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# 17. Socio-Economics and Human Health

## 17.1 Introduction

- 17.1.1 This chapter of the Environmental Statement (ES) addresses the potential socio-economic effects of two proposed Post-Combustion Carbon Capture (PCC) developments at VPI's Combined Heat and Power (CHP) Plant and Phillips 66 Limited's Humber Refinery (the 'Proposed Developments').
- 17.1.2 This chapter also provides a summary of the Proposed Developments' impacts on human health, drawing together the conclusions of assessments detailed in other technical chapters (Chapter 6: Air Quality, Chapter 7: Noise and Vibration, and Chapter 8: Traffic and Transport).

## 17.2 Legislation and Planning Policy Context

- 17.2.1 This section provides a brief overview of the relevant legislation, planning policy and technical guidance relevant to the socio-economic and human health assessment.

### Legislation and Government Guidance

- 17.2.2 Whilst there is no dedicated UK legislation that details the content required for a socio-economic assessment as part of an EIA, the socio-economic assessment presented in this chapter is based upon a range of relevant guidance. This includes:

- Additionality Guide (4th Edition) (Homes and Communities Agency (HCA), 2014);
- Research to Improve the Assessment of Additionality (Department for Business, Innovation and Skills (BIS), 2009);
- The Green Book – Appraisal and Evaluation in Central Government HM Treasury, 2022); and
- The Magenta Book – Guidance for Evaluation (HM Treasury, 2020).

- 17.2.3 Relevant legislation to the human health assessment is noted below.

### Town and Country Planning (Environmental Impact Assessment) Regulations

- 17.2.4 Schedule 4 of the EIA Regulations contains information for inclusion in environmental statements. It requires ES chapters to include a description of population and human health receptors likely to be affected by the development.

- 17.2.5 In addition, assessments should include robust methodology and mitigation sections to assess the significance of effects and measures to avoid or reduce any significant adverse effects if necessary.

### Health and Care Act

- 17.2.6 In April 2022, the Government passed the Health and Care Act 2022. The new Act proposes health reforms in England, removes existing competition rules and formalises Integrated Care Systems (ICS). It also grants the health secretary authority over the health service.

- 1.2.1 There are 42 ICSs across England (previously in April 2021, over 100 Clinical Commissioning Groups (CCGs) existed across the country) and each has been established with four strategic purposes:

- improve population health and healthcare;

- tackling unequal outcomes and access;
- enhance productivity and value for money; and
- help the NHS to support broader social and economic development.

## **National Policy**

### **National Planning Policy Framework**

- 17.2.7 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) requires local authorities to set out a clear economic vision and strategy which positively and proactively encourages sustainable economic growth. It states that planning policies should help create the conditions in which businesses can invest, expand and adapt.
- 17.2.8 Paragraph 81 of the NPPF states that *“Significant weight should be placed on the need to support economic growth and productivity, taking into account both local business needs and wider opportunities for development.”* The NPPF indicates that this approach will allow areas to build on their strengths especially in areas of high productivity. Paragraph 83 of the NPPF also states that planning policies should *“recognise and address the specific locational requirements of different sectors”*.
- 17.2.9 Paragraph 152 also states that *“the planning system should support the transition to a low carbon future in a changing climate... and support renewable and low carbon energy and associated infrastructure”*.

### **Ten Point Plan – Green Industrial Revolution**

- 17.2.10 This 2020 Government policy (HM Government, 2020) outlines the Government’s policies to achieve a ‘Green Industrial Revolution’ through finding ways to improve the country’s energy production and usage. One of these areas is low carbon technologies, including wind, nuclear, solar and gas.
- 17.2.11 Of the ten points, Point 8: Investing in Carbon Capture, Usage and Storage is most relevant to the Proposed Developments. The Government’s ambition is to capture 10 mega tonnes (Mt) of carbon dioxide a year by 2030, and it will do this by investing in four industrial clusters, one of which is the East Coast Cluster which covers the Humber.

### **Integrated National Energy and Climate Plan**

- 17.2.12 In 2020, the UK Government set out the dimensions of the country’s ‘Energy Union’, establishing direction of energy policy for the country. The five dimensions of the NECP (Department for Business, Energy and Industrial Strategy (BEIS), 2020) are:
- decarbonisation;
  - energy efficiency;
  - energy security;
  - internal energy market; and
  - research, innovation and competitiveness.

### **Spatial Planning for Health: An Evidence Resource for Planning and Designing Healthier Places**

- 17.2.13 In 2017, Public Health England (now UK Health Security Agency (UKHSA)) published ‘Spatial Planning for Health: An evidence resource for designing healthier places’.
- 17.2.14 The review provided public health planners and local communities with evidence informed principles for designing healthy places. 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.
- 17.2.15 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.
- 17.2.16 The two aspects deemed most relevant to the Proposed Developments 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”*.
- 17.2.17 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

### Humber Local Energy Strategy

- 17.2.18 The Proposed Developments fall in the Humber Local Enterprise Partnership (LEP) and the Greater Lincolnshire LEP. The Humber LEP (2020) places a large emphasis on its low carbon sector around the Humber Estuary. The role of carbon capture and storage is recognised in the Local Energy Strategy, including its potential to help the Humber’s decarbonisation of the regional industry.

### North Lincolnshire Core Strategy 2006-2026

- 17.2.19 The North Lincolnshire Core Strategy (North Lincolnshire Council, 2011) recognises North Lincolnshire’s position as a ‘renewable energy capital’ due to its leading role in the sector. The role of carbon capture in the area is recognised: *“The emerging technology of carbon capture and storage - pumping CO<sub>2</sub> from heavy industry and power generation to disused gas wells under the southern North Sea, will also be important, particularly given the presence of the steel, power generation and petrochemicals industries within and adjacent to the area.”*
- 17.2.20 The Strategy sets out the long-term spatial planning framework for the development of North Lincolnshire up to 2026. Section 9.2 states that it supports the: *“long-term success of existing and new businesses in the area to help encourage job creation and the diversification of the employment base, particularly in key growth sectors.”*

### North Lincolnshire Local Plan

- 17.2.21 Chapter 6 of the North Lincolnshire Local Plan (North Lincolnshire Council, 2021) details that developments should drive and support sustainable economic development to deliver jobs that the country needs. The Council places a key emphasis on driving economic vitality *“It seeks to shape the area into a more prosperous place for residents and businesses alike and to be ‘safer, greener and cleaner’ by increasing economic growth and prosperity through higher employment and increased home ownership”*.

### Greater Lincolnshire LEP Strategic Economic Plan 2014-2032

- 17.2.22 The Strategic Economic Plan (Greater Lincolnshire LEP, 2016) sets out plans and objectives to deliver sustainable growth by helping businesses increase productivity and creating new commercial and employment opportunities. Importance is placed upon increasing skills levels

of people in the area, giving them new career choices and allowing businesses to recruit and train talented individuals.

## 17.3 Assessment Methodology and Significance Criteria

### Impact Assessment and Significance Criteria

17.3.1 The general methods used in undertaking this technical study are outlined in Chapter 1: Introduction and EIA Methodology and have been followed in this chapter. To facilitate the impact assessment process and to ensure consistency in the terminology of significance, a standard assessment methodology has been applied that has regard to:

- the sensitivity of the receptor; and
- the magnitude of the impact.

17.3.2 These two factors have then been combined to determine the consequent significance of the effect.

#### Receptor Sensitivity

17.3.3 The sensitivity of socio-economic receptors is assessed as high, medium, low or very low. Socio-economic receptors generally include economic entities and users of social infrastructure provision. For example, those who will potentially benefit from employment generation (either directly, indirectly or induced).

17.3.4 The criteria for assessing and classifying levels of receptor sensitivity used within the assessment are defined in Table 17.1. These are based on professional judgement:

**Table 17.1: Sensitivity classification**

<b>Level of Sensitivity</b>	<b>Description</b>
High	There are limited/no comparable and accessible alternatives to the receptor that exist within the relevant catchment area; and/or receptors have limited ability to absorb the change.
Medium	There are limited comparable and accessible alternatives to the receptor within the relevant catchment area; and/or receptors have limited ability to absorb the change.
Low	Receptors are able to relatively easily absorb the change; and/or there are some comparable and accessible alternatives to the receptor that exist within the relevant catchment area.
Very low	Receptors are able to relatively easily absorb the change; and/or there are many comparable and accessible alternatives to the receptor that exist within the relevant catchment area.

#### Impact Magnitude

17.3.5 The magnitude of the socio-economic impacts of the Proposed Developments are assessed as being high, medium, low or very low. This is determined by having regard to:

- extent of change - the absolute number of people affected and the size of area in which the impact will be experienced i.e. the level of change to baseline conditions including the proportion of the existing workforce;
- scale of the impact - the relative magnitude of each impact in its relevant market context (for example, the effects on local employment will be considered in the context of the overall size of the local labour market); and

- duration of impact - more weight is given to long-term, permanent changes than to short-term, temporary ones. Temporary to short-term impacts are considered to be those associated with the construction works. Medium to long-term impacts are those associated with the operation of the Proposed Developments.

**Table 17.2: Magnitude classification**

Magnitude	Description
High	An impact that is expected to have considerable adverse or beneficial socio-economics effects. Such impacts will typically affect large numbers of businesses, workers or residents.
Medium	An impact that will typically have a noticeable effect on a moderate number of businesses, workers or residents, and will lead to a small change to the study area’s baseline socio-economic conditions
Low	An impact that is expected to affect a small number of businesses, workers or residents or an impact that may affect a larger number of receptors but does not materially alter the study area’s baseline socio-economic conditions.
Very low	An impact which has very little change from baseline conditions where the change is barely distinguishable, approximating to a “no change” situation.

### Effect Significance

17.3.6 The overall effects of the Proposed Developments are defined as either:

- beneficial - an advantageous or beneficial effect on a receptor;
- negligible - an imperceptible effect on a receptor; or
- adverse - a disadvantageous or negative effect on a receptor.

17.3.7 Where an effect is assessed as being beneficial or adverse, the effect has been classified as Major, Moderate, Minor or Negligible. The assessment of significance is informed by considering the sensitivity of the receptor and the magnitude of impact as set out in Table 17.3 below. For the purposes of this assessment, only Moderate and Major impacts are considered ‘significant’ in EIA terms.

**Table 17.3: Significance of effects matrix**

Magnitude of Impact	Sensitivity of Receptor				
	Negligible	Low	Medium	High	Very High
High	Minor	Moderate	Moderate	Major	Major
Medium	Negligible	Minor	Moderate	Moderate	Major
Low	Negligible	Negligible	Minor	Moderate	Moderate
Negligible	Negligible	Negligible	Negligible	Minor	Minor

17.3.8 The summary of effects on human health that is also provided in this chapter draws together the conclusions of other technical chapters of this ES, each of which provides its own topic-specific methodology for assessing the significance of effects on human receptors. Refer to the relevant technical chapters for further details.

## Study Area

- 17.3.9 Office for National Statistics (ONS) statistical geographies have been used to define the study area for this socio-economic assessment as described below.
- 17.3.10 The Proposed Developments are located within the Grimsby Travel to Work Area (TTWA). TTWAs take into account the principal labour market catchments of an area, contain at least 75% of the area's workforce that both live and work in the area and have populations of at least 3,500 people. The Grimsby TTWA forms the Study Area for this socio-economic assessment.
- 17.3.11 This assessment outlines the socio-economic context of the TTWA and makes comparisons to the region of Yorkshire and the Humber and the whole of England. Key indicators include: population and labour force; skills and unemployment; industry and the economy.
- 17.3.12 The Study Area relevant to the health-related assessment is consistent with the largest study area of the other informative technical assessments (Chapter 6: Air Quality, Chapter 7: Noise and Vibration, and Chapter 8: Traffic and Transport). The largest is used in the air quality assessment and is a 2 km radius from the Proposed Development Sites ('the Sites').

## Sources of Information/ Data

- 17.3.13 Baseline data illustrating the existing conditions surrounding the Sites has been collected through a desk-based research exercise using publicly available sources, documents, and web-based applications. These sources are listed below:
- Business Register and Employment Survey (ONS, 2020a);
  - Annual Population Survey (ONS, 2021a);
  - Mid-Year Population Estimates (ONS, 2020b);
  - Population Projections (ONS, 2021b);
  - Indices of Multiple Deprivation (MHCLG, 2019); and
  - 2011 Census (ONS, 2011).

## Limitations

- 17.3.14 The socio-economic and human health assessment is based on the available data at the time of writing and as detailed within this chapter. The baseline is informed by secondary data and although the most recently available data have been used, it usually suffers a time lag.
- 17.3.15 The assessment is a desk-based study, based on information available at the time of assessment.

## Consultation

- 17.3.16 Consultation has been undertaken as part of the pre-application consultation process. Any stakeholder comments during this process have been taken into account within this assessment. Whilst the majority of respondents expressed strong support for the Proposed Developments, no comments relating to socio-economics were provided as part of the EIA Scoping process with North Lincolnshire Council and statutory consultees.
- 17.3.17 In regard to human health, some concerns were raised during the pre-application public consultation about air quality and noise arising during construction of the Proposed Developments. Chapters 6: Air Quality and 7: Noise and Vibration contain a full assessment of these topics and their conclusions will be used to inform the human health assessment in this chapter.

## 17.4 Baseline Conditions

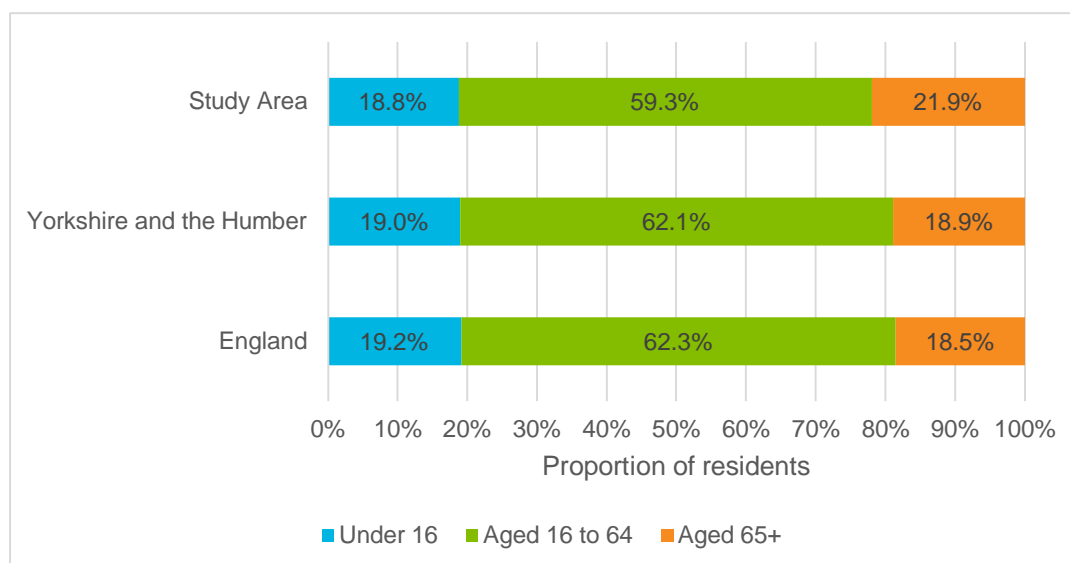
- 17.4.1 In order to assess the potential impacts and effects of the Proposed Developments, it is necessary to determine the environmental conditions that currently exist at the Sites and in the surrounding areas, for comparison. These are known as the existing baseline conditions.
- 17.4.2 It is also relevant for this assessment to consider future baseline conditions taking account of any planned or likely changes to the existing baseline, for comparison against the future 'With Development' scenarios (Construction, Operation and Decommissioning).
- 17.4.3 This section outlines the socio-economic baseline conditions in the Study Area (Grimsby TTWA), Yorkshire and the Humber and England. The local population and labour market are the main receptors in the assessment for employment effects. The baseline conditions help to determine the impact of employment generated by the Proposed developments. The impact is mostly influenced by the size of the labour market and whether it has the relevant skills, occupations, and sector strengths to access employment opportunities.
- 17.4.4 This section goes on to consider the health profile of the local population in order to describe the baseline conditions for the assessment of health effects.

### Existing Baseline

#### Socio-Economics

- 17.4.5 The 2020 Mid-Year Population Estimates show that the Study Area has a population of 187,850. Plate 17.1 below shows that the Study Area generally has a similar age breakdown to both Yorkshire and the Humber and England as a whole. However, there are slightly more residents aged 65 or over in the Study Area (21.9%) compared to regional (18.9%) and national (18.5%) levels suggesting a more ageing population there.

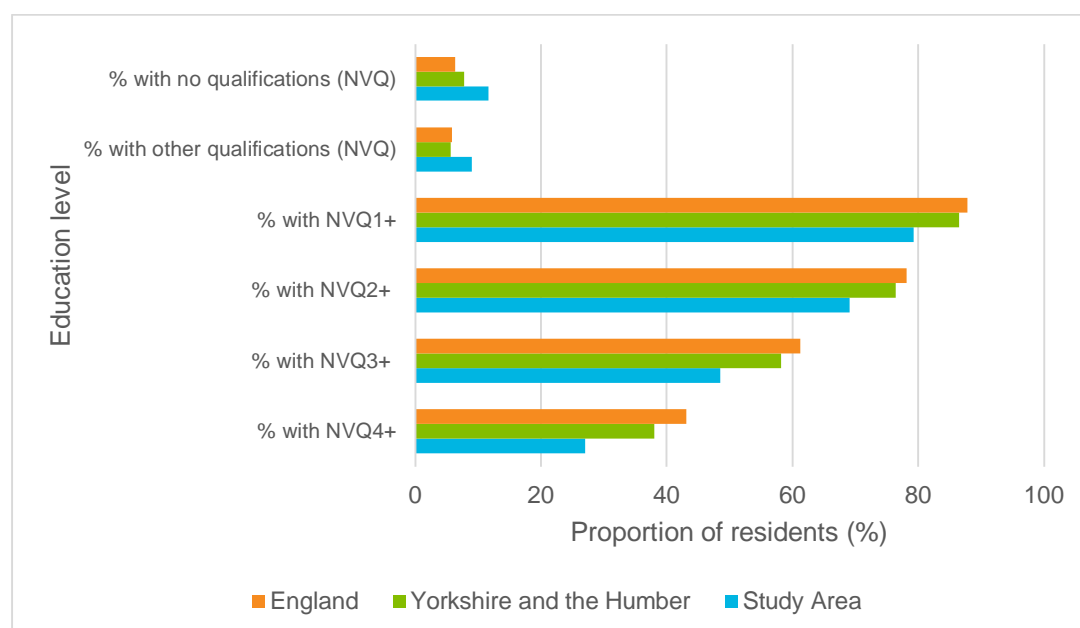
**Plate 17.1: Age breakdown**



Source: Mid-Year Population Estimates (ONS, 2020)

- 17.4.6 In terms of educational attainment, Plate 17.2 illustrates that the Study Area has a higher proportion of residents with no qualifications (11.7%) than both regional (7.8%) and national (6.4%) levels. In general, the share of residents in the Study Area educated to each NVQ Level is lower than the rates for Yorkshire and the Humber and England. For example, only 27% of people in the Study Area are educated to NVQ4+ (A-Level or above) compared to 38% regionally and 43.1% nationally.

**Plate 17.2: Qualifications breakdown**



Source: Annual Population Survey (ONS, 2021)

17.4.7 As shown in Table 17.4 the largest employment sector in the Study Area is manufacturing, which makes up 16.5% of employment there. This is a larger proportion than seen regionally (11%) and nationally (7.6%). The Study Area also has a high proportion of residents who work in the health sector (15.2%), however this rate more closely aligns with regional (13.3%) and national (12.9%) levels.

**Table 17.4: Employment sectors**

Industry	Study Area	Yorkshire and the Humber	England
Agriculture, forestry & fishing (%)	0.3	1.6	1.4
Mining, quarrying & utilities (%)	1.6	1.2	1.1
Manufacturing (%)	16.5	11.0	7.6
Construction (%)	5.7	5.3	4.9
Motor trades (%)	2.5	2.0	1.8
Wholesale (%)	3.2	4.0	3.9
Retail (%)	10.1	8.7	9.3
Transport & storage (inc postal) (%)	10.1	5.3	5.2
Accommodation & food services (%)	5.7	6.3	7.1
Information & communication (%)	0.6	2.6	4.5
Financial & insurance (%)	0.9	2.8	3.5
Property (%)	1.6	2.1	2.0
Professional, scientific & technical (%)	5.1	6.8	9.1
Business administration & support services (%)	7.6	9.4	8.8
Public administration & defence (%)	1.9	4.4	4.1

Industry	Study Area	Yorkshire and the Humber	England
Education (%)	8.9	9.2	8.7
Health (%)	15.2	13.3	12.9
Arts, entertainment, recreation & other services (%)	3.8	4.0	4.3

Source: Business Register and Employment Survey (ONS, 2020)

- 17.4.8 Regarding economic activity rates, as shown in Table 17.3 the Study Area has a slightly lower economic activity rate (73.8%) than Yorkshire and the Humber (77.4%) and England (78.7%) as a whole. The Study Area also has a slightly lower employment rate (71%) than regional (73.9%) and national (75.1%) levels. However, in contrast, the Study Area has a lower unemployment rate (3.7%) than Yorkshire and the Humber (4.5%) and England (4.6%).

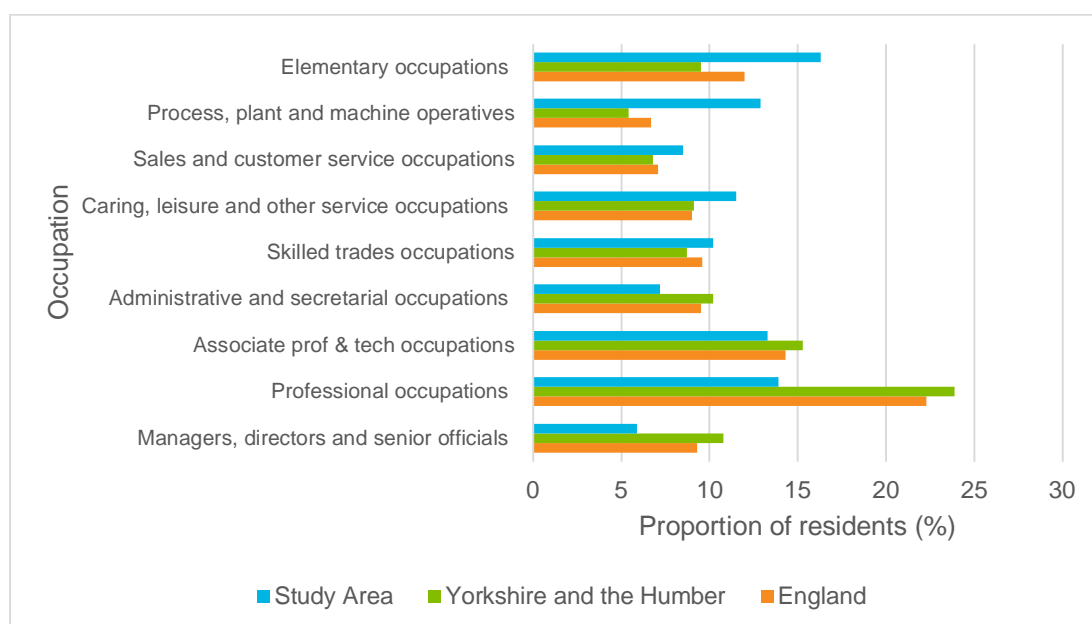
**Table 17.5: Economic activity**

Economic activity	Study Area	Yorkshire and the Humber	England
Economic activity rate	73.8	77.4	78.7
Employment rate	71.0	73.9	75.1
In employment	64.2	65.5	65.4
Self employed	6.8	8.2	9.5
Unemployment rate	3.7	4.5	4.6
Economically inactive	26.2	22.6	21.3
Economically inactive who want a job	20.9	16.6	18.8
Economically inactive who do not want a job	79.1	83.4	81.2

Source: Business Register and Employment Survey (ONS, 2020)

- 17.4.9 In terms of workforce occupations, the profile varies across the Study Area. Plate 17.3 shows that elementary occupations (e.g. postal workers, cleaners, security personnel, waiting staff) are the most common occupations in the Study Area, making up 16.3% of occupations. This rate is higher than that for the region (12%) and England, as a whole (9.5%). In contrast, whilst professional occupations are the most common type of job in both Yorkshire and the Humber (22.3%) and England (23.9%), this occupation only makes up 13.9% of jobs in the Study Area.

### Plate 17.3: Workforce occupations



Source: Annual Population Survey (ONS, 2021)

17.4.10 According to the Indices of Multiple Deprivation (IMD, 2019), North Lincolnshire is ranked the 120<sup>th</sup> most deprived Local Authority in England (out of 317 Local Authorities). This is based on the aggregation of the seven deprivation domains such as income, employment, education, and health. In particular, North Lincolnshire performs poorly in terms of education and employment deprivation for which it is ranked the 76<sup>th</sup> and 80<sup>th</sup> most deprived for those domains.

### Human Health

17.4.11 The study area for human health aligns with the study area used for health receptors in Chapter 8: Air Quality (ES Volume I). This is a 2 km radius around the Sites which intersects the electoral wards of Ferry in North Lincolnshire and Immingham in North East Lincolnshire. Therefore, these wards have been used to form the human health study area. Please note that deprivation data is not available at ward level and so local authority level data has been used.

17.4.12 In addition to the socio-economic factors illustrated above, this section presents data regarding ethnicity, deprivation, self-assessed health, and disability in order to compile a health profile of the local area.

17.4.13 As shown in Table 17.6, the proportion of residents living in the Study Area who identify ethnically as white is 98.6%, a higher proportion than in Yorkshire and the Humber (88.8%) and England (85.4%). Therefore, there is a considerably lower percentage of residents who are of an ethnic minority in the Study Area (1.4%) than in the region (11.2%) and nation (14.6%).

Table 17.6: Ethnic group

	Study Area	Yorkshire and the Humber	England
White (%)	98.6	88.8	85.4
Mixed/ multiple ethnic groups (%)	0.5	1.6	2.3
Asian/ Asian British (%)	0.6	7.3	7.8
Black/ African/ Caribbean/ black British (%)	0.2	1.5	3.5

**Study Area**   **Yorkshire and the Humber**   **England**

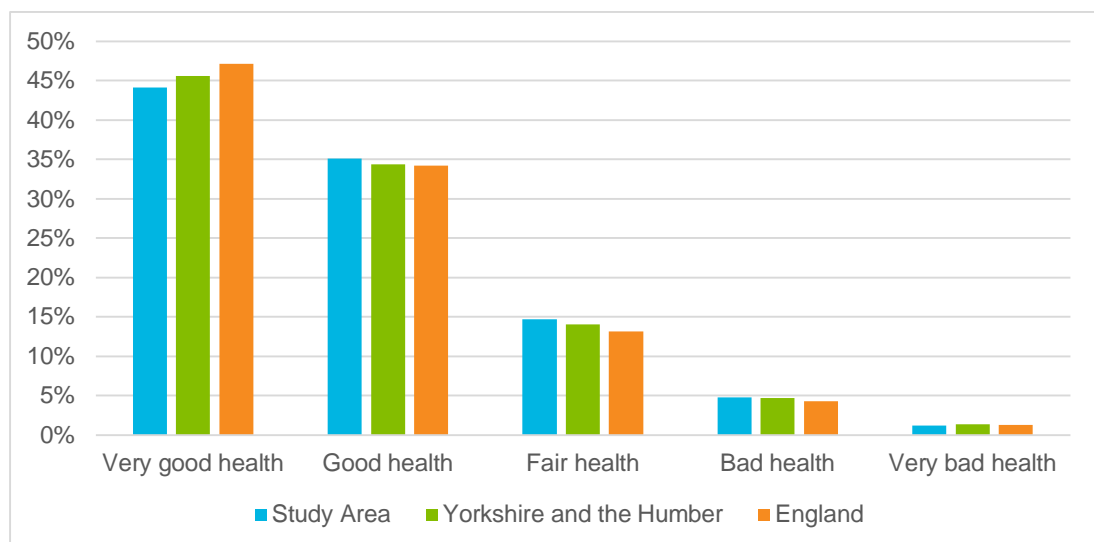
Other ethnic group (%)	0.2	0.8	1.0
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Source: 2011 Census (ONS, 2011)<sup>1</sup>

17.4.14 The 2019 Indices of Multiple Deprivation provide a set of relative measures of deprivation for Local Authorities across England. Of the local authorities which the Sites fall within, North Lincolnshire ranks 120<sup>th</sup> most deprived out of 317 and North East Lincolnshire ranks 66<sup>th</sup> (where 1 is most deprived). North Lincolnshire performs most poorly for education, skills and training deprivation for which it is the 76<sup>th</sup> most deprived, and best for barriers to housing and services for which it is 280<sup>th</sup>. North East Lincolnshire performs most poorly for ‘income deprivation affecting children index’ for which it is the 38<sup>th</sup> most deprived local authority and best for barriers to housing and services for which it is the 296<sup>th</sup> most deprived.

17.4.15 In regard to general health, 79.3% of residents within the Study Area described their health as ‘good’ or ‘very good’. This is in line with the proportion reported in Yorkshire and the Humber (80.0%) and England as a whole (81.4%). In contrast, 6.0% reported ‘bad’ or ‘very bad’ health, again similar to regional (6.0%) and national (5.5%) levels.

**Plate 17.4: Self assessment of health**

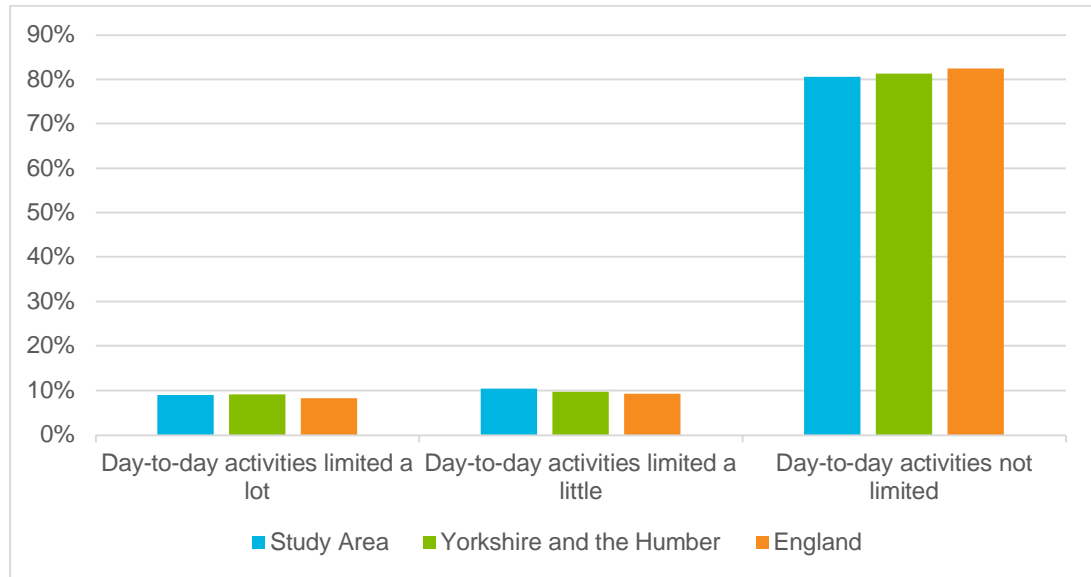


Source: 2011 Census (ONS, 2011)

17.4.16 In addition, Plate 17.5 illustrates a self-assessment of long-term health or disability (i.e. a problem that limits a person’s daily activities and has lasted at least 12 months). The proportion of residents within the Study Area that experience limitations to their daily activities ‘a little’ or ‘a lot’ is 19.5%, slightly more than in Yorkshire and the Humber (18.8%) and England (17.6%). Contrastingly, there are slightly fewer people in the Study Area whose day to day activities are ‘not limited’ (80.5%) compared to the region (81.2%) and nation (82.4%).

<sup>1</sup> 2021 Census data relating to this is due to be released in Spring 2023.

**Plate 17.5: Self-assessed disability**



Source: 2011 Census (ONS, 2011)

**Future Baseline**

17.4.17 Table 17.7 highlights projected population figures from 2021 to 2041, including setting out Compound Annual Growth Rates (CAGR) for the relevant geographies. The Study Area is expected to see a similar rate of growth (0.25%) to Yorkshire and the Humber (0.29%) but lower than England as a whole (0.44%). The additional population across the three geographies is forecasted to be seen mostly within the 65 and over age group with growth rate of 1.55% predicted in the Study Area, 1.46% regionally and 1.79% in England. This suggests an ageing population will occur in the future across each area.

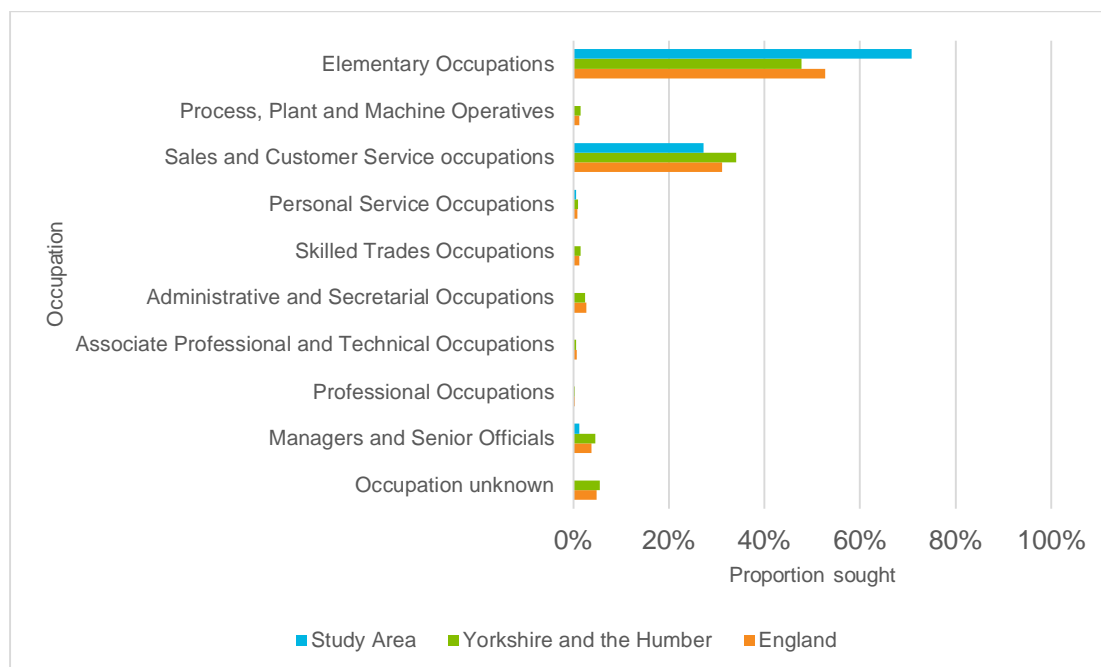
**Table 17.7: Future population**

Year	Study Area				Yorkshire and the Humber				England			
	All Ages	Aged 0 to 15	Aged 16 to 64	Aged 65+	All Ages	Aged 0 to 15	Aged 16 to 64	Aged 65+	All Ages	Aged 0 to 15	Aged 16 to 64	Aged 65+
2021	195,786	235,660	118,091	41,570	5,548,942	1,056,760	3,431,082	1061085	57,030,534	11,027,950	35,298,513	10,704,133
2026	198,815	232,936	118,029	45,466	5,640,706	1,034,203	3,452,442	1154061	58,505,621	11,048,393	35,659,571	11,797,633
2031	201,459	227,171	117,378	50,140	5,721,284	1,001,435	3,453,730	1266110	59,789,798	10,857,286	35,765,627	13,166,895
2036	203,507	224,772	116,247	54,102	5,792,377	996,011	3,435,541	1360847	60,905,483	10,779,344	35,788,796	14,337,402
2041	205,387	225,547	116,610	55,633	5,861,714	1,018,543	3,446,611	1396585	61,952,118	10,838,109	36,120,411	14,993,573
Compound annual growth rate (CAGR) %	<b>0.25%</b>	<b>-0.23%</b>	<b>-0.07%</b>	<b>1.55%</b>	<b>0.29%</b>	<b>-0.19%</b>	<b>0.02%</b>	<b>1.46%</b>	<b>0.44%</b>	<b>-0.09%</b>	<b>0.12%</b>	<b>1.79%</b>

Source: Population Projections (ONS, 2021)

17.4.18 In regard to sought occupations for the year of 2021 (see Plate 17.6), in the Study Area the majority of these (70.8%) were elementary occupations. This type of occupation was also the most common regionally (47.8%) and nationally (52.7%) although these were proportionally lower rates. The Study Area also experienced a relatively high proportion of sought sales and customer service jobs (27.2%), which again were also relatively popular regionally (34.1%) and nationally (31.2%).

**Plate 17.6: Sought occupations**



Source: Jobseeker's Allowance by Occupation (ONS, 2021)

## Local Receptors

- 17.4.19 The nearest school to the Sites is Killingholme Primary School located approximately 900 m south-east of the Phillips 66 Site and 1.8 km south-east of the VPI Site.
- 17.4.20 Other possible sensitive receptors in the area include The Killingholme Surgery (600 m south-west of the Phillips 66 Site and 1.5 km south-west of the VPI Site). The nearest hospital (Diana, Princess of Wales Hospital) is located in Grimsby and is approximately 14 km south-east of both Sites.
- 17.4.21 In terms of social infrastructure, the only receptor that lies within direct proximity to the Sites is Immingham West Fire Station located adjacent to the south-east of the VPI Site and approximately 100 m south-east of the Phillips 66 Site. The nearest police station (Immingham Police Station) is located 2 km south-east of both Sites.
- 17.4.22 There are a number of businesses located close to the Sites within the Port of Immingham. These are primarily energy related and industrial businesses. Located 600 m to the south-east of both Sites is Delta Engineering Group; 700 m to the south-west of the Phillips 66 Site and 1.5 km to the south-west of the VPI Site is Eric Carnaby & Son Ltd.; immediately west of the Phillips 66 Site and approximately 1 km to the south-west of the VPI Site is DFDS Logistics, Cory Brothers Shipping Agency Ltd., DVS Road Ltd., Delta Engineering Group Ltd., and Scangrit Ltd.; 2 km to the north-west of both Sites is GBA Killingholme and Able UK. The Humber Refinery (owned by Phillips 66) and VPI Immingham Combined Heat and Power plant (owned by VPI) are located within each respective Site boundary.

## 17.5 Development Design and Impact Avoidance

- 17.5.1 No development design or impact avoidance has been noted as being relevant to the socio-economics assessment.
- 17.5.2 Design or impact avoidance relevant to the human health assessment can be found in each of the technical chapters that inform the assessment (Chapter 6: Air Quality, Chapter 7: Noise and Vibration and Chapter 8: Traffic and Transport).

## 17.6 Likely Impacts and Effects of the Proposed Developments

- 17.6.1 This section identifies the likely impacts and effects on socio-economics and human health resulting from the Proposed Developments. The magnitude of impacts is defined with reference to the relevant baseline conditions (existing or future, as appropriate), and effects are determined in accordance with the identified methodology. As described earlier, where relevant the effects of the Proposed Developments are described compared to future baselines with and without the Proposed Developments.
- 17.6.2 The assessment scenarios that are considered for the purposes of this assessment are:
- **construction** of the Proposed Developments (starting in Q4 2023 for the Proposed VPI Development and Q1 2024 for the Proposed Phillips 66 Development);
  - **operation** of the Proposed Developments (starting in 2027 for both Proposed Developments); and
  - **decommissioning** of the Proposed Developments (after 2052).

### Construction Phase – Socio-Economics Assessment

- 17.6.3 Construction of the Proposed VPI Development is anticipated to commence in Q4 2023 and take approximately four years to complete. Construction of the Proposed Phillips 66 Development is anticipated to commence in Q1 2024 and take approximately 3.5 years to complete.
- 17.6.4 During the construction period, employment opportunities will be created as a result of the works. Although these jobs are temporary during the construction period, they represent a positive economic impact that can be estimated as a function of the scale and type of construction. The direct expenditure involved in the construction phase will lead to increased output generated in the Study Area (Grimsby TTWA) economy.
- 17.6.5 The peak number of construction staff required during the construction of the Proposed Developments has been estimated to be approximately 1,633 with 843 at the VPI Site and 790 at the Phillips 66 Site. Over the whole construction period, it is estimated that there will be 595 total gross FTE employees across the two Proposed Developments. There will be an average of 349 construction jobs created at the VPI Site over the 4-year construction period, and an average of 296 construction jobs created over their 3.5-year construction period at the Phillips 66 Site. When viewed over the entire 4-year construction period for the two Proposed Developments this results in an average of 595 total gross jobs.

### Leakage

- 17.6.6 Leakage effects refer to the proportion of jobs within an Impact Area that are filled by residents living outside the Impact Area (i.e. outside the Study Area, defined as the Grimsby TTWA).
- 17.6.7 Overall, it is expected that most of the employment generated will be taken by people living in the Grimsby TTWA. Origin destination data shows that 87.1% of people who work within Grimsby TTWA also live in the TTWA. Therefore, the demand-side self-containment of jobs in the Grimsby TTWA is 87.1% and leakage is set at 12.9%. A 12.9% discount is therefore applied to the estimated 349 jobs at the VPI Site and the 296 jobs at the Phillips 66 Site. This means that it is expected that 45 people from outside the Grimsby TTWA and 303 within will

benefit from the VPI Site. In addition, 38 people from outside the TTWA and 257 within will benefit from the Phillips 66 Site.

- 17.6.8 Overall, for the total 595 gross jobs created, it is therefore anticipated that 77 people from outside the Grimsby TTWA and 535 people from within will benefit from working at the Proposed Developments during the construction periods.

### Displacement

- 17.6.9 Displacement measures the extent to which the benefits of a project are offset by reductions of output or employment elsewhere. Any additional demand for labour cannot simply be treated as a net benefit - it removes workers from other posts and the net benefit is reduced to the extent that this occurs.
- 17.6.10 Overall, it is assumed that due to the flexibility of a typical construction workforce (i.e. they quickly move from project to project) displacement effects are considered to be low. The HCA Additionality Guide (HCA, 2014) suggests 25% as a ‘ready reckoner’ for low levels of displacement (i.e. there are expected to be some displacement effects, although only to a limited extent). Applying this level of displacement to the employment generated at the VPI Site results in a net direct employment of 262. At the Phillips 66 Site, this results in a net direct employment of 222.
- 17.6.11 Overall, applying this level of displacement to total gross direct employment from both of the Proposed Developments results in net direct employment of 446.

### Multiplier Effect

- 17.6.12 In addition to the direct construction employment generated by the project itself there will be an increase in local employment arising from indirect and induced effects of the construction activity. Employment growth will arise locally through manufacturing services and suppliers to the construction process (indirect or supply linkage multipliers). Additionally, part of the income of the construction workers and suppliers will be spent in the Grimsby TTWA, generating further employment (induced or income multipliers).
- 17.6.13 The impact of the multiplier depends on the size of the geographical area that is being considered, the local supply linkages and income leakage from the area. The HCA Additionality Guide (HCA, 2014) provides ‘ready reckoners’ of composite multipliers – the combined effect of indirect and induced multipliers. It has been assumed that the Grimsby TTWA has ‘average’ supply linkages based on the scale of its economy. Therefore a multiplier of 1.3 is determined from the HCA guidance.
- 17.6.14 Applying this multiplier generates an additional 78 indirect and induced jobs at the VPI Site and 66 at the Phillips 66 Site. Overall this is 133 indirect and induced jobs.
- 17.6.15 Based on the gross construction worker requirements in the construction schedule and the additionality factors outlined above, 340 net construction jobs would be generated at the VPI Site, of which around 295 are expected to be from the Grimsby TTWA. At the Phillips 66 Site, 288 net construction jobs would be created, of which 251 are likely to be from within the Grimsby TTWA.
- 17.6.16 Overall, 579 net construction jobs would be generated, of which around 504 are expected to be from the Grimsby TTWA.
- 17.6.17 Table 17.8 presents the short-term employment created at the VPI Site taking leakage, displacement and multiplier effects into account.

**Table 17.8: Net construction employment at the VPI Site**

	<b>Grimsby TTWA</b>	<b>Outside of Grimsby TTWA</b>	<b>Total</b>
Gross Direct Employment	303	45	349
Displacement	76	11	87

Net Direct Employment	227	34	262
Net Indirect/ Induced Employment	68	10	78
<b>Total Net Employment</b>	<b>295</b>	<b>44</b>	<b>340</b>

Source: AECOM calculations. Please note that figures have been rounded to nearest whole number

- 17.6.18 Table 17.9 presents the short-term employment created at the Phillips 66 Site taking leakage, displacement and multiplier effects into account.

**Table 17.9: Net construction employment at the Phillips 66 Site**

	Grimsby TTWA	Outside of Grimsby TTWA	Total
Gross Direct Employment	257	38	296
Displacement	64	10	74
Net Direct Employment	193	28	222
Net Indirect/ Induced Employment	58	8	66
<b>Total Net Employment</b>	<b>251</b>	<b>36</b>	<b>288</b>

Source: AECOM calculations. Please note that figures have been rounded to nearest whole number

- 17.6.19 Table 17.10 presents the short-term employment created by both of the Proposed Developments taking leakage, displacement and multiplier effects into account.

**Table 17.10: Net construction employment in Grimsby TTWA**

	Grimsby TTWA	Outside of Grimsby TTWA	Total
Gross Direct Employment	518	77	595
Displacement	130	19	149
Net Direct Employment	388	58	446
Net Indirect/Induced Employment	116	17	133
<b>Total Net Employment</b>	<b>504</b>	<b>75</b>	<b>579</b>

Source: AECOM calculations. Please note that figures have been rounded to nearest whole number

- 17.6.20 Taking into account the size of the labour pool of construction workers in the Grimsby TTWA (4,000) (BRES, 2020), the sensitivity of the receptor at the VPI Site is considered to be **Low**. For example, the gross direct employment required during the construction phase of the Proposed VPI Development would account for around 14.9% of the existing construction workforce in the Grimsby TTWA. The impact is assessed as **High** due to the large number of roles being created by the Proposed Development, over the short-term construction period (estimated at 4 years). Therefore, the direct, indirect and induced employment created by the construction phase of the Proposed VPI Development is likely to have a **Moderate beneficial (significant)** effect on the Grimsby TTWA economy.

- 17.6.21 Similarly, the sensitivity of the receptor at the Phillips 66 Site is considered to be **Low** for the same reasons as above. The impact is assessed as **High** due to the large number of roles being created by the Proposed Phillips 66 Development, over the short-term construction period (estimated at 3.5 years). Therefore, the direct, indirect and induced employment created by the construction phase of the Proposed Phillips 66 Development is likely to have a **Moderate beneficial (significant)** effect on the Grimsby TTWA economy.

**Table 17.11: Breakdown of construction phase employment creation for each Proposed Development**

Site	Sensitivity	Magnitude	Effect
Phillips 66	Low	High	Moderate beneficial (significant)
VPI	Low	High	Moderate beneficial (significant)

## Construction Phase – Human Health Summary

- 17.6.22 This section provides a summary of the potential impacts arising from the construction phase of the Proposed Developments from a human health perspective. This is based on information presented in each of the assessments within Chapter 6: Air Quality, Chapter 7: Noise and Vibration, and Chapter 8: Traffic and Transport.
- 17.6.23 Chapter 6: Air Quality assesses the likely impacts of the construction phase of the Proposed Developments in relation to dust generation and emissions from road traffic which are relevant to human health. As noted in the chapter, there are no significant effects on human health likely to arise from the construction phase.
- 17.6.24 Chapter 7: Noise and Vibration assesses the likely impacts of the construction of the Proposed Developments on sensitive noise receptors. As noted in the chapter, there are no significant noise effects anticipated during construction, provided further detailed assessment is undertaken and a Construction Environmental Management Plan is implemented once contractor appointed and appropriate mitigation is employed such that the BS 5228 ABC noise criteria are met and the section 7.5 mitigation guidance is followed (as detailed in Chapter 7 ES Volume I).
- 17.6.25 In Chapter 8: Traffic and Transport, potential impacts arising from construction traffic are assessed, including road safety, severance, and risks to pedestrians and cyclists, which are relevant to human health. However, during construction, no significant human health effects are expected in relation to increased traffic and number of trips.

## Operation Phase – Socio-Economics Assessment

- 17.6.26 The Proposed Developments will create long-term employment during their operation. It is anticipated there will be 50 gross direct FTE jobs created at the VPI Site and it is anticipated there will be 14.9 gross direct FTE jobs created at the Phillips 66 Site. This gives a total gross figure of 64.9 FTE jobs created by the Proposed Developments during operation.
- 17.6.27 Leakage has been assumed to be low with the majority of jobs anticipated to be filled by local residents. Therefore, a leakage figure of 12.9% has been used for the operational stage (the % of jobs in the Grimsby TTWA filled by non-residents), displacement of 25% (the 'low' ready reckoner by the HCA) and a composite multiplier of 1.3 (HCA Ready Reckoner for areas with 'average' linkages) at both Sites.

- 17.6.28 Table 17.12 and Table 17.13 present the short-term employment created by the Proposed Developments taking leakage, displacement, and multiplier effects into account. It is estimated that the total net employment for the VPI Site is 48 employees. Of these, 43 are likely to be from the TTWA, and 5 from outside. At the Phillips 66 Site, it is expected that there will be a total net employment of 14, with 13 from within the TTWA and 2<sup>2</sup> from outside.
- 17.6.29 Overall, the total net employment across both of the Proposed Developments is up to 64 employees as shown in Table 17.14. Of these, 56 are anticipated to be from the Wider Impact Area, and 8 outside the Wider Impact Area.

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<sup>2</sup> Please note that figures have been rounded to nearest whole number

**Table 17.12: Net operational employment at the VPI Site**

	Grimsby TTWA	Outside of Grimsby TTWA	Total
Gross Direct Employment	44	6	50
Displacement	11	2	13
Net Direct Employment	33	4	37
Net Indirect/Induced Employment	10	1	11
<b>Total Net Employment</b>	<b>43</b>	<b>5</b>	<b>48</b>

Source: AECOM calculations. Please note that figures have been rounded to nearest whole number

**Table 17.13: Net operational employment at the Phillips 66 Site**

	Grimsby TTWA	Outside of Grimsby TTWA	Total
Gross Direct Employment	13	2	15
Displacement	3	1	4
Net Direct Employment	10	1	11
Net Indirect/Induced Employment	3	0	3
<b>Total Net Employment</b>	<b>13</b>	<b>1</b>	<b>14</b>

Source: AECOM calculations. Please note that figures have been rounded to nearest whole number

**Table 17.14: Overall net operational employment in Grimsby TTWA**

	Grimsby TTWA	Outside of Grimsby TTWA	Total
Gross Direct Employment	57	8	65
Displacement	14	2	16
Net Direct Employment	43	6	49
Net Indirect/Induced Employment	13	2	15
<b>Total Net Employment</b>	<b>56</b>	<b>8</b>	<b>64</b>

Source: AECOM calculations. Please note that figures have been rounded to nearest whole number

- 17.6.30 At the VPI Site, it is anticipated that sensitivity of the receptor is **Low**, with the labour market being able to respond to the roles created. Impact magnitude is anticipated to be **Low** based on the number of roles created. It is therefore concluded that this will result in a **negligible** effect on employment creation during the operational stage of the Proposed VPI Development, which is **not significant**.
- 17.6.31 Similarly, the sensitivity of the receptor at the Phillips 66 Site is considered to be **Low** and impact magnitude **Low** for similar reasons as above. It is therefore concluded that this will result in a **negligible** effect on employment creation during the operational stage of the Proposed Phillips 66 Development, which is **not significant**.

**Table 17.15: Breakdown of operation phase employment creation for each Proposed Development**

Site	Sensitivity	Magnitude	Effect
<b>Phillips 66</b>	Low	Low	Negligible (not significant)
<b>VPI</b>	Low	Low	Negligible (not significant)

## Operation Phase – Human Health Summary

- 17.6.32 This section provides a summary of the potential impacts arising from the operational phases of the Proposed Developments from a human health perspective. This is based on information presented in each of the assessments within Chapter 6: Air Quality, Chapter 7: Noise and Vibration and Chapter 8: Traffic and Transport.
- 17.6.33 Chapter 6: Air Quality assesses the likely impacts of the operational phases of the Proposed Developments in relation to process emissions to air, which is relevant to human health. As noted in the chapter, there are no significant effects likely to arise from the operational phase.
- 17.6.34 Chapter 7: Noise and Vibration assesses the potential impacts of the operation of the Proposed Developments on sensitive noise receptors. As noted in the chapter, there are no significant effects likely to arise from the operational phase, provided application of practical sound mitigation to reduce relevant noise at source to meet the operational noise criterion (as detailed in Table 7.30 in Chapter 7 ES Volume I).
- 17.6.35 In Chapter 8: Traffic and Transport, assessment of potential impacts during the operational phases has been scoped out due to the small number of trips expected once in operation. Therefore, no significant human health effects are expected from operational traffic.

## Decommissioning Phase – Socio-Economics

- 17.6.36 At the end of the assumed design life, elements of the Proposed Developments would be assessed for ongoing viability and, only if no longer viable, be decommissioned. It is anticipated that the decommissioning phase would continue for a similar length of time to the construction phase (4 years). However, there is limited information available at this stage regarding decommissioning methods and timescales. For the purposes of this assessment, the decommissioning impacts are assumed to be similar to the construction impacts.
- 17.6.37 The people employed to decommission the Proposed Developments would have an effect on the economy by spending their wages in the same way that those employed in the other stages. Overall, the decommissioning phase of the Proposed Developments will have a **Moderate beneficial (significant)** effect on employment in the Grimsby TTWA economy, similar to the construction phase.

**Table 17.16: Breakdown of decommissioning phase employment creation for each Proposed Development**

	Sensitivity	Magnitude	Effect
<b>Phillips 66</b>	Low	High	Moderate beneficial (significant)
<b>VPI</b>	Low	High	Moderate beneficial (significant)

## Decommissioning Phase – Human Health Summary

- 17.6.38 Due to limited information available at this stage regarding decommissioning methods and timescales, for the purposes of this assessment the human health decommissioning impacts are assumed to be similar to the human health construction impacts. This assumption is based on information presented in each of the assessments within Chapter 6: Air Quality, Chapter 7: Noise and Vibration and Chapter 8: Traffic and Transport; these chapters conclude that there

are no significant effects likely to arise from the Proposed Developments during decommissioning.

## **17.7 Mitigation and Enhancement Measures**

- 17.7.1 There are no adverse significant effects noted during the construction, operation, and decommissioning phases. Therefore, no mitigation or enhancement measures will be required.
- 17.7.2 From a human health perspective, any relevant mitigation can be found in each of the technical chapters informing this assessment (Chapter 6: Air Quality, Chapter 7: Noise and Vibration, and Chapter 8: Traffic and Transport).

## **17.8 Residual Effects and Conclusions**

- 17.8.1 Effects of the Proposed Developments remaining following the implementation of available mitigation measures are known as 'residual effects'. A summary of the residual socio-economic effects (which are the same as those reported in Section 17.6 above, as no mitigation is required) is included in Table 17.17.

**Table 17.17: Summary of effects**

	<b>Description of Effect</b>	<b>Significance of Effect (Before Mitigation)</b>	<b>Mitigation Measures</b>	<b>Significance of Effect (After Mitigation)</b>	<b>Duration and Reversibility</b>
<b>Construction</b>					
Proposed Phillips 66 Development	Employment	Moderate beneficial (significant)	N/A	Moderate beneficial (significant)	Medium term, irreversible
Proposed VPI Development	Employment	Moderate beneficial (significant)	N/A	Moderate beneficial (significant)	Medium term, irreversible
<i>Both Proposed Developments Combined</i>	<i>Employment</i>	<i>Moderate beneficial (significant)</i>	<i>N/A</i>	<i>Moderate beneficial (significant)</i>	<i>Medium term, irreversible</i>
<b>Operation</b>					
Proposed Phillips 66 Development	Employment	Negligible (not significant)	N/A	Negligible (not significant)	Long term, irreversible
Proposed VPI Development	Employment	Negligible (not significant)	N/A	Negligible (not significant)	Long term, irreversible
<i>Both Proposed Developments Combined</i>	<i>Employment</i>	<i>Negligible (not significant)</i>	<i>N/A</i>	<i>Negligible (not significant)</i>	<i>Long term, irreversible</i>
<b>Decommissioning</b>					
Proposed Phillips 66 Development	Employment	Moderate beneficial (significant)	N/A	Moderate beneficial (significant)	Medium term, irreversible
Proposed VPI Development	Employment	Moderate beneficial (significant)	N/A	Moderate beneficial (significant)	Medium term, irreversible
<i>Both Proposed Developments Combined</i>	<i>Employment</i>	<i>Moderate beneficial (significant)</i>	<i>N/A</i>	<i>Moderate beneficial (significant)</i>	<i>Medium term, irreversible</i>

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