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**RWE Renewables UK Dogger Bank
South (West) Limited**

**RWE Renewables UK Dogger Bank
South (East) Limited**

**Dogger Bank South Offshore
Wind Farms**

Environmental Statement

Volume 7

Chapter 27 - Human Health

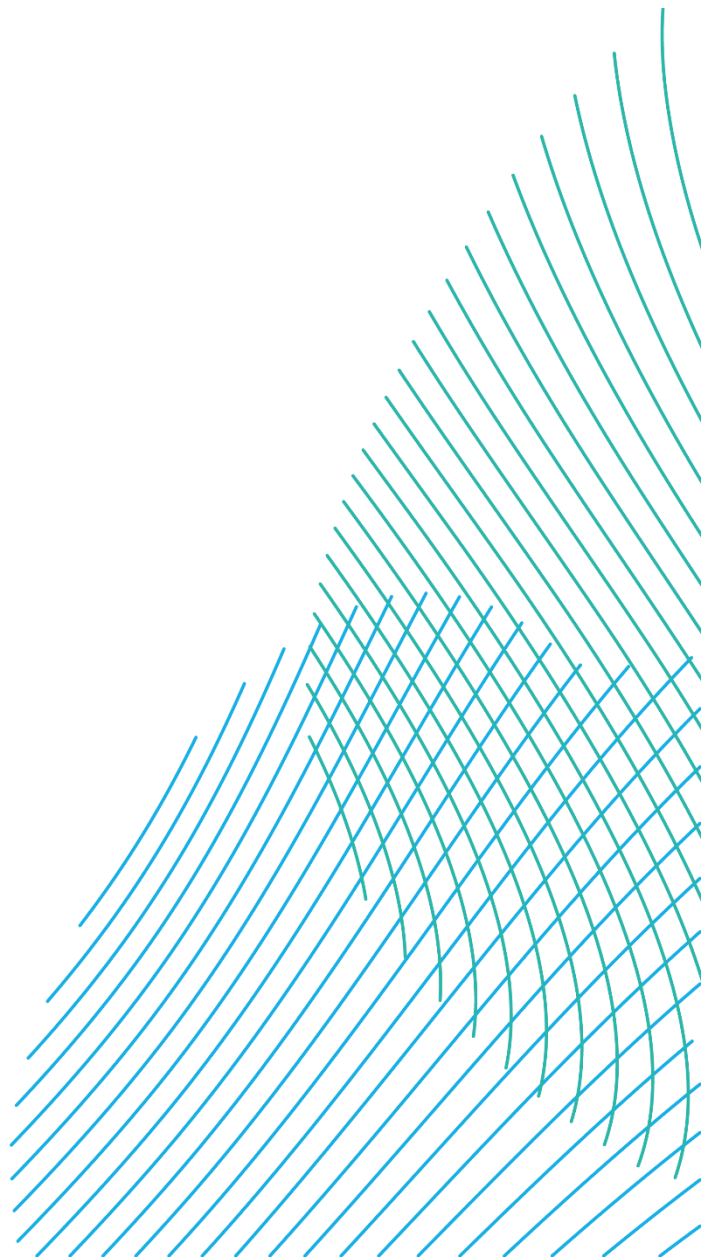
June 2024

Application Reference: 7.27

APFP Regulation: 5(2)(a)

Revision: 01

Unrestricted



Company:	RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited	Asset:	Development
Project:	Dogger Bank South Offshore Wind Farms	Sub Project/Package:	Consents
Document Title or Description:	Environmental Statement – Chapter 27 – Human Health		
Document Number:	005114700-01	Contractor Reference Number:	PC2340-RHD-XX-ZZ-RP-Z-0110

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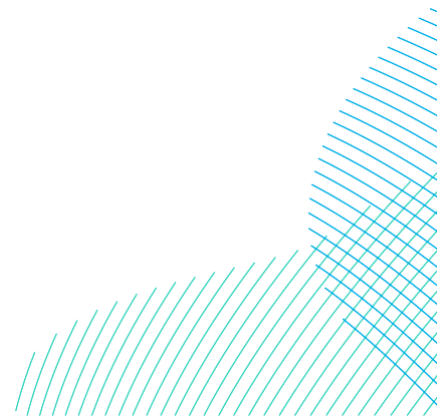
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01	June 2024	Final for DCO Submission	RPS	RWE	RWE



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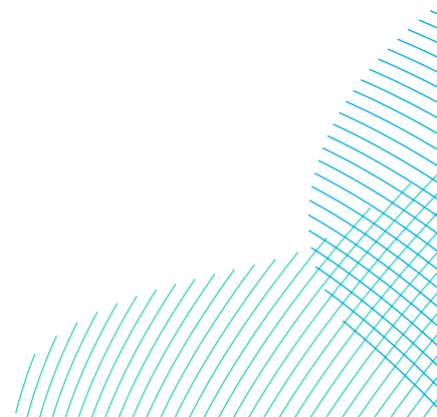
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Figure 27-1 Health Study Area

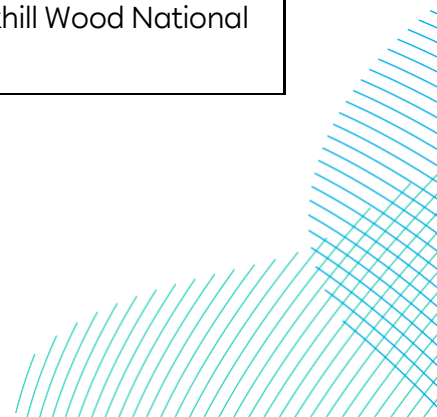
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Appendix 27-1 Consultation Responses

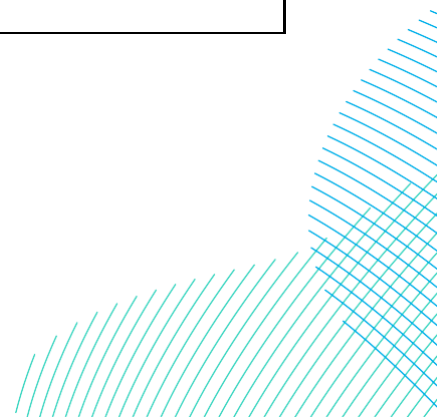


Glossary

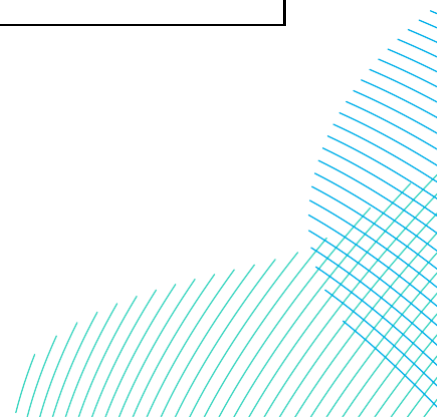
Term	Definition
Array Areas	The DBS East and DBS West offshore Array Areas, where the wind turbines, offshore platforms and array cables would be located. The Array Areas do not include the Offshore Export Cable Corridor or the Inter-Platform Cable Corridor within which no wind turbines are proposed. Each area is referred to separately as an Array Area.
Concurrent Scenario	A potential construction scenario for the Projects where DBS East and DBS West are both constructed at the same time.
Development Scenario	Description of how the DBS East and / or DBS West Projects would be constructed either in isolation, sequentially or concurrently.
Health	State of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity.
Health outcome	Change in health status of an individual, group or population attributable to a planned intervention or series of interventions, regardless of whether such an intervention was intended to change health status.
Health risk factor	A social, economic or biological status, or behaviours or environments which are associated with or that cause increased susceptibility to a specific disease, ill health or injury.
Horizontal Directional Drilling (HDD)	HDD is a trenchless technique to bring the offshore cables ashore at the landfall and can be used for crossing other obstacles such as roads, railways and watercourses onshore.
In Isolation Scenario	A potential construction scenario for one Project which includes either the DBS East or DBS West array, associated offshore and onshore cabling and only the eastern Onshore Converter Station within the Onshore Substation Zone and only the northern route of the onward cable route to the proposed Birkhill Wood National Grid Substation.



Term	Definition
Landfall	The point on the coastline at which the Offshore Export Cables are brought onshore, connecting to the onshore cables at the Transition Joint Bay (TJB) above mean high water.
Landfall Zone	The generic term applied to the entire landfall area between Mean Low Water Spring (MLWS) and the Transition Joint Bays (TJBs) inclusive of all construction works, including the landfall compounds, Onshore Export Cable Corridor and intertidal working area including the Offshore Export Cables.
Likely health effect	This effect is one that, with reference to the scientific literature, shows a plausible theoretical link between source-pathway-receptor; and the occurrence of which is judged as probable, in a specific context.
Mental health	State in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community.
Offshore Development Area	The Offshore Development Area for ES encompasses both the DBS East and West Array Areas, the Inter-Platform Cable Corridor, the Offshore Export Cable Corridor, plus the associated Construction Buffer Zones.
Onshore Converter Stations	A compound containing electrical equipment required to transform HVDC and stabilise electricity generated by the Projects so that it can be connected to the electricity transmission network as HVAC. There will be one Onshore Converter Station for each Project.
Onshore Development Area	The Onshore Development Area for ES is the boundary within which all onshore infrastructure required for the Projects would be located including Landfall Zone, Onshore Export Cable Corridor, accesses, Temporary Construction Compounds and Onshore Converter Stations.



Term	Definition
Onshore Export Cables Corridor	This is the area which includes cable trenches, haul roads, spoil storage areas, and limits of deviation for micro-siting. For assessment purposes, the cable corridor does not include the Onshore Converter Stations, Transition Joint Bays or temporary access routes; but includes Temporary Construction Compounds (purely for the cable route).
Onshore Export Cables	Onshore Export Cables take the electric from the Transition Joint Bay to the Onshore Converter Stations.
Onshore Substation Zone	Parcel of land within the Onshore Development Area where the Onshore Converter Station infrastructure (including the haul roads, Temporary Construction Compounds and associated cable routeing) would be located.
Population health	The health outcomes of a group of individuals, including the distribution of such outcomes within the group.
Sequential Scenario	A potential construction scenario for the Projects where DBS East and DBS West are constructed with a lag between the commencement of construction activities. Either Project could be built first.
Significant health effect	An effect triggered by the Projects that is judged to be important for public health (a positive or negative effect), highly desirable for public health (a positive effect) or unacceptable for public health (a negative effect).
The Applicant	The Applicants for the Projects are RWE Renewables UK Dogger Bank South (East) Limited and RWE Renewables UK Dogger Bank South (West) Limited. The Applicants are themselves jointly owned by the RWE Group of companies (51% stake) and Masdar (49% stake).
The Projects	DBS East and DBS West (collectively referred to as the Dogger Bank South offshore wind farms).

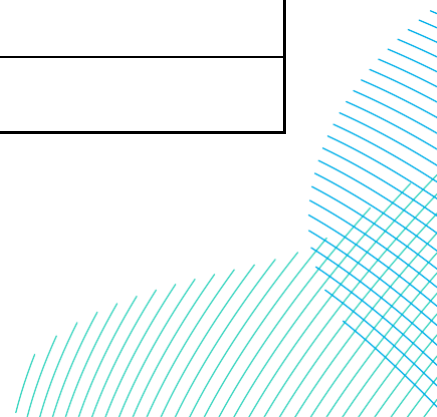


Term	Definition
Vulnerable groups or subpopulations	Sensitive to changes in health determinant in a given context. Can include groups such as ethnic minorities, people with disabilities, people who are homeless, people living in poverty, those struggling with addiction and substance abuse, and isolated older people.
Wider determinants of health	Biological, behavioural, socio-economic, cultural or environmental factors which contribute to the health status of individuals or populations.

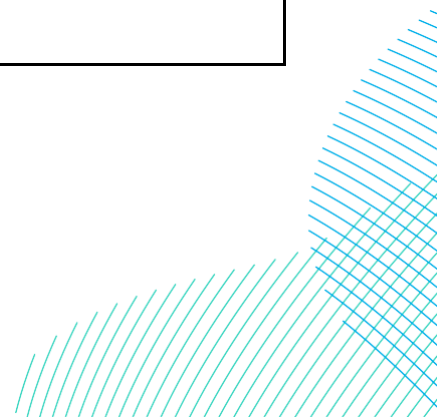


Acronyms

Term	Definition
CEA	Cumulative Effect Assessment
CoCP	Code of Construction Practice
COPD	Chronic Obstructive Pulmonary Disease
DBS	Dogger Bank South
DCO	Development Consent Order
dDPH	Deputy Director of Public Health
EEA	European Economic Area
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMF	Electro-magnetic field
ES	Environmental Statement
EUPHA	European Public Health Association
HDD	Horizontal Directional Drilling
HIA	Health Impact Assessment
HVDC	High Voltage Direct Current
IAIA	International Association for Impact Assessment
ICNIRP	International Commission on Non-ionizing Radiation Protection
IEMA	Institute of Environmental Management and Assessment
IPH	Institute of Public Health
IPMP	In-Principle Monitoring Plan



Term	Definition
JSNA	Joint Strategic Needs Assessment
KSI	Killed and Seriously Injured
LSOA	Lower layer Super Output Area
MHCLG	Ministry for Housing, Communities and Local Government
NEET	Not in education, employment or training
NHS	National Health Service
NO ₂	Nitrogen dioxide
NOMIS	National Online Manpower Information System
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Planning
OCTMP	Outline Construction Traffic Management Plan
OEP	The Office for Environmental Protection
OHID	Office for Health Improvement and Disparities
ONS	Office for National Statistics
PEIR	Preliminary Environmental Information Report
PHE	Public Health England
PM	Particulate Matter
PRoW	Public Right of Way
SAR	Standardised Admission Ratios
SMR	Standardised Mortality Ratio



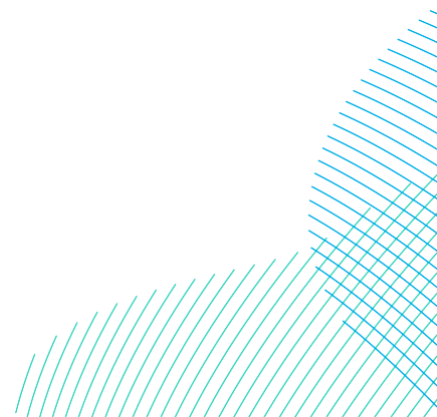
Term	Definition
SSC	Suspended Sediment Concentrations
UKHSA	United Kingdom Health Security Agency
WFD	Water Framework Directive
WHO	World Health Organisation



27 Human Health

27.1 Introduction

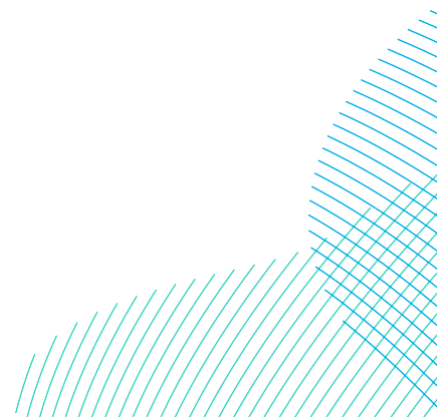
1. This chapter of the Environmental Statement (ES) considers the likely significant effects of the Projects on human health. The chapter provides an overview of the existing environment for the proposed Onshore and Offshore Development Areas, followed by an assessment of likely significant effects for the construction, operation, and decommissioning phases of the Projects.
2. This chapter should be read in conjunction with the following linked chapters:
 - **Volume 7, Chapter 8 Marine Physical Environment (application ref: 7.8);**
 - **Volume 7, Chapter 13 Commercial Fisheries (application ref: 7.13);**
 - **Volume 7, Chapter 14 Shipping and Navigation (application ref: 7.14);**
 - **Volume 7, Chapter 16 Infrastructure and Other Users (application ref: 7.16);**
 - **Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19);**
 - **Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20);**
 - **Volume 7, Chapter 21 Land Use (application ref: 7.21);**
 - **Volume 7, Chapter 23 Landscape and Visual Impact Assessment (application ref: 7.23);**
 - **Volume 7, Chapter 24 Traffic and Transport (application ref: 7.24);**
 - **Volume 7, Chapter 25 Noise (application ref: 7.25);**
 - **Volume 7, Chapter 26 Air Quality (application ref: 7.26);**
 - **Volume 7, Chapter 28 Socio-economics (application ref: 7.28);**
 - **Volume 7, Chapter 29 Tourism and Recreation (application ref: 7.29);** and
 - **Volume 7, Chapter 30 Climate Change (application ref: 7.30).**



3. This chapter does not seek to repeat text or replicate data from these inter-related technical disciplines. The health assessment takes as its input the residual effect conclusions of these other topic chapters. In this regard the health assessment relies on the mitigation measures set out in those chapters and does not repeat them. This avoids duplication and keeps the health assessment proportionate.
4. In this chapter the terms human health, health and wellbeing are used interchangeably. Key definitions are set out in the glossary.
5. Health in Environmental Impact Assessment (EIA) takes a public health approach, meaning it reaches conclusions on the health outcomes to defined populations, rather than the health outcomes of individuals. The guidance that explains that this is the correct approach is set out in section 27.4.1.
6. The chapter also assesses the cumulative effects of the Projects on human health.
7. The chapter follows guidance and good practice, giving the public health perspective of impacts. In so doing, the chapter:
 - Takes a population health approach to assessing physical and mental health outcomes;
 - Considers the wider determinants of health, that may be significantly affected directly or indirectly;
 - Having regard to the context of coastal community health needs;
 - Assesses the potential for health inequalities to vulnerable groups; and
 - Considers opportunities to improve population health.

27.2 Consultation

8. Consultation with regard to human health has been undertaken in line with the general process described in **Volume 7, Chapter 7 Consultation (application ref: 7.7)** and the **Consultation Report (Volume 5, application ref: 5.1)**. The key elements to date include EIA Scoping, formal consultation on the Preliminary Environmental Information Report (PEIR) under section 42 of the Planning Act 2008 and the ongoing Evidence Plan Process (EPP) via the Human Health Expert Topic Group (ETG).

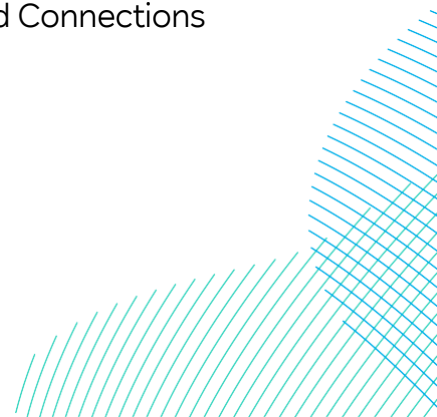


9. The feedback received throughout this process has been considered in preparing the ES. This chapter has been updated following consultation in order to produce the final assessment submitted within the Development Consent Order (DCO) application. **Volume 7, Appendix 27-1 (application ref: 7.27.27.1)** provides a summary of the consultation responses received to date of relevance to this topic, and details how the comments have been addressed within this chapter.
10. The key elements of consultation to date have included:
 - Scoping Opinion response, including from statutory health stakeholders the UK Health Security Agency (UKHSA) and the Department of Health and Social Care Office for Health Improvement and Disparities (OHID), who agreed with the health baseline approach; that appropriate data sources and health standards have been identified; that appropriate determinants of health and population groups have been identified; that the proposed approach is appropriate; and that electro-magnetic fields (EMF) impacts can be scoped out of the assessment based on compliance with extant guidance and regulations.
 - A further meeting with the Human Health ETG including UKHSA, OHID and the deputy Director of Public Health at East Riding of Yorkshire Council agreed in principle the health assessment methodology, study area and scope, as set out in the PEIR health assessment. These are unchanged in this ES.

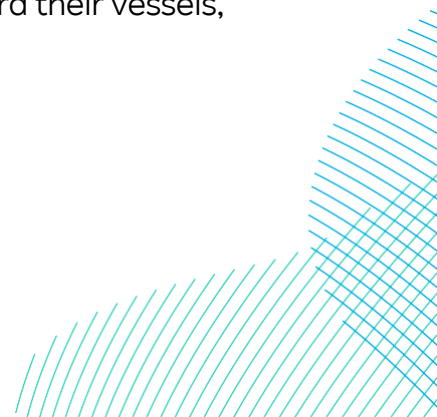
27.3 Scope

27.3.1 Effects Scoped In and Scoped Out

11. The scope of the human health assessment is set out in the Scoping Opinion issued by the Planning Inspectorate, the key points of which are summarised in **Volume 7, Appendix 23-1 (application ref: 7.23.23.1)**. A full description of the effects scoped in and out of the health assessment is presented in the Environmental Impact Assessment Scoping Report (see **Appendix B9 and B10 (Volume 5, application ref: 5.3)**).
12. The following issues are scoped in for assessment in section 27.6:
 - Construction and Decommissioning
 - Health Related Behaviours: Physical Activity, Open Space and Leisure
 - Social Environment: Transport Modes, Access and Connections
 - Bio-Physical Environment: Air Quality
 - Bio-Physical Environment: Water



- Bio-Physical Environment: Soil Contamination
 - Bio-Physical Environment: Noise Disturbance
 - Economic Environment: Workforce Upskilling
 - Economic Environment: Employment and Investment
 - Operations
 - Bio-Physical Environment: Noise Disturbance
 - Bio-Physical Environment: Public Concern and Understanding of Electro-Magnetic Field Risks
 - Bio-Physical Environment: Climate Change
 - Economic Environment: Workforce Upskilling
 - Economic Environment: Employment and Investment
 - Wider Social Infrastructure and Resources
13. Effects which are not considered to have the potential for 'likely significant population health effects' have been scoped out of the assessment. This is in line with a proportionate assessment as set out in guidance (Pyper, Lamming, et al., 2022). A summary of the effects scoped out is presented below:
- Health promotion within the Projects' workforces will be considered as a good practice enhancement measure but is otherwise scoped out.
 - Issues of community health behaviours being detrimentally affected construction workforce is scoped out based on the expectation of a relatively small onshore workforce, expected to be mainly from the regional area.
 - The issue of communicable illness are scoped out, as the Projects will operate appropriate measures to safeguard the project workforce and the public in line with Government guidance of the day, including in relation to vessel crews.
 - Effects on population diet are scoped out as any loss of farmland, or its reduced access or compaction, that reduces productivity are not expected to be on a scale to have the potential to affect population health through changes in the availability or price of healthy foods.
 - Housing related issues are scoped out as no new housing is proposed as part of the Projects. A high proportion of the workforce is expected to be resident in the regional area, or would be based aboard their vessels, unless traveling to their usual place of residence.



- The potential for the Projects to affect existing features of the built environment that are supportive of population health is scoped out. The Projects would have a relatively low impact, including due to the use of trenchless techniques to avoid surface disruption at sensitive features, such as road crossings.
- Other transport issues besides issues on public rights of way and cycle routes are scoped out due to the use of trenchless techniques at road crossings, there is limited potential for transport disruption associated with the export cable corridor. There are no significant effects in relation to road safety and driver delay anticipated in **Volume 7, Chapter 24 Traffic and Transport (application ref: 7.24)**.
- Issues of community safety are scoped out. There are not anticipated to be community safety or security issues associated with worker behaviour in ports or communities. The Projects would operate appropriate safeguarding and modern slavery policies.
- Changes in community identity are scoped out. Demographic changes that could affect community identity are not anticipated, as there would not be a large in-migration or out-migration of workers to local communities. Visual impacts of the Projects are expected to be limited, due to the offshore distance of the wind turbines. Onshore infrastructure, including the Transition Joint Bay at landfall and the Onshore Converter Station(s), is not expected to be of a scale of visual impact that could affect population health outcomes. Transient effects along the export cable corridor, including due to temporary lighting and temporary changes in views, are not expected to influence community identity or disrupt community gatherings.
- The potential to adversely affect access to schools is limited by the use of trenchless techniques in sensitive locations. A large influx for workers, including those bringing families, is not expected, so changes to educational capacity or quality are unlikely.
- The Projects will operate appropriate equality policies but is not expected to influence how employment affects family structures and relationships in local populations. Occupational working conditions in the onshore and offshore construction industry include particular risks. The Projects will operate appropriate health and safety policies. There are not differences from industry norms that would affect population health.
- Offshore air quality effects and operational onshore air quality effects are scoped out. Whilst onshore air quality effects are scoped in for the

construction phase in relation to dust effects from construction activities and Temporary Construction Compounds, as well as vehicle emissions from construction traffic, the following matters are scoped out;

- The offshore air quality effects on all phases to human health are scoped out on the basis that there is no pathway for a significant impact to human health receptors as there would be a relatively small number of vessels utilised as part of the Projects; there would be considerable distances to receptors.
- Operational onshore air quality effects to population health are scoped out. This reflects limited onshore maintenance requirements. As noted in **Volume 7, Appendix 26-1 (application ref: 7.26.26.1)**, the local air quality impact due to back-up generators would be short-term and unlikely to result in significant air quality impacts, as their operation would be very infrequent. Such temporary and occasional air quality emissions are scoped out of the health assessment as they do not have potential for significant population health effects.
- Whilst onshore and nearshore water quality effects are scoped in for the construction phase in relation to other impacts; drinking water infrastructure is scoped-out on the basis that disruption of the existing water utilities network would be avoided, including through diversions if appropriate. Agreement would be sought with water infrastructure asset owners for any diversions, as required.
- Whilst soil contamination is scoped in, in relation to other impacts, the following matters are scoped out:
 - Ground condition and soil effects are scoped out on the basis that risks of pollutant mobilisation, including direct exposure and food contamination are highly likely to be addressed by standard good practice mitigation measures as discussed in **Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19)**. Chapter 19 concludes that there would not be significant adverse effects in relation to contaminated soils and groundwater exposure for the workforce, landowners, land users or neighbouring land users.
- Whilst nearshore and onshore changes in noise and vibration exposure during construction and operations and maintenance are scoped in, the offshore airborne noise effects to human health are scoped out for all phases. Port activities would generate noise but are not expected to be

of a scale, timing or character that differs from existing operational port levels.

- Offshore EMF effects are scoped out. Offshore electrical infrastructure, including offshore substations, are not located in proximity to people. Relevant occupational safeguards would be followed. No EMF risk is therefore likely for offshore aspects of the Projects.
- For onshore electrical infrastructure, the 'actual EMF' risks are scoped out on the basis that the Projects would adopt the International Commission on Non-ionizing Radiation Protection (ICNIRP) guidelines (ICNIRP, 1998) and Government voluntary Code of Practice on EMF public exposure (Department for Energy and Climate Change, 2012). This is referenced within the **Commitments Register (Volume 8, application ref: 8.6)**.
- Transboundary effects in relation to health are not expected. Port activities within another jurisdiction, if required, would be expected to operate within their consented levels of activity. Any international supply chain would be expected to operate appropriate policies that safeguard against significant population challenges to equality, health and safety, for both workers and, as appropriate, the public.
- Effects on health and social care services are scoped out. The project workforce is assumed to include a high proportion of people who are resident in the regional area with NHS entitlement. Workers away from their usual place of residence for a prolonged period would be able to register with local primary healthcare on a temporary basis. This would facilitate NHS funding for their care. Any multinational workers are assumed to have appropriate healthcare insurances. The Projects will operate appropriate occupation health services. It is not expected that a high proportion of workers would move to the area with dependants requiring social care. Dental and health protection measures such as screening and immunisations are expected to continue from the workers' usual place of residence.
- Preparedness for emergency scenarios, for example in relation to offshore shipping and port storage/loading, is scoped out of the health assessment as it is covered in other permitting and risk management processes. This is in line with guidance (Pyper, Lamming, et al., 2022, para. 5.5) and proportionate assessment. Relevant occupational practices and emergency planning procedures would be required by law. Further details of measures that will be taken to respond to emergency

scenarios arising from major accidents and disasters are provided in **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)**.

27.3.2 Study Area

14. The human health study area has been defined on the basis of relevant human populations that may be affected directly or indirectly by the Projects.
15. Consistent with IEMA 2022 guidance (Pyper, Lamming, et al., 2022), the health chapter uses study areas to determine the sensitivity of the populations in the areas, not set a limit on the extent of all health effects. This reflects that health study areas do not necessarily define the boundaries of all potential health effects, particularly mental health effects. The health study areas represent the locations that would drive any likely significant population health effect, i.e., where the great majority of the impact is anticipated to occur. Any effects beyond the study areas would not change the conclusions reached in relation to the likely significant population health effects of the Projects.
16. In setting the study area, it is relevant context that the Array Areas are located in the southern North Sea. The DBS East array boundary lies approximately 122km from shore and the DBS West boundary is approximately 100km from shore at their closest points (Flamborough Head). The study area therefore reflects relevant indirect effects to onshore populations from the Array Areas and direct effects to onshore populations from the nearshore works at the landfall, Onshore Export Cable Corridor and Onshore Converter Stations.
17. The following study areas are used in the health assessment to indicate the relevant population and the expected maximum extent of any likely significant effects (**Volume 7, Figure 27-1 (application 7.27.1)**):
 - The site specific population is defined using the wards of:
 - **E05001695** East Wolds and Coastal and **E05001703** North Holderness (for landfall);
 - **E05001687** Beverley Rural and **E05001701** Mid Holderness (for the Onshore Export Cable Corridor); and
 - **E05001693** Dale, **E05001705** St Mary's and **E05001702** Minster and Woodmansey (for the Onshore Substation Zone).
 - The local population is defined using the local authority area of **East Riding of Yorkshire**.
 - The regional population is defined using the area of **Yorkshire and Humber** (including the city of Hull).

- The national population is defined with reference to **England**, and the wider UK as relevant.
 - The international population is defined with reference to global effects relevant to climate change.
18. The site-specific wards and lower layer super output areas (LSOA) have been selected to reflect the relevant geographic locations, but also the more deprived areas to ensure potential inequalities are reflected.
 19. The local study area for human health focuses on the local authority area of East Riding of Yorkshire, as the location of the Onshore Development Area and all onshore activities. As appropriate consideration is also given to effects to City of Hull, North East Lincolnshire and North Lincolnshire, for example in relation to wider transport effects, including associated air quality and noise impacts.
 20. The local (East Riding of Yorkshire) and regional (Yorkshire and Humber) study areas reflect a broad area onshore from which the project workforces are likely to be drawn (aligning with **Volume 7, Chapter 28 Socio-economics (application ref: 7.28)**), as well as the more localised effects of the Landfall Zone, Onshore Export Cable Corridor and Onshore Converter Stations locations in East Riding of Yorkshire. These are also the areas with the closest community populations for offshore influences on determinants of health, such as those related to fishing and nearshore leisure activities. The study area does not extend to port related activities and associated port transport.
 21. The health assessment also has regard to the zones of influence defined by other topic chapters. Those zones of influence are relevant and inform the health assessment's consideration of effect magnitude.

27.3.3 Realistic Worst Case Scenario

27.3.3.1 General Approach

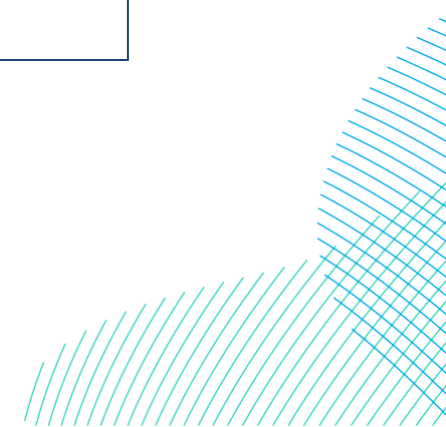
22. The health assessment does not duplicate all the realistic worst case design parameters described in the inter-related topic chapters as set out in section 27.1. Key parameters are noted.
23. The realistic worst case design parameters for likely significant effects scoped into the ES for the health assessment are summarised in **Table 27-1**. These are based on the project parameters described in **Volume 7, Chapter 5 Project Description (application ref: 7.5)**, which provides further details regarding specific activities and their durations.

24. In addition to the design parameters set out in **Table 27-1**, consideration is also given to the different Development Scenarios still under consideration and the possible phasing of the construction as set out in sections 27.3.3.2 to 27.3.3.4.

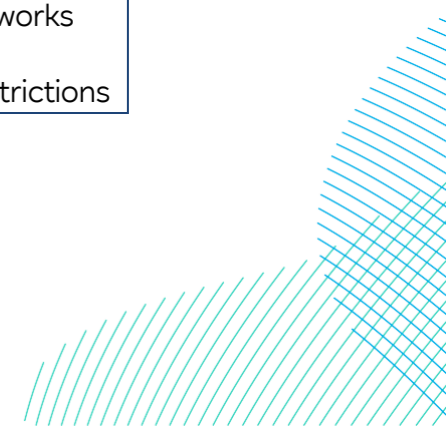


Table 27-1 Realistic Worst Case Maximum Design Parameters

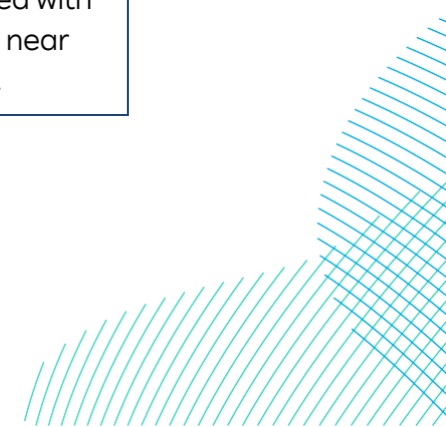
	Parameter			Notes and rationale
	DBS East or DBS West In Isolation	DBS East and DBS West Concurrently	DBS East and DBS West Sequentially	
Construction				
Intertidal Zone	<ul style="list-style-type: none"> A trenchless solution is to be used to install ducts that will house the cables under the beach. The ducts will run from the Transition Joint Bay (TJB), located landward of landfall, to an exit location which may be at an intertidal location (“short trenchless landfall”) or further offshore (“long trenchless landfall”). Duct extensions may be required to enable the landfall HDD ducts to be extended further offshore to facilitate cable installation from an installation vessel situated offshore. Exit pits would be located at each HDD exit location, approximately 20m x 10m per trenchless landfall exit. 			<p>Relevant to:</p> <ul style="list-style-type: none"> Beach closures or restricted access. Disruption / disturbance of recreation and leisure opportunity. Risk of reduced water quality. <p>Worst case is greatest number of trenchless crossings (concurrent and sequential) and longest duration of works (sequential).</p> <p>The concurrent and Sequential Scenarios will involve a greater extent of construction works. The Sequential Scenario will result in the longest duration. Therefore, the DBS East and DBS West Sequential Scenario is considered worst case and assessed in this Chapter.</p>
	<ul style="list-style-type: none"> For a short trenchless landfall there would be up to 3 exit pits in the intertidal zone Number of support vessels: 2 Number of pontoons: 1 Pontoon working area (m): 12x50 Dimensions of exit pits (m): 20x10 per trenchless crossing exit Number of trenchless crossing exits: 3 Dimensions for offshore cable extents – 20m offshore cable disturbance per cable Exit pits would be temporary Vehicle access on the beach but not accessed from the landward side There would be no permanent infrastructure in the intertidal Duration of works in the intertidal zone (months): 18 (not continuous) 	<ul style="list-style-type: none"> For a short trenchless landfall there would be up to 6 exit pits in the intertidal zone Number of support vessels: 2 Number of pontoons: 1 Pontoon working area (m): 12x50 Dimensions of exit pits (m): 20x10 per trenchless crossing exit Number of trenchless crossing exits: 6 Dimensions for offshore cable extents – 20m offshore cable disturbance per cable Exit pits would be temporary Vehicle access on the beach but not accessed from the landward side There would be no permanent infrastructure in the intertidal Duration of works in the intertidal zone (months): 18 (not continuous) 	<ul style="list-style-type: none"> For a short trenchless landfall there would be up to 6 exit pits in the intertidal zone Number of support vessels: 2 Number of pontoons: 1 Pontoon working area (m): 12x50 Dimensions of exit pits (m): 20x10 per trenchless crossing exit Number of trenchless crossing exits: 6 Dimensions for offshore cable extents – 20m offshore cable disturbance per cable Exit pits would be temporary Vehicle access on the beach but not accessed from the landward side There would be no permanent infrastructure in the intertidal Duration of works in the intertidal zone (months): 18 (not continuous) 	



	Parameter			
	DBS East or DBS West In Isolation	DBS East and DBS West Concurrently	DBS East and DBS West Sequentially	Notes and rationale
Landfall Zone	<ul style="list-style-type: none"> Total Landfall Zone area: 420,000m² Number of completed trenchless crossing ducts (maximum): 3 (2 for power cables, 1 for fibre optic cables) Indicative trenchless crossing depth (m): 20 No. of transition joint bays: 2 Transition joint bay dimensions (m): 5 x 20 Permanent land take for TJBs (m²): 200 – including below ground infrastructure Number of Link Boxes (2.5 x 4m): 2 – the only above ground infrastructure Permanent land take for total number of Link Boxes (m²): 20 Landfall TJB compound works area (m): 110 x 75 Landfall satellite compound (m): 75x 75 Temporary access: Route from the existing road system Temporary lighting during working hours. Temporary out-of-hours security lighting. Duration of works: 18 months overall (not continuous) 	<ul style="list-style-type: none"> Total Landfall Zone area: 420,000m² Number of completed trenchless crossing ducts: 6 (4 for power cables, 2 for fibre optic cables) Indicative trenchless crossing depth (m): 20 No. of transition joint bays: 4 Transition joint bay dimensions (m): 5 x 20 Permanent land take for TJBs (m²): 400 – including below ground infrastructure Number of Link Boxes (2.5 x 4m): 4 – the only above ground infrastructure Permanent land take for total number of Link Boxes (m²): 40 Landfall TJB compound works area (m): 190 x 75 Landfall satellite compound (m): 75x 75 Temporary access: Route from the existing road system Temporary lighting during working hours. Temporary out-of-hours security lighting. Duration of works: up to 18 months overall (not continuous) 	<ul style="list-style-type: none"> Total Landfall Zone area: 420,000m² Number of completed trenchless crossing ducts: 6 (4 for power cables, 2 for fibre optic cables) Indicative trenchless crossing depth (m): 20 No. of transition joint bays: 4 Transition joint bay dimensions (m): 5 x 20 Permanent land take for TJBs (m²): 400 – including below ground infrastructure Number of Link Boxes (2.5 x 4m): 4 – the only above ground infrastructure Permanent land take for total number of Link Boxes (m²): 40 Landfall TJB compound works area (m): 190 x 75 Landfall satellite compound (m): 75x 75 Temporary access: Route from the existing road system Temporary lighting during working hours. Temporary out-of-hours security lighting. Duration of works: up to 48 months overall (not continuous) 	<p>Relevant to:</p> <ul style="list-style-type: none"> Beach closures or restricted access. Disruption / disturbance of recreation and leisure opportunity. Risk of reduced water quality. Active travel routes diversions or temporary closures. Extended journey times, reduced access or increased severance due to additional construction vehicles. Temporary exposures and disturbance associated with cable laying activities near community locations. <p>Worst case is greatest number of trenchless crossing ducts, transition joint bays and Link Boxes (concurrent and sequential); greatest permanent land take for TJBs and Link Boxes (concurrent and sequential); greatest area of Landfall TJB compound works (concurrent and sequential) and longest duration of works (sequential).</p> <p>The trenchless crossing works should not require any prolonged periods of restrictions</p>

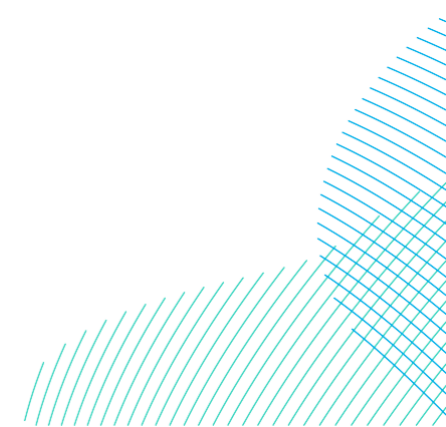


	Parameter			
	DBS East or DBS West In Isolation	DBS East and DBS West Concurrently	DBS East and DBS West Sequentially	Notes and rationale
				<p>or closures to the beach for public access, although it is possible that some work activities will be required to be performed on the beach that may require short periods of restricted access.</p> <p>The TJB compound works area and TJBs locations within the Landfall Zone are subject to detailed design. The TJBs would be at set back from the cliffs to account for potential coastal erosion over time.</p> <p>The concurrent and Sequential Scenarios will involve a greater extent of construction works. The Sequential Scenario will result in the longest duration. Therefore, the DBS East and DBS West Sequential Scenario is considered worst case and assessed in this Chapter.</p>
Onshore Export Cable Route from Landfall Zone to the Onshore Substation Zone	<ul style="list-style-type: none"> Indicative corridor length between landfall area and the Substation Zone (km): 32 Indicative total corridor length from landfall to the proposed Birkhill Wood Substation: 35km Number of earth cables per circuit: 1 Number of trenches: Up to 2 	<ul style="list-style-type: none"> Indicative corridor length between landfall area and the Substation Zone (km): 32 Indicative total corridor length from landfall to the proposed Birkhill Wood Substation: 35km Number of earth cables per circuit: 1 Number of trenches: Up to 4 	<ul style="list-style-type: none"> Indicative corridor length between landfall area and the Substation Zone (km): 32 Indicative total corridor length from landfall to the proposed Birkhill Wood Substation: 35km Number of earth cables per circuit: 1 Number of trenches: Up to 4 	<p>Relevant to:</p> <ul style="list-style-type: none"> Active travel route diversions or temporary closures. Extended journey times, reduced access or increased severance due to additional construction vehicles. Temporary exposures and disturbance associated with cable laying activities near community locations.

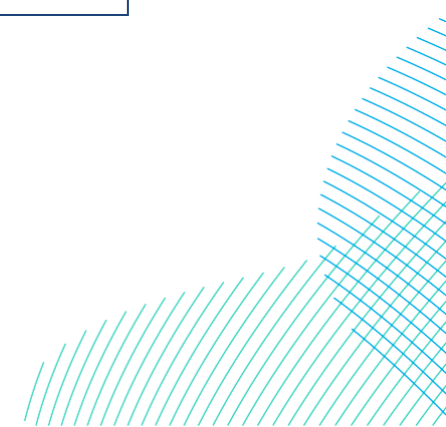


Parameter				
	DBS East or DBS West In Isolation	DBS East and DBS West Concurrently	DBS East and DBS West Sequentially	Notes and rationale
	<ul style="list-style-type: none"> Number of Temporary Construction Compounds: 17 (2 main compounds, 15 satellite compounds including landfall area satellite compound) Size of main construction compound (m²): 10,000 (roughly 100x100m)¹ Size of satellite Temporary Construction Compounds (m²): 5,625 (roughly 75x75m) Cable corridor width (m): 41 Cable corridor width at trenchless crossings (m): 45 Approximate depth of trench to top of duct / cables (m): 1.3 – 1.7 Maximum burial depth (m) where restrictions are not present: 2 Indicative burial depth (m): 1.6 Cable duct trench dimensions: 1.1m base to 3.9m surface for each single. 3.35m base to 6.15m surface for dual HVDC Jointing Bays (km): every 0.75 – 1.5 Indicative number of Jointing Bays: 103 Jointing Bay construction dimensions (per bay) (m): 10 x 25 	<ul style="list-style-type: none"> Number of Temporary Construction Compounds: 17 (2 main compounds, 15 satellite compounds including landfall area satellite compound) Size of main construction compound (m²): 10,000 (roughly 100x100m) Size of satellite Temporary Construction Compounds (m²): 5,625 (roughly 75x75m) Cable corridor width (m): 75 Cable corridor width at trenchless crossings (m): 90 Approximate depth of trench to top of duct / cables (m): 1.3 – 1.7 Maximum burial depth (m) where restrictions are not present: 2 Indicative burial depth (m): 1.6 Cable duct trench dimensions: 1.1m base to 3.9m surface for each single. 3.35m base to 6.15m surface for dual HVDC Jointing Bays (km): every 0.75 – 1.5 Indicative number of Jointing Bays: 205 Jointing Bay construction dimensions (per bay): 10 x 25m Jointing Bay infrastructure dimensions (all below ground) (m): 3x8 	<ul style="list-style-type: none"> Number of Temporary Construction Compounds: 17 (2 main compounds, 15 satellite compounds including landfall area satellite compound) Size of main construction compound (m²): 10,000 (roughly 100x100m) Size of satellite Temporary Construction Compounds (m²): 5,625 (roughly 75x75m) Cable corridor width (m): 75 Cable corridor width at trenchless crossings (m): 90 Approximate depth of trench to top of duct / cables (m): 1.3 – 1.7 Maximum burial depth (m) where restrictions are not present: 2 Indicative burial depth (m): 1.6 Cable duct trench dimensions: 1.1m base to 3.9m surface for each single. 3.35m base to 6.15m surface for dual HVDC Jointing Bays (km): every 0.75 – 1.5 Indicative number of Jointing Bays: 205 Jointing Bay construction dimensions (per bay): 10 x 25m Jointing Bay infrastructure dimensions (all below ground) (m): 3x8 	<p>Worst case is the greatest number of trenches, Jointing Bays, Earth / Link boxes and associated manhole covers, trenchless crossings compounds and exit compounds (concurrent and sequential); the widest cable corridor widths and the greatest permanent easement along the cable corridor (Concurrent and Sequential); the greatest total Onshore Export Cable Corridor works area (Concurrent and Sequential); and greatest duration of works (Sequential).</p> <p>Worst case is longest duration and largest scale of work and vehicles.</p> <p>Deeper burial depth may be required if open cut crossing of obstacle such as utility / watercourse / road etc.</p> <p>The Concurrent and Sequential Scenarios will involve a greater extent of construction works. The Sequential Scenario will result in the longest duration. Therefore, the DBS East and DBS West Sequential Scenario is considered worst case and assessed in this Chapter.</p>

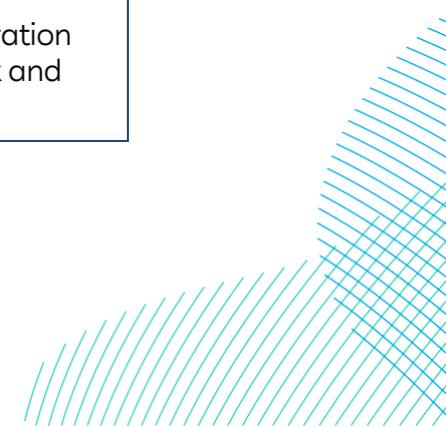
¹ Actual size may vary due to site specifics



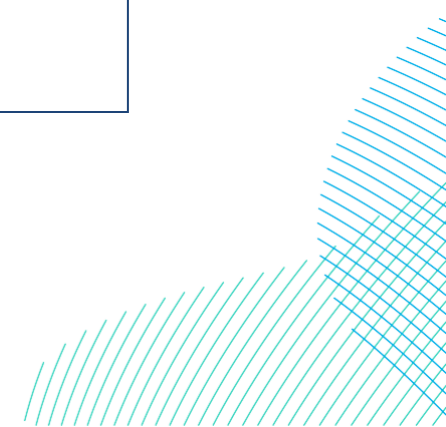
Parameter				
	DBS East or DBS West In Isolation	DBS East and DBS West Concurrently	DBS East and DBS West Sequentially	Notes and rationale
	<ul style="list-style-type: none"> Jointing Bay infrastructure dimensions (all below ground) (m): 3x8 Jointing Bay burial depth from existing ground level to bottom of Jointing Bay (m): 2.2 Jointing Bay depth from existing ground level to top of Jointing Bay (m): 1.35m Number of Earth / Link boxes and associated manhole covers: 103 Link box dimensions / manhole cover permanent infrastructure above ground (m): 2.5x4 Link box construction dimensions (m): 6.5x8 Access routes: Various from public highway to single tracks as shown on Volume 7, Figure 5-3 (application ref: 7.5.1) Haul road: 5m (increasing to 8m at passing places) Temporary lighting during working hours. Temporary out-of-hours security lighting. Approximate permanent easement along the cable corridor (m): 15 Expected maximum trenchless crossing depth (m): 20 	<ul style="list-style-type: none"> Jointing Bay burial depth from existing ground level to bottom of Jointing Bay (m): 2.2 Jointing Bay depth from existing ground level to top of Jointing Bay (m): 1.35m Number of Earth / Link boxes and associated manhole covers: 205 Link box dimensions / manhole cover permanent infrastructure above ground (m): 2.5x4 Link box construction dimensions (m): 6.5x8 Access routes: Various from public highway to single tracks as shown on Volume 7, Figure 5-3 (application ref: 7.5.1) Haul road: 5m (increasing to 8m at passing places) Temporary lighting during working hours. Temporary out-of-hours security lighting. Approximate permanent easement along the cable corridor (m): 24. Expected maximum trenchless crossing depth (m): 20 Trenchless crossing compound dimensions: 60 x 40m per Project assumed for the Project's compounds on each side of the obstacle (entry and exit compounds). 	<ul style="list-style-type: none"> Jointing Bay burial depth from existing ground level to bottom of Jointing Bay (m): 2.2 Jointing Bay depth from existing ground level to top of Jointing Bay (m): 1.35m Number of Earth / Link boxes and associated manhole covers: 205 Link box dimensions / manhole cover permanent infrastructure above ground (m): 2.5x4 Link box construction dimensions (m): 6.5x8 Access routes: Various from public highway to single tracks as shown on Volume 7, Figure 5-3 (application ref: 7.5.1) Haul road: 5m (increasing to 8m at passing places) Temporary lighting during working hours. Temporary out-of-hours security lighting. Approximate permanent easement along the cable corridor (m): 24. Expected maximum trenchless crossing depth (m): 20 Trenchless crossing compound dimensions: 60 x 40m per Project assumed for the Project's compounds on each side of the obstacle (entry and exit compounds). 	



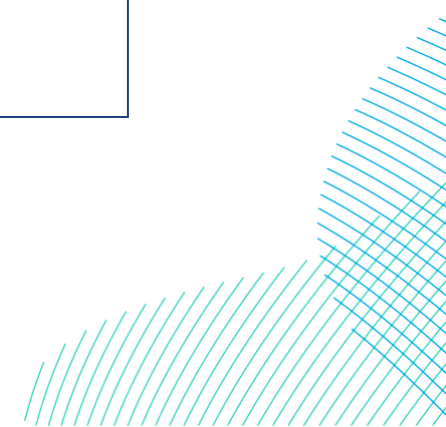
	Parameter			
	DBS East or DBS West In Isolation	DBS East and DBS West Concurrently	DBS East and DBS West Sequentially	Notes and rationale
	<ul style="list-style-type: none"> Trenchless crossing compound dimensions: 60 x 40m assumed for the Project's compounds on each side of the obstacle (entry and exit compounds) No. of trenchless crossings compounds: Min 41 and up to maximum of 147 entry compounds Min 41 and up to maximum of 147 exit compounds All other crossings assumed to be open cut (see Volume 7, Appendix 5-2 Obstacle Crossing Register (application ref: 7.5.5.2)) Total Onshore Export Cable Corridor works area (est.) (m2): 4,252,209 Duration: 33 months 	<ul style="list-style-type: none"> No. of trenchless crossings compounds: Min 82 and up to maximum of 294 entry compounds Min 82 and up to maximum of 294 exit compounds All other crossings assumed to be open cut (see Volume 7, Appendix 5-2 Obstacle Crossing Register (application ref: 7.5.5.2)) Total Onshore Export Cable Corridor works area (est.) (m2): 4,503,397 Duration: 33 months 	<ul style="list-style-type: none"> No. of trenchless crossings compounds: Min 82 and up to maximum of 294 entry compounds Min 82 and up to maximum of 294 exit compounds All other crossings assumed to be open cut (Volume 7, Appendix 5-2 Obstacle Crossing Register (application ref: 7.5.5.2)) Total Onshore Export Cable Corridor works area (est.) (m2): 4,503,397 Duration of works: up to 57 months overall (note this would not be continuous working within that timeframe) 	
Onshore Substation Zone	<ul style="list-style-type: none"> Operational compounds for GIS Converter station (m): 244 x 264 (HVDC Converter) Permanent area (m2): 64,000m2 (based on one HVDC Converter station) Total construction area (m2): 94,000 (based on one HVDC Converter station + temporary construction compound area) Area of Converter station (m2): 64,000 	<ul style="list-style-type: none"> Operational compounds for GIS Converter station (m): 244 x 264 (HVDC Converter) plus 244 x 264 (HVDC Converter) Permanent area (m2): 129,000(based on two HVDC Converter stations) Total construction area (m2): 189,000 (based on two HVDC Converter station + temporary construction compound areas) Area of Converter station(s) (m2): 129,000 	<ul style="list-style-type: none"> Operational compounds for GIS Converter station (m): 244 x 264 (HVDC Converter) plus 244 x 264 (HVDC Converter) Permanent area (m2): 129,000 (based on two HVDC Converter stations) Total construction area (m2): 189,000 (based on two HVDC Converter station + temporary construction compound area) Area of Converter station(s) (m2): 129,000 	<p>Relevant to temporary exposures and disturbance associated with substation construction near community locations.</p> <p>Worst case is the greatest number of operational compounds (Concurrent and Sequential); the greatest permanent and construction areas used (Concurrent and Sequential); and the greatest duration (Sequential).</p> <p>Worst case is longest duration and largest scale of work and vehicles.</p>



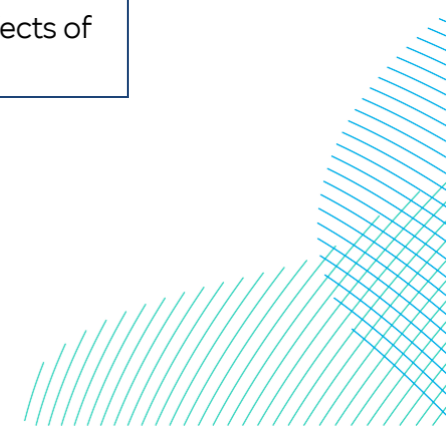
	Parameter			
	DBS East or DBS West In Isolation	DBS East and DBS West Concurrently	DBS East and DBS West Sequentially	Notes and rationale
	<ul style="list-style-type: none"> No. of Converter station compounds: 1 main temporary compound (3 location options identified) Converter station compound (m2): 30,000 Temporary lighting during working hours. Temporary out-of-hours security lighting. Duration: 4 years 	<ul style="list-style-type: none"> No. of Converter station compounds: 2 (1 main temporary construction compound and 1 satellite temporary construction compound) Converter station compounds total area (m2): 60,000 Temporary lighting during working hours. Temporary out-of-hours security lighting. Duration: 4 years 	<ul style="list-style-type: none"> No. of Converter station compounds: 2 (1 main temporary construction compound and 1 satellite temporary construction compound) Converter station compounds total area (m2): 60,000 Temporary lighting during working hours. Temporary out-of-hours security lighting. Duration: 6 years 	<p>The Concurrent and Sequential Scenarios will involve a greater extent of construction works. The Sequential Scenario will result in the longest duration. Therefore, the DBS East and DBS West Sequential Scenario is considered worst case.</p>
Onward Cable Connection to Proposed Birkhill Wood National Grid Substation	<ul style="list-style-type: none"> Onward corridor length from Onshore Converter Station to proposed Birkhill Wood National Grid Substation (km): 2.5 Number of export circuits: 4x400kV Technology: HVAC Cabling from Project substation to National Grid Substation: Buried General cable corridor approximate permanent easement swathe (m): 20 Cable corridor construction swathe (m): 53.5 Cable construction satellite construction compound dimensions (m): 75x75 Number of earth / link boxes: 35 	<ul style="list-style-type: none"> Onward corridor length from Onshore Converter Station to proposed Birkhill Wood National Grid Substation (km): 2.5 Number of export circuits: 8x400kV Technology: HVAC Cabling from Project substation to National Grid Substation: Buried General cable corridor approximate permanent easement swathe (m): 34 Cable corridor construction swathe (m): 100 Cable construction satellite construction compound dimensions (m): 75x75 Number of earth / link boxes: 70 	<ul style="list-style-type: none"> Onward corridor length from Onshore Converter Station to proposed Birkhill Wood National Grid Substation (km): 2.5 Number of export circuits: 8x400kV Technology: HVAC Cabling from Project substation to National Grid Substation: Buried General cable corridor approximate permanent easement swathe (m): 34 Cable corridor construction swathe (m): 100 Cable construction satellite construction compound dimensions (m): 75x75 Number of earth / link boxes: 70 	<p>Relevant to temporary exposures and disturbance near community locations.</p> <p>Worst case is the greatest number of export circuits and earth / link boxes (Concurrent and Sequential); the greatest cable corridor construction and approximate permanent easement swathe (Concurrent and Sequential); and the greatest duration (Sequential).</p> <p>Worst case is largest scale of work and vehicles.</p> <p>The Concurrent and Sequential Scenarios will involve a greater extent of construction works and are therefore considered worst case.</p>



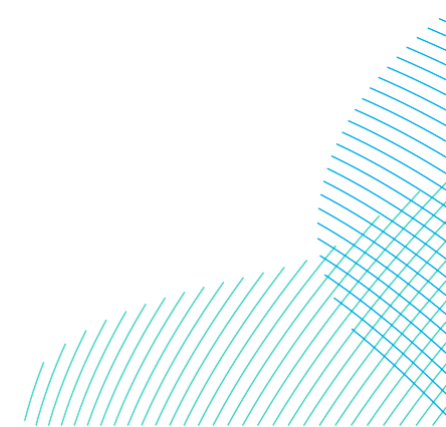
	Parameter			
	DBS East or DBS West In Isolation	DBS East and DBS West Concurrently	DBS East and DBS West Sequentially	Notes and rationale
Operation				
Landfall Zone	<ul style="list-style-type: none"> Permanent aboveground infrastructure: TJBs infrastructure Permanent land take for the total number of TJBs (m²): 200 Number of manhole covers within landfall area: 2 Total area of permanent land take for manhole covers above ground (m²): 20 All other construction disturbance restored to pre-existing condition. 	<ul style="list-style-type: none"> Permanent aboveground infrastructure: TJBs infrastructure Permanent land take for the total number of TJBs (m²): 400 Number of manhole covers within landfall area: 4 Total area of permanent land take for manhole covers above ground (m²): 40 All other construction disturbance restored to pre-existing condition. 	<ul style="list-style-type: none"> Permanent aboveground infrastructure: TJBs infrastructure Permanent land take for the total number of TJBs (m²): 400 Number of manhole covers within landfall area: 4 Total area of permanent land take for manhole covers above ground (m²): 40 All other construction disturbance restored to pre-existing condition. 	There is no substantive difference in the likely effects of the different scenarios.
Onshore Export Cable Route from Landfall Zone to the Onshore Substation Zone	<ul style="list-style-type: none"> Jointing Bay permanent infrastructure dimensions (all below ground): 3x8m Jointing Bay depth (m): 2.2 (from existing ground level to the bottom of the joint bay) Number of Earth/Link boxes (buried, manhole at the surface and the only above ground permanent infrastructure along the cable corridor): up to 103 (up to 2 link boxes per HVDC circuit) Link Box dimensions (permanent infrastructure/manhole covers) (m): 2.5x4 Total permanent land take for link boxes/manhole covers (m²): 1,030 All construction disturbance restored to pre-existing condition 	<ul style="list-style-type: none"> Jointing Bay permanent infrastructure dimensions (all below ground): 3x8m Jointing Bay depth (m): 2.2 (from existing ground level to the bottom of the joint bay) Number of Earth/Link boxes (buried, manhole at the surface and the only above ground permanent infrastructure along the cable corridor): up to 205 (up to 2 link boxes per HVDC circuit) Link Box dimensions (permanent infrastructure/manhole covers): 2.5x4m Total permanent land take for link boxes/manhole covers (m²): 2,050 All construction disturbance restored to pre-existing condition. Approximate permanent easement along the cable corridor (m): 24 	<ul style="list-style-type: none"> Jointing Bay permanent infrastructure dimensions (all below ground): 3x 8m Jointing Bay depth (m): 2.2 (from existing ground level to the bottom of the joint bay) Number of Earth/Link boxes (buried, manhole at the surface and the only above ground permanent infrastructure along the cable corridor): up to 205 (up to 2 link boxes per HVDC circuit) Link Box dimensions (permanent infrastructure/manhole covers): 2.5x4m Total permanent land take for link boxes/manhole covers (m²): 2,050 All construction disturbance restored to pre-existing condition. Approximate permanent easement along the cable corridor (m): 24. 	There is no substantive difference in the likely effects of the different scenarios.



	Parameter			
	DBS East or DBS West In Isolation	DBS East and DBS West Concurrently	DBS East and DBS West Sequentially	Notes and rationale
	<ul style="list-style-type: none"> Approximate permanent easement along the cable corridor (m): 15. Hedgerow trees cannot be replanted over the cable easement 	<ul style="list-style-type: none"> Hedgerow trees cannot be replanted over the cable easement 	<ul style="list-style-type: none"> Hedgerow trees cannot be replanted over the cable easement 	
Onshore Substation Zone	<ul style="list-style-type: none"> Permanent Converter station area (m²); 64,416 (244m x 264m) (based on one HVDC Converter station) Converter Station buildings: <ul style="list-style-type: none"> Tallest structure (m): 27 (lightning masts) Building height (m): 24 Largest building footprint (m): 60x45 Converter station laid out with large buildings to the south. Implementation of landscape screening in accordance with Volume 7, Figure 23-6 Indicative Landscape Plan (application ref: 7.23.1). Worst case considers year 1, before planting matures. All other construction disturbance restored to pre-existing condition. Security /operational lighting within the compound Operational duration: 30 years 	<ul style="list-style-type: none"> Permanent Converter station area (m²): 128,832 (244m x 264m plus 244m x 264m) (based on two HVDC Converter stations) Converter Station buildings: <ul style="list-style-type: none"> Tallest structure (m): 27 (lightning masts) Building height (m): 24 Largest building footprint (m): 60x45 Converter station laid out with large buildings to the south. Implementation of landscape screening in accordance with Volume 7, Figure 23-6 Indicative Landscape Plan (application ref: 7.23.1). Worst case considers year 1, before planting matures. All other construction disturbance restored to pre-existing condition. Security /operational lighting within the compound Operational duration: 30 years 	<ul style="list-style-type: none"> Permanent Converter station area (m²): 128,832 (244m x 264m plus 244m x 264 m) (based on two HVDC Converter stations) Converter Station buildings: <ul style="list-style-type: none"> Tallest structure (m): 27 (lightning masts) Building height (m): 24 Largest building footprint (m): 60x45 Converter station laid out with large buildings to the south. Implementation of landscape screening in accordance with Volume 7, Figure 23-6 Indicative Landscape Plan (application ref: 7.23.1). Worst case considers year 1, before planting matures. All other construction disturbance restored to pre-existing condition. Security /operational lighting within the compound Operational duration: 32 years 	<p>Relevant to level of community concern about the risk of EMF.</p> <p>Worst case is largest scale of infrastructure.</p> <p>The Concurrent and Sequential Scenarios will involve a greater extent of electrical infrastructure (two HVDC Converter stations). The Sequential Scenario will result in the longest duration. Therefore, the DBS East and DBS West Sequential Scenario is considered worst case.</p>
Onshore Onward Cable Route to the Proposed Birkhill	<ul style="list-style-type: none"> 35 manholes at the surface 	<ul style="list-style-type: none"> 70 manholes at the surface 	<ul style="list-style-type: none"> 70 manholes at the surface 	<p>There is no substantive difference in the likely effects of the different scenarios.</p>



	Parameter			
	DBS East or DBS West In Isolation	DBS East and DBS West Concurrently	DBS East and DBS West Sequentially	Notes and rationale
Wood National Grid Substation	<ul style="list-style-type: none"> Approximate total area of permanent land take for link boxes/manhole covers (m²): 350 General cable corridor approximate permanent easement swathe (m): 34 Hedgerow trees cannot be replanted over the cable easement 	<ul style="list-style-type: none"> Approximate total area of permanent land take for link boxes/manhole covers (m²): 700 General cable corridor approximate permanent easement swathe (m): 34 Hedgerow trees cannot be replanted over the cable easement 	<ul style="list-style-type: none"> Approximate total area of permanent land take for link boxes/manhole covers (m²): 700 General cable corridor approximate permanent easement swathe (m): 34 Hedgerow trees cannot be replanted over the cable easement 	
Decommissioning				
<p>No final decision regarding the final decommissioning policy for the onshore Project infrastructure including landfall, onshore cable route and onshore substation has yet been made. It is also recognised that legislation and industry best practice change over time. However, it is likely that the onshore Project equipment, including the cable, will be removed, reused or recycled wherever possible and the transition bays and cable ducts being left in place. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and will be agreed with the regulator. It is anticipated that for the worst case scenario, the impacts will be no greater than those identified for the construction phase. A decommissioning plan for the onshore works would be submitted prior to any decommissioning commencing.</p>				

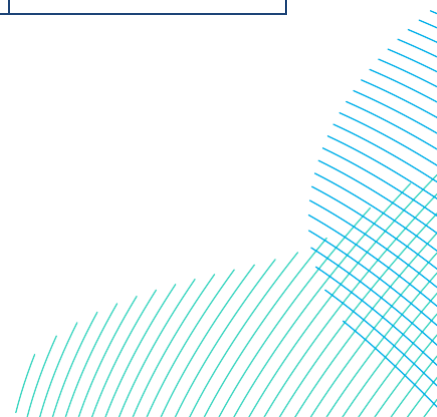


27.3.3.2 Development Scenarios

25. Following Statutory Consultation high voltage alternating current (HVAC) technology (previously assessed in PEIR) was removed from the Projects' design envelope (see **Volume 7, Chapter 4 Site Selection and Assessment of Alternatives (application ref: 7.4)** for further information). As a result, only high voltage direct current (HVDC) technology has been taken forward for assessment purposes. The ES considers the following Development Scenarios:
- Either DBS East or DBS West is built In Isolation; or
 - DBS East and DBS West are both built either Sequentially or Concurrently.
26. An In Isolation Scenario has been assessed within the ES on the basis that theoretically one Project could be taken forward without the other being built out. If an In Isolation project is taken forward, either DBS East or DBS West may be constructed. As such the onshore assessment considers both DBS East and DBS West In Isolation.
27. If an In Isolation project is taken forward, only the eastern Onshore Converter Station within the Onshore Substation Zone would be constructed. In either the Concurrent or Sequential Scenario, both Onshore Converter Station locations within the Onshore Substation Zone would be taken forward for the onshore assessment.
28. In order to ensure that a robust assessment has been undertaken, all development scenarios have been considered to ensure the realistic worst-case scenario for each topic has been assessed. A summary is provided here, and further details are provided in **Volume 7, Chapter 5 Project Description (application ref: 7.5)**.
29. The three Development Scenarios to be considered for assessment purposes are outlined in **Table 27-2**.

Table 27-2 Development Scenarios and Construction Durations

Development Scenario	Description	Total Maximum Construction Duration (Years)	Maximum construction Duration Offshore (Years)	Maximum construction Duration Onshore (Years)
In Isolation	Either DBS East or DBS West is built In Isolation	Five	Five	Four
Sequential	DBS East and DBS West are both built Sequentially, either Project could commence construction first with staggered / overlapping construction	Seven	A five year period of construction for each Project with a lag of up to two years in the start of construction of the second Project (excluding landfall duct installation) – reflecting the maximum duration of effects of seven years.	Construction works (i.e. onshore cable civil works, including duct installation) to be completed for both Projects simultaneously in the first four years, with additional works at the landfall, substation zone and cable joint bays in the following two years. Maximum duration of effects of six years.
Concurrent	DBS East and DBS West are both built Concurrently reflecting the maximum peak effects	Five	Five	Four



30. Any differences between the Projects, or differences that could result from the manner in which the first and the second Projects are built (Concurrent or Sequential and the length of any lag) are identified and discussed where relevant in section 27.6. For each potential impact, the worst case construction scenario for the In Isolation Scenario and the Concurrent or Sequential Scenario is presented. The worst case scenario presented for the Concurrent or Sequential Scenario will depend on which of these is the worst case for the potential impact being considered. The justification for what constitutes the worst case is provided, where necessary, in section 27.6.

27.3.3.3 Operation Scenarios

31. Operation scenarios are described in detail in **Volume 7, Chapter 5 Project Description (application ref: 7.5)**. The assessment considers the following scenarios:
- Only DBS East in operation;
 - Only DBS West in operation; and
 - DBS East and DBS West operating concurrently with or without a lag of up to two years between each Project commencing operation.
32. If the Projects are built using a phased approach, there would also be a phased approach to starting the operational phase. The worst case scenario for the operational phases for the Projects have been assessed. See section 5.1.1 of **Volume 7, Chapter 5 Project Description (application ref: 7.5)** for further information on phasing scenarios for the Projects.
33. The operational lifetime of each Project is expected to be 30 years.

27.3.3.4 Decommissioning Scenarios

34. Decommissioning scenarios are described in **Volume 7, Chapter 5 Project Description (application ref: 7.5)**. Decommissioning arrangements would be agreed through the submission of a Decommissioning Plan to be submitted and approved following cessation of commercial operation prior to decommissioning commencing. For the purpose of this assessment it is assumed that decommissioning of the Projects could be conducted separately, or at the same time.

27.3.4 Embedded Mitigation

35. This section outlines the embedded mitigation relevant to the health assessment, which has been incorporated into the design of the Projects or constitutes standard mitigation measures for this topic (**Table 27-3**). Mitigation is also detailed within the **Commitments Register (Volume 8, application ref: 8.6)** and cross-referenced within (**Table 27-3**). Where additional mitigation measures are proposed, these are detailed in the impact assessment (section 27.6).
36. This health assessment takes as its input the residual effect conclusions of the inter-related technical disciplines set out in section 27.1. In this regard the health assessment relies on the mitigation measures set out in those chapters and does not repeat all measures. This avoids duplication and keeps the health assessment proportionate. Key measures are set out in **Table 27-3**.

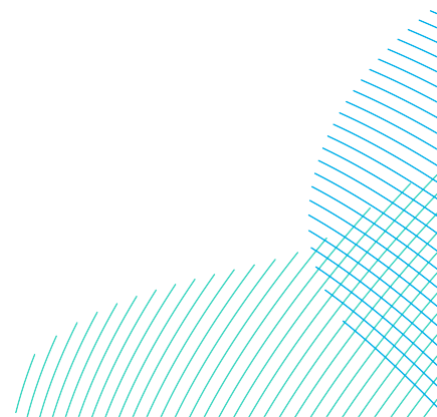
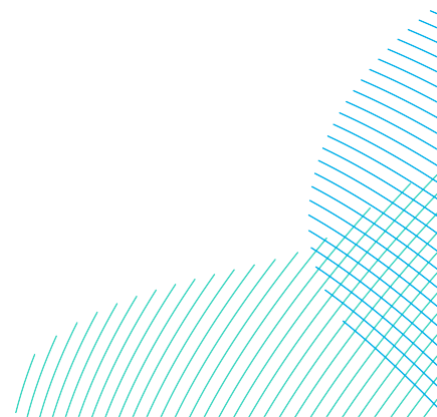
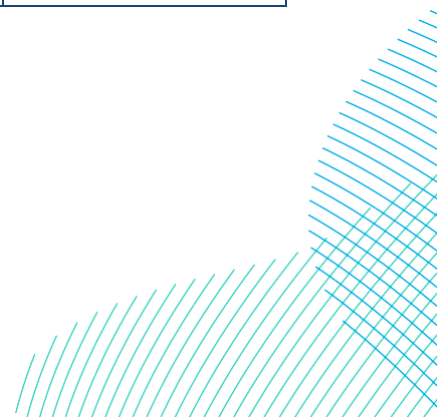


Table 27-3 Embedded Mitigation Measures

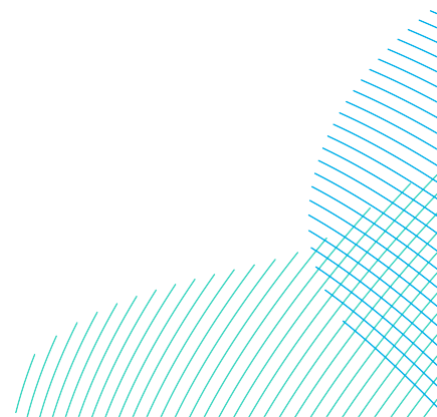
Parameter	Embedded Mitigation Measures	Where Commitment is Secured
<p>Pollution Prevention Measures</p>	<p>Due to the presence and movements of construction and operation and maintenance vessels/equipment there is the potential for spills and leaks which could result in changes to water quality. All vessels involved will be required to comply with the International Convention for the Prevention of Pollution from Ships (MARPOL) 73/78.</p> <p>The production of one or more Project Environmental Management Plans (PEMPs) is a Condition of the five Deemed Marine Licences (DMLs). The final PEMP(s) would be in accordance with the Outline PEMP (Volume 8, application ref: 8.21) and would detail all procedures and measures (in the form of a Marine Pollution Contingency Plan (MPCP)) to be followed during the different phases of the Projects to minimise the risk of, and effects in, the event of an accidental spill. The final PEMP will identify all potential sources and types of accidental pollution for the relevant project phase and set out the proposed mitigation measures and will be developed in consultation with key stakeholders for approval by the MMO. The individual Projects and phases may require separate final PEMP(s). In addition separate PEMP(s) may also be produced for individual packages. All vessels involved will be required to comply with the International Convention for the Prevention of Pollution from Ships (MARPOL) 73/78.</p>	<p>Project Environmental Management Plan (s) (PEMP)</p> <p>Marine Pollution Contingency Plan (MPCP)</p> <p>DML 1 &2 - Condition 15</p> <p>DML 3 & 4- Condition 13</p> <p>DML 5 - Condition 11</p>



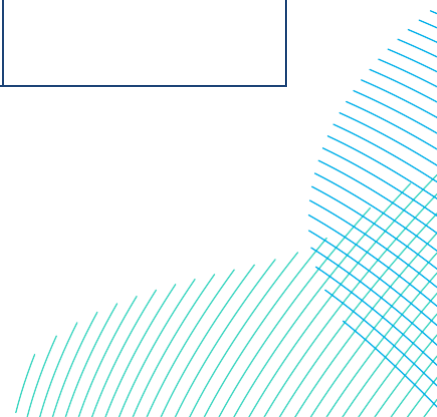
Parameter	Embedded Mitigation Measures	Where Commitment is Secured
Fisheries Liaison	<p>Ongoing liaison with the fishing industry through the Fisheries Liaison Officer (FLO) will be maintained during construction, maintenance and decommissioning activities. The most recent available FLOWW best practice with regards to fisheries liaison will be adhered to in order to maintain effective communications between the Projects and the fishing industry.</p> <p>This will be committed to within the Outline Fisheries Liaison and Coexistence Plan(s) (Volume 8, application ref: 8.28).</p>	<p>Fisheries Liaison and Coexistence Plan</p> <p>DML 1 &2 - Condition 18</p> <p>DML 3 & 4- Condition 20</p> <p>DML 5 - Condition 14</p>
Promulgation Of Information	<p>The Projects will ensure that local Notifications to Mariners are updated and reissued at weekly intervals during construction activities and at least five days before any planned operation and maintenance works.</p> <p>Advance warning and accurate location details of construction, maintenance and decommissioning operations (including details of vessel routes, timings and locations), associated safety zones and advisory passing distances will be given via Kingfisher Bulletins at least 14 days prior where possible.</p>	<p>DML 1 &2 - Condition 9</p> <p>DML 3 & 4- Condition 7</p> <p>DML 5 - Condition 5</p>
Charting Of Infrastructure	<p>Aids to navigation (marking and lighting) will be deployed in accordance with the latest relevant available standard industry guidance. An Aids to Navigation Management Plan will be agreed as a condition of the Deemed Marine Licences included in the draft DCO.</p> <p>The United Kingdom Hydrographic Office (UKHO) will be notified of both the commencement, progress, and completion of offshore construction works, to allow marking of installed infrastructure on nautical charts. This is secured as a condition of the Deemed Marine Licences included in the draft DCO.</p>	<p>DML 1 & 2 - Condition 10</p> <p>DML 3 & 4 - Condition 8</p> <p>DML 5 - Condition 6</p>



Parameter	Embedded Mitigation Measures	Where Commitment is Secured
Cable Routing	<p>The route of the Onshore Export Cable Corridor has been determined as part of a detailed site selection process (see Volume 7, Chapter 4 Site Selection and Assessment of Alternatives (application ref: 7.4)). The route of the Onshore Export Cable Corridor has been designed to avoid potential sources of contamination (e.g. landfills) where possible.</p>	DCO Schedule 1
	<p>The Onshore Export Cable Corridor has been designed to avoid sensitive landscape elements, such as woodland, buildings and trees, where the loss of such features would be detrimental to the character of the area.</p>	
Project Dimensions	<p>All parameters for the Projects, such as Onshore Converter Station(s) dimensions and working widths, are the smallest that can reasonably be defined at the time of commencing ES impact assessment.</p>	DCO Schedule 1
Offshore Platform	<p>Any proposed offshore platform (including those in the Offshore Export Cable Corridor and in the more distant Array Areas) will be over 52km from the landfall point, and over 37km from the closest location on land (Flamborough Head). It will therefore not have likely significant effects on onshore receptors.</p>	DCO Schedule 1



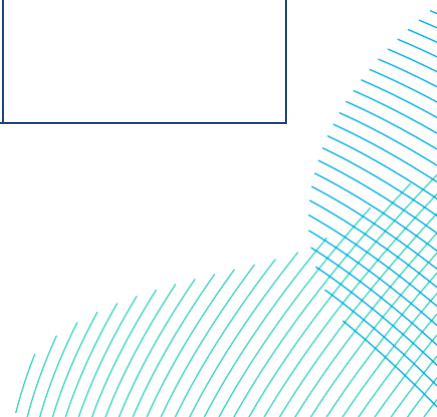
Parameter	Embedded Mitigation Measures	Where Commitment is Secured
<p>Construction Traffic Management Plan</p>	<p>Outline Construction Traffic Management Plan (OCTMP) (Volume 8, application ref: 8.13) is submitted as part of the DCO Application, and preparation of a detailed Construction Traffic Management Plan will be secured through a DCO Requirement. The OCTMP contain details of measures to control, monitor and enforce HGV movements and would provide details of the mechanisms for managing design of accesses and offsite highway works. Prior to the commencement of construction, a Traffic Management Co-ordinator (TMCo) would be appointed with responsibilities to include:</p> <ul style="list-style-type: none"> • Acting as a point of contact for the local community; • Sharing information with emergency and healthcare services, e.g. dates of any road closures, abnormal load movements, etc. <p>The OCTMP also includes 'Travel Plan' measures to manage the number of single occupancy car trips.</p>	<p>DCO Requirement 14</p>
<p>Strategy for Access</p>	<p>An access strategy has been developed that seeks to reduce the impact of HGV traffic upon the most sensitive communities and to minimise travelling via narrow roads. The access strategy would be facilitated by:</p> <ul style="list-style-type: none"> • The construction of a temporary haul road along the Onshore Export Cable Corridor; • The creation of vehicle crossovers; and • Controls on vehicle routing. <p>The Access Strategy is discussed in Volume 7, Chapter 24 Traffic and Transport (application ref: 7.24) and set out in detail in Volume 7, Appendix 24-2 (application ref: 7.24.24.2).</p>	<p>DCO Requirement 14</p>



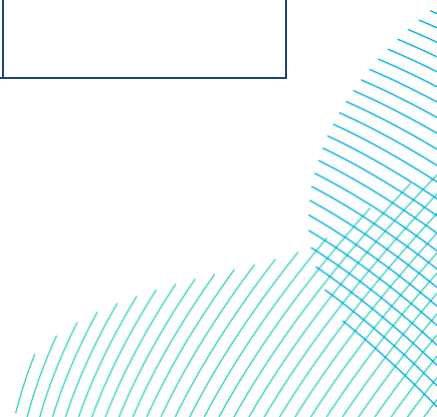
Parameter	Embedded Mitigation Measures	Where Commitment is Secured
Trenchless Crossing Techniques e.g. HDD	<p>To avoid disruption to transport users whilst the Projects' Onshore Export Cables are installed under road and rail infrastructure, trenchless crossing techniques will be used at the following locations:</p> <ul style="list-style-type: none"> • The railway line between Hull and Bridlington (to the north of Beverley); • All A and B roads (for the B1230 the option of trenching is retained); • Dunnington Lane; and • The following local roads: Cliff Road, Dunnington Lane; Meaux Lane; Eske Lane; and Newbald Road. <p>Details are set out in Volume 7, Chapter 24 Traffic and Transport (application ref: 7.24), which also discusses temporary traffic signals and temporary road diversions.</p>	DCO Requirement 14
Crossing Private Access Tracks	<p>To avoid disruption to transport users whilst the Projects' Onshore Export Cables are installed under private access tracks, temporary road diversions would be established. This would be via agreed diversion routes, via existing private tracks or a temporary access track within the DCO order limits. Further details are detailed in the Outline Code of Construction Practice (OCoCP) (Volume 8, application ref: 8.9) submitted as part of the DCO application.</p>	DCO Requirement 19



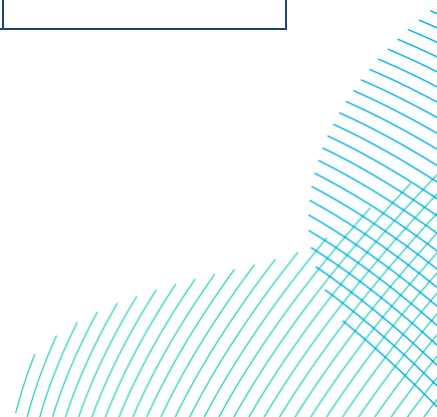
Parameter	Embedded Mitigation Measures	Where Commitment is Secured
Crossing PROW	<p>The Projects commit to only short-term temporary closures with short diversions lasting up to two months for the majority of crossings.</p> <p>Following completion of works, the footpaths will be restored to their original condition (or improved) before reopening to the public. An Outline Public Rights of Way Management Plan (see Appendix C (Volume 8, application ref: 8.9)), submitted as part of the DCO application, outlines the health and safety requirements associated with the interactions of PROW during construction, as well as the PROW management methodologies that will be implemented.</p>	DCO Requirement 24
Best Practice Dust Management Mitigation Measures	<p>The Projects will commit to the implementation of best practice dust mitigation measures as per the Outline Code of Construction Practice (OCoCP) (Volume 8, application ref: 8.9). However, a project-specific dust assessment has been undertaken, taking into consideration the specific activities which will be carried out and the sensitivity of nearby receptors. This has resulted in the identification of site-specific mitigation measures, as set out in full in Volume 7, Chapter 26 Air Quality (application ref: 7.26), section 26.6.1.1.5, and summarised below.</p> <p>Mitigation measures include minimising the production and transmission of dust from construction activities, and the requirement to carry out regular visual on-site and off-site inspections of dust deposition levels, so that appropriate action can be taken in the event of any issues being identified. Dust management mitigation measures are outlined within the Outline Code of Construction Practice (Volume 8, application ref: 8.9), which is submitted as part of the DCO Application, and preparation of a detailed CoCP will be secured through a DCO Requirement.</p>	DCO Requirement 19



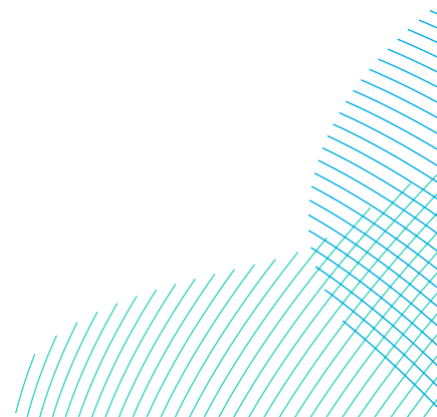
<p>Construction Noise</p>	<p>Prior to the commencement of construction, noise management measures will be detailed in a Code of Construction Practice (CoCP) detailing site-specific best practicable means (BPM) noise control measures to be adopted throughout construction. Outline Code of Construction Practice (Volume 8, application ref: 8.9) is submitted as part of the DCO application and preparation of a detailed Code of Construction Practice will be secured through a DCO Requirement. Mitigation measures will be identified and adhered to, including, but not limited to:</p> <ul style="list-style-type: none"> • Ensuring plant and machinery is turned off when not in use; • Using modern, quiet equipment and ensuring such equipment is properly maintained and regularly inspected; • Locating noise generating plant at a low level and as distant as possible from NSRs; • Plant to operate at low speeds, where possible, and incorporate automatic low-speed idling; • Locating site entrances and exits to prevent the need for vehicles to reverse and also minimise impacts upon sensitive receptors; • Consideration to be given to temporary screening or enclosures for static noisy plant to reduce noise emissions and plant should be certified to meet relevant EC Directive standards; • Informing local receptors about the construction works, including the timing and duration of any particularly noisy elements; and • Implementing a grievance mechanism (e.g. complaint procedure) for local receptors to report nuisance and other issues, including 	<p>DCO Requirement 19</p>
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Parameter	Embedded Mitigation Measures	Where Commitment is Secured
	<p>contact details for a site representative during construction hours.</p>	
<p>Management of New and/or Historic Contamination</p>	<p>Outline Code of Construction Practice (Volume 8, application ref: 8.9) is submitted as part of the DCO application, will be developed into a Code of Construction Practice which will be adhered throughout construction. The CoCP will be regularly reviewed and updated post consent, prior to and during the construction period. The CoCP will be informed by the findings of pre-construction site investigation and will include an assessment of the potential risks to human health and controlled waters receptors from the Projects. Based on that risk assessment appropriate working methods would be developed to avoid, minimise or mitigate impacts relating to construction. The risk mitigation strategies incorporated into Outline Code of Construction Practice (Volume 8, application ref: 8.9) include:</p> <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE); • Provision of welfare facilities; • Monitoring of works including air quality and odour; and • Implementation of relevant good working practices applied including stockpile management and dust suppression activities to reduce the risk relating to the creation and inhalation of wind-blown dusts. <p>In addition, a plan for dealing with unexpected contamination will be developed as part of the CoCP. This plan would also incorporate the Environment Agency best practice guidelines for pollution prevention.</p>	<p>DCO Requirement 19</p>



Parameter	Embedded Mitigation Measures	Where Commitment is Secured
Workforce Management Measures	Workforce management measures including appropriate communicable disease prevention measures to safeguard the project workforce and the public in line with Government guidance of the day, including in relation to vessel crews, and commitment to appropriate occupational health services is detailed in the Outline PEMP (Volume 8, application ref: 8.21) and the Outline Code of Construction Practice (Volume 8, application ref: 8.9) .	DCO Requirement 19 PEMP DML 1 &2 - Conditon 15 DML 3 & 4- Condition 13 DML 5 - Condition 11
PRoW Diversions	An Outline Public Rights of Way Management Plan (see Appendix C (Volume 8, application ref: 8.9)), submitted as part of the DCO application, outlines relevant measures including that all diversions would provide equivalent access to current routes (including mobility and sensory need considerations), would be of similar distances, would be appropriately signposted and would be advertised in advance.	DCO Requirement 19
EMF Risk Avoidance	The Projects will adopt and implement the International Commission on Non-ionizing Radiation Protection (ICNIRP) guidelines (ICNIRP, 1998) and Government voluntary Code of Practice on EMF public exposure (Department for Energy and Climate Change, 2012) in engineering considerations of cable specification and routing to avoid exceeding EMF health protection standards.	DCO Schedule 1



27.4 Assessment Methodology

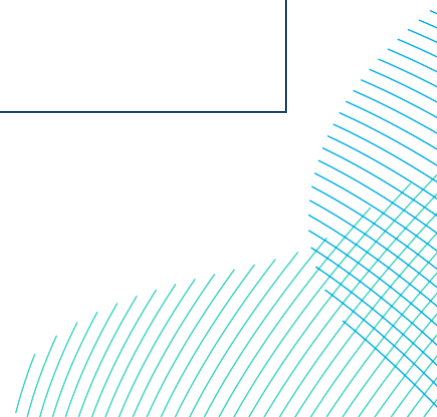
27.4.1 Policy, Legislation and Guidance

27.4.1.1 National Policy Statements

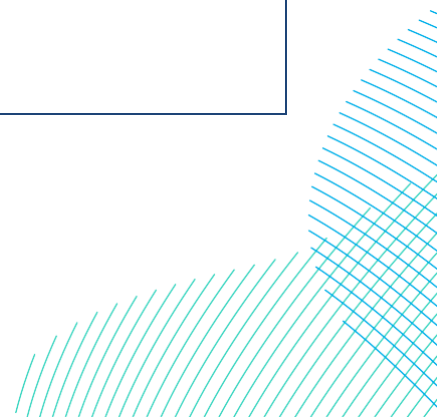
37. The assessment of potential impacts upon human health has been made with specific reference to the relevant National Policy Statements (NPS) including the Overarching NPS for Energy (EN-1), the NPS for Renewable Energy Infrastructure (EN-3) and the NPS for Electricity Networks Infrastructure (EN-5). These were published in November 2023 and were designated in January 2024. The specific assessment requirements for human health, as detailed in the NPS, are summarised in **Table 27-4** together with an indication of the section of this chapter where each is addressed.
38. EN-3 (Department for Energy Security and Net Zero, 2023b) has been reviewed and it is not considered that there are relevant policy positions in relation to human health that need to be taken into account for the Projects.

Table 27-4 EN-1 NPS Assessment Requirements

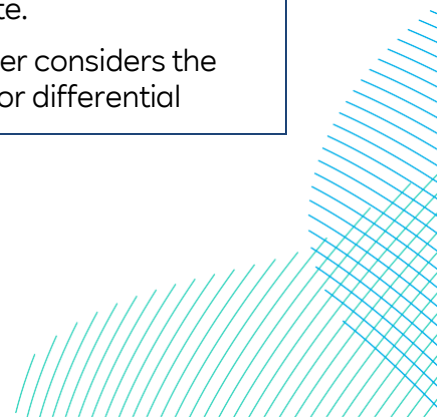
NPS Requirement	NPS Reference	ES Section Reference
EN-1 NPS for Energy		
<p><i>“All proposals for projects that are subject to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) must be accompanied by an Environmental Statement (ES) describing the aspects of the environment likely to be significantly affected by the project”</i></p> <p><i>“The Regulations specifically refer to effects on population, human health, biodiversity, land, soil, water, air, climate, the landscape, material assets and cultural heritage, and the interaction between them”</i></p> <p><i>“The Regulations require an assessment of the likely significant effects of the proposed project on the environment, covering the direct effects and any indirect, secondary, cumulative,</i></p>	<p>EN-1 paragraphs 4.3.1-4.3.3</p>	<p>This chapter provides the health assessment.</p>



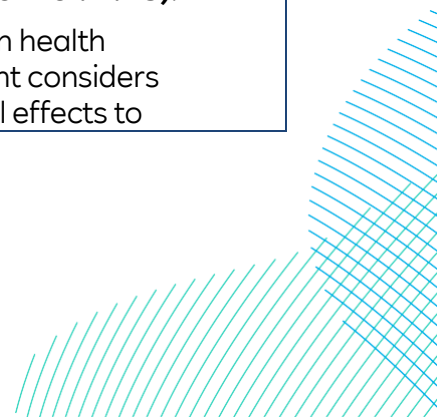
NPS Requirement	NPS Reference	ES Section Reference
<p><i>transboundary, short, medium, and long-term, permanent and temporary, positive and negative effects at all stages of the project, and also of the measures envisaged for avoiding or mitigating significant adverse effects”.</i></p>		
<p>“To consider the potential effects, including benefits, of a proposal for a project, the applicant must set out information on the likely significant environmental, social and economic effects of the development, and show how any likely significant negative effects would be avoided, reduced, mitigated or compensated for, following the mitigation hierarchy. This information could include matters such as employment, equality, community cohesion, health and wellbeing” [emphasis added]</p>	<p>EN-1 paragraph 4.3.4</p>	<p>Employment is considered within this chapter, as well as Volume 7 Chapter 28 Socio-economics (application ref: 7.28). Well-being is an integral consideration throughout this chapter, reflecting that the WHO define health in terms of states of wellbeing.</p> <p>Community identity including community cohesion has been scoped out as explained in section 27.3.1.</p>
<p>“Energy infrastructure has the potential to impact on the health and well-being (‘health) of the population. Access to energy is clearly beneficial to society and to our health as a whole. However, the construction of energy infrastructure and the production, distribution and use of energy may have negative impacts on some people’s health”.</p> <p>“...where the proposed project has an effect on human beings, the ES should assess these effects for each element of the project, identifying any potential adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate” [emphasis added]</p> <p>“The impacts of more than one development may affect people</p>	<p>EN-1 paragraphs 4.4.1, 4.4.4 and 4.45</p>	<p>The effects to population health are considered in the section 27.6 Assessment of Significance.</p> <p>Cumulative effects to population health are considered in section 27.8.</p>



NPS Requirement	NPS Reference	ES Section Reference
<p><i>simultaneously, so the applicant should consider the cumulative impact on health in the ES where appropriate".</i> [emphasis added]</p>		
<p><i>"The direct impacts on health may include increased traffic, air or water pollution, dust, odour, hazardous waste and substances, noise, exposure to radiation".</i></p>	<p>EN-1 paragraph 4.4.2</p>	<p>The scope of the health assessment is set out in the Scoping Opinion (Volume 8, application ref: 8.7). For this application direct effects of particular relevance relate to traffic, air, water pollution, dust, noise, climate change and public understanding of EMF. It has been agreed though the Scoping Opinion and ETG meeting that other direct effects are scoped out.</p>
<p><i>"New energy infrastructure may also affect the composition and size of the local population, and in doing so have indirect health impacts, for example if it in some way affects access to key public services, transport, or the use of open space for recreation and physical activity".</i></p>	<p>EN-1 paragraph 4.4.3</p>	<p>The scope of the health assessment is set out in the Scoping Opinion. For this application in-direct effects of particular relevance relate to physical activity, open space and leisure, climate change, wider societal infrastructure and resources as well as employment and training opportunities. It has been agreed though the Scoping Opinion and ETG meeting that other indirect effects are scoped out.</p>
<p><i>"Opportunities should be taken to mitigate indirect impacts, by promoting local improvements to encourage health and wellbeing, this includes potential impacts on vulnerable groups within society and impacts on those with protected characteristics under the Equality Act 2010, i.e. those groups</i></p>	<p>EN-1 paragraph 4.4.6</p>	<p>This chapter considers opportunities to promote health and wellbeing where proportionate and appropriate.</p> <p>This chapter considers the potential for differential</p>



NPS Requirement	NPS Reference	ES Section Reference
<p><i>which may be differentially impacted by a development compared to wider society as whole”.</i></p>		<p>effects to vulnerable groups. See section 27.6.</p>
<p><i>“Generally, those aspects of energy infrastructure which are most likely to have a significantly detrimental impact on health are subject to separate regulation (for example for air pollution) which will constitute effective mitigation of them, so that it is unlikely that health concerns will either by themselves constitute a reason to refuse consent or require specific mitigation under the Planning Act 2008”.</i></p> <p><i>“However, not all potential sources of health impacts will be mitigated in this way and the Secretary of State may want to take account of health concerns when setting requirements relating to a range of impacts such as noise”.</i></p>	<p>EN-1 paragraph 4.4.7 and 4.4.8</p>	<p>The assessment in section 27.6 has regard to statutory limits, e.g. for air quality, as well as non-threshold effects relevant to air quality and noise. In addition consideration is given to the public understanding of risk (concern) relating to EMF effects.</p>
<p><i>“The Government’s policy is to ensure there is adequate provision of high quality open space and sports and recreation facilities to meet the needs of local communities. Connecting people with open spaces, sports and recreational facilities all help to underpin people’s quality of life and have a vital role to play in promoting healthy living”.</i></p>	<p>EN-1 paragraph 5.11.6</p>	<p>Potential health effects relating to physical activity, open space and leisure are considered in section 27.6.1.1.</p>
<p><i>“Excessive noise can have wide-ranging impacts on the quality of human life and health such as annoyance, sleep disturbance cardiovascular disease and mental ill health. It can also have an impact on the environment and the use and enjoyment of areas of value such as quiet places and areas with high landscape quality”.</i></p>	<p>EN-1 paragraph 5.12.1, 5.12.2 and 5.12.6</p>	<p>Potential health effects related to noise are considered in section 27.6.2.1, as well as in Volume 7, Chapter 25 Noise (application ref: 7.25).</p> <p>The human health assessment considers differential effects to</p>



NPS Requirement	NPS Reference	ES Section Reference
<p><i>“The Government’s policy on noise is set out in the Noise Policy Statement for England. It promotes good health and good quality of life through effective noise management.”</i></p> <p><i>“Where noise impacts are likely to arise from the proposed development, the applicant should include the following... an assessment of any likely impact on health and quality of life/ wellbeing where appropriate, particularly among those disadvantaged by other factors who are often disproportionately affected by noise sensitive areas”.</i></p>		<p>vulnerable groups in all its assessments in section 27.6.2.1</p>
<p><i>“During the construction, operation and decommissioning phases, developments can lead to ... increased risk of spills and leaks of pollutants to the water environment. These effects could lead to adverse impacts on health.”</i></p>	<p>EN-1 paragraph 5.16.2</p>	<p>Potential health effects are considered in sections 27.6.1.4 and 27.6.1.5, as well as in Volume 7, Chapter 8 Marine Physical Environment (application ref: 7.8), Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20) and Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19).</p>
<p><i>“Infrastructure development can have adverse effects on air quality. The construction, operation and decommissioning phases can involve emissions to air which could lead to adverse impacts on health.”</i></p> <p><i>“Proximity to emission sources can have significant impacts on sensitive receptor sites for air quality, such as education or healthcare sites, residential use or sensitive or protected ecosystems”.</i></p>	<p>EN-1 paragraph 5.2.1 and 5.2.7</p>	<p>Potential health effects related to air quality are informed by Volume 7, Chapter 26 Air Quality (application ref: 7.26) and considered in section 27.6.1.3.</p>

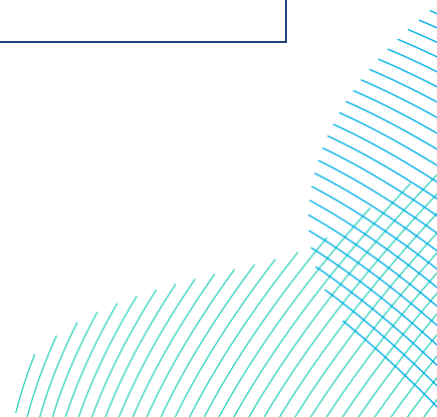
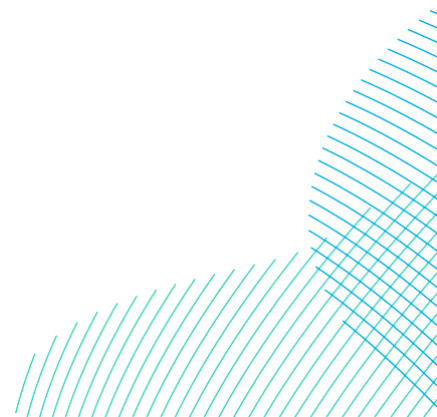


Table 27-5 EN-5 NPS Assessment Requirements

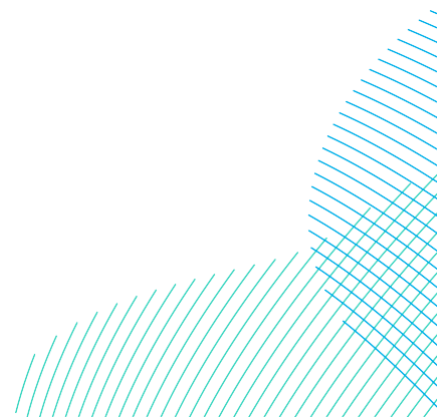
NPS Requirement	NPS Reference	ES Section Reference
EN-5 NPS for Electricity Network Infrastructure		
<p><i>“EMFs can have both direct and indirect effects on human health.”</i></p> <p><i>“The balance of scientific evidence over several decades of research has not proven a causal link between EMFs and cancer or any other disease.”</i></p>	<p>EN-5 paragraphs 2.9.46 and 2.9.56</p>	<p>This chapter considers public understanding of EMF exposure in terms of mental health outcomes associated with concern, acknowledging that actual risks are unlikely to be significant for public health.</p>
<p><i>“To prevent these known effects, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) developed health protection guidelines in 1998 for both public and occupational exposure...”</i></p>	<p>EN-5 paragraph 2.9.48</p>	<p>The Projects adopt the ICNIRP guidelines.</p>
<p><i>“The levels of EMFs produced by power lines in normal operation are usually considerably lower than the ICNIRP 1998 reference levels. For electricity substations, the EMFs close to the sites tend to be dictated by the overhead lines and cables entering the installation, not the equipment within the site.”</i></p>	<p>EN-5 paragraph 2.9.51</p>	<p>This chapter notes the importance of giving the public relevant non-technical information such as this in order to mitigate against levels of concern about EMF, which could affect mental health.</p>
<p><i>“...Government policy is that exposure of the public should comply with the ICNIRP (1998) guidelines”</i></p>	<p>EN-5 paragraph 2.9.55</p>	<p>The Projects adopt the ICNIRP guidelines.</p>



NPS Requirement	NPS Reference	ES Section Reference
<p><i>“Government has developed with the electricity industry a Code of Practice, “Power Lines: Demonstrating compliance with EMF public exposure guidelines – a voluntary Code of Practice” ... that specifies the evidence acceptable to show compliance with ICNIRP (1998)”</i></p>	<p>EN-5 paragraph 2.11.9</p>	<p>The Projects will adopt and implement the International Commission on Non-ionizing Radiation Protection (ICNIRP) guidelines (ICNIRP, 1998) and Government voluntary Code of Practice on EMF public exposure (Department for Energy and Climate Change, 2012) in engineering considerations of cable specification and routing to avoid exceeding EMF health protection standards (as outlined in the Commitments Register (Volume 8, application ref: 8.6)).</p>
<p><i>“Where EMF exposure is within the relevant public exposure guidelines, re-routing a proposed overhead line purely on the basis of EMF exposure or undergrounding a line solely to further reduce the level of EMF exposure are unlikely to be proportionate mitigation measures.”</i></p>	<p>EN-5 paragraph 2.10.13</p>	<p>This chapter acknowledges the value of such information in reassuring the public that further design modification in relation to EMF would not be proportionate.</p>

27.4.1.2 Other

39. In addition to the NPS, there a number of pieces of legislation, policy and guidance applicable to the assessment of Human Health which are included in the following sections.



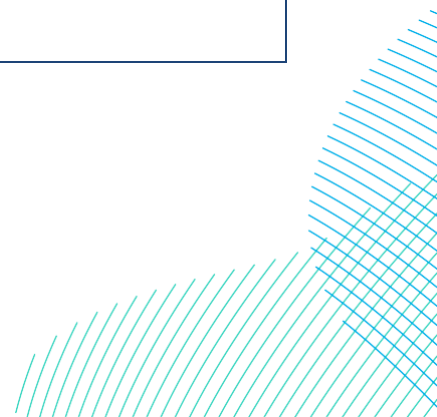
27.4.1.2.1 East Inshore and East Offshore Marine Plan

40. The assessment of potential changes to human health has also been made with consideration to the specific policies set out in the East Inshore and East Offshore Marine Plans (Marine Management Organisation, 2004). Key provisions are set out in **Table 27-6** along with details as to how these have been addressed within the assessment.

Table 27-6: East Inshore and East Offshore Marine Plan policies of relevance to Human Health

Policy/Objective	Key Provisions	ES Reference
Policy SOC1	<i>“Proposals that provide health and social well-being benefits including through maintaining, or enhancing, access to the coast and marine area should be supported”</i>	This ES chapter considers the health and wellbeing impacts of the Projects including beneficial and adverse impacts. See section 27.6.
Policy EC1	<i>“Proposals that provide economic productivity benefits which are additional to Gross Value Added currently generated by existing activities should be supported”</i>	This chapter of the ES considers potential health effects related to socioeconomic changes including employment opportunities and income are assessed in section 27.6.1.8
Policy EC2	<i>“Proposals that provide additional employment benefits should be supported, particularly where these benefits have the potential to meet employment needs in localities close to the marine plan areas”</i>	This chapter of the ES considers potential health effects related to socioeconomic changes including employment opportunities and income. These are assessed in section 27.6.1.8
Objective 6	<i>“Proposals should take account of any potential impacts on ecological and chemical water quality and consult the relevant River Basin Management Plans for more detailed information”.</i>	Potential health effects related to changes in water quality are assessed in section 27.6.1.4

Policy/Objective	Key Provisions	ES Reference
Policy FISH 1	<p><i>“Within areas of fishing activity, proposals should demonstrate in order of preference:</i></p> <ul style="list-style-type: none"> <i>a) that they will not prevent fishing activities on, or access to, fishing grounds</i> <i>b) how, if there are adverse impacts on the ability to undertake fishing activities or access to fishing grounds, they will minimise them</i> <i>c) how, if the adverse impacts cannot be minimised, they will be mitigated</i> <i>d) the case for proceeding with their proposal if it is not possible to minimise or mitigate the adverse impacts”</i> 	<p>This chapter considers potential health impacts related to socioeconomic changes as a result of disruptions in commercial fisheries. See section 27.6.1.8</p>
Policy TR1	<p><i>“Proposals for development should demonstrate that during construction and operation, in order of preference:</i></p> <ul style="list-style-type: none"> <i>a) they will not adversely impact tourism and recreation activities,</i> <i>b) how, if there are adverse impacts on tourism and recreation activities, they will minimise them,</i> <i>c) how, if the adverse impacts cannot be minimised, they will be mitigated</i> <i>d) the case for proceeding with the proposal if it is not possible to minimise or mitigate the adverse impacts”</i> 	<p>This chapter considers potential physical and mental health impacts related to changes recreational and healthy lifestyle behaviours. See section 27.6.1.1</p>



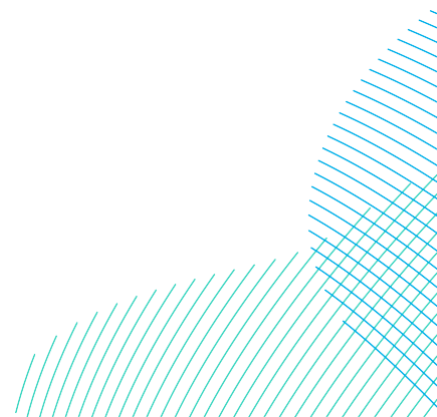
27.4.1.2.2 Local Planning Policy

41. The East Riding Local Plan (2012-2029) is the most relevant local planning policy applicable to human health based on the extent of the study areas for this assessment. Key provisions of the Local Plan as well as how these have been addressed in the health assessment are summarised in **Table 27-7**.

Table 27-7: Summary of East Riding Local Plan provisions relevant to Human Health

Local plan key provisions	Local plan reference	ES Section Reference
<i>“National planning policy emphasises the importance of providing access to good quality open spaces, including opportunities for sport and recreation and protecting public rights of way, in order to promote the health and well-being of communities and facilitate social interaction and inclusion”.</i>	Paragraph 9.23	Potential health effects related to changes in access to open space, recreation and leisure are assessed in section 27.6.1.1
<i>“New development should seek to protect and support existing and disused public transport, cycling and footpath networks (including public rights of way and the National Cycle Network”.</i>	Paragraph 5.58	Potential health effects related to changes in transport modes, access and connections are assessed in section 27.6.1.2
<i>“Proposals should, through the layout and design of new development, consider the needs of users, including equality of access, and how these needs would change for individuals and families through the different stages of their life. It will also be important to consider whether the proposal would contribute to improving healthy lifestyles and help to reduce health inequalities”.</i>	Paragraph 8.8	Potential health effects of changes in healthy lifestyles are assessed in section 27.6.1.1. Health inequalities are considered through the assessment and are reported in section 27.6.

Local plan key provisions	Local plan reference	ES Section Reference
<p><i>“Whilst the use of fossil fuels continues to be important, an increase in renewable energy generation over the plan period will help reduce emissions that cause climate change. This will contribute to fuel security and create opportunities for economic growth”.</i></p>	<p>Paragraph 7.55</p>	<p>Potential health effects related to changes in wider infrastructure and resources are assessed in section 27.6.2.6.</p>
<p><i>“Some energy developments, particularly those involving significant underground works, have the potential to increase the risk of flooding on the site or elsewhere. They could also impact on geology and ground water sources, leading to water pollution and/or ground subsidence. These impacts will need to be satisfactorily addressed”.</i></p>	<p>Paragraph 7.73</p>	<p>Potential health effects related to changes in water quality, including related to flooding, are assessed in section 27.6.1.4</p>
<p><i>“Proposals should also ensure they are located at an appropriate distance from noise sensitive uses, such as housing and quiet leisure based uses, to ensure that increases in ambient noise levels are acceptable”.</i></p>	<p>Paragraph 7.69</p>	<p>Potential health effects related to noise disturbance are assessed in section 27.6.1.6</p>

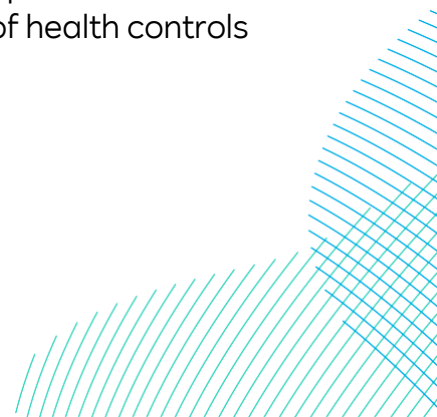


Local plan key provisions	Local plan reference	ES Section Reference
<p><i>“Proposals for the development of the energy sector,will be supported where any significant adverse impacts are addressed satisfactorily, and the residual harm is outweighed by the wider benefits of the proposal. Developments and their associated infrastructure should be acceptable in terms of the land, including land stability, contamination and soil resources”.</i></p>	<p>Policy EC5: Supporting the energy sector</p>	<p>This chapter explains how adverse effects have been addressed and the benefits of the Projects for public health.</p> <p>Potential health effects related to land/soil contamination are addressed in section 27.6.1.5</p>
<p><i>“Proposals will be supported where they would particularly benefit areas identified as being among the 20% most deprived areas in the country, for example, by providing training or employment opportunities for local people”</i></p>	<p>Paragraph 7.7</p>	<p>Potential health effects related to socioeconomic changes including employment opportunities and income are assessed in section 27.6.1.8</p>



27.4.1.2.3 Legislation

42. In addition, there a number of pieces of legislation, policy and guidance applicable to the assessment of human health. These include:
- The Environment Act 2021 (HM Government, 2021) – The Environment Act 2021 established The Office for Environmental Protection (OEP) as a public body in England and Northern Ireland. The OEP sets targets and takes enforcement action to prevent, or mitigate, serious damage to the natural environment or to human health. This includes reducing adverse impacts on public health. The OEP objective (OEP, 2022) is for environmental law (including EIA legislation) and its implementation to be well designed and delivered, so that positive outcomes for the environment and people’s health and wellbeing are achieved.
 - The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations 2017) (HM Government, 2017) – The 2017 update of the EIA Regulations clarified that population and human health was to be included in the list of topics to be considered in an EIA: “*The EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the Project on the following factors – population and human health*”.
 - The Air Quality Standards Regulations 2010 (HM Government, 2010) – set out statutory health protection standards on ambient air quality.
 - The Health and Social Care Act 2012, sections 12 and 13 of the Act outline the responsibilities of Local Authorities regarding public health duties and the involvement of Integrated Care Boards (ICBs) in planning local healthcare services (HM Government, 2012).
 - The Environment Act 1995 (HM Government, 1995)– sets provisions for protecting certain environmental conditions of relevance to health in the UK. Part II covers contaminated land and Part IV covers air quality.
 - The Environmental Protection Act 1990 (HM Government, 1990) - Part IIA covers contaminated land and Part III manages the control of emissions (including dust, noise and light) that may be prejudicial to health or a nuisance.
 - The Public Health (Control of Disease) Act 1984 (HM Government, 1974) – relates to disease control and establishing of port health authorities. Port health authorities carry out a range of health controls at the UK borders.



- Health and Safety at Work Act 1974 (HM Government, 1974)- The act sets a duty on employers to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all their employees. Similarly, employers must also ensure, so far as is reasonably practicable, that persons not in their employment are not exposed to risks to their health or safety as a result of activities being undertaken.
- International Convention for the Prevention of Pollution from Ships (MARPOL) 1973 (International Maritime Organisation, 1973) – Regulations aimed at preventing and minimising, both accidental and operational, pollution from ships are included in the MARPOL (International Maritime Organisation, 1973).
- Bathing Water Regulations 2013 – Safeguards public health and clean bathing waters (UK Statutory Instruments, 2013).
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017- The WFD sets out a commitment to protecting water bodies, including bodies of water designated as recreational waters (The Secretary of State and the Welsh Ministers, 2017).

27.4.1.2.4 *Guidance*

- Institute of Environmental Management and Assessment (IEMA) 2022 guidance on health in EIA series, effective scoping (Pyper, Lamming, et al., 2022) and determining significance (Pyper, Waples, et al., 2022). – Practitioner guidance on the coverage of human health in EIA for England, Wales, Scotland, Northern Ireland and the Republic of Ireland. This includes methods for determining population health sensitivity, magnitude and significance. This is the key methods citation.
- Institute of Public Health (IPH), Guidance, Standalone Health Impact Assessment and health in environmental assessment (IPH, 2021)- Sets current good practice for the assessment of human health in EIA, including assessment methods. This updates the 2009 guidance from the IPH. This guidance for Northern Ireland and Republic of Ireland can be applied more broadly in the UK.
- International Association for Impact Assessment (IAIA) and European Public Health Association (EUPHA). A reference paper on addressing human health in EIA (IAIA and EUPHA, 2020) – This international consensus piece informed the IPH 2021 guidance. The publication explains EIA for public health stakeholders and sets out transparent assessment approaches adopted by the IPH.



- International Association for Impact Assessment. Health Impact Assessment International Best Practice Principles, 2021 – Confirms the relationship between HIA and EIA. Confirms the application of HIA principles when undertaking health in EIA.
- Public Health England (PHE), Health Impact Assessment in spatial planning (PHE, 2020) – The guidance confirms that where EIA is undertaken the requirements for HIA should be met through the EIA health chapter. “*First, establish whether the project is subject to EIA. If yes, follow health in EIA process*”. (Page 28 final paragraph).
- PHE, Advice on the content of Environmental Statements accompanying an application under the Nationally Significant Infrastructure Planning (NSIP) Regime (PHE, 2021) – Guidance to assist applicants preparing an ES as part of their NSIP submission. Themes of access, traffic and transport, socio-economics and land use are discussed in addition to bio-physical health determinants.
- The Department for Environment Food and Rural Affairs (Defra) Environmental Improvement Plan 2023 (DEFRA, 2023) amends the national PM_{2.5} standards. The Environmental Improvement Plan includes a long-term target for reducing population exposure to PM_{2.5} concentrations to meet an annual mean of 10µg/m³, as recommended by the World Health Organization’s (WHO) 2005 guideline. The Plan therefore aims to achieve a target of 12µg/m³ annual mean concentration by 2028 and a target of 10µg/m³ annual mean concentration by 2040.

27.4.1.2.5 Local Health Priorities

43. The East Riding Health and Wellbeing Strategy 2023 – 2028 (East Riding Health and Wellbeing Board, 2023) identifies the following priorities:
- For children and young people to enjoy good health and wellbeing including improving school readiness, improving mental health, raising the education attainment of disadvantaged pupils, and encouraging and supporting healthy behaviours;
 - For working age adults to reduce their risk of ill health including equipping people with skills they need to progress in the labour market; providing employment and income; and providing support to maintain healthy behaviours;
 - For residents to achieve healthy, independent ageing including reducing social isolation particularly for the vulnerable groups and supporting

creation of ‘active communities’ to help reduce, prevent and delay the need for services and improve healthy happy years of life; and

- For health inequalities to be reduced including engaging those furthest from employment or education and deliver higher level skills, building strong and effective community networks and providing ease of access to healthy lifestyle choices.

44. The East Riding Joint Strategic Needs Assessment (JSNA) identifies the following vulnerable groups as priorities:

- Looked after children, children with special needs and disability, young people aged 16 to 17 not in education, employment or training (NEET).
- Working age population who are unemployed, veterans including physical and mental health and wellbeing, and unpaid carers.
- People in old age living with multiple long-term conditions, older people living alone and older people in poverty.

45. Further policy context detail for the Projects is provided in **Volume 7, Chapter 3 Policy and Legislative Context (application ref: 7.3)**.

27.4.2 Data and Information Sources

46. Sources that have been used to inform the assessment are listed in **Table 27-8**.

Table 27-8 Available Data and Information Sources

Data Set	Spatial Coverage	Year	Notes
OHID	National, regional, local and ward level.	2016-2022.	Public health intelligence data, notably from the Fingertips tools for Local Authority Health Profiles and Local Health (ward level).
Ministry for Housing, Communities and Local Government (MHCLG)	LSOA	2019	LSOA resolution data on community deprivation.

Data Set	Spatial Coverage	Year	Notes
Office of National Statistics (ONS) and official labour market statistics (NOMIS) statistics.	National, regional, local and ward level.	2016-2022	Census data (2021 used where released at time of baseline work).
East Riding of Yorkshire Health and Wellbeing Strategy	Local	2023-2028	Local public health priorities.
East Riding of Yorkshire Joint strategic needs assessment (JSNA)	Local	2022-2023	Local vulnerable groups and local health challenges.

27.4.3 Impact Assessment Methodology

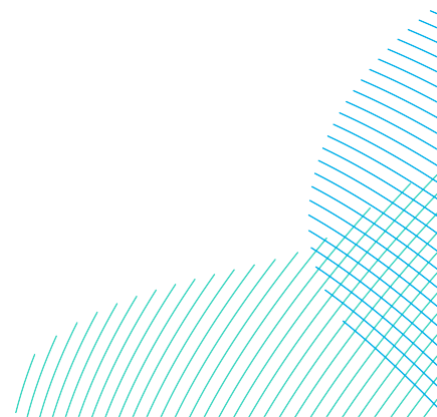
47. **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)** provides a summary of the general impact assessment methodology applied. The following sections describe the methods used to assess the likely significant effects on human health.
48. The health assessment methodology uses best practice IEMA 2022 guidance on health in EIA:
 - IEMA Guide: Effective Scoping of Human Health in Environmental Impact Assessment (Pyper *et al.*, 2022a); and
 - IEMA Guide: Determining Significance for Human Health in Environmental Impact Assessment (Pyper *et al.*, 2022b).
49. The health assessment is a qualitative analysis, following the IEMA 2022 guidance approach, which draws on qualitative and quantitative inputs from other topic chapters. This is considered the most appropriate methodology for assessing wider determinants of health proportionately, consistently and transparently.
50. As set out in guidance the assessment methods allow a consideration of the effect on population health outcomes and what this means for public health, drawing on scientific literature, health baseline change, local health priorities, health policy context, compliance with regulatory or statutory standards and consultation as relevant.



51. The approach taken ensures that wider requirements for Health Impact Assessment (HIA) are embedded within this EIA health assessment in line with good practice.
52. Where proportionate, the need for monitoring has been considered, including relevant governance.

27.4.3.1 Determinants of Health, Risk Factors and Health Outcomes

53. The chapter uses the World Health Organization (WHO) definition of health, which states that health is a “*state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity*” (WHO, 1948).
54. The chapter also uses the WHO definition for mental health, which is a “*state in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community*” (WHO, 2007).
55. Health and wellbeing are influenced by a range of factors, termed the ‘wider determinants of health’. Determinants of health span environmental, social, behavioural, economic and institutional factors. Determinants therefore reflect a mix of influences from society and environment on population and individual health.
56. Impacts of the Projects that result in changes 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.
57. A change in a determinant of health affects does not equate directly to a change in population health. Rather the change in a determinant alters risk factors for certain health outcomes. The health assessment considers the degree and distribution of change in these pathways. The analysis of health pathways focuses on the risk factors and health outcomes that are most relevant to the determinants of health affected by the Projects. As there are both complex and wide-ranging links between determinants of health, risk factors and health outcomes, it would not be proportionate or informative for an assessment to consider every interaction.
58. Typically, the change in a risk factor may need to be large, sustained and widespread within a population for there to be a significant influence on public health outcomes.

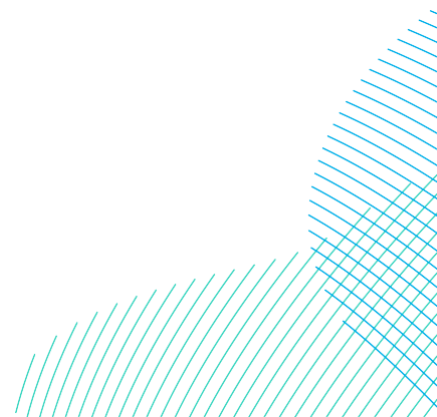


27.4.3.2 Definitions

59. For each potential impact, the health assessment identifies receptors (populations) sensitive to that impact and implements a systematic approach to understanding the impact pathways and the level of impacts (i.e. magnitude) on given receptors. The definitions of sensitivity and magnitude for the purpose of the health assessment are provided in **Table 27-9** and **Table 27-10**.
60. The health assessment conclusions are presented in both EIA categories of significance, such as major, moderate, minor or negligible; and a narrative explaining this score with reference to evidence, local context and any inequalities. The approach follows that set out in the IEMA 2022 guidance.
61. **Table 27-9, Table 27-10** and **Table 27-12** together summarise the health assessment criteria. The approach uses professional judgement, drawing on consistent and transparent criteria for sensitivity and magnitude. It also references relevant contextual evidence to explain what significance means for human health in public health terms.
62. Judgments are based on the most relevant criteria in **Table 27-9, Table 27-10** and **Table 27-12**, and it is likely in any given analysis that some criteria will span score categories.

Table 27-9 Definition of Sensitivity for a Human Health Receptor

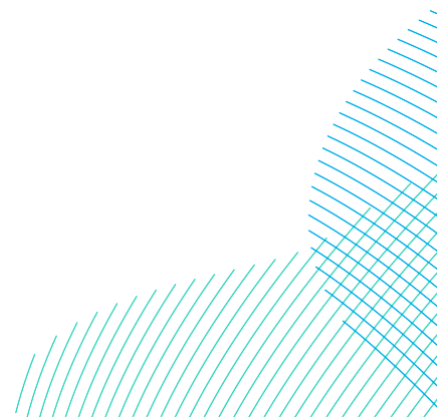
Sensitivity	Definition (Indicative Criteria)
High	High levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the Projects); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern ; people who are prevented from undertaking daily activities; dependants ; people with very poor health status; and/or people with a very low capacity to adapt.
Medium	Moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care ; people with poor health status; and/or people with a limited capacity to adapt.



Sensitivity	Definition (Indicative Criteria)
Low	Low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily activities; people providing or requiring some care ; people with fair health status; and/or people with a high capacity to adapt.
Very low	Very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependant); people with good health status; and/or people with a very high capacity to adapt.

Table 27-10 Definition of Magnitude of Impacts

Magnitude	Definition (Indicative Criteria)
High	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications.
Low	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications.
Negligible	Negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life ; very few people affected; immediate reversal once activity complete; no service quality implication.

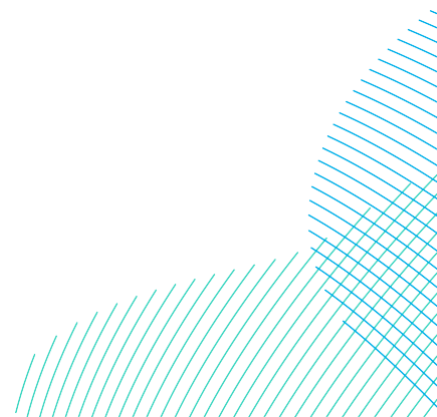


27.4.3.3 Significance of Effect

63. The assessment of significance of an effect is informed by the sensitivity of the receptor and the magnitude of the impact (see **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)** for further detail). The determination of significance is guided by the use of a human health significance of effect matrix, as shown in **Table 27-11**. Definitions of each level of significance are provided in **Table 27-12**. For the purposes of this assessment, any effect that is of major or moderate significance is considered to be significant in EIA terms, whether this be adverse or beneficial. Any effect that has a significance of minor or negligible is not significant. Where the matrix offers more than one significance option, professional judgement is used to decide which option is most appropriate.
64. For the health assessment, following IEMA 2022 guidance, a single conclusion on significance is reached that takes into account the sensitivity of both the general population and the vulnerable group population. In this regard the significance conclusion takes into account the potential for health inequalities between these groups. For the purposes of applying the **Table 27-11** significance matrix sensitivity is driven by the vulnerable population group score.

Table 27-11 Human Health Significance of Effect Matrix

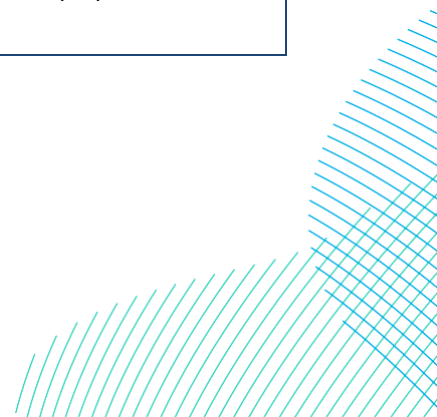
		Adverse Magnitude				Beneficial Magnitude			
		High	Medium	Low	Negligible	Negligible	Low	Medium	High
Sensitivity	High	Major	Major / moderate	Moderate / minor	Minor / negligible	Minor / negligible	Moderate / minor	Major / moderate	Major
	Medium	Major / moderate	Moderate	Minor	Minor / negligible	Minor / negligible	Minor	Moderate	Major / moderate
	Low	Moderate / minor	Minor	Minor	Negligible	Negligible	Minor	Minor	Moderate / minor
	Very low	Minor / negligible	Minor / negligible	Negligible	Negligible	Negligible	Negligible	Minor / negligible	Minor / negligible



27.4.3.4 Significance in Public Health Terms

Table 27-12 Definition of Effect Significance

Category/Score	Indicative Criteria
Major (Significant)	<p>The narrative explains that this is significant for public health because (select as appropriate):</p> <ul style="list-style-type: none"> • Changes, due to the Projects, have a substantial effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size (magnitude and sensitivity scores), and as informed by consultation themes among stakeholders, particularly public health stakeholders, that show consensus on the importance of the effect. • Change, due to the Projects, could result in a regulatory threshold or statutory standard being crossed (if applicable). • There is likely to be a substantial change in the health baseline of the population, including as evidenced by the effect size and scientific literature showing there is a causal relationship between changes that would result from the Projects 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 Projects.
Moderate (Significant)	<p>The narrative explains that this is significant for public health because (select as appropriate):</p> <ul style="list-style-type: none"> • Changes, due to the Projects, 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 Projects, 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 Projects 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 Projects.



Category/Score	Indicative Criteria
Minor (not significant)	<p>The narrative explains that this is not significant for public health because (select as appropriate):</p> <ul style="list-style-type: none"> • Changes, due to the Projects, 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 Projects, would 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 would result from the Projects 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 Projects.
Negligible (not significant)	<p>The narrative explains that this is not significant for public health because (select as appropriate):</p> <ul style="list-style-type: none"> • Changes, due to the Projects, 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. • Change, due to the Projects, would 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 would result from the Projects 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 Projects.



65. The following terminology is also used to consistently classify effects:
- Beneficial – effects that have a positive influence on population health;
 - Adverse – effects that have a negative influence on population health;
 - Temporary – effects that persist for a limited period only (due for example, to particular activities taking place for a short period of time);
 - Permanent – effects that result from an irreversible change to the baseline or which persist for the foreseeable future;
 - Secondary – effects that arise as a consequence of an initial effect of the Projects (e.g., induced employment elsewhere); and
 - Cumulative – effects that can arise from a combination of different effects at a specific location or the interaction of different effects over different periods of time.
66. The temporal scope of this chapter used the following summary terms:
- Very short term relates to effects measured in hours, days or weeks;
 - Short term relates to effects measured in months, (up to 24 months duration);
 - Medium term relates to effects measured in years; and
 - Long term relates to effects measured in decades (e.g., the long-term effects on health from long-term employment).

27.4.3.5 Impact Receptors

67. The principal receptors with respect to human health are population groups located onshore who may be affected by onshore, nearshore and offshore activities of the Projects.
68. The specific groups and characteristics of these populations that are taken into account by the health assessment are listed in **Table 27-13**.

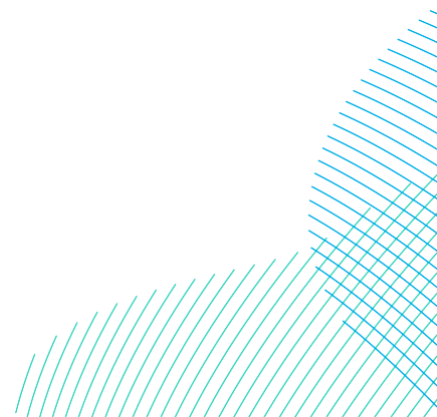
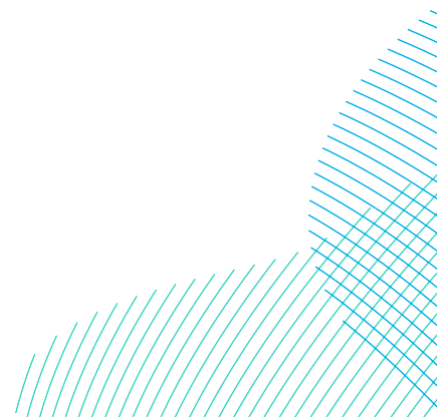


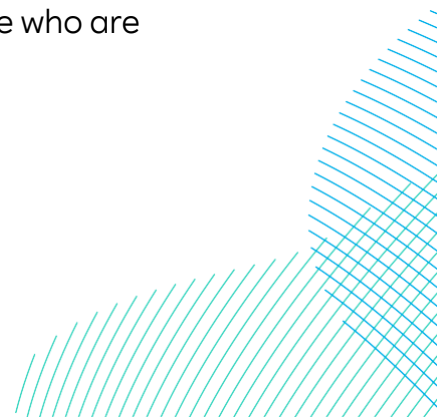
Table 27-13 Receptors

Receptor Group	Receptor	Relevant Features	Closest Distance from the Projects
Human Population	General Population	<ul style="list-style-type: none"> Residents Visitors Workforce Energy consumers 	Offshore, the nearest point from the wind farm site to shore is approximately 100km.
	Vulnerable Group Population	<ul style="list-style-type: none"> Age Income status Health status Social disadvantage Access/geographical 	In some locations, the Onshore Development Area is adjacent to or directly interacts with some PRow.

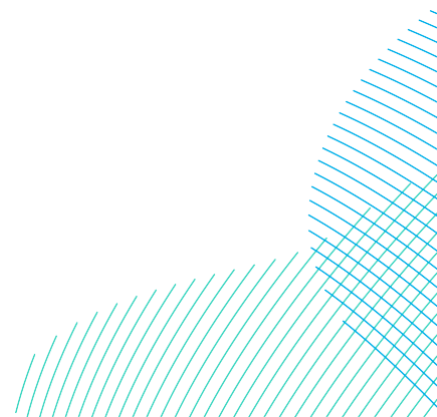
69. In line with IEMA, IPH and IAIA/EUPHA guidance a population health approach has been taken, informed by discussion of receptors within the other topic chapters.
70. For each determinant of health, the health assessment identifies relevant inequalities through consideration of the differential effect to the general population of the relevant study area and effects to the vulnerable population group of that study area. The vulnerable population group being comprised of relevant sensitivities for that determinant of health. The following population groups have been considered:
- The general population including residents, visitors, workers, service providers, and service users; and
 - The vulnerable group population.
71. That there is variation between people is widely acknowledged in public health. Public health frames this variation in terms of a likely distribution of effects within a population. This distribution can be applied conceptually or statistically as a way of describing how most individuals are likely to be affected. This links to the general population analysis.



72. Because there are invariably people towards the extremes of the distribution, e.g. experiencing much smaller or larger effects, it is relevant to also consider sub-populations who may be more likely to experience such extremes because of certain characteristics. This links to the vulnerable group analysis.
73. The methods draw on the list of vulnerable population groups set out in guidance. The following six broad population groups are used to inform a consistent narrative on potential health inequalities across the health assessment. These groups are broadly defined to facilitate a consistent discussion across health issues. People falling into more than one group may be especially sensitive:
- Young age: Children and young people (including pregnant women and unborn children).
 - Old age: Older people (particularly frail elderly).
 - Low income: People on low income, who are economically inactive or unemployed/workless.
 - Poor health: People with existing poor health; those with existing long-term physical or mental health conditions or disability that substantially affects their ability to carry out normal day-to-day activities.
 - Social disadvantage: People who suffer discrimination or other social disadvantage, including relevant protected characteristics under the Equality Act 2010 or groups who may experience low social status or social isolation for other reasons.
 - Access and geographical factors: People experiencing barriers in access to services, amenities and facilities and people living in areas known to exhibit high deprivation or poor economic and/or health indicators.
74. The following general characterisations of how the general population may differ from vulnerable group populations have been considered when scoring sensitivity. These statements are not duplicated in each assessment and apply (as relevant) to the issues discussed for both construction and operation.
- In terms of life stage, the general population can be characterised as including a high proportion of people who are independent, as well as those who are providing some care. By contrast, the vulnerable group population can be characterised as including a high proportion of people who are providing a lot of care, as well as those who are dependant.



- The general population can be characterised as experiencing low deprivation. However, the professional judgment is that the vulnerable group population experiences high deprivation (including where this is due to pockets of higher deprivation within low deprivation areas).
 - The general population can be characterised as broadly comprised of people with good health status. Vulnerable groups, however, tend to include those parts of the population reporting bad or very bad health status.
 - The general population tends to include a large majority of people who characterise their day-to-day activities as not limited. The vulnerable group population tends to represent those who rate their day-to-day activities as limited a little or limited a lot.
 - Based on a professional judgement the general population's resilience (capacity to adapt to change) can be characterised as high whilst the vulnerable group population can be characterised as having limited resilience.
 - Regarding the usage of affected infrastructure or facilities, the professional judgement is that the general population are more likely to have many alternatives to resources shared with the Projects. For the vulnerable group population, the professional judgement is that they are more likely to have a reliance on shared resources.
 - The general population includes the proportion of the community whose outlook on the Projects includes support and ambivalence. The vulnerable group population includes the proportion of the community who are uncertain or concerned about the Projects.
75. As all development has the potential for adverse effects to some particularly vulnerable individuals, the role of EIA significance conclusions are not to set a threshold of no harm from development, but to show where, at a population level, the harm should weigh strongly in the balance alongside the development's benefits for health and other outcomes. The assessment's population health conclusions take into account that all populations are likely to include some particularly sensitive individuals, including relating to sensory impairments, reduced mobility, disability, neuro-diversity, learning disabilities, chronic physical health conditions or mental health conditions.



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

27.4.3.6 In-combination Effects

77. The analysis considers how, due to the Projects, the same populations may be affected by more than one change in relevant health determinants, for example the combined effects of changes in water quality and economic impacts on population health outcomes. The combined effects have regard to the nature of the interactions and the degree to which the same people are likely to be affected.

27.4.4 Cumulative Effect Assessment Methodology

78. The cumulative effect assessment (CEA) considers other schemes, plans and projects that may result in significant effects in cumulation with the Projects. **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)** and accompanying **Volume 7, Appendix 6-1 Onshore Cumulative Effects Assessment (application ref: 7.6.6.1)** provides details of the general framework and approach to the CEA that has been undertaken for the Projects.

27.4.5 Assumptions and Limitations

79. This assessment is based on publicly available statistics and evidence sources. No new primary research or bespoke analysis of non-public data was undertaken for the health assessment.
80. The health and wellbeing assessment partially draws from and builds upon, the technical outputs from inter-related technical disciplines, listed in section 27.1.
81. As a consequence, the assumptions and limitations of those assessments also apply to any information used in this chapter (e.g. for modelling work undertaken). It is, however, considered that the information available provides a suitable basis for assessment.
82. All decision making is within the context of imperfect information and therefore uncertainty. Reducing uncertainty is a key element of the assessment. Whilst not all uncertainty can be removed, the following steps have been taken to allow confidence in the health assessment conclusions:
- Methods are used that triangulate evidence sources and professional perspectives;

- The scientific literature reviews undertaken give priority to high quality study design, such as systematic reviews and meta-analysis, and strength of evidence;
- Quantitative inputs for other assessments have been used, which included model validation, as described in other chapters;
- The health assessment has been cautious, with conservative assessments, for example in taking account of non-threshold effects and vulnerable group findings;
- Monitoring and adaptive management is conditioned as part of ongoing compliance; and
- The health assessment has been transparent in its analysis and follows good practice.

27.5 Existing Environment

27.5.1 The Coastal Context

83. As a generality there is a trend of poor health outcomes in coastal communities in England. The pleasant environment attracts older, retired citizens to settle, who inevitably have more and increasing health problems. An oversupply of guest housing can lead to Houses of Multiple Occupation which lead to concentrations of deprivation and ill health. The sea is a benefit but attracting NHS and social care staff to peripheral areas can be harder. It can also be the case that catchment areas for health services are artificially foreshortened by the coastline and transport is also often limited, in turn limiting job opportunities. Many coastal communities were created around a single industry such as previous versions of tourism, or fishing, or port work that have since moved on, meaning work can often be scarce or seasonal (Chief Medical Officer, 2021).

27.5.2 Site Specific Wards

84. Most outcomes of the Projects relate to localised effects at landfall, along the cable corridor or at the Onshore Converter Stations. There are relatively few public health indicators that are available at this small area geographic resolution. The site specific baseline draws on available indicators and in line with proportionate reporting summarises the site specific health baseline relative to local (East Riding of Yorkshire), regional (Yorkshire and Humber) and national (England) benchmarks.

85. The site specific population is defined using the seven wards of:

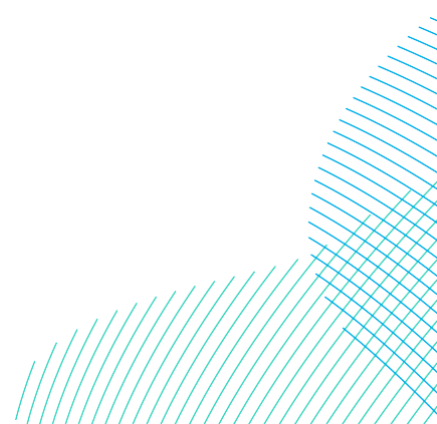
- **E05001695** East Wolds and Coastal and **E05001703** North Holderness (for landfall), including LSOA East Riding of Yorkshire **010A**

(40% most deprived – landfall site at Skipsea) and **006D** (20% most deprived – adjoining more deprived area);

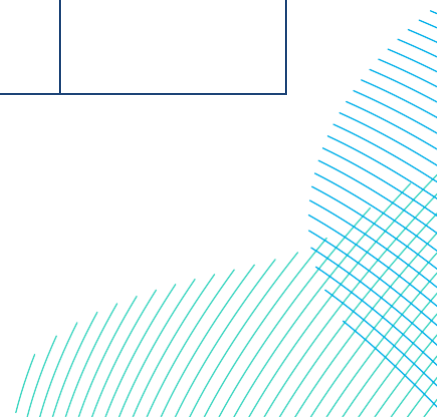
- **E05001687** Beverley Rural and **E05001701** Mid Holderness (for the Onshore Export Cable Corridor), including LSOA East Riding of Yorkshire **017A** (20% most deprived – central Beverley) and **014D** (50% least deprived – rural corridor) in relation to the index of multiple deprivation. Noting the location of East Riding Community Hospital as a sensitive receptor; and
- **E05001693** Dale, **E05001705** St Mary's and **E05001702** Minster and Woodmansey (for the Onshore Converter Stations) including LSOA East Riding of Yorkshire **024B** (which has higher health and environment deprivation than other surrounding LSOAs).

Table 27-14 Site Specific Ward Level Baseline Health Indicators (OHID, 2023)

Indicators	Seven wards (Site-specific)	East Riding of Yorkshire (Local)	Yorkshire and Humber (Regional)	England (National)
Population aged 0 to 15 years (%) (young age population)	15.6	16.3	19.0	19.2
Population aged 16 to 64 years (%) (working age population)	57.9	57.3	62.1	62.3
Population aged 65 years and over (%) (older age population)	26.6	26.4	18.9	18.5
Limiting long-term illness or disability (%) (general health indicator)	17.4	19.1	18.8	17.6

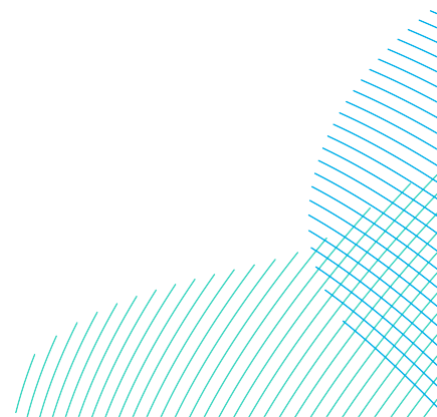


Indicators	Seven wards (Site-specific)	East Riding of Yorkshire (Local)	Yorkshire and Humber (Regional)	England (National)
Deaths from causes considered preventable, under 75 years (Standardised mortality ratio (SMR)) (general health indicator)	69.1	82.6	113.5	100
Income deprivation (%) (economic indicator)	7.6	9.6	14.6	12.9
Older people living alone (%) (social isolation indicator)	26.2	27.3	32.2	31.5
Emergency hospital admissions for Chronic Obstructive Pulmonary Disease (COPD) (Standardised Admission Ratios (SAR)) (respiratory health indicator)	60.4	79.8	118.2	100
Emergency hospital admissions for intentional self-harm (SAR) (mental health indicator)	76.2	83.7	103.1	100
Deaths from circulatory disease under 75 years (Standardised mortality ratio (SMR)) (cardiovascular health indicator)	72.2	90.3	113.2	100



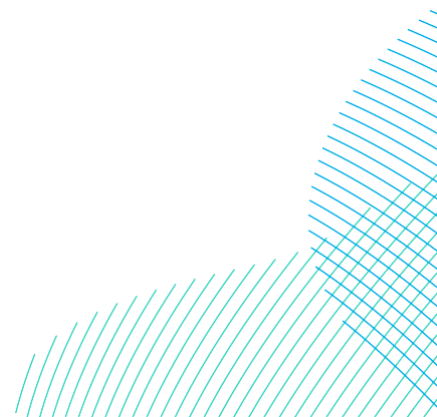
86. **Table 27-14** shows that the seven ward site specific area:

- Has proportionally fewer younger people than local, regional or national benchmarks;
- Has a similar working age population to the local benchmark, but lower than the regional and national benchmarks;
- Has a similar proportion of older people to the local benchmark, which is higher than the regional and national benchmarks;
- Notwithstanding this older age profile, there are a lower proportion of people with limiting-long-term illness than the local and regional benchmarks. The figure is similar to, and slightly lower than, the national benchmark. This suggests above average general health within the population;
- This is consistent with all cause mortality considered preventable in under 75 year olds, which is another general measure of population health and is lower than the local, regional or national benchmarks;
- Income deprivation is also lower than the local, regional or national benchmarks. This suggests a more prosperous than average population, though does not exclude that there are pockets of higher general deprivation, as noted above;
- The proportion of older people living alone is an indicator of social isolation, which can increase vulnerability. This is lower than the local, regional or national benchmarks, suggesting a potentially more resilient population than average;
- Measures of specific types of health outcomes across respiratory health, mental health and cardiovascular health are all lower than the local, regional or national benchmarks; and
- Across the indicators the site-specific level performs well, indicating the presence of vulnerable groups, but also a generally good state of population health. Local benchmarks also tend to outperform the regional, but not the national, benchmark, indicating the greatest health challenges are at the regional level.



27.5.3 East Riding of Yorkshire

87. **Table 27-15** provides additional public health outcomes framework indicators that are available at the local authority, but not ward level. The data is from the OHID Fingertips data tool. In the following summary the comparative terminology of 'similar', 'better' or 'worse' in relation to the national benchmark is a Fingertips classification.
88. Overall health can be informed by life expectancy indicators. For both men and women, healthy life expectancy is better in East Riding of Yorkshire compared to the national benchmark. Health inequalities are an important public health consideration, reflecting how health varies by social gradient. Inequalities in life expectancy, an indicator of levels of variation between those with and without additional pressures and barriers to achieving good health, is also better in East Riding of Yorkshire compared to the national benchmark. These indicators are a general measure of health and of existing inequalities.
89. Socio-economic status has correlations with health, both for those directly employed and their dependants. The number of children in low income families in East Riding of Yorkshire is better compared to the national benchmark. However, the recent trend has been for increasing numbers, i.e. a worsening situation with this indicator. Whilst better than the national benchmark, there are still around three percent of 16 to 17 year olds not in education, employment or training (NEET) in East Riding of Yorkshire. Notwithstanding this, levels of employment are better than the national benchmark. These indicators are relevant to employment and training opportunities due to the Projects.
90. Exposure to transport noise, complaints about noise and particulate air pollution attributable mortality are all lower in East Riding of Yorkshire than the national benchmark. Measures of respiratory and cardiovascular disease are also lower in East Riding of Yorkshire than the national benchmarks. These indicators are relevant to disruption and disturbance associated with construction works and associated traffic.
91. Road injury rates, hospital admissions for falls in the elderly and measures of social isolation (adult loneliness) are all lower in East Riding of Yorkshire than national benchmarks. These indicators are relevant to transport modes, access and connection changes due to the Projects, including pedestrian and cyclist amenity. Injury rates can be used as a road safety indicator.



92. Changes to the physical environment can influence health behaviours. Health related utilisation of outdoor space in East Riding of Yorkshire is slightly below, but similar to, the national benchmark. Prevalence of being overweight at age 4-5 years old is worse than the national benchmark, though is similar by the age of 10-11 years old. For adults the proportion who are overweight is higher than, though similar to, the national benchmark. Adult physical activity levels are similar to national benchmarks. These indicators are relevant to changes in access to physical activity, outdoor space or leisure due to the Projects.
93. The Projects have benefits for climate change, energy security and potentially energy costs. A relevant public health indicator relates to excess deaths at times of extreme cold temperatures when home heating is a factor. Fuel poverty is higher and excess winter deaths are lower in East Riding of Yorkshire than the national benchmarks.
94. Levels of anxiety within the population are higher than the national benchmark. This indicator is relevant to changes in public understanding of risk due to the Projects.
95. Deprivation can be used as a health resilience indicator. Deprivation mapping (2019) indicates relatively low levels of deprivation in the majority of the East Riding of Yorkshire. For overall deprivation the East Riding of Yorkshire is in the second lowest quintile compared to England. That there are pockets of deprivation within areas of overall low deprivation is noted.
96. The East Riding Health and Wellbeing Strategy 2023 – 2028 (East Riding Health and Wellbeing Board, 2023) identifies the following priorities:
 - For children and young people to enjoy good health and wellbeing including improving school readiness, improving mental health, raising the education attainment of disadvantaged pupils, and encouraging and supporting healthy behaviours;
 - For working age adults to reduce their risk of ill health including equipping people with skills they need to progress in the labour market; providing employment and income; and providing support to maintain healthy behaviours;
 - For residents to achieve healthy, independent ageing including reducing social isolation particularly for the vulnerable groups and supporting creation of ‘active communities’ to help reduce, prevent and delay the need for services and improve healthy happy years of life; and
 - For health inequalities to be reduced including engaging those furthest from employment or education and deliver higher level skills, building



strong and effective community networks and providing ease of access to healthy lifestyle choices.

97. Overall, the health baseline indicators suggest generally higher than average resilience in the population compared to national benchmarks. The data suggests the importance of maintaining opportunities for people to be physically active. It also highlights that there are also opportunities for the Projects to respond positively to challenges around worsening numbers of low-income households and fuel poverty.

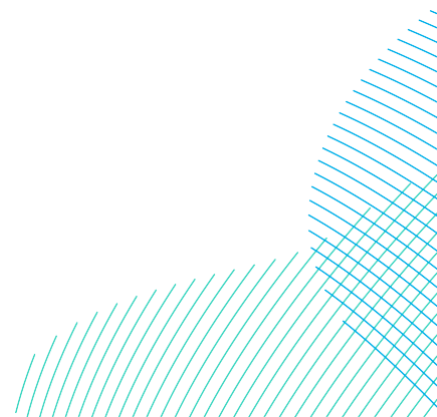
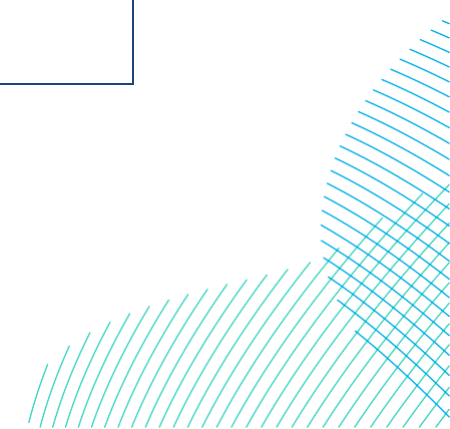
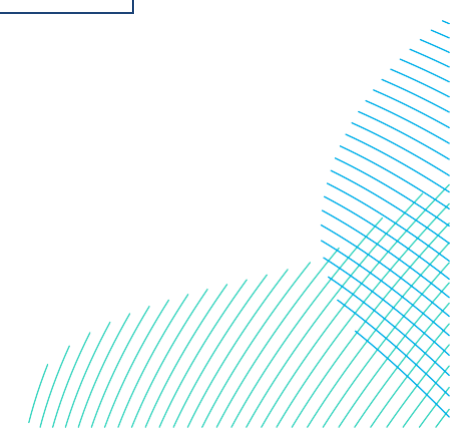


Table 27-15 Local Area Baseline Health Indicators (Public Health Outcomes Framework)(OHID, 2023)

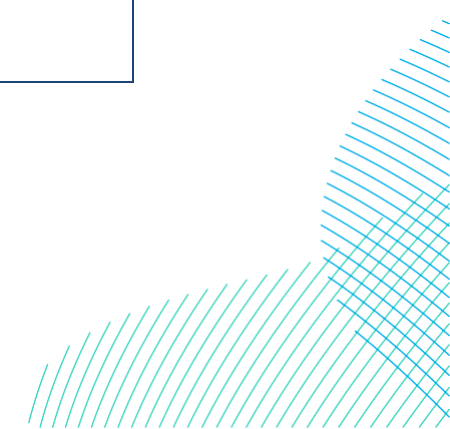
Indicator Name	Time period	East Riding of Yorkshire	England	Recent Trend	Compared to England
Healthy life expectancy at birth (male)	2018 - 20	65.34	63.14	N/A	Better
Healthy life expectancy at birth (female)	2018 - 20	67.89	63.87	N/A	Better
Inequality in life expectancy at birth (male)	2018 - 20	6.80	9.70	N/A	2nd lowest quintile
Inequality in life expectancy at birth (female)	2018 - 20	3.20	7.90	N/A	Lowest quintile
Percentage of children in absolute low income families (under 16s)	2021/22	11.37	15.28	Increasing and getting worse	Better
Percentage of 16 to 17 year olds NEET or whose activity is not known	2021	3.23	4.70	No significant change	Better
Percentage of people in employment (16-64 years old)	2021/22	78.30	75.40	No significant change	Similar
Killed and seriously injured (KSI) casualties on England's roads (per billion vehicle miles)	2021	89.26	95.64	N/A	Similar



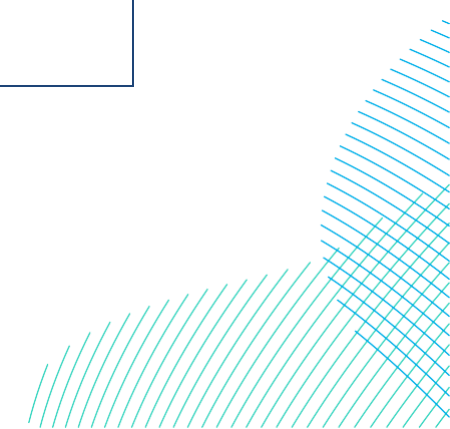
Indicator Name	Time period	East Riding of Yorkshire	England	Recent Trend	Compared to England
Violent crime - violence offences per 1,000 population	2021/22	23.01	34.95	No significant change	Lowest quintile
The rate of complaints about noise per 1,000 population	2020/21	5.46	12.0	No significant change	Better
The percentage of the population exposed to road, rail and air transport noise of 65dB(A) or more, during the daytime	2016	1.95	5.50	N/A	Lowest quintile
The percentage of the population exposed to road, rail and air transport noise of 55 dB(A) or more during the night-time	2016	2.88	8.48	N/A	Lowest quintile
Utilisation of outdoor space for exercise/health reasons (16+ years old) (percentage)	Mar 2015 - Feb 2016	16.78	17.92	N/A	Similar
Fuel poverty (low income, low energy efficiency methodology) (percentage)	2020	14.66	13.23	N/A	2nd highest quintile



Indicator Name	Time period	East Riding of Yorkshire	England	Recent Trend	Compared to England
Loneliness: Percentage of adults who feel lonely often or always or some of the time (16+ years old)	2019/20	13.86	22.26	N/A	Better
Reception: Prevalence of overweight (including obesity) (4-5 years old) (percentage)	2021/22	23.85	22.25	Increasing and getting worse	Worse
Year 6: Prevalence of overweight (including obesity) (10-11 years old) (percentage)	2021/22	37.46	37.76	Increasing and getting worse	Similar
Percentage of adults (aged 18+) classified as overweight or obese	2021/22	69.39	63.80	N/A	Worse
Percentage of physically active adults (aged 19+)	2021/22	68.14	67.30	N/A	Similar
Percentage of physically inactive adults (aged 19+)	2021/22	21.50	22.26	N/A	Similar
Self reported wellbeing: people with a high anxiety score (aged 16+) (percentage)	2021/22	23.48	22.55	N/A	Similar

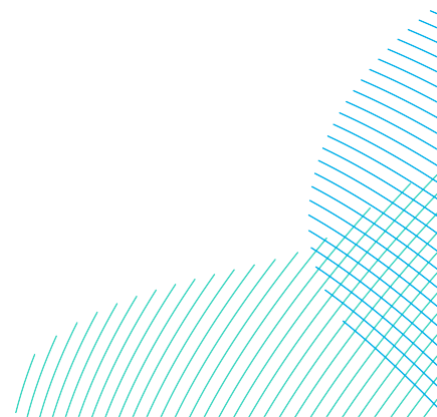


Indicator Name	Time period	East Riding of Yorkshire	England	Recent Trend	Compared to England
Emergency hospital admissions due to falls in people aged 65 and over (directly standardised rate per 100,000 people)	2021/22	1633.59	2099.92	N/A	Better
Fraction of mortality attributable to particulate air pollution (new method) (aged 30+) (percentage)	2021	4.75	5.50	N/A	Not compared
Under 75 mortality rate from cardiovascular diseases considered preventable (2019 definition) (directly standardised rate per 100,000 people)	2021	27.30	30.19	No significant change	Similar
Under 75 mortality rate from respiratory disease considered preventable (2019 definition) (directly standardised rate per 100,000 people)	2021	12.58	15.61	No significant change	Better
Excess winter deaths index (ratio of extra deaths from all causes that occur in the winter months compared with the expected number of deaths)	Aug 2020 - Jul 2021	29.20	36.20	N/A	Similar



27.5.4 Future Trends

98. In the event that the Projects are not developed, an assessment of future conditions for human health has been carried out and is described within this section.
99. Population health data presents a snapshot at a particular time. It is well recognised that population health is subject to continuing influences, both at the individual and community level. Influences may be environmental, such as seasonal variation in wellbeing and communicable diseases, they may also respond to socio-economic factors, such as migration and the availability of jobs.
100. Longer term trends and interventions in population health may influence the future baseline. Health and social care, public health initiatives and government policies aim to reduce inequalities and improve quality of life. The historic success of such interventions is increasingly challenged by national trends such as an aging population, rising levels of obesity and the COVID-19 pandemic. The implications of COVID-19 for public health will take years to be reflected within statistical data releases, but it is expected that the pandemic will have exacerbated public health challenges. The pandemic disproportionately affected vulnerable groups, including due to age and ill-health.
101. For assessment purposes, the current health baseline is considered a suitable proxy of the future baseline. The current baseline used in this assessment includes appropriate health indicators to reflect the types of health outcomes that that would also be relevant for the future population (e.g. in relation to age and long-term conditions). The health assessment methodology includes a categorisation of vulnerable population groups, which, for example, allows for the effects of older people and people with existing poor health to be distinguished from the general population. The health assessment sensitivity score for each vulnerable group is independent of the population size within that group, which would be the main change between the current and future baseline. The sensitivity scores within the health assessment therefore account for both current and future population characteristics.



102. It would not be proportionate (or consistent with the qualitative assessment approach taken) to quantitatively model the population's future health. This reflects the complexities of interactions between the wider determinants of health, as well as the potential for macro-economic changes in the next decade that are hard to predict. Any predication would have such wide error margins that it would greatly limit the value of the exercise. Annual national population health trend forecasting is undertaken as a government public health activity (Chief Medical Officer, 2021, 2023; HM Government, 2021) and has been taken into account by the health assessment.
103. In the do nothing scenario there is the potential for the future baseline of UK energy security to be met by non-renewable sources, or not met at all. The former is likely to increase climate change related pressures on public health, including extreme weather events, exacerbating inequalities and mental health outcomes. The latter is also likely to increase pressure on public health due to interrupted energy supplies affecting availability of goods and services, including healthcare, employment and food safety.

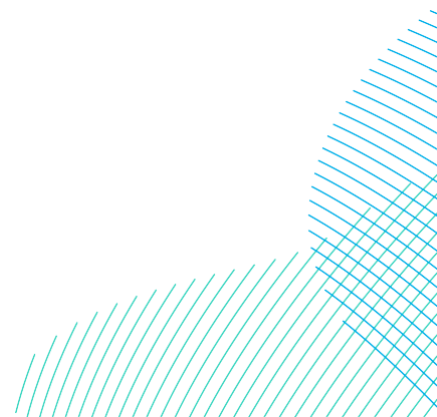


27.6 Assessment of Significance

27.6.1 Potential Effects During Construction

27.6.1.1 Impact 1: Health Related Behaviours: Physical Activity, Open Space and Leisure

104. This section considers the population health implications of construction activities affecting marine, nearshore and onshore recreational and leisure activities. Relevant activities may lead to temporary disruption of public open spaces (including beaches) and PRoW, potentially affecting recreational activities. Consideration has also been given to the influences on nearshore recreation, e.g. bathing, sailing and other water sports. It is noted that the beach at landfall is not expected to be closed for public access during construction. Access would only be temporarily restricted should there be emergency access needs. It is noted that in the event of a short trenchless landfall to install cable ducts under the beach there may be some temporary restrictions to some areas of the intertidal zone. Up to 6 exit pits may be installed within the intertidal zone (each measuring 200m² in area), in addition to cable trenching within the intertidal zone (measuring 660m² in area). Cumulatively, works in the intertidal zone may occur over a maximum of 18 months. Works in the intertidal zone would not prevent use of other areas of the beach.
105. The context is of coastal communities near the landfall (with long stretches of beach below cliffs). Further inland land use is dominated by agricultural fields. Both are characterised by small communities, including holiday accommodation. Routes crossed by the Onshore Export Cable Corridor, such as Hudson Way (the 'rail trail' between Beverley and Market Weighton, also known as the Molescroft Footpath No.6, see **Volume 7, Chapter 21 Land Use (application ref: 7.21)**), are important for physical activity (walking and cycling). The wider area includes the City of Hull, which provides port and marina facilities. Affected activities potentially include:
- Offshore disruption to leisure related sea transport, including blue water or live aboard sailing;
 - Nearshore fishing, diving, boat trips or water sports; and
 - Onshore community open space or recreational amenities, coastal or inland, including use of the beach and adjoining land.



106. The scientific literature identifies the following general points. The availability of a natural environment and attractive views of nature within an individual's living environment are important contributors to physical activity. Peoples' experiences in using the natural environment can enhance attitudes toward physical activity and perceived behavioural control via positive psychological states and stress-relieving effects, which lead to firmer intentions to engage in physical activity (Calogiuri & Chroni, 2014). Improvements in health behaviour influence health outcomes like mortality, chronic diseases, mental and obesity disorders (Salgado et al., 2020). Physical activity can improve cognitive and mental health, particularly improvements in physical self-perceptions, which accompany enhanced self-esteem (Lubans et al., 2016).
107. The health benefits of recreation and leisure include physical activity, as well as general wellbeing benefits. Health outcomes span physical health (e.g. cardiovascular health) and mental health (e.g. stress, anxiety or depression). Locations such as Skipsea Castle, accessed via a footpath from the B1249, are also influential to physical activity. Use of such locations may be affected by not only physical barriers but also changes in the amenity or setting of the destination.
108. This section has been informed by **Volume 7, Chapter 14 Shipping and Navigation (application ref: 7.14)**, **Volume 7, Chapter 29 Tourism and Recreation (application ref: 7.29)**, and **Volume 7, Chapter 21 Land Use (application ref: 7.21)**, which set out relevant assessment findings and mitigation measures that have been taken into account.
109. The potential effect is considered plausible as there is a theoretical source-pathway-receptor relationship:
- The source is disruption and disturbance by construction activities.
 - The pathway is behavioural change in levels of use of leisure and recreation, affecting physical activity and wellbeing outcomes.
 - Receptors are coastal and inland populations of residents and visitors.
110. Furthermore, the theoretical effect is considered applicable in the context of these Projects.
111. The population groups relevant to this assessment are:
- The site specific population, see section 27.3.1;
 - The local population of East Riding of Yorkshire; and
 - The sub-population vulnerable due to young age, old age, low income, poor health, social disadvantage or access and geographical factors (for example, people for whom alternative opportunities may be limited).

27.6.1.1.1 *Magnitude of Impact – All Scenarios*

112. Magnitude of change has been considered for all the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially. In all Scenarios the magnitude of change for population health due to the Projects is **low**.
113. **Volume 7, Chapter 14 Shipping and Navigation (application ref: 7.14)** concludes:
- All scenarios:
 - The frequency of occurrence, severity of consequence, and resulting significance of effect resulting from vessel displacement and third-party Collision risk for DBS East and DBS West together has been assessed as tolerable with mitigation for all phases.
 - DBS East or DBS West In Isolation:
 - Should only DBS East or DBS West In Isolation be developed, this would result both in a greater area of available sea room for routing commercial vessels, and fewer routes requiring a deviation; four route deviations would be necessary compared to five for DBS East and DBS West together. Therefore, it is expected that both the severity of consequence and frequency of occurrence for this impact would decrease compared to if both DBS East and DBS West are built together.
 - DBS East and DBS West Concurrently:
 - Vessel displacement and third-party collision risk for DBS East and DBS West together is considered tolerable with mitigation.
 - DBS East and DBS West Sequentially:
 - Vessel displacement and third-party collision risk for DBS East and DBS West sequentially is considered tolerable with mitigation.
114. **Volume 7, Chapter 29 Tourism and Recreation (application ref: 7.29)** concludes:
- All scenarios:
 - The effect of the construction of the Projects on onshore recreational assets is assessed to be minor adverse. No impacts have been identified during the construction phase which could impact the performance of marine recreation activities.
115. **Volume 7, Chapter 21 Land Use (application ref: 7.21)** concludes:

- In relation to PRow, for both the Projects In Isolation or together (Concurrently or Sequentially), the significance of effect is deemed as minor adverse which is not significant in EIA terms.
 - In relation to the National Trail, Coastal Path and National Cycle Network routes, for both the Projects In Isolation or together (Concurrently or Sequentially), the significance of effect is deemed as minor adverse which is not significant in EIA terms.
116. In terms of population health the magnitude of low reflects that in the worst case (sequential development) there is a *small* scale of change over the *medium-term* from construction activities, including shipping movements and land access, affecting marine, nearshore and onshore recreational and leisure activities. Any such effect is likely to be characterised as an *occasional* effect on opportunities to be active at a given location, e.g. due to transitory cable laying. It is likely there would be *rapid* reversal of any effect once the given construction activity concluded, with limited potential to cause lasting behavioural change. The outcome is likely to be a *minor* change in *quality of life* and / or *cardiovascular related morbidity* for a *small minority* of the affected population. No effect on healthcare services would be expected. If DBS East or DBS West were carried out In Isolation the level of disruption would be over a shorter timeframe, albeit the overall magnitude score would still be characterised as low rather than negligible.

27.6.1.1.2 Sensitivity of Receptor – All Scenarios

117. The following conclusions on population sensitivity apply to all scenarios.
118. The sensitivity of the general population is **low**. Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 27.4.3.5. This reflects that most people in the local area would only make occasional use of the affected marine, coastal and inland recreational and leisure opportunities including PRow. It also includes those with access to many alternatives that are not affected. The general population comprise those members of the community with a high capacity to adapt to changes, for example due to greater resources and good physical and mental health.
119. The sensitivity of the vulnerable group population is **high**. Vulnerability in this case is linked to have fewer resources and less capacity to adapt to changes. The population may therefore be more reliant on the affected recreational and leisure opportunities with greater likelihood that any additional disruption or disturbance could affect use and behaviours. For example, vulnerable groups living in Skipsea, including use of caravans and similar holiday accommodation.

27.6.1.1.3 Significance of Effect – All Scenarios

120. All scenarios have been considered by the assessment and the conclusion on significance is the same. As set out in **Volume 7, Chapter 5 Project Description (application ref: 7.5)**, open spaces (offshore, nearshore and onshore) and PRow onshore will be reinstated following construction activities that require temporary closures or access restrictions.
121. The effect is characterised as being *adverse* in direction, *temporary* and *indirect*. The significance of the population health effect is **minor** adverse (not significant). Although the scientific literature supports a *clear* association between recreational and leisure activities and health outcomes, there is likely to be at most a *slight* change in the population health baseline. This would have no more than a *marginal* effect on health policy delivery and is *not* expected to change population health inequalities.

27.6.1.1.4 Mitigation and Residual Significance of Effect – All Scenarios

122. Based on the low magnitude and high sensitivity in the vulnerable group population (which is used to reflect the role of potential inequalities, see paragraph 64), the significance of effect would be **minor** adverse. No additional mitigation is considered to be required.

27.6.1.2 Impact 2: Social Environment: Transport Modes, Access and Connections

123. This section considers the onshore population health implications of changes in construction activities affecting highway safety and access as well as other PRow and cycle routes. This includes road works, temporary diversions and traffic volumes required due to the Onshore Export Cable Corridor or in relation to the construction of the Onshore Converter Stations.
124. The scientific literature identifies the following general points relevant to potential exposures and health outcomes. For road safety, health effects may be associated with the severity or frequency of road traffic incidents. For accessibility, health effects may be associated with emergency response times or non-emergency treatment outcomes associated with delays or non-attendance. For active/sustainable travel, health effects may relate to physical health (eg cardiovascular health) and mental health conditions (eg stress, anxiety or depression) associated with obesity and levels of physical activity.
125. Transportation barriers are important to healthcare access, particularly for those with lower incomes. Transportation barriers lead to rescheduled or missed appointments, delayed care, and missed or delayed medication use. These consequences may lead to poorer management of chronic illness and thus poorer health outcomes (Syed et al., 2013).

126. Walking and cycling for transportation (i.e. active transportation), provide substantial health benefits from increased physical activity. Health gains exceed detrimental effects of traffic incidents and air pollution exposure (Mueller et al., 2015). Active transport to work or school is significantly associated with improved cardiovascular health and lower body weight (Xu et al., 2013). The provision of convenient, safe and connected walking and cycling infrastructure is at the core of promoting active travel (Winters et al., 2017). Physically active transport (i.e. walking or cycling) has been directly related to increased residential density, street connectivity, mixed land use and amenities within a walkable distance (Thomson et al., 2008).
127. The health assessment has had regard to the population groups identified in the literature that may be particularly sensitive. For example, children, pregnant women and cyclists (particularly older cyclists) are generally more vulnerable in terms of road safety. People with lower socio-economic status typically face more transportation barriers in accessing health care.
128. This section has been informed by **Volume 7, Chapter 24 Traffic and Transport (application ref: 7.24)** and **Volume 7, Chapter 21 Land Use (application ref: 7.21)**, which set out relevant assessment findings and mitigation measures that have been considered.
129. The potential effect is considered plausible as there is a theoretical source-pathway-receptor relationship:
 - The source is potential construction disruption and disturbance, including to PRow and cycle routes.
 - The pathway is behavioural change in levels of physical activity, driver delay and accidents and safety.
 - Receptors are coastal and inland populations of residents and visitors.
130. Furthermore, the theoretical effect is considered applicable in the context of these Projects.
131. The population groups relevant to this assessment are:
 - The site specific population, see section 27.3.1;
 - The local population of East Riding of Yorkshire;
 - The regional population of Yorkshire and Humber and the city of Hull; and
 - The sub-population vulnerable due to young age, old age, low income, poor health, social disadvantage or access and geographical factors (for example, people for whom alternative opportunities may be limited).

132. Regard has been had to the potential for effects to the regional population of Yorkshire and Humber (including the city of Hull). Whilst transport effects, as assessed in **Volume 7, Chapter 24 Traffic and Transport (application ref: 7.24)**, would extend to this area; there is not considered the potential to affect public health at a regional level from such impacts. The health assessment focus is on effects at the site specific and local level.

27.6.1.2.1 *Magnitude of Impact – All scenarios*

133. Magnitude of change has been considered for all the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially. In all Scenarios the magnitude of change due for population health to the Projects is **low**. For traffic impacts, the worst case scenario is DBS East and DBS West Concurrently. It is assumed the impacts associated with a Sequential construction scenario would be the same or less than those associated with the Concurrent Scenario.
134. **Volume 7, Chapter 24 Traffic and Transport (application ref: 7.24)** concludes:
- All scenarios
 - Severance residual effects are considered negligible to minor adverse for both the construction of the Projects In Isolation and together.
 - Amenity residual effects are considered negligible to minor adverse for both the construction of the Projects In Isolation and together.
 - Road safety residual effects are considered negligible to minor adverse.
 - Driver delay residual effects due to road closures are considered negligible and driver delay residual effects due to capacity and highway geometry are considered minor adverse.
 - In relation to active travel, there would be appropriate diversions of active travel routes to maintain access and provide early notice of any route changes. Such measures are detailed in the **Outline Construction Traffic Management Plan (Volume 8, application ref: 8.13)** and the **Appendix C Outline PRow Management Plan (Volume 8, application ref: 8.9)**.
 - There are currently identified to be a number of locations where accident risk is elevated by the Projects during the construction, but mitigation is proposed.

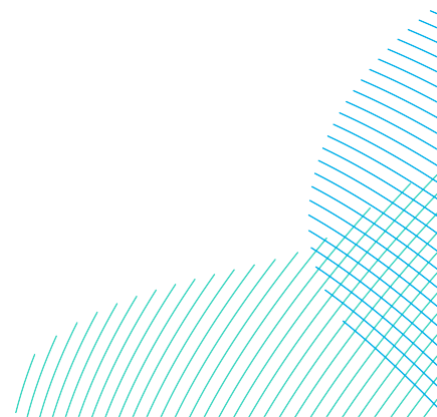
135. **Volume 7, Chapter 21 Land Use (application ref: 7.21)** concludes:
- In relation to PRoW, for both the Projects In Isolation or together (Concurrently or Sequentially), the significance of effect is deemed as minor adverse which is not significant in EIA terms.
 - In relation to the National Trail, Coastal Path and National Cycle Network routes, for both the Projects In Isolation or together (Concurrently or Sequentially), the significance of effect is deemed as minor adverse which is not significant in EIA terms.
136. In terms of population health the scale of change to active travel is therefore considered *small* and *medium-term*, albeit of limited duration at any given location, including due to the transitory nature of construction works to lay cables. Only *minor* changes in *morbidity* for *cardiovascular* and *mental health* outcomes would be expected for a *small minority* of the population due to the temporary disruption during construction works. Most adverse effects on health behaviours and outcomes would be expected to *reverse* on completion of the construction works. With the implementation of the ProW Management Plan and the minor adverse conclusion detailed in **Volume 7, Chapter 21 Land Use (application ref: 7.21)**, the health chapter identifies a **low** magnitude of change on this issue.
137. In relation to road safety at the population level the scale of change in accidents would be *small*. The frequency of any incidents would be *occasional*, with severity related to a *very minor change in risk of injury or mortality* (though with outcome reversal gradual or permanent). The expectation is that *very few* people would be affected, with *no or slight* implications for healthcare services. Reflecting the residual effects reported in **Volume 7, Chapter 24 Traffic and Transport (application ref: 7.24)** the health chapter identifies a **low** magnitude of change on this issue.



138. In relation to health-related travel times and accessibility the scale of change in delays is expected to be *small*. The frequency with which health related journeys may be affected is likely to be *occasional* for most people though for a few people, severity could relate to a *small* change in risk for morbidity or mortality associated with time critical treatment. Ambulance services (and the recipients of their care) are particularly sensitive to delays in response times (time taken to arrive and stabilise the patient). Even with the delays described in **Volume 7, Chapter 24 Traffic and Transport (application ref: 7.24)**, the priority given to ambulances travelling under blue lights would be expected to reduce any changes in journey times. Mitigation in terms of early and ongoing information sharing with emergency and healthcare services is secured within the **Outline Construction Traffic Management Plan (Volume 8, application ref: 8.13)**. Due to the temporary nature of the work and ability for people to adapt to known planned diversions or delays means there is a low magnitude of change in access to social infrastructure such as shops, employment and educational facilities. A **low** magnitude is assigned to active travel and health-related travel times for population health.

27.6.1.2.2 Sensitivity of Receptor – All Scenarios

139. The following conclusions on population sensitivity apply to all scenarios.
140. The sensitivity of the general population is **low**. Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 27.4.3.5. Most residents are unlikely to make regular use of the PRow and cycle routes affected by the Projects and would likely have a high capacity to adapt by selecting alternative routes or physical activity opportunities to avoid any temporary disruption or disturbance. The general population comprise those members of the community with a high capacity to adapt to changes in access, including changes in healthcare access, for example due to greater resources and good physical and mental health.



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

27.6.1.2.3 *Significance of Effect - All scenarios*

142. All scenarios have been considered by the assessment and the conclusion on significance is the same.
143. In relation to active travel and health-related travel times, the significance of the population health effect is **minor** adverse (not significant). The professional judgment is that there would, at most, be a *slight* adverse change in the health baseline. This conclusion reflects that physical activity is a public health priority and the scientific literature on the benefits of physical activity to health is well established however, the level of change due to the Projects, whether In Isolation, Sequential or Concurrent, is small and is appropriately mitigated by standard good practice measures that minimise disruption. The change is unlikely to result in significant differential or disproportionate effects between the general population (low sensitivity) and the vulnerable sub-population (high sensitivity). Consequently, *no* widening of health inequalities would be expected, and *no* influence is expected on the ability to deliver local or national health policy.

144. For road safety the significance of the population health effect is **minor** adverse (not significant). This conclusion reflects the potential for a *slight* change in the health baseline due to increased risk of high severity road accident outcomes. The change is *not* expected to widen inequalities and have *marginal* influence on the achievement of health policy relating to road safety.

27.6.1.2.4 Mitigation and Residual Significance of Effect – All scenarios

145. For active travel, health-related journey times and road safety, based on the low magnitude and high sensitivity in the vulnerable group population (which is used to reflect the role of potential inequalities, see paragraph 64), the significance of effect would be **minor** adverse. No additional mitigation is considered to be required.

27.6.1.3 Impact 3: Bio-Physical Environment: Air Quality

146. This section discusses changes to onshore air quality during construction, and related effects on population health. Construction of the onshore works has the potential to result in dust effects from construction activities and Temporary Construction Compounds, as well as vehicle emissions from construction traffic.
147. This section has been informed by **Volume 7, Chapter 26 Air Quality (application ref: 7.26)**, which sets out relevant assessment findings and mitigation measures that have been taken into account.
148. The potential effect is considered plausible as there is a theoretical source-pathway-receptor relationship:
149. The source is air pollutants (particularly NO₂, PM_{2.5} and PM₁₀) from construction emissions.
- The pathway is diffusion through the air.
 - Receptors are residents, visitors and long-term occupiers of nearby properties and community buildings.
150. Furthermore, the theoretical effect is considered applicable in the context of these Projects.
151. The population groups relevant to this assessment are:
- The site specific population, see section 27.3.1;
 - The local population of East Riding of Yorkshire;
 - The regional population of Yorkshire and Humber and the city of Hull; and

- The sub-population vulnerable due to young age, old age, low income, poor health, social disadvantage or access and geographical factors (for example, people for whom alternative opportunities may be limited).
152. Regard has been had to the potential for effects to the regional population of Yorkshire and Humber. Whilst transport related air quality effects would extend to this area; there is not considered the potential to affect public health at a regional level from such impacts. The health assessment focus is on effects at the site specific and local level. Effects within the City of Hull are discussed.
153. Construction activities that produce dust tend to relate to the coarser fractions of PM₁₀ and potential nuisance from dust deposition on property. The great majority of anthropogenic PM_{2.5} health effects relate to combustion related processes, e.g. construction plant and transport.
154. The health outcomes of PM₁₀ and PM_{2.5} are not distinguished in this assessment. This reflects that both are typically present (though the relative proportions change) and that the evidence base does not consistently distinguish their effects particularly given that PM_{2.5} is a subset of PM₁₀. However, generally, elevated concentrations of PM_{2.5} are considered of greater concern due to their greater potential to interact within the body.
155. The scientific literature identifies the following general points. For construction dusts, the main health outcomes are likely to relate to exacerbation of existing conditions, such as asthma or COPD (i.e. airway inflammation by coarse PM) and to reductions in wellbeing associated with annoyance or reduced amenity. Whilst other outcomes (e.g. cardiovascular events) may be relevant in the event of brief high concentrations, such elevated exposures are expected to be avoided through the use of standard good practice mitigation secured through the **Outline Code of Construction Practice (Volume 8, application ref: 8.9)** as discussed **Volume 7, Chapter 26 Air Quality (application ref: 7.26)**. The potential for dusts and PM to include mobilised soil contaminants is noted and taken into account. The use of standard good practice measures to avoid new contamination and appropriately manage any historic contamination encountered (see **Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19)**) would mitigate against a public health risk due to airborne mobilisation of soil contaminants.



156. Whilst the literature supports there being thresholds set for health protection purposes, it also acknowledges that for PM_{2.5} and NO₂ there are non-threshold health effects (i.e. when there is no known exposure threshold level below which adverse health effects may not occur) (WHO, 2013b). The health assessment has identified population groups that may be particularly sensitive to air quality effects. For example, young children are particularly susceptible to air pollution because of their developing lungs, high breathing rates per bodyweight, and amount of time spent exercising outdoors. Other vulnerable groups include the sick (e.g. people with type 2 diabetes), the elderly, and pregnant women.

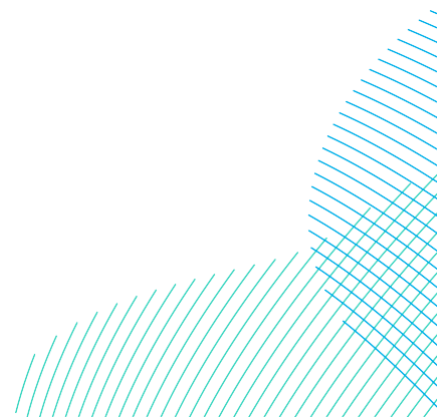
27.6.1.3.1 *Magnitude of Impact – All Scenarios*

157. Magnitude of change has been considered for all the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially. In all scenarios the magnitude of change for population health due to the Projects is **low**. The worst case is likely to be the Concurrent Scenario, where greater intensity of activity may result in higher exposures.
158. As reported in **Volume 7, Chapter 26 Air Quality (application ref: 7.26)** the construction activity and Temporary Construction Compound dust impacts on the identified sensitive receptors are predicted to have very localised spatial extent, be short-term in duration and intermittent. **Volume 7, Chapter 26 Air Quality (application ref: 7.26)** concludes:
- All scenarios
 - The dust and PM₁₀ emission risk of effects for human health is considered to be low for earthworks, construction and trackout. It is anticipated that the risk of dust effects would be the same under all scenarios. Dust mitigation measures are incorporated within the **Outline Code of Construction Practice (Volume 8, application ref: 8.9)** and will be included in the final COCP (Secured by DCO Requirement). A Travel Plan and further dust management measures are included in the **Outline Construction Traffic Management Plan (Volume 8, application ref: 8.13)**. Effects following mitigation measures are considered to be not significant.
 - DBS East or DBS West In Isolation
 - The results of the construction phase road traffic emissions assessment show that annual mean concentrations of Nitrogen dioxide (NO₂), particulate matter (PM) including PM₁₀, and PM_{2.5} are predicted to be well below (i.e. less than 75% of) the respective air quality Objectives in the peak construction (2026) Scenario 1 (DBS East or DBS West In Isolation) at all receptors, both ‘with’ and

‘without’ DBS East or DBS West in place, including in the city of Hull. Therefore, this is deemed to be a **negligible** effect.

- DBS East and DBS West Concurrently
 - The assessment concluded that impacts generated by road traffic upon local air quality (NO₂, PM₁₀ and PM_{2.5} concentrations) with DBS East and DBS West Concurrent construction scenario are considered to be **negligible**.

159. In terms of population health, occasionally, weather conditions may coincide with construction activities to generate higher levels of dust. This can cause temporary annoyance, and for people with existing poor health, higher levels of coarse dust in the air it can exacerbate some conditions (e.g. asthma). Coarse PM is larger and heavier and so it is deposited more quickly, this includes dusts containing any mobilised contaminants. This means that the concentration of coarse PM in the air reduces rapidly as it gets further from the source. The potential for polluting or nuisance-type dust effects is therefore expected to be *occasional* and limited in extent. Deposition rates are slower for finer PM and affect a wider area and thus, potentially, a greater number of people. However, exposure is expected to be *very low* due to the finer PM being typically a relatively small component of construction dusts and the effects of dispersion would reduce concentrations over distance. At these levels it is unlikely that there would be discernible changes in the risk of developing a new health condition or of exacerbating an existing condition. Such changes would occur over the *medium-term* construction period, albeit for shorter periods at any given location, with a *minor* influence on quality of life and/or morbidity risk for respiratory and cardiovascular conditions for a *small minority* of the population. Most effects on wellbeing would *rapidly* reverse, with *no* discernible influence for healthcare services. The transitory nature of the works along the Onshore Export Cable Corridor is relevant and indicates that at any given location exposures would be of shorter duration.



27.6.1.3.2 Sensitivity of Receptor – All Scenarios

160. The following conclusions on population sensitivity apply to all scenarios.
161. The sensitivity of the general population is **low**. Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 27.4.3.5. The general population comprise those members of the community who live, work and study at a distance where high levels of dispersion and deposition would greatly limit the effects any change in exposure due to the Projects. Furthermore, most people enjoy good respiratory health (e.g. are not asthmatic) and are not at a life stage (e.g. infant or frail elderly) with particular sensitivity to air quality.
162. The sensitivity of the vulnerable group population is **high**. This reflects that the sub-population includes a high representation of dependants, both children, elderly and those receiving care due to poor health. For example, existing respiratory conditions including asthma COPD and type 2 diabetes would increase sensitivity. People likely to be most affected by the Projects are those living close to the onshore works.

27.6.1.3.3 Significance of Effect – All Scenarios

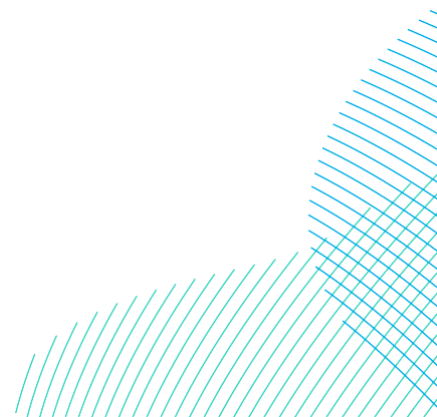
163. All scenarios have been considered by the assessment and the conclusion on significance is the same.
164. The effect is characterised as being *adverse* in direction, *temporary* and *direct*. For the health assessment, the construction air quality effects are considered **minor** adverse (not significant). This assessment conclusion reflects that whilst the scientific literature establishes a causal effect relationship between changes in air quality and health outcomes, the changes would result in a very limited effect in the health baseline of the local population. This finding takes into account potential for mobilisation of new or historic contaminants in construction dusts, as well as non-threshold effects of PM_{2.5} and NO₂, particularly for vulnerable sub-populations. The temporary and slight reduction in air quality is not expected to affect health inequalities. All air quality changes are predicted to be well within statutory standards set for health protection.

27.6.1.3.4 Mitigation and Residual Significance of Effect – All Scenarios

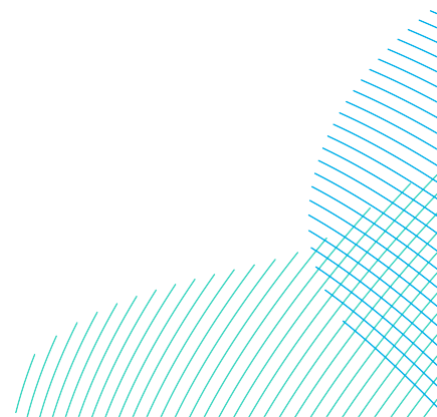
165. Based on the low magnitude and high sensitivity in the vulnerable group population (which is used to reflect the role of potential inequalities, see paragraph 64), the significance of effect would be **minor** adverse. No additional mitigation is considered to be required.

27.6.1.4 Impact 4: Bio-Physical Environment: Water

166. This section considers onshore and nearshore water quality implications for population health of potential pollution releases during construction.
167. During construction, there is potential for the accidental release of lubricants, fuels and oils from construction machinery. This can occur because of spillages, leakage from vehicle storage areas and direct release from construction machinery working directly in or adjacent to water bodies, including land drainage channels. Bentonite, which is an inert clay-based material used at the drillhead during the installation of trenchless crossings, can breakout during use and cause smothering of habitats, although it is inert and not a pollutant.
168. Pollution of surface water or groundwater bodies which are subsequently used as a potable source could pose a risk to public health. The Onshore Development Area is predominately agricultural and food safety could be compromised by contamination affecting agricultural land directly, or indirectly contaminating agricultural water sources. This includes contamination that occurs during flood events.
169. Bathing water quality at the nearshore of the possible landfall locations may be temporarily affected by activities of the offshore cable corridor (including trenchless installation works such as Horizontal Direction Drilling (HDD)). The key health outcomes relevant to this determinant of health arise from toxicological exposure by skin contact, accidental swallowing of water or inhalation and can cause a wide range of acute or chronic illnesses.
170. Changes to water quality onshore and nearshore may be due to either new accidental pollutant spills or mobilisation of historic pollutants. In both cases standard good practice pollution control measures form part of construction management plans. Increased suspended sediment concentrations (SSC) that do not pose toxicological risk may discourage bathing but are not expected to pose direct risks to population health. The indirect effects are covered as part of the physical activity discussion in section 27.6.1.1.
171. This section has been informed by **Volume 7, Chapter 8 Marine Physical Environment (application ref: 7.8)** and **Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20)**, which set out relevant assessment findings and mitigation measures that have been taken into account.
172. The potential effect is considered plausible as there is a theoretical source-pathway-receptor relationship:



- The source is mobilisation of contaminants or sediment or new leaks or spills of pollutants.
 - The pathway is transmission through marine or onshore waters. Exposure includes ingestion and dermal contact.
 - Receptors are populations of residents and visitors.
173. Furthermore, the theoretical effect is considered applicable in the context of these Projects.
174. The population groups relevant to this assessment are:
- The site specific population, see section 27.3.1;
 - The local population of East Riding of Yorkshire; and
 - The sub-population vulnerable due to young age, old age, low income, poor health, social disadvantage or access and geographical factors (for example, people for whom alternative opportunities may be limited).
175. The scientific literature identifies the following general points relevant to potential exposures and health outcomes. Recreational exposure to natural toxins by skin contact, accidental swallowing of water or inhalation can cause a wide range of acute or chronic illnesses (Koreivienė et al., 2014). Drinking water supplies from both surface water and groundwater sources may be contaminated during flooding events (Andrade et al., 2018). Use of spray irrigation with contaminated water is a risk factor for contamination in fruits and vegetables.
176. The safety of water supplies is of paramount public health importance. Good hydration is vital for good health and well-being. There is increasing evidence of the links between water intake and physical disease and cognitive performance (Gandy, 2015). Although microbiological contamination is the largest contribution to waterborne disease and mortality at a global scale, chemical contaminants in water supplies also can cause disease, sometimes after long periods of exposure. Water supplies often include mixtures of chemical contaminants at negligible concentrations that vary in time and space. However, drinking-water quality is regulated and monitoring is conducted routinely (Villanueva et al., 2014). This ensures that drinking water guidelines are not exceeded.



27.6.1.4.1 Magnitude of Impact – All Scenarios

177. **Volume 7, Chapter 8 Marine Physical Environment (application ref: 7.8)**

concludes:

- DBS East or DBS West In Isolation
 - The effect on suspended sediment concentrations due to foundation installation, drill arisings from foundation installation, cable installation, and landfall HDD installation is considered to be **negligible**. Any changes in suspended sediment will be short-lived and considering the coarse-grained nature of the seabed, any disturbed sediment would settle back to the seabed in close proximity to the area of disturbance.
 - The effects on water quality due to the release of sediment bound contaminants are considered to be **negligible**.
- DBS East and DBS West Concurrently
 - If both DBS East and DBS West are constructed together, a larger volume of sediment would be disturbed over the entire construction phase which may result in higher concentrations of suspended sediment overall. However, suspended sediment concentrations arising from one foundation installation are unlikely to persist for a sufficiently long period of time for them to interact with subsequent operations. Therefore, the construction of DBS East and DBS West together would not result in a more significant effect than DBS East or DBS West In Isolation, and the effect is considered to be **negligible**.
 - Construction of DBS East and DBS West together would not result in a more significant effect than DBS East or DBS West In Isolation. As a result, the significance of effect is predicted to be **negligible**.

178. **Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20)**

concludes:

- DBS East or DBS West In Isolation
 - Significance of effect on each watercourse resulting from the accidental release of contaminants during construction of the Projects In Isolation is considered to be **negligible to minor** adverse. These are worst case effects which may be reduced further for the In Isolation Scenario due to narrower corridor swathe and smaller landfall and Substation Zone compounds.

- Significance of effect on each watercourse resulting from the direct disturbance of surface water bodies due to construction of the Projects In Isolation is considered to be **negligible to minor** adverse, except for Beverley and Barmston Drain, which is **moderate** adverse. Best practice mitigation measures at trenched crossings of Ordinary watercourses will reduce all effects to not significant.
 - DBS East and DBS West Concurrently
 - Significance of effect on each watercourse resulting from the accidental release of contaminants during construction of the Projects together is considered to be **negligible to minor** adverse.
 - Construction activities will adhere to industry good practice measures, therefore impacts will reduce to **negligible** in all catchments except for the Catchwater Drain, which will reduce from **medium** to low. All effects are judged to be not significant.
179. In terms of population health, magnitude of change has been considered for all the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially. The Concurrent Scenarios is considered the worst case due to potential for greater mobilisation of sediments and therefore higher concentrations of any exposures. In all scenarios the magnitude of change for population health due to the Projects is **low**. This reflects that nearshore works would result in high dispersion in relation to bathing waters and the use of standard good practice mitigations to avoid and contain any spills or appropriately respond to historic contamination encountered. It is considered unlikely that SSC would be directly harmful or could have secondary effects, e.g. via toxic algal blooms.
180. Whilst **Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20)** identifies the potential for some localised effects to a limited number of water courses, these are not considered to pose a risk to public health.
181. In terms of population health, the level of exposure to any contaminants would likely be *very low, short-term* and associated with *one-off* events. The severity of health outcomes would likely relate to a *minor* change in *mortality or morbidity* related risk factors associated with toxin exposures for a *very few* people. At most there may be *slight* healthcare service implications.



27.6.1.4.2 Sensitivity of Receptor – All Scenarios

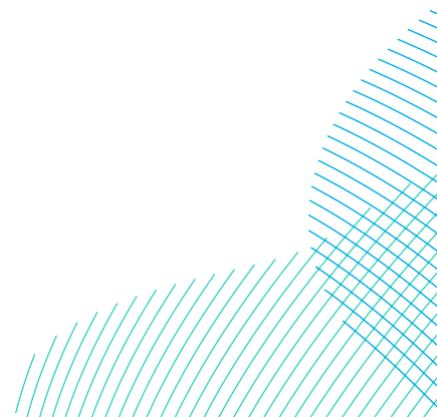
182. The following conclusions on population sensitivity apply to all scenarios.
183. The sensitivity of the general population is **low**. Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 27.4.3.5. This reflects many people would make limited use of coastal waters for bathing or related recreation. The potential for any effect to public water supplies is considered very limited, with the great majority of people having water supplies that would be unaffected. The general population includes those who are in good health and less likely to be adversely affected by contaminants.
184. The sensitivity of the vulnerable group population is **high**. Vulnerability in this case relates to people more sensitive due to life stage or health status. For example, children and young people may spend more time in coastal waters and due to developmental stage or relative body size have increases risks from a given toxin exposure. Increase sensitivity to exposure may also apply to older people and those with existing poor health (e.g. long-term illness).

27.6.1.4.3 Significance of Effect – All Scenarios

185. All scenarios have been considered by the assessment and the conclusion on significance is the same.
186. The effect is characterised as being *adverse* in direction, *temporary* and *direct*. The significance of the population health effect for this determinant of health is **minor** adverse (not significant). This conclusion reflects that although there are credible pathways in the scientific literature by which bathing waters and onshore waters (surface or ground) may be affected, these are addressed by mitigation and there is therefore potential for only a *very limited* effect on the population health baseline. Water quality is expected to be *well within* standards for bathing and drinking water and the changes are *not* expected to affect delivery of health policy or influence inequalities.

27.6.1.4.4 Mitigation and Residual Significance of Effect – All Scenarios

187. Based on the low magnitude and high sensitivity in the vulnerable group population (which is used to reflect the role of potential inequalities, see paragraph 64), the significance of effect would be **minor** adverse. No additional mitigation is considered to be required.



27.6.1.5 Impact 5: Bio-Physical Environment: Soil Contamination

188. Linked to the issue of air and water quality discussed in sections 27.6.1.3 and 27.6.1.4 respectively, the source of contaminants may include new or historic soil-based pollutants or toxins. Occupational soil contamination exposures are governed by statutory health and safety requirements, appropriately avoiding or reducing risks to the construction workforce, including through working practices, management plans and personal protective equipment. For the community, the potential for exposures may either be via water, as discussed in section 27.6.1.4, or via construction dusts as discussed in section 27.6.1.3. Given restricted access to the onshore works construction areas, including due to fencing, it is unlikely that there is the potential for the community to have direct contact with contaminated soils to an extent that could affect public health. This issue is not assessed further as a separate issue.
189. **Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19)** concludes, for all scenarios, that with the implementation of the embedded mitigation measures and additional mitigation measures detailed in Chapter 19, the residual effect due to exposure to potentially contaminated soils, ground gas and vapours during construction is considered to be minor adverse (not significant). Similarly impacts to groundwater and aquifers; surface water quality; and agricultural land are considered to be of minor adverse significance (not significant) for both construction workers and community residents.

27.6.1.6 Impact 6: Bio-Physical Environment: Noise Disturbance

190. This section discusses nearshore and onshore changes in noise and vibration exposure during construction that may be detrimental to population health. Some specific activities such as trenchless crossings and concrete pouring require periods of night-time working, however the majority of works would occur during normal daytime construction working hours. Noise effects may also arise from construction transport activities.
191. This section has been informed by **Volume 7, Chapter 25 Noise (application ref: 7.25)**, which sets out relevant assessment findings and mitigation measures that have been taken into account.
192. The potential effect is considered plausible as there is a theoretical source-pathway-receptor relationship:
- The source is noise generated by construction activities and vehicle movements.
 - The pathway is pressure waves through the air.

- Receptors are residents and long-term occupiers of nearby properties and community buildings.
193. Furthermore, the theoretical effect is considered applicable in the context of these Projects.
194. The population groups relevant to this assessment are:
- The site specific population, see section 27.3.1;
 - The local population of East Riding of Yorkshire;
 - The regional population of Yorkshire and Humber and the city of Hull; and
 - The sub-population vulnerable due to young age, old age, low income, poor health, social disadvantage or access and geographical factors (for example, people for whom alternative opportunities may be limited).
195. The scientific literature identifies the following general points. Evidence suggests cardiovascular effects, annoyance and sleep disturbance (and consequences arising from inadequate rest) as being the main pathways by which population health may be affected (Peris & Fenech, 2020). The literature also notes the potential for chronic noise to have a detrimental effect on learning outcomes (e.g. noise distracting and affecting communication within classrooms) (Peris & Fenech, 2020). Whilst the literature supports there being thresholds at which effects (such as annoyance and sleep disturbance) are likely, it also acknowledges the subjective nature of responses to noise. In this regard noise effects can be considered to have non-threshold effects, with characteristics other than sound levels also determining the influence on health outcomes (Basner et al., 2014).
196. The health assessment has regard to the population groups identified in the literature that may be particularly sensitive. For example, children, the elderly, the chronically ill, people with a hearing impairment, shift-workers and people with mental illness (e.g., schizophrenia or autism).



27.6.1.6.1 Magnitude of Impact – All Scenarios

197. Magnitude of change has been considered for all the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially. Whether the concurrent or Sequential Scenario is worst case depends on subjective responses to noise. Generally sequential effects which extend the level of noise disruption over a longer period are likely to be slightly worse, though at some locations the higher noise levels of concurrent exposure may cause a greater, albeit more temporary, effect on quality of life. The main health outcome is likely to be an annoyance related. Physiological effects of long-term exposure to road traffic noise are considered unlikely for temporary construction traffic. In all scenarios the magnitude of change for population health due to the proposed construction works is **low**.
198. **Volume 7, Chapter 25 Noise (application ref: 7.25)** concludes:
- All scenarios
 - Prior to the commencement of construction activity, a CoCP will be prepared detailing site-specific noise control measures to be adopted throughout construction. Following the implementation of the noise control measures agreed through the **Outline Code of Construction Practice (Volume 8, application ref: 8.9)**, the residual effect from landfall construction activities, should the Projects be built In Isolation or Concurrently, is considered to be **minor adverse**.
 - After implementation of generic mitigation and specific targeted noise control measures the residual effect for on-site construction noise at Temporary Construction Compounds and HDD locations is considered **minor adverse**.
 - The effect of on-site construction noise at the Onshore Converter Stations is considered to be a **minor adverse** effect if the Projects are built Concurrently or In Isolation.
 - Following the implementation of agreed traffic measures within the **Outline Construction Traffic Management Plan (Volume 8, application ref: 8.13)**, noise from off-site construction traffic is considered **minor adverse** for all project scenarios.
 - Vibration impacts for all project scenarios are predicted to be no greater than **minor adverse** effect.

199. As reported in **Volume 7, Chapter 25 Noise (application ref: 7.25)**, construction along the Onshore Export Cable Corridor would involve activities that are mobile (i.e. only temporarily taking place at a given location during the construction period), such as trenching for cable laying; and activities that are static such as construction of the Onshore Converter Stations. Mobile works will impact receptors for short periods of time, whereas static works will last longer. Noise and vibration impacts from construction activities and construction traffic will be mitigated through the use of appropriate construction hours and best practice measures detailed in **Volume 7, Chapter 25 Noise (application ref: 7.25)**. The elevated noise level at a small number of representative receptor locations reported in **Volume 7, Chapter 25 Noise (application ref: 7.25)** (e.g., R3, R43 and R66 relating to nighttime HDD construction works) are taken into account, and mitigation to avoid significant residual effects to these receptors is discussed in Chapter 25.
200. In terms of population health, the *small* scale of change in noise levels is likely to predominantly relate to a *minor* change in quality of life and/or cardiovascular and mental wellbeing morbidity for a *small minority* of the community populations along the new Onshore Export Cable Corridor. The changes would be over the *medium-term* construction period, albeit short-term at any given location due to the transitory nature of works and relate to *frequent* construction related noise exposures. The greatest potential for effects is likely for the *few people* close to either the landfall HDD and Transition Joint Bay works, or the Onshore Converter Stations. Prolonged periods of construction noise at night or daytime disruption of educational activities at schools (e.g. Skipsea Primary School or Longcroft School in Beverley) are not anticipated.

27.6.1.6.2 Sensitivity of Receptor – All Scenarios

201. The following conclusions on population sensitivity apply to all scenarios.
202. The sensitivity of the general population is **low**. Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 27.4.3.5. The general population comprise those members of the community in good physical and mental health and with resources that enable a high capacity to adapt to change. Additionally, most people live, work or study at a distance from the onshore works where construction noise and vibration would be unlikely to be a source of concern.

203. The sensitivity of the vulnerable group population is **high**. This reflects that the sub-population includes a high representation of dependants, both children, elderly and those receiving care due to poor health. This sub-population may experience existing widening inequalities due to living in areas with increased noise and elevated deprivation, with limited capacity to adapt to changes. Vulnerability particularly relates to those living close to the construction activities and Temporary Construction Compounds, including those spending more time in affected dwellings, e.g. due to low economic activity, shift work or poor health. People who are concerned or have high degrees of uncertainty about construction noise and its effect on their wellbeing may be more sensitive to changes in noise. Individuals with neuro-diversity, learning disabilities, or a mental health condition are likely to be present within the population and may also be more sensitive to changes in noise, which has been taken into account. The small population living at the coastal edge of Skipsea may experience nearshore noise (noise can travel longer distances across water than land) as well as night-time landfill HDD noise and noise associated with the Transition Joint Bays. Occupants of dwellings with less acoustic insulation properties, such as caravans and similar, may be more sensitive to noise effects. Schools, e.g. at Skipsea and Beverley, are considered sensitive in terms of educational outcomes affected by noise.
204. **Volume 7, Chapter 25 Noise (application ref: 7.25)** identifies a total of 51 noise sensitive receptor locations to represent the worst case effects. The majority of the receptors are residential, two are educational (R5 and R29) and one relates to healthcare (R33).

27.6.1.6.3 Significance of Effect – All Scenarios

205. All scenarios have been considered by the assessment and the conclusion on significance is the same.
206. The effect is characterised as being *adverse* in direction, *temporary* and *direct*. Construction noise impacts of the Projects are considered to result in a **minor** adverse (not significant) effect on population health. This assessment conclusion reflects that although the scientific literature indicates a *clear* association between elevated and sustained noise disturbance and reduced health outcome, the changes would result in a *very limited* effect in the health baseline of the population. The temporary construction noise is *not* expected to affect health inequalities. The level of effect is *not* expected to affect the ability to deliver local or national health policy. The score takes into account the subjective, and therefore non-threshold, nature of noise, including that tonal and other characteristics influence the effect on wellbeing.

27.6.1.6.4 Mitigation and Residual Significance of Effect – All Scenarios

207. Based on the low magnitude and high sensitivity in the vulnerable group population (which is used to reflect the role of potential inequalities, see paragraph 64), the significance of effect would be **minor** adverse. No additional mitigation is considered to be required.

27.6.1.7 Impact 7: Economic Environment: Workforce Upskilling

208. This section considers the population health implications of additional upskilling and educational support to the construction workforce.

209. The scientific literature identifies the following general points. Increased educational attainment is associated with better health outcomes and delayed mortality. Education is an important indicator of socioeconomic status and is associated with subsequent income, employment, social networks, and behaviours.

210. The Projects are associated with general construction workforce upskilling opportunities.

211. This section has been informed by **Volume 7, Chapter 28 Socio-economics (application ref: 7.28)**, which sets out relevant assessment findings and mitigation measures that have been taken into account.

212. The potential effect is considered plausible as there is a theoretical source-pathway-receptor relationship:

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

213. Furthermore, the theoretical effect is considered applicable in the context of these Projects.

214. The population groups relevant to this assessment are:

- The site specific population, see section 27.3.1;
- The local population of East Riding of Yorkshire;
- The regional population of Yorkshire and Humber; and
- The sub-population vulnerable due to young age, old age, low income, poor health, social disadvantage or access and geographical factors (for example, people for whom alternative opportunities may be limited).

215. The scientific literature identifies the following general points relevant to potential effects and health outcomes. Increased educational attainment is associated with better health outcomes and delayed mortality. Education is an important indicator of socio-economic status and is associated with subsequent income, employment, social networks, and behaviours (Byhoff et al., 2017). Training improves the likelihood of good earnings (Lindeboom et al., 2009) and is generally associated with better health (Behrman et al., 2011).

27.6.1.7.1 Magnitude of Impact – All Scenarios

216. Magnitude of change has been considered for all the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially. In all scenarios the magnitude of change for population health due to the Projects is **negligible**. The worst case would be either DBS East or DBS In Isolation, as this would be a smaller scale of workforce with fewer upskilling opportunities. Whether sequential or concurrent there are expected to be similar levels of overall opportunity.

217. **Volume 7, Chapter 28 Socio-economics (application ref: 7.28)** concludes:

- The effect associated with the employment supported by the construction of DBS East or DBS West In Isolation, Concurrently or Sequentially is assessed as minor beneficial with respect to the Humberside economy and negligible beneficial with regards to the UK economy.

218. In terms of population health, based on current commitments, the scales of new training opportunities is expected to be *very small* over the *medium-term*. The opportunities would vary with some being *one-off* and others being *continuous* learning opportunities, e.g. apprentices. The health effect is characterised as a *minor* change in *morbidity* for risk factors related to educational outcomes for a *very few people*.

27.6.1.7.2 Sensitivity of Receptor – All Scenarios

219. The following conclusions on population sensitivity apply to all scenarios.

220. The sensitivity of the general population is **low**. Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 27.4.3.5. This reflects that most people in the local area would make use of alternative educational or training opportunities or have existing educational attainment appropriate to their vocation and career progression.

221. The sensitivity of the vulnerable group population is **high**. Vulnerability in this case is linked to young adults, in relation to apprenticeship opportunities, and children or young people, in relation to educational support initiatives. For both these groups those who are from disadvantaged backgrounds would be particularly sensitive to educational interventions that provide knowledge, new skills or personal development. Young people leaving education or early in their careers may have the most to gain from an increase in training opportunities as a pathway into good quality local employment.

27.6.1.7.3 Significance of Effect – All Scenarios

222. All scenarios have been considered by the assessment and the conclusion on significance is the same.

223. The effect is characterised as being *beneficial* in direction, *permanent* in supporting ongoing future career progression and *indirect*. The significance of the population health effect for this determinant of health is **negligible** beneficial (not significant). This conclusion reflects the scientific literature supports a *clear* association between educational outcomes and health outcomes, with the potential for a *very limited* change in the population health baseline, reflecting existing commitment levels. This change could have a supportive influence on delivering health policy, including strategic health priorities and narrowing inequalities where vulnerable groups are targeted by and take-up the training opportunities.

27.6.1.7.4 Mitigation and Residual Significance of Effect – All Scenarios

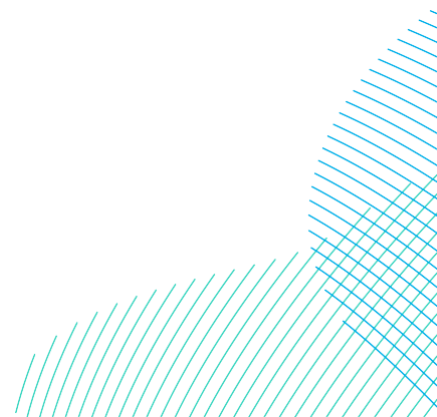
224. Based on the negligible magnitude and high sensitivity in the vulnerable group population (which is used to reflect the role of potential inequalities, see paragraph 64), the significance of effect would be **negligible** beneficial.

27.6.1.8 Impact 8: Economic Environment: Employment and Investment

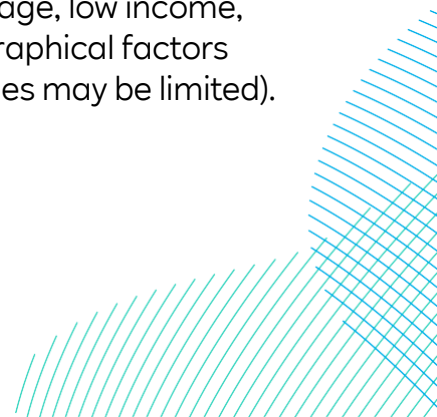
225. This section considers the population health implications of increased employment and economic impacts during construction.

226. If DBS East or DBS West were built in isolation, at its peak (Q4 2029), construction activity is expected to support a total of 900 jobs across Humberside and 1,470 jobs across the UK.

227. If DBS East and DBS West are built together, at its peak (Q4 2029), construction activity is expected to support a total of 1,240 jobs across Humberside and 2,150 jobs across the UK.



228. The scientific literature identifies the following general points. Employment is an important determinant of health and well-being both directly and indirectly by making health-promoting resources available to an employee and any dependants. The socio-economic benefits associated with employment are improved living conditions and the potential to make healthier choices, e.g. eating a healthier diet and undertaking more physical activity. If members of the community are employed, this can also generate indirect economic activity.
229. Economic effects may also arise from disruption caused by the Projects to local trades and business. The area around landfall at Skipsea includes holiday accommodation, as well as associated retail and services that cater to a visiting population. Offshore and nearshore there is also the potential to affect commercial leisure and fisheries activities that support the local economy. Inland effects are less likely, though may be influenced by construction traffic.
230. This section has been informed by **Volume 7, Chapter 13 Commercial Fisheries (application ref: 7.13)**, **Volume 7, Chapter 14 Shipping and Navigation (application ref: 7.14)**, **Volume 7, Chapter 28 Socio-economics** and **Volume 7, Chapter 29 Tourism and Recreation (application ref: 7.29)**, which set out relevant assessment findings and mitigation measures that have been taken into account.
231. The potential effect is considered plausible as there is a theoretical source-pathway-receptor relationship:
- The source is changes in direct and indirect jobs and economic activity.
 - The pathway is good quality employment providing more health supporting resources.
 - Receptors are people of working age (and their dependants), including vulnerable groups that may be disproportionately affected.
232. Furthermore, the theoretical effect is considered applicable in the context of these Projects.
233. The population groups relevant to this assessment are:
- The site specific population, see section 27.3.1;
 - The local population of East Riding of Yorkshire;
 - The regional population of Yorkshire and Humber; and
 - The sub-population vulnerable due to young age, old age, low income, poor health, social disadvantage or access and geographical factors (for example, people for whom alternative opportunities may be limited).



234. The scientific literature identifies the following general points relevant to potential effects and health outcomes. Employment is an important determinant of health and well-being both directly and indirectly by making health-promoting resources available to an employee and any dependants. The socio-economic benefits associated with employment are improved living conditions and the potential to make healthier choices, e.g. eating a healthier diet and undertaking more physical activity. If members of the community are employed, this can also generate indirect economic activity.
235. There is strong evidence for a protective effect of employment on depression and general mental health. Statistics showed favourable effects on depression (OR=0.52; 95% CI 0.33 to 0.83) and psychological distress (OR=0.79; 95% CI 0.72 to 0.86) (van der Noordt et al., 2014). Unemployment is associated with poor health outcomes, with more negative health effects linked to lower socio-economic status and unemployment due to health reasons, whilst a strong social network is beneficial in reducing the health effects of unemployment (Norström et al., 2014).

27.6.1.8.1 Magnitude of Impact – All Scenarios

236. Magnitude of change has been considered for all the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially. It is likely that for adverse economic effects prolonged disruption of local business would be the worst case, i.e. the Sequential Scenario. The worst case for beneficial employment opportunities would be either DBS East or DBS In Isolation, as this would be a smaller scale of workforce with fewer job opportunities. The health effects of construction employment benefits of the concurrent and Sequential Scenarios are likely to be similar. In all scenarios the magnitude of change for population health due to the Projects is **low**.
237. **Volume 7, Chapter 13 Commercial Fisheries (application ref: 7.13)** concludes for all scenarios:
- With the Dogger Bank Special Area of Conservation (SAC) byelaw in place which prohibits bottom towed gear within the entire SAC, there is **no significant change** predicted within the DBS Array Areas for all receptor groups.
 - With the Dogger Bank (SAC) byelaw revoked and bottom fishing activity is permitted again within the boundary of the SAC.
 - The significance of effect for loss or restricted access to fishing grounds during construction for all project scenarios is considered to be **negligible to minor** adverse for all receptor groups.

- Following mitigation measures, a residual effect for inshore static gear vessel receptor groups is considered to be **minor** adverse.
 - The effect relating to displacement of fishing activity leading to gear conflict and increased pressure on adjacent grounds during construction is considered **negligible** to **minor** adverse for all receptor groups for all project scenarios.
 - The effect of increased steaming times is deemed **minor** adverse for all project scenarios.
 - The risk of loss or damage of gear due to snagging during construction is considered to be there **no change** for all receptor groups.
 - The impact on supply chain opportunities during construction is considered to be **negligible** to **minor** beneficial for all receptor groups.
 - The impact on commercially important fish and shellfish during construction is considered **negligible** to **minor** adverse for all receptor groups.
 - The effect on navigational safety during construction is considered to be **no change** for all receptor groups.
238. **Volume 7, Chapter 14 Shipping and Navigation (application ref: 7.14)** conclusions are set out at paragraph 113.
239. **Volume 7, Chapter 28 Socio-economics (application ref: 7.28)** concludes:
- All scenarios:
 - The effect on expenditure and employment is assessed as **minor** beneficial with respects to the Humberside economy and as **negligible** with respects to the UK economy.
240. **Volume 7, Chapter 29 Tourism and Recreation (application ref: 7.29)** concludes:
- DBS East or DBS West In Isolation
 - The effect of the Projects In Isolation are not assessed.
 - DBS East and DBS West Together
 - The effect of the construction of the Projects on the tourism economy is assessed as negligible for the Local Area.

241. In terms of population health, there are anticipated to be relatively *small* scales of change in direct and indirect employment, beneficial or adverse, in the context of the local labour market. The direct construction employment is likely to be *medium-term* and on a *continuous* basis, whether full-time or part-time. The duration of disruption that could adversely affect local businesses, whether related to leisure, tourism or fisheries, is likely to be shorter term due to the transitional nature of works at any given location. Where effects are localised, e.g. at landfall or the Onshore Converter Stations there is unlikely to be a widescale adverse effect due to the works that could significantly affect population health. Employment and economic effects, both beneficial and adverse, are likely to be associated with *minor* changes in *morbidity* and *quality of life* for a *small minority* of the population.

27.6.1.8.2 Sensitivity of Receptor – All Scenarios

242. The following conclusions on population sensitivity apply to all scenarios.
243. The sensitivity of the general population is **low**. Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 27.4.3.5. This reflects that most people would already be within stable employment that would be unaffected by the Projects (or being a dependant of such a person).
244. The sensitivity of the vulnerable group population is **high**. Vulnerability in this case relates to people and their dependants who are on low incomes, have poor job security, poor working conditions or who are unemployed. Future young or older people may also come to rely on those employed. Owners and employees of business experiencing large direct or indirect effects, positive or negative, due to the Projects would be particularly sensitive.

27.6.1.8.3 Significance of Effect – All Scenarios

245. All scenarios have been considered by the assessment and the conclusion on significance is the same.
246. The effect is characterised as being *beneficial* and *adverse* in direction, *temporary* and *indirect*. The significance of the population health effect for this determinant of health is **minor** beneficial (not significant) and **minor** adverse (not significant). This conclusion reflects that employment has a *clear* association with better health outcomes in the scientific literature and the Projects are likely to make *slight* positive and negative contribution to the local health baseline. Such effects are likely to have a *marginal* effect on delivering health policy and on narrowing health inequalities.

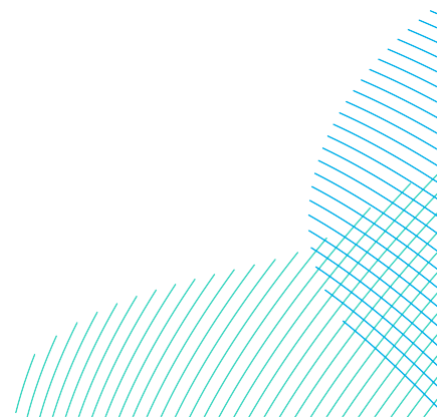
27.6.1.8.4 Mitigation and Residual Significance of Effect – All Scenarios

Based on the low magnitude and high sensitivity in the vulnerable group population (which is used to reflect the role of potential inequalities, see paragraph 64), the significance of effect would be **minor** beneficial and **minor** adverse. No additional mitigation is considered to be required.

27.6.2 Potential Effects During Operation

27.6.2.1 Impact 1: Bio-Physical Environment: Noise Disturbance

247. This section discusses operational changes in noise exposure at the Onshore Converter Stations that may be detrimental to population health. Substations include fixed plant such as transformers and capacitors, which can cause community annoyance due to noise, including distinctive tonal characteristics. Noise effects from other operational activities are unlikely to have the potential to affect population health.
248. This section has been informed by **Volume 7, Chapter 25 Noise (application ref: 7.25)**, which sets out relevant assessment findings and mitigation measures that have been taken into account.
249. The potential effect is considered plausible as there is a theoretical source-pathway-receptor relationship:
- The source is noise generated by substation electrical infrastructure.
 - The pathway is pressure waves through the air.
 - Receptors are residents and long-term occupiers of nearby properties and community buildings.
250. Furthermore, the theoretical effect is considered applicable in the context of these Projects.
251. The population groups relevant to this assessment are:
- The site specific population, see section 27.3.1; and
 - The sub-population vulnerable due to young age, old age, low income, poor health, social disadvantage or access and geographical factors (for example, people for whom alternative opportunities may be limited).



252. The literature highlights cardiovascular effects, annoyance and sleep disturbance (and consequences arising from inadequate rest) as being the main pathways by which population health may be affected (Peris & Fenech, 2020). The literature also notes the potential for chronic noise to have a detrimental effect on learning outcomes (e.g. noise distracting and affecting communication within classrooms) (Peris & Fenech, 2020). Whilst the literature supports there being thresholds at which effects (such as annoyance and sleep disturbance) are likely, it also acknowledges the subjective nature of responses to noise. In this regard noise effects can be considered to have non-threshold effects, with characteristics other than sound levels also determining the influence on health outcomes (Basner et al., 2014).
253. The health assessment has regard to the population groups identified in the literature that may be particularly sensitive. For example, children, the elderly, the chronically ill, people with a hearing impairment, shift-workers and people with mental illness (e.g., schizophrenia or autism).

27.6.2.1.1 *Magnitude of Impact – All Scenarios*

254. Magnitude of change has been considered for all the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially. In all scenarios the magnitude of change due to the operational activities for population health is considered to be no greater than **low**. The worst case is likely to be DBS East and DBS Concurrently, as this would be a larger scale of new electrical infrastructure in operation with the greatest temporal overlap.
255. As reported in **Volume 7, Chapter 25 Noise (application ref: 7.25)**, daytime effects will be negligible and minor adverse effects during night-time.
256. In terms of population health, the small scale of change in noise levels is likely to predominantly relate to a *minor* change in quality of life for a *very few people*. That level of change, whilst appropriate to mitigate, is unlikely to constitute a population health effect. The change is expected to be *long-term* duration and *continuous*.

27.6.2.1.2 *Sensitivity of Receptor – All Scenarios*

257. The following conclusions on population sensitivity apply to all scenarios.
258. The sensitivity of the general population is **low**. Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 27.4.3.5. Most people live, work or study at a distance from the Onshore Converter Stations where noise effects would be imperceptible.

259. The sensitivity of the vulnerable group population is **high**. This reflects that the sub-population sensitive for reasons discussed in section 27.6.1.2. Vulnerability particularly relates to those living south of Beverley close to the Onshore Converter Stations, including those spending more time in affected dwellings, e.g. due to low economic activity, shift work or poor health. Individuals with neuro-diversity, learning disabilities, or a mental health condition are likely to be present within the population and may also be more sensitive to changes in noise, which has been taken into account.

27.6.2.1.3 Significance of Effect - All Scenarios

260. All scenarios have been considered by the assessment and the conclusion on significance is the same.
261. The effect is characterised as being adverse in direction, temporary and direct. Operational noise impacts of the Projects are considered to result in a **minor adverse** (not significant) effect on population health. This assessment conclusion reflects that although the scientific literature indicates a clear association between elevated and sustained noise disturbance and reduced health outcome, the changes would result in a very limited effect in the health baseline of the population. The operational noise is not expected to affect health inequalities. The level of effect is not expected to affect the ability to deliver local or national health policy. The score takes into account the subjective, and therefore non-threshold, nature of noise, including that tonal and other characteristics influence the effect on wellbeing.

27.6.2.1.4 Mitigation and Residual Significance of Effect - All Scenarios

262. Based on the low magnitude and high sensitivity in the vulnerable group population (which is used to reflect the role of potential inequalities, see paragraph 64), the significance of effect would be **minor** adverse. No additional mitigation is considered to be required.

27.6.2.2 Impact 2: Bio-Physical Environment: Public Concern and Understanding of Electro-Magnetic Field Risks

263. This section considers the potential onshore operational population health effect due to EMF exposure. All electrical systems, including natural processes and living organisms generate EMF. EMF effects diminish rapidly with distance, often requiring only a few metres, or less, to reach background levels.
264. In line with good practice, public understanding of risk in relation to operational EMF is assessed. This includes considering how mental health effects can be avoided or reduced through provisions of timely and non-technical information explaining on how actual health risks are mitigated.

265. As noted in section 27.2, the Planning Inspectorate and the UKHSA are satisfied with the actual risks of EMF to population health being scoped out of the health assessment based on the Projects' commitment to compliance with extant guidance and regulations. In this regard the Projects have adopted and implemented within their design relevant guidelines of the ICNIRP and the UK Government voluntary code of practice (**Commitments Register (Volume 8, application ref: 8.6)**). This includes considerations in relation to HVDC.
266. The focus of this assessment section is therefore not on the actual risk, which are considered appropriately mitigated, but on people's understanding of risks (risk perception). This relates to the potential for community concern about their proximity the electrical infrastructure, including buried cables and Onshore Converter Stations to affect mental health, even where relevant public EMF exposure guideline limits are met.
267. The potential effect is considered plausible as there is a theoretical source-pathway-receptor relationship:
- The source is electrical equipment introduced by the Projects;
 - The pathway is concern about field strength affecting mental health; and
 - Receptors are residents in the local community, particularly those living in close proximity to new electrical infrastructure.
268. Furthermore, the theoretical effect is considered applicable in the context of these Projects.
269. The population groups relevant to this assessment are:
- The site specific population, see section 27.3.1; and
 - The sub-population vulnerable due to young age, old age, low income, poor health, social disadvantage or access and geographical factors (for example, people for whom alternative opportunities may be limited).
270. The scientific literature identifies the following general points relevant to potential effects and health outcomes. The way risks are understood has important influences on health behaviour (Ferrer & Klein, 2015). Awareness of risk can affect mental, physical and emotional wellbeing, and can be worse when it is accompanied by uncertainty (Luria et al., 2009).



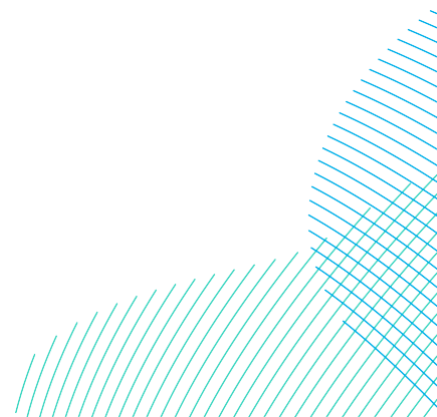
271. The ultimate goal of dialogue between regulators and communities is to produce an informed public (Sinisi, 2004). Trust, credibility, competence, fairness and empathy are of great importance (Sinisi, 2004) and the routine monitoring and clear communication of results can greatly increase trust, empower people and reduce fear factors (WHO, 2013a).
272. The views that people hold can be associated with low-grade illnesses (e.g. headaches or hypertension) and can be exacerbated when there is uncertainty (Luria et al., 2009).

27.6.2.2.1 *Magnitude of Impact - All Scenarios*

273. Magnitude of change has been considered for all the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially. In all scenarios the magnitude of change for population health due to the Projects is **low**. The worst case is likely to be DBS East and DBS Concurrently, as this would be a larger scale of new electrical infrastructure in operation with the greatest temporal overlap.
274. In terms of population health, the level of actual exposure is negligible, however the scale of change that may contribute to community concern about EMF is *medium, continuous and long-term*. The severity of the health outcome relates predominantly to a *minor* change in *mental health* related morbidity for a *very few* people within the population. Such individual level effects are unlikely to have implications for health service capacity. For many people there is likely to be a rapid reversal of effects should their concerns be responded to and resolved to their satisfaction.

27.6.2.2.2 *Sensitivity of Receptor - All Scenarios*

275. The following conclusions on population sensitivity apply to all scenarios.
276. The sensitivity of the general population is **low**. Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 27.4.3.5. Most people in the live, work or travel at a separation distance from the Project's electrical infrastructure where they would not be concerned about the potential for EMF risks. This group also includes that proportion of the population who are ambivalent or not concerned about EMF as a risk factor.



277. The sensitivity of the vulnerable sub-population is **high**. This reflects that the sub-population includes people who may be uncertain or concerned about EMF and this may exacerbate existing mental health conditions or be a source of stress and anxiety in itself. This may particularly be the case for people with near views and/or who live in close proximity to the Onshore Converter Stations. Low incomes or existing deprivation may contribute to a limited sense of control and reduced capacity to obtain further information.

27.6.2.2.3 Significance of Effect - All Scenarios

278. All scenarios have been considered by the assessment and the conclusion on significance is the same.
279. The significance of the population health effect is **minor** adverse (not significant). The professional judgment is that there could be a *slight* adverse change in the health baseline for the local population if concerns are widespread. This conclusion reflects scientific understanding of the impact of uncertainty or concern about environmental risks on mental health. It also reflects that the actual risks would be well within regulatory standards for EMF and that most members of the public would expect this to be the case. The context that electrical transmission infrastructure and substations are relatively common features would also be expected to inform population risk perception.

27.6.2.2.4 Mitigation and Residual Significance of Effect - All Scenarios

280. Based on the low magnitude and high sensitivity in the vulnerable group population (which is used to reflect the role of potential inequalities, see paragraph 64), the significance of effect would be **minor** adverse.
281. The following mitigation is proposed. The sharing with communities, particularly those in south Beverley near the Onshore Converter Stations, of non-technical summary information about EMF regulatory standards, the actual negligible EMF risks of the Projects. This information sharing to reduce uncertainty and support a shared understanding could be via a website and/or posted leaflets. Information relevant to HVDC would be included. This mitigation is outlined within **Appendix B, Outline Communications and Public Relations Procedure (Volume 8, application ref: 8.9)** of the **Outline Code of Construction Practice (Volume 8, application ref: 8.9)** which is secured through the DCO.
282. The residual significance of the effect on mental health from public uncertainty or concern about EMF risks would be **negligible** (not significant).

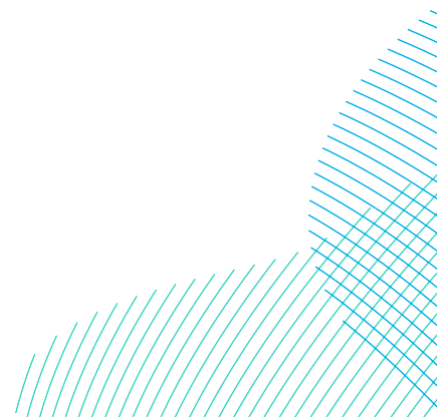
27.6.2.3 Impact 3: Bio-Physical Environment: Climate Change

283. This section considers the population health implications of the contribution of the Projects to reducing the effects of climate change.
284. If DBS East or DBS West were built In Isolation there would be a total generating capacity of 1.5 GW from the installation of up to 100 turbines.
285. If DBS East and DBS West are built together there would be a total generating capacity of 3.0 GW from the installation of up to 200 turbines installed across both Projects.
286. Renewable energy generation supports avoiding adverse health effects associated with climate change. These include extreme temperature effects, infectious diseases occurrence, food insecurity and injury. These effects relate to the UK population, but also the global population, particularly deprived populations in low- and middle-income countries.
287. There are important global inequalities in the effects of climate change, with the greatest adverse effects on health expected in the some of the poorest and least economically developed populations. In contrast, populations that benefit from rapid social and economic development are expected to experience reduced (but not eliminated) adverse effects to health from climate change. Changes in health outcomes related to climate change are therefore expected to be relatively small in the UK. When considering health and well-being, there is a global responsibility to reduce the effect of climate-altering pollutants that are expected to reduce health outcomes in low- and middle-income countries. The Intergovernmental Panel on Climate Change states that there are opportunities to achieve co-benefits from actions that reduce emissions of climate altering pollutants and at the same time improve health.
288. This section is informed by **Volume 7, Chapter 30 Climate Change (application ref: 7.30)**, which concludes:
- The Projects would result in a reduction in the release of GHG's to the atmosphere by approximately 181 million tonnes CO₂e, compared to the without-project baseline (i.e. electricity produced by gas), and will provide a renewable source of electricity which beneficially contributes to the UK's goal of achieving net zero emissions by 2050.
289. The potential effect is considered plausible as there is a theoretical source-pathway-receptor relationship:
- Source: renewable energy created during the operation of the wind farms.

- Pathway: reduction in climate-altering pollutants contribute to climate change, which is associated with global changes in temperature, crop yields, productivity and disease prevalence.
 - Receptor: international global population, particularly deprived populations in low- and middle-income countries.
290. Furthermore, the theoretical effect is considered applicable in the context of these Projects.
291. The population groups relevant to this assessment are:
- The national population of England
 - The international population globally
 - The sub-population vulnerable due to young age, old age, low income, poor health, social disadvantage or access and geographical factors (for example, people for whom alternative opportunities may be limited).

27.6.2.3.1 *Magnitude of Impact - All Scenarios*

292. Magnitude of change has been considered for all the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially. In all scenarios the magnitude of change for population health due to the Projects is **low**. The worst case would be either DBS East or DBS In Isolation, as this would be a smaller scale of renewable energy generation.
293. In terms of population health, the scale of change would be *small* within the national energy sector emissions context, albeit *continuous* and *long-term*. The health effect likely represents a *very minor* change in the risk of mortality and morbidity linked to a range of health determinants influenced by a changing climate for a *large minority* of the global population and a *small minority* of the national population. Relevant effects include population displacement, food insecurity, shifts in communicable illness ranges and exposure to extreme meteorological conditions. Whilst the concurrent or Sequential Scenarios represent a larger renewable energy contribution to the In Isolation Scenarios, the magnitude of effect for health remains low, rather than medium, within the national energy sector emissions context.



27.6.2.3.2 Sensitivity of Receptor – All Scenarios

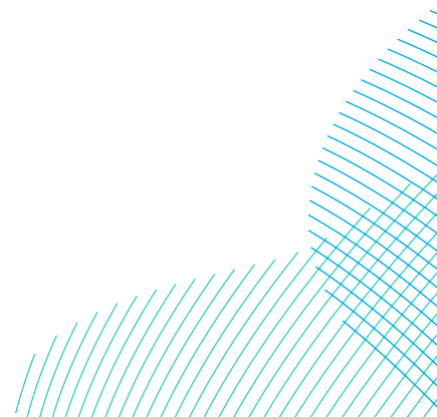
294. The following conclusions on population sensitivity apply to all scenarios.
295. The sensitivity of the general population is **low**. Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 27.4.3.5. England is a developed economy and has comparatively high resilience and capacity to adapt, so in general the national population can be considered to be of low sensitivity.
296. The sensitivity of the vulnerable group population is **high**. This reflects that the adverse effects would fall most heavily on the poorest and most vulnerable members and regions of society (globally). Disproportionate effect on the most disadvantaged in society are likely to widen health inequalities. Although people in England are generally less vulnerable, as they are able to get support to cope with the effects of climate change, some may still be at greater risk (e.g. low incomes or age making it harder to cope with heatwaves or flooding).

27.6.2.3.3 Significance of Effect – All Scenarios

297. All scenarios have been considered by the assessment and the conclusion on significance is the same.
298. The effect is characterised as being *beneficial* in direction, *permanent* and due to a range of *direct* and *indirect* health pathways. The significance of the population health effect is **minor** beneficial (not significant) effect. This reflects a *very limited* effect on the global or national health baseline with long-term inter-generational effects; the scientific literature supports a *causal* relationship between climate altering pollutants and climate change; and the Projects support a *marginal* narrowing of inequalities nationally and globally. The conclusion reflects that climate change is a *general* public health priority issue, with *consensus* from stakeholders as to its importance for public health.

27.6.2.3.4 Mitigation and Residual Significance of Effect – All Scenarios

299. Based on the low magnitude and high sensitivity in the vulnerable group population (which is used to reflect the role of potential inequalities, see paragraph 64), the significance of effect would be **minor** beneficial. No additional mitigation is considered to be required.



27.6.2.4 Impact 4: Economic Environment: Workforce Upskilling

- 300. This section considers the population health implications of additional upskilling and educational support to the operational workforce.
- 301. Increased educational attainment is associated with better health outcomes as set out in section 27.6.1.7.
- 302. The Projects are associated with general operational workforce upskilling opportunities.
- 303. This section has been informed by **Volume 7, Chapter 28 Socio-economics (application ref: 7.28)**, which sets out relevant assessment findings and mitigation measures that have been taken into account.
- 304. The potential effect is considered plausible as there is a theoretical source-pathway-receptor relationship as set out in section 27.6.1.7. Furthermore, the theoretical effect is considered applicable in the context of these Projects.
- 305. The population groups relevant to this assessment are the same as set out in section 27.6.1.7.

27.6.2.4.1 Magnitude of Impact – All Scenarios

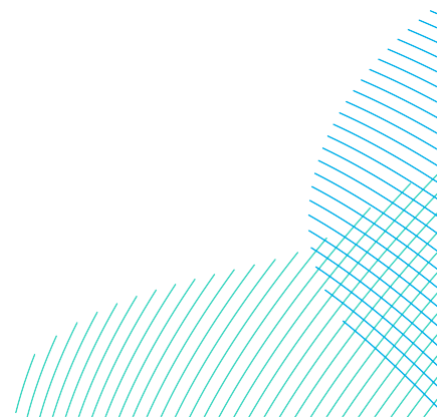
- 306. Magnitude of change has been considered for all the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially. In all scenarios the magnitude of change for population health due to the Projects is **negligible** on the same basis as set out in section 27.6.1.7.

27.6.2.4.2 Sensitivity of Receptor – All Scenarios

- 307. The following conclusions on population sensitivity apply to all scenarios.
- 308. The sensitivity of the general population is **low** and the sensitivity of the vulnerable group population is **high** on the same basis as set out in section 27.6.1.7.

27.6.2.4.3 Significance of Effect – All Scenarios

- 309. All scenarios have been considered by the assessment and the conclusion on significance is the same.
- 310. The effect is characterised as being *beneficial* in direction, *permanent* in supporting ongoing future career progression and *indirect*. The significance of the population health effect for this determinant of health is **negligible** beneficial (not significant). The rationale for this conclusion is as set out in section 27.6.1.7.



27.6.2.4.4 *Mitigation and Residual Significance of Effect – All Scenarios*

311. Based on the low magnitude and high sensitivity in the vulnerable group population (which is used to reflect the role of potential inequalities, see paragraph 64), the significance of effect would be **negligible** beneficial.

27.6.2.5 *Impact 5: Economic Environment: Employment and Investment*

312. This section considers the population health implications of increased employment and economic impacts during operation.

313. If DBS East or DBS West were built In Isolation, operation and maintenance is expected to support a total of 400 jobs across Humberside and 580 jobs across the UK.

314. If DBS East and DBS West are built together, operation and maintenance is expected to support a total of 810 jobs across Humberside and 1,120 jobs across the UK.

315. Employment is an important determinant of health and well-being as set out in section 27.6.1.8. Adverse effects on local businesses and livelihoods, including commercial fisheries, leisure and tourism are not expected.

316. This section has been informed by **Volume 7, Chapter 28 Socio-economics (application ref: 7.28)**, which sets out relevant assessment findings and mitigation measures that have been taken into account.

317. The potential effect is considered plausible as there is a theoretical source-pathway-receptor relationship as set out in section 27.6.1.8. Furthermore, the theoretical effect is considered applicable in the context of these Projects.

318. The population groups relevant to this assessment are the same as set out in section 27.6.1.8.

27.6.2.5.1 *Magnitude of Impact – All Scenarios*

319. Magnitude of change has been considered for all the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially. In all scenarios the magnitude of change for population health due to the Projects is **low**. The worst case for beneficial employment opportunities would be either DBS East or DBS In Isolation, as this would be a smaller scale of workforce with fewer job opportunities.

320. **Volume 7, Chapter 28 Socio-economics (application ref: 7.28)** concludes:

- DBS East or DBS West In Isolation

- The effect on expenditure and employment is assessed as **minor** beneficial with respects to the Humberside economy and as **negligible** with respects to the UK economy.
- DBS East and DBS West together (Concurrently or Sequentially)
 - The effect on expenditure and employment is assessed as **minor** beneficial with respects to the Humberside economy and as **negligible** with respects to the UK economy.

321. **Volume 7, Chapter 13 Commercial Fisheries (application ref: 7.13)** concludes:

- Under the current situation, with the Dogger Bank SAC Byelaw in place, no significant change is predicted in relation to loss or restricted access to fishing grounds within the DBS Array Areas for all receptor groups. In the event the byelaw is revoked, no change is predicted for intertidal netters or inshore static gear, negligible significance is predicted for demersal seine and offshore static gear, and minor adverse is predicted for all other receptor groups.
- Under the current situation, with the Dogger Bank SAC Byelaw in place, impacts of negligible significance are predicted for all receptor groups with regards to displacement of fishing activity leading to gear conflict and increased pressure on adjacent grounds during operation. In the event the byelaw is revoked, negligible significance is predicted for demersal seine and minor adverse is predicted for all other receptor groups.
- The effect of increased steaming times is deemed negligible for all project scenarios.
- The impact on supply chain opportunities during operation and maintenance is considered **negligible** to **minor** beneficial for all receptor groups for all project scenarios.

322. In terms of population health, the low magnitude of change conclusion reflects that there will be a relatively *small* scale of change in operational employment in the context of the local labour market. These opportunities would be of *long-term* duration and reflect employment that is on a *continuous* basis, whether full-time or part-time. Such jobs are likely to be associated with *minor* changes in *morbidity* and *quality of life* for a *small minority* of the population due to improved socio-economic status and increased spend on health supporting resources and activities.



27.6.2.5.2 Sensitivity of Receptor – All Scenarios

- 323. The following conclusions on population sensitivity apply to all scenarios.
- 324. The sensitivity of the general population is **low** and the sensitivity of the vulnerable group population is **high** on the same basis as the discussion of positive effects set out in section 27.6.1.8.

27.6.2.5.3 Significance of Effect – All Scenarios

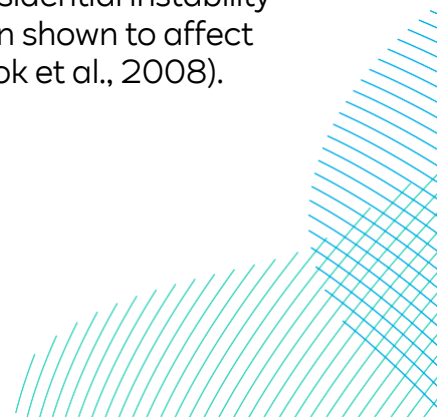
- 325. All scenarios have been considered by the assessment and the conclusion on significance is the same.
- 326. The effect is characterised as being *beneficial* in direction, *permanent* and *indirect*. The significance of the population health effect for this determinant of health is **minor** beneficial (not significant). The rationale for this conclusion is as for the discussion of positive effects set out in section 27.6.1.8.

27.6.2.5.4 Mitigation and Residual Significance of Effect – All Scenarios

- 327. Based on the low magnitude and high sensitivity in the vulnerable group population (which is used to reflect the role of potential inequalities, see paragraph 64), the significance of effect would be **minor** beneficial. No additional mitigation is considered to be required.

27.6.2.6 Impact 6: Wider Social Infrastructure and Resources

- 328. The Projects support UK energy security, which is important for maintaining continuity and affordability of electricity supplies. Public health has a high reliance on electricity supplies. This includes power to safely cook and refrigerate food, regulate the temperature and lighting of homes and schools, operate health and social care services, maintain economic productivity and employment, and operate technologies that improve quality of life and social networking. Sustained interruption of supply or rapid increases in costs would both be expected to result in reductions in health and well-being outcomes. Increases in the cost of electricity, particularly in the context of rising costs of living, can cause some people to prioritise essential costs (e.g. food, shelter) over electricity demands (e.g. heating a home).
- 329. Energy insecurity is a public health concern particularly for vulnerable populations (low-income, children, elderly). It is associated with hazardous exposures, heat stress, cold stress, asthma, chronic disease, poor mental health, parental fear and stigma, family disruption and residential instability (Hernández, 2016). In children, energy insecurity has been shown to affect development, hospitalisation and overall child health (Cook et al., 2008).



330. The potential effect is considered plausible as there is a theoretical source-pathway-receptor relationship:
- Source: renewable electricity generation.
 - Pathway: energy security providing continuity of services and infrastructure that supports public health and healthcare.
 - Receptor: population connected to the national power grid.
331. Furthermore, the theoretical effect is considered applicable in the context of these Projects.
332. The population groups relevant to this assessment are:
- The national population of England (including regional and local populations); and
 - The sub-population vulnerable due to young age, old age, low income, poor health, social disadvantage or access and geographical factors (for example, people for whom alternative opportunities may be limited).

27.6.2.6.1 *Magnitude of Impact – All Scenarios*

333. Magnitude of change has been considered for all the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially. In all scenarios the magnitude of change for population health due to the Projects' contribution to renewable electricity is **medium**. The worst case would be either DBS East or DBS In Isolation, as this would be a smaller scale of renewable energy generation.
334. In terms of population health, the magnitude conclusion is driven by the *long-term* and *continuous* public health benefits to energy security, despite the scale of the Project's contribution being relatively *small* within the national energy generation context. The effects are likely to provide a *minor* reduction in risks for population *mortality* (e.g. reducing excess winter deaths) and *morbidity* of physical and mental health outcomes related to standard of living and access to health supporting infrastructure. Such an effect may extend via the national grid to a *large minority* of the national population. Such effects may bring *small* benefits to healthcare service quality by avoiding or reducing capacity burdens due to the direct and indirect effects of energy security of health. Whilst the Concurrent or Sequential Scenarios represent a larger renewable energy contribution of up to 3GW of renewable electricity (powering up to around 3 million households a year) compared to the In Isolation Scenarios, the magnitude of effect for health remains medium, rather than large, within the national electricity supply context.

27.6.2.6.2 Sensitivity of Receptor – All Scenarios

335. The following conclusions on population sensitivity apply to all scenarios.
336. The sensitivity of the general population is **low**. Common factors that differentiate the sensitivity of the general population and the vulnerable group population have been taken into account and are listed in section 27.4.3.5. The general population comprise those members of the community in good physical and mental health and with greater resources to respond to the costs of energy or to interruptions in supply.
337. The sensitivity of the vulnerable group population is **high**. This reflects the sub-population on low incomes for whom energy security, and interruption of energy supplies, pose a greater risk. This is particularly the case for dependants at risk during temperature extremes, including heatwaves and cold weather, as well as people in poor health, including when accessing healthcare.

27.6.2.6.3 Significance of Effect – All Scenarios

338. All scenarios have been considered by the assessment and the conclusion on significance is the same.
339. The significance of the population health effect for this determinant of health is **moderate** beneficial (significant). The professional judgment is that the Projects provide a protective effect on the health baseline and that this would be important for public health. This conclusion reflects the scientific literature establishes a clear association between energy security and health outcomes. The Projects are likely to be *influential* to delivering health policy, including in narrowing inequalities that are at risk of widening due to reduced national energy security.

27.6.2.6.4 Mitigation and Residual Significance of Effect – All Scenarios

Based on the medium magnitude and high sensitivity in the vulnerable group population (which is used to reflect the role of potential inequalities, see paragraph 64), the significance of effect would be **moderate** beneficial. No additional mitigation is considered to be required.

27.6.3 Potential Effects During Decommissioning

340. No decision has been made regarding the final decommissioning policy for the Onshore Export Cables, as it is recognised that industry best practice, rules and legislation change over time. It is likely that the cables would be pulled through the ducts and removed, with the ducts themselves left in situ.

341. In relation to the Onshore Converter Stations, the programme for decommissioning is expected to be similar in duration to the construction phase. The detailed activities and methodology would be determined later within the project lifetime. Any such methodology and associated mitigation would be agreed with the relevant authorities and statutory consultees through a decommissioning plan in accordance with the requirements of the **Draft DCO (Volume 3, application ref: 3.1)**. The detailed activities and methodology are expected to include:
- Dismantling and removal of outside electrical equipment from site located outside of the Onshore Converter Stations' buildings;
 - Removal of cabling from site;
 - Dismantling and removal of electrical equipment from within the Onshore Converter Stations' buildings;
 - Removal of main Onshore Converter Stations' buildings and minor services equipment;
 - Demolition of support buildings and removal of fencing;
 - Landscaping and reinstatement of the site (including land drainage); and
 - Removal of areas of hard standing.
342. The decommissioning works could be subject to a separate licencing and consenting approach.
343. Whilst details regarding the decommissioning of the Onshore Converter Stations are currently unknown, considering a worst case scenario, which would be the removal and reinstatement of the current land use, it is anticipated that the impacts would be similar or less than those during construction. To avoid duplication such effects are not restated.



27.7 Potential Monitoring Requirements

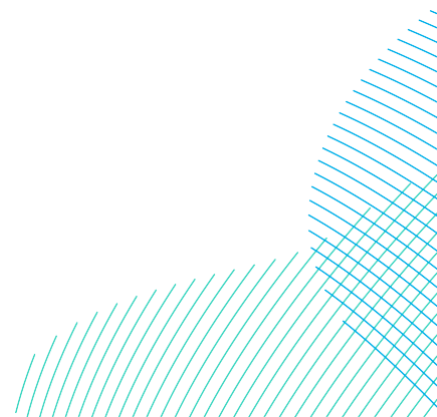
344. As no significant population health effects have been identified, no additional public health related monitoring is proposed.
345. Offshore monitoring requirements are described in the **In-Principle Monitoring Plan (IPMP) (Volume 8, application ref: 8.23)** submitted alongside the DCO application and further developed and agreed with stakeholders prior to construction based on the IPMP and taking account of the final detailed design of the Projects.

27.8 Cumulative Effects Assessment

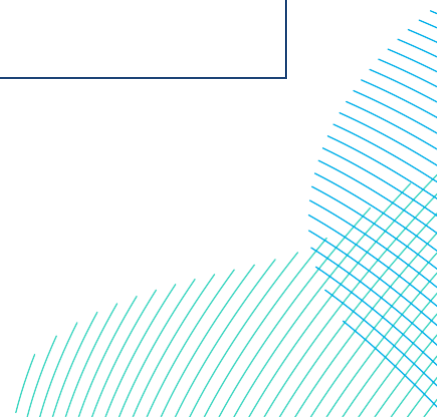
346. Cumulative effects can be defined as incremental effects on that same receptor from other proposed and reasonably foreseeable schemes and developments in combination with the Projects. This includes all schemes that result in a comparative effect that is not intrinsically considered as part of the existing environment and is not limited to offshore wind projects.
347. The overarching method followed in identifying and assessing potential cumulative effects is set out in **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6), Volume 7, Appendix 6-1 Onshore Cumulative Effects Assessment (application ref: 7.6.6.1) and Volume 7, Appendix 6-2 Offshore Cumulative Effects Assessment (application ref: 7.6.6.2)**. The approach is based upon the Planning Inspectorate Advice Note Seventeen: Cumulative Effects Assessment (PINS 2017). The approach to the CEA is intended to be specific to DBS Projects and takes account of the available knowledge of the environment and other activities around the Onshore and Offshore Development Areas.
348. The CEA has followed a four-stage approach developed from the Planning Inspectorate Advice Note Seventeen. These stages are set out in **Table 1-2 of Volume 7, Appendix 6-1 Onshore Cumulative Effects Assessment (application ref: 7.6.6.1) and Table 1-1 of Volume 7, Appendix 6-2 Offshore Cumulative Effects Assessment (application ref: 7.6.6.2)**. Stage four of this process, the CEA, is undertaken in two stages.
349. The first step in the CEA is the identification of which residual impacts assessed for the Projects on their own have the potential for a cumulative impact with other schemes, plans, projects and activities. This information is set out in **Table 27-16** which sets out the potential impacts assessed in this chapter and identifies the potential for cumulative effects to arise, providing a rationale for such determinations. Only potential impacts assessed as negligible or above are included in the CEA. Those assessed as 'no impact' are not taken forward as there is no potential for them to contribute to a cumulative impact.

Table 27-16 Potential Cumulative Impacts

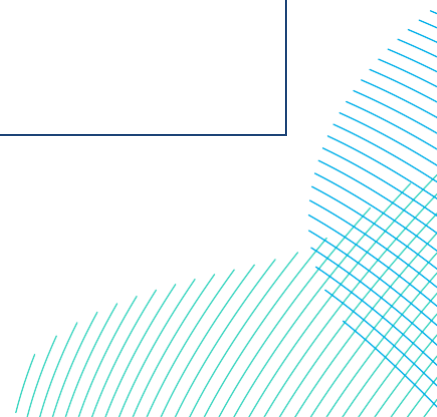
Potential Impact	Potential for Cumulative Effects	Data Confidence	Justification
Construction			
Impact 1: Health Related Behaviours: Physical Activity, Open Space and Leisure (Section 27.6.1.1)	No	Moderate	Schemes currently in planning have limited potential to have cumulative effects on health related behaviours due to limited expected overlap in the very localised effects where the population undertakes physical activity and leisure based activities.
Impact 2: Social Environment: Transport Modes, Access and Connections (Section 27.6.1.2)	Yes	Moderate	Schemes currently in planning have potential to affect transport infrastructure capacity and thus outcomes such as access, road safety and travel times.
Impact 3: Bio-Physical Environment: Air Quality (Section 27.6.1.3)	Yes	Moderate	Schemes currently in planning have potential to contribute to changes in local air quality where their activities or transport routes coincide or are in close proximity.
Impact 4: Bio-Physical Environment: Water (Section 27.6.1.4)	Yes	Low	Schemes currently in planning have potential to contribute to changes in water quality where the same onshore catchments or aquifers are affected, or offshore works are in close proximity and sufficiently close to the shore.



Potential Impact	Potential for Cumulative Effects	Data Confidence	Justification
Impact 5: Bio-Physical Environment: Soil Contamination (Section 27.6.1.5)	Yes	Moderate	Schemes currently in planning have potential to contribute to mobilisation of soil contamination affecting landowners, land users and neighbouring land users where their activities are in close proximity.
Impact 6: Bio-Physical Environment: Noise Disturbance (Section 27.6.1.6)	Yes	Moderate	Schemes currently in planning have potential to contribute to changes in local noise disturbance where their activities or transport routes coincide or are in close proximity.
Impact 7: Economic Environment: Workforce Upskilling (Section 27.6.1.7)	Yes	Moderate	Schemes currently in planning have potential to contribute to new training opportunities, locally and regionally.
Impact 8: Economic Environment: Employment and Investment (Section 27.6.1.8)	Yes	Moderate	Schemes currently in planning have potential to contribute to new jobs opportunities and affect local supply chains locally and regionally.



Potential Impact	Potential for Cumulative Effects	Data Confidence	Justification
Operation & Maintenance			
Impact 1: Bio-Physical Environment: Noise Disturbance (Section 27.6.2.1)	Yes	Moderate	Schemes currently in planning have limited potential to have cumulative effects from noise from other substations as such effects are typically highly localised and would require very close proximity to act cumulatively. However, the potential for such effects is considered.
Impact 2: Bio-Physical Environment: Public Concern and Understanding of Electro-Magnetic Field Risks (Section 27.6.2.2)	Yes	Moderate	Schemes currently in planning have potential to contribute to concern about EMF, where other projects include electrical infrastructure that is visible within the same landscape and visual study area.
Impact 3: Bio-Physical Environment: Climate Change (Section 27.6.2.3)	No	Low	Schemes currently in planning have potential to contribute to the overall scale of renewable energy generation, e.g. other wind farms. However, cumulative assessment is not considered appropriate as such an assessment should account for all development that affects the global atmosphere as a receptor. This is not a feasible activity for EIA.
Impact 4: Economic Environment: Workforce Upskilling (Section 27.6.2.4)	Yes	Moderate	Schemes currently in planning have potential to contribute to new training opportunities, locally and regionally.



Potential Impact	Potential for Cumulative Effects	Data Confidence	Justification
Impact 5: Economic Environment: Employment and Investment (Section 27.6.2.5)	Yes	Moderate	Schemes currently in planning have potential to contribute to new jobs opportunities and affect local supply chains locally and regionally.
Impact 6: Wider Social Infrastructure and Resources (Section 27.6.2.6)	Yes	Moderate	Schemes currently in planning have potential to contribute to the overall scale of renewable energy generation that supports public health through energy security, regionally and nationally.
Decommissioning			
<p>The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. As such, cumulative effects during the decommissioning phase are assumed to be the same as those identified during the construction phase.</p>			

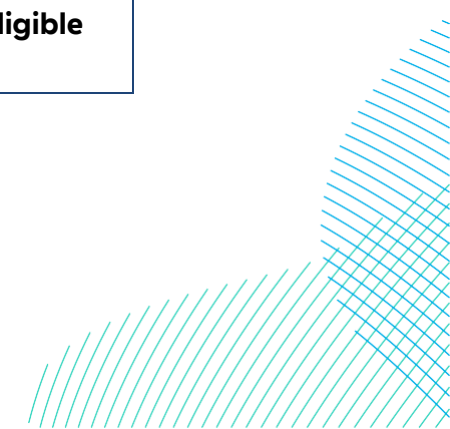


350. The second stage of the CEA is a project specific assessment of the potential for any significant cumulative effects to arise due to the construction and/or operation and maintenance of the Projects. To do this, a short list of schemes for CEA has been produced relevant to human health following the approach outlined in **Volume 7, Appendix 6-1 (application ref: 7.6.6.1)** and **Volume 7, Appendix 6-2 (application ref: 7.6.6.2)**. The second stage of this assessment is only undertaken if the first stage identifies that cumulative effects are possible.
351. The CEA has been based on information available on each potential scheme (e.g. as set out on the East Riding of Yorkshire Council and Hull City Council planning portals and the Planning Inspectorate website) as of January 2024. It is noted that the other scheme details available may change in the period up to construction or may not be available in detail at all. The assessment presented here is therefore considered to be conservative, with the level of impacts expected to be reduced compared to those presented here.
352. A total of sixteen schemes have been identified for inclusion on the short list of projects to be assessed cumulatively for human health. Schemes that have not been considered as resulting in likely cumulative significant effects for human health reflect no spatial or temporal overlap with the Onshore or Offshore Development Area or a scale of change to affected populations that does not have the potential to give rise to significant changes in population health outcomes.
353. Summary information on the short list schemes progressing through this exercise (i.e. the short list of other schemes) for assessment on Human Health is provided below in **Table 27-17** which presents the scenarios whereby the Projects and the other schemes/developments that have been identified on the short list of schemes screened for Human Health as listed in **Table 27-16**, could potentially result in cumulative effects for onshore human health.

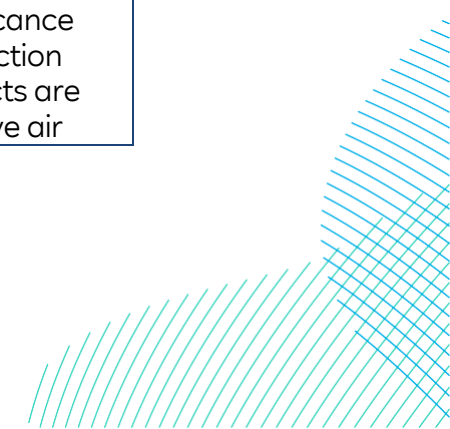


Table 27-17 Short List of Schemes Considered Within the Human Health Cumulative Effects Assessment

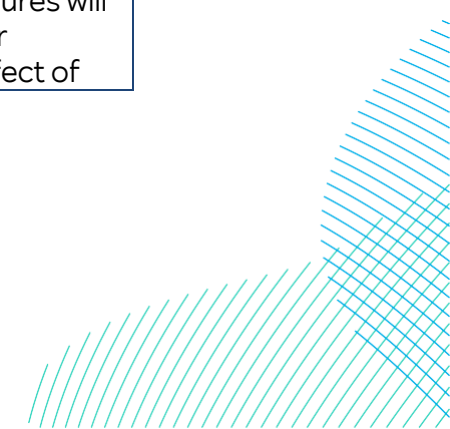
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
Dogger Bank A and B	1	There is spatial and temporal overlap between the Projects and Dogger Bank A and B during construction and operational phases. There is potential for cumulative effects of direct and indirect nature related to workforce upskilling, employment and income, risk perception and wider societal infrastructure and resources.	<p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the construction and operational cumulative effects on employment and investment for Dogger Bank A and B with the Projects is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.8 and 27.6.2.5 in relation to employment and investment and population health effects are expected due to this scheme and the Projects. The significance of effect for the cumulative health assessment of employment and investment remains minor beneficial and minor adverse.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the construction and operational cumulative effects on employment and income for Dogger Bank A and B with the Projects is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.7 and 27.6.2.4 in relation workforce upskilling and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of workforce upskilling is negligible beneficial.</p>



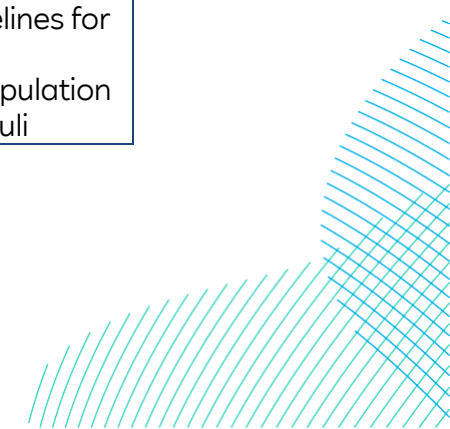
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>Cumulative effects in terms of actual risks or public understanding of risk relating to EMF are not expected. It is expected that the scheme would also adopt appropriate public exposure guidelines for EMF as appropriate. Any increase in the level of effect is not considered to be on a scale that could significantly affect population health. This includes due to additional visual or auditory stimuli associated with the electrical infrastructure of the scheme. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.2.2 is expected due to the scheme. The significance of effect for the cumulative health assessment of public understanding of risk relating to EMF is negligible (not significant).</p> <p>The Projects and Dogger Bank A and B will provide enhanced energy security. The national context of such energy security has been considered and the individual effects are not expected to be collectively greater. On this basis, the cumulative effect of the schemes and the Projects remains moderate beneficial.</p>
Tickton Bridge POC Mast	1	Due to the potential for overlapping construction programmes and the proximity of the scheme to the Projects, there is potential for a cumulative effect of a	<p>Volume 7, Chapter 26 Air Quality (application ref: 7.26) concludes there should be no residual cumulative air quality effect following the implementation of the appropriate dust mitigation and controls. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.3 in relation to air quality and population health effects are expected due to the scheme and the Projects. The cumulative air</p>



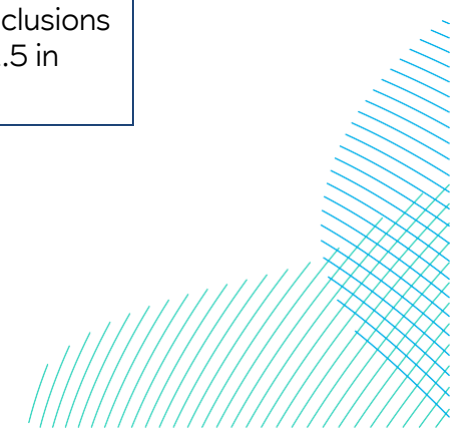
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
		<p>direct and indirect nature due to dust and soil contamination impacts</p>	<p>quality effect on population health of the Projects and this scheme remains minor adverse.</p> <p>As stated in Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19) there is no potential for significant cumulative effects on land quality. On this basis, the cumulative effect of the scheme and the Projects in relation to soil contamination and population health effects is assessed to be negligible adverse.</p>
<p>JBM Peartree Hill Solar Farm</p>	<p>2</p>	<p>Due to the proximity of the scheme to the Projects, there is potential for cumulative effects of a direct/indirect nature on human health related to air quality, water, noise, soil contamination during construction, and those related to risk perception and wider societal infrastructure during operations.</p>	<p>Volume 7, Chapter 26 Air Quality (application ref: 7.26) concludes there should be no residual cumulative air quality effect following the implementation of the appropriate dust mitigation and controls. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.3 in relation to air quality and population health effects are expected due to this scheme and the Projects. The cumulative air quality effect on population health of the Projects and the scheme remains minor adverse.</p> <p>Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19) concludes that due to the nature which the scheme will be constructed, it is assumed that appropriate mitigation measures will be incorporated into the design thus limiting the potential for cumulative effects to occur. On this basis, the cumulative effect of</p>



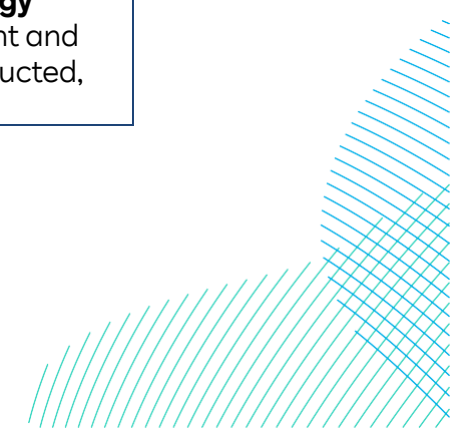
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>the scheme and the Projects in relation to soil contamination and population health effects is assessed to be negligible adverse.</p> <p>As stated in Volume 7, Chapter 25 Noise (application ref: 7.25), the cumulative noise effect will be no more than minor adverse assuming that Solar Farm construction is undertaken during daytime and can be controlled below a significant adverse effect. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in sections 27.6.1.6 and 27.6.2.1 in relation to noise disturbance and population health effects are expected due to the cumulative projects.</p> <p>As stated in Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20), due to the nature of the development and the regulatory regime under which the scheme will be constructed, cumulative effects are not anticipated. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.4 in relation to water quality and population health effects are expected due to the scheme and the Projects.</p> <p>Cumulative effects in terms of actual risks or public understanding of risk relating to EMF are not expected. It is expected that the scheme would also adopt appropriate public exposure guidelines for EMF as appropriate. Any increase in the level of effect is not considered to be on a scale that could significantly affect population health. This includes due to additional visual or auditory stimuli</p>



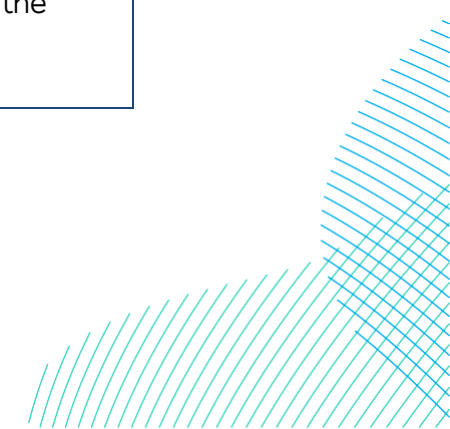
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>associated with the electrical infrastructure of the scheme. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.2.2 is expected due to the scheme. The significance of effect for the cumulative health assessment of public understanding of risk relating to EMF is negligible (not significant).</p> <p>The Projects and this scheme will provide enhanced energy security. The national context of such energy security has been considered and the individual the individual effects are not expected to be collectively greater. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.2.6 in relation to wider societal infrastructure and resources and population health effects are expected due to the cumulative projects.</p>
Carr Lane Tickton	3	Due to the proximity of the scheme to the Projects, there is potential for cumulative effects of a direct/indirect nature on human health receptors during construction and operational phases.	As stated in Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19) , due to the nature of the development, no cumulative effects on the receptors identified are considered likely. It is also assumed that should permission be granted; appropriate mitigation measures will be incorporated into the design thus limiting the potential for cumulative effects to occur. On this basis, there are no new or materially different magnitude or significance conclusions to those listed for The Projects assessment in section 27.6.1.5 in



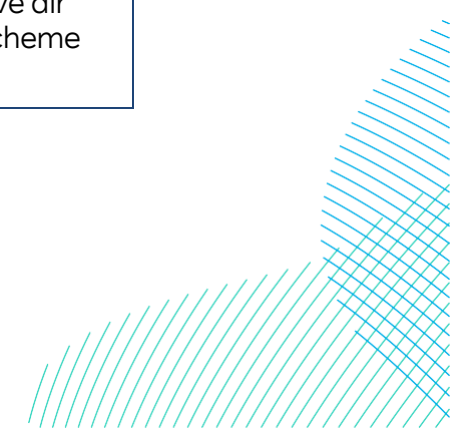
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			relation to soil contamination and population health effects expected due to this scheme together with the Projects.
A164 and Jocks Lodge Improvement Scheme	1	A small area of the road improvement scheme red line boundary overlaps the Onshore Development Area of the Projects. Due to the proximity of the scheme to the Projects, there is potential for cumulative dust, noise, water, soil contamination and socioeconomic impacts.	<p>As stated in Volume 7, Chapter 25 Noise (application ref: 7.25), due to the short duration of the Projects HDD works including with good communication and stakeholder engagement, cumulative noise effect can be controlled to minor adverse. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in sections 27.6.1.6 and 27.6.2.1 in relation to noise disturbance and population health effects are expected due to the A164 scheme and the Projects.</p> <p>Volume 7, Chapter 26 Air Quality (application ref: 7.26) concludes there should be no residual cumulative air quality effect following the implementation of the appropriate dust mitigation and controls. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.3 in relation to air quality and population health effects are expected due to this scheme and the Projects. The cumulative air quality effect on population health of the Projects and the scheme remains minor adverse.</p> <p>As stated in Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20), due to the nature of the development and the regulatory regime under which the scheme will be constructed, cumulative effects are not anticipated. No new or materially</p>



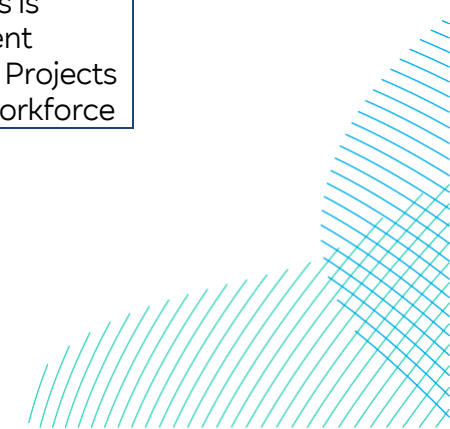
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.4 in relation to water quality and population health effects are expected due to the scheme and the Projects.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects due to the scheme and the Projects on employment and investment is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.8 and 27.6.2.5 in relation to employment and investment and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of employment and investment remains minor beneficial and minor adverse.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects on employment and income due to the scheme and the Projects is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.7 and 27.6.2.4 in relation to workforce upskilling and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of workforce upskilling is negligible beneficial.</p>



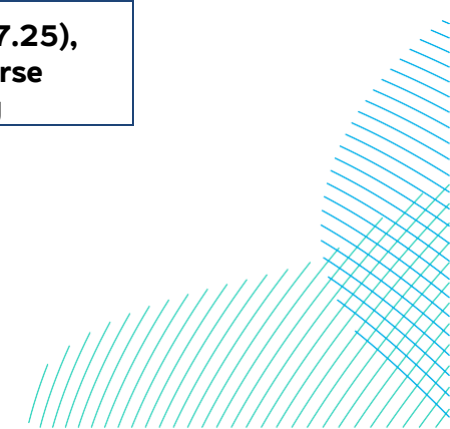
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
Creyke Beck Solar Farm	1	<p>Construction activity for this scheme is expected to last around six months. So, at worst there will only be temporary overlapping between the Projects and the Scheme. Operational activity is likely limited in scale.</p>	<p>As stated in Volume 7, Chapter 25 Noise (application ref: 7.25), based on the indicative programmes for the Projects and Solar Farm scheme, it is likely that the scheme construction would be completed before the Projects. The construction cumulative noise effect is therefore expected to be only minor adverse. Considering the large distances between the proposed operational Solar Farm and the operational noise sensitive receptors, as well as the relatively low noise levels generated by solar farms, it expected that the cumulative effects at these receptors will be no more than assessed for the Projects only. On this basis, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in sections 27.6.1.6 and 27.6.2.1 in relation to noise disturbance and population health effects are expected due to the cumulative projects.</p> <p>Volume 7, Chapter 26 Air Quality (application ref: 7.26) concludes there should be no residual cumulative air quality effect following the implementation of the appropriate dust mitigation and controls. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.3 in relation to air quality and population health effects are expected due to this scheme and the Projects. The cumulative air quality effect on population health of the Projects and the scheme remains minor adverse.</p>



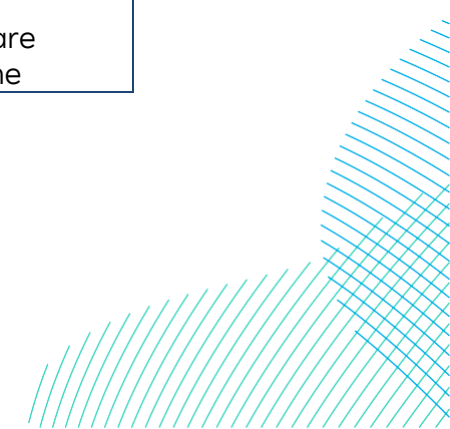
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>As stated in Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20), due to the nature of the development and the regulatory regime under which the scheme will be constructed, cumulative effects are not anticipated. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.4 in relation to water quality and population health effects are expected due to the scheme and the Projects.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects due to the scheme and the Projects on employment and investment is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.8 and 27.6.2.5 in relation to employment and investment and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of employment and investment remains minor beneficial and minor adverse.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects on employment and income due to the scheme and the Projects is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.7 and 27.6.2.4 in relation to workforce</p>



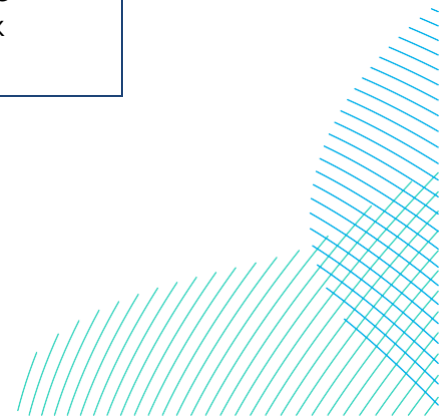
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>upskilling and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of workforce upskilling is negligible beneficial.</p> <p>Cumulative effects in terms of actual risks or public understanding of risk relating to EMF are not expected. It is expected that the scheme would also adopt appropriate public exposure guidelines for EMF as appropriate. Any increase in the level of effect is not considered to be on a scale that could significantly affect population health. This includes due to additional visual or auditory stimuli associated with the electrical infrastructure of the scheme. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.2.2 is expected due to the scheme. The significance of effect for the cumulative health assessment of public understanding of risk relating to EMF is negligible (not significant).</p> <p>The Projects and the scheme will provide enhanced energy security. The national context of such energy security has been considered and the individual effects are not expected to be collectively greater. On this basis, the cumulative effect of the schemes and the Projects remains moderate beneficial.</p>
Tickton Bridge Solar	1	Due to the proximity of the scheme to the Projects, there is	As stated in Volume 7, Chapter 25 Noise (application ref: 7.25) , the cumulative noise effect will be no more than minor adverse assuming that Solar Farm construction is undertaken during



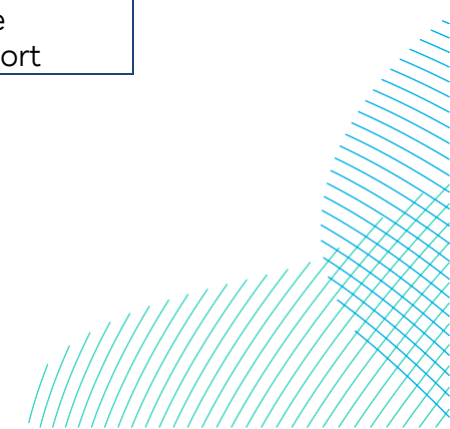
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
		<p>potential for cumulative effects of a direct/indirect nature on human health receptors during construction and operational phases. Timings for the Solar Farm are currently unknown, a temporal overlap has therefore been considered as a worst case assumption.</p>	<p>daytime and can be controlled below a significant adverse effect. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in sections 27.6.1.6 and 27.6.2.1 in relation to noise disturbance and population health effects are expected due to the cumulative projects.</p> <p>As stated in Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19), due to the nature of the development, no cumulative effects on the receptors identified are considered likely. It is also assumed that should permission be granted; appropriate mitigation measures will be incorporated into the design thus limiting the potential for cumulative effects to occur. On this basis, there are no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.5 in relation to soil contamination and population health effects expected due to this scheme together with the Projects.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects due to the scheme and the Projects on employment and investment is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.8 and 27.6.2.5 in relation to employment and investment and population health effects are expected due to the scheme. The significance of effect for the</p>



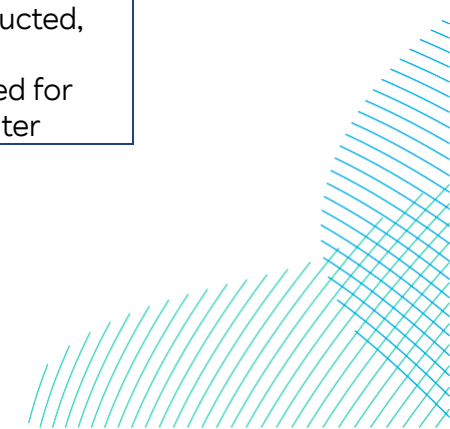
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>cumulative health assessment of employment and investment remains minor beneficial and minor adverse.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects on employment and income due to the scheme and the Projects is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.7 and 27.6.2.4 in relation to workforce upskilling and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of workforce upskilling is negligible beneficial.</p> <p>Cumulative effects in terms of actual risks or public understanding of risk relating to EMF are not expected. It is expected that the scheme would also adopt appropriate public exposure guidelines for EMF as appropriate. Any increase in the level of effect is not considered to be on a scale that could significantly affect population health. This includes due to additional visual or auditory stimuli associated with the electrical infrastructure of the scheme. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.2.2 is expected due to the scheme. The significance of effect for the cumulative health assessment of public understanding of risk relating to EMF is negligible (not significant).</p>



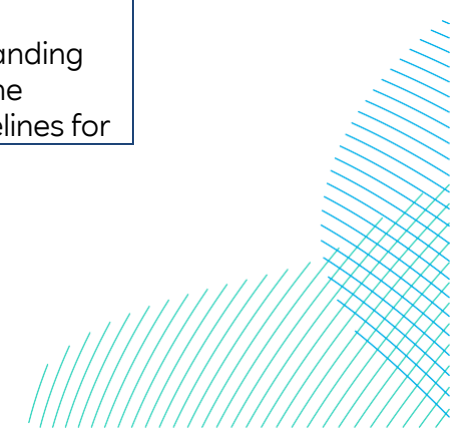
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>The Projects and the scheme will provide enhanced energy security. The national context of such energy security has been considered and the individual effects are not expected to be collectively greater. On this basis, the cumulative effect of the schemes and the Projects remains moderate beneficial</p>
Hornsea Project Four Offshore Wind Farm	1	<p>Due to the proximity of the scheme to the Projects, there is potential for cumulative dust, water and soil contamination impacts including cumulative traffic impacts as both the Projects and the scheme could use the same road links.</p>	<p>As stated in Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19), due to the nature of the development, no cumulative effects on the receptors identified are considered likely. It is also assumed that should permission be granted; appropriate mitigation measures will be incorporated into the design thus limiting the potential for cumulative effects to occur. On this basis, there are no new or materially different magnitude or significance conclusions to those listed for The Projects assessment in section 27.6.1.5 in relation to soil contamination and population health effects expected due to this scheme together with the Projects.</p> <p>Volume 7, Chapter 24 Traffic and Transport (application ref: 7.24) assesses the construction cumulative severance effects of the Projects and Hornsea Project Four Offshore Wind Farm scheme as minor adverse; cumulative amenity and road safety effects as minor adverse. On this basis, there are no new or materially different magnitude or significance conclusions to those listed for The Projects assessment in section 27.6.1.2 in relation to transport</p>



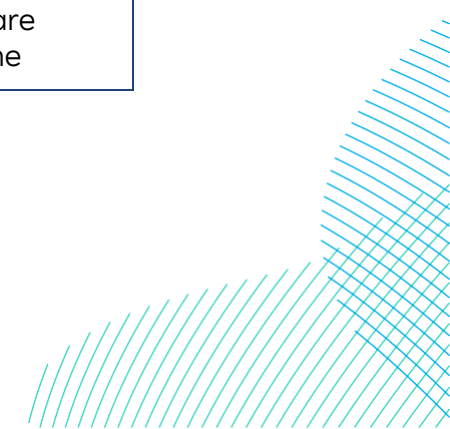
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>modes, access and connections and population health effects expected due to this scheme together with the Projects.</p> <p>As stated in Volume 7, Chapter 25 Noise (application ref: 7.25), the cumulative road traffic noise effect will be no more than minor adverse. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in sections 27.6.1.6 and 27.6.2.1 in relation to noise disturbance and population health effects are expected due to the cumulative projects.</p> <p>Volume 7, Chapter 26 Air Quality (application ref: 7.26) concludes there should be no residual cumulative air quality effect following the implementation of the appropriate dust mitigation and controls. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.3 in relation to air quality and population health effects are expected due to this scheme and the Projects. The cumulative air quality effect on population health of the Projects and the scheme remains minor adverse.</p> <p>As stated in Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20), due to the nature of the development and the regulatory regime under which the scheme will be constructed, cumulative effects are not anticipated. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.4 in relation to water</p>



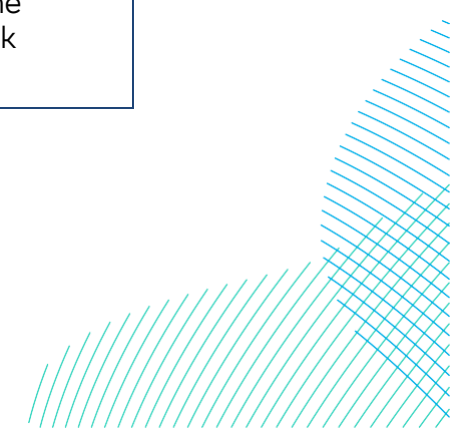
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>quality and population health effects are expected due to the scheme and the Projects.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects due to the scheme and the Projects on employment and investment is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.8 and 27.6.2.5 in relation to employment and investment and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of employment and investment remains minor beneficial and minor adverse.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects on employment and income due to the scheme and the Projects is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.7 and 27.6.2.4 in relation to workforce upskilling and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of workforce upskilling is negligible beneficial.</p> <p>Cumulative effects in terms of actual risks or public understanding of risk relating to EMF are not expected. It is expected that the scheme would also adopt appropriate public exposure guidelines for</p>



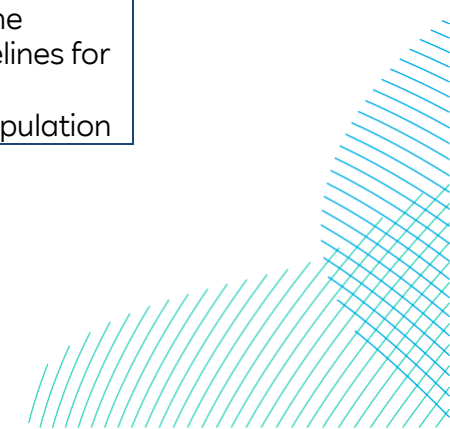
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>EMF as appropriate. Any increase in the level of effect is not considered to be on a scale that could significantly affect population health. This includes due to additional visual or auditory stimuli associated with the electrical infrastructure of the scheme. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.2.2 is expected due to the scheme. The significance of effect for the cumulative health assessment of public understanding of risk relating to EMF is negligible (not significant).</p> <p>The Projects and the scheme will provide enhanced energy security. The national context of such energy security has been considered and the individual effects are not expected to be collectively greater. On this basis, the cumulative effect of the schemes and the Projects remains moderate beneficial</p>
Scotland England Green Link 2 (SEGL2)	2	There is potential for overlap in construction timescales with potential for cumulative effects related to workforce upskilling and employment and investment.	As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28) , the significance of the operational cumulative effects due to the scheme and the Projects on employment and investment is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.8 and 27.6.2.5 in relation to employment and investment and population health effects are expected due to the scheme. The significance of effect for the



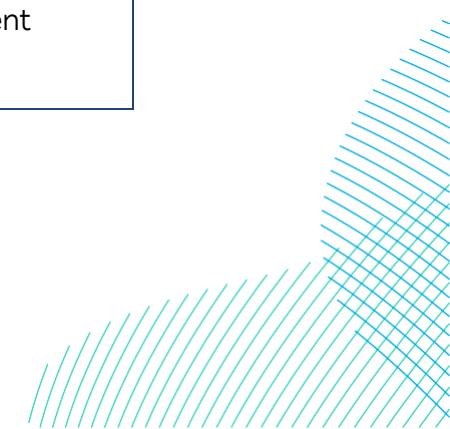
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>cumulative health assessment of employment and investment remains minor beneficial and minor adverse.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects on employment and income due to the scheme and the Projects is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.7 and 27.6.2.4 in relation to workforce upskilling and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of workforce upskilling is negligible beneficial.</p> <p>Cumulative effects in terms of actual risks or public understanding of risk relating to EMF are not expected. It is expected that the scheme would also adopt appropriate public exposure guidelines for EMF as appropriate. Any increase in the level of effect is not considered to be on a scale that could significantly affect population health. This includes due to additional visual or auditory stimuli associated with the electrical infrastructure of the scheme. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.2.2 is expected due to the scheme. The significance of effect for the cumulative health assessment of public understanding of risk relating to EMF is negligible (not significant).</p>



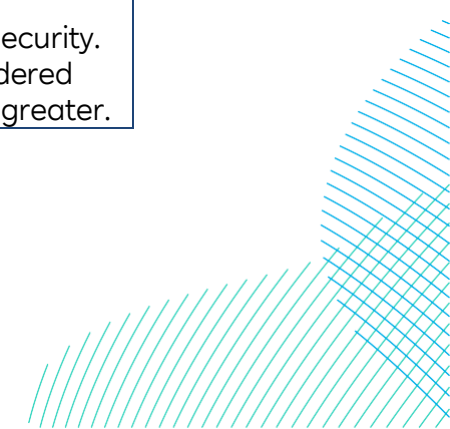
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
Ferry Road Carr Plantation	1	<p>The construction activity of the Solar Farm scheme is expected to last around six months. So, at worst only temporary overlapping. Operational activity is likely limited in scale in relation to workforce upskilling and employment and investment.</p>	<p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects due to the scheme and the Projects on employment and investment is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.8 and 27.6.2.5 in relation to employment and investment and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of employment and investment remains minor beneficial and minor adverse.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects on employment and income due to the scheme and the Projects is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.7 and 27.6.2.4 in relation to workforce upskilling and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of workforce upskilling is negligible beneficial.</p> <p>Cumulative effects in terms of actual risks or public understanding of risk relating to EMF are not expected. It is expected that the scheme would also adopt appropriate public exposure guidelines for EMF as appropriate. Any increase in the level of effect is not considered to be on a scale that could significantly affect population</p>



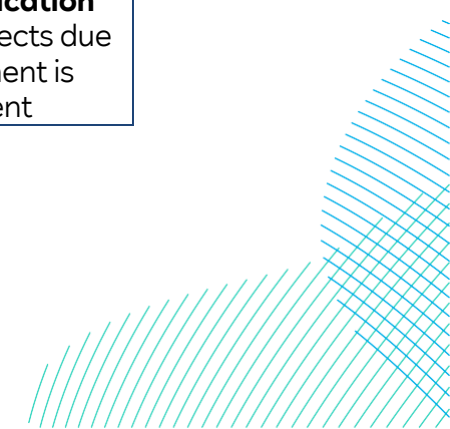
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>health. This includes due to additional visual or auditory stimuli associated with the electrical infrastructure of the scheme. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.2.2 is expected due to the scheme. The significance of effect for the cumulative health assessment of public understanding of risk relating to EMF is negligible (not significant).</p> <p>The Projects and the scheme will provide enhanced energy security. The national context of such energy security has been considered and the individual effects are not expected to be collectively greater. On this basis, the cumulative effect of the schemes and the Projects remains moderate beneficial.</p>
White Hall	3	There is overlap between the Projects and this Solar Farm scheme. There is potential for cumulative effects of direct and indirect nature related to workforce upskilling, employment and income, risk perception and wider societal	As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28) , the significance of the operational cumulative effects due to the scheme and the Projects on employment and investment is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.8 and 27.6.2.5 in relation to employment and investment and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of employment and investment remains minor beneficial and minor adverse .



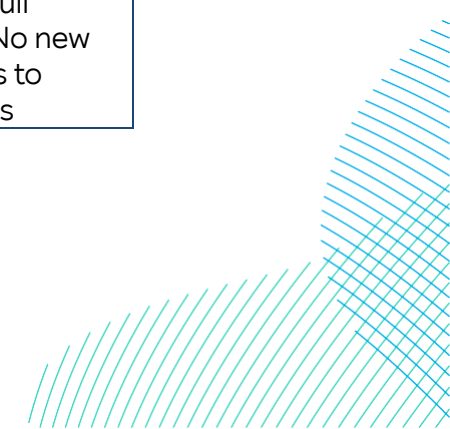
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
		<p>infrastructure and resources.</p>	<p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects on employment and income due to the scheme and the Projects is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.7 and 27.6.2.4 in relation to workforce upskilling and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of workforce upskilling is negligible beneficial.</p> <p>Cumulative effects in terms of actual risks or public understanding of risk relating to EMF are not expected. It is expected that the scheme would also adopt appropriate public exposure guidelines for EMF as appropriate. Any increase in the level of effect is not considered to be on a scale that could significantly affect population health. This includes due to additional visual or auditory stimuli associated with the electrical infrastructure of the scheme. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.2.2 is expected due to the scheme. The significance of effect for the cumulative health assessment of public understanding of risk relating to EMF is negligible (not significant).</p> <p>The Projects and the scheme will provide enhanced energy security. The national context of such energy security has been considered and the individual effects are not expected to be collectively greater.</p>



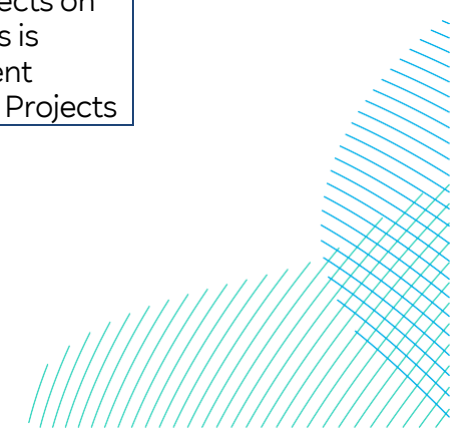
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			On this basis, the cumulative effect of the schemes and the Projects remains moderate beneficial .
Proposed Birkhill Wood National Grid Substation	2	Due to the proximity of the scheme to the Projects, there is potential for cumulative effects of a direct/indirect nature on human health related to air quality, water, workforce upskilling, employment and noise during construction, and those related to risk perception and wider societal infrastructure during operations.	<p>As stated in Volume 7, Chapter 25 Noise (application ref: 7.25), assuming that construction of the substation is undertaken during daytime and can be controlled below a significant adverse effect, it is considered likely that the cumulative noise effect will be no more than minor adverse. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in sections 27.6.1.6 and 27.6.2.1 in relation to noise disturbance and population health effects are expected due to the cumulative projects.</p> <p>As stated in Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20), due to the nature of the development and the regulatory regime under which the scheme will be constructed, cumulative effects are not anticipated. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.4 in relation to water quality and population health effects are expected due to the scheme and the Projects.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects due to the scheme and the Projects on employment and investment is negligible. For population health, no new or materially different</p>



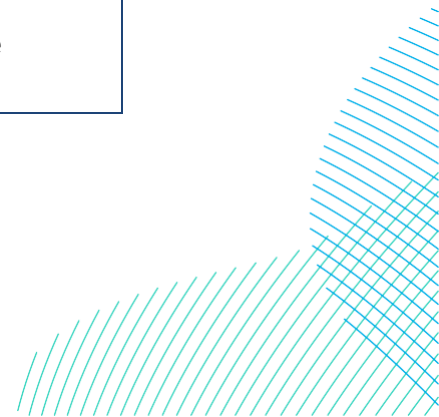
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.8 and 27.6.2.5 in relation to employment and investment and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of employment and investment remains minor beneficial and minor adverse.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects on employment and income due to the scheme and the Projects is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.7 and 27.6.2.4 in relation to workforce upskilling and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of workforce upskilling is negligible beneficial.</p> <p>Cumulative effects in terms of actual risks or public understanding of risk relating to EMF are not expected. It is expected that the scheme would also adopt appropriate public exposure guidelines for EMF as appropriate. Any increase in the level of effect is not considered to be on a scale that could significantly affect population health. This includes due to additional visual or auditory stimuli associated with the electrical infrastructure of the scheme. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.2.2 is</p>



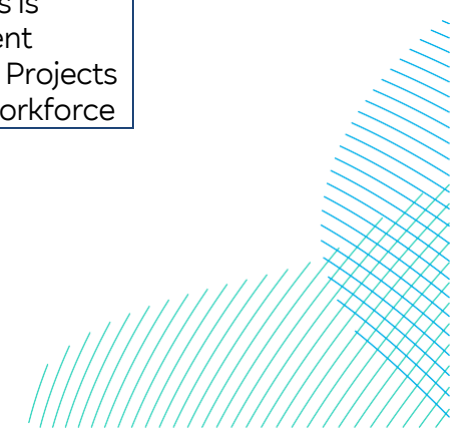
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>expected due to the scheme. The significance of effect for the cumulative health assessment of public understanding of risk relating to EMF is negligible (not significant).</p> <p>The Projects and the scheme will provide enhanced energy security. The national context of such energy security has been considered and the individual effects are not expected to be collectively greater. On this basis, the cumulative effect of the schemes and the Projects remains moderate beneficial</p>
North Humber to High Marnham grid upgrade	2	There is limited information available on this scheme with regards to economic impact. Overlapping in timescales is expected.	<p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects due to the scheme and the Projects on employment and investment is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.8 and 27.6.2.5 in relation to employment and investment and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of employment and investment remains minor beneficial and minor adverse.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects on employment and income due to the scheme and the Projects is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects</p>



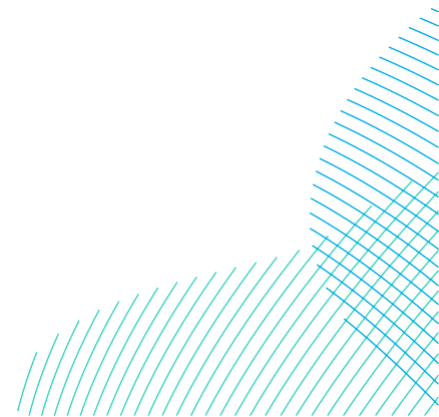
Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>assessment in section 27.6.1.7 and 27.6.2.4 in relation to workforce upskilling and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of workforce upskilling is negligible beneficial.</p> <p>Cumulative effects in terms of actual risks or public understanding of risk relating to EMF are not expected. It is expected that the scheme would also adopt appropriate public exposure guidelines for EMF as appropriate. Any increase in the level of effect is not considered to be on a scale that could significantly affect population health. This includes due to additional visual or auditory stimuli associated with the electrical infrastructure of the scheme. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.2.2 is expected due to the scheme. The significance of effect for the cumulative health assessment of public understanding of risk relating to EMF is negligible (not significant).</p>
Creyke Beck Substation Extension	1		<p>As stated in Volume 7, Chapter 25 Noise (application ref: 7.25), the cumulative road traffic noise effect will be no more than minor adverse. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in sections 27.6.1.6 and 27.6.2.1 in relation to noise disturbance and population health effects are expected due to the cumulative projects.</p>



Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>As stated in Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20), due to the nature of the development and the regulatory regime under which the scheme will be constructed, cumulative effects are not anticipated. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.4 in relation to water quality and population health effects are expected due to the scheme and the Projects.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects due to the scheme and the Projects on employment and investment is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.8 and 27.6.2.5 in relation to employment and investment and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of employment and investment remains minor beneficial and minor adverse.</p> <p>As stated in Volume 7, Chapter 28 Socio-economics (application ref: 7.28), the significance of the operational cumulative effects on employment and income due to the scheme and the Projects is negligible. For population health, no new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.1.7 and 27.6.2.4 in relation to workforce</p>



Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
			<p>upskilling and population health effects are expected due to the scheme. The significance of effect for the cumulative health assessment of workforce upskilling is negligible beneficial.</p> <p>Cumulative effects in terms of actual risks or public understanding of risk relating to EMF are not expected. It is expected that the scheme would also adopt appropriate public exposure guidelines for EMF as appropriate. Any increase in the level of effect is not considered to be on a scale that could significantly affect population health. This includes due to additional visual or auditory stimuli associated with the electrical infrastructure of the scheme. No new or materially different magnitude or significance conclusions to those listed for the Projects assessment in section 27.6.2.2 is expected due to the scheme. The significance of effect for the cumulative health assessment of public understanding of risk relating to EMF is negligible (not significant).</p> <p>The Projects and the scheme will provide enhanced energy security. The national context of such energy security has been considered and the individual effects are not expected to be collectively greater. On this basis, the cumulative effect of the schemes and the Projects remains moderate beneficial.</p>



354. The CEA for Human Health has not identified any schemes where significant cumulative effects could arise.

27.9 Transboundary Effects

355. The transboundary assessment considers the potential for transboundary effects to occur on human health receptors as a result of the Projects; either those that might arise within the Exclusive Economic Zone (EEZ) of European Economic Area (EEA) states or arising on the interests of EEA states e.g. a non UK fishing vessel. **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)** provides further details of the general framework and approach to the assessment of the transboundary effects.
356. For human health, there may be indirect effects in relation to port activities, where there is the potential for these to be within other jurisdictions.
357. However, it is considered that there are no transboundary effects with the potential for significant population health effects, as the Onshore Development Area and the Offshore Development Area would not be sited in proximity to any international boundaries. Transboundary effects are therefore scoped out of this assessment and not considered further.

27.10 Interactions

358. The effects identified and assessed in this chapter have the potential to interact with each other. The areas of potential interaction between effects are presented in **Table 27-18**. This provides a screening tool for which effects have the potential to interact. **Table 27-19** and **Table 27-20** provide an assessment for each receptor group as related to these impacts.
359. Within **Table 27-21** the effects are assessed relative to each development phase to see if multiple effects could increase the significance of the effect upon a receptor. Following this a lifetime assessment is undertaken which considers the potential for effect to affect receptors across all development phases.

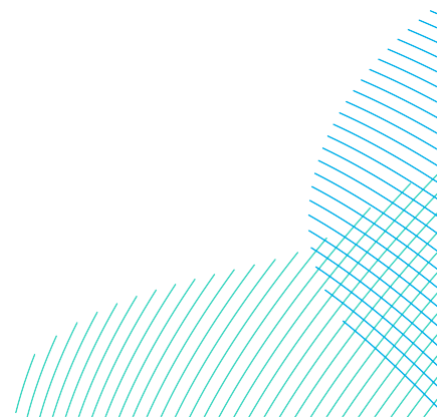
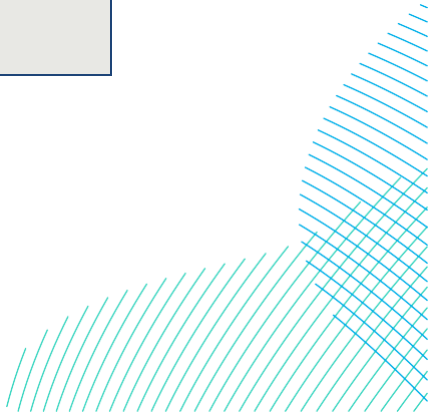


Table 27-18 Interactions Between Impacts – Screening

Potential Interactions between Impacts							
Construction							
	Physical Activity	Transport	Air Quality	Water	Noise	Upskilling	Employment
Physical Activity		Yes	Yes	Yes	Yes	No	No
Transport	Yes		Yes	No	Yes	No	No
Air Quality	Yes	Yes		No	No	No	No
Water	Yes	No	No		No	No	No
Noise	Yes	Yes	No	No		No	No
Upskilling	No	No	No	No	No		Yes
Employment	No	No	No	No	No	Yes	



Potential Interactions between Impacts						
Operation						
	Noise	EMF	Climate Change	Upskilling	Employment	Wider Societal
Noise		Yes	No	No	No	No
EMF	Yes		No	No	No	No
Climate Change	No	No		No	No	Yes
Upskilling	No	No	No		Yes	No
Employment	No	No	No	Yes		No
Wider Societal	No	No	Yes	No	No	

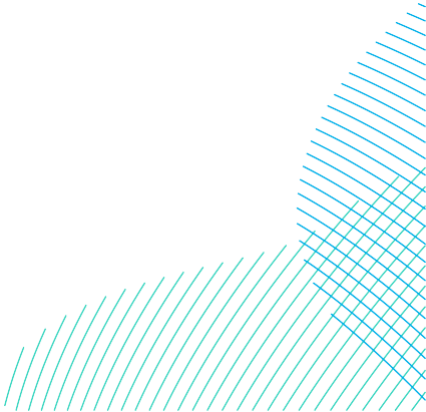


Table 27-19 Interaction Between Impacts by Geographic Populations – Construction and Decommissioning

	Site Specific	Local	Regional	National	International
Physical Activity	Yes	Yes	No	No	No
Transport	Yes	Yes	No	No	No
Air Quality	Yes	Yes	Yes	No	No
Water	Yes	Yes	No	No	No
Noise	Yes	Yes	No	No	No
Upskilling	Yes	Yes	Yes	No	No
Employment	Yes	Yes	Yes	No	No

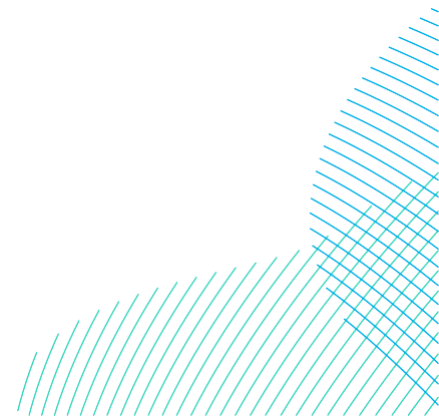


Table 27-20 Interaction Between Impacts by Geographic Populations – Operation

	Site Specific	Local	Regional	National	International
Noise	Yes	No	No	No	No
EMF	Yes	No	No	No	No
Climate Change	No	No	No	Yes	Yes
Upskilling	Yes	Yes	Yes	No	No
Employment	Yes	Yes	Yes	No	No
Wider Societal	No	No	No	Yes	No

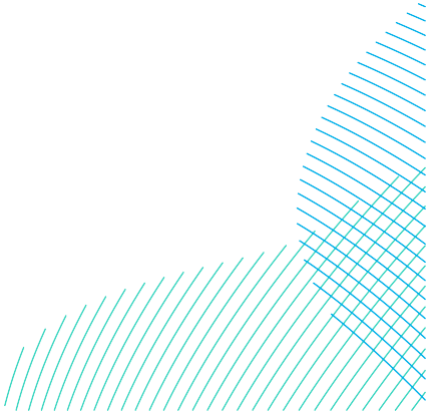
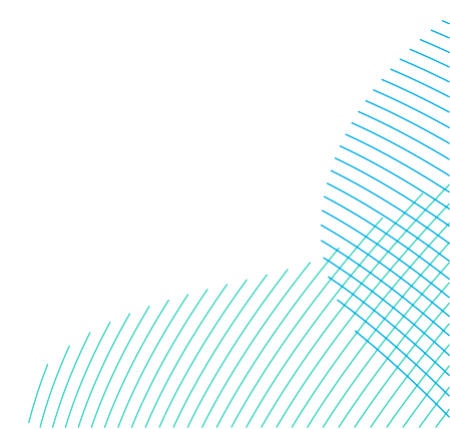
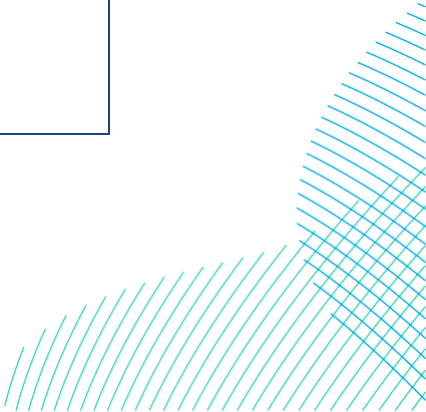


Table 27-21 Interaction Between Impacts - Phase and Lifetime Assessment

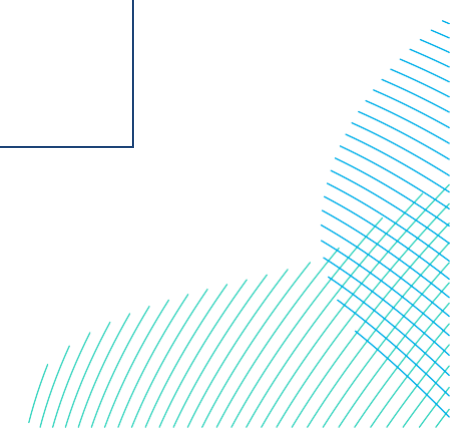
Receptor	Highest Significance Level				
	Construction	Operation	Decommissioning	Phase Assessment	Lifetime Assessment
Site-specific population	Minor adverse (multiple determinants)	Minor adverse (public concern of EMF driven)	Minor adverse (multiple determinants)	<p>No greater than individually assessed impact.</p> <p>Within each phase, whilst there will be some overlap of impacts across determinants of health that arise from the same activity (e.g. construction temporarily impacting levels of dust, noise and access) such interactions would remain at most a minor influence on risk factors for a small minority of the population.</p>	<p>No greater than individually assessed impact.</p> <p>Population health effects, across the assessed determinants, are no greater when considering the combined effects to the same population groups of the construction, operation and decommissioning phases.</p>



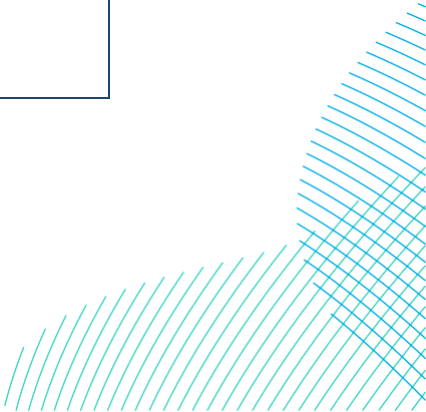
Receptor	Highest Significance Level				
	Construction	Operation	Decommissioning	Phase Assessment	Lifetime Assessment
				<p>Furthermore, the populations affected by different activities within a phase have limited overlap. For example, during construction the site-specific population affected by landfall impacts has very limited overlap with the site-specific population affected by the Onshore Export Cable Corridor impacts and is distinct from the population affected by the Onshore Substation Zone impacts. Impacts across the activities within a phase would therefore not change the population health conclusion on significance.</p>	



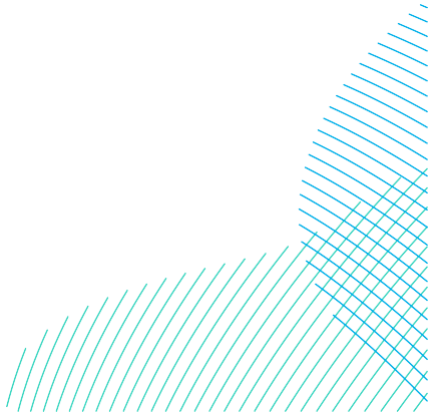
Receptor	Highest Significance Level				
	Construction	Operation	Decommissioning	Phase Assessment	Lifetime Assessment
Local population	Minor adverse (multiple determinants)	Minor beneficial (employment driven)	Minor adverse (multiple determinants)	<p>No greater than individually assessed impact.</p> <p>Within each phase, there is limited potential at the local authority level for impacts from multiple determinates of health to occur to the same individuals at a scale that would change population health conclusion on significance. This reflects that effects are more diffuse within a larger population.</p> <p>It is however noted that there would be overlap between some determinants of health. For example, where project vehicle</p>	<p>No greater than individually assessed impact.</p> <p>Population health effects, across the assessed determinants, are no greater when considering the combined effects to the same population groups of the construction, operation and decommissioning phases.</p>



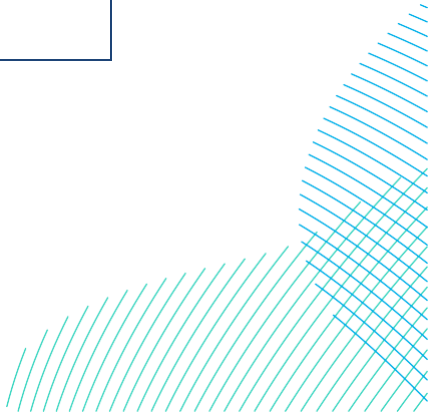
Receptor	Highest Significance Level				
	Construction	Operation	Decommissioning	Phase Assessment	Lifetime Assessment
				<p>movements on the local road network have associated very minor changes in air quality, noise, road safety and journey times. Similarly, opportunities for both training and employment may be linked and benefit the health of the same individuals. Such combined effects have been considered and it is concluded that effects remain minor influences on risk factors (beneficial or adverse) even where interactions may arise. Such interactions are not of a scale to give rise to significant public health effects.</p>	



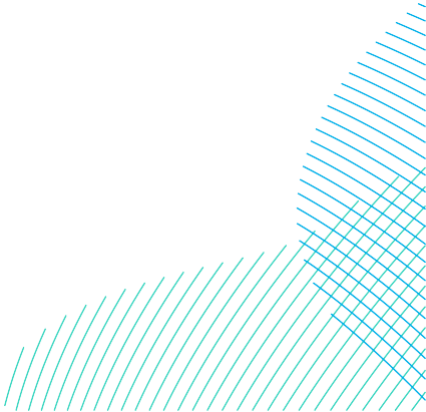
Receptor	Highest Significance Level				
	Construction	Operation	Decommissioning	Phase Assessment	Lifetime Assessment
Regional population	Minor beneficial (employment driven)	Minor beneficial (employment driven)	Minor beneficial (employment driven)	<p>No greater than individually assessed impact.</p> <p>Within each phase, regional level impacts on population health are limited and not of a scale where interactions could give rise to significant population level effects. This includes that the Projects' training and employment benefits may interact but would remain a minor influence on public health at the regional level.</p>	<p>No greater than individually assessed impact.</p> <p>Population health effects are no greater when considering the combined effects to the same population groups of the construction, operation and decommissioning phases.</p>



Receptor	Highest Significance Level				
	Construction	Operation	Decommissioning	Phase Assessment	Lifetime Assessment
National population	N/A	Moderate beneficial (wider societal benefits driven)	N/A	<p>No greater than individually assessed impact.</p> <p>National level impacts for public health are only expected during the operational phase, relating to the benefits of renewable electricity generation in terms of both energy security (wider societal infrastructure and resources) and climate change. Whilst these have some interaction, the combined effect is not considered to change the population health significance conclusion.</p>	<p>No greater than individually assessed impact.</p> <p>Population health effects are no greater when considering the combined effects to the same population groups of the construction, operation and decommissioning phases.</p>



Receptor	Highest Significance Level				
	Construction	Operation	Decommissioning	Phase Assessment	Lifetime Assessment
International population	N/A	Moderate beneficial (wider societal benefits driven)	N/A	<p>No greater than individually assessed impact.</p> <p>The international impact for public health relates only to the operational benefits for climate change. No impact interactions are therefore expected.</p>	<p>No greater than individually assessed impact.</p> <p>Population health effects, across the assessed determinants, are no greater when considering the combined effects to the same population groups of the construction, operation and decommissioning phases.</p>



27.11 Inter-relationships

360. There are inter-relationships cited within this chapter between the human health topic and other topics that have been considered within this ES. These interrelationships have been assessed in this chapter where there is the potential for likely significant effects. Relevant chapters referenced are:

- **Volume 7, Chapter 8 Marine Physical Environment (application ref: 7.8);**
- **Volume 7, Chapter 13 Commercial Fisheries (application ref: 7.13);**
- **Volume 7, Chapter 14 Shipping and Navigation (application ref: 7.14);**
- **Volume 7, Chapter 16 Infrastructure and Other Users (application ref: 7.16);**
- **Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19);**
- **Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20);**
- **Volume 7, Chapter 21 Land Use (application ref: 7.21);**
- **Volume 7, Chapter 23 Landscape and Visual Impact Assessment (application ref: 7.23);**
- **Volume 7, Chapter 24 Traffic (application ref: 7.24);**
- **Volume 7, Chapter 25 Noise (application ref: 7.25);**
- **Volume 7, Chapter 26 Air Quality (application ref: 7.26);**
- **Volume 7, Chapter 28 Socio-economics (application ref: 7.28);**
- **Volume 7, Chapter 29 Tourism and Recreation (application ref: 7.29);** and
- **Volume 7, Chapter 30 Climate Change (application ref: 7.30).**

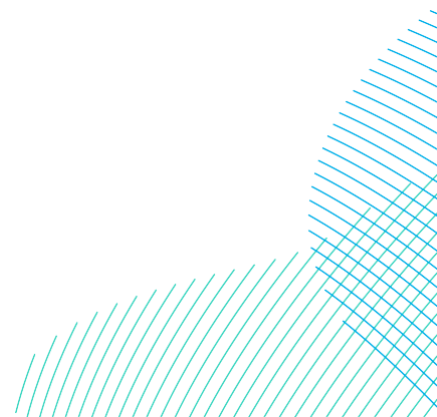
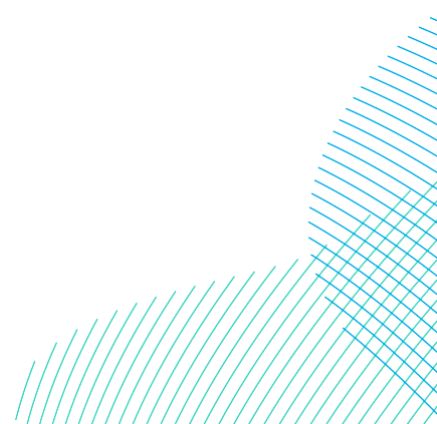


Table 27-22 Human Health Inter-Relationships

Topic and Description	Related Chapter	Where Addressed in this Chapter	Rationale
Construction			
Health Related Behaviours: Physical Activity, Open Space and Leisure	Volume 7, Chapter 14 Shipping and Navigation (application ref: 7.14), Volume 7, Chapter 29 Tourism and Recreation (application ref: 7.29), and Volume 7, Chapter 21 Land Use (application ref: 7.21),	Section 27.6.1	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from minor adverse (and not significant in EIA terms).
Social Environment: Transport Modes, Access and Connections	Volume 7, Chapter 24 Traffic and Transport (application ref: 7.24) and Volume 7, Chapter 21 Land Use (application ref: 7.21)	Section 27.6.1.2	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from minor adverse (and not significant in EIA terms).
Bio-Physical Environment: Air Quality	Volume 7, Chapter 26 Air Quality (application ref: 7.26)	Section 27.6.1.3	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from minor adverse (and not significant in EIA terms).



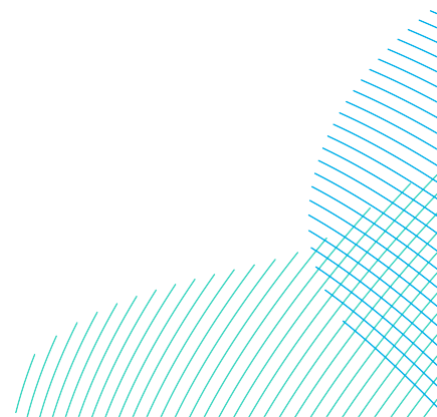
Topic and Description	Related Chapter	Where Addressed in this Chapter	Rationale
Bio-Physical Environment: Water	Volume 7, Chapter 8 Marine Physical Environment (application ref: 7.8) and Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20)	Section 27.6.1.4	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from minor adverse (and not significant in EIA terms).
Bio-Physical Environment: Soil Contamination	Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19)	Section 27.6.1.5	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from minor adverse (and not significant in EIA terms).
Bio-Physical Environment: Noise Disturbance	Volume 7, Chapter 25 Noise (application ref: 7.25)	Section 27.6.1.6	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from minor adverse (and not significant in EIA terms).



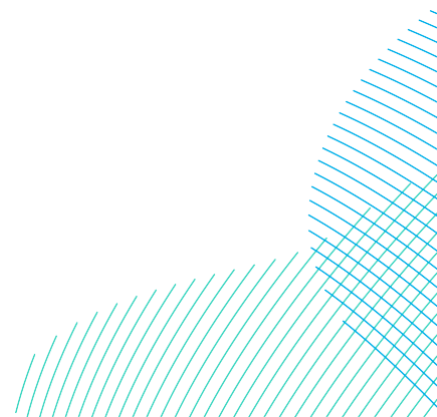
Topic and Description	Related Chapter	Where Addressed in this Chapter	Rationale
Economic Environment: Workforce Upskilling	Volume 7, Chapter 28 Socio-economics (application ref: 7.28)	Section 27.6.1.7	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from negligible beneficial (and not significant in EIA terms).
Economic Environment: Employment and Investment	Volume 7, Chapter 28 Socio-economics (application ref: 7.28)	Section 27.6.1.8	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from minor beneficial (and not significant in EIA terms).
Operation			
Bio-Physical Environment: Noise Disturbance	Volume 7, Chapter 25 Noise (application ref: 7.25)	Section 27.6.2.1	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from minor adverse (and not significant in EIA terms).



Topic and Description	Related Chapter	Where Addressed in this Chapter	Rationale
Bio-Physical Environment: Public Concern and Understanding of Electro-Magnetic Field Risks	N/A	Section 27.6.2.2	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from minor adverse (and not significant in EIA terms).
Bio-Physical Environment: Climate Change	Volume 7, Chapter 30 Climate Change (application ref: 7.30)	Section 27.6.2.3	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from minor adverse (and not significant in EIA terms).
Economic Environment: Workforce Upskilling	Volume 7, Chapter 28 Socio-economics (application ref: 7.28)	Section 27.6.2.4	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from negligible beneficial (and not significant in EIA terms).

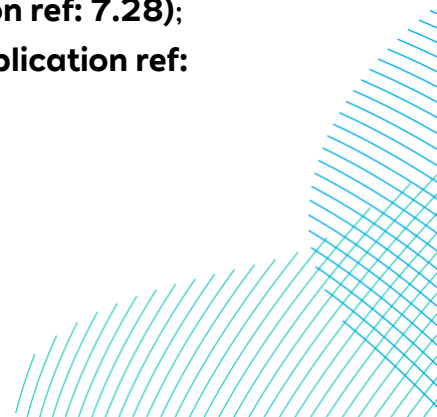


Topic and Description	Related Chapter	Where Addressed in this Chapter	Rationale
Economic Environment: Employment and Investment	Volume 7, Chapter 28 Socio-economics (application ref: 7.28)	Section 27.6.2.5	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from minor beneficial (and not significant in EIA terms).
Wider Social Infrastructure and Resources	N/A	Section 27.6.2.6	No additional inter-related impacts to human health have been identified for these receptors during construction which would increase the standalone assessment from moderate beneficial (significant in EIA terms).
Decommissioning			
As per construction phase.			



27.12 Summary

361. This assessment considers potential impacts on population health from changes due to the Projects. The assessment considers the scenarios of DBS East and DBS West In Isolation, Concurrently or Sequentially.
362. Population health varies given factors such as personal choice, location, mobility and exposure. These factors that influence health are called determinants of health and they span environmental, social, behavioural, economic and institutional aspects. The Projects have the potential to change determinants of health, with beneficial and adverse effects, either directly, indirectly or cumulatively.
363. The methodology for assessing human health as part of the EIA follows guidance and good practice. The assessment identifies any likely significant effects on population health. Consideration is given to physical health, mental health and health inequalities.
364. The health assessment is informed by the findings of other EIA chapters, including:
 - **Volume 7, Chapter 8 Marine Physical Environment (application ref: 7.8);**
 - **Volume 7, Chapter 13 Commercial Fisheries (application ref: 7.13);**
 - **Volume 7, Chapter 14 Shipping and Navigation (application ref: 7.14);**
 - **Volume 7, Chapter 16 Infrastructure and Other Users (application ref: 7.16);**
 - **Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19);**
 - **Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20);**
 - **Volume 7, Chapter 21 Land Use (application ref: 7.21);**
 - **Volume 7, Chapter 23 Landscape and Visual Impact Assessment (application ref: 7.23);**
 - **Volume 7, Chapter 24 Traffic (application ref: 7.24);**
 - **Volume 7, Chapter 25 Noise (application ref: 7.25);**
 - **Volume 7, Chapter 26 Air Quality (application ref: 7.26);**
 - **Volume 7, Chapter 28 Socio-economics (application ref: 7.28);**
 - **Volume 7, Chapter 29 Tourism and Recreation (application ref: 7.29);** and



- **Volume 7, Chapter 30 Climate Change (application ref: 7.30).**

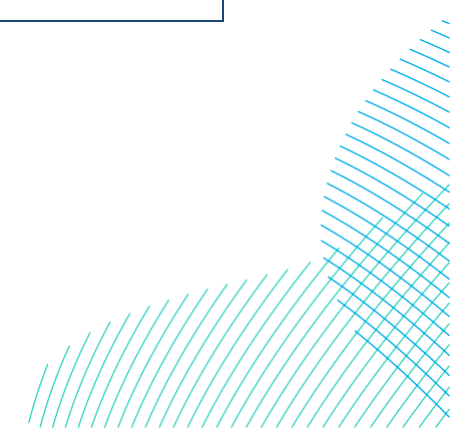
365. The health assessment has also been informed by a review of relevant public health evidence sources, including scientific literature, baseline data, health policy, local health priorities and health protection standards.
366. The health assessment looks at the potential effects for both the general population and for vulnerable groups. Vulnerability relates to experiencing effects differently due to age, income level, health status, degree of social disadvantage or ability to access services or resources. The health assessment considers localised effects as well as effects to the wider community in East Riding of Yorkshire, Yorkshire and Humber and the city of Hull. National and international effects relating to health effects of climate change and the public health benefits of energy security are also discussed.
367. The health of people in the localised study area where the majority of the Projects' impacts would be experienced is generally better than the national average. The presence of vulnerable groups and pockets of deprivation is however noted and taken into account.
368. During construction and decommissioning the Projects have the potential to adversely affect: use of open space for recreation; journey times, road safety and active travel; air, water and soil quality; noise levels; and existing businesses. For population health these effects are found to be **minor** adverse, which are not significant in EIA terms. Construction and decommissioning employment opportunities are considered and found to be **minor** beneficial.
369. During operation the potential for the Projects' Onshore Converter Stations to cause community concern about electromagnetic fields has been considered. Such an effect is expected to be **negligible**, including due to the sharing of non-technical information with local communities about how electromagnetic field standards for public health protection would be met. The expectation is that significant adverse effects to population health would not arise. The benefits of the Projects to public health are noted. This includes how renewable energy generation both provides a **moderate** beneficial (significant) effect in supporting many health promoting aspects of life (such as food safety, thermal comfort and operation of healthcare) and also provides a **minor** beneficial effect through reducing climate change related extreme temperatures and reducing spread of infectious disease. Job opportunities associated with operation and maintenance of the Projects are noted and expected to provide **minor** beneficial population health effects locally and regionally. Monitoring will consider vulnerable group access to these job opportunities.

370. The potential for transboundary effects has been considered and excluded. The potential for interaction between the various health effects has also been considered and it is concluded that any interactions would not change the conclusions reached.
371. **Table 27-23** provides a summary of the assessment findings.

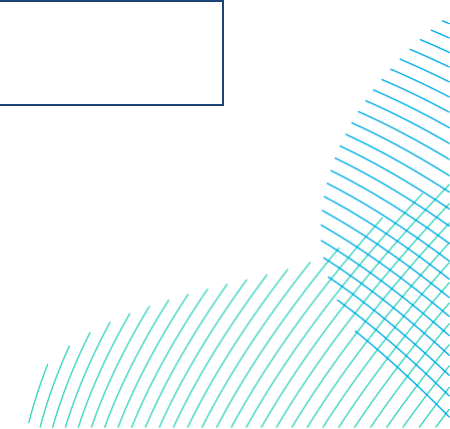


Table 27-23 Summary of Potential Likely Significant Effects on Human Health

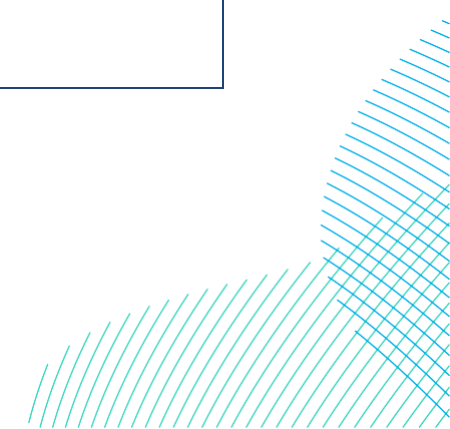
Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
Construction						
Physical Activity, open space and leisure	General Population	Low	Low	Minor adverse (not significant)	None	Minor adverse (not significant)
	Vulnerable Group Population	High				
Transport modes, access and connections	General Population	Low	Low	Minor adverse (not significant)	None	Minor adverse (not significant)
	Vulnerable Group Population	High				
Air Quality	General Population	Low	Low		None	



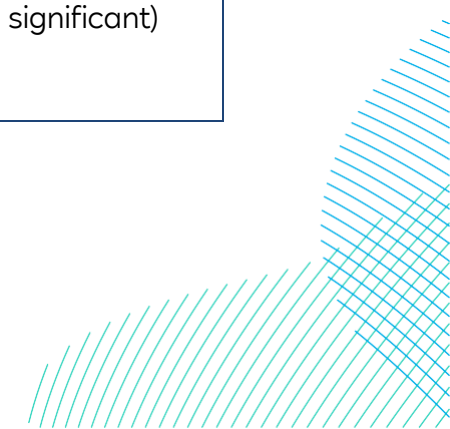
Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
	Vulnerable Group Population	High		Minor adverse (not significant)		Minor adverse (not significant)
Water	General Population	Low	Low	Minor adverse (not significant)	None	Minor adverse (not significant)
	Vulnerable Group Population	High				
Soil Contamination	General Population	Low	Low (see air quality and water for the relevant pathways)	Minor adverse (not significant) (see air quality and water for the relevant pathways)	None	Minor adverse (not significant) (see air quality and water for the relevant pathways)
	Vulnerable Group Population	High				
Noise Disturbance	General Population	Low	Low		None	



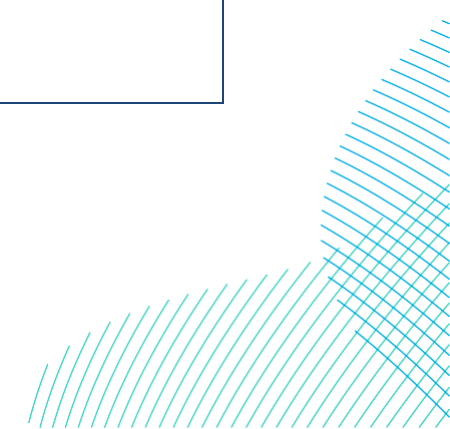
Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
	Vulnerable Group Population	High		Minor adverse (not significant)		Minor adverse (not significant)
Workforce Upskilling	General Population	Low	Negligible	Negligible beneficial (not significant)	None	Negligible beneficial (not significant)
	Vulnerable Group Population	High				
Employment and Investment	General Population	Low	Low	Minor beneficial (not significant) and minor adverse (not significant)	None	Minor beneficial (not significant) and minor adverse (not significant)
	Vulnerable Group Population	High				



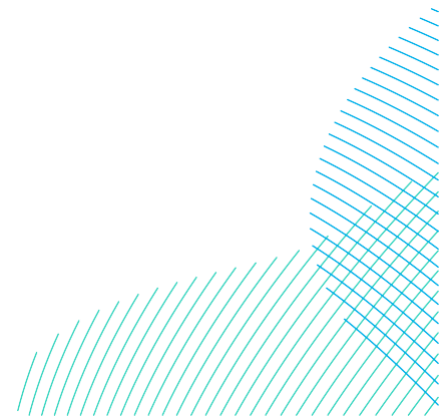
Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
Operation						
Noise Disturbance	General Population	Low	Low	Minor adverse (not significant)	None	Minor adverse (not significant)
	Vulnerable Group Population	High				
Public concern and understanding of EMF	General Population	Low	Low	Minor adverse (not significant)	Non-technical information sharing	Negligible (not significant)
	Vulnerable Group Population	High				
Climate Change	General Population	Low	Medium	Minor beneficial (not significant)	None	Minor beneficial (not significant)
	Vulnerable Group Population	High				



Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
Workforce Upskilling	General Population	Low	Negligible	Negligible beneficial (not significant)	None	Negligible beneficial (not significant)
	Vulnerable Group Population	High				
Employment and Investment	General Population	Low	Low	Minor beneficial (not significant)	None	Minor beneficial (not significant)
	Vulnerable Group Population	High				
Wider Societal Infrastructure	General Population	Low	Medium	Moderate beneficial (significant)	None	Moderate beneficial (significant)
	Vulnerable Group Population	High				



Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
Decommissioning						
<p>The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A Decommissioning Plan would be provided prior to any decommissioning commencing onshore.</p>						



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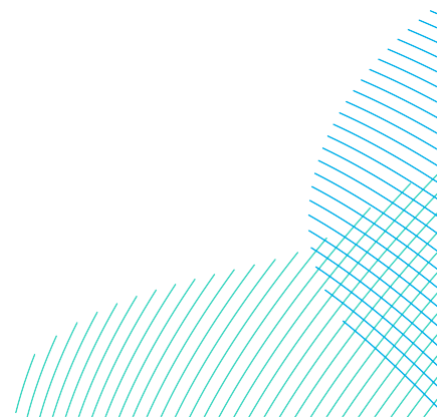
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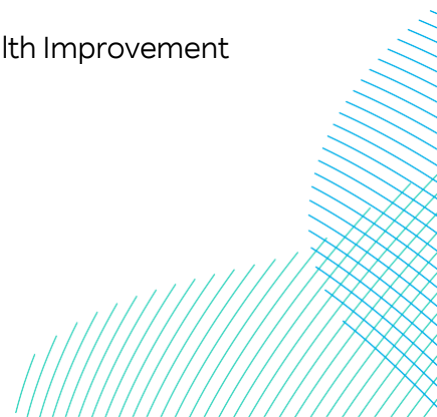
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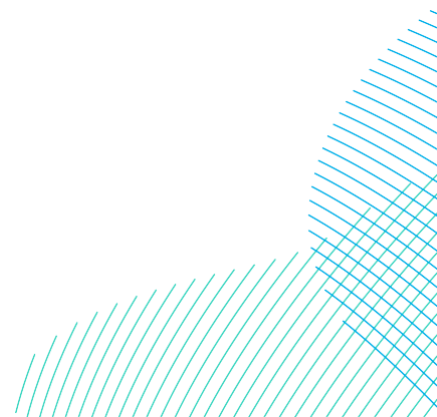
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**RWE Renewables UK Dogger
Bank South (West) Limited**

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Bank South (East) Limited**

**Windmill Hill Business Park
Whitehill Way
Swindon
Wiltshire, SN5 6PB**

