

Viking CCS pipeline

Preliminary Environmental Information Report Volume II

Main PEIR

Applicant: Chrysoar Production (U.K.) Limited,
a Harbour Energy Company

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Chapter 17

Health and Wellbeing



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17 Health and Wellbeing

17.1 Introduction

- 17.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents an initial baseline for health and wellbeing, an overview of the assessment methodology to be followed during the environmental assessment and identifies the potential effects of the Viking CCS Pipeline (hereafter referred to as ‘the Project’).
- 17.1.2 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref 17-1) require the consideration of the likely significant direct or indirect effects of projects on ‘population and human health’. This chapter aims to consider the potential for health impacts to the local and wider population as a result of the Project during the construction, operation and decommissioning phases.
- 17.1.3 A Health and Wellbeing assessment assesses the likely effects of proposed projects, both positive and negative, on the health and wellbeing of the population. With no statutory guidance for assessing health impacts, the approach remains flexible and scalable to meet individual project requirements which will be determined by the nature of the proposal, timescales involved and resources available.
- 17.1.4 The chapter is supported by *Chapter 3: The Viking CCS Pipeline* and should be read in conjunction with the following chapters of this PEIR, which have helped to inform the assessment:
- *Chapter 7: Landscape and Visual;*
 - *Chapter 12: Traffic and Transport;*
 - *Chapter 13: Noise and Vibration;*
 - *Chapter 14: Air Quality;* and
 - *Chapter 16: Socio-economics.*

17.2 Legislation, Policy and Guidance

National Legislation and Policy

National Policy Statement for Energy (EN-1) (2011)

- 17.2.1 Planning policy on Nationally Significant Infrastructure Projects (NSIPs) is primarily contained in Overarching National Policy Statements (NPS). The previous NPS for Energy was approved in July 2011.
- 17.2.2 The Overarching National Policy Statement (NPS) for Energy (EN-1) requires the decision maker to consider potential benefits of development proposals including ‘*the potential to impact on the health and well-being of the population*’.
- 17.2.3 Section 4.13 ‘Health’ states that the assessment should consider all relevant human health impacts, which may include the following:
- The direct impacts on health including increased traffic, air or water pollution, dust, odour, hazardous waste and substance, noise, exposure to radiation, and increases in pests; and

- The indirect health impacts of new energy infrastructure, through access to key public services, transport, or the use of open space for recreation and physical activity.

17.2.4 It also states that applicants should describe the existing human health conditions in the areas surrounding schemes and refer to how their human health impacts correlate with local planning policies.

Draft Overarching National Policy Statement for Energy (EN-1) (2021)

17.2.5 The Draft Overarching NPS for Energy (EN-1) was published on September 2021 (Ref 17-6), which places a greater emphasis on net zero, following the release of the Energy White Paper, published in December 2020, and updates the existing Statement. In addition to the health impacts of energy infrastructure development outlined in the existing Statement, the Draft Statement notes the potential health impacts to be considered:

- The direct impacts on health may include increased traffic, air or water pollution, dust, odour, hazardous waste and substances, noise, exposure to radiation, and increases in pests; and
- 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.

National Planning Policy Framework (2021)

17.2.6 The National Planning Policy Framework (NPPF) (Ref 17-8) was revised on 20 July 2021 and sets out the national government planning policies for England and how these are expected to be applied. This revised Framework replaces the previous National Planning Policy Framework published in March 2012, revised in July 2018, and updated in February 2019. It provides a framework within which local people and their relevant councils produce their own local and neighbourhood plans. The NPPF contains policies that are applicable to human health, as per the below.

17.2.7 Section 8 of the NPPF “*Promoting healthy and safe communities*” states that policies should aim to achieve healthy, inclusive, and safe places which: promote social inclusion; are safe and accessible; and enable and support healthy lifestyles. In order to do this, planning policies and decisions should:

- Plan positively for the provision of local services to enhance the sustainability of communities and residential environments;
- Take into account and support the delivery of local strategies to improve health, social and cultural well-being for all sections of the community;
- Guard against the unnecessary loss of valued facilities and services, particularly where this would reduce the community’s ability to meet its day-to-day needs;
- Ensure that established shops, facilities, and services are able to develop and modernise, and are retained for the benefit of the community;
- Ensure an integrated approach to considering the location of housing, economic uses and community facilities and services; and
- Steps should also be sought to promote public safety and take into account wider security and defence in developing planning policy.

Spatial Planning for Health: An evidence resource for planning and designing healthier places (2017)

- 17.2.8 In 2017, Public Health England published ‘Spatial Planning for Health: An evidence resource for designing healthier places’ (Ref 17-13). The Spatial Planning for Health is an evidence base to explore the link between spatial planning and health in the current available literature. The review provided public health planners and local communities with evidence informed principles for designing healthy places.
- 17.2.9 The review addresses the relationship which exists between public health and the built environment. It identifies five aspects of the built and natural environment which can be influenced by local planning policy:
- Neighbourhood design;
 - Housing;
 - Healthier food;
 - Natural and sustainable environment; and
 - Transport.
- 17.2.10 For each aspect identified above, the review provides the evidence base underpinning why they are important determinants of public health. It also sets out principles which public health professionals and planners should follow to ensure healthier places.
- 17.2.11 The two aspects deemed most relevant to the Project are ‘neighbourhood design’ and ‘natural and sustainable environment’. For ‘neighbourhood design’, the review states that:
- “Neighbourhoods are places where people live, work, and play and have a sense of belonging. The design of a neighbourhood can contribute to the health and well-being of the people living there. Several aspects of neighbourhood design (walkability and mixed land use) can also maximise opportunities for social engagement and active travel. Neighbourhood design can impact on our day-to-day decisions and therefore have a significant role in shaping our health behaviours.”*
- 17.2.12 For the ‘natural and sustainable environment’, the review states:
- “there is a very significant and strong body of evidence linking contact and exposure to the natural environment with improved health and wellbeing. For the purpose of this review, the natural and sustainable environment is comprised of neighbourhood ecosystems and the resulting co-benefits between the environment and health. Protecting the natural environment is essential to sustaining human civilization.”*

Local Policy

- 17.2.13 This section outlines the key national and local policies which are relevant to the Health and Wellbeing assessment. While this includes all relevant details with respect to the scope of the assessment, when undertaking the assessment, a wider range of policies and guidance appropriate to individual impacts and their mitigation has been drawn on.

North East Lincolnshire Local Plan 2013 to 2032 (2018)

- 17.2.14 The North East Lincolnshire Local Plan was officially adopted in 2018 (Ref 17-14). As part of the Local Plan, strategic objectives were set for the local authority, including for health. Strategic Objective 5 focuses on Social and Health Inequality, in which North East Lincolnshire Council (NELC) aim to narrow the gap for social and health inequality by ‘addressing issues of housing choice, providing accessible employment and training

opportunities, promoting healthier lifestyles, providing healthcare and community facilities, improving educational attainment and cultural facilities; and establishing protecting and maintaining a network of accessible good quality open space, sport and recreation facilities’.

17.2.15 For NELC, the key critical success factors to achieve this are as follows:

- To reduce deprivation; and
- To safeguard and develop open space and sport and recreation facilities to maintain or exceed local accessibility standards, promoting healthy lifestyles.

North Lincolnshire Core Strategy Local Plan (2011)

17.2.16 The North Lincolnshire Core Strategy Local Plan (Ref 17-15) was originally adopted in June 2011 and sets out the long term spatial planning framework for the development of North Lincolnshire up to 2026. It details 27 strategic policies, of which CS24: Health Care Provision is the most relevant. The strategic policy aims to:

- Improve the health of residents through safeguarding and enhancing open space, facilities for sports and recreation and improving walking and cycling routes.

17.2.17 The relevant excerpt from the policy states that:

“Developers will be expected to make an appropriate contribution towards necessary improvements, additional provision improvements or additional provision for health care services and facilities arising from their development proposals, in accordance with the Planning Obligations policy and Developer Contributions SPD. The implementation of new facilities supported by this policy will be permitted subject to other relevant plan policies.”

North Lincolnshire Draft Local Plan 2020 to 2038 (2021)

17.2.18 North Lincolnshire Council is currently preparing a new Local Plan (Ref 17-16) that will replace the current Local Plan and Core Strategy once formally adopted. The following aspects of the policies in the draft Local Plan are of specific relevance to this chapter:

- *Policy CSC1: Health and Wellbeing*
 - Make the potential for achieving positive mental and physical health outcomes a priority when considering all development proposals;
 - Promote improvements and enhancing accessibility to the historic environment, nature, accessible natural greenspaces and green infrastructure corridors and blue and green infrastructure;
 - Recognise the vital role heritage and nature plays in people’s lives by safeguarding and enhancing the quality of our surroundings to ensure positive impacts on individuals and communities;
 - Use the ten principles of Active Design to support development in North Lincolnshire;
 - Ensure development does not have an adverse impact on the environment or residential amenity through air, noise, vibration, and water pollution; and
 - Work with relevant stakeholders to reduce geographical inequalities in health through maximising the provision of affordable housing and regenerating poorer neighbourhoods within the area.
- *Policy CSC2: Health Care Provision*

- Where appropriate, developers should consult with health care commissioners at an early stage in order to understand the need for new or enhanced health care infrastructure and improved access to primary and mental health care facilities; and
- That the healthcare infrastructure implications of any relevant proposed development have been considered and addressed;

East Lindsey District Council Core Strategy Local Plan (2018)

17.2.19 East Lindsey District Council (ELDC) adopted their Local Plan in 2018 (Ref 17-17). Within it, there is a key priority placed on health and wellbeing. ELDC state that by 2031, the district will be ‘a network of thriving, safer and healthy sustainable communities, where people can enjoy a high quality of life and an increased sense of well-being and where new development simultaneously addresses the needs of the economy, communities and the environment.’

17.2.20 In order to achieve a higher quality of life in the local communities, the following relevant objectives have been identified from the Local Plan:

- Protect and enhance the vitality and viability of our town centres;
- Require new development to contribute to improving the environmental quality of our spaces and places; and
- Protect and commit to improve essential community facilities in towns and villages.

Central Lincolnshire Local Plan (2017)

17.2.21 West Lindsey District Council (WLDC) joined with three other local authorities (City of Lincoln Council, North Kesteven District Council and Lincolnshire County Council) in 2009 to form the Central Lincolnshire Joint Strategic Planning Committee (CLJSPC).

17.2.22 The Central Lincolnshire Local Plan (Ref 17-18) adopted in April 2017 makes reference to health in the following policies:

- *Policy LP9: Health and Wellbeing:* this states that the potential for achieving positive and physical health outcomes will be taken into account when considering all development proposals;
- *Policy LP13: Accessibility and Transport:* this states that development proposals should contribute towards an efficient and safe transport network, where the use of sustainable transport modes are maximised;
- *Policy LP15: Community Facilities:* this states that all development proposals should recognise the community facilities as an integral component in achieving and maintaining sustainable, well integrated, and inclusive development;
- *Policy LP18. Climate Change and Low Carbon Living:* this states that development proposals will be considered more favourably if the scheme would make a positive and significant contribution towards one or more of the following: reducing demand; resource efficiency; energy production; and carbon off-setting; and
- *Policy LP21: Green Infrastructure Network:* this states that the Central Lincolnshire Authorities will aim to maintain and improve the green infrastructure network by enhancing, creating, and managing multifunctional green space within and around settlements that are well connected to each other and the wider countryside.

Guidance

17.2.23 There is no prescriptive or statutory method for assessing 'Health and Wellbeing'. Whilst preparing the baseline community profile and signposting to where human health will be assessed in the wider environmental impact assessment reports, guidance has been drawn from the following sources:

- Planning Practice Guidance: Health and Wellbeing;
- NHS/Healthy Urban Development Unit (HUDU) Rapid HIA Toolkit (Ref 17-19); and
- Wales Health Impact Assessment Support Unit (WHIASU) Health Impact Assessment Guide (Ref 17-20).

17.2.24 Whilst the Project is located within England, the WHIASU does provide a good array of guidance and resources on how health and wellbeing of a population may be affected by an action, such as a development proposal. Consideration has been given to the health and wellbeing checklist to help with the identification of which health determinants are relevant.

17.2.25 This report also acknowledges the "*Health Impact Assessment for Planning Applications: Guidance Note*" formed as part of the 2017 Central Lincolnshire Local Plan, which represents a relevant policy document for the district of West Lindsey. This guidance note is based on the same principles developed by HUDU and NHS guidance, and as such, this PEIR's assessment methodology has been informed by this local level guidance note.

17.3 Scoping Opinion and Consultation

17.3.1 A scoping exercise was undertaken in early 2022 to establish the content of the EIA and health assessment and the approach and methods to be followed.

17.3.2 The Scoping Report (Ref 17-21) records the findings of the scoping exercise and details the technical guidance, standards, best practice, and criteria to be applied in the assessment to identify and evaluate the effects of the Project on Health and Wellbeing.

17.3.3 Following receipt of the Scoping Opinion (*PEIR Volume IV - Appendix 5.2*), the following requirements have been identified by the Planning Inspectorate which will be taken account of as part of the ongoing health and wellbeing assessment:

- To agree the approach to the assessment of human health effects with the relevant stakeholders, in particular the UKHSA and local public health teams, to ensure it is appropriate to the construction, operation and decommissioning of the Project; and
- The ES should consider the potential health impacts caused by the permanent loss or change to formal PRowS and accessible open space as a result of the construction, operation and decommissioning of the Project.

17.3.4 These requirements will be met through this PEIR and explored and assessed further within the ES chapter for Health and Wellbeing which will follow the PEIR.

17.3.5 Following receipt of the Scoping Opinion from the Planning Inspectorate, no matters have been proposed to be scoped out of the health and wellbeing assessment.

Table 17-1: Summary of the EIA Scoping Opinion in relation to Health and Wellbeing

Section Reference to Scoping Opinion	Applicant's proposed matter	Planning Inspectorate / prescribed consultee comments	Response
Planning Inspectorate	Assessment of effects - methodology	The Applicant should make effort to agree the approach to the assessment of human health effects with the relevant stakeholders, in particular the UK Health Security Agency and local public health teams, to ensure it is appropriate to the construction, operation and decommissioning of the Proposed Development.	Agreement will be sought with the relevant stakeholders and this will be detailed within the Health and Wellbeing ES chapter.
Planning Inspectorate	Public Right of Way (PRoW) - health impacts	The ES should consider the potential health impacts caused by the permanent loss or change to formal PRoWs and accessible open space as a result of the construction, operation and decommissioning of the Proposed Development.	This has been preliminary assessed in section 17.7 of this chapter and will be assessed in the Health and Wellbeing ES chapter.
North East Lincolnshire County Council	Date Reference	At the Health and Well-being section 16.2.1 (of the Scoping Report) The NELC Local Plan is referenced as 2013 as opposed to 2018.	This has been amended, see section 17.2.14.
United Kingdom Health Security Agency	EMF	The applicant should assess the potential public health impact of EMFs arising from the electrical equipment associated with the development. For more information on how to carry out the assessment, please see the accompanying reference for details.	This will be considered within the Health and Wellbeing ES chapter.
	Assessment	Chapter 16 of the scoping report comments there are no established or widely accepted frameworks for assessing the 'significant' health effects of a development proposal. The scoping report proposes	The assessment methodology uses Healthy Urban Development Unit (HUDU) and WHIASU guidance to carry out the assessment of potential effects on Health and Wellbeing.

Section Reference to Scoping Opinion	Applicant's proposed matter	Planning Inspectorate / prescribed consultee comments	Response
		<p>to provide a qualitative assessment of impacts using Table 16-7 (of the Scoping Report), which does not include an assessment of significance.</p> <p>The lack of an assessment of significance does not conform to the requirements of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (2017 Regulations) and as such an assessment of significance should form part of the ES.</p> <p>Guidance on the assessment for population and human health has been published by the International Association for Impact Assessment (IAIA). This guidance could be used as the basis for an assessment of significant in accordance with the 2017 Regulations. It is noted that the scoping report also details general criteria for the assessment of significance in para 4.4.13 to 4.4.21 and Table 4.4, which could also form the basis of the determination of significance in the population and human health chapter.</p> <p>The final ES must provide an assessment of significance for those health determinants scoped into the population and human health chapter.</p> <p>As there is no UK national approach to the assessment of significance for human health it is strongly advised that any proposed approach is agreed with OHID/UKHSA and the local public health teams.</p>	<p>There is no guidance which provides a justified definition of significance for human health effects, therefore it is not possible to robustly identify significance. A qualitative assessment is therefore made as to whether effects are likely to be positive, negative or neutral with respect to health. Where negative effects are identified, suitable mitigation measures will be identified. The proposed approach will be agreed through consultation for the ES.</p>

Section Reference to Scoping Opinion	Applicant's proposed matter	Planning Inspectorate / prescribed consultee comments	Response
	PRoW	The PRoW should be surveyed to assess usage in order to identify the need for mitigation and to assist in the determination of sensitivity of each PRoW.	The sensitivity of users of individual PRoWs will be assigned as part of the assessment of socio-economic effects in <i>Chapter 16: Socio-economics</i> . This will take into account designation, condition of the routes and likely usage levels sufficient to identify whether mitigation is required..
	Vulnerable Populations	The impacts on health and wellbeing of the scheme will have particular effect on vulnerable or disadvantaged populations, including those that fall within the list of protected characteristics. The report does not comprehensively identify a potential list of vulnerable populations, some of which are also within the protected characteristics. The list of vulnerable populations should be reviewed and include data on the Indices of Multiple Deprivation. Guidance is available from the IAIA3.	<p>Baseline health data is presented in section 17.7. This seeks to identify vulnerable populations via the presentation of data relating to population, age, ethnicity, deprivation, health deprivation, self-assessment of health, and a number of wider health determinant indicators. These indicators align with WHIASU vulnerable populations list (age related groups, income related groups, groups who suffer discrimination or other social advantage, geographical groups). Additional socio-economic data relating to the local population is set out in <i>Chapter 16: Socio-economics</i>.</p> <p>Within the Health and Wellbeing ES chapter, a more detailed baseline section will be presented, drawing on the most recent data available to inform the full assessment of Health and Wellbeing effects..</p>
	Community Impact Reports	The final report should include scheme wide assessments supported by logically bounded	Baseline conditions for each route section relevant health, socio-economic and community

Section Reference to Scoping Opinion	Applicant's proposed matter	Planning Inspectorate / prescribed consultee comments	Response
		community impact reports. These community impact reports should draw together relevant findings that relate to health.	receptors are set out in section 17.7. This will be considered further within the Health and Wellbeing ES assessment.

Consultation

17.3.6 As part of the preparation of the Health and Wellbeing chapter of the Environmental Statement there will be engagement with stakeholders to confirm the assessment methodology, supplement the desk-based analysis, and to capture any local data or local knowledge that might not be accessible in the public domain. Key stakeholders to be engaged will include health officials from relevant local authorities and the local health boards, including the NHS Humber and North Yorkshire Integrated Care Board (ICB) which covers North East Lincolnshire, and NHS Lincolnshire ICB (covering North Lincolnshire, East Lindsey, and West Lindsey).

17.4 Assessment Method

17.4.1 The wider environmental assessment of the Project covers a range of environmental topics with individual topic chapters written accordingly as outlined below. The relationship to those likely to affect health and wellbeing are summarised below.

17.4.2 There is no consolidated methodology or practice for the assessment of effects on human health. The Health and Wellbeing assessment considers the impacts of the Project on both the mental and physical health of local residents, the workforce and visitors that may arise from the construction, operation, and decommissioning phases. Best practice principles are provided in NHS England's HUDU Rapid Health Impact Assessment (HIA) Toolkit 2019 and forms the basis of the approach adopted to assess impacts on health and wellbeing. Based on this, the impacts of the Project on health and wellbeing are assessed qualitatively using professional judgement, best practice and draw upon other assessments where practicable.

17.4.3 With no statutory definition of 'health', a widely accepted definition is offered by the World Health Organisation (WHO) as '*a state of complete physical, social and mental wellbeing, and not merely the absence of disease or infirmity*'.

17.4.4 The determinants of health are well reported and accepted. Health determinants can be described as lifestyle (diet, physical activity, alcohol consumption etc.), social and community influences (social isolation, culture, social support etc.), living/environmental conditions (built environment, housing, noise, air and water quality etc.), economic (unemployment, income, workplace conditions etc.), access and quality of services (medical services, public amenity, education etc.) and macro-economic (government policies, economic development, climate etc.).

17.4.5 The qualitative assessment of health and wellbeing effects considers the following health and well-being determinants of relevance:

- Access to healthcare services and other social infrastructure;
- Air quality, noise, and neighbourhood amenity;
- Accessibility and active travel;
- Access to work and training; and
- Social cohesion and neighbourhoods.

17.4.6 The assessment considers the potential consequences for health and wellbeing from the construction, operation and decommissioning phases of the Project and draws upon the preliminary information reported within the following PEIR chapters:

- *Chapter 7: Landscape and Visual;*
- *Chapter 12: Traffic and Transport;*

- *Chapter 13: Noise and Vibration;*
- *Chapter 14: Air Quality; and*
- *Chapter 16: Socio-economics.*

17.4.7 A qualitative assessment of human health has been undertaken, with evidence provided to support the conclusions. The assessment of human health effects describes the likely qualitative health outcomes. When describing the impact on each health determinant, where possible, the duration of the change and the population exposed to this is identified.

17.4.8 There is no accepted definition of significance for health effects. The description of the changes to health determinants, the characteristics and sensitivity of the receptor population, and the likelihood of negative or positive health effects has been undertaken in accordance with HUDU and WHIASU guidance. The description provides information to inform stakeholders and decision makers of the likely direction of change in terms of health and wellbeing outcomes. Therefore, in line with current knowledge and methods of assessment, the consideration of health outcomes reports effects as being positive, negative, or neutral, rather than indicating a level of significance.

17.4.9 The potential health effects during construction, operation, and decommissioning are described using the criteria as outlined in **Table 17-2**. Where an impact is identified, actions have been proposed to mitigate any negative impact on health, or to realise opportunities to create health benefits. It should be noted that in many cases, mitigation is embedded within the Project and the implementation of this is an underlying assumption of the assessment.

Table 17-2: Health and Wellbeing impact categories

Impact Category	Description
Positive	A beneficial impact is identified
Neutral	No discernible health impact is identified
Negative	An adverse impact is identified
Uncertain	Where uncertainty exists as to the overall impact

Assumptions and limitations

17.4.10 This assessment is based on baseline and design information available at the time of writing this PEIR. A full assessment is being undertaken as part of the EIA and will be reported in the ES that will be submitted with the Development Consent Order (DCO) application.

17.4.11 The assessment of effects has been carried out against a benchmark of current human health and wellbeing baseline conditions prevailing around the Project, as far as is possible within the limitations of such a dataset.

17.4.12 Baseline data is also subject to a time lag between collection and publication. As with any dataset, these conditions may be subject to change over time which may influence the findings of the assessment. Baseline Conditions reported in Section 17.6 regarding human health and wellbeing are based on latest data available at the time of writing. It is likely that current conditions may have changed from the effects of the COVID-19 pandemic, which may have affected some baseline data.

17.4.13 The preliminary assessment of effects reported in section 17.7 are based on the conditions as reported within the Draft Order Limits and the current health baseline condition in the

Study Area, as detailed in Section 17.5. It is not expected that these conditions would change prior to the assessment conclusions being made.

- 17.4.14 This assessment is based on professional judgement and considered both the negative and positive impacts that the Project will have on the surrounding receptors. It provides an indication of human health and wellbeing effects on people and the local community.
- 17.4.15 Effects on Health and Wellbeing during the construction, operation and decommissioning phases are based on preliminary assessments taking into consideration the results from other relevant environmental studies.
- 17.4.16 A full assessment will be undertaken at the ES stage.
- 17.4.17 In advance of a detailed construction programme, which will be prepared following the granting of the DCO, all temporary effects during construction are assessed as occurring simultaneously and for the entire construction programme. The same is assumed for decommissioning. This may result in the overestimation of predicted adverse health effects but is considered a robust approach to the assessment. Should the construction phase be extended or delivered in phases, the predicted effects would be the same or less than those outlined in this chapter.
- 17.4.18 It is possible that the Project will be operational for a longer period of time than anticipated, however, should parts of the Project be decommissioned in advance of the main decommissioning phase, the predicted effects would be the same or less than those outlined in this chapter. Similar to the construction period, the assessment of a decommissioning period therefore represents a realistic worst case.

17.5 Baseline Environment and Study Area

Study Area

- 17.5.1 At present, a wide definition of the spatial area for consideration for the health assessment applies. This includes the Draft Order Limits, along with the surrounding areas based on administrative boundaries to align with how the Government publishes official data and with the boundaries of health service planning areas, which are typically at district / unitary level. Study Areas.
- 17.5.2 For the purposes of the assessment, the Baseline environment section is split into two sections reflecting that they have different Study Areas; Health Profile; and Sensitive Receptors. For Health Profile, the Local Authorities areas (North East Lincolnshire Council, North Lincolnshire Council, as well as East Lindsey District Council, and West Lindsey District Council which are within Lincolnshire County Council), are regarded as 'the Study Area', and the data for this area are compared to the relevant regions (East Midlands and Yorkshire and the Humber) and England as a whole, with no segregation to reflect the different route sections.
- 17.5.3 For Sensitive Receptors, the Study Area is defined based on that defined by other topics for each environmental aspect of relevance to health and wellbeing, namely socio-economics, air quality, noise and vibration, and traffic and transport) and are as set out in the relevant chapters of this PEIR.

Baseline Environment – Health Profile

- 17.5.4 The following section has been prepared using existing desk-based knowledge and accessible evidence base to give an overview of the existing health baseline of the Study Area.

- 17.5.5 The baseline data takes account of relevant local authority, regional and national statistics. These describe the characteristics of people and households by area and are built on information including age, ethnicity, deprivation, and population change.
- 17.5.6 The local Study Area statistics that are discussed in the following sections show, where available, Census (2021) data for the above areas, as well as recent data from Mid-year Population estimates (2020), Annual Population Survey (2020) and from Public Health England (2017-2020) for characteristics where Census 2021 data is yet to be released. Given the large number of unitary level areas under consideration, tables have been used to display the relevant data as follows.
- 17.5.7 At the time of writing, COVID-19 is no longer leading to restrictions in the UK and is having a reduced impact on daily life. However, the COVID-19 pandemic may influence the discussion on health in this chapter. This is because the data used in this section varies by year, with some data being derived from 2020, when the UK was impacted by the COVID-19 pandemic. However, the construction, operation and subsequent decommissioning of the Project is not expected to have any direct and indirect impacts in relation to COVID-19.

Population

- 17.5.8 **Table 17-3** below shows the total population of the Wards and Counties considered for the community profile based on the 2021 Census from the ONS (Ref 17-22). There are 570,300 people in the four local authorities, which cross the regional borders of the East Midlands and Yorkshire and the Humber. Combined, the Study Area local authorities account for 5% of the two regions’ total population.

Table 17-3: Population of Study Area

Council areas / Regions / National	Total population
Unitary Council areas	
North East Lincolnshire	156,900
North Lincolnshire	169,700
East Lindsey	142,300
West Lindsey	95,200
Regions	
East Midlands	4,880,200
Yorkshire and The Humber	5,480,800
National	
England	56,489,800

Source: Census, ONS, 2021

Age breakdown

- 17.5.9 The age profile of a community or population can help to indicate any future trends, any signs of an ageing population and sets out the requirements of future generations.
- 17.5.10 As shown in **Table 17-4**, data from the 2020 Mid-year population estimates (Ref 17-23) shows that all of the local authorities considered (North East Lincolnshire, North Lincolnshire, East Lindsey and West Lindsey) have a lower percentage of working age population cohorts (aged between 16-64) compared to the national average of 62.3%, with East Lindsey the lowest at 54.4%. This is also true when compared to regional proportions. Conversely, all four local authorities have larger proportions of people aged 65 and over

than the national average of 18.5%. This is a theme that is consistent when also comparing to regional averages.

Table 17-4: Percentage of population in age range

District/ Regional / National level	Percentage of population in age range	
	16-64 (%)	65+ (%)
North East Lincolnshire	59.7%	20.9%
North Lincolnshire	60.0%	21.6%
East Lindsey	54.4%	30.4%
West Lindsey	57.7%	25.2%
East Midlands	61.8%	19.6%
Yorkshire and The Humber	62.1%	18.9%
England	62.3%	18.5%

Source: Mid-year Population Estimates, ONS, 2020.

Ethnicity

17.5.11 **Table 17-5** below, from the Annual Population Survey (Ref 17-24), shows the number of people stating their ethnicity as non-White (not any White category) as a percentage of the total number of respondents to the survey in 2020.

Table 17-5: Ethnicity

District/ Regional / National level	Ethnicity (% of population not White)
North East Lincolnshire	2.1%
North Lincolnshire	5.2%
East Lindsey	0.8%
West Lindsey	1.5%
East Midlands	10.3%
Yorkshire and The Humber	8.8%
England	13.8%

Source: APS, ONS, 2020

17.5.12 The four local authorities in the Study Area each have substantially smaller proportions of non-White residents compared to the national average of 13.8% of the population. This is also true at a regional level.

Education, Skills and Training

17.5.13 Education, skills, and training are important socio-economic factors with potential to influence a person’s lifestyle, self-efficacy, employment, income and quality of housing and health. Baseline data for the education, skills and training are provided in **Chapter 16: Socio-economics**.

Employment and Income

17.5.14 The Annual Population Survey provides data on economic activity, which can indicate trends in employment, unemployment, and economic inactivity within an area.

17.5.15 In 2020, the proportion of economically active working age people in the Study Area averaged between 72.5% (West Lindsey) and 77.9% (North Lincolnshire). All four local authorities presented a lower proportion of economically active working age people than nationally (79.4%).

17.5.16 As seen in the economically active trends in **Table 17-6**, unemployment varies among the local authorities in the Study Area. This ranges from as low as 4.9% in West Lindsey to as high as 7.3% in East Lindsey. West Lindsey's proportion of unemployment is in line with national averages, along with North East Lincolnshire (5.2%). However, rates in both North Lincolnshire (6.2%) and East Lindsey are higher than these national levels, as well as regional levels.

Table 17-6: Economic Activity

District/ Regional / National level	Economically Active	
	16-64 economically active (%)	16-64 unemployed (%)
North East Lincolnshire	76.8	5.2
North Lincolnshire	77.9	6.2
East Lindsey	75.2	7.3
West Lindsey	72.5	4.9
East Midlands	79.5	5.0
Yorkshire and The Humber	77.8	4.6
England	79.4	4.9

Source: APS, ONS, 2020

Indices of Multiple Deprivation

17.5.17 The Index of Multiple Deprivation (2019) Deprivation Score (IMD score) (Ref 17-25) is an overall measure of multiple deprivation experienced by people living in an area. The 2019 Indices of Deprivation are based on 37 indicators across seven domains of deprivation. These are combined using appropriate weighting to give an overall IMD score. Using a standardised scoring system like this allows areas to be compared based on their overall deprivation.

17.5.18 Baseline data for the Indices of Multiple Deprivation are provided in *Chapter 16: Socio-economics*.

Life Expectancy

17.5.19 The most recent life expectancy data, shown in **Table 17-7** considers a three-year period from 2018 to 2020, sourced from the latest published Public Health England (now UKHSA) data (Ref 17-26). There is a relatively low spread of life expectancy by gender across the unitary local authorities in the Study Area, ranging from 78.0 to 79.5 for males and 81.6 to 83.4 for females. Only West Lindsey represents a higher life expectancy for both males and females than the national average (79.4 for males, 83.1 for females) however, this is only marginally different.

Table 17-7: Life Expectancy

Local / Regional / National level	Life Expectancy Males	Life Expectancy Females
North East Lincolnshire	78.0	82.2
North Lincolnshire	78.7	82.7
East Lindsey	78.2	81.6
West Lindsey	79.5	83.4
East Midlands region	79.2	82.7
Yorkshire and the Humber region	78.4	82.2
England	79.4	83.1

Source: Life expectancy at birth, Public Health England, 2018-2020

Health, Wellbeing and Mortality

17.5.20 **Table 17-8** provides a profile of health and wellbeing in the area surrounding the Project, focusing on key indicators identified by Public Health England (Ref 17-27) at local authority level including a comparison of these to regional and national averages.

Table 17-8: Key health indicators

Indicator	North East Lincolnshire	North Lincolnshire	East Lindsey	West Lindsey	East Midlands region	Yorkshire and the Humber	England
Under 75 mortality rates from all cardiovascular diseases, 2017-19	92.0	72.2	90.9	66.3	72.1	80.2	70.4
Admission episodes for alcohol-specific conditions, 2019/20	732.4	517.1	519.5	327.9	548.9	641.8	644.1
Percentage of physically active adults, 2019/20, %	61.9	64.4	62.7	67.6	65.9	65.4	66.4
Percentage of adults (aged 18+) classified as overweight or obese, 2019/20	74.6	71.5	73.3	59.2	65.4	65.2	62.8
Under 75 mortality rate from cancer, standardised rate, per 100,000	152.6	136.9	141.6	125.8	131.3	137.5	129.2

Source: Local Authority and Regional Health Profiles, Public Health England, 2017-2020.

17.5.21 For simplicity, the remaining baseline conditions will be split by section of the Draft Order Limits of the Project. This follows the structure also detailed in *Chapter 16: Socio-economics*; see this for full details on relevant socio-economic and community receptors definition. The remaining baseline conditions are shown on **Figure 17-1**.

Section 1 – Rosper Road, Immingham to A180

17.5.22 Section 1 describes the portion of the Project between the Immingham Facility near South Killingholme and the town of Immingham. This portion is within North Lincolnshire and North East Lincolnshire. Section 1 consists primarily of agricultural land and is traversed by public footpaths, local access roads and two major roads. Within this section, receptors are described as they are found within the Study Area following a transect from the Immingham Facility southwards.

Healthcare facilities

17.5.23 There are no hospitals within the Draft Order Limits in Section 1. There are three GP surgeries within the Draft Order Limits, which are Pilgrim Primary Care Centre / Roxton Practice and the Killingholme Surgery.

Public Rights of Way (PROW)

17.5.24 Two PROWs, serving South Killingholme, Immingham and Habrough, traverse Section 1 and there are also a number of other PROWs outside of, but close to, the Draft Order Limits.

17.5.25 The Draft Order Limits are also within the proposed Protected Landscape Impact Risk Zone of the English Coastal Path – Mablethorpe to Humber Bridge.

Private assets

17.5.26 There are a number of community facilities within the Draft Order Limits in Section 1, including primary schools, a secondary school and a library. See *Chapter 16: Socio-economics* for further details. There are no residential properties within the Draft Order Limits in Section 1, however, there are a number of rural properties and farmhouses, with associated agricultural buildings, in the Study Area. The residential properties closest to the Draft Order Limits are on Immingham Road (B1210), near the junction with Mill Lane, approximately 50m from the Draft Order Limits. The large residential settlement of Immingham is approximately 1km south east of the Draft Order Limits.

17.5.27 There are a number of industrial buildings, adjacent to the Immingham Facility, as detailed in *Chapter 16: Socioeconomics*.

Section 2 – A180 to A46

17.5.28 Section 2 describes the portion of the Project between the town of Immingham and the village of Laceby. This portion is within North East Lincolnshire and West Lindsey. Section 2 consists primarily of agricultural land and is traversed by public footpaths, local access roads and three major roads. Within this section, receptors are described as they are found within the Study Area following a transect from the town of Immingham southwards.

Healthcare facilities

17.5.29 There are a number of healthcare facilities in the Section 2 Study Area. These include the following GP surgeries all located in Grimsby:

- Stirling Medical Centre;
- Quayside Medical Centre;
- Weelsby View Health Centre;
- Birkwood Surgery;
- Cromwell Primary Care Centre;
- Church View Health Centre;

- Freshney Green Primary Care Centre; and
- Little Coates Road Medical Surgery; and

Public Rights of Way (PROW)

17.5.30 Five PROW, serving Harbrough, Stallingborough, Keelby, Laceby, and Irby upon Humber, traverse the Section 2 route alignment. There are also a number of other PROW within the Study Area.

Private assets

17.5.31 There are a number of community facilities within the Draft Order Limits of Section 2, including primary schools, secondary schools and a library. See *Chapter 16: Socio-economics* for further details. There are no residential properties within the Draft Order Limits in Section 2, however, there are a number of rural properties and farmhouses, with associated agricultural buildings, in the Study Area. The residential properties closest to the Draft Order Limits are on Keelby Road, Stallingborough, approximately 50m from the Draft Order Limits. The villages of Aylesbury (0.5km east), and Laceby (1km east) are also located within the Study Area. There are no business premises within the Draft Order Limits in Section 2. However, there are a number of business premises serving agricultural, commercial and tourism purposes in the Study Area.

Section 3 – A46 to Pear Tree Lane

17.5.32 Section 3 describes the portion of the Project between the village of Laceby and the village of Ludborough. This portion is within North East Lincolnshire and East Lindsey. Section 3 consists primarily of agricultural land and is traversed by public footpaths, local access roads and two major roads. Within this section, receptors are described as they are found within the Study Area following a transect from the village of Laceby south-eastwards.

Healthcare facilities

17.5.33 There are three hospitals, namely, Diana Princess of Wales Hospital, St Hugh's Hospital, and Bradley Woodlands Independent Hospital all located in Grimsby. There are GP Surgeries located within the Draft Order Limits in Section 3, which are North Thoresby Practice, Holton-Le-Clay Practice and Scartho Medical Centre. There is one hospice; St Andrew's Hospice.

Public Rights of Way (PROWs)

17.5.34 Seven PROW, serving Irby upon Humber, Barnoldby le Beck, Brigsley, Ashby cum Fenby, and North Thoresby, are located within the Draft Order Limits in the Section 3 route alignment. There are also a number of other PROW within the Study Area.

17.5.35 The Draft Order Limits are also within the proposed Protected Landscape Impact Risk Zone of the English Coastal Path – Mablethorpe to Humber Bridge.

Private assets

17.5.36 There are no major centres for community facilities and social infrastructure in the Study Area in Section 3. However, there are some community facilities and social infrastructure in the villages in close proximity to the Study Area in Section 3.

17.5.37 There are no residential properties within the Draft Order Limits in Section 3, however, there are a number of rural properties and farmhouses, with associated agricultural buildings, in the Study Area. The residential properties closest to the Draft Order Limits are at Moorhouse Farm, Ashby cum Fenby, approximately 50m from the Draft Order Limits. The villages of Irby upon Humber (0.5km west), Barnoldby le Beck (0.5km north east), Brigsley (0.5km

north east), Ashby cum Fenby (0.5km east), and Ludborough (1km west) are also located in the Study Area.

Section 4 – Pear Tree Lane to Manby Middlegate (B1200)

17.5.38 Section 4 describes the portion of the Project between the village of Ludborough and the village of Grimoldby. This portion is wholly within East Lindsey. Section 4 consists primarily of agricultural land and is traversed by public footpaths and local access roads. Within this section receptors are described as they are found within the Study Area following a transect from the village of Ludborough south-eastwards.

Healthcare facilities

17.5.39 There is one hospital within the Draft Order Limits in Section 4, which is the County Hospital for Louth. There are two GP Surgeries; James Street Surgery and Newmarket Medical Practice, both located in Louth. There is also Louth Hospice, located to the north of Louth.

Public Rights of Way (PROWs)

17.5.40 Five PROWs, serving Covenham St Bartholomew, Covenham St Mary, Little Grimsby, Alvingham, North Cockerington, and Louth, traverse the Draft Order Limits in Section 4. There are also a number of other PROWs outside of, but close to, the Draft Order Limits in Section 4.

17.5.41 The Draft Order Limits are also within the proposed Protected Landscape Impact Risk Zone of the English Coastal Path – Mablethorpe to Humber Bridge.

Private assets

17.5.42 There are a number of community facilities within the Study Area, including primary schools, two secondary schools and a library. See *Chapter 16: Socio-economics* for further details. There are no residential properties within the Draft Order Limits in Section 4, however, there are a number of rural properties and agricultural buildings in close proximity in the Study Area. There are no business premises within the Study Area in Section 4.

Section 5 – Manby Middlegate (B1200) to Theddlethorpe and down to MLWS

17.5.43 Section 5 describes the portion of the Project between the B1200 Manby Middlegate south of the village of Grimoldby and the Theddlethorpe Facility. This portion is wholly within East Lindsey District Council. Section 5 consists primarily of agricultural land and is traversed by public footpaths and local access roads. Within this section receptors are described as they are found within the Study Area following a transect from south of the village of Grimoldby eastwards.

Healthcare facilities

17.5.44 There are no hospitals within the Draft Order Limits in Section 5. There are two GP Surgeries, the Marisco Medical Practice, located in Louth.

Public Rights of Way (PROW)

17.5.45 Three PROW, serving Gayton le Marsh, Theddlethorpe All Saints, Theddlethorpe St Helen, and Mablethorpe, traverse Section 5. There are also a number of other PROWs within the Study Area of Section 5. For all Sections 1-5, the Draft Order Limits are also within the proposed Protected Landscape Impact Risk Zone of the English Coastal Path – Mablethorpe to Humber Bridge.

Private assets

17.5.46 There are a number of community facilities within the Study Area, including a primary school and a library, as detailed in *Chapter 16: Socio-economics*. There is one residential property

and one agricultural building within the Draft Order Limits in Section 5, as well as a number of rural properties and agricultural buildings in the Study Area. The villages of Theddlethorpe All Saints (0.5km north) and Theddlethorpe St Helen (1km north) are located within the Study Area. The town of Mablethorpe is also within the Study Area, adjacent to the south of the Draft Order Limits at the Theddlethorpe Facility. There are no business premises within the Draft Order Limits.

Air Quality

17.5.47 Air pollution is deemed to be one of the greatest environmental risks to the health of the UK public. Where an air quality objective set by the government is exceeded and identified at a receptor point, an Air Quality Management Area (AQMA) is declared. As outlined in *Chapter 14: Air Quality* of this PEIR. The methodological approach to defining the spatial extent of the Study Area for air quality has been informed by Institute of Air Quality Management (IAQM) (2014, 2017 and 2019) guidance documents. Using this, an area within 10 km of the Draft Order Limits has been considered with respect to published baseline information on existing air quality.

17.5.48 For the Project, there are two AQMA's, which are as follows:

- Scunthorpe AQMA, which is located in North Lincolnshire Council and is 21.5km from the scoping boundary;
- Grimsby AQMA, which is located in North East Lincolnshire Council, and is 7.8km from the scoping boundary.

17.5.49 Existing background dust levels are likely to be variable across the Study Area. Closer to the Port of Immingham and surrounding industrial/ commercial areas, there are likely to be a number of dust generating activities already present away from the Port and the industrial areas, dust deposition rates and dust soiling are likely to be typical of most urban, suburban, and semi-rural locations. Furthermore, based on the location of the AQMAs in relation to the Study Area, it is not expected that construction traffic would be routed through any of the existing AQMAs. In terms of air quality, there were slight exceedances of the AQO at one roadside diffusion tube location within the Grimsby AQMA in 2016 and 2017, however it is remote from the Draft Order Limits.

Noise Sensitivity

17.5.50 *Chapter 13: Noise and Vibration* of this PEIR describes the likely sensitive receptors to noise associated with the construction and operation of the Project, including those of relevance to this chapter:

- Residential: Individual dwellings and private open spaces; and
- Non-residential: community facilities such as schools, hospitals, places of worship, and noise sensitive commercial properties.

17.5.51 A number of receptors that may potentially be affected have been considered in this assessment. The sensitive receptors considered are the nearest receptors to the Project (i.e., the receptors that will experience the highest levels of noise and vibration). Although noise and vibration may be perceivable at other receptors in the area around the Project, effects will not be significant if they are suitably controlled at the identified receptors. Baseline noise monitoring will be carried out to establish the existing noise climate in the area.

Landscape amenity

17.5.52 *Chapter 7: Landscape and Visual Amenity* of this PEIR identifies a Study Area of 1km from the Draft Order Limits and Block Valve Stations for the landscape and visual assessments. The locations of the Block Valves Stations have been determined, taking into consideration landscape and visual factors. Additional measures have been identified to assess the impacts of these permanent above ground structures.

17.5.53 A small part of the Study Area is located within the Lincolnshire Wolds Area of Outstanding Natural Beauty (AONB) and an area identified as an Area of Great Landscape Value (AGLV). The AGLV is a non-statutory, local-level designation identified by West Lindsey in the adopted West Lindsey District Council Local Plan. At the national level, the Study Area falls within parts of the following Natural England National Character Areas (NCAs):

- NCA 41: Humber Estuary;
- NCA 42: Lincolnshire Coast and Marshes; and
- NCA 43: Lincolnshire Wolds

17.5.54 The Study Area also encompasses several regional level Regional Character Areas (RCA) and Local Character Areas (LCA). These include a variety of marshland features, the Wolds, shallow coastal waters, and fens. Viewpoints have been identified at 17 sites across the Study Area and are detailed in *Chapter 7: Landscape and Visual Amenity*.

Accessibility and Transport

17.5.55 The Study Area includes many key roads that will be regularly used through the construction and operational phases of the project. As part of *Chapter 12: Traffic and Transport*, this section's baseline details the highway conditions across each of the five sections of the Study Area. As a minimum, it is anticipated that the following strategic/primary links will likely be used by construction vehicles to access the Project:

- A160;
- A180;
- A18;

- A46;
- A16;
- B1200; and
- A1031.

17.5.56 Alongside these, a variety of smaller routes are also included for assessment purposes to account for proposed routing to the spread. The main baseline data considered fundamental to the assessment of traffic and transport effects is traffic flow data and personal injury accident (PIA) data. To monitor the roads detailed above and other roads in close proximity to the Study Area, ATCs have been undertaken during a neutral month during 2022 to provide two-way traffic flows, classified by vehicle type, including HGVs. The details of these studies can be seen in Tables 12-5 to 12-23 in *Chapter 12: Traffic and Transport*. In general, the majority of the roads in the baseline study are heavily trafficked by HGVs, given the industrial nature of the businesses within the surrounding area.

17.6 Mitigation

Embedded Mitigation

- 17.6.1 EIA is an iterative process which informs the development of a project's design. Where the outputs of the preliminary assessment identify likely significant effects changes to the design can be made or mitigation measures can be built-in to the proposal to reduce these effects.
- 17.6.2 This type of mitigation is defined as embedded mitigation, as mitigation measures which have been identified and adopted as part of the evolution of the Project's design ("embedded" into the Project's design).
- 17.6.3 The design of the Project will be further developed to reflect the findings of ongoing environmental studies, comments raised during this Statutory Consultation and ongoing engagement with stakeholders. As the design develops, the embedded mitigation measures will also be refined as part of an iterative process.

Additional Mitigation and Enhancement Measures

- 17.6.4 Primary mitigation measures are embedded within the Project, as set out in the respective chapters, to reduce other construction and operational effects (such as noise, air quality, transport, and landscape and visual) which in turn will mitigate the effects on the local community and existing facilities from a socio-economic and land use perspective. This mitigation is set out in **Table 17-9**.
- 17.6.5 In addition, a Preliminary Draft Construction Environmental Management Plan (CEMP) has been prepared as part of this PEIR and can be found in *PEIR - Volume IV Appendix 3.1*. This sets out the preliminary additional and enhancement mitigation measures identified in this preliminary assessment of significant effects. This section summarises the types of mitigation measures that will be considered to mitigate against the effects on Health and Wellbeing where required. These measures should be adopted during the construction phase and will be refined and be developed as part of the construction assessment for the ES:

Table 17-9: Additional Mitigation from Respective Chapters

PEIR Chapters	Paragraph reference	Summary
Chapter 7: Landscape and Visual	7.6.8	<ul style="list-style-type: none"> • C6: Opportunities to reduce impacts of nearby highly sensitive visual receptors should be sought through sensitive design of construction compounds e.g. organising compound features and using earthworks / fencing to screen internal activities during the construction phase; • C8: Reinstatement of any sections of hedgerow and/or other vegetation required to be removed to facilitate the Project; • C9: Landscape maintenance will be put in place to maintain any new planting for a period of five years; and • C10: Post construction, hedgerows will be re-planted and breaks in existing retained hedgerows within the Project boundary will be gapped up (using locally sourced plants), as appropriate and in agreement with the landowner.
Chapter 12: Traffic and Transport	12.7.5	<ul style="list-style-type: none"> • H1: Produce a Traffic Management Plan to establish construction vehicle routeing, safe access and egress to construction compounds and pipe storage areas in consultation with the Highways Authorities. This will include such items as: <ol style="list-style-type: none"> a. The necessary agreements and timing restrictions for construction traffic for example Monday – Saturday working, prohibition during school drop-off and pick-up times (this will be managed by appropriate measures in the Construction Traffic Management Plan (CTMP) which will likely prohibit movements during busy network periods), and prohibition during loading times at commercial premises; b. Proposals for monitoring and agreeing maintenance costs; c. Escort arrangements for abnormal loads; d. Route signing; e. Details of the advanced notification to the general public, warning of any construction transport movements, specifically AILs; f. Details of information and road signage warning road users of forthcoming AIL transport and construction traffic movements; g. Arrangements for regular road maintenance and cleaning, e.g., road sweeping in the vicinity of the site access point as necessary, drain clearing, wheel cleaning / dirt control arrangements; h. Arrangements for winter road maintenance e.g., de-icing and snow clearing; i. Construction Contractor speed limits; and j. Community and emergency services liaison details.

PEIR Chapters	Paragraph reference	Summary
Chapter 13: Noise and Vibration	13.6.9	<ul style="list-style-type: none"> • I1: Pre-construction noise monitoring surveys will be undertaken as agreed with the relevant local authorities to establish a pre-construction baseline for the derivation of construction noise limits; • I2: Following any changes to the design, the Contractor would ensure that an updated noise assessment has been carried out to ensure there would be no additional or increase in negative effects on nearby receptors; • I4: The Contractor would be responsible for notifying the local residents of particularly noisy work prior to commencement of those works. Effective communication should be established, keeping residents informed of the type and timing of works involved; • I7: Provision of contact details for a site representative in the event that disturbance due to noise or vibration from the construction works occurs; ensuring that any complaints are dealt with pro-actively and that subsequent resolutions are communicated to the complainant;
Chapter 14: Air Quality	14.6.6	<ul style="list-style-type: none"> • A3: Develop and implement a stakeholder communications plan that includes community engagement before work commences on site; • J1: Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; • J5: Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken; • J7: Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book;
Chapter 16: Socio-economics	16.6.4	<ul style="list-style-type: none"> • L1: All practicable measures will be taken to avoid land take which adversely effects socio-economic receptors;; • L2: Harbour Energy will inform local businesses / residents of proposed works as set out in the stakeholder engagement plan; and • L3: Harbour Energy would seek to develop links with education and employment establishments in the locality (for example, schools, colleges, local authorities, employment agencies, business groups) to investigate how the Project could contribute directly or indirectly to maximising the economic and educational benefits of the Project for local people.

17.6.6 The preliminary assessment is undertaken based on the assumption that the embedded and additional mitigation measures are in place.

17.7 Preliminary Assessment of Effects

17.7.1 The following tables (**Table 17-10** and **Table 17-11**) considers potential likely effects during the construction and operation stages of the Project. It should be noted that the decommissioning programme would be developed nearer the time of construction, however the basic principles that would be followed are described in *Chapter 3: The Viking CCS Pipeline*.

Table 17-10: Preliminary Health and Wellbeing Assessment of the Construction Phase

Receptor	Health determinants	Potential Impact	Duration	Mitigation	Likely impact	Confidence in Prediction
Construction workforce.	Access to work and training.	Increased temporary employment and training in the Study Area leading to improved mental and physical health outcomes. Increased expenditure for local businesses	Medium term (construction period is less than 24 months)	Potentially through assurances for a proportion of construction employment to originate from the local community or the relevant local authority.	Positive - temporary	High – The number of workers required to construct the Project is approximately 127 workers on average over the construction period. Indirect and induced jobs will also be created. There will be a positive local impact associated with the employment generated.
Local residents living in residential accommodation or accessing existing health services.	Access to healthcare services and other social infrastructure.	Temporary increase in population including demographic change from construction workforce. potential increase in demand for accommodation and community services including health services.	Medium term (construction period is less than 24 months)	None likely required.	Neutral	High - The number of workers required to construct the Project is approximately 127 workers on average over the construction period. Owing to the relatively short construction period any impact will be short such that there is likely to be capacity to cope with this increase in employment.

Receptor	Health determinants	Potential Impact	Duration	Mitigation	Likely impact	Confidence in Prediction
Local residents and, workers and visitors in communities close to the construction sites and exposed to amenity effects (e.g. noise, construction traffic, air quality and visual intrusion).	Air quality, noise and Neighbourhood amenity.	Potential amenity effects (e.g. noise, dust, construction traffic, air quality and visual intrusion) which could impact on the mental and physical health of people living or working in local communities as well as visitors, including impacts on community cohesion due to severance and/or impacts to the local communities' quality of life.	Medium term (construction period is less than 24 months))	Through the implementation of the Project CEMP.	Negative - temporary	Moderate – The assessments presented in <i>Chapter 7: Landscape and Visual</i> , <i>Chapter 13: Noise and Vibration</i> and <i>Chapter 14: Air Quality</i> are preliminary and subject to change. A negative impact is possible based on the typical nature of these environmental impacts. However, the use of industry-standard guidance and best practice mitigation where applicable, this is likely to be able to be minimised during construction.
Users of affected recreational routes and amenity areas including open spaces and nature, public rights of way, local community	Accessibility and active travel and Social cohesion and Neighbourhoods.	Potential severance impacts (temporary diversions in a worst case scenario) on walkers, cyclists and horse-riders in accessing recreational routes and amenity areas	Medium term (construction period is less than 24 months)	Through the implementation of the Public Rights of Way Management Plan.	Negative - temporary	Moderate - The assessment presented in <i>Chapter 16: Socio-economics</i> on which this assessment is primarily based is

Receptor	Health determinants	Potential Impact	Duration	Mitigation	Likely impact	Confidence in Prediction
services and social infrastructure.		including open spaces and nature, public rights of way, local community services and social infrastructure.				preliminary. Some temporary closures and diversions are likely which may result in severance of access.

Table 17-11: Preliminary Health and Wellbeing Assessment of the Operational Phase

Receptor	Health determinants	Potential Impact	Duration	Mitigation	Likely impact	Confidence in Prediction
Local residents and, workers and visitors in communities close to the operational sites and exposed to amenity effects (e.g. noise, maintenance traffic, air quality and visual intrusion).	Air quality, noise and neighbourhood amenity.	Potential amenity effects (e.g. noise, maintenance traffic, air quality and visual intrusion) which could impact on the mental and physical health of people living or working in local communities as well as visitors, including impacts on community cohesion due to severance and/or impacts to the local communities' quality of life.	Long term	None likely required.	Neutral	High - The assessments presented in <i>Chapter 7: Landscape and Visual Amenity</i> , <i>Chapter 13: Noise and Vibration</i> and <i>Chapter 14: Air Quality</i> are preliminary and subject to change. A neutral impact is expected based on the typical nature of the Project during operation. This is due to the long term recovery expected for Landscape and Visual receptors, which will be replaced following construction.
Users of affected recreational routes and amenity areas including open spaces and nature, public rights of way, local community services and	Accessibility and active travel and Social cohesion and neighbourhoods.	Potential severance impacts (diversions or closures) on walkers, cyclists and horse-riders in accessing recreational routes and amenity areas including open spaces and nature, public rights of way,	Long term	Through the implementation of the Public Rights of Way Management Plan.	Neutral	High - No permanent changes to PRow routes are anticipated and as such no severance impacts are expected.

Receptor	Health determinants	Potential Impact	Duration	Mitigation	Likely impact	Confidence in Prediction
social infrastructure.		local community services and social infrastructure.				

Decommissioning phase

- 17.7.2 The decommissioning phase of the Project is assumed to follow the same pattern of effects as in the construction phase. Therefore, these findings have not been re-stated here.

17.8 Summary of Likely Impacts and Effects

- 17.8.1 In general, the construction phase is likely to lead to some negative impacts, however, these will only apply for the medium term and will be temporary based on the 12-month construction period. This is expected to be similar for the decommissioning phase due to its parallels and the scale of decommissioning required. For the operational phase, the effects of the Project are expected to be neutral on the health and wellbeing receptors assessed.

17.9 Summary and Next Steps

- 17.9.1 The information provided in this PEIR is preliminary, the final assessment of health effects will be reported in the ES. This section describes the further work to be undertaken to support the health and wellbeing assessment presented in the ES.

Baseline

- 17.9.2 It is possible that updated versions of some of the datasets used in the PEIR will be published. These will be reviewed to identify whether they provide a reliable update to the datasets used in each case, and actioned with an update where confirmed.

Assessment

- 17.9.3 Consultation on the assessment presented in this PEIR chapter will be reviewed and there may be discussion as to issues related to the methodology of the assessment which could lead to an amended assessment reported in the ES.
- 17.9.4 The assessment will be updated at ES stage cross-referencing the findings from the relevant chapters on visual impacts (*Chapter 7: Landscape and Visual Amenity*), traffic (*Chapter 12: Traffic and Transport*), noise and vibration (*Chapter 13: Noise and Vibration*), air quality (*Chapter 14: Air Quality*) and socio-economics (*Chapter 16: Socio-economics*).

Additional Mitigation and Enhancement Measures

- 17.9.5 To date, no additional mitigation or enhancement measures have been identified related to health and wellbeing beyond those identified by other environmental topics as referenced in Section 17.7. Should additional measures be identified following stakeholder consultation feedback, further design refinement and further assessment, these will be detailed as part of the ES.

17.10 References

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Ref 17-18 Central Lincolnshire Joint Strategic Planning Committee, (2017); Central Lincolnshire Local Plan.

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Ref 17-22 ONS (2021); Census 2021.

Ref 17-23 ONS (2020); Mid-year Population estimates.

Ref 17-24 ONS (2020); Annual Population Survey.

Ref 17-25 Ministry of Housing, Communities and Local Government (MHCLG) (2019); English Indices of Deprivation.

Ref 17-26 Public Health England (2020); Life Expectancy at birth

Ref 17-27 Public Health England (2017-2020); Local Authority Health Profiles.