lower levels of motor ownership which provides a means to access alternative opportunities for recreation and physical activity. The EDs representative of the OSS and onshore ECR are also vulnerable due to having an aging population;

- **Health priorities:** Priority 2 within the Dún Laoghaire-west Central Health County Plan 2019-2022 is related to physical health and activity and aims to improve information provision, raise awareness and advocate for greater access to existing facilities for the whole population;
- **Regulatory standards:** There are no statutory limits with respect to physical activity, however, no significant impacts have been identified within the Socio-economic, Tourism, Recreation and Land Use chapter, and the Traffic and Transport chapter; and
- **Policy Context:** Within the NPF, physical activity is a running theme throughout the document, including National Policy Objective 26 that supports the delivery of public health policy including Healthy Ireland and the National Physical Activity Plan, though integrating such policies, where appropriate and at the applicable scale, with planning policy.

9.12.51 Overall, the magnitude of the impact has been assessed as **Low**, with the maximum sensitivity of the receptors being at a **Low** to **high** sensitivity Therefore, the significance of effect in terms of impacts to physical activity is **Moderate Adverse**, which may be significant in EIA terms.

Proposed additional mitigation

9.12.52 Mitigation relating to physical activity is set out within the Socio-economic, Tourism, Recreation and Land use chapter:

- A CTMP has been prepared alongside the EIAR which sets out the key principles and types of measures to be implemented during construction of the Project; and. Measures include (see the Traffic and Transport chapter for further details):
  - Abnormal load delivery management – prior to the movement of abnormal loads, extensive public awareness is required to allow residents to plan and time their journeys to avoid disruption. The haulage contractor shall remain responsible for obtaining all necessary permits from the relevant road and bridge authorities along the access route. The movement of abnormal loads will be timed to avoid periods of heavy traffic flow to minimise disruption to the public. The appropriate permits will be secured, and escorts appointed. These will be required for the OSS only;
  - Signage – Warning signs will be provided throughout the construction locations. Any on-street signs will be in accordance with requirements of the 'Traffic Signs Manual' and in consultation with the Roads Authority; and
  - TCC Site traffic – traffic visiting the TCC sites will be required to report to the gatehouse/reception to obtain clear instructions. Inductions will be completed, vehicle permits will be issued, and the site rules and emergency procedure will be explained. Heavy Goods Vehicles will be equipped with audible reversing warning with additional visual aids e.g. reversing cameras, mirrors utilised on all

plant. Drivers will ensure that all loads are covered fully to limit the loss of material in transit.

- Where open trenching is proposed, the following will be adopted to minimize disruption and maintain access to footpaths and cycle routes:
  - The road crossings will be completed in two stages maintaining one traffic lane in each direction;
  - Traffic will be controlled through temporary traffic signals;
  - A safe through route will be maintained for pedestrians to avoid the works areas;
  - Advanced signing will be implemented to assist drivers in finding alternative routes; and
  - The works will be staggered so that multiple roads will not be closed at the same time, minimising the potential impact to users of the highway network.

Residual effect assessment

9.12.53 With the measures detailed above, **no significant adverse residual effects** have been predicted in respect of impacts to physical activity to both the general population and vulnerable groups.

9.13 Environmental assessment: Decommissioning phase

9.13.1 The construction, operation and maintenance works associated with the OES will be managed by the Applicant until the end of the proving period and handover of ownership to EirGrid. As the enduring asset owner, EirGrid will become responsible for decommissioning of the transferring assets at the end of their deemed lifetime.

9.13.2 Accordingly, this planning application does not seek permission for decommissioning of the OES. However, for the purpose of enabling a comprehensive environmental impact assessment, we have set out below our recommended approach to decommissioning, should EirGrid choose to decommission any aspect of the OES. This approach is informed by the Applicant's experience of decommissioning onshore substations and onshore export cables on other projects and knowledge of how EirGrid typically do this.

9.13.3 In addition, we have set out below the factors which will inform any decision by EirGrid to decommissioning:

- The baseline environment at the time decommissioning works are carried out;
- Technological developments relating to decommissioning of onshore transmission infrastructure;
- Changes in what is accepted as best practice relating to decommissioning of onshore transmission infrastructure;

- Submissions or recommendations made by interested parties, organisations and other bodies concerned with decommissioning of onshore transmission infrastructure; and
- Any new relevant regulatory requirements.

9.13.4 Further, any decommissioning works must:

- Comply with any decommissioning specific conditions in the Development Consent;
- Ensure that the environmental impacts are consistent or less in scale and magnitude to those predicted in the EIAR, Natura Impact Statement and Water Framework Directive Assessment associated with the Development Consent or any amendment of the Development Consent or any subsequent consent EirGrid might be granted in respect of decommissioning;
- Comply with the relevant health and safety regulations; and
- A decommissioning plan, along with an environmental management plan, should be prepared before any decommissioning works begin. If necessary, an application for consent should be made by Eirgrid, and submitted to the relevant competent authority, in respect of any decommissioning works which require consent. We would expect any such application to involve further environmental assessment and public participation, and for any decision made by the competent authority to be judicially reviewable.

O&M Base

9.13.5 A Decommissioning and Restoration Plan has been included in Volume 7 Appendix 7.2 of the Environmental Impact Assessment Report. As outlined in the Decommissioning and Restoration Plan, the O&M building will be either re-purposed for an alternative use or demolished following the decommissioning of the offshore infrastructure.

9.13.6 Following the decommissioning of the offshore infrastructure the fencing and pontoon will be removed, and the hardstanding area will be taken over by DLRCC for general harbour operations.

9.13.7 Decommissioning activities for the OES and the O&M Base are not anticipated to exceed the construction phase design parameters which have been assessed in section 9.12. Accordingly, it is anticipated that there would be the same level of impact and resulting level of effect and significance (or less) in comparison to the assessment of construction effects set out in section 9.12 of this chapter.

9.14 Environmental assessment: Cumulative effects

Methodology

9.14.1 This section outlines the cumulative impact assessment for human health and takes into account the impacts of Dublin Array alongside other projects or plans.

9.14.2 The cumulative impacts assessment for human health has been undertaken in accordance with the methodology provided in Volume 2, Chapter 4: Cumulative Effects Assessment Methodology, based on the driver, pressure, states, impacts and responses model.

9.14.3 As the Human Health impacts assessed in section 9.12 are all informed by the following EIAR chapters namely: Impact 1 draws upon the Noise and Vibration Assessment; Impact 2: Air Quality Assessment; and Impact 3: Socio-economic Assessment, reference will be made to the corresponding cumulative assessments in those chapters. Accordingly, no projects are scoped into the cumulative assessment in this chapter.

9.15 Interactions of the environmental factors

9.15.1 By the nature of human health, the topic interacts with each of the other onshore topics assessed in this EIAR, due to its direct involvement as a receptor for other impacts.

9.15.2 Further details can be found within Volume 8: Interactions of the Environmental Factors. The interrelated effects assessment considers:

- Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the project (construction, operation and decommissioning); to interact to potentially create a more significant effect on a receptor than if just assessed in isolation in these three key project stages (e.g. subsea noise effects from piling, operational Wind Turbine Generators (WTGs), vessels and decommissioning); and
- Receptor-led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor. Receptor-led effects might be short-term, temporary or transient effects, or incorporate longer term effects.

9.15.3 No lifetime effects will occur at a receptor, as the majority of human health effects will dissipate once the construction phase passes and operational effects will be mitigation by the proposed in the assessment section, such that there are no significant effects.

9.15.4 With regards to receptor-led effects, none have been identified within this chapter and impacts on health receptors are also considered by the chapters below, which interact with human health as a topic:

- Volume 3, Chapter 16: Noise and Vibration (Terrestrial Receptors);
- Volume 3, Chapter 17: Socio-Economics, Tourism, Recreation and Land Use;
- Volume 3, Chapter 18: Climate Change;
- Volume 3, Chapter 19: Major Accidents and Disasters;
- Volume 5, Chapter 10: Air Quality;
- Volume 5, Chapter 3: Land, Soils and Geology;
- Volume 5, Chapter 4: Water (Hydrology, Hydrogeology and Flood Risk);

- Volume 5, Chapter 5: Noise and Vibration; and
- Volume 5, Chapter 6: Traffic and Transport;

9.15.5 In addition, the effects of individual health determinants that have been assessed within this EIAR, have the potential to be experienced by the same populations and as a consequence result in additive or synergistic effects. A small number of individuals may have multiple vulnerabilities like age and disability which is categorised as intersectionality and consequently experience greater changes to health outcomes. However, they are not expected to be widespread in relation to their overlap with Dublin Array's activities to result in likely significant impacts at the population level.

9.16 Transboundary statement

9.16.1 There are no transboundary effects with regards to human health as the Dublin Array onshore area is within the Republic of Ireland and near any international boundaries.

9.17 Summary of effects

9.17.1 Overall, following an assessment of potential health effects, during the construction and operational phases of Dublin Array, it is concluded that there will be no significant effects on physical or mental health. The results of this EIAR assessment are summarised

Table 26 Summary of human health effects

Description of effect	Effect	Possible mitigation measures	Residual effect
Construction			
Impact 1: Noise	Slight adverse	N/A / contained with a different technical chapter	No significant adverse residual effect
Impact 2: Air Quality	Slight adverse	N/A / contained with a different technical chapter	No significant adverse residual effect
Impact 3: Physical Activity	Moderate adverse	N/A / contained with a different technical chapter	No significant adverse residual effect
Cumulative effects			
N/A			
Transboundary			
N/A			

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