THE PROJECT, SITE SELECTION AND ALTERNATIVES

THE VPI IMMINGHAM LLP (LAND AT ROSPER ROAD) COMPULSORY PURCHASE ORDER 2024

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APPENDICES TO STATEMENT OF EVIDENCE

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APPENDIX 1

HUMBERZERO
THE UK'S GATEWAY PROJECT

Humber Zero EIA Scoping Report

VPI Immingham LLP and Phillips 66 Limited

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AECOM

DWD

Quality information

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List of Abbreviations

Abbreviation	Definition
AADT	Average Annual Daily Traffic
ADMS	Atmospheric Dispersion Modelling System
AELs	Achievable Emissions Levels
AERA	Air Emissions Risk Assessment
AIL	Abnormal Indivisible Load
ALARP	As Low As Reasonably Practicable
ALC	Agricultural Land Classification
APIS	UK Air Pollution Information System
AQMA	Air Quality Management Area
AQS	Air Quality Standards Regulations 2010 (as amended)
ATC	Automated Traffic Counts
BAT	Best Available Techniques
BEIS	Department for Business, Energy and Industrial Strategy
BGS	British Geological Survey
CCS	Carbon Capture and Storage
CDM	Construction (Design and Management) Regulations 2015
CEMP	Construction Environmental Management Plan
CIfA	Chartered Institute for Archaeologists
CO_2	Carbon dioxide
COPA	Control of Pollution Act 1974
CRTN	Calculation of Road Traffic Noise
CSM	Conceptual Site Model
DBA	desk-based assessment
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
DEFRA	Department of Environment, Food and Rural Affairs
DLUCH	Department for Levelling Up, Communities and Housing
DMRB	Design Manual for Roads and Bridges
DPD	Development Plan Document
DTM	Digital Terrain Model
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
ELV	Emission Limit Values
EPR	Environmental Permitting (England and Wales) Regulations 2016
ES	Environmental Statement
ETP	Effluent Treatment Plant
EWP	Energy White Paper
FCC	Fluid Catalytic Cracker
FRA	Flood Risk Assessment
GT1	Gas turbine 1
GT2	Gas turbine 2
HCA	Homes and Communities Agency
HE	Historic England
HGVs	Heavy Goods Vehicles

HRA	Habitats Regulations Assessment
IAQM	Institute of Air Quality Management
IDB	Internal Drainage Board
IED	Industrial Emissions Directive
IEEM	Institute for Ecology and Environmental Management
Km	kilometre
LDF	Local Development Framework
LPA	Local Planning Authority
M	metre
MA&D	Major Accidents and Disasters
MHCLG	Ministry of Housing, Communities and Local Government
MTPA	Megatonnes per annum
NCA	National Character Area
NELC	North East Lincolnshire Council
NLC	North Lincolnshire Council
NO_2	Nitrogen dioxide
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSR	noise sensitive receptors
NTS	Non-Technical Summary
OCGT	Open cycle gas-turbine
OGUK	Oil and Gas UK
PCC	Post-Combustion Carbon Capture
PIA	Personal Injury Accident
PINS	Planning Inspectorate
PM_{10}	Particulate Matter (<10µm in diameter)
PRoW	Public Right of Way
SAC	Special Area of Conservation
SCR	Selective Catalytic Reduction
SO_2	Sulphur dioxide
SPA	Special Protection Area
SPMP	Site Protection and Monitoring Plan
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
TA	Transport Assessment
TCPA	Town and Country Planning Act
ug/m^3	Microgram per meter cubed
WetESP	Wet electrostatic precipitator
WHO	World Health Organisation
ZTV	Zone of Theoretical Visibility

List of Terms

Term	Definition
The Applicants	VPI Immingham LLP and Phillips 66 Ltd
The Proposed Development	The collective development at the Phillips 66 and VPI Site
Phillips 66 Site	The areas of the Site to the west of the railway line
VPI Site	The areas of the Site to the east of the railway line
The Site	The combined indicative application site boundary, comprising the Phillips 66 Site and the VPI Site (see Figure 1 in Appendix A)
The Proposed Phillips 66 Development	PCC retrofit to the Fluid Catalytic Cracker (FCC) stack at the Humber Refinery
The Proposed VPI Development	PCC retrofit to two gas turbines (GT1 and GT2) and two auxiliary gas boilers at the VPI Immingham 1230 MW CHP Plant
barg	A barg is a unit of gauge pressure.

1. Introduction

1.1 Introduction to the Project and Context

1.1.1 AECOM Ltd has been commissioned by VPI Immingham LLP and Phillips 66 Ltd (hereafter referred to as 'the Applicants') to prepare an Environmental Impact Assessment (EIA) Scoping Report for the proposed Post-Combustion Carbon Capture (PCC) developments located at VPI Immingham's Combined Heat and Power (CHP) Plant and Phillips 66 Ltd's Humber Refinery (hereafter referred to as 'the Proposed Development'), which comprise the first phase of the Humber Zero project. This EIA Scoping Report will inform the scope and content of an EIA for the Proposed Development.

1.1.2 The Proposed Development will deliver up to 3.8 megatonnes per annum (Mtpa) of abated carbon dioxide (CO_2) emissions via:

- PCC retrofit to two gas turbines (GT1 and GT2) and two auxiliary gas boilers at the VPI Immingham 1230 MW CHP Plant ('the Proposed VPI Development'); and
- PCC retrofit to the Fluid Catalytic Cracker (FCC) stack at the Humber Refinery ('the Proposed Phillips 66 Development').

1.1.3 The Proposed Development aims to form the basis for a potential cluster of projects in the future, with ambitions for blue hydrogen production and further decarbonisation related developments, collectively known as Humber Zero.

1.1.4 The Proposed Development will be consented under the Town and Country Planning Act 1990. Two planning applications will be submitted – one for the Proposed VPI Development and one for the Proposed Phillips 66 Development – because the applicant is different for each development, but in recognition of the inter-related nature of the two parts of the Proposed Development, the EIA for both applications will be integrated.

1.1.5 At this stage, a single combined applications site boundary ('the Site') has been identified as shown on Figure 1 (the Site Red Line Boundary) and Figure 2 (the Site Location Plan) (included at Appendix A). The application site boundary will be refined in due course and separate (but potentially overlapping) application site boundaries will be identified for the two Applicants. The Site is wholly located within the administrative boundary of North Lincolnshire Council (NLC). The main development areas are shown on Figure 6 (Site Areas Plan).

1.1.6 The CO_2 transportation network that the Proposed Development will connect into is also under development by others. There are two potential networks that the Proposed Development could be connected to - the proposed V Net Zero CO_2 transportation and storage network (promoted by Harbour Energy) which is anticipated to commence in the southern part of the VPI Site, or the East Coast Cluster Humber Low Carbon Pipelines (HLCP), also known as Zero Carbon Humber (promoted by National Grid Ventures). Both pipeline networks will run close to the Site and the decision as to which network will be connected in to initially will be made following Government funding announcements. It is likely that access to both transportation networks would be available in the long-term development of the networks.

1.1.7 The V Net Zero pipeline would transport CO_2 in dense phase (90-135 barg) via a below ground pipeline to Theddlethorpe and out to the Viking fields (which have 300 CO_2Mt storage potential) via an existing subsea pipeline. The HLCP would include a connection to Immingham and would take captured CO_2 across the Humber Estuary to Easington, and from there via an offshore pipeline to the Endurance saline aquifer. . It may also be possible to export some CO_2 from the Proposed Development via the Port of Immingham, however no infrastructure to facilitate such a connection is included within the Proposed Development planning applications or the supporting EIA.

1.1.8 This EIA Scoping Report considers the environmental context and the potential environmental impacts of the Proposed Development. Where impacts are considered to have the potential

to cause significant environmental effects, these are identified and the proposed approach to be used to characterise those effects is outlined. This report also outlines issues perceived to be non-significant which it is proposed do not require formal assessment as part of the EIA.

1.1.9 All definitions of the Proposed Development elements and parts of the Site are defined in the List of Terms at the front of this report.

1.2 Consenting Regime and Requirement for EIA

1.2.1 As noted above, planning consent for the Proposed Development is to be sought via two planning applications under the Town and Country Planning Act 1990.

1.2.2 With regards to EIA, the relevant regulations are the Town and Country Planning (EIA) Regulations 2017 (as amended) (hereafter referred to as the 'EIA Regulations').

1.2.3 The Proposed Development is of a type which falls within Schedule 1 Part 23 of the EIA Regulations ("*Installations for the capture of carbon dioxide streams for the purposes of geological storage pursuant to Directive 2009/31/EC from installations referred to in this Schedule, or where the total yearly capture of carbon dioxide is 1.5 megatonnes or more*") for which EIA is mandatory.

1.2.4 As such, an EIA will be undertaken and an Environmental Statement (ES) produced for the Proposed Development. The ES will cover both the Proposed VPI Development and the Proposed Phillips 66 Development (including assessment of each in isolation as well as the whole Proposed Development together) and will be submitted with each of the two planning applications.

1.2.5 Although not mandatory, submission of the EIA Scoping Report to NLC commences the EIA process and represents the first formal notification to NLC, as the Local Planning Authority (LPA), that the Applicants will undertake an EIA in respect of the Proposed Development and produce an ES to report the findings of the EIA.

1.2.6 EIA is an iterative process that feeds into the engineering design process to mitigate significant environmental effects where they are predicted to occur. The final design iteration, along with the findings of the EIA will be reported in the ES, in accordance with EIA Regulations.

1.3 Objectives of EIA Scoping

1.3.1 EIA Scoping forms a key stage of the EIA process, providing a framework for identifying likely significant environmental effects arising as a result of the Proposed Development, and distinguishing the priority issues needing to be addressed within the ES. The Scoping Report also identifies those matters which do not need to be assessed in detail, and provides key stakeholders with an early opportunity to comment on the proposed structure, methodology and content of the EIA.

1.3.2 The EIA will assess the likely significant effects which the Proposed Development could have on the Site and surrounding area through detailed baseline studies and technical assessments of issues which require detailed assessment. It will propose mitigation measures and further monitoring, as required. This information will be used to produce an ES and will inform the design of the Proposed Development.

1.3.3 In accordance with Regulation 15(1) of the EIA Regulations, by submission of this EIA Scoping Report, the Applicants have requested that NLC states its opinion as to the information to be provided in the ES, by adopting an EIA scoping opinion.

1.3.4 This EIA Scoping Report sets out the information which the Applicants are required to provide in accordance with Regulation 15(2)(a) of the EIA Regulations in support of this request, namely:

- the key environmental aspects in relation to the Proposed Development;

- how these aspects have been identified;
- the proposed methodologies and guidance that will be used to assess the environmental impacts within the ES;
- the format and layout of the ES; and
- what aspects it is proposed need not be assessed ('scoped out') and why.

1.3.5 Table 1-1 presents a list of information that should be included within a Scoping Report, as prescribed by the EIA Regulations Part 4 Regulation 15.

Table 1-1: Information provided within the Scoping Report (based on requirements of EIA Regulations 2017)

Description of Information Required		Section in Scoping Report where the Information is Presented
A request under paragraph (1) must include (a) in relation to an application for planning permission:		
(i)	a plan sufficient to identify the land;	Figures 1 and 2 in Appendix A
(ii)	a brief description of the nature and purpose of the development, including its location and technical capacity;	Section 1.1, Section 2, Section 3 and Figures 1-7
(iii)	an explanation of the likely significant effects of the development on the environment; and	Section 6
(iv)	such other information or representations as the person making the request may wish to provide or make.	Additional information is provided in Sections 1-8, including information on project alternatives at Section 4, planning policy at Section 5 and the EIA process at Section 8

1.4 Structure of Remainder of this Report

1.4.1 The remainder of this report is structured as follows:

- Section 2 – Description of the Existing Environment: provides a description of the Site and the surrounding areas, history of the Site and surrounding areas, local topography and land-use, and any potentially significant environmental sensitivities/receptors within the vicinity of the Site;
- Section 3 – Description of the Proposed Development: outlines the key components of the Proposed Development, the infrastructure to be developed and how it will operate;
- Section 4 – Project Alternatives: summarises the alternatives that have been considered during definition of the Proposed Development;
- Section 5 – Planning Policy: identifies the key documents relating to national and local planning policy in the area, together with a summary of some of the principal planning policies or provisions as relevant to the need for the Proposed Development;
- Section 6 – Scoping Assessment of Environmental Issues: provides a discussion of how the Proposed Development may interact with the different aspects of the receiving environment, the potential for significant adverse effects on environmental receptors, and a description of the proposed assessment methodologies, guidance and best practice to be adopted for the EIA of the Proposed Development;

- Section 7 – Summary of Potentially Significant Environmental issues: provides a summary of the issues proposed to be scoped in and out of the EIA;
- Section 8 – The EIA Process: provides an overview of the approach to be taken in the EIA and outline structure for the proposed ES;
- Section 9 – References; and
- Appendix A – Figures

2. Description of the Existing Environment

2.1 Proposed Development Site

2.1.1 The Site lies 1.6 km north of Immingham and 1.5 km west of the Humber Estuary. The Site is located within the administrative boundary of the NLC, in the ward of Ferry.

2.1.2 Figure 1 in Appendix A illustrates the Site boundary identified at this stage, which comprises an area of approximately 80 hectares (ha) – this is likely to be refined and reduced in size as the design of the Proposed Development progresses during the EIA and planning application preparation processes. Figure 6 in Appendix A shows the indicative locations of each part of the Proposed Development and areas of the Site referred to throughout this report.

Phillips 66 Site

2.1.3 The Phillips 66 Site is the land to the south and west of the railway line between the Port of Immingham and Ulceby, within and associated with the operational Humber Refinery, accessed from Eastfield Road.

2.1.4 The majority of the area required for the proposed Phillips 66 PCC plant (refer to Figure 6) is currently used for open storage and temporary uses such as site cabins for maintenance contractors, which will be relocated to other parts of the Humber Refinery. The existing buildings in this area are likely to be retained, but some minor demolition may be required. The westernmost part of the proposed Phillips 66 PCC plant area is used for car parking and this is not anticipated to be required for the Phillips 66 PCC plant, but a proposed new access from Eastfield Road will pass through this parking area.

2.1.5 The indicative area for the proposed Phillips 66 high pressure CO_2 booster compression station is currently used for open storage of coke stockpiles. This area also falls within the flare pad (the area around the flare stack where activities are limited for health and safety reasons). The coke stockpiles will be relocated to another part of the Humber Refinery.

2.1.6 The route of the proposed low pressure CO_2 pipeline connecting the Phillips 66 PCC plant to the Phillips 66 high pressure CO_2 booster compression station comprises an existing utilities corridor (known as Avenue A) with several above ground pipes on racks. These existing utilities will be retained and will not be affected by the Proposed Development.

2.1.7 The route of the proposed high pressure CO_2 pipeline connecting the Phillips 66 high pressure CO_2 booster compression station to the CO_2 transportation network tie-in point in the vicinity of the VPI Site comprises internal roadways, Phillips 66 railway sidings and part of the National Rail operated railway line between the Port of Immingham and Ulceby. The CO_2 pipeline will cross the railway sidings and railway line, using one of the existing pipeline crossings over or under the tracks or a new crossing point (to be discussed and agreed with Network Rail as part of the design process).

VPI Site

2.1.8 The VPI Site is the land to the south of the operational VPI Immingham CHP Plant site, accessed from Rosper Road and separated from the Phillips 66 Site by the railway line between the Port of Immingham and Ulceby.

2.1.9 The area for the proposed VPI PCC plant and high pressure CO_2 booster compression station comprises previously undeveloped grassland with an open drainage ditch running through the centre. The northern part of the VPI Site has some areas of hardstanding where the area was previously used for laydown during the construction of the existing VPI Immingham CHP Power Station. Some underground pipelines and utilities are known to run across the VPI Site.

2.2 Local Topography and Surrounding Land-Use

2.2.1 The topography of the area comprises a low-lying estuarine landscape. This consists of extensive stretches of intertidal habitats containing mudflats, salt marsh, coastal dunes and wetland adjacent to the estuary.

2.2.2 The surrounding land-use is dominated by the large heavy industrial and port areas around the villages of Killingholme and Immingham. This industrial land-use is mixed with interspersed pockets of flat open farmland, woodland and natural coastal habitats. There is more sporadic development to the north of the Proposed Development as the land-use becomes more rural with more isolated development.

2.3 Environmental Context

2.3.1 Figures 3 and 4 (the Site Environmental Constraints plans in Appendix A), illustrate environmental constraints within 2 km and 15 km of the Proposed Development Site. The environmental context of the Phillips 66 Site and the VPI Site is summarised below.

Phillips 66 Site

2.3.2 The Phillips 66 Site is located approximately 2.2 km to the west of the Humber Estuary Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site and falls within the SSSI impact risk zone. The Phillips 66 Site itself is not considered to be sensitive with respect to biodiversity, given the industrial land uses in and around the Phillips 66 Site, although great crested newts are present in the wider area.

2.3.3 The area has a relatively flat topography so the Zone of Theoretical Visibility (ZTV) for the Proposed Phillips 66 Development (and the overall Proposed Development) may be extensive, albeit set in the context of the existing refinery structures (see Figure 5). The closest residential properties are located along Staple Road approximately 0.3 km west of the Site boundary (and over 0.5 km from the proposed Phillips 66 PCC plant area).

2.3.4 There are a number of designated heritage assets within 2 km of the Phillips 66 Site, including Grade I and II listed buildings (see Figure 3). However, there are no known heritage assets within the Phillips 66 Site and no cropmarks have been mapped from aerial photography. The former site of an undated cropmark enclosure and an Iron Age and Roman settlement is located within 1 km of the Phillips 66 site, but it is assumed that any archaeological remains within the Phillips 66 Site will have been partially or completely removed during previous construction works.

2.3.5 As a brownfield site, the Phillips 66 Site may contain some localised contamination due to historic land uses, but periodic borehole monitoring is undertaken as required by the Environmental Permit for the Humber Refinery.

2.3.6 The Phillips 66 Site is located entirely in Flood Zone 1 (low risk) and as such flood risk is not anticipated to be a significant development constraint.

VPI Site

2.3.7 The VPI Site lies directly to the south and south-east of the VPI Immingham CHP Power Station on a parcel of vacant land (approximately 13 ha).

2.3.8 The Humber Estuary SSSI, SAC, SPA and Ramsar site is located 1.4 km east of the VPI Site.

2.3.9 The VPI Site is flat and therefore views may be extensive. There is a single isolated residential property on Marsh Lane approximately 0.3 km east of the VPI Site and other residential properties within 1-2 km of the VPI Site (South and North Killingholme, Immingham and in the vicinity of Chase Hill Road).

2.3.10 A number of scheduled monuments and listed buildings lie within a 2 km radius of the VPI Site (see Figure 3). The northern strip of the VPI Site has been affected by development

previously, but the remainder of the VPI Site is not known to be previously developed. An Iron Age and Roman settlement is located at the northern boundary of the VPI Site, whilst other cropmarks and field boundaries have been recorded within the VPI Site boundary.

2.3.11 The VPI Site is bisected by a watercourse maintained by North East Lindsey Internal Drainage Board (IDB) (see Figure 3).

2.3.12 With the exception of some small areas, the VPI Site lies within Flood Zone 3 and is therefore classified as having a 'high risk' of flooding from fluvial or tidal sources.

3. Description of the Proposed Development

3.1 Overview

3.1.1 The Proposed VPI Development will include a PCC plant (of either two or three units) and associated facilities for capturing carbon dioxide from two of the gas turbines (GT1 and GT2)[1] and two auxiliary boilers at the VPI Immingham CHP Plant. Each VPI PCC unit will have a dedicated train of low pressure CO_2 compression, oxygen removal and dehydration to achieve a pure stream at 21 barg. The captured CO_2 will be further compressed at a high pressure CO_2 compression station within the VPI Site to deliver the assumed 135 barg required for export to the CO_2 transportation network.

3.1.2 The Proposed Phillips 66 Development will include one PCC unit for the FCC. The plant requires flue gas pre-treatment prior to the capture unit, and energy recovery equipment, a Selective Catalytic Reduction (SCR), wet gas scrubber and wet electrostatic precipitator (WetESP) are also likely to be required. The Phillips 66 PCC unit will have a dedicated train of low-pressure CO_2 compression, oxygen removal and dehydration to achieve a pure stream at 21 barg. A high pressure CO_2 compression station within or close to the Phillips 66 Site will also be developed to deliver the assumed 135 barg required for export to the CO_2 transportation network.

3.1.3 The water, steam and power required for the Proposed Development will be supplied from existing Humber Refinery systems and the VPI Immingham CHP Power Station.

3.1.4 The PCC facilities will be designed for 95% CO_2 capture during steady state operation. It is intended that CO_2 will be exported at high pressure via an interface to a CO_2 transportation network adjacent to the VPI Site.

3.2 Components of the Proposed Development

3.2.1 The Proposed Phillips 66 Development is likely to include the following components:

- flue gas pre-treatment using, Selective Catalytic Reduction (SCR), a wet gas scrubber and WetESP
- one PCC unit with associated quencher, blower, absorber, stack, regenerator and air-cooled heat exchangers;
- low pressure CO_2 compression facility;
- oxygen removal and dehydration facilities;
- FCC flue gas waste heat exchanger for steam raising;
- ducting (over an existing internal access road) to connect the PCC units to the FCC unit;
- one high pressure CO_2 booster compression station;
- CO_2 pipelines connecting the PCC units to the compression facilities and the CO_2 gathering network interface, including a pipeline crossing of the Phillips 66 railway sidings and Network Rail railway line;
- chemical offloading, storage and distribution facilities;
- electrical substation;
- instrument equipment house;

[1] The third gas turbine is proposed to be converted to hydrogen firing as part of the wider Humber Zero project.

- internal access roads;
- surface water drainage system;
- construction laydown area and welfare facility; and
- a new site access from Eastfield Road.

3.2.2 The Proposed VPI Development is likely to include the following components:

- two or three PCC units, each with associated quencher, blower, absorber, stack, regenerator and cooling system ;
- low pressure CO_2 compression facility;
- oxygen removal and dehydration facilities;
- ducting to connect the PCC units to the existing VPI Immingham CHP Plant;
- an electrical sub-station;
- a chemicals store and storage tanks;
- one high pressure CO_2 booster compression station;
- CO_2 pipelines connecting the PCC units to the compression facilities and the CO_2 transportation network interface;
- internal access roads;
- water treatment plant;
- realignment of the existing ditch within the VPI Site;
- surface water drainage system; and
- construction laydown area;

3.3 Access

3.3.1 The Proposed Development will utilise the existing accesses to the VPI Site and to the Phillips 66 Site (see Figure 6 in Appendix A) both during construction and operation of the Proposed Development. A new access (also shown on Figure 6) is also proposed to be constructed from the public highway (Eastfield Road) into the north-west corner of the Phillips 66 Site for construction use and operational deliveries.

3.4 Site Preparation

3.4.1 Ground conditions vary across the Site depending on their historical use. Given the nature of the former and current site operations within the Phillips 66 Site, it is possible that subsurface contamination may be present. The area for the proposed VPI PCC plant has not historically been used for industrial operations, although some of the area was used for csontruction laydown for the VPI Immingham CHP Plant. Soil and groundwater investigations will be undertaken prior to commencing construction.

3.4.2 No substantial changes to existing site levels are proposed and therefore no significant spoil movements are envisaged into or from the Proposed Development Site to support the construction of the Proposed Development.

3.4.3 Demolition works may be required within the Phillips 66 Site – this will be confirmed as the design progresses and will be considered as appropriate within the EIA technical chapters.

3.5 Construction

3.5.1 Subject to being granted planning consent and following a final investment decision, it is anticipated that construction will commence in late-2023 and last approximately 3 to 4 years.

3.5.2 The ES will provide further details of the proposed construction activities and their anticipated duration, along with an indicative programme of each phase of the works.

3.5.3 The ES will be supported by a framework Construction Environmental Management Plan (CEMP), which will describe the specific mitigation measures to be followed to reduce impacts from:

- construction traffic (including parking and access requirements);
- earthworks;
- noise and vibration;
- dust generation; and
- waste generation.

3.5.4 The requirement for a detailed CEMP is expected to be secured by conditions attached to the planning consents.

3.5.5 Contracts with companies involved in the construction works will incorporate environmental control, health and safety regulations and current guidance with the intention that construction activities are sustainable and that all contractors involved with the construction stages are committed to agreed best practice and meet all relevant environmental legislation including: Control of Pollution Act 1974 (COPA), Environment Act 1995 and Hazardous Waste (England and Wales) Regulations 2005.

3.5.6 All construction works will adhere to the Construction (Design and Management) Regulations 2015 (CDM)

3.6 Operation

3.6.1 The Proposed Development will be designed to operate 24 hours a day, 7 days a week as per the existing Humber Refinery and VPI Immingham CHP Plant.

3.6.2 The Proposed Development will operate under Environmental Permits from the Environment Agency which will stipulate the required environmental monitoring and controls to be employed, including emissions monitoring systems.

3.6.3 The Proposed Development will require water, power and steam when under operation. It is anticipated that these utilities will be sourced from within the Site.

3.6.4 The Proposed Development will also require chemicals such as ammonia (for the Phillips 66 PCC SCR), caustic and solvents (which treat the flue gases to remove the carbon dioxide).

3.6.5 The Proposed Development will generate solid and liquid wastes, which will be treated on Site as required and/or discharged or disposed off-site by a licensed waste carrier.

3.6.6 Surface water runoff will be managed in accordance with an approved drainage strategy and it is anticipated that this will discharge via the ditch along the eastern boundary on the VPI Site.

3.6.7 Scheduled maintenance will take place at regular intervals during the operational life of the Proposed Development.

3.6.8 The Proposed Development will have a design life of at least 25 years, yet the operational life could potentially be longer subject to market conditions which will be appraised as the project operates.

3.7 Decommissioning

3.7.1 At the end of the Proposed Development's design life, it is expected that the Proposed Development will have some residual life remaining. An investment decision would then be made based on the market conditions prevailing at that time. If the operating life were to be

extended, the Proposed Development would be upgraded in line with the legislative requirements at that time.

3.7.2 At the end of its operating life, the most likely scenario is that the Proposed Development would be shut down and all above ground structures removed from the Site. The Site would then be suitably remediated as required to facilitate re-use.

3.7.3 A Decommissioning Plan (including Decommissioning Environmental Management Plan) would be produced at the time of decommissioning and agreed with the Environment Agency as part of the Environmental Permitting and site surrender process. The Decommissioning Environmental Management Plan would consider in detail all potential environmental risks on the Site and contain guidance on how risks can be removed or mitigated during the decommissioning and demolition.

3.8 Embedded Environmental Mitigation

3.8.1 The Proposed Development itself is a form of environmental mitigation for the existing FCC stack and VPI Immingham CHP Plant, given that its purpose is to reduce CO_2 emissions from entering the atmosphere.

3.8.2 The design of the Proposed Development will be required to meet relevant legislation, standards and guidance including:

- The Environmental Permitting Regulations 2016 (as amended);
- The Pollution Prevention and Control Act 1999;
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;
- The Environmental Noise (England) Regulations 2006;
- The Hazardous Waste (England and Wales) Regulations 2005;
- The Environmental Protection Act 1990;
- The Industrial Emissions Directive (Directive 2010/75/EU);
- The Environment Agency guidance 'Post-combustion carbon dioxide capture: best available techniques (BAT)';
- BAT reference documents (BREFs) for both Large Combustion Plants and Refining; and
- UK and EU ambient air quality standards.

3.8.3 The stack heights for the PCC units will determined on the basis of air dispersion modelling results to ensure compliance with the relevant air quality standards or Environmental Assessment Levels.

4. Project Alternatives

4.1.1 The EIA Regulations require that an ES should include an outline of the main alternatives that have been studied by the Applicant and an indication of the main reasons for its choices, taking into account the likely significant environmental impacts of each alternative. Under the EIA Regulations there is no requirement to assess alternatives, only a requirement to provide a review of those alternatives that have been considered.

4.1.2 Where alternatives are examined and assessed during the pre-application process, details of the options and reasons for selection (or otherwise) will be included within the ES. Where, at the time of the planning applications, alternatives still exist for any particular element of the Proposed Development, the EIA will consider and assess the 'worst case' impacts, in accordance with the Rochdale Envelope approach that is often applied in planning applications and is outlined in the Planning Inspectorate (PINS) Advice Note Nine (PINS, 2008).

4.1.3 The following alternatives have been considered at this stage:

- No development – the alternative of no development was deemed not an option as this would not achieve decarbonisation of the FCC and the VPI Immingham CHP Plant Station;
- Cease operations at the Site – the alternative of ceasing operation of the FCC and VPI Immingham CHP Plant GT1 and GT2 is not considered to be an option given the economic significance of the Humber Refinery and the VPI Immingham CHP Plant which supplies heat and power to the Refinery;
- Hydrogen firing – there isn't sufficient hydrogen available for firing the VPI Immingham CHP Plant GT1 and GT2 however the future plan for GT3 is conversion to hydrogen firing; hydrogen firing is also under consideration for heaters at the Humber Refinery;
- PCC for other emission points within the Humber Refinery – the FCC within the Humber Refinery is the largest CO_2 emitter at the Refinery, but the Proposed Development does not preclude other emission points at the Refinery from being retrofitted with PCC in future (and may in fact enable other such developments by providing a high pressure CO_2 booster compression station within the Phillips 66 Site and establishing a tie-in to the CO_2 gathering network).

5. Planning Policy

5.1 Introduction

5.1.1 As confirmed in Chapter 1 (Section 1.2), consent for the Proposed Development will be sought under the Town and Country Planning Act 1990 (TCPA). Two separate planning applications will be submitted to the Local Planning Authority (LPA) NLC, seeking planning permission for the Proposed Phillips 66 Development and the Proposed VPI Development respectively.

5.1.2 Section 70(2) of the TCPA states that in dealing with an application for planning permission, the LPA shall have regard to the provisions of the development plan, as far as it is material to the application, and any "*other material considerations*".

5.1.3 This chapter of the EIA Scoping Report provides an overview of the development plan policy that may be material to the Proposed Development and refers to national planning, energy and climate change policy that may also be material and relevant to the determination of the planning applications.

5.1.4 Development plan policy and any other material considerations, including national policy, which may be relevant to the Proposed Development, will be considered in detail within the Planning Statement that will form part of the planning applications submitted to NLC.

5.2 Development Plan Policy

5.2.1 The Development Plan for North Lincolnshire comprises the North Lincolnshire Local Development Framework (LDF) and the 'Saved Policies' of the North Lincolnshire Local Plan (NLC, 2007).

5.2.2 The LDF comprises a suite of Development Plan Documents (DPDs) that set out the local planning policy for the area for the period to 2026. The DPD documents that are considered to be of relevance to the Proposed Development are:

- the Core Strategy (adopted June 2011) (NLC, 2011); and
- the Housing and Employment Land Allocations DPD and Proposals Map (adopted March 2016) (NLC, 2016a).

5.2.3 The North Lincolnshire Local Plan was adopted in May 2003. This plan has been largely replaced by the LDF however, a number of its policies have been saved, and are still therefore potentially material to the determination of planning applications.

5.2.4 NLC is currently in the process of preparing a new Local Plan. A 'Publication Draft' of the new Local Plan was subject to public consultation in October and November 2021. It is anticipated that the Local Plan will be submitted to the Secretary of State for Levelling Up, Housing and Communities for examination during 2022 with adoption following during 2023. At present the new Local Plan carries limited weight.

5.2.5 The Site is shown upon Inset 57 'South Humber Bank' of the LDF Proposals Map (NLC, 2016b). The Site is subject to the following allocations/ designations:

- Proposed Employment Land;
- South Humber Bank Landscape Initiative;
- Defined Industrial Buffer; and
- Landscape Enhancement Scheme.

5.2.6 The Core Strategy (Policy CS12) (NLC, 2011) and Housing and Employment Land Allocations DPD (Policy SHBE-1) (NLC, 2016) identify the South Humber Bank as a 'Strategic Employment Area'. Within this area around 900 hectares is identified for new employment

and industrial development and there is recognition of the importance of the area as a location for port activities, oil, chemicals, power generation and for renewable energy and emerging technologies such as Carbon Capture and Storage (CCS). These policies also state that it will be important to protect and enhance the biodiversity and landscape character of the South Humber Bank.

5.2.7 Saved Local Plan Policy LC20 (NLC, 2003 and 2007) relates to 'The South Humber Bank – Landscape Initiative' and confirms that the aim of this is to achieve environmental enhancement across the South Humber Bank, improve the appearance of the industrial zones and retain buffer areas between those and the residential areas. The initiative extends across much of the South Humber Bank.

5.2.8 Saved Local Plan Policy IN6 'Defined Industrial Buffer Areas' (NLC, 2003 and 2007) states that development will not be permitted within the defined amenity buffer areas associated with the South Humber Bank in order to maintain the separation between industry and residential areas. Within the buffer areas schemes for indigenous tree and shrub planting and habitat creation will be required.

5.2.9 Saved Local Plan Policy LC15 'Landscape Enhancement' (NLC, 2003 and 2007) identifies areas for landscape enhancement within the South Humber Bank, including new and informal landscape areas, wildlife habitats and also to provide visual screening and improve the appearance of the area.

5.2.10 The western section of the Site, between the Humber Refinery and the village of South Killingholme is identified on the Proposals Map as being both an Industrial Buffer Area and a Landscape Enhancement Area.

5.2.11 The policies within the Core Strategy and Housing and Employment Land Allocations DPD (NLC, 2016a) that it is considered may be relevant to the determination of the planning applications include:

- Policy CS1: Spatial Strategy for North Lincolnshire;
- Policy CS2: Delivering more Sustainable Development;
- Policy CS3: Development Limits;
- Policy CS5: Delivering quality design in North Lincolnshire;
- Policy CS6: Historic Environment;
- Policy CS12: South Humber Bank Strategic Employment Site – A Broad Location;
- Policy CS16: North Lincolnshire's Landscape, Greenspace and Waterscape;
- Policy CS17: Biodiversity;
- Policy CS18: Sustainable Resource Use and Climate Change;
- Policy CS19: Flood Risk;
- Policy CS20: Sustainable Waste Management;
- Policy CS25: Promoting Sustainable Transport; and
- Policy SHBE-1: South Humber Bank Strategic Employment Site.

5.2.12 The 'Saved' policies of the Local Plan (NLC, 2003 and 2007) that it is considered may be relevant to the determination of the planning applications include:

- Policy IN6: Defined Industrial Buffers;
- Policy T1: Location of Development;
- Policy T18: Traffic Management;
- Policy LC1: Special Protection Areas, Special Areas of Conservation and Ramsar Sites;
- Policy LC2: Sites of Special Scientific Interest and National Nature Reserves;

- Policy LC5: Species Protection;
- Policy LC6: Habitat Creation;
- Policy LC7: Landscape Protection;
- Policy LC12: Protection of Trees, Woodland and Hedgerows;
- Policy LC15: Landscape Enhancement;
- Policy LC20: South Humber Bank – Landscape Initiative;
- Policy HE9: Archaeological Excavation;
- Policy DS1: General Requirements (Development Standards);
- DS7: Contaminated Land;
- DS9: Development of Land in the Vicinity of Established Hazardous Installations and Pipelines;
- DS10: New Hazardous Installations and Pipelines;
- DS11: Polluting Activities;
- DS12: Light Pollution;
- DS13: Groundwater Protection and Land Drainage;
- DS14: Foul Sewage and Surface Water Drainage;
- DS15: Water Resources; and
- DS16: Flood Risk.

5.3 National Planning Policy Framework

5.3.1 The latest version of the National Planning Policy Framework (the NPPF or the Framework) was adopted in July 2021 (Ministry of Housing, Communities and Local Government (MHCLG), 2021). The NPPF sets out the Government's planning policies for England. Those policies are expanded upon and supported by the Planning Practice Guidance (Department for Levelling Up, Housing and Communities (DLUHC) and MHCLG, 2021). Paragraph 2 of the NPPF states that it (the Framework) is a material consideration in planning decisions, including the determination of planning applications.

5.3.2 The planning policies within the NPPF that it is considered may be of relevance to the Proposed Development can be found within the following chapters of the Framework:

- Chapter 2: Achieving Sustainable Development;
- Chapter 6: Building a Strong, Competitive Economy;
- Chapter 11: Making Effective Use of Land;
- Chapter 12: Meeting the Challenge of Climate Change, Flooding and Coastal Change;
- Chapter 15: Conserving and Enhancing the Natural Environment; and
- Chapter 16: Conserving and Enhancing the Historic Environment.

5.4 National Policy Statements

5.4.1 While National Policy Statements apply to Nationally Significant Infrastructure Projects (NSIPs) rather than local planning applications, nevertheless they can have points of relevance in the determination of local planning application.

5.4.2 In July 2011 the Secretary of State for the Department of Energy and Climate Change (now Business, Energy and Industrial Strategy or BEIS) designated a number of National Policy Statements (NPSs) relating to nationally significant energy infrastructure. The NPSs are the primary policy used by the Secretary of State for BEIS in determining applications for

development consent for energy infrastructure that fall under Sections 14 to 21 of the Planning Act 2008.

5.4.3 The designated NPSs include an 'Overarching NPS for Energy (EN-1)' (Department of Energy and Climate Change (DECC), 2011a) setting out general policies and assessment principles for nationally significant energy infrastructure and a number of technology specific NPSs. EN-1 states (paragraph 1.2) that in England and Wales the NPSs are likely to be material considerations for LPAs in determining planning applications under the TCPA.

5.4.4 The NPSs considered to be of relevance to the Proposed Development are the:

- Overarching NPS for Energy (EN-1) (DECC, 2011a); and the
- NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2) (DECC, 2011b).

5.4.5 Paragraphs 3.6.4 to 3.6.7 of EN-1 relate specifically to Carbon Capture and Storage (CCS). They explain the role CCS can have in meeting emissions targets while also maintaining security of supply (allowing fossil fuel fired power stations to provide flexible low carbon electricity generation) and that the technology has the potential to reduce carbon dioxide emissions by up to 90%. Paragraph 3.6.8 of EN-1 further underlines the need for fossil fuel generation to be linked to CCS:

> "*It is important that such fossil fuel generating capacity should become low carbon, through development of CCS, in line with carbon reduction targets. Therefore there is a need for CCR fossil fuel generating stations …* "

5.4.6 In response to the Government's commitment to achieve net zero in terms of greenhouse gas emissions by 2050 and the publication of the Energy White Paper (the EWP) in December 2020 (BEIS, 2020a), the Secretary of State for BEIS is undertaking a review of the suite of NPSs for energy infrastructure to ensure that these reflect the policies set out in the EWP, and that the Government continues to have a planning policy framework that can deliver the investment required to build the infrastructure needed for the transition to net zero by 2050. The Secretary of State has recently consulted on draft updated energy NPSs (BEIS, 2021a) and it is anticipated that the updated NPSs will be designated around the middle of 2022.

5.5 National Energy and Climate Change Policy

5.5.1 Recent UK Government energy and climate change policy is also considered to be both material and relevant to the Proposed Development. These policy documents set out important Government objectives for decarbonising the power and industrial sectors, including through the large-scale deployment of CCS and the production and use of hydrogen in order to achieve net zero by 2050. These include:

- The Clean Growth Strategy (HM Government, 2017);
- Clean Growth – The UK Carbon Capture Usage and Storage deployment pathway – An Action Plan (HM Government, 2018);
- The Ten Point Plan for a Green Industrial Revolution (HM Government, 2020a);
- National Infrastructure Strategy: Fairer, faster, greener (HM Treasury, November 2020);
- The Energy White Paper (BEIS, 2020a);
- Industrial Decarbonisation Strategy (BEIS, 2021b);
- North Sea Transition Deal (BEIS and Oil and Gas UK (OGUK), March 2021);
- UK Hydrogen Strategy (BEIS, 2021); and
- Net Zero Strategy: Build Back Greener (BEIS, 2021d).

5.5.2 As stated above, development plan policy and national planning, energy and climate change policy that may be material and relevant to the Proposed Development, will be considered in detail within the Planning Statement that will form part of the planning applications submitted to NLC, in addition to the Proposed Development's compliance with that policy.

6. Scoping Assessment of Environmental Issues

6.1.1 The following sections present a discussion of the potential environmental impacts associated with the Proposed Development that it is proposed will be considered as part of the EIA. The methodology and assessment criteria that will be used to assess the potential significance of identified impacts are also outlined alongside potential mitigation measures for implementation following assessment.

6.2 Air Quality

Baseline Conditions

6.2.1 The Environment Act 1995 requires local authorities to review air quality within their district or borough in order to determine where pollutant levels identified in the Air Quality Framework Directive may be in excess of the standards.

6.2.2 If pollutant levels in an area are likely to exceed statutory objectives, then local authorities must declare an Air Quality Management Area (AQMA) and draft an Action Plan to achieve the statutory objectives. The Department of Environment, Food and Rural Affairs (DEFRA) has issued technical guidance to local authorities to assist in undertaking this task.

6.2.3 The most recent publication within the above framework is the '2014 Air Quality progress Report' from NLC (NLC, 2015).

6.2.4 There is one AQMA designated within the administrative boundary of NLC however this is over 15 km from the Site, in Scunthorpe, and therefore it is considered unlikely that this would be affected by emissions from the Proposed Development. A previous AQMA at Low Santon was revoked in 2018.

6.2.5 There is one AQMA designated within the neighbouring administrative boundary of North East Lincolnshire Council (NELC). This is the Grimsby AQMA approximately 13.5 km south east of the Site. There was previously an AQMA designated in Immingham, approximately 2.5 km south of the Site, yet this was revoked in 2016. In the adjoining local authority area of Hull City Council there is an AQMA approximately 12.5 km north of the Site.

6.2.6 NLC had a network of eight automatic monitoring sites during 2019, in order to measure the concentration of PM_{10}, SO_2 and NO_2 across the region. Two of these monitoring sites are within proximity to the Proposed Development Site.

6.2.7 In 2019, NLC had a network of 22 non-automatic monitoring sites (diffusion tubes) in order to measure the concentration of NO_2 across the region. Five of these diffusion tubes are in proximity to the Proposed Development Site, with four being located along the A160, and one being co-located with one of the continuous monitors. These diffusion tube locations range from approximately 300 m to 1.3 km west of the Site.

6.2.8 The available monitoring data for NO_2 for these diffusion tube locations indicate that the recorded annual mean concentrations are below the air quality objective limit concentration of 40 ug/m^3. The available 2019 data set for two diffusion tube sites closest to the Site record an average annual mean average NO_2 concentration of 31.15 ug/m^3. It is also noted that these sites are 'roadside' monitors where the ambient concentrations can be expected to be principally influenced by emission from road traffic.

6.2.9 Baseline, or existing, background air quality for the area in the vicinity of the Proposed Development will be determined from available monitoring data and Defra background air quality maps (UK-AIR) (DEFRA, 2016), supplemented by diffusion tube (NO_2) monitoring if required.

6.2.10 The existing air quality concentrations at designated habitat sites in the vicinity of the Proposed Development, and the existing acid and nutrient nitrogen deposition rates at those sites, will be obtained from the UK Air Pollution Information System (APIS), supplemented by data from UK-AIR.

Scope of Assessment

6.2.11 The following potential impacts may be associated with the Proposed Development:

- emission of pollutants to air from the stacks and other emission sources on the plant during operation;
- emission of pollutants to air from vehicles associated with construction, operation and decommissioning of the Proposed Development; and
- construction dust and mobile plant exhaust emissions generated during construction and decommissioning of the capture plant.

6.2.12 The Proposed Development will be designed and operated to comply with the relevant provisions of the Industrial Emissions Directive 2010/75/EU (the IED). The requirements of the IED are transposed into English law via the Environmental Permitting (England and Wales) Regulations 2016 (as amended) (the EPR).

6.2.13 The EPR requires the Proposed Development to operate in accordance with an environmental permit issued by the Environment Agency. As part of the permitting process, an operator is required to demonstrate that BAT will be implemented, and during permit determination, the Environment Agency will set Emission Limit Values (ELVs) within the permit for pollutant releases, based on the IED ELVs, or other relevant guidance. For carbon capture, the Environment Agency issued guidance in 2021 on BAT for the PCC in the UK, and therefore this will be considered within the Proposed Development's design and during the permitting process.

6.2.14 The potential use of a SCR system to remove the NOx within the flue gas entering the Phillips 66 PCC plant, and the use of absorption solvent within the PCC plants themselves, may also result in small emissions of ammonia ('ammonia slip'), amines and amine degradation products. These pollutants will be assessed for potential human health and habitats effects, recognising the nitrogen deposition potential of ammonia and also the lessons learned from the previous carbon capture projects consented in England and Scotland.

6.2.15 An atmospheric impact assessment will be undertaken for the main point source emissions, utilising air dispersion modelling to assess the process contributions and predicted environmental concentrations of emitted pollutants.

6.2.16 The atmospheric dispersion modelling study of operational emissions will be undertaken using the Atmospheric Dispersion Modelling System (ADMS) model, currently version 5.2. ADMS is widely used by industry and the regulatory authorities.

6.2.17 The modelling will be based on ELVs set by the IED or appropriate guidance where available and at full operating load, thereby presenting a worst-case scenario in the ES. Should it be deemed appropriate to model lower loads, justification for this will be provided and the load clearly stated in the assessment. Modelling will be undertaken in accordance with the Environment Agency 'Air emissions risk assessment for your environmental permit' (2016) ('AERA Guidance').

6.2.18 The dispersion modelling study will be used to determine the most appropriate height for the emission stacks based on the resultant maximum short-term and long-term ground level pollutant concentrations predicted.

6.2.19 Potential impacts on ecological receptors will be assessed, including statutory designated habitat sites within 15 km of the proposed stacks and non-statutory habitat sites within 2 km, in accordance with the EA's AERA Guidance.

6.2.20 An air quality impact assessment will also be undertaken of the effects of road traffic on the local road network associated with the construction and operation of the Proposed

Development in accordance with the Defra 'Local Air Quality Management Technical Guidance LAQM.TG(09)' (2009a). The Highways Agency 'Design Manual for Roads and Bridges' (DMRB) screening model will be used. However, based on the anticipated traffic volumes, it is not currently considered that more detailed modelling would be required for either construction or operational phase traffic. Should the screening model determine that road traffic could cause potentially significant concentrations of NOx or particulate matter (PM_{10}), more detailed assessment will be undertaken using the ADMS-Roads dispersion model. Both tools have been specifically designed to assess the impact of road traffic emissions in the UK.

6.2.21 In addition, potential impacts and nuisance from site clearance, construction dust and mobile plant exhaust emissions generated during the construction phase of the Proposed Development and any associated development will be considered using a screening assessment (Institute for Environmental Management and Assessment (IEMA), 2016) and the Institute of Air Quality Management (IAQM) 'Assessment of dust from demolition and construction' (2014), supplemented by case studies where appropriate. Where necessary, mitigation measures will be recommended for the control of dust and site plant emissions during site preparation and construction works to minimise the potential effects.

6.2.22 Given the subjectivity that can occur when attempting to assign a level of significance to a given air quality impact, AECOM has produced a set of quantitative significance criteria for air quality matters. These are based on the regulatory and expert guidance identified above, together with the IAQM 'Guidance on land-use planning and development control: Planning for air quality' (2017).

6.3 Noise and Vibration

Baseline Conditions

6.3.1 The Site is situated in a heavily industrialised area with limited residential receptors nearby.

6.3.2 The nearest residential settlements are the villages of South Killingholme (approximately 0.3 km west of the Site and over 0.5 km from the proposed Phillips 66 PCC plant area) and North Killingholme (approximately 0.7 km north west of the Site). The town of Immingham is also located approximately 1.7 km to the south. The closest residential receptors to the Site are 0.3 km west of the Phillips 66 Site and 0.3 km east of the VPI Site.

6.3.3 Ecological receptors may also be sensitive to noise. The Humber Estuary SSSI is located 1.4 km east of the Site and North Killingholme Haven Pits SSSI is located 2.3 km north of the Site.

6.3.4 Consultation with NLC will be undertaken in order to determine specific noise sensitive receptors (NSR) and/ or representative locations at which sound surveys will be undertaken to establish the baseline sound conditions within the vicinity of the Site. Baseline sound survey requirements at identified sensitive ecological receptors will be agreed in conjunction with the project ecologists and Natural England.

Scope of Assessment

6.3.5 The following potential impacts may be associated with the Proposed Development:

- construction and decommissioning noise and vibration impacts (including impacts related to traffic on public roads);
- operational noise impacts from the Proposed Development, including the potential air cooling infrastructure; and
- operational noise impacts from road traffic on public roads.

6.3.6 As it is anticipated that operational traffic will be minimal (refer to Section 6.4 below) and is proposed to be scoped out of the EIA, subject to NLC confirmation, assessment of operational traffic-related noise impacts is also proposed to be scoped out of the EIA.

6.3.7 Based on the distance between the Site boundary and the nearest receptors, significant vibration impacts associated with operational activities are considered unlikely, although they will still be considered as part of the EIA.

6.3.8 The scope of the noise and vibration assessment will be:

- identification of nearest NSRs;
- liaison with NLC and the project ecologists to agree scope and methodology of noise assessment, including baseline sound monitoring locations and measurement protocol;
- establishment of baseline sound levels in the locality; and
- assessment of the impact of predicted noise levels at the nearest noise sensitive receptors from the construction and operation of the proposed carbon capture plant and associated developments within the Site, including:
  - construction noise and vibration (including construction traffic on public roads); and
  - operational noise and vibration (including site traffic on public roads).

6.3.9 The noise and vibration assessment will be carried out in accordance with the following guidance:

- 'Noise Policy Statement for England' (DEFRA, 2010); and
- Planning Practice Guidance for 'Noise' (DLUCH and MHCLG, 2021).

6.3.10 Additionally, reference will be made, but not be limited, to the following:

- British Standard (BS) 5228-1 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Part 1: Noise' (British Standards Institute (BSI), 2014a);
- BS 5228-2 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Part 2: Vibration' (BSI, 2014b);
- International Organisation for Standardisation (ISO) 9613-2: 1996 'Attenuation of sound during propagation outdoors. Part 2: General method of calculation' (ISO, 1996);
- BS 4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' (BSI, 2019a);
- BS 7385: 1993 'Evaluation and measurement for vibration in buildings' (BSI, 1993);
- BS 6472: 2008 'Guide to evaluation of human exposure to vibration in buildings' (BSI, 2008);
- Control of Pollution Act 1974 (as amended);
- 'Calculation of Road Traffic Noise' (CRTN) (Department for Transport, 1988); and
- DMRB LA111 Revision 2 'Noise and Vibration' (Highways England, 2020a).

6.3.11 Baseline sound monitoring requirements will be agreed in advance with NLC. The monitoring procedures will conform to BS 7445: 2003 '*Description and Measurement of Environmental Noise*' (BSI, 2003), and monitoring will be undertaken in close proximity to NSRs at both weekend and weekday times, ideally (subject to adequate security and access) over a minimum five-day unmanned monitoring period.

6.3.12 Noise levels associated with enabling and construction works will be calculated (at chosen NSRs) using the data and procedures given in BS 5228 (BSI, 2014a). The need for prediction of vibration levels will be further considered depending upon the types of activities required. Additionally, noise increases at NSRs due to any construction traffic on public roads will be calculated according to the methods given in CRTN. The predictions will be based on baseline and with-development traffic data provided as part of the proposed traffic and transport assessment (see Section 6.4 Traffic and Transportation).

6.3.13 The operational noise impact of the Proposed Development will be predicted using 3-dimensional computer noise modelling software (SoundPLAN or Cadna-A), based on information on plant layout, and the operating conditions and the levels of noise generated by plant items and vehicles. The modelling software enables a detailed implementation of the proposed equipment and buildings, existing surrounding buildings and ground features. The software implements the methodology in ISO 9613-2 (ISO, 1996) for the calculation of environmental noise levels from industrial sources.

6.3.14 The significance of the noise impact of the Proposed Development during operation will be assessed using the method given in BS 4142 (BSI, 2019a), supplemented as necessary with an assessment of noise level change. BS 4142 provides a method for rating the acceptability of increases in existing noise levels at noise-sensitive receptors affected by noise from industrial sources at proposed developments, and the British Standard and WHO guidance provide information regarding noise and sleep disturbance. Further details of the approach will be discussed and agreed as required with NLC.

6.3.15 The significance of changes in road traffic noise levels will be assessed based on a range of relevant guidance including the DMRB (Highways England, 2020a).

6.4 Traffic and Transport

6.4.1 This chapter sets out the proposed scope of the environmental assessment for traffic and transport. The objectives of the chapter are to:

- describe the baseline environment in relation to traffic and transportation;
- outline the methods and assessment to be undertaken for inclusion within the ES; and
- identify any potential effects on users of the local transport network that may arise as a result of the Scheme and any potential mitigation measures.

Baseline Conditions

6.4.2 The Proposed Development is located on land to the north of A160 Humber Road, Immingham, within the administrative boundary of NLC which, as a unitary authority, is responsible for both Planning and Highways matters. The site location is presented in Plate 1 below, which also shows local authority boundaries.

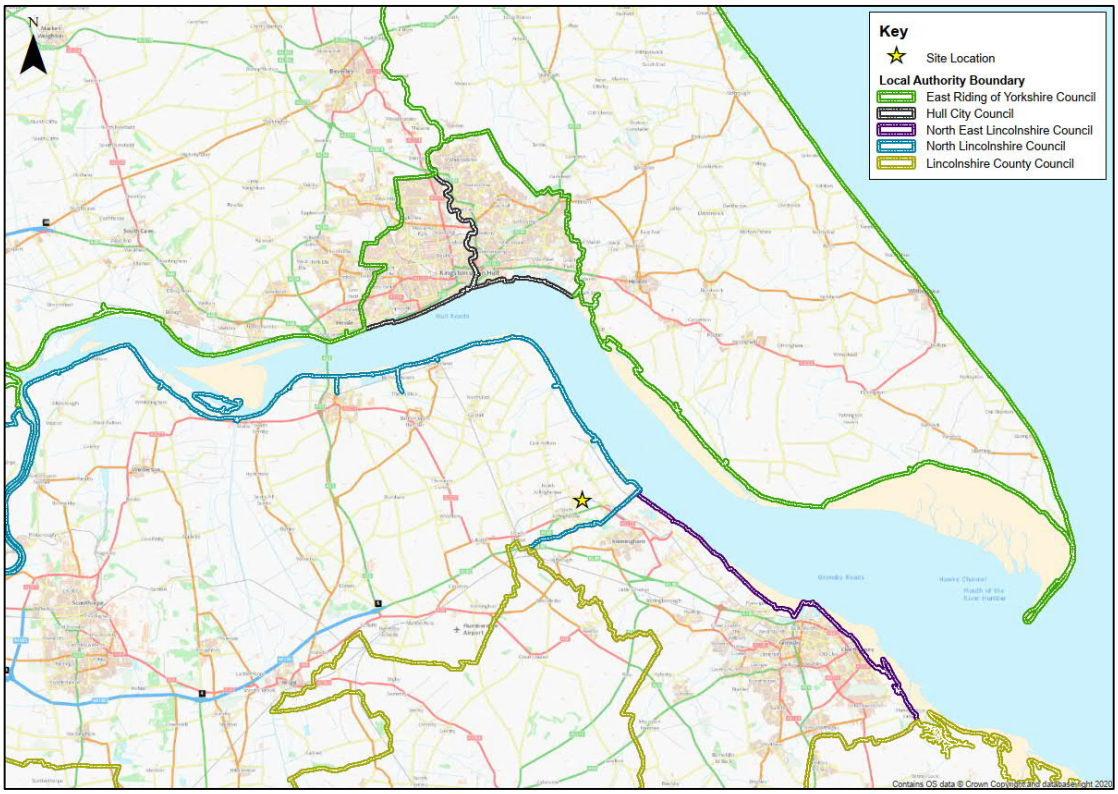

Plate 1: Site location and local authority boundaries

6.4.3 As a minimum, it is anticipated that the following strategic/ primary links will be used by vehicles to provide access:

- Eastfield Road;
- Rosper Road;
- Humber Road/ A160;
- A180;
- A1173;
- A15;
- A63; and
- M180.

6.4.4 The main data l to be gathered for the assessment of traffic and transport effects will be traffic flow data and personal injury accident data (PIA).

Automated Traffic Counts

6.4.5 Automated Traffic Counts (ATCs) will be required to obtain up to date baseline traffic flows along links which could be impacted by the Proposed Development. This count data shall provide two-way traffic flows classified by vehicle type, including HGVs and shall be conducted during 'neutral' periods, in-line with TAG Unit M1.2 (2020), which states that neutral periods are defined as Monday to Thursday from March through to November (excluding August) and avoiding the weeks before / after Easter. Surveys may be carried out outside these months if the conditions being surveyed are representative, however in this instance surveys will be conducted during the identified neutral periods.

6.4.6 The locations and timings of the surveys are to be agreed with the NLC highways team and National Highways (as the A180 is on the strategic road network). The selected count locations will provide a basis for the analysis and incorporate local routes within the corridors

close to potential sensitive receptors, as well as routes along key strategic links to provide a robust baseline for assessment.

6.4.7 For ease of reference, the proposed traffic survey locations are identified within Plate 2 below.

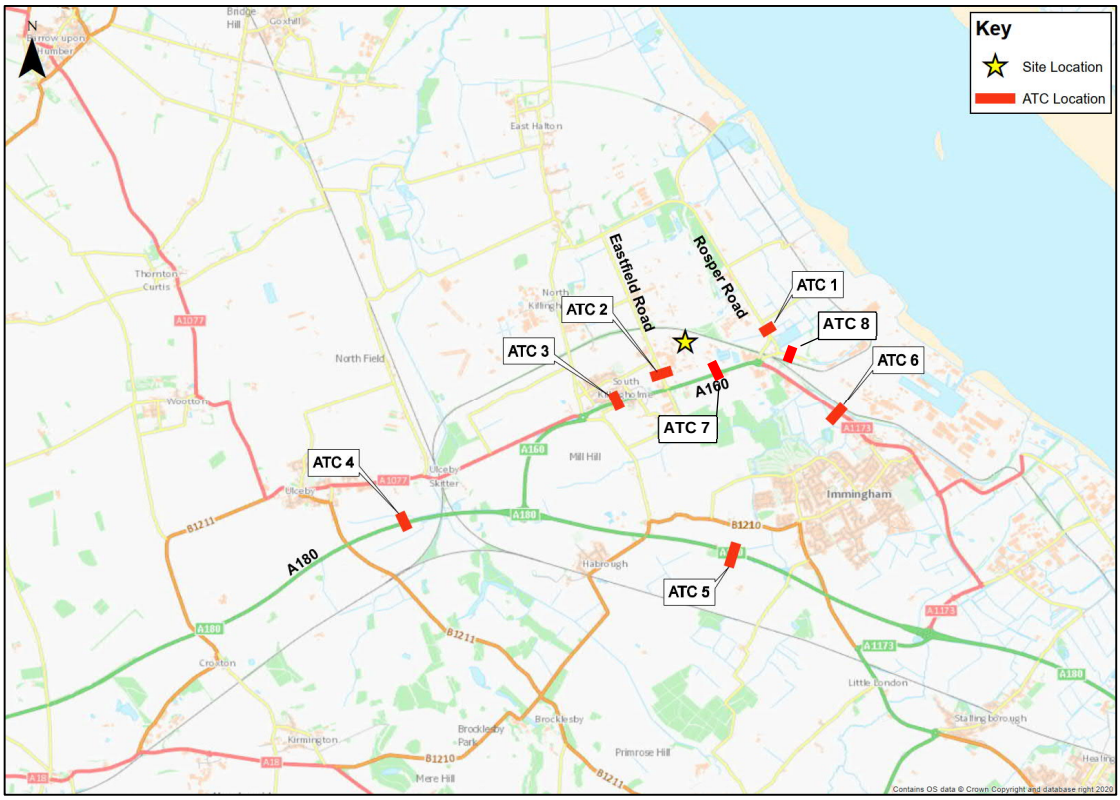

Plate 2: Proposed traffic survey locations

6.4.8 With reference to the above figure, the proposed traffic survey scope can be summarised as follows:

- ATC 1: Rosper Road;
- ATC 2: Eastfield Road;
- ATC 3: A160;
- ATC 4: A180 (A);
- ATC 5: A180 (B);
- ATC 6: A1173;
- ATC 7: A160 (between Eastfield Road and Manby Roundabout); and
- ATC 8: Humber Road (West of ABP Immingham Dock West Gate).

6.4.9 ATCs further afield and not shown on the above plan:

- ATC 9: A15;
- ATC 10: A63 (west of Humber Bridge); and
- ATC 11: A63 (east of Humber Bridge).

6.4.10 As stated above, the dates of the proposed traffic surveys are to be confirmed (likely to be early 2022), however all surveys will be conducted during 'neutral periods', in-line with TAG Unit M1.2 (2020) guidance.

6.4.11 Average Annual Daily Traffic (AADT) flows will be derived from the recorded ATC data. Traffic generation at the Proposed Development will be estimated , with a profile of daily light and

Heavy Goods Vehicle (HGV) arrivals and departures presented across the construction and operational periods.

6.4.12 It is widely accepted that government enforced travel restrictions as a result of the COVID-19 pandemic have affected traffic levels across the highway network, such that post-COVID traffic surveys may be considered unrepresentative, when compared with pre-pandemic levels. Although the proposed traffic surveys to be conducted as part of this assessment will not be conducted in a period of 'national' or 'local' lockdown, the lingering effects of the pandemic, such as an increase in people choosing to work from home alongside other changes in usual travel patterns which have occurred as a result of the pandemic, could still conceivably be affecting traffic flows.

6.4.13 As the economy and society exits the pandemic, the degree to which the lingering affects highlighted above could be affecting current traffic flows, over and above daily fluctuations, could be questioned, with traffic levels broadly seen to be reaching pre-pandemic levels, across the country.

6.4.14 Therefore, it may be appropriate to validate the surveys against pre-pandemic traffic flows, where sufficient data is available. The level of acceptable validation is to be agreed with NCL Highways and National Highways (A180), and should the surveys not be seen to be representative then a growth factor (to be agreed) could be calculated and applied to the data collected, to satisfy concerns around its representativeness.

6.4.15 It should be noted that, for purposes of the ES, lower baseline flows may provide a more robust assessment as the ES utilises a percentage-based assessment methodology and therefore the impact of the Scheme is likely to be higher.

6.4.16 NLC will be consulted in relation to the requirement for conducting a COVID-19 validation check on the baseline traffic data.

Personal Injury Accident Data

6.4.17 It is anticipated that Personal Injury Accident (PIA) data will be obtained from NLC for the most recent five-year period (where available), which will provide information on each collision including severity as well as factors which attributed the collision.

6.4.18 The proposed PIA study area scope is presented in the Plate 3 below.

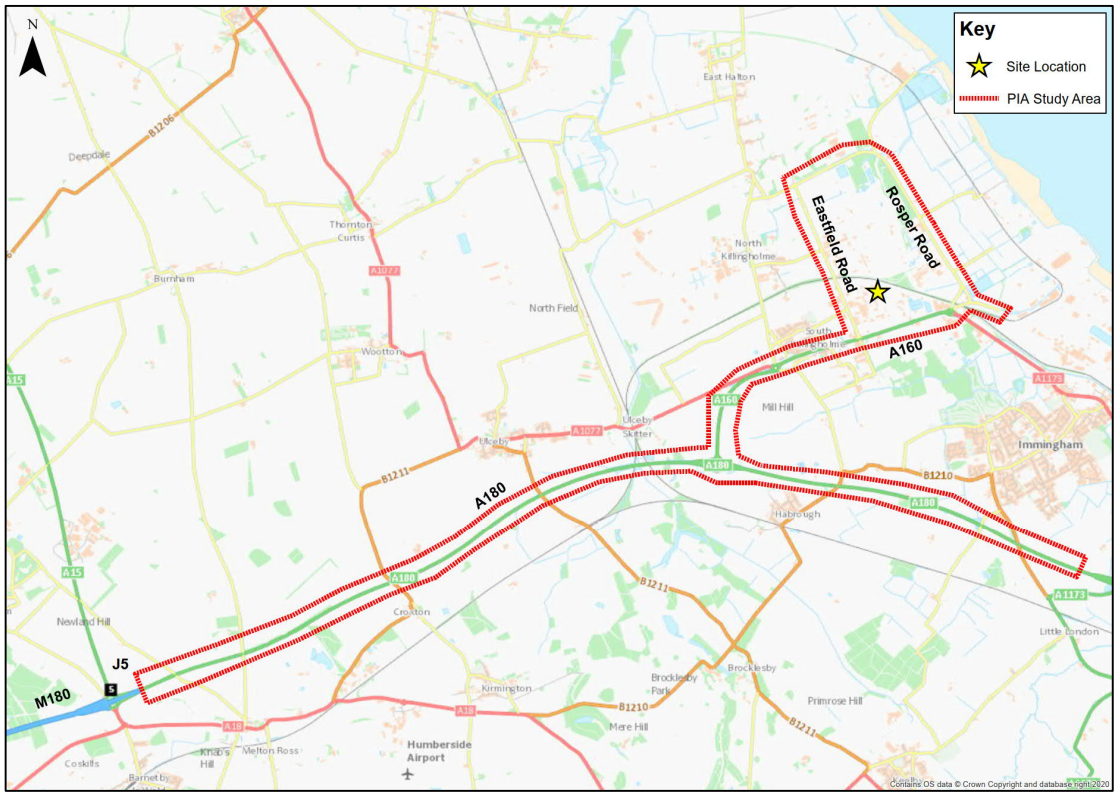

Plate 3: Proposed PIA study area

Scope of Assessment

6.4.19 The methodology for assessing the impact of development-generated traffic will be based on that outlined in Institute of Environmental Assessment's (IEA, now known as IEMA) 'Guidelines for the Environmental Assessment of Road Traffic' (January 1993). The IEA guidelines state that a link on the highway network should be included within the study if one of the following criteria is met:

- traffic flows increase by more than 30% (or HGV flows increase by more than 30%); or
- traffic flows in sensitive areas increase by more than 10%.

6.4.20 Given the nature of the proposals, it is anticipated that operational traffic will be minimal, and below the screening threshold. It is therefore proposed that operational traffic associated with the Proposed Development is scoped out of the EIA, subject to NLC confirmation.

6.4.21 The IEMA guidelines recommend that several environmental effects may be considered important when considering traffic from an individual development. The following types of impacts and effect are considered here:

- impact of HGV construction traffic;
- severance;
- pedestrian delay;
- pedestrian amenity; and
- accidents and safety.

6.4.22 The type of traffic which is anticipated to be generated by the Proposed Development will be categorised as follows; primarily general traffic, LGVs, HGVs and Abnormal Indivisible Loads (AILs).

6.4.23 The proposed vehicle routeing and movement associated with the construction of the Proposed Development is to be considered in detail and confirmed through consultation with NLC.

6.4.24 Once the locations and volumes of the proposed traffic have been identified it is necessary to identify those receptors that may be impacted upon, due to the increase in vehicle movements. This will be done by identifying the percentage increase in vehicular activity along the identified construction routes following the collection of traffic data. The ATCs will be used to derive AADT for individual links, subdivided into 24 hour counts for total traffic and HGVs.

6.4.25 In order to calculate the trip distribution of workers travelling to and from the Proposed Development a gravity model will be developed. Construction traffic associated with the proposals will be distributed onto the local highway network to calculate the resultant percentage increase on each link.

6.4.26 Assessments will be undertaken for one or several years throughout the construction period, which is currently estimated as taking 3 to 4 years following the successful granting of planning permissions.

6.4.27 Currently, it is anticipated that the construction will commence in late 2023 If historical data is utilised, base traffic flows would therefore be increased, using appropriate growth factors, to the base year in order to establish baseline flows and then increased using appropriate growth factors, to the identified peak year of construction. Growth factors will be derived from TEMPro v7.2c within MSOA North Lincolnshire 004. Meanwhile, the peak construction traffic flows will be derived by analysing construction traffic data and anticipated construction programmes.

6.4.28 It is proposed that the routeing of Abnormal Indivisible Loads (AILs) be considered in the EIA for the delivery of large components, considering the frequency and size of the loads .

Transport Assessment

6.4.29 The ability of the highway network to accommodate the development traffic will be assessed and reported in a Transport Assessment (TA) which will form a technical annex to the ES Traffic and Transport Chapter.

6.4.30 It is envisaged that the TA will encompass the following:

- summary of the scoping discussions;
- a review of relevant national, regional and local policies;
- description of the existing baseline conditions - a thorough description of the roads, railway lines, footpaths, bridleways and cycle paths impacted. Traffic flows on these routes and levels of use on bridleways, footpaths and cycle paths;
- review of committed developments;
- a review of the road safety data for the most recent five-year period within the identified search cordon;
- a description of the proposed Humber Zero Scheme;
- cumulative impact assessment – including consideration of the traffic likely to be generated by any decommissioning and demolition of existing infrastructure within the SSI site, which is likely to be concurrent with the Proposed Development construction phase;
- details of construction traffic with a profile of total vehicle and HGV arrivals and departures across a typical day;
- distribution and assignment of trips to the network with construction distribution based on a gravity model of worker catchment area and HGV's assigned from the A road network;
- mitigation measures; and
- summary and conclusions.

Sensitivity, Value or Importance

6.4.31 The criteria for defining the importance or sensitivity of receptors are set out in **Error! Reference source not found.**.

Table 6-1 Receptor Sensitivity Criteria (Traffic & Transport)

Sensitivity	Description
Very High	Schools, colleges, playgrounds, hospitals, retirement homes.
High	Heavily congested junctions, residential properties very close to carriageway.
Medium	Congested junctions, shops/businesses, areas of heavy pedestrian / cycling use, areas of ecological/nature conservation, residential properties close to carriageway.
Low	Tourist/visitor sites, places of worship, residential areas set back from the highway with screening.
Negligible	Those people and places located away from the affected highway link.

Magnitude

6.4.32 General criteria for defining the magnitude of an impact are set out in Table 6-2.

Table 6-2 Impact Magnitude Criteria (Traffic & Transport)

Magnitude	Description
High	Total loss or major alternation to key elements/features of the baseline conditions such that post development character/composition of baseline condition will be fundamentally changed.
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition of the baseline condition will be materially changed.
Low	Minor shift away from baseline conditions. Changes arising from the alteration will be detectable but not material; the underlying character/composition of the baseline condition will be similar to the pre-development situation.
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximating to a "no change" situation.

6.4.33 Information provided in Table 6-3 expands on the information from Table 6-2 and shows further details of the individual aspects of the assessment and the thresholds to be applied for each.

Table 6-3 Impact Magnitude Criteria Detail (Traffic & Transport)

Magnitude	Description	Illustrative Criteria
High	HGV Construction Traffic	High number of construction vehicles using roads over a protracted period of time. More than a 40% increase for more than 6 months.
	Pedestrians/ Cyclists	Limited or no facilities for pedestrians and cyclists with limited crossing facilities and low-quality linkages to the local facilities.
	Severance	Increase in total traffic flows of 90% and above (or increase in HGV flows over 10% based on the sensitivity of the receptors).
	Road Safety	High increase in traffic at known collision locations.
Medium	HGV Construction Traffic	Moderate number of construction vehicles using roads over a protracted time period. • 16-39% increase for more than 6 months; or

Magnitude	Description	Illustrative Criteria
		More than 40% increase for 3-6 months.
	Pedestrians/ Cyclists	Few facilities for pedestrians and cyclists with limited crossing facilities and linkages to the local facilities.
	Severance	Increase in total traffic flows of 60-89% (or increase in HGV flows over 10% based on the sensitivity of the receptors).
	Road Safety	Moderate increase in traffic at known collision locations.
Low	HGV Construction Traffic	Small number of construction vehicles using roads over a short period of time. • 6-15% increase for more than 6 months; • 31-39% for 3-6 months; or >40% increase for less than 3 months.
	Pedestrians/ Cyclists	Facilities for pedestrians and cyclists with safe and convenient crossing facilities and good linkages to the local facilities.
	Severance	Increase in total traffic flows of 30-59% (or increase in HGV flows over 10% based on the sensitivity of the receptors).
	Road Safety	Minor increase in traffic at known collision locations.
Negligible	HGV Construction Traffic	Occasional construction vehicles using roads over a short period of time. • Less than 5% Increase for more than 6 months; or • Between 6-30% increase for 3- 6 months; or Between 31-40% for less than 3 months.
	Pedestrians/ Cyclists	Dedicated facilities for pedestrians and cyclists with safe and convenient crossing facilities and good linkages to the local facilities.
	Severance	Increase in total traffic flows of 29% or under (or increase in HGV flows under 10%).
	Road Safety	Negligible increase in traffic at known collision locations.

Significance

6.4.34 The general approach adopted for evaluating the significance of effects considering the sensitivity of the receptor and the magnitude of impact is outlined in Table 6-4. Effects predicted to be 'major' or 'moderate' are considered significant whilst effects predicted to be 'minor' or 'neutral' are considered not significant.

Table 6-4 Significance of Effects Matrix (Traffic & Transport)

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

Identification of Potential Effects

Construction Phase

6.4.35 During construction there will be temporary increases in traffic flows on the road network as a result of construction vehicles and construction staff accessing the Proposed Development. The network of roads affected will be relatively small, with the majority of traffic expected to utilise the A160/A180/M180 corridor, however the extent of the impact will be confirmed following development of the gravity model.

6.4.36 Other aspects of the construction phase could lead to a significant effect, such as:

- severance to communities caused by an increase in traffic for a longer period;
- increased risk of road traffic accidents caused by a large increase in traffic for a longer period; and
- temporary road closures and diversions.

Operational Phase

6.4.37 Traffic generation associated with the operational phase of the Proposed Development is predicted to be limited and not likely to result in significant effects as levels are expected to be below the screening threshold. Therefore, on this basis it is proposed to scope out of the EIA any assessment of the operational traffic impacts of the Proposed Development.

Likely Design, Mitigation and Enhancement Measures

6.4.38 It is likely that the provision of a new vehicular access via Eastfield Road will require temporary traffic management measures, including the provision of traffic-controlled shuttle workings.

6.4.39 It is anticipated that all mitigation required will be set out within the outline designs where required for the compound access junctions. If appropriate, swept path analysis will be presented to support these designs.

6.5 Water Resources and Flood Risk

Baseline Conditions

6.5.1 The Humber Estuary is approximately 1.4 km to the east of the Site. The Humber Estuary is tidal at this location.

6.5.2 There are several unnamed drains running through the Site, these flow eastwards from the Site adjacent to Humber Road before entering a sluice into the Humber Estuary 1.6 km east of the Site. Skitter Beck/ East Halton Beck is 2.7 km west of the Site, with North Beck Drain also 4.3 km south of the Site.

6.5.3 The Environment Agency 'Flood map for planning' indicates that the whole of the Phillips 66 Site is located within Flood Zone 1 whilst with the exception of small areas, the VPI Site is located within Flood Zone 3. Flood Zone 1 has a low probability of flooding (less than 1 in 1,000 annual probability) whereas Flood Zone 3 has a high probability (greater than 1 in 100 annual probability of river flooding or a 1 in 200 or greater annual probability of flooding from the sea).

Scope of Assessment

6.5.4 The following potential impacts may be associated with the Proposed Development:

- potential temporary changes to surface water flows within Flood Zone 3 during the construction phase at the VPI Site;
- change to the impermeable area within the indicative site boundary and associated changes to surface water flows during operation;
- change to surface water flows and fluvial flood risk due to the proposed diversion of the un-named watercourse that crosses the VPI Site;
- pollution of surface watercourses within or near the Proposed Development during construction and decommissioning, due to spillages or polluted surface water run-off entering a watercourse (if an appropriate Environmental Management Plan is not adhered to); and
- pollution of surface watercourses within or near the Proposed Development during operation, due to:
  - direct discharge of effluent from any proposed Effluent Treatment Plant (ETP) and/ or water used for cooling water; and
  - spillages or polluted surface water run-off entering the watercourse (if materials are not appropriately stored at the Proposed Development in accordance with the environmental permit and an appropriate environmental management plan/ system, and/or appropriate drainage systems are not implemented and maintained).

6.5.5 There will be no direct discharges to groundwater, however, the potential for fugitive emissions from the Proposed Development and the resultant impacts to groundwater will be considered within the Geology and Hydrogeology assessments (see Section 6.9).

6.5.6 In accordance with the NPPF, planning applications of 1 ha or greater in Flood Zone 1 and all applications in Flood Zones 2 and 3 are to be accompanied by a flood risk assessment (FRA). The FRA will be undertaken based on a surface water drainage strategy for the Site that is the subject of on-going studies and will consider risks to the Proposed Development from flooding as well as the potential for the construction and operation to increase flood risk off-site. The FRA will be based on the latest climate change projection data from the Environment Agency and sensitivity analysis will be undertaken on potential flood scenarios. The results of the FRA will be used to inform the design of the Proposed Development (including finished ground and floor levels).

6.5.7 The operational Proposed Development will generate a number of effluent streams, some of which may require treatment on Site prior to disposal into the wider site drainage systems. The assessments of the potential impacts from the discharge of treated effluents and/ or cooling water from the Proposed Development will be undertaken in accordance with the Environment Agency '*Surface water pollution risk assessment for your environmental permit*' (April 2018). Effluent discharges from the operational processes will be regulated by the Environment Agency through the respective environmental permits.

6.5.8 The diversion of the un-named watercourse within the VPI site and the direct discharge of effluents and/ or cooling water will also require assessments under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

6.5.9 The Environment Agency, NLC (in their role as Lead Local Flood Authority (LLFA)) and North East Lindsey Internal Drainage Board will be consulted for local water and flood data to inform the assessments.

6.6 Landscape and Visual Amenity

Baseline Conditions

6.6.1 The Site falls within the Humber Estuary National Character Area (NCA) 41. This NCA focuses on the low-lying estuarine landscape, with extensive stretches of intertidal habitats including mudflats, salt marsh and reedbeds, coastal dunes and wetlands along the side of the estuary.

6.6.2 The North Lincolnshire Landscape Character Assessment (1999) defines the Site area as being within the Humber Estuary North Lincolnshire Character Area. The Site is located within the Industrial Landscape Character Type (LCT) South Humber Gateway, dominated by industry, the key characteristics include remnant pockets of flat open farmland, woodland and natural coastal habitats interspersed within the dominant industrial infrastructure.

6.6.3 The large industrial areas around Killingholme and Immingham dominate the landscape. The surrounding area to the north east is largely rural, comprising mostly farmland and pockets of woodland, with more sporadic development and residential areas.

Scope of Assessment

6.6.4 The following potential impacts may be associated with the Proposed Development:

- temporary changes to landscape character and views from sensitive receptors in the vicinity of the Proposed Development during construction and decommissioning; and
- permanent changes to landscape character and views from sensitive receptors in the vicinity of the Proposed Development during operation.

6.6.5 The proposed method of landscape and visual impact assessment has been devised to address the specific impacts likely to result from a development of its scale and nature. The methodology draws upon the following established best practice guidance:

- 'Guidelines for Landscape and Visual Impact Assessment' (GLVIA3) (IEMA, 2013); and
- 'Technical Guidance Note (TGN) 06/2019: Visual Representation of Development Proposals' (Landscape Institute, 2019).

6.6.6 The EIA process requires that a clear distinction is drawn between landscape and visual impacts, as follows:

- landscape impacts relate to the degree of change to physical characteristics or components of the landscape, which together form the character of that landscape, e.g. landform, vegetation and buildings; and
- visual impacts relate to the degree of change to an individual receptor's view of that landscape, e.g. local residents, users of public footpaths or motorists passing through the area.

6.6.7 The assessment of impacts on built heritage, including impacts on the setting of listed buildings and structures, will be addressed by the Cultural Heritage assessment (see Section 6.7 below).

6.6.8 A detailed study of the existing landscape components, character and views of the Site and an identified study area will be carried out in consideration of the following:

- site context (including industrial heritage);
- topography;
- vegetation including green infrastructure;
- roads, public rights of way and access;
- settlement and land-use;
- landscape character; and
- representative views.

6.6.9 This will be supported by figures and photographs as appropriate. The planning context with respect to landscape character and visual amenity will also be assessed, taking into account relevant European, national, regional and local planning policies. The baseline study will form the basis of the assessment of the predicted impacts of the Proposed Development.

6.6.10 Up to ten representative views will be identified within the Zone of Theoretical Visibility (ZTV) for the main building envelope and the potential stacks. An indicative ZTV drawing has been produced and is included in Appendix A of this report (Figure 5). The ZTV will be refined using a bare ground Digital Terrain Model (DTM) and be reviewed in the field against the following criteria in order to determine the selection of representative views which form the basis of the visual assessment:

- receptor function/ activity;
- distance from the site;
- topography and elevation;
- degree and period of exposure;
- designation of the viewing place; and
- distribution of receptors.

6.6.11 An initial site visit will be undertaken together with a review of the full landscape and visual planning policy context in the vicinity of the site. Technical details regarding the height of the tallest elements of the Proposed Development will then enable the definition of a study area within which landscape or visual impacts have the potential to be significant.

6.6.12 Visual representations of the Proposed Development for agreed representative views (visual receptors) will be produced in line with the guidance within the Landscape Institute Advice Note 06/2019 (Landscape Institute, 2019).

6.6.13 The location of representative views and photomontages will be agreed in consultation with NLC and other key stakeholders.

6.6.14 Where the assessment indicates the need for mitigation as a result of significant effects on landscape character or visual amenity, these will be outlined within the ES.

6.7 Cultural Heritage

Baseline Conditions

6.7.1 There are no Scheduled Monuments that are likely to be affected by the Proposed Development. The nearest Scheduled Monument is 'Manor Farm moated site' approximately 1 km north west of the Site. There are also Scheduled Monument sites at North Garth Moated site (approximately 1.4 km north west) and the moated site and associated earthworks at Baysgarth Farm (approximately 2 km north west).

6.7.2 There are 14 listed buildings within 2 km of the Site. This includes 12 grade II listed buildings, three grade I listed buildings and one grade II*. The closest are:

- The Nook, grade II, approximately 370 m west, and
- The Old Vicarage, grade II, approximately 970 m north west.

6.7.3 More detail regarding the baseline conditions, such as non-designated heritage assets, will be determined through consultation with NLC and supplemented by a site visit.

VPI Site

6.7.4 The northern strip of the VPI Site has been previously developed. The remainder of the Site is previously undeveloped although part of it was used as a construction laydown area during construction of the existing power station.

6.7.5 An Iron Age and Roman settlement, comprising ditched enclosures and field boundaries located at the northern boundary of the Site, was identified from aerial photography and subsequently recorded during an archaeological excavation of the area. Other cropmarks and field boundaries have been recorded within the Site boundary and there is a high possibility that the archaeological remains are present within the Site. Geophysical surveys and archaeological trial trenching carried out to the east and south of the Site have identified deposits interpreted as the former shoreline ground surface preserved beneath alluvium. The trial trenching also identified mid and late-Iron Age deposits, plus peat deposits containing palaeoenvironmental data. There has also been a medieval ridge and furrow remains noted to the south of the Site.

Phillips 66 Site

6.7.6 The Phillips 66 Site has been previously developed. There are no known heritage assets within the Site and no cropmarks have been mapped from aerial photography. There is, however, the former site of an undated cropmark enclosure approximately 300 m east of the Site, as well as Iron Age and Roman settlement approx. 650 m east. The presumption is, if archaeological remains were present within the Site, they would have been partially or completely removed during the construction of the refinery. However, the uncertainty about the level of disturbance means that potential significant effects are a possibility.

Scope of Assessment

6.7.7 The following potential impacts may be associated with the Proposed Development:

- physical impacts and/ or impacts on the setting of non-designated heritage assets, including historic landscape character areas, within the Site during construction; and
- impacts on the setting of designated and non-designated heritage assets, including historic landscape character areas, in the vicinity of the Site during construction and operation.

6.7.8 A desk-based archaeological assessment will determine, as far as is reasonably possible from existing records and visits to relevant archives and local studies libraries, the nature of the archaeological resource within a study area of 1 km for non-designated assets. A larger study area of 5km, or larger if appropriate, will be used to identify designated heritage assets and the results will be used to identify any impacts that the Proposed Development may have on the receptors. An inventory of all heritage assets will be cross-referenced to drawings (base maps) and the report narrative. This baseline collation of data will be supported by site visits to identify any unknown heritage assets, the potential for survival of archaeological remains and to establish the setting of identified heritage assets.

6.7.9 Due to the scale of the Proposed Development, there is the potential for the setting of heritage assets to be affected, therefore, potential impacts upon designated and non-designated assets arising from changes within their setting will be assessed. The ZTV will be used as a tool of assessment to identify areas of visibility, however as the setting of a heritage asset is not a solely visual concept, other aspects such as aural intrusion and historical associations will also be taken into account. The assessment will follow current professional good practice and guidance including that produced by the Chartered Institute for Archaeologists (CIfA) and Historic England (HE):

- Standard and Guidance for historic environment desk-based assessment (CIfA, 2020);
- Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment (HE, 2015a);
- Historic Environment Good Practice Advice in Planning Note 3 (Second Edition): The Setting of Heritage Assets (HE, 2017); and
- Historic England Advice Note 4: Tall Buildings (HE, 2015b).

6.7.10 It is expected that sufficient heritage information is currently available to provide an adequate baseline assessment for the EIA. Further archaeological evaluation such as geophysical survey is not anticipated, but this will be discussed and agreed with NLC.

6.7.11 The purpose of the assessment will be to assess the potential impacts of the Proposed Development upon the significance of the heritage resource and to understand the level of harm to that resource. The aim will then be to propose appropriate mitigation to resolve the harm caused, where possible.

6.7.12 Once all of the potential heritage receptors have been identified, they will be assigned a 'value'. This is not solely a reflection of their designated or non-designated status but is determined through their value which derives from their artistic, archaeological, architectural or historic interest. The impact from the Proposed Development upon the significance of the heritage assets will then be quantified and expressed within the EIA. This will produce an initial significance of effect of the Proposed Development upon the heritage resource, taking into account any design or embedded mitigation.

6.7.13 Following the impact assessment process, any potential mitigation strategies required will be considered and recommendations made. The significance of residual effects remaining after mitigation will be assessed according to accepted criteria for assessing heritage assets.

6.8 Ecology & Nature Conservation

Baseline Conditions

6.8.1 The Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations') provide for the ecological designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites.

6.8.2 The Humber Estuary SSSI/ SPA/ SAC/ Ramsar site is located approximately 1.4 km east of the Site (at its nearest point). The Humber Estuary includes a range of coastal habitats (such as mud and salt flats, lagoons, salt marshes and coastal sand dunes), which provide feeding and roosting opportunities for important numbers of waterbirds in non-breeding season.

6.8.3 There are no other European sites within 5 km of the Site. Further, there no other European sites within 15 km, which could be impacted by air emissions from the Proposed Development.

6.8.4 North Killingholme Haven Pits SSSI is located approximately 2.4 km north of the Site.

6.8.5 There are seven locally designated sites within 2 km of the Site, with the closest being Rosper Road Pools Local Wildlife Site (LWS) 75 m to the east of the Site (at its nearest point).

6.8.6 A Preliminary Ecological Appraisal was undertaken in June 2021, and was updated in November 2021 to incorporate additional areas (see the Phase I Habitat Map at Figure 7 in Appendix A). The habitat information will be updated in 2022 prior to the formal ecological impact assessment. Most of the Phillips 66 Site comprises operational land in industrial use, with small areas of low-value wasteland/ disturbed ground vegetation, an area of mown amenity grassland used as an overflow carpark and bound by new coniferous and broadleaved screening plantations. At present, none of the habitats on the Phillips 66 Site are likely to be of significant conservation value.

6.8.7 In contrast, the VPI Site, south of the operational area, comprises a mosaic of habitats including:

- open mosaic habitats on previously disturbed land;
- modified grassland, which makes up the largest component of habitats being typically nutrient-rich and species-poor, but includes areas of false oat-grass grassland, tufted hair-grass grassland, stands of common reed, and mosaics of rushes, as well as tall herb dominated areas;
- other neutral grassland, occurring along the south-eastern boundary and comprising a more open grassland with finer grasses and a herb rich sward;
- bramble and bramble dominated mixed scrub, form vast areas of homogenous habitat;

- other broadleaved woodland, which occurs along the railway track over ballast and comprises of an ash dominated canopy and hawthorn shrub layer, with a limited ground flora; and
- drains and ditches used for discharge from the operational facilities.

6.8.8 To date, the only plant species recorded on the Site listed above the 'Least Concern' threat level in the British Red Data Book (Stroh er al., 2014) is common cudweed *Filago vulgaris*. No invasive, non-native plant species has been recorded on the Site so far.

6.8.9 An invertebrate scoping assessment of the VPI Site was undertaken in July 2021 by Conops Entomology. The report concluded that the habitat mosaic is likely to support an invertebrate assemblage that could include species with a localised distribution and/ or of a nationally significant status. Further targeted surveys will be undertaken during 2022 as necessary.

6.8.10 Six waterbodies were sampled for great crested newt eDNA in May 2021. All returned a negative result. Further eDNA sampling of any additional waterbodies will be undertaken during spring 2022 where necessary, although at present, GCN are not considered likely to be a significant constraint. Common toad (a Section 41 species) was recorded on the VPI Site.

6.8.11 A standard seven-visit reptile survey of the VPI Site was undertaken in summer 2021 using artificial refuges. No reptiles were recorded. Further targeted surveys will be undertaken of suitable habitat during 2022 if necessary.

6.8.12 A preliminary evaluation of use of the VPI Site by breeding birds in June/ July 2021 identified an assemblage typical of the habitats present together with species of greater conservation priority including linnet, reed bunting, lapwing and little ringed plover; with all four species likely to be breeding on the VPI Site. A six-visit breeding bird survey will be undertaken in spring 2022. Winter bird surveys are currently being undertaken on the VPI Site (and wider area).

6.8.13 Acoustic monitoring and dawn/ dusk surveys for bats were undertaken in summer 2021. No roosts have been identified on or adjacent to the Site and the bulk of activity is attributed to localised foraging by common and soprano pipistrelles, and flyovers by noctules. No significant adverse effects on bat are anticipated.

6.8.14 Surveys of the drain network on and adjacent to the VPI Site were undertaken in June and September, 2021. No evidence of use by water voles or otter was recorded. Further targeted surveys will be undertaken of suitable habitat during 2022 as necessary.

6.8.15 A badger survey was undertaken in spring 2021, and was updated on subsequent site visits. No evidence of use by badgers has been recorded to date.

6.8.16 Dormouse and white-clawed crayfish can be confidently scoped out of the assessment due to a combination of a lack of suitable habitats and/ or the Sites being beyond the known distribution for both species.

Scope of Assessment

6.8.17 The following potential impacts may be associated with the Proposed Development:

- permanent loss of habitats during construction;
- disturbance of ecological receptors (including noise, dust and light impacts) during construction, operation and decommissioning;
- temporary impacts on habitats during construction; and;
- air quality and deposition impacts on ecological receptors during operation.

6.8.18 Potential impacts on ecological receptors will be assessed using the Chartered Institute for Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018). For the assessment of the potential deposition impacts, the assessment will be undertaken in accordance with the Environment

Agency '*AQTAG 06 - Technical Guidance on detailed modelling approach for an appropriate assessment for emissions to air*' (2010) and the associated methodologies/ tools provided by APIS.

6.8.19 Any likely significant adverse effects will be mitigated or compensated for and a number of ecological enhancements will also be recommended where appropriate. Following the implementation of mitigation and compensation, any residual effects on ecological receptors will be identified.

6.8.20 The results of the surveys, the desk study, consultation responses and the Extended Phase-1 Habitat survey will be used to undertake an ecological impact assessment. Once the ecological baseline for the Proposed Development has been fully described, any ecological receptors that are likely to be significantly impacted by the Proposed Development will be identified and appropriate and proportionate mitigation will be described where necessary. Mitigation and enhancement proposals will consider wider strategic aims and options for mitigation of development in the Humber Estuary area.

6.8.21 The results of the winter bird surveys and the air dispersion modelling will be used to undertake a Habitats Regulations Assessment (HRA) in order to determine whether the Proposed Development will give rise to a 'likely significant effect' on the Humber Estuary SAC, SPA and Ramsar site.

6.8.22 The habitats will be assessed using the appropriate DEFRA Biodiversity Metric methodology (currently v3.0). The Applicants have made a commitment that the Proposed Development will achieve a minimum 10% biodiversity net gain.

6.9 Geology, Hydrogeology & Contaminated Land

Baseline Conditions

6.9.1 According to the Coal Authority interactive map viewer, the Site does not lie within a development high risk area. Therefore, as stated within the Coal Authority planning application guidance, the Proposed Development does not require a coal mining risk assessment. However, the Site does lie within a surface coal resource area which define the potential presence of coal resource capable of being extracted by surface mining methods.

6.9.2 According to the British Geological Survey (BGS) Geology of Britain Viewer, the VPI Site is underlain by tidal flat deposits comprising clay and silt. The Tidal Flats are described by the BGS as "*normally consolidated soft silty clay, with layers of sand, gravel and peat; characteristically low relief; from the tidal zone*". The Tidal Flat Deposits are designated as unproductive strata with low permeability; however permeable sands are likely to contain groundwater.

6.9.3 The remainder of the Site, excluding the VPI Site, is underlain by Till, Devensian deposits comprising diamicton. The Till is described by the BGS as "*unsorted and unstratified drift, generally over consolidated, deposited directly by and underneath a glacier without subsequent reworking by water from the glacier. It consists of a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape*." The Till is classified as a secondary (undifferentiated) aquifer which is assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

6.9.4 Soils at the VPI Site are described on Cranfield Soil and Agrifood Institute's Soilscapes mapping as "*loamy and clayey soils of coastal flats with naturally high groundwater*". Across the remainder of the Site the soils are described as "*slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils*".

6.9.5 The bedrock geology beneath the entire Site forms part of the Burnham Chalk Formation. The BGS describes this as "*white, thinly-bedded chalk with common tabular and discontinuous flint bands; sporadic marl seams*". The Burnham chalk formation is designated as a Principal

Aquifer. Principal Aquifers usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

6.9.6 The groundwater vulnerability (1:100,000 scale) mapping notes that the Principal Aquifer of the Burnham Chalk Formation is a highly permeable aquifer with overlying soils of high leaching potential.

6.9.7 The sensitivity of the groundwater underlying the Proposed Development is high due to its designation as a Principal Aquifer and the overlying soils are described as having a high leaching potential.

6.9.8 The Site is located within a Zone III Total Catchment groundwater Source Protection Zone (SPZ). The nearest Inner Zone (Zone 1) SPZ is located approximately 1km south-east.

6.9.9 The Environment Agency's Water Resources: Help for licence trading web viewer lists two groundwater abstraction licences held by Phillips 66 Limited within the Site boundary. Both licences are held for the purpose of extracting process water.

6.9.10 The historic and current industrial land-uses within and surrounding the study area indicate that there is the possibility for the presence of potential contaminants in ground and groundwater at the site. There are no obvious indicators of significant historic industrial development within the VPI Site but is adjacent to industrial sites to the north and west and a railway line adjacent to the VPI Site's western boundary. The Phillips 66 Site has been and is currently in industrial use, and a railway is adjacent to the northern/ eastern boundary to the Phillips 66 Site.

6.9.11 Using Agricultural Land Classification (ALC) information available on the MAGIC website (www.magic.gov.uk), classification data is generally available for land immediately adjacent to the Site. Where classification information is available land is generally classed as Urban. However, the area of the VPI Site may be (mapping is at a scale of 1:250,000) classified as ALC Grade 3. Grade 3 land contains sub-grade 3a and 3b classifications. It is noted that ALC Grade 1, 2 and 3a are considered to be 'best and most versatile' agricultural land. Currently it is not possible to note whether the site is sub-grade 3a or 3b as only mapping at 1:250,000 scale is available to review.

Scope of Assessment

6.9.12 The following potential impacts may be associated with the Proposed Development:

- disturbance of potentially contaminated soils and perched groundwater and creation of new pathways allowing migration of such contaminants to reach sensitive receptors (including construction workers and controlled waters) during construction;
- pollution of surface watercourses and/or the underlying Principal Aquifer within or near the Proposed Development during construction and decommissioning, due to spillages or polluted surface water run-off entering a watercourse or vertical migration into the underlying aquifer (if an appropriate Environmental Management Plan was not adhered to);
- pollution of the underlying principal aquifer and/or surface watercourses within or near the Proposed Development during operation, due to spillages or polluted surface water run-off entering the watercourse or vertical migration into the underlying aquifer (if materials were not appropriately stored at the Proposed Development in accordance with the environmental permit and an appropriate environmental management plan/ system, and/or appropriate drainage systems are not implemented and maintained); and
- potential temporary/permanent loss of best and most versatile agricultural land.

6.9.13 The Phase 1 geo-environmental desk study will be completed to identify potential contaminative uses and provide preliminary geotechnical assessment of the Site. The Phase 1 desk study will identify potential contaminative uses of the Site and identify the potential for land contamination and potential pathways to sensitive receptors. It will also consider the potential for contaminants associated with current and historic land use in and around the

Site. As part of the Phase 1 desk study, an initial conceptual site model (CSM) will be developed for the land potentially affected by the Proposed Development.

6.9.14 The CSM will be developed to identify potential source pathway receptor contaminant linkages. The baseline data and CSM will input into a qualitative risk assessment, and a high-level geotechnical engineering (ground stability) assessment. The Phase I desk study will note uncertainties and gaps in the available data and identify additional work that may be required to mitigate potential contaminant linkages identified.

6.9.15 The results of the Phase 1 desk study and CSM will be used to assess data gaps and uncertainties and, if required an initial scope for additional site investigation prior to construction. It is anticipated that the requirements for intrusive investigation will be discussed and agreed in advance with the Environment Agency and NLC as appropriate.

6.9.16 An assessment of potential impacts on existing ground conditions will be undertaken as part of the EIA, including the potential for the Proposed Development to result in land contamination, following Environment Protection Act 1990 Part 2A Contaminated Land Statutory Guidance (DEFRA, 2012) and Land Contamination Risk Management (EA 2021). Consideration will also be given to potential impacts associated with the construction and operation of the Proposed Development and how these will be mitigated.

6.9.17 As appropriate, the EIA will inform the design as to where mitigation measures may be required during Proposed Development construction, operation or decommissioning. These may include the recommendation for further intrusive investigation to address residual data gaps or better delineate identified contamination hotspots or plumes, quantitative risk assessment, remediation strategy, verification plan and verification report. It will also make recommendations for possible mitigation measures to be employed by contractors, on a precautionary basis, to allow for the encounter of previously unidentified contamination during the construction phase.

6.10 Waste Management

6.10.1 Waste is defined as per the Waste Framework Directive (2008/98/EC) as "*any substance or object which the holder discards or intends or is required to discard*" and this definition is transposed into law in England and Wales by The Waste (England and Wales) Regulations 2011.

6.10.2 Waste will be generated during the construction of the Proposed Development, and subsequently during operation and maintenance. Materials will be required for the construction of the Proposed Development.

6.10.3 Due to the nature of the Proposed Development, there will be a number of waste streams that will need to be managed, these include:

- during construction, waste will be generated from demolition, excavation and construction activities.
- during operation, the Proposed Development will generate various process waste streams from the flue gas pre-treatment and carbon capture processes, some of which are likely to be classified as hazardous.

Baseline Conditions

6.10.4 The generation of waste during construction, operation and decommissioning of the Proposed Development has the potential to cause impacts on the capacity of the waste infrastructure in the region.

6.10.5 Baseline conditions will include:

- the available capacity for managing waste from the Proposed Development, at an appropriate scale (regional for inert and non-hazardous waste, and national for hazardous waste);

- relevant waste management polices at national, regional and local level;
- locations of sites currently used, or safeguarded in planning policies, for waste management or minerals extraction and processing;
- availability of major materials used by the Proposed Development; and
- relevant waste management policies at national, regional and local level.

Scope of Assessment

6.10.6 The methodology for assessment of impacts will be as set out in the IEMA Guide to Materials and Waste in Environmental Impact Assessment (IEMA, 2020a).

6.10.7 Two study areas are applicable for the waste and materials assessment. The first study area is defined by the construction boundary of the Proposed Development (including any compounds and temporary land take) and informs the assessment of:

- potential sterilisation of mineral safeguard sites and/ or peat resources;
- materials used in the construction of the Proposed Development;
- waste arising from the construction of the Proposed Development; and
- direct impacts on waste management infrastructure.

6.10.8 The second (expansive) study area is defined as the geographic area within which materials will be sourced and wastes will be managed and is defined by consideration of the proximity principle and value for money. The second study area for inert, non-hazardous and hazardous landfill capacity will comprise the Yorkshire and the Humber region, and for other waste management infrastructure capacity will comprise England. For certain categories of hazardous waste for which transfrontier shipment to facilities outside the UK is the best practicable environmental option, a wider expansive study area may be considered, that would encompass these facilities.

6.10.9 The study areas may be refined at subsequent stages of the project to reflect the Proposed Development details including the location, construction boundary, type of construction work and the types and quantities of material use and waste arising.

6.10.10 The sensitive receptor identified by the IEMA Guidance for waste is landfill void capacity. Landfill void capacity has been considered as the sensitive receptor rather than waste management infrastructure capacity for the following reasons:

- disposal to landfill results in a permanent impact and the landfill capacity is no longer available (e.g. in most cases is irreversible);
- impacts on other types of waste management infrastructure e.g. material recovery facilities, are temporary in nature. The impacts occur over a period of months or years; and
- other types of waste management infrastructure are better placed to react to waste management market demands (e.g. by provision of additional plant and equipment).

6.10.11 The approach to assessing impacts on material resources will comprise the following steps:

- establish the baseline for national demand for the key construction materials by weight;
- assess the sensitivity of materials as related to the availability and types of resources to be consumed by the Proposed Development;
- establish the quantities of key materials required for the construction of the development; and
- compare the total quantities of key construction materials with the most recent national demand.

6.10.12 The approach to assessing waste management impacts will comprise the following steps:

- establish the baseline landfill void capacity in the expansive study area;

- establish a future baseline for landfill void capacity in the expansive study areas;
- establish the quantities of waste to be generated during the construction of the development and the likely methods of management;
- forecast the quantities of operational waste to be generated and the likely methods of management; and
- compare the total waste arising from the construction and operation of the Proposed Development against the landfill void capacity.

6.11 Climate Change & Carbon

6.11.1 This section of the EIA Scoping Report addresses the potential for likely significant effects on climate because of the Proposed Development and effects on the Proposed Development as a result of climate change.

6.11.2 The Proposed Development has the potential to capture 3.8 megatonnes per annum (MTPA) of abated carbon dioxide (CO_2) emissions.

6.11.3 The Proposed Development aims to form the basis for a potential cluster of projects in the future, with ambitions for both green and blue hydrogen production and further decarbonisation related developments. The retrofit provides an opportunity to reuse existing assets and reduce carbon emissions associated with construction.

6.11.4 It is considered that the Proposed Development will represent a step forward in the implementation of large-scale PCC for refineries that could make a significant contribution to reducing the CO_2 emissions from industry.

6.11.5 To align with the requirements of the EIA Regulations, consideration has been given to the following aspects of climate change assessment:

- Greenhouse Gas (GHG) Impact Assessment: the effects on the climate of GHG emissions arising from the Proposed Scheme over its lifetime, including how the scheme would affect the ability of government to meet its carbon reduction plan targets;
- Climate Change Risk (CCR) Assessment: the resilience of the Proposed Development to future climate change impacts; and
- In-combination Climate Change Impact (ICCI) Assessment: the combined impact of the Proposed Development and future climate change on receptors in the surrounding environment.

Baseline Conditions

GHG Impact Assessment

6.11.6 The current and future baseline for the assessment of the impact of the project on climate is a 'business as usual' scenario where the Proposed Development is not constructed and operated. The baseline comprises of existing carbon stock and sources of GHG emissions within the boundary of the existing site activities.

6.11.7 The baseline for the lifecycle GHG impact assessment will be established by quantifying the existing GHG emissions.

CCR assessment

6.11.8 The current baseline for the assessment of the climate change risks to the Proposed Development will be based on historic climate data obtained from the Met Office (2021) recorded by the closest meteorological station to the Site (Hull).

6.11.9 The future climatic baseline for Site will be determined through the UK Climate Impacts Programme UK Climate Projections 2018 (UKCP18) (Met Office, 2018).

ICCI Assessment

6.11.10 Due to the scale and location of the existing development, it is not anticipated there will be any ICCI. This will therefore be scoped out of the assessment.

Policy, Legislation and Guidance

6.11.11 A brief overview of the policy, legislative and guidance relevant to the climate change assessment have been reviewed and summarised in **Error! Reference source not found.**.

Table 6-5 Policy, legislation, and guidance overview

Policy, Legislation, or Guidance Name	Relevance to Climate Change & Carbon Assessment
United Nations Framework Convention on Climate Change Paris Agreement (UNFCCC, 2015)	The Paris Agreement is an agreement within the UNFCCC requiring all signatories to strengthen their climate change mitigation efforts to keep global warming to below 2°C this century and to pursue efforts to limit global warming to 1.5°C.
UK Nationally Determined Contribution (UK Government, 2020)	In 2020, the UK communicated its new Nationally Determined Contribution to the UNFCCC. Within this, the UK has committed to reducing GHG emissions by at least 68% by 2030 compared to 1990 levels.
Climate Change Act 2008 Climate Change Act (2050 Target Amendment) Order 2019	The Climate Change Act 2008 originally set a legally binding target for the UK to reduce its GHG emissions from 1990 levels by at least 80% by 2050. This target is supported by a system of legally binding five-year 'carbon budgets' and an independent body to monitor progress, the Climate Change Committee (CCC). The UK carbon budgets restrict the amount of GHG emissions the UK can legally emit in a defined five-year period. The Act was amended in 2019 requiring the government to reduce the UK's net emissions by 100% (net zero) relative to 1990 levels by 2050.In 2020, the 6th carbon budget was legislated for in June 2021 and is the first budget to reflect the amended trajectory to net zero by 2050.
The Town and Country Planning (Environmental Impact Assessment) Regulations 2017	The 2017 Regulations state that an EIA (where relevant): "*must include a description of the likely significant effects of the development on the environment resulting from … the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and vulnerability of the project to climate change*".
National Planning Practice Guidance on Climate Change (DLUHC and MHCLG, 2021)	This guidance for Climate Change advises on how to identify and implement suitable mitigation and adaptation measures in the planning process. The guidance states that "*effective spatial planning is an important part of a successful response to climate change as it can influence the emission of greenhouse gases… Planning can also help increase resilience to climate change impact through the location, mix and design of development*"
Draft Overarching National Policy Statement for Energy (EN-1) (DECC, 2021a)	Published by the Department of Energy and Climate Change (DECC), this describes the national policy for energy infrastructure in relation to climate impacts and adaptation; adverse effects and benefits; in relation to the EU Directive and ES requirements; and in relation to adaptation measures in response to climate projections; in relation to climate projections, flood risk and the importance of relevant mitigation.

Policy, Legislation, or Guidance Name	Relevance to Climate Change & Carbon Assessment
National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2) (DECC, 2011b)	Published by the DECC, this describes the need for all new fossil fuel electricity generating plants to assess the viability for supporting carbon capture and storage technologies. This policy has been used to inform this Chapter and the wider submission
The National Planning Policy Framework (MHCLG, 2021)	The revised National Planning Policy Framework (NPPF) published by the Ministry of Housing, Communities and Local Government (MHCLG), sets out the Government's planning policies for England. While the NPPF does not set specific policies for Nationally Significant Infrastructure Projects (NSIP), its policies may be of relevance to decision making. Policies of relevance to climate change include those meeting the challenge of moving to a low carbon economy, climate change, flooding and coastal change. The NPPF states that the planning system should support this transition by supporting low carbon energy and associated infrastructure.
The GHG Protocol (WRI and WBCSD, 2015)	The GHG Protocol, published by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) provides overarching guidance on developing GHG inventories and reporting standards.
The Clean Growth Strategy (HM Government, 2017)	The Clean Growth Strategy was published in 2017and updated in 2018 by the government. This Strategy details the increased investment and collaboration in carbon capture usage and storage in the UK to drive industrial innovation and its importance in long-term emissions reduction.
Clean Growth: The UK Carbon Capture Usage and Storage (CCUS) Deployment Pathway-An Action Plan (HM Government, 2018)	The UK Government (2018) has identified Carbon Capture Usage and Storage (CCUS) as having a significant part to play in the UK's transition to a low carbon economy. CCUS has been identified as a least cost energy system decarbonisation pathway to 2050. In their Clean Growth CCUS action plan it is stated that: '*CCUS has economy-wide qualities which could be very valuable to delivering clean industrial growth. It could deliver tangible results in tackling some of the biggest challenges we face in decarbonising our economy, contributing to industrial competitiveness and generating new economic opportunities – a key part of our modern Industrial Strategy*.'
Net Zero Strategy: Build Back Greener (BEIS, 2021d)	In October 2021, the Department of BEIS published the Net Zero Strategy: Build Back Greener. which sets out policies and proposals for decarbonising all sectors of the UK economy to meet our net zero target by 2050.
Guidance for the Calculation of Land Carbon Stocks (European Commission, 2010)	EU Commission published a calculation methodology for calculating carbon stocks from land use.
Net Zero - Opportunities for the Power Sector (National Infrastructure Commission, 2020)	This report states that decarbonising the power sector is integral to achieving the goal of Net Zero by 2050. The National Infrastructure Commission (NIC) provides impartial advice to the government on infrastructure requirements, strategic drivers and solutions. The NIC terms of reference are set by government, and while NIC recommendations do not constitute government policy, the government is required

Policy, Legislation, or Guidance Name	Relevance to Climate Change & Carbon Assessment
	to formally respond to the recommendations, and they may form the evidence base for future policy.
British Standards (BSI, 2019b and 2019c)	The British Standards Institution BS EN ISO 14064-1:2019 and 14064-2:2019 provides specifications for organisational-level and project-level guidance for the quantification and reporting of GHG emissions and removals.
IEMA: Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2017)	In the absence of any widely accepted guidance on assessing the significance of the impact effect of GHG emissions, the EIA Guidance published by IEMA in 2017 will be followed. This provides a framework for the consideration of GHG emissions in the EIA process, in line with the 2014 European Union (EU) Directive. The guidance sets out how to: • Identify the GHG emissions baseline in terms of GHG current and future emissions; • Identify key contributing GHG sources and establish the scope and methodology of the assessment; • Assess the impact of potential GHG emissions and evaluate their significance; Consider mitigation in accordance with the hierarchy for managing project related GHG emissions (avoid, reduce, substitute, and compensate).
IEMA: Environmental Impact Assessment Guide to: Climate Chance Resilience and Adaptation (IEMA, 2020b)	The IEMA Guidance for assessing climate change resilience and adaptation in EIA (IEMA, 2020) has also been followed. It provides guidance for consideration of the impacts of climate change within project design. The guidance sets out how to: • Define potential climate change concerns and environmental receptors vulnerable to climate factors; • Define the environmental baseline with projections for changing future climate parameters; and Determine the resilience of project design and define appropriate mitigation measures to increase resilience to climate change.

Scope of Assessment

GHG Emissions

6.11.12 A lifecycle approach will be used that considers emissions from different lifecycle stages of the Proposed Development as a whole: construction stage (approximately 3 to 4 years) and operation stage (at least 25 years).

6.11.13 The net change in emissions from the baseline to the Proposed Development emitting up to 3.8 megatonnes per annum (Mtpa) of abated carbon dioxide (CO_2) emissions will be assessed for the operational stage. The Proposed Development will be beneficial because it captures up to 95% of the otherwise emitted carbon dioxide.

6.11.14 The proposed scope of the GHG emissions impact to be assessed are described in **Error! Reference source not found.**.

Table 6-6 Proposed scope of the GHG emissions impact assessment

Lifecycle Stage	Stage Activities	Primary emission sources	Proposed to be Scoped In or Out	Rationale
Pre-construction	Enabling works (i.e. demolition, earthworks, etc.)	GHG emissions from energy consumption during construction (i.e., electricity, fuel, LPG, etc.)	In	Material GHG emissions are expected from fuel use, electricity use, loss of carbon sink and waste disposal
		Workers travelling to and from the site of the Proposed Development	In	
		Carbon stock loss from land clearance	Out	Existing development is a brownfield site, as such carbon stock loss from land clearance is not anticipated to be material
		GHG emissions from enabling works waste disposal	In	Material GHG emissions are expected from fuel use, electricity use, loss of carbon sink and waste disposal
		GHG emissions from transportation of enabling works waste	In	
Production of materials	Raw material extraction and manufacturing of products required to build the Proposed Development	Embodied carbon associated with enabling works/ construction materials	In	Material GHG emissions are expected from construction materials
	Transport of materials to site	GHG emissions from transportation of materials to site	In	
Construction	On-site construction activities	GHG emissions from energy consumption during construction (i.e. electricity, fuel, LPG, etc.)	In	Material GHG emissions are expected from embodied carbon of materials, electricity use, fuel use, and waste disposal
	Construction Worker commuting	Workers travelling to and from the site of the Proposed Development	In	
	Disposal of construction waste	GHG emissions from construction waste disposal	In	
		GHG emissions from transportation of construction waste from site	In	

Lifecycle Stage	Stage Activities	Primary emission sources	Proposed to be Scoped In or Out	Rationale
Operation	Energy consumption	GHG emissions from electricity consumption	In	Material GHG emissions are expected from embodied carbon of materials, electricity use, fuel use, waste disposal, gain of carbon sinks
		GHG emissions from gas consumption	In	
	Process emissions	GHG emissions from other industrial processes (e.g. chemicals)	In	
	Disposal of operational waste	GHG emissions from operational waste disposal	In	
		GHG emissions from transportation of operational waste	In	
	Maintenance	Embodied carbon associated with replacement materials and any maintenance equipment	Out	It is anticipated that embodied carbon associated with maintenance will not be material.
	Vehicle journeys	GHG emissions from the transport of staff and materials	In	Material GHG emissions are expected from embodied carbon of fuel use
Decommiss-ioning	Removal or renewal of the Proposed Development	Reuse and or disposal of materials	Out	Timescale and methods for decommissioning are unknown.

6.11.15 Where activity data will allow, expected GHG emissions arising from the lifecycle activities associated with the Proposed Development will be quantified using a calculation-based methodology as per the following equation stated in the DEFRA emissions factors guidance (DEFRA, 2009b):

Activity data x GHG emissions factor = GHG emissions value

6.11.16 In line with The GHG Protocol when reporting GHG emissions, the seven Kyoto Protocol GHGs have been considered, specifically:

- carbon dioxide (CO_2);
- methane (CH_4);
- nitrous oxide (N_2O);
- sulphur hexafluoride (SF_6);
- hydrofluorocarbons (HFCs);
- perfluorocarbons (PFCs); and

- nitrogen trifluoride (NF_3).

6.11.17 Where data are not available, a qualitative approach to addressing GHG impacts will be followed, in line with the IEMA Guidance on assessing GHG emissions and evaluating their significance (IEMA, 2017).

6.11.18 BEIS (2021e) greenhouse gas emissions factors and embodied carbon data from the Inventory of Carbon and Energy (University of Bath, 2019) will be used for calculating GHG emissions.

CCR Assessment

6.11.19 An assessment of climate change risk will be undertaken for the Proposed Development to identify potential climate change impacts, and to consider their potential consequence and likelihood of occurrence, taking account of the adaptation measures incorporated into the design of the Proposed Development.

6.11.20 The types of receptors considered vulnerable to climate change, are:

- construction phase receptors (i.e. workforce, plant and machinery).
- the Proposed Development assets and their operation, maintenance and refurbishment (i.e. pavements, structures, earthworks and drainage, technology assets, etc.); and
- end-users (i.e. staff and commercial operators etc.).

6.11.21 The scope of the CCR assessment is set out in Table 6-7. Consideration of climate change impacts within EIAs is an area of emerging practice. The approach outlined below is aligned with existing guidance such as that of IEMA (IEMA, 2020b). The CCR assessment identifies potential climate change impacts and considers their potential consequence and likelihood of occurrence.

Table 6-7 Proposed scope of the CCR assessment

Climate Parameter	Proposed to be Scoped In or Out	Rationale
Extreme weather events	In	The Proposed Development may be vulnerable to extreme weather events such as storm damage and storm surge to structures and assets.
Precipitation change	In	The Proposed Development may be vulnerable to changes in precipitation, for example, pressure on water supply during periods of reduced rainfall, and damage to structures and drainage systems during periods of heavy precipitation.
Temperature change	In	Increased temperatures may increase cooling requirements, alter the power plant efficiency of the Proposed Development and could impact on structural integrity of buildings and materials.
Sea level rise	In	The Site is located in an area that is susceptible to sea level rise. Scoped in, subject to information from FRA.
Sea temperature rise	Out	Marine infrastructure is not included within the scope of the Proposed Development therefore is not likely to be affected by the small increase in sea temperature during its operational life.
Wind	Out	Currently, there is no evidence of compelling trends in storminess when considering maximum gusts over the last five decades (Kendon et al., 2020).

6.11.22 Once potential hazards have been identified, the likelihood and consequence of each hazard impacting a receptor (where relevant) are assessed for the selected future time frame for operation.

6.11.23 Criteria used to determine the likelihood of an event occurring, based on its probability and frequency of occurrence, are detailed in **Error! Reference source not found.** . The consequence of an impact has been measured using the criteria detailed in **Error! Reference source not found.**. The probability and consequence will take into account embedded design and impact avoidance measures.

Table 6-8 Description of likelihood for climate change hazard

Likelihood Category	Description (probability and frequency of occurrence)
Very likely	90-100% probability that the hazard will occur.
Likely	66-90% probability that the hazard will occur.
Possible, about as likely as not	33-66% probability that the hazard will occur.
Unlikely	0-33% probability that the hazard will occur.

***The event is defined as the climate event (such as heatwave) and the hazard (such as overheated electrical equipment) occurring in combination*

Table 6-9 Measure of consequence for climate change risk

Consequence of Impact	Measure of Consequence for Climate Change Resilience
Very high	Permanent damage to structures/ assets; Complete loss of operation/service; Complete/partial renewal of infrastructure; Serious health effects, possible loss of life; Extreme financial impact; and Exceptional environmental damage.
High	Extensive infrastructure damage and complete loss of service; Some infrastructure renewal; Major health impacts; Major financial loss; and Considerable environmental impacts.
Medium	Partial infrastructure damage and some loss of service; Moderate financial impact; Adverse effects on health; and Adverse impact on the environment.
Low	Localised infrastructure disruption and minor loss of service; No permanent damage, minor restoration work required; and Small financial losses and/or slight adverse health or environmental effects.
Very low	No damage to infrastructure; No impacts on health or the environment; and No adverse financial impact.

6.11.24 The CCR assessment will be used to identify mitigation measures for incorporation into the design of the Proposed Development.

Embedded Mitigation

6.11.25 The climate change assessment described will take into account the embedded design mitigation. Relevant embedded mitigation measures will be described. Any residual significance of effects will be mitigated with further recommendations.

Likely Significant Effects

6.11.26 Due to the absence of any defined industry guidance for assessing the significance of GHG emissions impacts for EIA, standard GHG emissions accounting and reporting principles will be followed to determine the impact magnitude. In GHG accounting, it is common practice to consider exclusion of emission sources that are <1% of a given emissions inventory on the basis of a de minimis contribution.

6.11.27 Both DECC (2013) (now part of BEIS) and Publicly Available Specification (PAS) 2050 (BSI, 2011) specification allow emissions sources of <1% contribution to be excluded from emission inventories, and these inventories to still be taken into account for verification purposes. This would, therefore, suggest that a development with emissions of <1% a relevant carbon budget would be minimal in its contribution to the wider national GHG emissions. This criteria will be used to contextualise the significance of the GHG emissions, as outlined in **Error! Reference source not found.**.

6.11.28 The global climate has been identified as the receptor for the purposes of the lifecycle GHG emissions impact assessment. However, to enable significance evaluation of the estimated GHG emissions arising from the Proposed Development, the UK national carbon budgets will be used as a proxy for the global climate.

6.11.29 There is no standard definition for receptor sensitivity to GHG emissions set out in the IEMA guidance (2020b). The sensitivity of the receptor, the UK carbon budget (as a proxy for the global climate), has been defined as high. The rationale is as follows:

- any additional GHG impacts could compromise the UK's ability to reduce its GHG emissions and therefore meet its future carbon budgets; and
- the extreme importance of limiting global warming to below 2°C above industrial levels, while pursuing efforts to limit such warming to 1.5°C as set out in the Paris Agreement and a recent report by the Intergovernmental Panel on Climate Change highlighted the importance of limiting global warming below 1.5°C.

Table 6-10 Significance criteria for the GHG impact assessment

Significance	Magnitude Criteria
Major	GHG emissions represent equal to or more than 1% of total emissions from the relevant annual UK carbon budget in which they arise
Minor	GHG emissions represent less than 1% of total emissions from the relevant annual UK carbon budget in which they arise

6.11.30 In line with the Climate Change Act (2050 Amendment) Order 2019, a system of legally binding five-year 'carbon budgets' that restrict the amount of GHG emissions the UK can emit has been established to guide the UK to net zero. **Error! Reference source not found.** shows the current and future UK carbon targets, which at present have only been calculated up to 2037. These carbon budget targets have been extrapolated from 1990 levels, with the most recent target aiming to reduce emissions by 78% by 2035 (BEIS, 2021f).

Table 6-11 UK Carbon Budgets

Carbon Budget	Total GHG emissions (MtCO2e)
3rd (2018 to 2022)	2,544
4th (2023 to 2027)	1,950
5th (2028 to 2032)	1,725
6th (2033 to 2037)	965

Significance

6.11.31 The significance is determined by, as detailed in **Error! Reference source not found.**: The approach is slightly different to the assessment of significance for most other technical

elements of the EIA, because the assessment relates to likelihood and consequence, rather than receptor sensitivity and impact magnitude.

Likelihood of climate hazard occurring × consequence to receptor if climate hazard occurs

Table 6-12 Significance criteria for climate change risk

Consequence of climate change hazard occurring	Likelihood of climate change hazard occurring				
	Very unlikely	**Unlikely**	**Possible**	**Likely**	**Very likely**
Very low	Negligible	Negligible	Negligible	Negligible	Negligible
Low	Negligible	Minor	Minor	Minor	Minor
Medium	Negligible	Minor	Moderate	Moderate	Moderate
High	Negligible	Minor	Moderate	Major	Major
Very high	Negligible	Minor	Moderate	Major	Major

6.11.32 Additional mitigation measures to adapt the Proposed Development are identified where potential climate change consequences are identified as being significant. However professional judgement will be applied where appropriate.

Summary and Conclusions

6.11.33 In summary, it is proposed that the GHG impact assessment and CCR assessments are scoped in to determine the potential for likely significant effects to and from climate change as a result of the Proposed Development.

6.11.34 Best practice methods and guidance will be used in these assessments, as described within this section.

6.12 Major Accidents and Disasters

Baseline Conditions

6.12.1 The EIA Regulations (2017) has introduced a requirement to consider major accidents and disasters.

6.12.2 Major accidents are defined as "*Events that threaten immediate or delayed serious environmental effects to human health, welfare and/ or the environment and require the use of resources beyond those of the client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events*." (IEMA, 2020c).

6.12.3 The impact of major accidents can be significant, with the potential to impact people both on and off-site, assets and property on and off-site, and the surrounding environment.

6.12.4 Disasters can be natural hazards, such as earthquakes, landslides and flooding or can be man-made hazards (e.g. caused by accidental loss of containment) or external hazards (e.g. act of terrorism) which result in consequences for people or the environment.

6.12.5 Part of the Site is already covered by the Control of Major Accident Hazards (COMAH) Regulations 2015, which ensures that all necessary measures are taken to prevent major accidents and limit the consequences to people and the environment of any major accidents which occur.

Scope of Assessment

6.12.6 The aim of the major accidents and disasters (MA&D) assessment will be to identify the reasonably foreseeable worst-case consequence of relevant hazards or threats (i.e. the likely

significant effects) on human health and the environment on the basis of potential severity of harm and duration. However, by definition, all MA&D hazards and threats could result in some form of serious damage and therefore the assessment will then consider the likelihood of a significant hazard or threat occurring. Furthermore, the arrangements that would be put in place to manage the risk to be as low as reasonably practicable (ALARP) will be considered. This will be determined based on review of available documentation; any risks which may require further mitigation will be identified.

6.12.7 An initial scoping exercise has been undertaken to identify the types of MA&D that could be relevant to the Proposed Development. The scoping exercise considered a number of sources, including the UK Government's Risk Register of Civil Emergencies (HM Government, 2020b). MA&D with little relevance in the UK were not included.

6.12.8 In identifying the potential for the Proposed Development to create or alter the existing baseline MA&D risks for receptors, it is proposed that the MA&D assessment will be conducted using a staged approach:

- identification of receptors;
- identification of hazards and threats based on the concept design work completed to date and in accordance with industry standard approaches to hazard identification;
- screening of hazards and threats, including the potential for likely significant effects;
- identification of prevention, minimisation and/ or mitigation measures; and
- determination of whether risk has been mitigated to ALARP and identification of any residual risks and their significance.

6.12.9 The MA&D assessment will consider domino effects which may occur in the event of a major accident at the Proposed Development which causes consequences for nearby sites, and vice versa. In respect of such domino effects, the vulnerability of the Proposed Development to a major accident will also be considered.

6.12.10 It is proposed that receptors to be considered in the MA&D assessment will include:

- population and human health of members of the public, local communities and nearby workers at other facilities, if relevant;
- biodiversity, with particular attention to species and habitats protected under The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations) (as amended);
- land, soil, water, air and climate; and
- property and material assets, cultural heritage and the landscape.

6.12.11 It is recognised that potential effects of the Proposed Development on employees and/ or contractors and suppliers (e.g. construction, operational and maintenance staff) are managed through compliance with other health and safety legislation including, but not limited to:

- Health and Safety at Work etc. Act 1974;
- The Management of Health and Safety at Work Regulations 1999;
- The Workplace (Health, Safety and Welfare) Regulations 1992; and
- CDM 2015 Regulations.

6.12.12 Through compliance with health and safety legislation, risks to employees will be mitigated to ALARP and no further mitigation will be available. However, for completeness, risks to employees and/ or contractors – including those at neighbouring facilities – will be included within the MA&D assessment results.

6.12.13 Appropriate security measures including a secure boundary fence for the Proposed Development will reduce the likelihood of trespass to ALARP. As no further mitigation will be available, effects on these receptor groups will be mitigated to ALARP. For completeness,

potential effects related to vandalism/ terrorism will however be included within the MA&D assessment.

6.12.14 Significance has been considered for each identified receptor in conjunction with the appropriate environmental topics for this EIA. With reference to IEMA 2020 guidance (IEMA, 2020c), factors that are considered in determining whether potential adverse effects are significant include:

- the geographic extent of the effects – effects beyond the project boundaries are more likely to be considered significant;
- the duration of the effects – effects which are permanent (i.e. irreversible) or long lasting are considered significant;
- the severity of the effects in terms of number, degree of harm to those affected and the response effort required – effects which trigger the mobilisation of substantial civil emergency response effort are likely to be considered significant;
- the sensitivity of the identified receptors; and
- the effort required to restore the affected environment – effects requiring substantial clean-up or restoration efforts are likely to be considered significant.

6.12.15 Table 6-9 below presents a short list of major accidents or disasters that are considered to need further consideration. Where the major accidents and disasters identified are not already being considered within the scope of existing technical assessments, they will continue to be reviewed with the design team to ensure the risks are understood and addressed through design as necessary.

Table 6-13 Short list of major accidents and disasters that are considered to need further consideration

Major Accident or Disaster	Potential Receptor	Comments
Fire/ explosion and risk of release of harmful gas.	Local residents, Site employees, habitats and species.	There may be some potential risk ofr fire as a result of the chemicals stored on site combusting, and or electrical fires starting due to faults.
Extreme weather (e.g. flooding, drought) which is either caused or exacerbated by the construction of the Proposed Development and leads to release of stored construction related material, equipment and potential contaminants.	Property and people in areas of increased flood risk.	Both the vulnerability of the Proposed Development to flooding, and its potential to exacerbate flooding, will be covered in the FRA, and also reported in ES, both in terms of the risk to the Proposed Development and increased risk caused by the Proposed Development.
Spillage/ leak of chemicals or hazardous materials	Site employees, local habitats and species.	Risk of contamination of water resources.
Vandalism (trespass)/ terrorism	Site employees and local residents.	Risk of vandalism/ terrorism leading to fires/ explosions.
Ground collapse	Site employees	Risk of construction resulting in disturbance of manmade or naturally occurring ground related hazards.
Major road traffic accident	Aquatic environment and road users.	The risk of road collisions and accidents will be addressed in the TA. The risk posed by spillage from hazardous loads as a result of a road traffic accident during

		construction or decommissioning will be considered in the Water Resources and Flood Risk chapter of the ES.
Release of asbestos	Site employees, local residents and public.	Risk of uncontrolled release of asbestos present on site, if disturbed during construction of the Proposed Development.
Aircraft/ drone impact	Site employees and the Proposed Development assets.	Tall structures have potential to present a visual distraction to pilots, causing aircraft incident.
Pandemic	Site employees and local residents.	Risk of pandemic causing civil emergency.
Domino effects from incidents at neighbouring facilities	Site employees, local residents and Proposed Development assets.	Risk of incident at adjacent industry could lead to major accident at the Proposed Development.
Rail accidents	Rail users and Site employees.	A railway line passes through the Site between the Phillips 66 Site and VPI Site.
Utilities failure (gas, electricity, water, sewage, oil, communications)	Employees and local residents.	The Proposed Development has the potential to affect existing utility infrastructure above and below ground. To identify any existing infrastructure constraints, both consultation and a desk-based study will be undertaken.

6.12.16 Where further design mitigation is unable to remove the potential interaction between a major accident or disaster and a particular topic, the relevant ES chapter will identify the potential consequence for receptors covered by the topic and give a qualitative evaluation of the potential for the significance of the reported effect to be increased as result of a major accident or disaster.

6.12.17 The existing measures in place within the Site and the identified measures implemented for compliance with existing legislative and regulatory requirements or standard industry practice would ensure that all MA&D risks during construction and operation would be reduced.

6.13 Socio-economics and Human Health

Baseline Conditions

6.13.1 The Site and its surrounds have historically been used as agricultural land. However, is now dominated by industrial land uses and transport infrastructure (road, rail and port).

6.13.2 All of the previously discussed environmental aspects that are or are partially relevant to population and human health are proposed to be assessed against criteria that have been established for the protection of human health (e.g. air quality standards). Therefore, no specific human health impact assessment is proposed for the EIA.

6.13.3 The ES for the Proposed Development will draw on the assessments of environmental aspects where there is a potential for a significant impact on population and human health (e.g. air quality). A dedicated section will be provided to summarise the results of the assessment of each environmental aspect, as relevant in order to determine the potential overall (in-combination) impact to identified population and human health receptors.

6.13.4 The consultations undertaken in defining the methodology, identifying receptors, etc. for the assessment of each environmental aspect will include consideration of population and human health.

Scope of Assessment

6.13.5 The following potential impacts may be associated with the Proposed Development:

- creation of direct and indirect employment during construction, operation and decommissioning.

6.13.6 Potential traffic, noise, air quality/ dust and visual impacts on residential and other sensitive receptors will be assessed as part of the traffic and transport, noise and vibration, air quality, and landscape and visual amenity assessments described in other sections above.

6.13.7 The methodology for assessing socio-economic impacts will involve:

- review of relevant baseline conditions across the land to be used by the Proposed Development, including its utilities connections, and locality;
- assessment of socio-economic policy justification for the Proposed Development and the contribution of these activities to the socio-economic policy objectives of NLC;
- estimate of employment generated during the construction, operational and decommissioning phases; and
- assessment of the impact on local businesses, that may be affected by the Proposed Development.

6.13.8 The social and economic policy context review will consider relevant policy local, regional and national levels. The assessment will be carried out using a number of recognised data sources including, but not limited to, the following:

- Office of National Statistics Labour Force and Neighbourhood Statistics;
- Annual Business Inquiry;
- Annual Population Survey;
- Census 2011; and
- Travel to Work Data.

6.13.9 Wherever possible the impacts of the socio-economic assessment will be appraised against relevant national standards such as those provided by HM Treasury and Homes and Communities Agency (HCA). Where no standards exist, professional experience and judgement will be applied and justified.

6.13.10 A summary will be provided of key residual impacts of the Proposed Development and how the Proposed Development fits into local and regional socio-economic objectives, as well as its overall impact on the contribution to the local economy and community.

6.14 Cumulative and Combined Effects

Introduction

6.14.1 This chapter of the Environmental Statement will provide an assessment of the potential for cumulative and combined effects to occur as a result of the Proposed Development. Cumulative and combined effects are defined as follows:

- **Combined effects:** these are the effects resulting from several different impacts from a single development, in this case the Proposed Development, that may collectively cause an effect/ effects of greater significance, on any single environmental receptor. Individually the effects resulting from these impacts may not be significant, but the accumulation of effects may collectively cause an overall significant effect; and

- **Cumulative effects:** these occur when the environmental impacts and effects of the Proposed Development interact with those associated with other planned projects and developments located within a given geographical scope where environmental impacts could act together to result in a greater significance of effect on environmental receptors.
- **Intra-project / project-wide cumulative effects:** due to the nature of the Proposed Development, which comprises two developments each of which will be subject to separate planning applications, the ES will need to set out the impacts and effects of each individual development (the Proposed Phillips 66 Development and the Proposed VPI Development) and also the effects of the two developments together, i.e. of the overall Proposed Development as defined in Section 1 of this EIA Scoping Report. The overall effect of the two developments may result in effects of greater significance than the effects of the individual proposed developments. Such project-wide cumulative effects will be described within each technical chapter of the ES (see Section 8 for information on the proposed technical ES chapter structure).

Combined Effects

6.14.2 The assessment of combined effects considers whether an individual environmental receptor or resource would be affected by more than one type of impact as a result of the Proposed Development. For example, a single receptor, such as a property or habitat, being subject to noise, air quality and visual impacts associated with the Proposed Development.

6.14.3 The assessment methodology for combined effects involves the identification of environmental resources and receptors where there is potential for more than one impact to be experienced and therefore potential for interactions between these. This enables the identification of the overall combined environmental effects of the Proposed Development.

Cumulative Effects

6.14.4 In accordance with the EIA Regulations, consideration will also be given to the potential for cumulative impacts to arise. Cumulative impacts are those that accrue over time and space from a number of development activities. The impact of the Proposed Development will be considered in conjunction with the potential impacts from other projects or activities which are both reasonably foreseeable in terms of delivery (e.g. have planning consent) and are located within a relevant geographical scope where environmental impacts could act together to create a more significant overall effect.

6.14.5 A number of other proposed developments have already been identified in the vicinity of the Proposed Development that could potentially result in cumulative impacts during its construction and operation – these are listed below. However, consultation with NLC will be undertaken in respect of identifying additional proposals and planning applications submitted under the Town and Country Planning Act 1990 that may also have the potential to produce significant cumulative environmental impacts.

6.14.6 An assessment of potentially significant cumulative effects with other proposed developments in the vicinity of the Proposed Development will be undertaken for each of the topics described above and reported in the ES.

6.14.7 The Applicant will consult with NLC and neighbouring local authorities in order to define the full list of current and future developments/ projects to be considered for the potential cumulative impacts.

6.14.8 The following planned developments are in the vicinity of the Proposed Development Site:

- two storage tanks to store FAME (Bio-diesel) (application reference PA/2021/274), located approximately 0.3 km south of the Site;
- VPI Immingham Open Cycle Gas Turbine Power Station Development Consent Order (DCO), located approximately partly within the VPI Site;
- car storage and distribution facility (application reference PA/SCR/2018/14), located approximately 0.6 km north of the Site;

- new transit/ storage shed (application reference PA/SCR/2019/7), located approximately 1.7 km east of the Site;
- Monopile manufacturing facility (PA/2021/1525), located approximately 0.5 km north east of the Site;
- Immingham Eastern Ro-Ro Terminal DCO approximately 2.1 km south east of the Site;
- V Net Zero CO_2 transportation and storage network to the south of the Site (details not yet published);
- HLCP CO_2 transportation and storage network to the north of the Site (details not yet published).

Intra-project / Project-wide Cumulative Effects

6.14.9 The assessment of intra-project cumulative effects considers the effects on environmental resources and receptors that will likely occur from the changes arising from the Phillips 66 Site in conjunction with the VPI Site within the overarching Proposed Development.

6.14.10 A combination of professional judgement and established guidance will be used to confirm the scope of the cumulative effects assessment and to aid the identification and (where necessary) mitigation of likely significant effects.

7. Summary of Potentially Significant Environmental Effects

7.1.1 This Scoping Report has been prepared on the basis that the Applicant intends to undertake an EIA in respect of the Proposed Development and to produce an ES to report the findings of the EIA. The Scoping Report provides the information required to accompany a request for a Scoping Opinion, in accordance with Regulation 15 of the EIA Regulations.

7.1.2 This report has identified the environmental effects that are considered to have the potential to be significant and proposes the approach to be used in assessments that will be undertaken for the EIA to characterise and understand the significance of these effects.

7.1.3 For clarity, Table 7-1 presents a summary of the proposed scope of the technical topics to be included in the ES, i.e. scoped in. It also identifies those elements that it is proposed are scoped out of the EIA, on the basis that these would not result in significant effects, and the rationale behind this decision.

Table 7-1: Scope of Technical Topics and Elements to be Scoped Out

Environmental Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Air Quality			
Construction	Emission of pollutants to air from vehicles. Construction dust. Mobile plant exhaust emissions.		
Operation	Emission of pollutants to air from the stacks and other emission sources. Emission of pollutants to air from vehicles (screening assessment).	Detailed assessment of emission of pollutants to air from vehicles associated with operation	Operational traffic is considered likely to be negligible when compared with air quality screening criteria, and not likely to result in vehicle numbers which could generate significant changes in air quality due to vehicle emissions.
Decommissioning	Assumed to be similar to construction.		
Noise and Vibration			
Construction	Noise and vibration from activities on site and construction traffic on public roads.		
Operation	Noise from the Proposed Development, including the potential air cooling infrastructure. Operational vibration impacts (if relevant).	Operational traffic-related noise impacts.	It is anticipated that operational traffic generation would be negligible, hence any effects due to traffic-related noise Impacts are not likely to be significant.
Decommissioning	Assumed to be similar to construction.		
Traffic and Transport			
Construction	Traffic generation and impacts on the local highway network		
Operation		Traffic generation associated with the operational phase	Traffic generation during operation is predicted to be negligible and not likely to result in significant effects.
Decommissioning	Assumed to be similar to construction.		
Water Resources and Flood Risk			

Environmental Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Construction	Changes to surface water flows. Pollution of surface watercourses within or near the Site.		
Operation	Changes to impermeable area and associated changes to surface water flows. Changes to surface water flows and fluvial flood risk due to proposed diversion of watercourse. Pollution of surface watercourses within or near the Site.		
Decommissioning	Assumed to be similar to construction.		
Landscape and Visual Amenity			
Construction	Temporary changes to landscape character and views from sensitive receptors in the vicinity of the Site.		
Operation	Permanent changes to landscape character and views from sensitive receptors in the vicinity of the Site.		
Decommissioning	Assumed to be similar to construction.		
Cultural Heritage			
Construction	Physical impacts and/ or impacts on the setting of non-designated heritage assets, including historic landscape character areas, within the Site. Impacts on the setting of designated and non-designated heritage assets, including historic landscape character areas, in the vicinity of the Site.		
Operation	Impacts on the setting of designated and non-designated heritage assets, including historic landscape character areas, in the vicinity of the Site.		
Decommissioning		Physical or setting impacts on designated and non-designated heritage assets, including historic landscape character areas, in and around the Site.	No potential for additional impacts beyond those assessed for construction and operation.

Environmental Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Ecology and Nature Conservation			
Construction	Permanent loss of habitats during construction. Disturbance of ecological receptors (including noise, dust and light impacts). Temporary impacts on habitats.	Impacts on dormouse and white-clawed crayfish.	Lack of suitable habitats and/or the Sites being beyond the known distribution for both dormouse and white-clawed crayfish.
Operation	Disturbance of ecological receptors (including noise, dust and light impacts). Air quality and deposition impacts on ecological receptors.		
Decommissioning	Disturbance of ecological receptors assumed to be similar to construction.		
Geology, Hydrogeology and Contaminated Land			
Construction	Disturbance of potentially contaminated soils and perched groundwater and creation of new pathways allowing migration of such contaminants to reach sensitive receptors (including construction workers and controlled waters). Potential for pollution of the underlying Principal Aquifer within or near the Site. Potential temporary/ permanent loss of best and most versatile agricultural land within the VPI Site.		
Operation	Potential for pollution of the underlying Principal Aquifer within or near the Site.		
Decommissioning	Potential for pollution of the underlying Principal Aquifer within or near the Site assumed to be similar to construction.		
Waste Management			
Construction	Effects due to waste generation from demolition, excavation and construction activities.		
Operation	Effects due to the generation of various process waste streams from the carbon capture process (some of which classified as hazardous).		
Decommissioning	Assumed to be similar to construction.		

Environmental Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Climate Change and Carbon			
Construction	GHG emissions.		
Operation	GHG emissions. A statement on resilience of the Proposed Development to future climate changes will be provided.	In-combination climate change impacts. Sea level rise is proposed to be scoped out of the climate change resilience review.	The Site is not located in an area that is susceptible to sea level change, and no in-combination effects with other environmental disciplines are predicted.
Decommissioning		GHG emissions.	Timescale and methods for decommissioning are unknown.
Major Accidents and Disasters			
Construction	Potential for major accidents and disasters such as fire/ explosion, release of harmful gas, spillage of chemicals or hazardous materials, and vandalism/ terrorism to affect people, biodiversity, land, soil, water, air, climate and property/ material assets.		
Operation	Potential for major accidents and disasters such as fire/ explosion, release of harmful gas, spillage of chemicals or hazardous materials, and vandalism/ terrorism to affect people, biodiversity, land, soil, water, air, climate and property/ material assets.		
Decommissioning	Assumed to be similar to construction.		
Socio-economics and Human Health			
Construction	Creation of direct and indirect employment. Summary of human health impacts assessed in other technical chapters.		
Operation	Creation of direct and indirect employment. Summary of human health impacts assessed in other technical chapters.		
Decommissioning	Assumed to be similar to construction.		

8. The EIA Process

8.1 EIA Methodology and Reporting

8.1.1 The EIA will be carried out in accordance with the requirements defined by the EIA Regulations.

8.1.2 The ES will set out the process followed during the EIA including the methods used for the collection of data and for the identification and assessment of impacts and effects. Any assumptions made or limitations on the assessments will be clearly identified.

8.1.3 The EIA process is designed to be capable of considering, and sensitive to, changes that occur as a result of changes to the design, including any mitigation measures that are incorporated during the EIA. This will be particularly important for the Proposed Development as the design and layout is still being refined and minor changes are likely to be made following submission of this EIA Scoping Report.

8.1.4 The EIA is based on a number of related activities, as follows:

- establishing existing baseline conditions;
- consultation with statutory and non-statutory consultees throughout the pre-planning application process;
- consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to EIA;
- consideration of technical standards for the development of significance criteria;
- review of secondary information, previous environmental studies and publicly-available information and databases;
- physical surveys and monitoring;
- desk-top studies;
- computer modelling;
- reference to current legislation and guidance; and
- expert opinion.

8.1.5 Impacts will be considered on the basis of their magnitude, duration and reversibility. Cumulative and combined effects will also be considered where appropriate. Significance will be evaluated on the basis of the scale of the impact and the importance or sensitivity of the receptors, in accordance with standard assessment methodologies (major, moderate, minor and not significant).

8.1.6 Where likely significant environmental effects are identified in the assessment process, measures to mitigate these effects will be put forward in the form of recommendations to be undertaken as part of the Project development.

Structure of the Environmental Statement

8.1.7 The ES will comprise the following set of documents:

- **Non-Technical Summary (NTS)**: this document will provide a summary of the key issues and findings of the EIA in non-technical language.
- **Volume I**: Environmental Statement Main Text. This will contain the full text of the EIA with the proposed chapter headings as follows:
  1. Introduction and EIA Methodology;
  2. Site and Site Surroundings;
  3. Project Description, Need and Alternatives Considered;

4. Construction Programme and Management;
5. Policy Context;
6. Air Quality;
7. Noise and Vibration;
8. Traffic and Transport;
9. Water Resources and Flood Risk;
10. Landscape and Visual Amenity;
11. Cultural Heritage;
12. Ecology and Nature Conservation;
13. Geology, Hydrogeology and Land Contamination;
14. Waste Management;
15. Climate Change and Carbon;
16. Major Accidents and Disasters;
17. Socio-economics and Human Health;
18. Cumulative and Combined Effects; and
19. Summary of Significant Environmental Effects.

- **Volume II**: Figures
- **Volume III**: Technical Appendices: These will provide supplementary details of the environmental studies conducted during the EIA including relevant data tables, figures and photographs. The Technical Appendices will include but will not be limited to the TA, the FRA, the Phase 1 Geo-environmental Desk Study, the HRA Screening and the Biodiversity Net Gain assessment.

8.2 Structure of the Technical Chapters

8.2.1 Technical chapters 6 to 16 of the ES will be structured based on the following subheadings:

Introduction

8.2.2 The Introduction will describe the format of the assessment presented within the chapter.

Legislation and Planning Policy Context

8.2.3 The Legislation and Planning Policy Context section of the technical chapters will provide a brief overview of the relevant legislation, planning policy and technical guidance relevant to the assessment.

Assessment Methodology and Significance Criteria

8.2.4 The assessment method will incorporate feedback from consultation that has been undertaken throughout all stages of the project. The ES will highlight key issues that have arisen from the scoping exercise that have been specifically addressed within the EIA.

8.2.5 The methods used in undertaking the technical study will be outlined in this section with references to published standards, guidelines and relevant significance criteria.

8.2.6 The significance of effects before and after mitigation will be evaluated with reference to definitive standards, accepted criteria and legislation where available. Where it is not possible to quantify impacts, qualitative assessments will be carried out, based on available knowledge and professional judgment. Where uncertainty exists, this will be noted in the relevant technical assessment chapter.

8.2.7 Specific criteria for each technical assessment will be developed, giving due regard to the following:

- extent and magnitude of the impact;
- impact duration (whether short, medium or long term);
- impact nature (whether direct or indirect, reversible or irreversible);
- whether the impact occurs in isolation, is cumulative or interactive;
- performance against environmental quality standards where relevant;
- sensitivity of the receptor; and
- compatibility with environmental policies and standards.

8.2.8 For issues where definitive quality standards do not exist, significance will be based on the:

- local, district, regional or national scale or value of the resource affected;
- number of receptors affected;
- sensitivity of these receptors; and
- duration of the impact.

8.2.9 In order to provide a consistent approach to expressing the outcomes of the various studies undertaken as part of the EIA, and thereby enable comparison between effects upon different environmental components, the following matrix will be applied throughout the ES to define effects, unless otherwise specified and explained.

Table 8-1 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

8.2.10 For the purpose of this EIA, moderate and major effects (shaded grey in the matrix above) will be deemed ‘significant’, and where possible mitigation measures will be identified to reduce the residual effects to ‘not significant’.

8.2.11 Each of the technical chapters will provide the criteria, including sources and justifications, for quantifying the different levels of residual effect. Where possible, this has been based upon quantitative and accepted criteria (for example, the National Air Quality Strategy objectives or noise assessment guidelines), together with the use of value judgment and expert interpretation to establish to the scale of an effect.

Baseline Conditions (including Future Baseline)

8.2.12 In order to assess the potential impacts and effects of the Proposed Development, it is necessary to determine the environmental conditions that currently exist on site and in the surrounding area, for comparison. These are known as the existing baseline conditions. Baseline conditions are determined using the results of site surveys and investigations or desk-based data searches, or a combination of these, as appropriate.

8.2.13 It is also relevant for the EIA to consider future baseline conditions taking account of any planned or likely changes to the existing baseline.

Development Design and Impact Avoidance

8.2.14 Measures that have been integrated into the Proposed Development in order to avoid or reduce adverse environmental effects will be described. Such measures may include refinement of the design and layout of the Proposed Development to avoid impacts on sensitive receptors, implementation of Environmental Management Plans, and adherence of relevant legislation, guidance and best practice. The assessment of impacts and effects in the next section takes account of these measures already being in place.

Likely Impact and Effects of the Proposed Development

8.2.15 This section will identify the likely impacts and effects resulting from the Proposed Development. The likely impacts and effects associated with the Proposed Phillips 66 Development and the Proposed VPI Development will be assessed separately as well as together (project-wide) to provide transparency and clarity to the planning process.

8.2.16 The magnitude of impacts will be defined with reference to the relevant baseline conditions (existing or future, as appropriate), and effects will be determined in accordance with the identified methodology.

8.2.17 The technical assessments will identify the environmental impacts of the Proposed Development at key stages in its construction, operation (including maintenance) and eventual decommissioning.

8.2.18 There are several scenarios being considered for the construction of the Proposed Development. The assessment scenarios that will be considered for the purposes of the EIA (and considered in the ES) are as follows:

- Existing Baseline without the Proposed Development - the year that the baseline data has been collected;
- Future Baseline without the Proposed Development - for comparison respectively with the construction and operation scenarios described below;
- Construction of the Proposed Development;
- Opening and/ or Operation (including maintenance) of the Proposed Development - where opening represents the start of operation; and
- Decommissioning of the Proposed Development.

Mitigation and Enhancement Measures

8.2.19 The Mitigation and Enhancement Measures section will describe the measures that will be implemented by the Applicants to reduce any significant adverse effects identified by the assessment and enhance beneficial effects during construction and operation of the Proposed Development.

Residual Effects and Conclusions

8.2.20 Effects of the Proposed Development remaining following the implementation of available mitigation measures are known as ‘residual effects’. These will be discussed for each of the potential effects, and their significance level identified.

8.2.21 As for the ‘before mitigation’ effects, residual effects associated with the Proposed Phillips 66 Development and the Proposed VPI Development will be assessed separately as well as together (project-wide) to provide transparency and clarity to the planning process.

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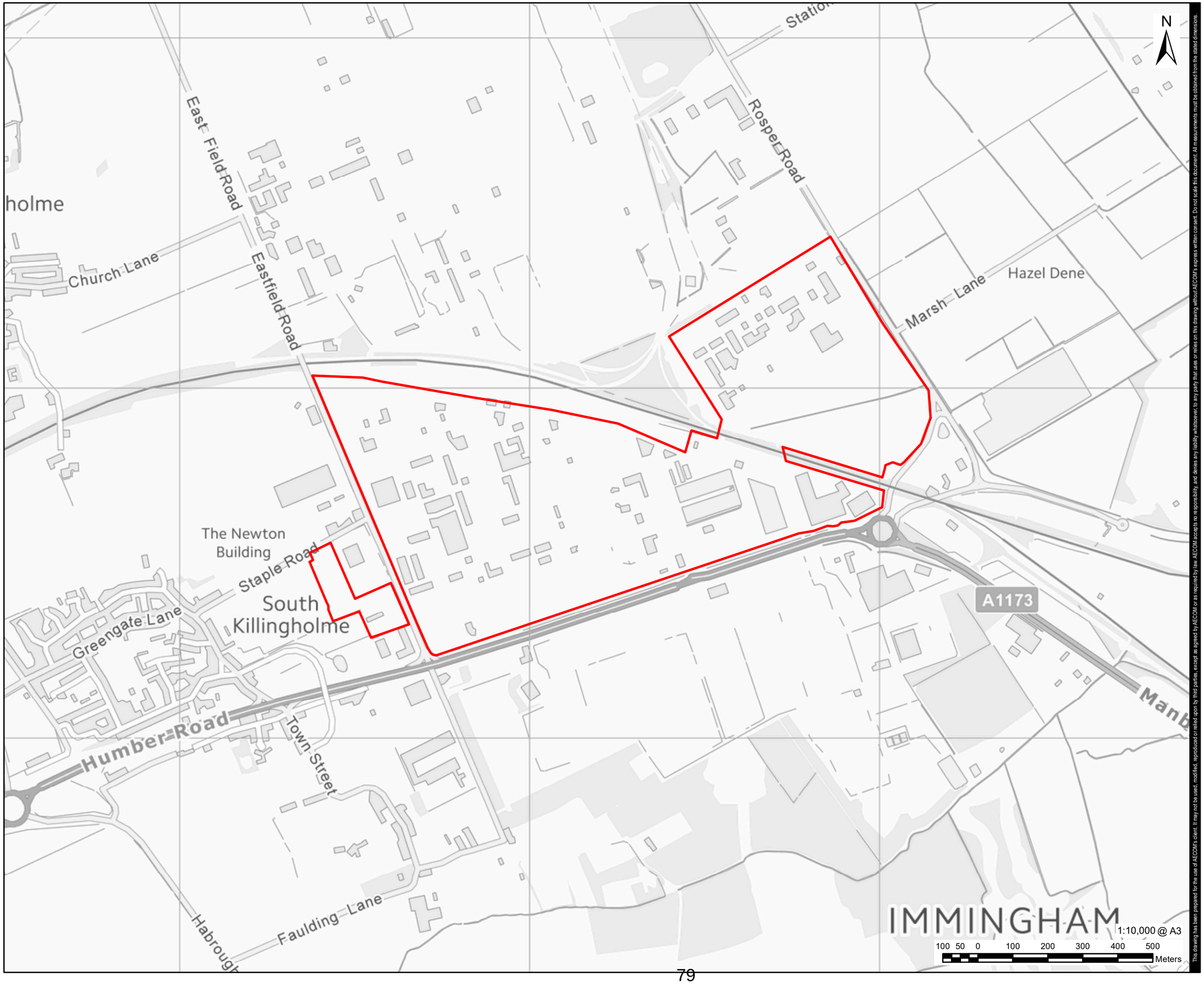
Appendix A - Figures



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Humber Zero

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VPI Immingham

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LEGEND
Combined Applications Site Boundary

NOTES
1: Site Boundary is indicative only

ISSUE PURPOSE
EIA SCOPIING

PROJECT NUMBER
60668866

FIGURE TITLE
Site Red Line Boundary

FIGURE NUMBER
Figure 1

Revision: 4 Drawn: ER Checked: LC Approved: KC Date: 2022-01-18

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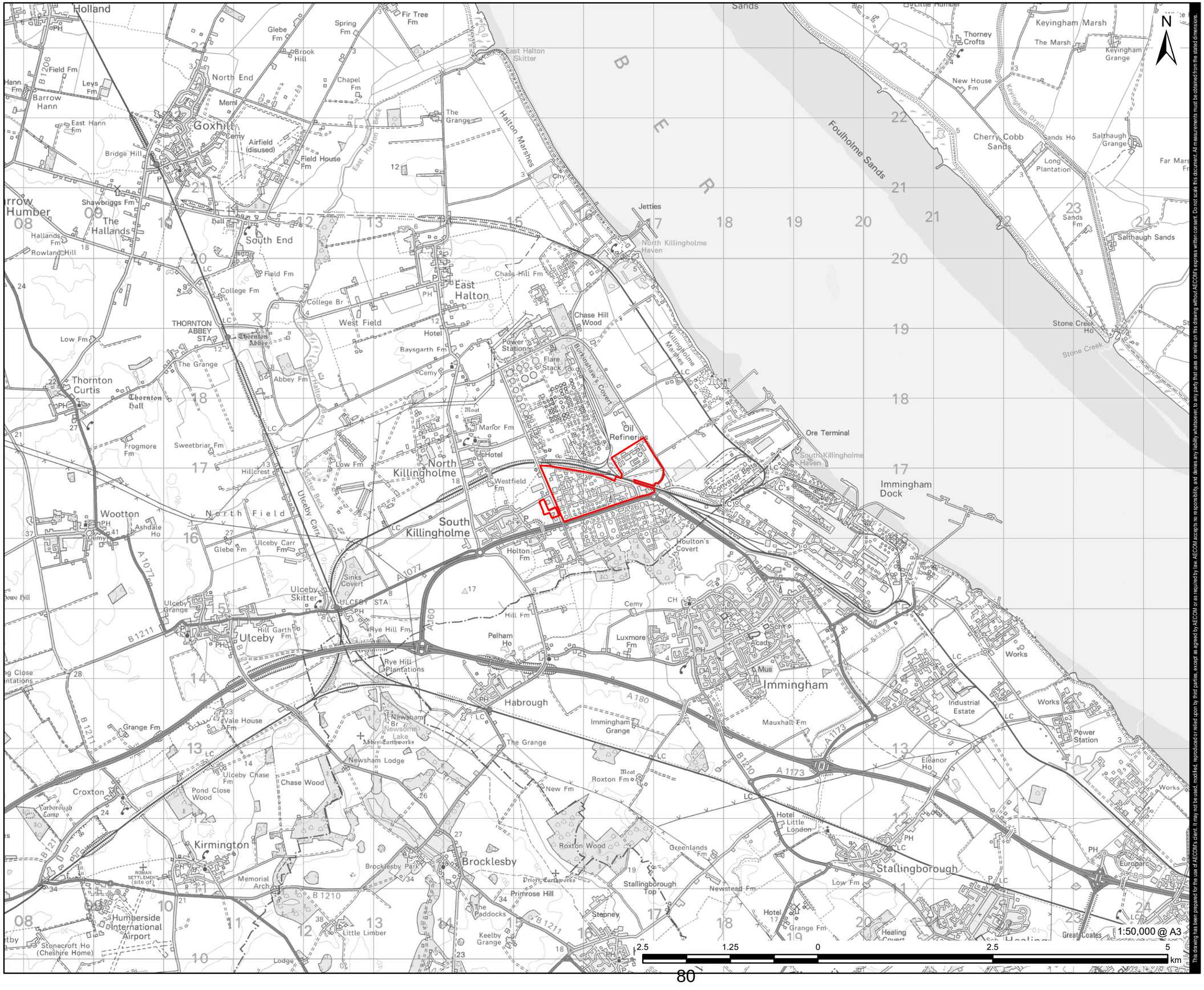

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LEGEND

Combined Applications Site

NOTES

1: Site Boundary is indicative only

ISSUE PURPOSE

EIA SCOPING

PROJECT NUMBER

60668866

FIGURE TITLE

Site Location Plan

FIGURE NUMBER

Figure 2

Revision: 4 Drawn: ER Checked: LC Approved: KC Date: 2022-01-18

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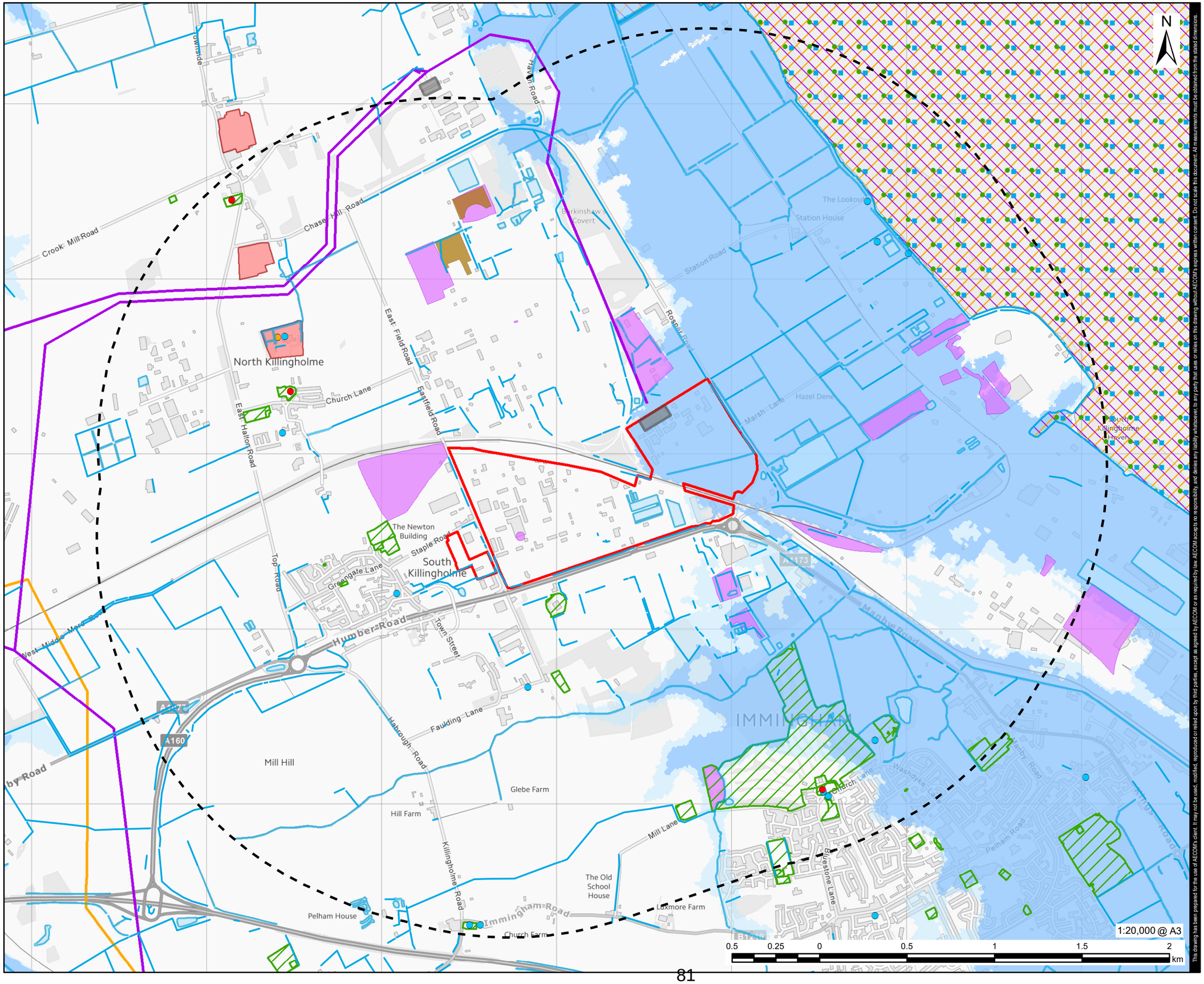

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LEGEND

- Combined Applications Site
- 2km Study Area
- Grade I Listed Building
- Grade II Listed Building
- Grade II* Listed Building
- National Grid Substation
- National Grid Overhead Electricity Transmission Line - 400kV
- National Grid Gas Transmission Pipeline
- Surface Watercourse / Waterbody
- Special Protection Area
- Ramsar
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation
- Permitted Waste Site (EA)
- Historic Landfill Site
- Scheduled Monument
- Open Greenspace
- Flood Zone 2
- Flood Zone 3

NOTES

1: Site Boundary is indicative only

ISSUE PURPOSE

EIA SCOPING

PROJECT NUMBER

60668866

FIGURE TITLE

Environmental Constraints Plan - 2km

FIGURE NUMBER

Figure 3

Revision: 4 Drawn: ER Checked: LC Approved: KC Date: 2022-01-18

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LEGEND

- Combined Applications Site Boundary
- 15km Study Area
- National Trail
- National Cycle Route
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar
- Site of Special Scientific Interest (SSSI)
- Area of Outstanding Natural Beauty (AONB)
- Local Nature Reserve
- National Nature Reserve
- RSPB Reserve
- Important Bird Area
- Ancient Woodland

NOTES

1: Site Boundary is indicative only

ISSUE PURPOSE

EIA SCOPING

PROJECT NUMBER

60668866

FIGURE TITLE

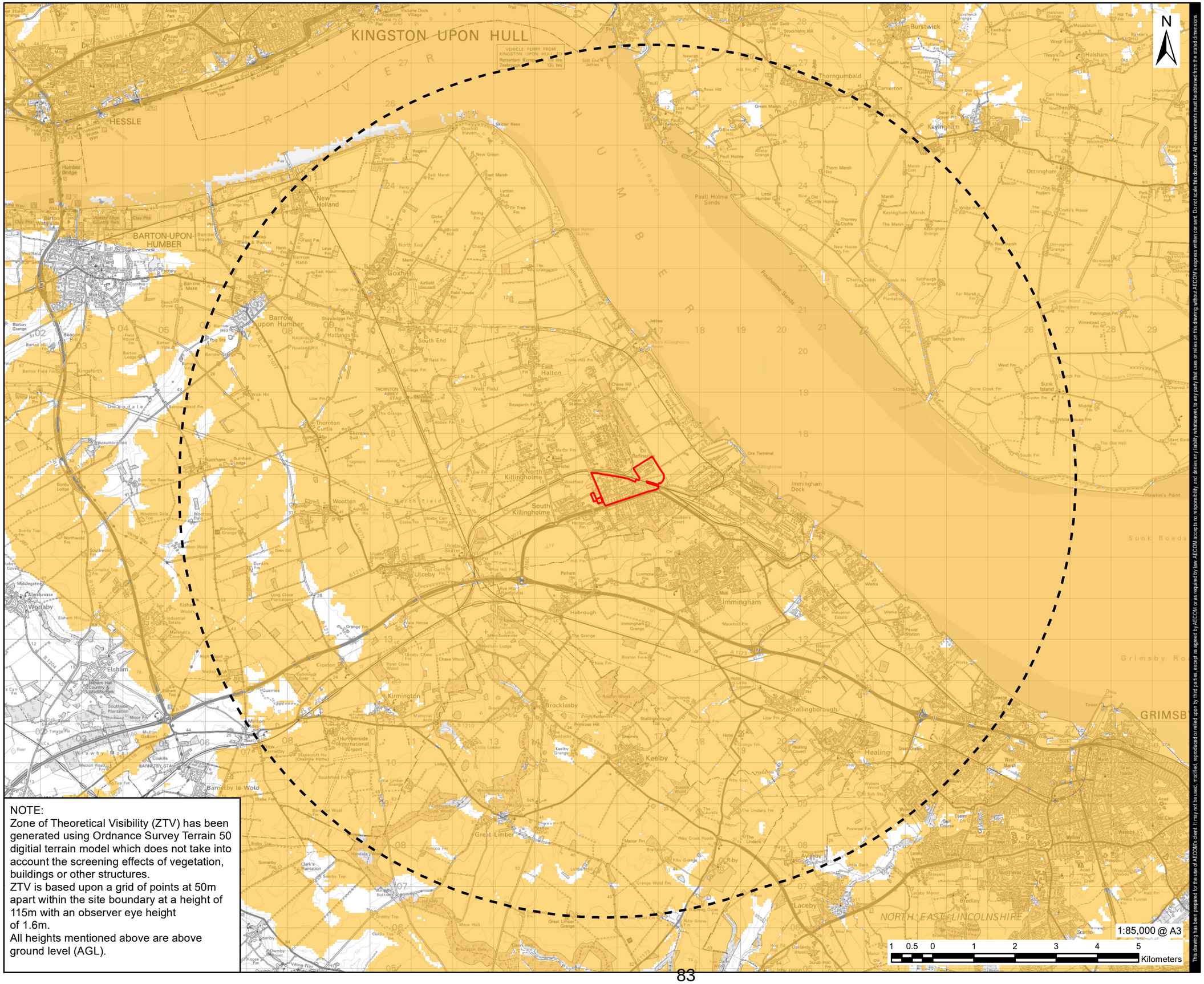
Environmental Constraints Plan - 15km

FIGURE NUMBER

Figure 4

1:125,000 @ A3

2 1 0 2 4 6 8 10 km



NOTE:
Zone of Theoretical Visibility (ZTV) has been generated using Ordnance Survey Terrain 50 digitial terrain model which does not take into account the screening effects of vegetation, buildings or other structures.
ZTV is based upon a grid of points at 50m apart within the site boundary at a height of 115m with an observer eye height of 1.6m.
All heights mentioned above are above ground level (AGL).

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LEGEND
- Combined Applications Site Boundary
- 10km Study Area
- Zone of Theoretical Visibility

NOTES
1: Site Boundary is indicative only

ISSUE PURPOSE
EIA SCOPING

PROJECT NUMBER
60668866

FIGURE TITLE
Zone of Theoretical Visibility
Maximum Height of 115m

FIGURE NUMBER
Figure 5

Revision: 6 Drawn: ER Checked: LC Approved: KC Date: 2022-01-18

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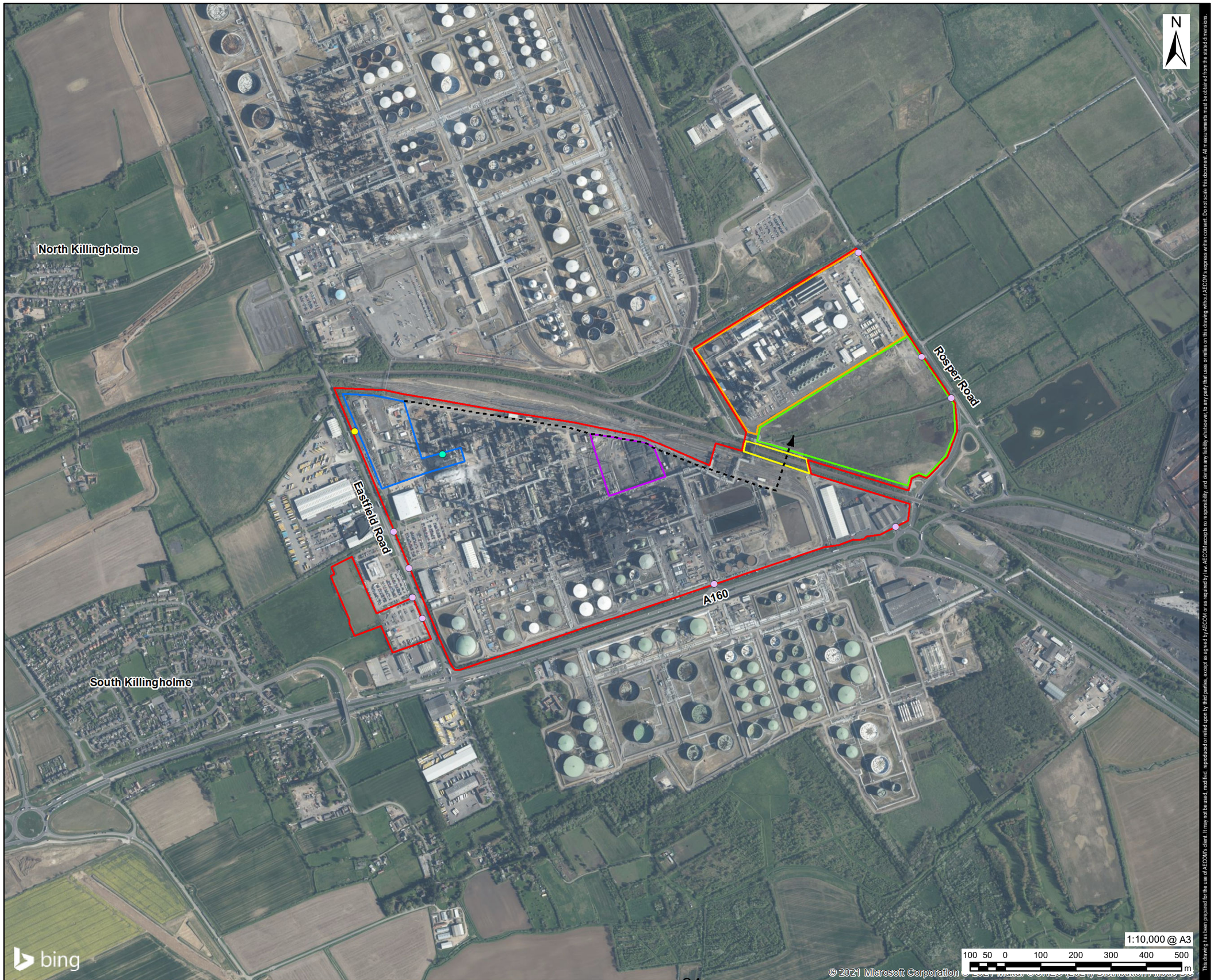

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LEGEND

- Combined Applications Site Boundary
- Indicative Area for Phillips 66 FCC Carbon Capture Plant
- Indicative Area for Phillips 66 High Pressure CO_2 Booster Compression Station
- Indicative Area for VPI Immingham Carbon Capture Plant and High Pressure CO_2 Booster Compression Station
- Existing VPI Site Boundary
- Existing National Rail Land
- Existing Site Access
- Fluid Catalytic Cracker (FCC) Stack
- Proposed New Site Access
- Indicative CO_2 Pipeline Route

NOTES

1: Site Boundary is indicative only

ISSUE PURPOSE

EIA SCOPING

PROJECT NUMBER

60668866

FIGURE TITLE

Site Areas Plan

FIGURE NUMBER

Figure 6

Revision: 2 Drawn: ER Checked: LC Approved: KC Date: 2022-01-18

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LEGEND

- Combined Applications Site Boundary
- Scattered scrub
- Tree
- Native Hedgerow
- Railway
- Lakes - Ditches
- Grassland - Modified grassland
- Heathland and shrub - Bramble scrub
- Heathland and shrub - Mixed scrub
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Artificial lake or pond
- Urban - Artificial unvegetated, unsealed surface
- Urban - Buildings
- Urban - Developed land; sealed surface
- Urban - Open Mosaic on Previously Developed Land
- Woodland and forest - Other coniferous woodland
- Woodland and forest - Other woodland; broadleaved

NOTES

1: Site Boundary is indicative only

ISSUE PURPOSE

EIA SCOPING

PROJECT NUMBER

60668866

FIGURE TITLE

Phase 1 Habitat Map

FIGURE NUMBER

Figure 7 - Sheet 1 of 2

Revision: 2 Drawn: ER Checked: LC Approved: KC Date: 2022-01-18

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LEGEND

- Combined Applications Site Boundary
- Native Hedgerow
- Railway
- Lakes - Ditches
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Bramble scrub
- Heathland and shrub - Mixed scrub
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Artificial lake or pond
- Urban - Artificial unvegetated, unsealed surface
- Urban - Buildings
- Urban - Developed land; sealed surface
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- Woodland and forest - Other coniferous woodland
- Woodland and forest - Other woodland; broadleaved

NOTES

1: Site Boundary is indicative only

ISSUE PURPOSE

EIA SCOPING

PROJECT NUMBER

60668866

FIGURE TITLE

Phase 1 Habitat Map

FIGURE NUMBER

Figure 7 - Sheet 2 of 2

APPENDIX 2

HUMBERZERO

VPI Immingham LLP and Phillips 66 Limited have launched a consultation on proposals for Humber Zero, a project that will result in an immediate reduction in carbon emissions and which will preserve jobs in critical industries in the Humber region, maintaining its role as an industrial hub.

The consultation will run between **26 May and 7 July 2022** and we will be hosting a number of events to further understand the views of the public. Your views are important to help us develop our proposals and better understand any potential impacts they may have on you. We'd like to hear what you think, so please read our consultation materials and share your ideas with us.

We are specifically consulting on proposals to help the decarbonisation of the Immingham industrial area by introducing new carbon capture technologies and infrastructure to the existing VPI Immingham Combined Heat and Power Plant and the Phillips 66 Ltd Humber Refinery.

We will be holding the following in-person and digital events during June 2022, where you will be able to view our consultation materials, find out more about the proposals and speak to members of the project team.

Venue	Date	Time
Asbourne Hotel, Vicarage Lane, North Killingholme, Immingham, DN40 3JL	Wednesday 8 June 2022	3pm to 6.30pm
Immingham Civic Centre, Pelham Road, Immingham, DN40 1QF	Saturday 11 June 2022	11.30am to 2.30pm
South Killingholme Community Centre, Moat Lane, South Killingholme, DN40 3EU	Thursday 16 June 2022	11.30am to 3.30pm
Teams Live - via our virtual consultation room (link below)	Tuesday 21 June 2022	10am to 11am
Teams Live - via our virtual consultation room (link below)	Thursday 23 June 2022	10am to 11am

The consultation materials can be viewed online at:
https://www.humberzero.co.uk/humber-zero-community-news/.

You can also visit our virtual consultation event at: humberzero.consultation.ai.

Comments and feedback on our proposals can be submitted in the following ways:

Email: consultation@humberzero.co.uk

Post: Freepost HUMBER ZERO CONSULTATION

Online: humberzero.consultation.ai

Comments and feedback should be submitted no later than **11.59pm on 7 July 2022**.

HUMBERZERO Newsletter

Aerial view of the VPI Immingham LLP Combined Heat and Power Plant and the Phillips 66 Limited Humber Refinery

Consultation on new post-combustion carbon capture technology and infrastructure

This newsletter is part of Phillips 66 Limited and VPI Immingham LLP's public consultation on proposals that form part of Humber Zero, a set of large-scale decarbonisation projects with the potential to prevent up to 8 million tonnes of CO_2 from the Immingham industrial area entering the atmosphere each year by 2050, contributing to the government's national net zero target.

What is net zero?

Net zero refers to achieving a balance between the amount of emissions produced and the amount prevented from entering the atmosphere. When the amount of emissions produced are cancelled out by the amount blocked, the UK will be a net-zero emitter. CO_2 is one of the main greenhouse gases that is damaging to the atmosphere, so reducing CO_2 emissions is a key component of reaching net zero.

We are consulting on the first phase of Humber Zero - **the introduction of new post-combustion carbon capture technology and infrastructure to existing facilities within the Phillips 66 Limited Humber Refinery and the VPI Immingham LLP Combined Heat and Power (CHP) Plant.** These proposals are a critical component of Humber Zero, and will contribute significantly to the overall CO_2 reduction figure. They are expected to collectively prevent up to 3.8 million tonnes of CO_2 from entering the atmosphere each year by 2028.

Your views are important to help us develop our proposals and better understand any potential impacts they may have on you. We'd like to hear what you think, so please read our consultation materials and share your ideas and any questions with us. Information on how you can provide your feedback is on the back of this newsletter.

What is Humber Zero?

Our proposals will adapt existing industry, safeguard jobs and create opportunities in the lower carbon economy by retrofitting carbon capture and storage technology into some of the processes at the Phillips 66 Limited Humber Refinery and VPI Immingham CHP plant.

Post-combustion, the CO_2 emissions from some of the processes at both facilities (which are normally released to the atmosphere as a greenhouse gas) will be captured at the source and compressed. The CO_2 will then be transported off site via one of two pipelines (separate independent projects that are also under development by other companies, shown below) for storage under the North Sea.

In particular, Humber Zero will deliver post-combustion carbon capture plants:

- within the Phillips 66 Limited Humber Refinery for the Fluid Catalytic Cracker; and
- for two of the gas turbines and auxiliary boilers within the VPI Immingham CHP plant.

Each of the plants will have its own CO_2 compression facilities.

Who are we?

Phillips 66 Limited

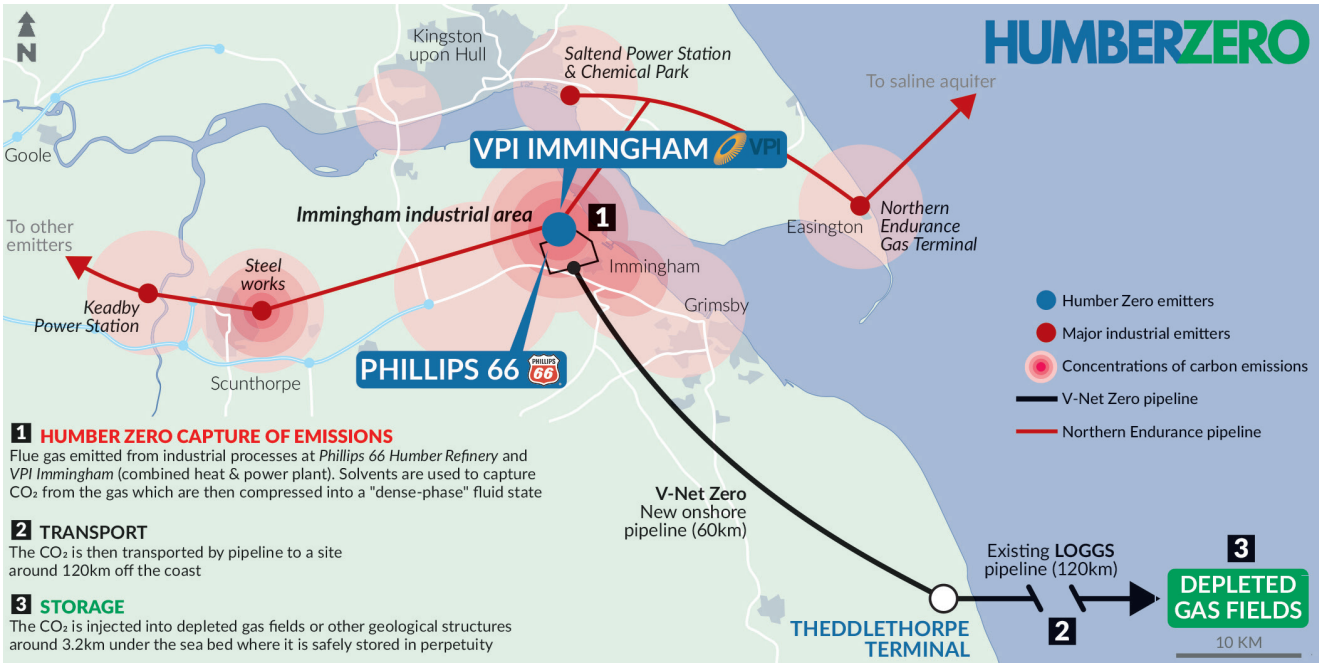
Own and operate the Humber Refinery. The Humber Refinery is one of the most sophisticated in Europe; it is highly integrated, energy efficient and manufactures both fuels and specialist products. It is Europe's only supplier of graphite coke for electric vehicle batteries and consumer goods and is a UK leader in the production of lower carbon liquid fuels.

VPI Immingham LLP

Own and operate the gas-fired CHP plant on Rosper Road. The plant operates 24/7 to provide the electricity and steam that is critical to the operation of the neighbouring refineries and also to the National Grid.

What is carbon capture?

Carbon capture refers to capturing CO_2 emissions at source (i.e. before they enter the atmosphere) and compressing them ready for safe storage or export. Carbon capture is one of the government's tools for achieving its goal to reach net zero by 2050.



Location of the Phillips 66 Limited Humber Refinery and the VPI Immingham CHP plant, part of the Immingham industrial cluster, in relation to proposed transport and storage networks

Benefits and impacts of Humber Zero

Our proposals will have significant environmental, economic, and social benefits for the Humber region and the UK as a whole. This will include preventing carbon emissions reaching the atmosphere, improving local green space, providing job and training opportunities for local people, as well as future-proofing current jobs and driving inward investment.

Local context

- The Humber region produces many of the everyday products we take for granted in the UK, from construction materials to chemicals, food to fuel. The region generates 20% of UK's electricity and produces a third of the UK's fuel.
- Estimated emissions from Humber industries were 14.8 million tonnes of CO_2 in 2017, plus a further five million tonnes emitted from a number of power generators in the region.
- There are 55,000 jobs in the manufacturing sector in the region and 20% of the economy derives from energy intensive industry. The sector provides around 15% of local jobs and 23% of the gross value added to the local economy.

Project statistics

- Prevention of up to 3.8 million tonnes of CO_2 from entering the atmosphere each year by 2028 – a significant proportion of the UK government's national target.
- Total creation of up to around 2,500 jobs during construction, up to around 200 permanent jobs and safeguarding of up to around 20,000 direct and indirect jobs in the Humber region.
- Total investment of £1.2 billion in the initial phase.

Environmental impacts

We understand our responsibility to consider and minimise the impact our work has on the environment. To understand the existing environment around the site and to inform our proposals, we have undertaken surveys to support an environmental assessment for the scheme. This assessment will look at the likely significant effects of the development on the environment and help ensure that suitable measures to minimise them are included within the overall scheme.

Construction management and safety

We will always aim to minimise any disruption during construction by coordinating with other projects planned in the area and communicating details with local residents, businesses and road users well in advance.

Phillips 66 Limited and VPI Immingham LLP consider the safety of workers and the public to be the top priority in the ongoing operation of the facilities and in the development of the Humber Zero project. We will rigorously manage safety throughout the construction phase and during operation.

Planning applications

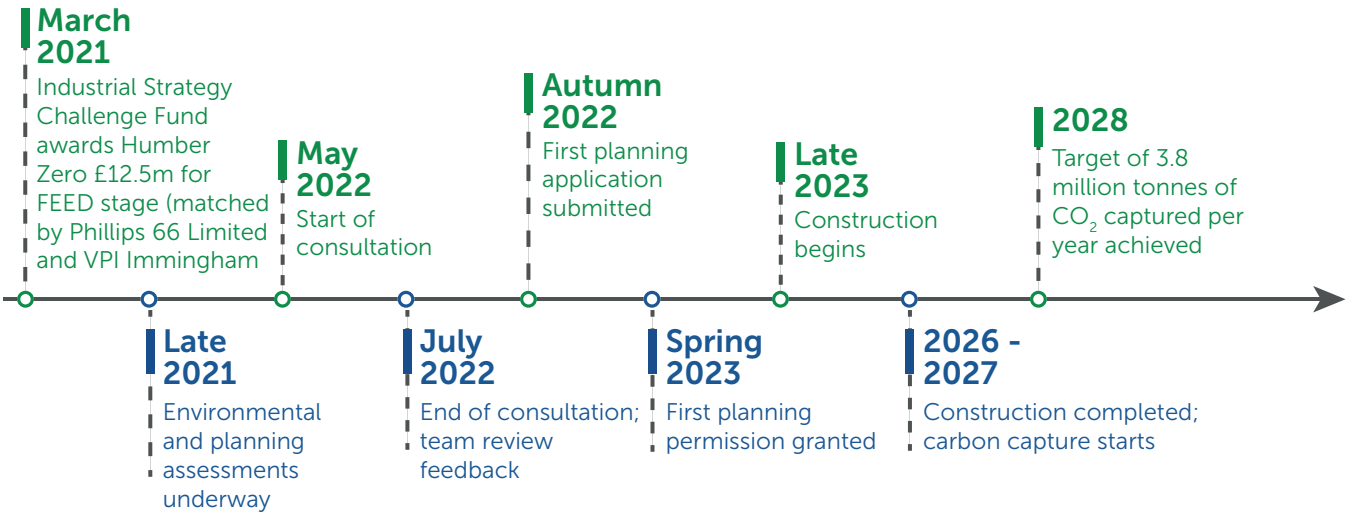
Phillips 66 Limited and VPI Immingham LLP will submit separate planning applications to the Local Planning Authority, North Lincolnshire Council, for the respective carbon capture plants and their associated works in Autumn 2022.

Once the planning applications are submitted, you will be able to read and comment on the proposals and supporting information on the Council's planning portal.

Public consultation and next steps

Project first phase timeline

The timeline below sets out our key project milestones. Please note that successful delivery of the project will depend on key funding decisions, as well as the necessary planning approvals.



Public consultation events

We will be sharing more information about our proposals at online and in person events, summarised in the table below. The events will provide the opportunity to meet the project team, find out more information about the project, ask questions and provide feedback.

All information presented at the in-person events will be available to view in a virtual exhibition room at the following link: **humberzero.consultation.ai**. The events will be held with appropriate health measures in place to make them as safe as possible for visitors and staff. We ask you to please be COVID aware when attending the in-person events, and not to attend if you have any symptoms.

Have your say

We encourage you to provide feedback on our proposals. You can respond to the consultation until 11.59pm on 7 July 2022. You can do this using the channels below.

https://www.humberzero.co.uk/humber-zero-community-news/

consultation@humberzero.co.uk

Freepost HUMBER ZERO CONSULTATION

Venue	Date	Time
Ashbourne Hotel, Vicarage Lane, North Killingholme, DN40 3JL	Wednesday 8 June	3pm - 6pm
Immingham Civic Centre, Pelham Road, DN40 1QF	Saturday 11 June	11.30am - 2.30pm
South Killingholme Community Centre, Moat Lane, South Killingholme, DN40 3EU	Thursday 16 June	11am - 4pm
Online - visit **humberzero.consultation.ai**	Tuesday 21 June	10am - 11am
Online - visit **humberzero.consultation.ai**	Thursday 23 June	10am - 11am

HUMBERZERO
THE UK'S GATEWAY PROJECT

Humber Zero
Public Consultation Strategy

May 2022

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Glossary

Abbreviation	Definition
CAG	Phillips 66 Limited Community Advisory Group
CHP	Combined Heat and Power
CO_2	Carbon Dioxide
CCUS	Carbon Capture, Utilisation and Storage
EIA	Environmental Impact Assessment
ES	Environmental Statement
GT	Gas Turbine
ICZ	Inner Consultation Zone
LPA	Local Planning Authority
MT	Million tonnes
MW	Megawatt
NELC	North East Lincolnshire Council
NLC	North Lincolnshire Council
OCZ	Outer Consultation Zone
PCC	Post-combustion Carbon Capture
VCR	Virtual Consultation Room
VPI	VPI Immingham LLP

1.0 Introduction

1.1 Background to Humber Zero

1.1.1 Humber Zero is a large-scale decarbonisation programme, being advanced in partnership by Phillips 66 Limited and VPI Immingham LLP (VPI), that aims to remove up to 8 million tonnes (MT) of atmospheric CO_2 emissions per annum from the Immingham industrial cluster by 2030 through the deployment of a number of technologies such as Carbon Capture, Storage (CCUS). The Immingham industrial cluster is located on the south bank of the River Humber, approximately 1 kilometre from the coastline with the North Sea.

1.1.2 Phillips 66 Limited own and operate the Humber Refinery at Eastfield Road, South Killingholme, which along with the adjacent PRAX Lindsey Refinery provides around 25% of the UK's total oil refining capacity. Additionally the Humber Refinery is Europe's only supplier of graphite coke for Electric Vehicle (EV) batteries and consumer goods and is a UK leader in the production of lower carbon liquid fuels.

1.1.3 VPI Immingham LLP own and operate the 1,200 megawatt (MW) gas-fired combined heat and power (CHP) plant located to the north-east of the Humber Refinery at Rosper Road. The CHP plant operates 24/7 to provide the electricity and steam that is critical to the operation of the Humber and Lindsey refineries.

1.1.4 Humber Zero is ideally placed. It is located in the Humber region, which emits 40% of the UK's industrial emissions[1] and in close proximity to depleted oil and gas fields in the North Sea (within which captured CO_2 can be stored), as well as to proposed CO_2 transportation infrastructure (pipelines) for taking the captured CO_2 offshore for permanent storage. It therefore has the potential to play a major role in the decarbonisation of industry and power generation within the Humber region.

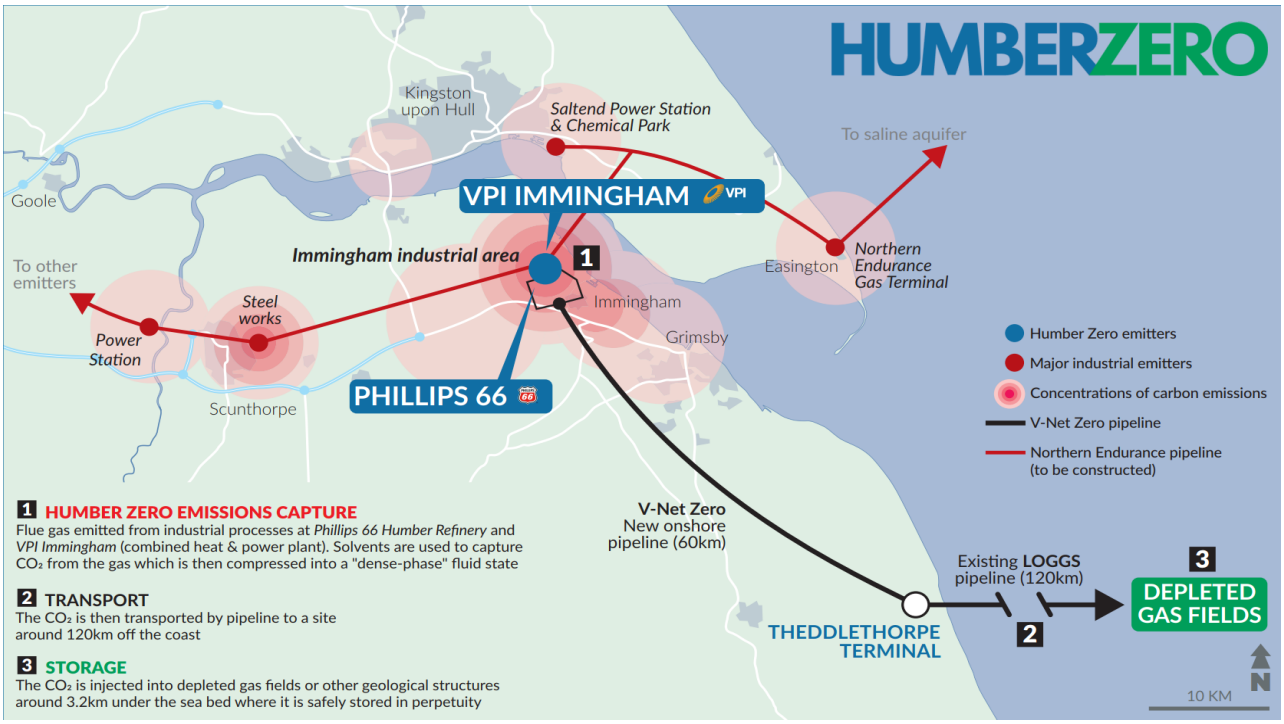
1.1.5 Humber Zero will include retrofitting carbon capture technology into some of the processes at the Humber Refinery and also to the VPI CHP plant. Post-combustion, the CO_2 emissions from some of the refinery processes and the CHP plant will be captured at source, compressed and then transported via the one of the proposed CO_2 transportation pipelines in the Humber region for storage in the North Sea.

1.1.6 It is estimated that Humber Zero could represent a total investment of £1.2 billion. Humber Zero is expected to create 2,500 jobs during construction, 200 permanent jobs and safeguard 20,000 direct and indirect jobs in the Humber region.

1.1.7 The location of Humber Zero and the indicative routes of the proposed CO_2 transportation infrastructure that it may connect to is shown below in **Figure 1.1**.

1. HM Government, Industrial Decarbonisation Strategy Press Release, 17 March 2021

Figure 1.1 – Location of Humber Zero and CO_2 transportation infrastructure



1.1.8 CCUS is a key part of the Government's strategy set out in 'The Ten Point Plan for a Green Industrial Revolution' (November 2020) and the 'Energy White Paper: Powering our Net Zero Future' (December 2020) to decarbonise industry and power generation in the UK in order to achieve its legally binding target of net zero greenhouse gas emissions by 2050.

1.2 The Humber Zero proposals

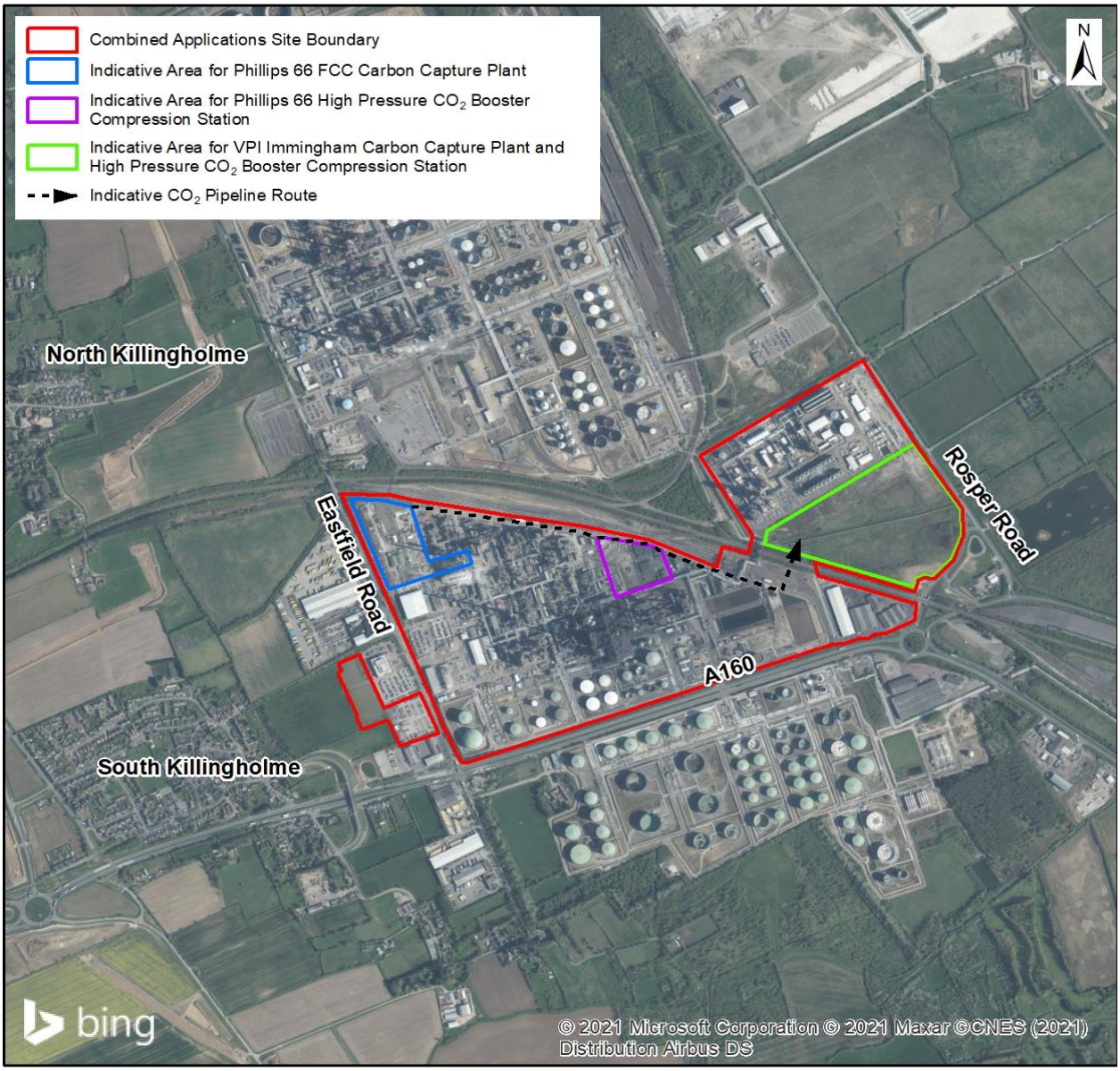
1.2.1 Humber Zero will include the following proposals:

- A Post-combustion Carbon Capture (PCC) Plant within the Humber Refinery for the Fluid Catalytic Cracker.
- A PCC Plant within the VPI CHP Plant for two of the Gas Turbines (GTs) – GTs 1 and 2 – and the auxiliary boiler.

1.2.2 Each of the PCC Plants will have its own CO_2 compression facilities as well as CO_2 pipelines that will transport the captured and compressed CO_2 to the interface with whichever CO_2 transportation pipeline is selected; this will then take the captured CO_2 offshore for permanent storage.

1.2.3 Indicative locations for the proposed PCC Plants, CO_2 compression facilities and indicative routes for the associated CO_2 pipeline connections are shown below in **Figure 1.2**.

Figure 1.2 – Location of the Humber Zero Proposals



1.2.4 We intend to submit separate planning applications to the Local Planning Authority (LPA), North Lincolnshire Council (NLC), for the respective proposed PCC Plants and their associated works. The applications will be submitted at the same time in Quarter 1 2023, with the aim being to have obtained the required planning permissions by Quarter 2 2023. Subject to final investment decisions, which are contingent on consents being received and government policy/ funding support being in place, construction could start on the PCC Plants in 2024 and being completed by 2026-27.

1.2.5 The planning applications will be supported by a joint Environmental Statement (ES). The ES will document the findings of an Environmental Impact Assessment (EIA) of the proposals that will be undertaken in accordance with 'The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 2017'. The EIA will assess the likely significant environmental effects arising from the proposals and identify any mitigation that is

necessary to control or reduce those environmental effects. The ES will also be accompanied by a Non-Technical Summary.

1.2.6 In advance of undertaking the EIA, we have obtained an 'EIA Scoping Opinion' from NLC as to the scope of the EIA work to be undertaken. The formal EIA scoping opinion request was submitted on 25 January 2022. NLC issued its Scoping Opinion on 11 March 2022.

1.2.7 We will also engage with key technical consultees such as the Environment Agency and Natural England to discuss and agree the details of the EIA work to be undertaken.

1.2.8 Prior to the submission of the planning applications we will undertake pre-application consultation on the proposals. Environmental information will be made available during our pre-application consultation. There will be an opportunity to comment upon and provide feedback on the proposals and the environmental information during the pre-application consultation.

1.2.9 Future Humber Zero proposals could involve further PCC plants as well as hydrogen production and use.

1.3 The purpose of this document

1.3.1 This purpose of this document (the Public Consultation Strategy) is to outline the proposed pre-application community consultation for the Humber Zero proposals. It sets out who will be consulted, when, how, and also the timescales for that consultation.

1.3.2 The Public Consultation Strategy has been prepared taking account of good practice in respect of pre-application consultation and draws upon the project team's experience of having carried out consultation on a number of other major infrastructure projects within the South Humber area, notably the development consent applications for the VPI Open Cycle Gas Turbine, South Humber Bank Energy Centre and Keadby 3 projects. In preparing the Public Consultation Strategy the Applicants have also had regard to NLC's Statement of Community Involvement (adopted 2018).

1.3.3 We will keep the Public Consultation Strategy under review in light of the ongoing situation with regard to the Coronavirus (COVID-19) pandemic in England and it will be adapted accordingly, if required, in line with UK Government legislation and NHS and UK Health Security Agency advice and guidance.

2.0 Approach to Pre-Application Consultation

2.1 Introduction

2.1.1 This section sets out our proposed approach to pre-application community consultation for the Humber Zero proposals. This includes the objectives of the consultation, stages and timescales, who it is proposed to consult, and how.

2.1.2 The approach we will take to the consultation will have regard to any other consultations being undertaken in the locality (for example, any consultation on the emerging CO_2 transportation infrastructure proposals). We will look to collaborate with the promoters of those proposals, and where appropriate consider combining consultations, to ensure that the local community and other stakeholders are provided with consistent messaging and clear information so that the different proposals are not confused with each other.

2.2 Consultation objectives

2.2.1 The overarching objectives for consultation on the Humber Zero proposals are:

- to raise awareness of what is being proposed, including what is Carbon Capture, Utilisation and Storage (CCUS) and ensure that the local community, local elected representatives, local authorities and other stakeholders have a full understanding of Humber Zero;
- to provide clear and concise information on the proposals and to keep stakeholders informed throughout the pre-application stage;
- to make information available in a number of ways in order to reach all sections of the community;
- to provide stakeholders with the opportunity and time to submit comments and feedback while the proposals are still at a formative stage and to provide them with a number of different ways in which to do so;
- to review the comments and feedback received and show how regard has been had to these in finalising the applications for planning permission; and
- to keep stakeholders informed of progress following the submission of the applications for planning permission.

2.2.2 In defining the above objectives, we have had regard to NLC's Statement of Community Involvement (adopted 2018). The objectives have also been informed by the project team's experience of undertaking pre-application consultation on other major infrastructure projects within the South Humber area.

2.3 Consultation stages and timescales

2.3.1 We are proposing a two-stage approach to the pre-application consultation on the Humber Zero proposals as follows:

- **Stage 1 Consultation**: this will involve early engagement with key stakeholders to help ensure that they are aware of Humber Zero and the emerging proposals. It is envisaged that this will involve offering briefings and meetings to the Phillips 66 Limited Community Advisory Group (CAG), local parish and town councils within the vicinity of the proposals (e.g. Habrough Parish Council, Immingham Town Council, East Halton Parish Council and North and South Killingholme Parish Councils), other local elected representatives (e.g. wards councillors and MPs), neighbouring business and

operators, and relevant officers at NLC and adjoining North East Lincolnshire Council (NELC). We also plan to arrange a Humber Zero 'launch event' toward the end of April 2022 for key stakeholders. There will also be some press and social media coverage on the emerging proposals.

2.3.2 This early engagement will take place in **March and April 2022**.

- **Stage 2 Consultation:** this will be the main stage of consultation and will involve us consulting on our more developed proposals including available environmental information. A wider range of consultation methods will be employed during this stage of the pre-application consultation, including the issue of newsletters to residents and businesses within the vicinity of the proposals, online consultation events and tools, physical face-to-face consultation events (subject to the situation with regard to COVID-19), press and social media coverage, amongst other methods. Further information on the proposed consultation methods can be found in Section 3.0.

2.3.3 The **Stage 2 Consultation** will commence in **late May 2022 and run to the early July 2022**. People will be invited to provide comments and feedback (it will be possible to do this in a number of ways) by a specified date. The Stage 2 consultation period will be approximately 6-weeks in total, which exceeds the established 'good practice' minimum period of 28 days for consultation.

2.3.4 As confirmed earlier, we will keep the proposed consultation methods under review in light of the ongoing situation with regard to the Coronavirus (COVID-19) pandemic and the Public Consultation Strategy will be adapted accordingly, if required.

2.4 What will we consult on?

2.4.1 The Stage 1 Consultation will be used to introduce the project partners (Phillips 66 Limited and VPI) and what we do, raise awareness of Humber Zero generally and outline the emerging proposals. The information provided will focus upon the broad objectives of Humber Zero, the potential locations for the proposals, the work required to support the applications for planning permission (and other consent applications), the consenting process and the timescales for the first phase.

2.4.2 The Stage 2 Consultation will be used to provide information on our more developed proposals for Humber Zero, taking account of the work that will have been undertaken by late May 2022 and will cover:

- the need for Humber Zero within the context of achieving net zero by 2050 and its role in decarbonising the Humber region;
- how the PCC Plants will work and how they will link potentially link with other decarbonisation projects in the region;
- the employment and economic benefits of the proposals;
- functional requirements and the decisions made about the design of the proposals;
- the initial findings of the EIA work at the time of the consultation and the likely significant environmental effects during the construction and operational phases of the proposals, including the duration of the construction programme;
- the measures for avoiding, minimising and/or mitigating any likely significant adverse environmental effects of the proposals, to the extent that they are defined or known at the time of the consultation;
- an update on the timescales for the proposals and the key milestones, including the submission date for the applications for planning permission;

- the information being made available during the consultation and the consultation events taking place;
- the aspects of the proposals in respect of which feedback is being invited; and
- how comments and feedback can be provided and the deadline for the receipt of these.

2.5 Where and who will we consult?

2.5.1 As confirmed above, for Stage 1 we will engage primarily with the CAG and local parish and town councils. For Stage 2, the consultation will be extended to include local residents and businesses with a wider range of consultation methods being employed, including the issue of a newsletter to residents and businesses within the vicinity of the proposals, online consultation events and tools, physical face-to-face consultation events (subject to the situation with regard to COVID-19), press and social media coverage, amongst other methods. Those consulted will include:

- The Phillips 66 Limited CAG;
- South Killingholme Parish Council;
- North Killingholme Parish Council;
- East Halton Parish Council;
- Habrough Parish Council;
- Immingham Town Council;
- District ward councillors at NLC, NELC, East Riding Council and Hull City Council;
- Local MPs;
- Adjoining operators (e.g. PRAX Lindsey Refinery, Port of Immingham); and
- Local residents and businesses within the vicinity of the proposals.

2.5.2 We will also consult with relevant officers at NLC and NELC, technical consultees such as the Environment Agency and Natural England, amongst others.

2.5.3 A 'Consultation Area' has been defined for the purposes of the Stage 2 Consultation. This comprises two zones: an Inner Consultation Zone (ICZ) and an Outer Consultation Zone (OCZ).

2.5.4 The ICZ extends approximately 5 kilometres from the Humber Zero proposals and encompasses the nearest settlements of East Halton, Habrough, Immingham and North and South Killingholme. It is considered that this is the area that has the most potential to be affected by the proposals, although we do not anticipate that there will be significant/material adverse impacts upon the local communities within this area. The ICZ will be the focus of more targeted consultation activities, for example, the issue of a newsletter to residents and businesses and the placing of posters on community notice boards.

2.5.5 The extent of the ICZ is shown below in **Figure 2.1**.

Figure 2.1 – Extent of Inner Consultation Zone

2.5.6 The OCZ has been defined by reference to the early EIA work being undertaken and extends to approximately 10 kilometres from the Humber Zero proposals. The OCZ is considered to broadly represent the maximum extent of the area within which environmental impacts, such as air quality and landscape and visual effects could occur. While we do not anticipate any significant adverse impacts within the OCZ there could be interest in the proposals from residents and business within this area. The newsletter will not be issued within the OCZ; however, notices will be placed within newspapers circulating within the OCZ to make people aware of the proposals and the consultation and a range of other methods will be employed to reach people within this area, including communications with local elected representatives and use of radio channels and online platforms.

2.5.7 The extent of the OCZ is shown in **Figure 2.2**.

Figure 2.2 – Extent of Outer Consultation Zone

3.0 Consultation Methods

3.1 Introduction

3.1.1 We propose to employ a range of consultation methods, taking account of any restrictions in place due to COVID-19, in order to ensure that the consultation on Humber Zero is effective, safe and resilient, and provides the local community and other stakeholders with sufficient opportunity to learn about the proposals and to provide comments and feedback. The range of methods employed will ensure that all sections of the community are provided with the opportunity to provide comments and feedback. The consultation methods are outlined below. These methods will be used primarily during the Stage 2 Consultation.

3.2 Press/media releases

3.2.1 Press/media releases will be used to publicise the Humber Zero proposals. A press release will be issued to the local and regional press at the start of the Stage 2 Consultation. Press releases will also provide information on how the local community can find out about the proposals and the ways in which people can provide comments and feedback.

3.3 Radio/social media/digital channels

3.3.1 Radio adverts will be placed with radio stations broadcasting within the Consultation Area (e.g. BBC Radio Humberside & BBC Radio Lincolnshire) to publicise the latest proposals, how the local community and other stakeholders can find out about the proposals and the ways in which people can provide comments and feedback. In-house and local social media and digital forums and pages (e.g. local and community Facebook pages) will also be used to further publicise the Stage 2 Consultation.

3.4 Email & Newsletter

3.4.1 An email will be sent to the CAG, local parish and town councils, district ward councillors, local MPs and other stakeholders at the start of the Stage 2 Consultation. This will provide information on how these stakeholders can find out more about the consultation and engage in the process.

3.4.2 In addition, a newsletter will be produced and sent to all residents and businesses within the ICZ at the start of the Stage 2 Consultation. This will provide information on the latest proposals, ways in which information is being provided, how further information and consultation materials can be requested, and how comments and feedback can be provided, as well as the deadline for the submission of these. The newsletter will incorporate a comments/feedback form and include a Freepost address for the return of the form.

3.4.3 The newsletter will also be sent to the stakeholders receiving the email at the start of the consultation.

3.4.4 The newsletter will include details of how people will be able to submit comments and feedback online.

3.5 Newspaper adverts/posters

3.5.1 The Stage 2 Consultation will be publicised by placing adverts in local and regional newspapers circulating across the Consultation Area. It is proposed to publish adverts for up to two consecutive weeks in advance of and during the early part of the Stage 2 Consultation in the following publications:

- Scunthorpe Telegraph;
- Grimsby Telegraph;

- Hull Daily Mail; and
- East Riding Mail.

3.5.2 Subject to COVID-19 restrictions, posters advertising the Stage 2 Consultation will also be placed in public venues (e.g. libraries, council offices) and on community notice boards.

3.6 Project website

3.6.1 A project website has been established and will be used to host consultation materials and to provide information on how people can provide comments and feedback and request hard copy documents. People will also be able to complete an online feedback form on the website. The website address is: https://www.humberzero.co.uk/.

3.7 Virtual meetings

3.7.1 We will host at least two virtual meetings to provide information to the local community and other stakeholders and provide a further means by which people can learn about the proposals, ask questions of the project team and provide comments and feedback. Details of the virtual meetings will be communicated through the newsletter, newspaper adverts and the posters. Details will also be provided on the project website. The virtual meetings will be hosted via the virtual consultation room (see below).

3.8 Virtual consultation room

3.8.1 To provide an alternative to physical face-to-face events, and to mitigate for any potential reintroduction of COVID-19 restrictions, an online virtual consultation room (VCR) that replicates a traditional face-to-face public consultation event will be created and made available throughout the Stage 2 Consultation. The project website will include a link to the VCR. As part of the VCR various consultation materials will be available, including videos, information boards/banners, drawings and plans, environmental information and a frequently asked questions document. This will be the same information that is made available at any physical face-to-face public consultation events held.

3.8.2 The VCR will also include an online version of the comments/feedback form for people to complete.

3.9 Face-to-face public consultation

3.9.1 Subject to COVID-19 restrictions, we intend to host up to three physical face-to-face public consultation events either within or close to the ICZ during the Stage 2 Consultation. The information provided at the face-to-face events will be the same as for the VCR. The face-to-face events will also provide an opportunity to meet and speak to members of the project team.

3.9.2 Copies of the comments/feedback form will be available for people to complete at the events or take away to complete later and send back using a Freepost address.

3.9.3 The following venues will be used for events in June 2022:

- Ashbourne Hotel, Vicarage Lane, North Killingholme, Immingham, DN40 3JL;
- Immingham Civic Centre, Pelham Road, Immingham,DN40 1QF; and
- South Killingholme Community Centre, Moat Lane, South Killingholme, DN40 3EU.

3.10 Telephone number

3.10.1 We will provide a telephone number for the Stage 2 Consultation so people, including those without internet access, can contact us to ask questions about the proposals, provide comments and feedback and also request hard copy documents.

3.11 Project email address

3.11.1 A project email address has been set up and will be included on the consultation materials and website so people can submit comments/feedback via email.

3.12 Comments/feedback form

3.12.1 A comments/feedback form will be made available during the consultation for people to use to submit comments and feedback. The comments/feedback form will accompany the newsletter and will also be available to complete online and at the face-to-face public consultation events. It will also be possible to return the comments/feedback form by Freepost.

4.0 Recording and Taking Account of Consultation Responses

4.1 Recording and analysis

4.1.1 All comments and feedback received to the consultation (including completed comments/feedback forms) will be recorded and entered into a consultation tracker. The comments and feedback received will then be carefully reviewed, analysed and grouped under specific topic or theme headings. Under each topic/theme heading the issues/matters requiring consideration will then be identified.

4.1.2 We will consider the topics and issues raised during the pre-application consultation for the Humber Zero proposals. In having regard to the topics and issues raised, we will identify where these have resulted in any changes to the proposals and also set out where they have not resulted in changes.

4.2 Reporting

4.2.1 The pre-application consultation undertaken, including the comments/feedback received to the consultation and how we have had regard to those comments, will be documented within a Consultation Report, which will form part of the applications for planning permission.

4.2.2 Comments/feedback received to the pre-application consultation may be made public, however, no personal information will be published. Humber Zero will comply with the requirements of the General Data Protection Regulation. A copy of Humber Zero's Privacy Notice can be viewed on the project website: https://www.humberzero.co.uk/privacy-policy/. This may be updated from time to time.

5.0 Contact Details

5.1 Contact Details

5.1.1 Interested parties can find out more about Humber Zero by viewing the project website: https://www.humberzero.co.uk/ or by contacting us as follows:

- Via the project website: https://www.humberzero.co.uk/contact/
- By email: consultation@humberzero.co.uk
- By post: **Freepost HUMBER ZERO CONSULTATION**

APPENDIX 3

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Tables

1. Introduction and EIA Methodology

1.1 Background

1.1.1 This Environmental Statement (ES) has been prepared by AECOM Limited (AECOM) on behalf of VPI Immingham LLP (VPI) and Phillips 66 Limited (Phillips 66) ('The Applicants') in relation to planning applications ('the Applications') for the construction, operation and maintenance of two proposed Post-Combustion Carbon Capture (PCC) developments and associated facilities located at VPI Immingham Combined Heat and Power (CHP) Plant and Phillips 66's Humber Refinery ('the Proposed Developments'). The Proposed Developments comprise the first phase of the Humber Zero project.

1.1.2 This ES presents the findings of the Environmental Impact Assessment (EIA) undertaken in connection with the Proposed Developments.

1.1.3 The Proposed Developments will be separately consented under the Town and Country Planning Act 1990. Two planning applications will be submitted – one for the Proposed VPI Development and one for the Proposed Phillips 66 Development. In recognition of the inter-related nature of the Proposed Developments, the EIA for both applications is integrated and reported in this ES.

1.1.4 This chapter is supported by Figure 1.1 (ES Volume III), which illustrates the locations of the Proposed Developments, and Figures 1.2 and 1.3 (ES Volume III) which illustrate the boundaries of the two planning application sites ('the Phillips 66 Site' and 'the VPI Site' respectively).

1.2 The Applicants

1.2.1 VPI Immingham LLP own and operate the gas-fired CHP Plant located on Rosper Road in Immingham. The plant operates 24/7 to provide the electricity and steam that is critical to the operation of the neighbouring refineries and also to supply electricity to the National Grid.

1.2.2 Phillips 66 Limited own and operate the Humber Refinery at Eastfield Road, South Killingholme. The Humber Refinery is one of the most sophisticated in Europe; it is highly integrated, energy efficient and manufactures both fuels and specialist products. It is Europe's only supplier of synthetic graphite coke for Electric Vehicle batteries and consumer goods and is a UK leader in the production of lower carbon fuels.

1.2.3 The designs of the Proposed Developments demonstrate the Applicants' progress towards decarbonisation.

1.3 The Proposed Developments

1.3.1 The Proposed Developments will deliver up to 3.8 million tonnes (also known as megatonnes) per annum (Mtpa) of abated carbon dioxide (CO_2) emissions via:

- PCC retrofit to two gas turbines (GT1 and GT2) and two auxiliary gas boilers at the VPI Immingham CHP Plant ('the Proposed VPI Development'); and
- PCC retrofit to the Fluid Catalytic Cracker (FCC) stack at the Humber Refinery ('the Proposed Phillips 66 Development').

Progress of the Proposed Developments is subject to the necessary consents being granted and government policy/ funding support being in place to enable final investment decisions to be made.

1.3.2 Further information on the Proposed Developments is provided in ES Chapter 3: Proposed Developments Description, Need and Alternatives Considered and ES Chapter 4: Construction Programme and Management.

1.3.3 The VPI Site and the Phillips 66 Site (collectively 'the Sites') are both located wholly within the administrative boundary of North Lincolnshire Council (NLC).

1.3.4 The VPI Site (see Figure 1.3 in ES Volume III) comprises an area of 28.51 hectares (ha) and includes the existing CHP Plant and the parcel of vacant land directly to the south and south-east of the CHP Plant where the PCC plant will be located.

1.3.5 The Phillips 66 Site (see Figure 1.2 in ES Volume III) comprises an area of 15.68 ha and includes the northern part of the Humber Refinery and areas to the north-east of the Refinery (some overlapping with the VPI Site) which are required for connections including the CO_2 pipeline connection to the CO_2 transmission network.

1.3.6 Further information on the Sites is provided in ES Chapter 2: Sites and Site Surroundings.

1.3.7 All definitions of the Proposed Development elements and parts of the Site are defined in the ES Glossary.

1.3.8 The CO_2 transmission network that the Proposed Developments will connect into is under development by others. There are two potential networks that the Proposed Developments could be connected to:

- the proposed Viking CCS (formerly V Net Zero) CO_2 transport and storage network (promoted by Harbour Energy) which is anticipated to commence adjacent to the Sites (to the south of the VPI CHP Plant) and will transport CO_2 in dense phase (high pressure) via a below ground pipeline to Theddlethorpe and out to the Viking fields (which have 300 CO_2 Mt storage potential) via an existing subsea pipeline; and/ or
- the East Coast Cluster's Humber Low Carbon Pipelines (HLCP) (promoted by National Grid) which is anticipated to be located approximately 2 km to the north of the Sites and will transport captured CO_2 across the Humber estuary to Easington, and from there via an offshore pipeline to the Endurance saline aquifer.

1.3.9 The decision as to which network will be connected to by each of the Proposed Developments will be made following Government funding announcements and commercial discussions.

1.4 Consenting Regime and Requirement for EIA

1.4.1 As noted above, planning consents for the Proposed Developments are to be sought via two planning applications under the Town and Country Planning Act 1990.

1.4.2 With regards to EIA, the relevant regulations are the Town and Country Planning (EIA) Regulations 2017 (as amended) (hereafter referred to as the 'EIA Regulations').

1.4.3 The Proposed Developments are of a type which falls within Schedule 1 Part 23 of the EIA Regulations ("*Installations for the capture of carbon dioxide streams for the purposes of geological storage pursuant to Directive 2009/31/EC from installations referred to in this Schedule, or where the total yearly capture of carbon dioxide is 1.5 megatonnes or more*"). As such the Proposed Developments comprise 'EIA development' and an EIA is required to accompany the Applications.

1.4.4 Although not mandatory, an EIA Scoping Report was submitted to NLC to commence the EIA process and represented the first notification to NLC, as the Local Planning Authority (LPA), that the Applicants will undertake an EIA in respect of the Proposed Developments and produce an ES to report the findings of the EIA.

1.4.5 EIA is an iterative process that feeds into the engineering design process to mitigate significant environmental effects where they are predicted to occur. The final design iteration, along with the findings of the EIA are reported in this ES, in accordance with EIA Regulations.

1.4.6 The ES covers both the Proposed VPI Development and the Proposed Phillips 66 Development (including assessment of each in isolation as well as the whole Proposed Development) and is submitted with each of the Applications.

1.4.7 The Applicant has formally notified NLC in writing under Regulation 8(1)(b) of the EIA Regulations that an ES would be prepared in respect of the Proposed Development. The Proposed Development is therefore 'EIA development' for the purposes of the EIA Regulations and this ES summarises the results of the EIA work undertaken.

1.5 EIA Scoping

1.5.1 The issues that the Applicant considered the EIA should address were identified in the EIA Scoping Report (Appendix 1A in ES Volume II) submitted to NLC pursuant to Regulation 15 of the EIA Regulations on 25 January 2022. The EIA Scoping Report was developed with reference to standard guidance and best practice following initial consultation with a number of statutory consultees and was informed by the EIA team's experience of working on a number of similar projects.

1.5.2 NLC's Scoping Opinion was received on 11 March 2022, including the formal responses received from consultees, and is presented within Appendix 1B (ES Volume II). Key issues raised in the Scoping Opinion are summarised at the start of each technical chapter of the ES, with all matters having been considered during the EIA process.

1.5.3 The EIA scoping process concluded that the following environmental topics required assessment and would be reported in the ES:

- Air Quality;
- Noise and Vibration;
- Traffic and Transport;
- Water Resources and Flood Risk;
- Landscape and Visual Amenity;
- Cultural Heritage;
- Ecology and Nature Conservation;
- Geology, Hydrogeology and Land Contamination;
- Waste Management;
- Climate Change and Carbon;
- Major Accidents and Disasters; and
- Socio-economics and Human Health.

1.6 EIA Methodology and Reporting

1.6.1 The EIA has been carried out in accordance with the requirements defined by the EIA Regulations. The information presented in the ES describes the findings of the EIA.

1.6.2 The ES sets out the process followed during the EIA including the methods used for the collection of data and for the identification and assessment of impacts and effects, and the findings of the EIA. Any assumptions made or limitations on the assessments are clearly identified.

1.6.3 The EIA process is designed to be capable of considering, and sensitive to, changes that occur as a result of changes to the design, including any mitigation measures that are incorporated during the EIA.

1.6.4 The EIA is based on a number of related activities, as follows:

- establishing existing baseline conditions;
- consultation with statutory and non-statutory consultees throughout the pre-planning application process;
- consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to EIA;
- consideration of technical standards for the development of significance criteria;
- review of secondary information, previous environmental studies and publicly-available information and databases;
- physical surveys and monitoring;
- desk-top studies;
- computer modelling;
- reference to current legislation and guidance; and
- expert opinion.

1.6.5 Impacts are considered on the basis of their magnitude, duration and reversibility. Cumulative and combined effects are also to be considered where appropriate. Significance is evaluated on the basis of the scale of the impact and the importance or sensitivity of the receptors, in accordance with standard assessment methodologies (major, moderate, minor and not significant).

1.6.6 Where likely significant environmental effects are identified in the assessment process, measures to mitigate these effects are put forward.

1.6.7 The EIA adopts a worst-case assessment basis, based on the Proposed Developments' design and adopting the principles of the Rochdale Envelope, wherever specific parameters cannot yet be fixed for the Proposed Development. This is detailed further in Chapter 3: Project Description, Need and Alternatives (ES Volume I).

Structure of the ES

1.6.8 The structure of the ES reflects the assessment topics agreed through the EIA Scoping process.

1.6.9 The ES comprises the following documents:

- **Non-Technical Summary (NTS)**: this document provides a summary of the key issues and findings of the EIA in non-technical language.
- **Volume I**: Environmental Statement Main Text. This contains the full text of the EIA with the chapter headings as follows:
  1. Introduction and EIA Methodology;
  2. Site and Site Surroundings
  3. Proposed Developments Description, Need and Alternatives;
  4. Construction Programme and Management;
  5. Policy Context;
  6. Air Quality;
  7. Noise and Vibration;
  8. Traffic and Transport;
  9. Water Environment and Flood Risk;
  10. Landscape and Visual Amenity;
  11. Cultural Heritage;

12. Ecology and Nature Conservation;
13. Geology, Hydrogeology and Land Contamination;
14. Climate Change;
15. Materials and Waste;
16. Major Accidents and Disasters;
17. Socio-economics and Human Health;
18. Cumulative and Combined Effects; and
19. Summary of Significant Environmental Effects.

- **Volume II**: Figures
- **Volume III**: Technical Appendices: These provide supplementary details of the environmental studies conducted during the EIA including relevant data tables, figures and photographs.

Structure of the Technical Chapters

1.6.10 Technical Chapters 6 to 17 of the ES are structured based on standard subheadings, as described below.

Section 1 Introduction

1.6.11 The Introduction briefly summarises the scope of the assessment presented within the chapter.

Section 2 Legislation and Planning Policy Context

1.6.12 The Legislation and Planning Policy Context section provides a brief overview of the relevant legislation, planning policy and technical guidance relevant to the assessment.

Section 3 Assessment Methodology and Significance Criteria

1.6.13 The assessment method incorporates feedback from consultation that has been undertaken throughout all stages of the project, highlighting any key issues that have arisen from the EIA scoping exercise that have been specifically addressed within the EIA.

1.6.14 The methods used in undertaking the technical study are outlined in this section with reference to published standards, guidelines and relevant significance criteria.

1.6.15 The method for evaluating the significance of effects before and after mitigation is described with reference to definitive standards, accepted criteria and legislation where available. Where it is not possible to quantify impacts, qualitative assessments are carried out, based on available knowledge and professional judgment. Where uncertainty exists, this is noted.

1.6.16 Specific criteria for each technical assessment are set out, giving due regard to:

- extent and magnitude of the impact;
- impact duration (whether short, medium or long term);
- impact nature (whether direct or indirect, reversible or irreversible);
- whether the impact occurs in isolation, is cumulative or interactive;
- performance against environmental quality standards where relevant;
- sensitivity of the receptor; and
- compatibility with environmental policies and standards.

1.6.17 For issues where definitive quality standards do not exist, significance may be based on the:

- local, district, regional or national scale or value of the resource affected;
- number of receptors affected;

- sensitivity of these receptors; and
- duration of the impact.

1.6.18 In order to provide a consistent approach to expressing the outcomes of the various studies undertaken as part of the EIA, and thereby enable comparison between effects upon different environmental components, the following matrix is applied throughout the ES to define effects, unless otherwise specified and explained.

Table 1.1: 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

1.6.19 For the purpose of this EIA, moderate and major effects (shaded orange in the matrix above) are deemed 'significant', and where possible mitigation measures have been identified to reduce the residual effects to 'not significant' (minor or negligible).

1.6.20 Each of the technical chapters provide the criteria, including sources and justifications, for quantifying the different levels of residual effect. Where possible, this has been based upon quantitative and accepted criteria (for example, the National Air Quality Strategy objectives or noise assessment guidelines), together with the use of value judgment and expert interpretation to establish to the scale of an effect.

Section 4 Baseline Conditions (including Future Baseline)

1.6.21 In order to assess the potential impacts and effects of the Proposed Developments, it is necessary to determine the environmental conditions that currently exist on the Phillips 66 Site and VPI Site and in the surrounding area, for comparison. These are known as the existing baseline conditions. Baseline conditions are determined using the results of site surveys and investigations or desk-based data searches, or a combination of these, as appropriate.

1.6.22 The EIA also considers future baseline conditions taking account of any planned or likely changes to the existing baseline, for comparison to future 'with development' scenarios – for example, future baseline flood risk with climate change.

Section 5 Development Design and Impact Avoidance

1.6.23 Measures that have been integrated into the Proposed Developments in order to avoid or reduce adverse environmental effects will be described. Such measures may include refinement of the design and layout of the Proposed Developments to avoid impacts on sensitive receptors, implementation of Environmental Management Plans, and adherence of relevant legislation, guidance and best practice. The assessment of impacts and effects in the next section takes account of these measures already being in place.

Section 6 Likely Impacts and Effects of the Proposed Developments

1.6.24 This section identifies the likely impacts and effects resulting from the Proposed Developments. The likely impacts and effects associated with the Proposed Phillips 66 Development and the Proposed VPI Development are assessed separately as well as together (project-wide) to provide transparency and clarity to the planning process.

1.6.25 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.

1.6.26 The technical assessments identify the environmental impacts of the Proposed Developments at key stages in their construction, operation (including maintenance) and eventual decommissioning.

1.6.27 The assessment scenarios that are considered for the purposes of the EIA (and considered in the ES) are as follows:

- Existing Baseline without the Proposed Developments – the year that the baseline data has been collected;
- Future Baseline without the Proposed Developments – for comparison respectively with the construction and operation scenarios described below;
- Construction of the Proposed Developments;
- Opening and/ or Operation (including maintenance) of the Proposed Developments – where opening represents the start of operation; and
- Decommissioning of the Proposed Developments.

Section 7 Mitigation and Enhancement Measures

1.6.28 The Mitigation and Enhancement Measures section will describe the measures that will be implemented by the Applicants to reduce any significant adverse effects identified by the assessment and enhance beneficial effects during construction and operation of the Proposed Developments.

Section 8 Residual Effects and Conclusions

1.6.29 Effects of the Proposed Developments remaining following the implementation of available mitigation measures are known as 'residual effects'. These are discussed for each of the potential effects, and their significance level identified.

1.6.30 As for the 'before mitigation' effects, residual effects associated with the Proposed Phillips 66 Development and the Proposed VPI Development will be assessed separately as well as together (project-wide) to provide transparency and clarity to the planning process.

1.7 Statement of Competence

1.7.1 As required under Regulation 18(5)(b) of the EIA Regulations, an ES must be accompanied by a statement outlining the relevant expertise or qualifications of those involved in its preparation. A statement of competence of the EIA coordinators and the technical specialists that have provided expert input to the ES is included as Appendix 1C (ES Volume II).

1.8 Consultation

1.8.1 Consultation is integral to developing the proposals and related assessments that underpin a planning application and the EIA process. The views of consultation bodies and information provided by the local community serve to focus the environmental studies and to identify specific issues that require further investigation, as well as to inform aspects of the design of the Proposed Development. Consultation is an ongoing process as part of the design development.

1.8.2 Consultation with statutory consultees regarding the technical scope and approach to the EIA has been ongoing throughout the EIA process, and is described in the technical chapters of this ES.

1.8.3 Public consultation has also been undertaken in accordance with a consultation strategy agreed with NLC. This has included a project website, newsletters, social media, meetings with local councillors, communications with the Humber Refinery Community Advisory Committee, in-person events at local venues and interactive virtual events. Feedback has been collected via the events, feedback forms (postal and online), the project website, email and freepost.

1.8.4 Feedback has been analysed and given regard during the finalisation of the planning applications and this ES.

1.8.5 A summary of the public consultation that has been undertaken, the feedback received and the responses made, is provided in the Consultation Report that accompanies the planning applications.

1.9 References

Department for Business, Energy and Industrial Strategy (2021) *Industrial Decarbonisation Strategy*. [Available at] Industrial Decarbonisation Strategy (publishing.service.gov.uk)

APPENDIX 4

CO2 Capture, Transport and Storage

Interface workshop

Action List

A workshop was held on the 4th and 5th January 2023 between VPI, Harbour Energy and Phillips 66 to discuss the potential land interfaces for each project associated with the undeveloped land south of the existing VPI power station. The main aim was to discuss implications for each stakeholder during execution and operation. A slide pack was produced to guide the meeting along with some preliminary overall plot playouts and these will be shared with this document. The information below are the main action items that came from the discussions along with a target end date for resolution.

1. Phillips 66 require an access corridor for future services from the west side of the undeveloped land to the east. Investigate if the pipeline corridor could be located north of the proposed T&S compounds and South of the VPI capture plant. Phillips 66 to lead initial investigation and propose solutions to the other stakeholders. End of Q1 2023
    a. The southern pipe route around the boundary may have challenges in terms of ground elevation. Phillips 66 to assess potential impacts on future projects. End of Q1 2023
    b. Phillips 66 to inform if the potential utility corridors will include power cables. This potentially influences underground pipeline design and Cathodic Protection. End of Q1 2023

2. Investigate the space requirements for potential future emitters to export CO2 and terminate at the T&S compound. Phillips 66 to lead. End of Q1 2023

3. Harbour Energy to investigate the optimum location, size and orientation for their T&S compound in the Southern area allocated to CO2 gathering.
    a. This study should consider requirements for the Cathodic Protection bed and craneage for future maintenance activities. End of Q1 2023
    b. The study should Investigate options for the T&S compound to be located away from the current proposed location on the undeveloped land to other suitable locations around the industrial area. Avoiding locations associated with current known projects such as the Gigastack and VPI expansion. End of Q1 2023

4. Harbour Energy to define what a temporary and permanent access is required to the south area for T&S compound construction and operation. End of Q1 2023

5. Stakeholders to collaborate on warehousing and laydown areas required for the construction of each project to assess potential synergies. Phillips 66 to take initial lead on the initial strategy. End of Q1 23
    a. Harbour Energy to share areas that are currently proposed within in the DCO. End of January 2023

6. Harbour Energy will require utilities (Power, water, air, communications, Nitrogen) for their construction activities. Harbour Energy to determine requirements and request from VPI. End of Q1 2023

7. Emergency response requirements for all stakeholders associated with the undeveloped land both during construction works and operation needs to be considered.
    a. Harbour Energy and VPI to share FEL2/FEED QRA information. End of Q1 2023
    b. Phillips 66 are meeting with the HSE in March abut implementation of decarbonisation projects and will feed back to all stakeholders and outcome of the discussions. End of Q1 2023.
    c. Following the initial feedback from stakeholders another touchpoint should be organised between all parties following the government commitment to track 1 and track 2 projects and when the relevant projects have entered the next stages of development. End of Q2 2023.

8. For the undeveloped land several investigations have and are planned to be undertaken. Phillips 66, as part of the agreements in place with the stakeholders, will collate Geotech, environmental and archaeological information. This information can be shared upon request if required.
    a. Harbour Energy to submit an Interface Request for initial survey information collected by VPI. End of January 2023

9. VPI to share spoil removal/cut fill information and what effect this may have on the surrounding area. End of Q1 23

10. Extension to the existing rail crossing pipe bridge and any new intermediate height pipe bridge to cross the open Killingholme drain would be lifted from the VPI side of the rail potentially using the crane pads that were installed for originally lifting in the pipe bridge. Co-ordination required with VPI on the proposed design and lifting study of new structures. Phillips 66 End of Q2 2023

11. Investigate any potential efficiencies in contracting strategy for project execution between the different stakeholders VPI/Phillips 66/Harbour Energy.
    a. Phillips 66 to first investigate how we could collaborate between stakeholders without breeching any competition law. End of Q1 2023

12. Harbour Energy require a water source to hydrotest the underground CO2 pipeline when installation is complete. Harbour Energy have asked Phillips 66 to consider the use of treated refinery effluent for hydrotest. Harbour intend to discharge at Theddlethorpe.
    a. Harbour Energy to submit an Interface Request to Phillips 66 about the use, quantity and quality of water required for hydrotest. End of January 2023
    b. Phillips 66 to investigate suitable water sources and the practicality of supplying to Harbour Energy following IR submission. End of Q1 2023

13. CO2 pipeline dryness is critical to Integrity of pipeline during operation. Harbour Energy to share drying procedures to VPI and Phillips 66. End of Q1 2023

14. Harbour Energy to investigate what agreement is required to continue collaboration after the current MOU expires at end of FEL 2/Feed. End of Q1 2023

15. Harbour Energy to raise Interface Requests to VPI and Phillips 66 regards fiscal metering solutions that align with the Government business models. End of January 2023

16. Phillips 66 and Worley to provide update on the preferred location of the start of the culverting associated with the diverted Killingholme drain. End of January 2023.

17. Commissioning/operational strategy and procedures to be developed by Harbour Energy and shared with potential emitters for review. End of Q1 2023

18. Phillips 66 and Worley to continue to develop an integrated plot plan for the undeveloped land. Stakeholders to issue updates on projects when any significant advances have been made.

Longer term actions

1. The Immingham industrial cluster would benefit from the 2 potential CO2 gathering networks (Viking CCS and HLCP) being interconnected to de-risk any reliability issues and enable the emitters to have a reliable export path. Course of action will become clearer when the cluster sequencing announcements are made.

2. An integrated schedule for all projects and stakeholders to align key execution milestones is deemed best practice to avoid costly clashes during installation. Further guidance on cluster sequencing from the UK Government required for more certainty of schedule goals.

3. Collaboration on permit to work systems and how execution activities in the field will be controlled between all stakeholders.

PROVIDING ENERGY. IMPROVING LIVES.

Harbour Energy

VPI Immingham

HUMBERZERO

VikingCCS

Humber Low Carbon Pipelines project

Worley
energy | chemicals | resources

Technical Integration

Project Execution and Operation

4th January 2023

Restricted Business Confidential

Humber Refinery, UK

Agenda

1. Introductions – Day 1, 13:00
2. Project update – 13:10
3. Objectives – 13:30
4. Proposed land allocation – 13:45
5. Project Execution – 14:00 and Day 2, 09:00
6. AOB – Day 2, 13:00
7. Back-up Slides

2. Project Update

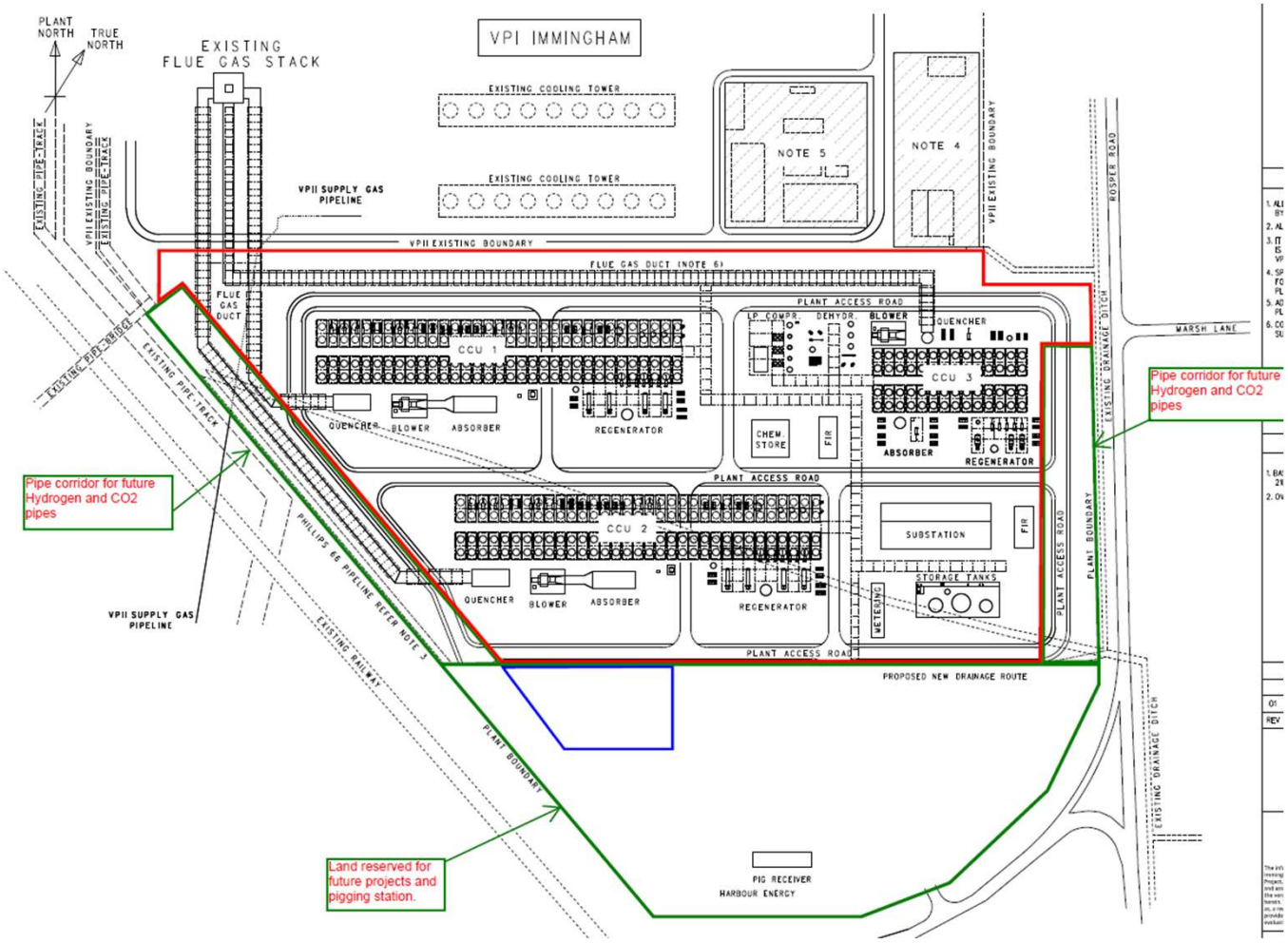
- VPI
  - Humber Zero – Post Combustion Carbon Capture
- Phillips 66
  - Humber Zero – FCC Carbon Capture
  - Gigastack Green Hydrogen
- Harbour Energy
  - Viking CCS
- Other interested stakeholders
  - National Grid Ventures
  - Prax, Others
- Major Project Milestones
  - FID
  - Construction start
  - Commissioning
  - Operation

3. Objectives

- Gain understanding from the main stakeholders of the requirements for land and access to execute each project in a co-ordinated manner
- Identify items that could impact FEED or FEL 2 estimate production
- Identify items that could impact execution schedule
- Identify any critical contractual or commercial agreements that need to be resolved
- Produce a list of action items and assign responsibility to resolve between the stakeholders

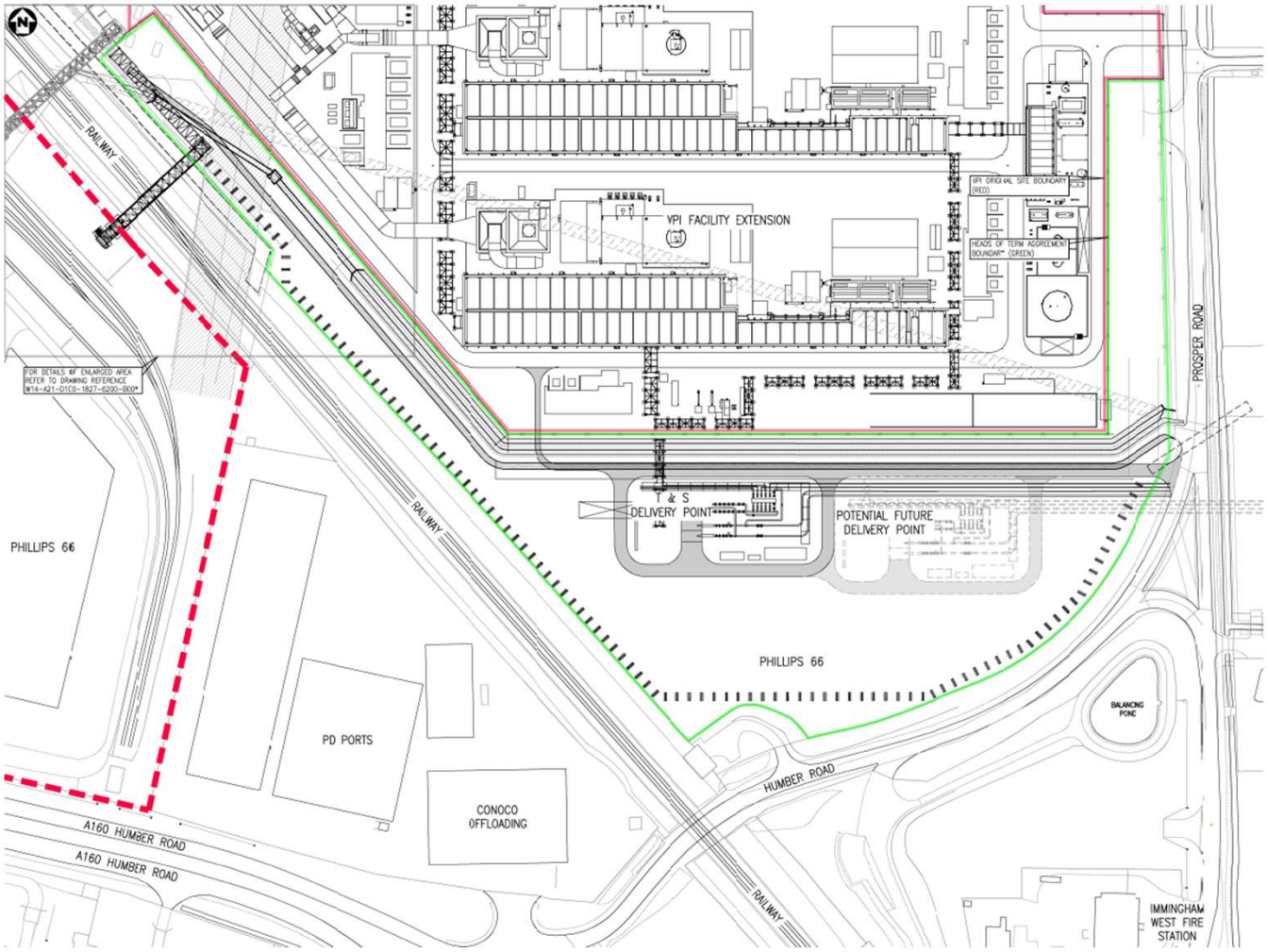
4. Proposed Land Allocation

- Current land allocations



4. Proposed Land Allocation - Continued

- Current land allocations – Detailed plan



5. Project Execution

- Early Enabling works
  - Ditch Diversion
  - Access from Rosper Road
  - Permanent and temporary site access roads
  - Offices and Welfare facilities
  - Utility requirements
    - Power, Air, Water, Drainage, Comms
  - Establishing boundaries
  - Security
  - Warehousing and Laydown
  - Transportation routes
  - Early Environmental works (BNG)

5. Project Execution – Continued

- Civil Works
  - Geotech survey results
  - Foundations
  - Underground Service Routes
    - VCCS
    - HLCP
    - Gigastack
    - HV Cable for Gigastack
    - Existing Gas pipeline
- Above Ground Installations
  - Pipeline Routes
  - Main VPI Capture Plant
  - Gigastack
  - Viking CCS compound
  - HLCP Compound
  - Main Heavy Lifts
  - Logistics (personnel, traffic management plan)
  - Hours of work (12 hour shift, 24 hours, weekends)

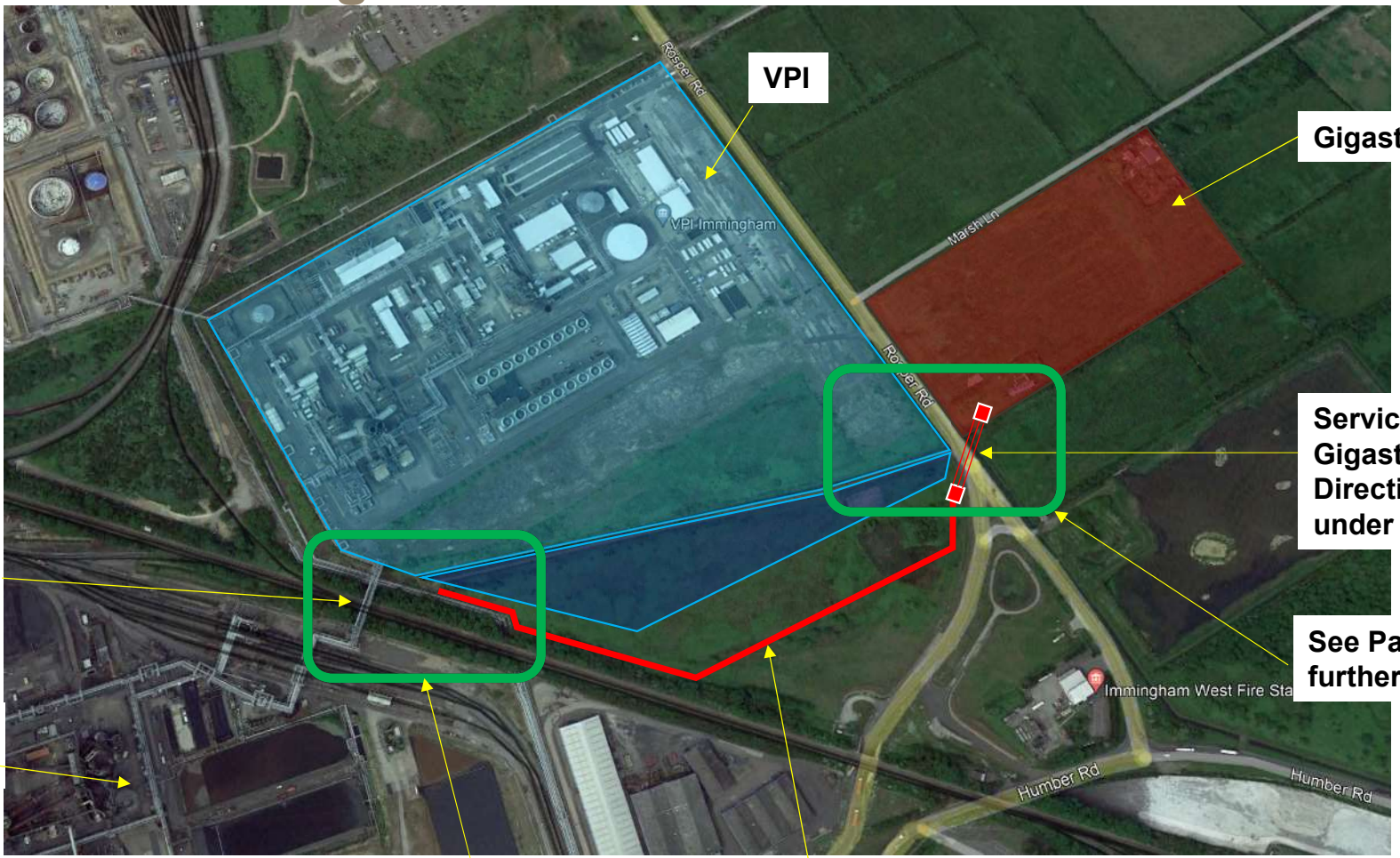
5. Project Execution – Continued

- Commissioning
  - Exclusion Zones
    - Pressure Testing
    - Steam Blowing
    - Emmissions
- External Interfaces
  - Network Rail
  - IDB
  - Highways
- Operational Limitations
  - Live pipework & Cables
  - Noise
- Sequencing / Milestones
  - Enabling Works
  - Main Works
  - Existing site Turnaround periods
  - Commissioning Sequence

6. AOB

- Contract agreement
  - HoT
- Action Review

7. Back-Up Slides – Gigastack



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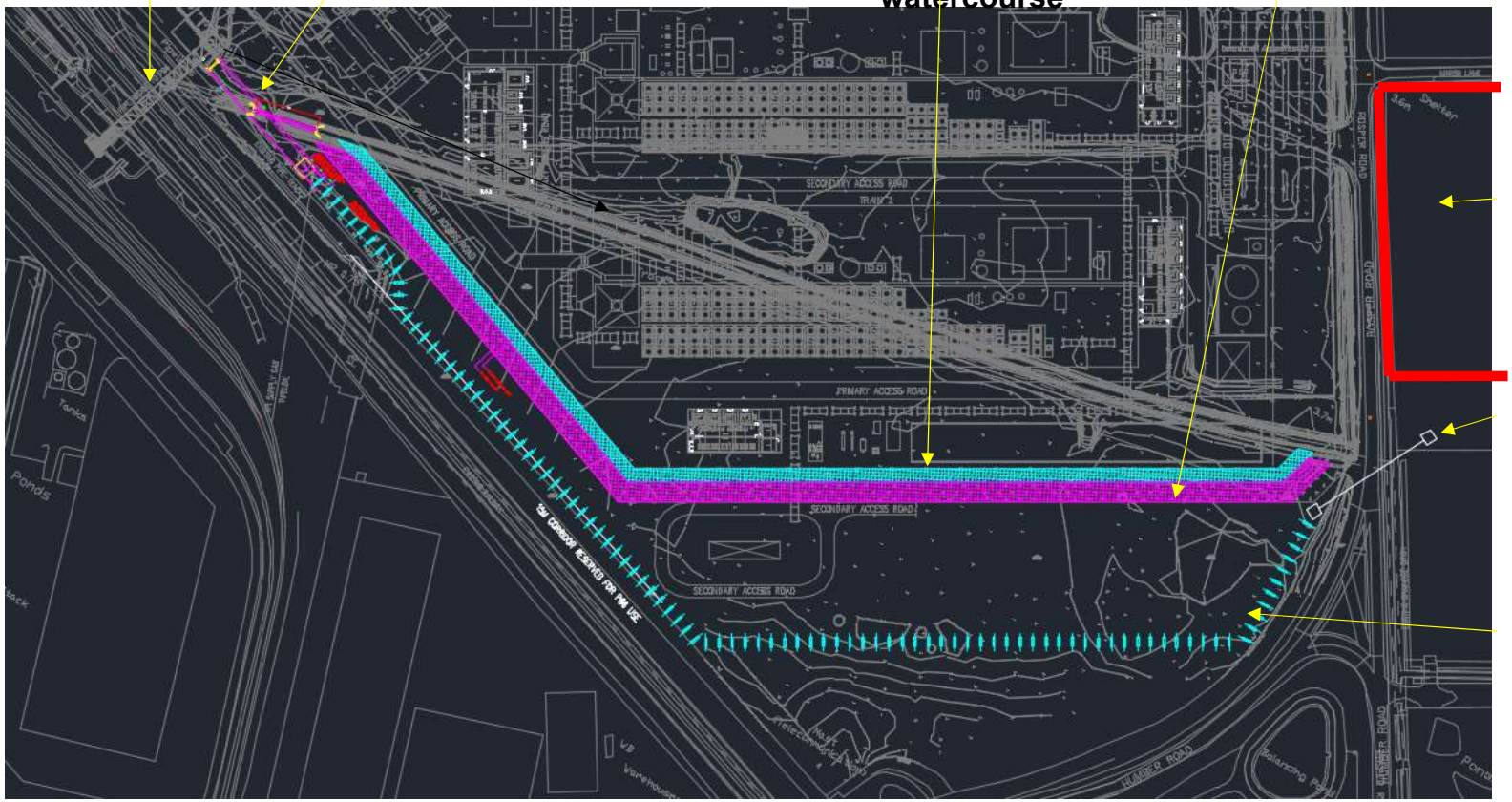
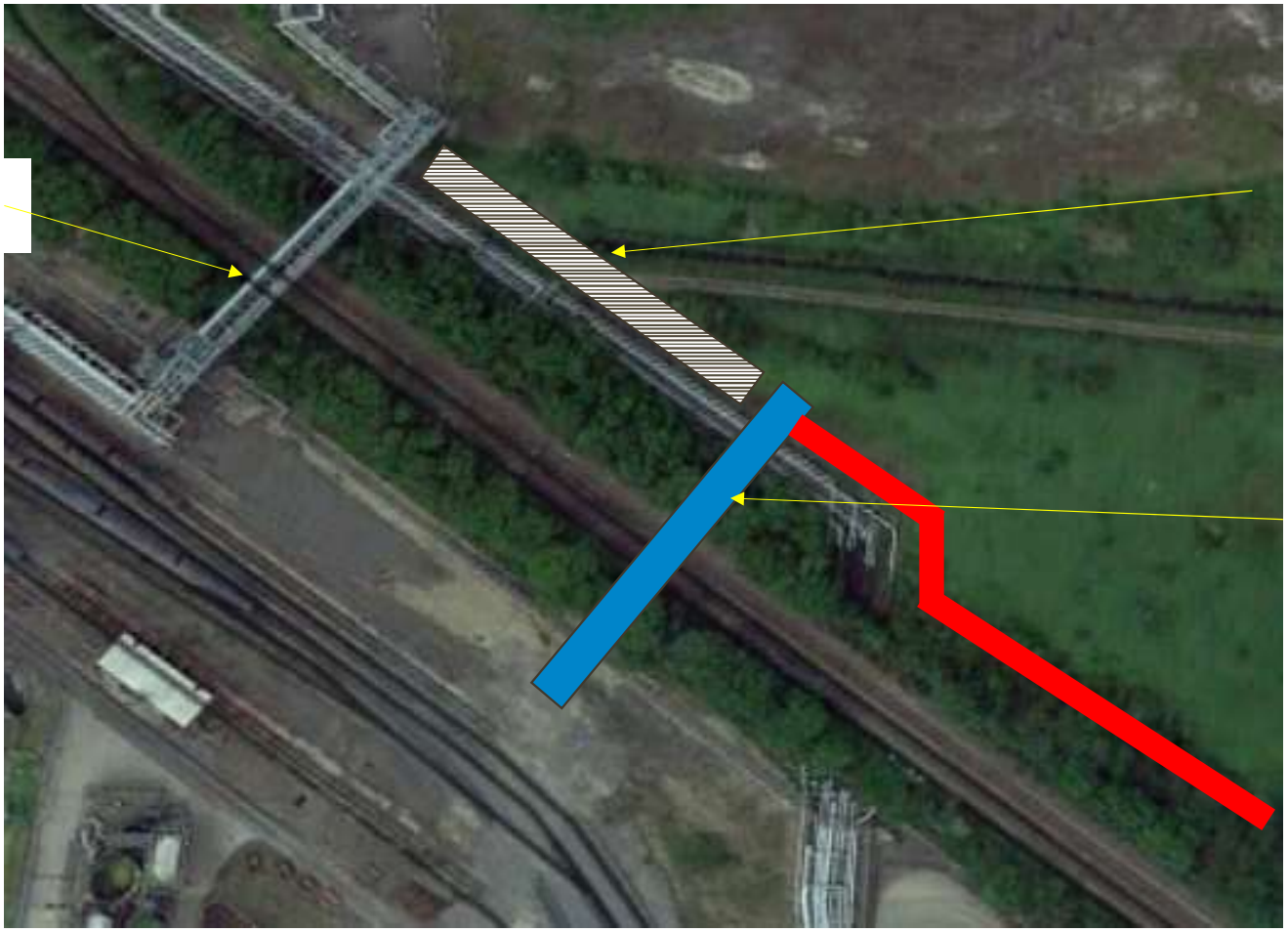


7. Back-Up Slides – Gigastack

Existing Pipebridge over rail lines

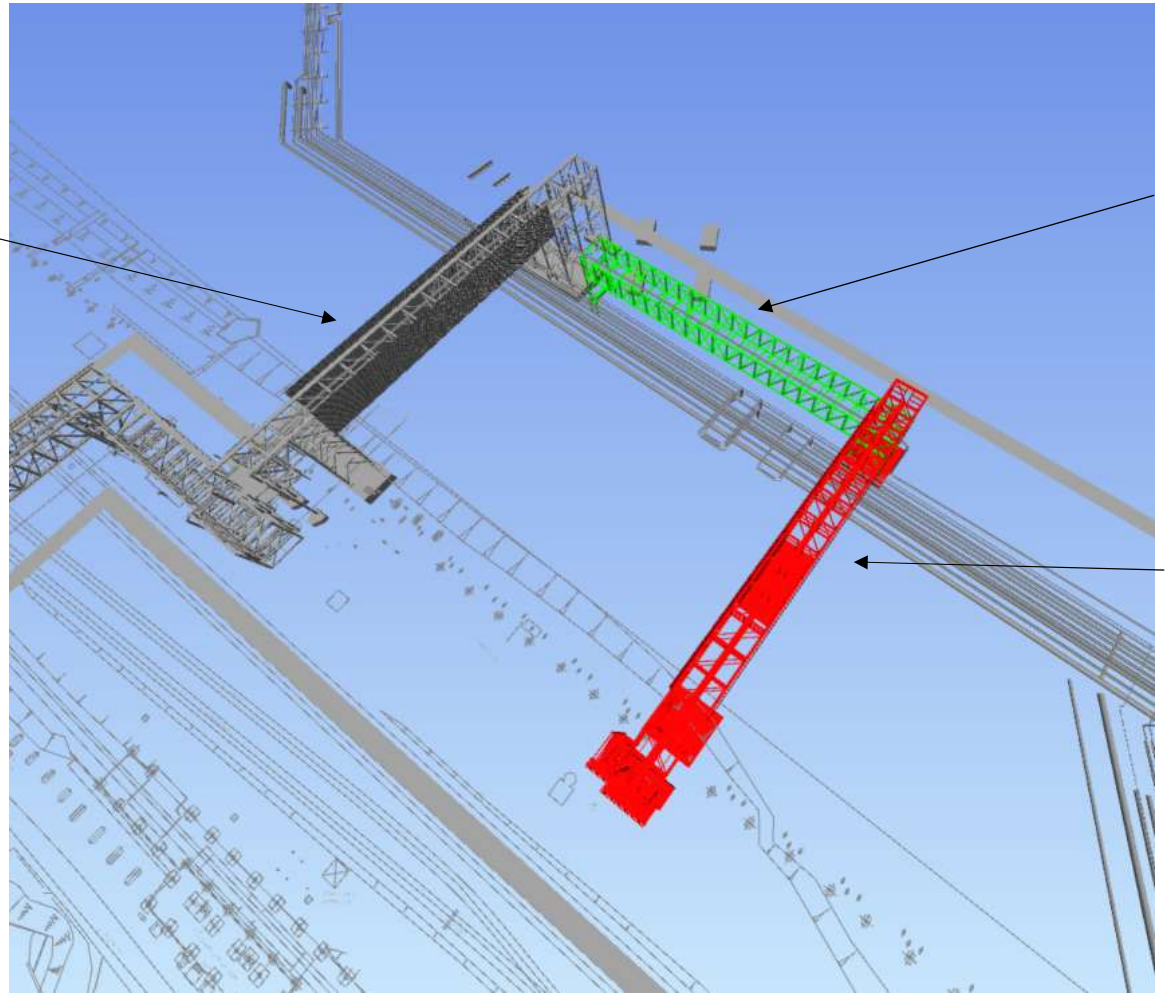


OPTION 1:
Use existing pipebridge for new pipes and cable routing from P66. New Pipebridge to be constructed to ensure maintenance access is not compromised. New low level pipe track to be used from pipebridge to Gigastack

OPTION 2:
New Pipebridge to be constructed over rail lines. New low level pipe track to be used from pipebridge to Gigastack

7. Back-Up Slides – Gigastack

Existing Pipebridge over rail lines



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7. Back-Up Slides – Gigastack

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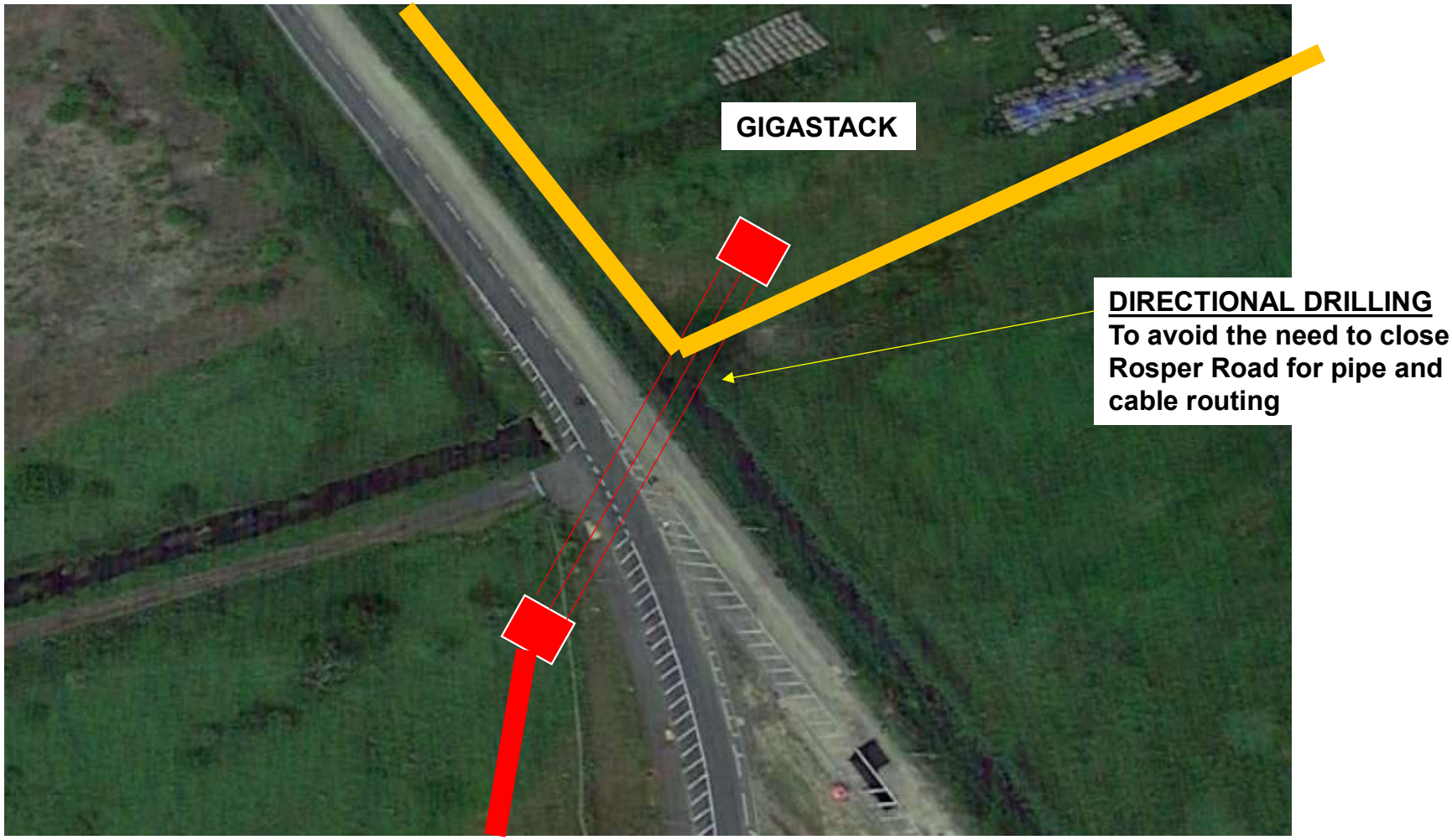
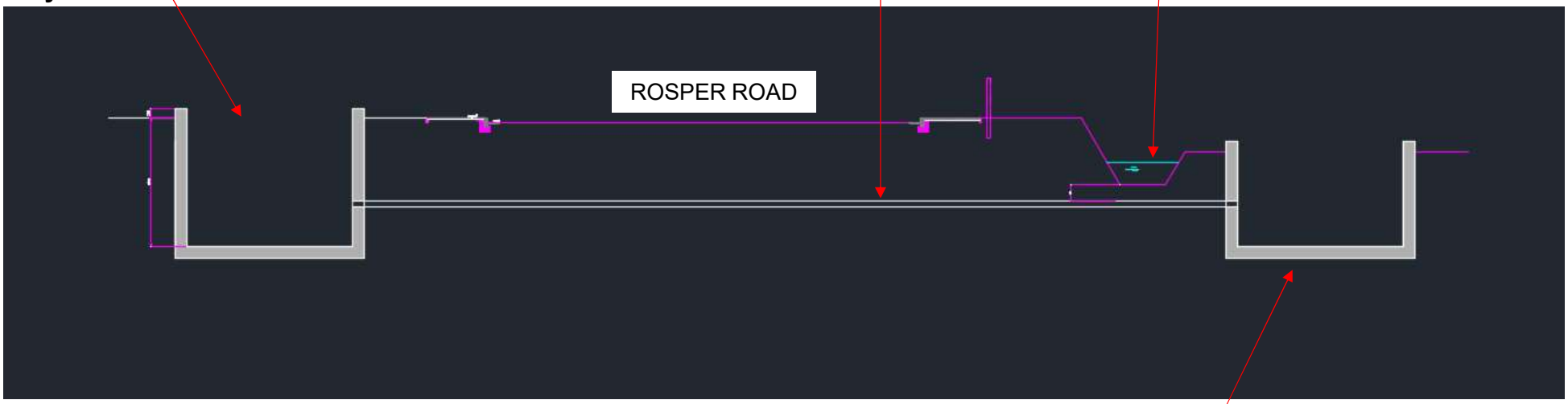


7. Back-Up Slides – Gigastack



7. Back-Up Slides – Gigastack

Existing drainage watercourse to be diverted

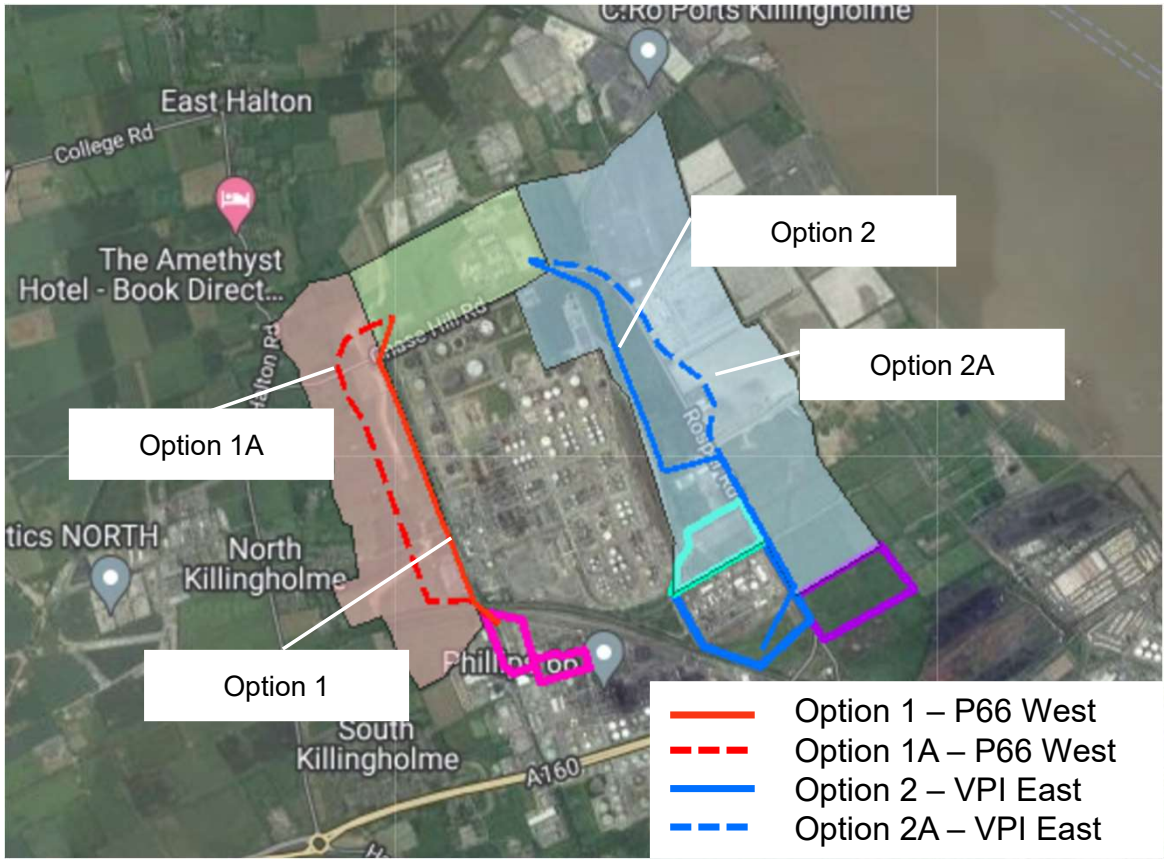
Existing Maintenance access to P66 boundary

7. Back-Up Slides – Gigastack Cable Route Options

Add diagram for the cable route options

7. Back-Up Slides – HLCP

- To identify a feasible pipeline corridor between P66/ VPI Immingham and National Grid Ventures HLCP.
- To route the pipeline in a linear manner, minimising changes in direction.
- Adhere to all necessary statutory and regulatory requirements.
- To avoid, minimise and manage impacts on the local environment and community.
- To utilise existing infrastructure and routing corridors where possible.
- To be constructable with minimum disruption to existing assets.
- Consideration of environmental and ecological constraints using open source/ client supplied data.



7. Back-Up Slides – HLCP

Section 3: Scunthorpe to Killingholme

This section of the map shows the proposed route between Scunthorpe and Killingholme. It includes:

Scawby AGI
(Block valve KP 57.4 / KP 57)
This Above Ground Installation (AGI) will include two block valves - one for hydrogen and one for carbon dioxide. Each block valve will be approximately 90m x 90m plus a natural planting strip to reduce visual effects. We are considering two different site options, A and B. Please note these site options are identified as block valves KP 57.4 (option A) and KP 57 (option B) in the PEIR.

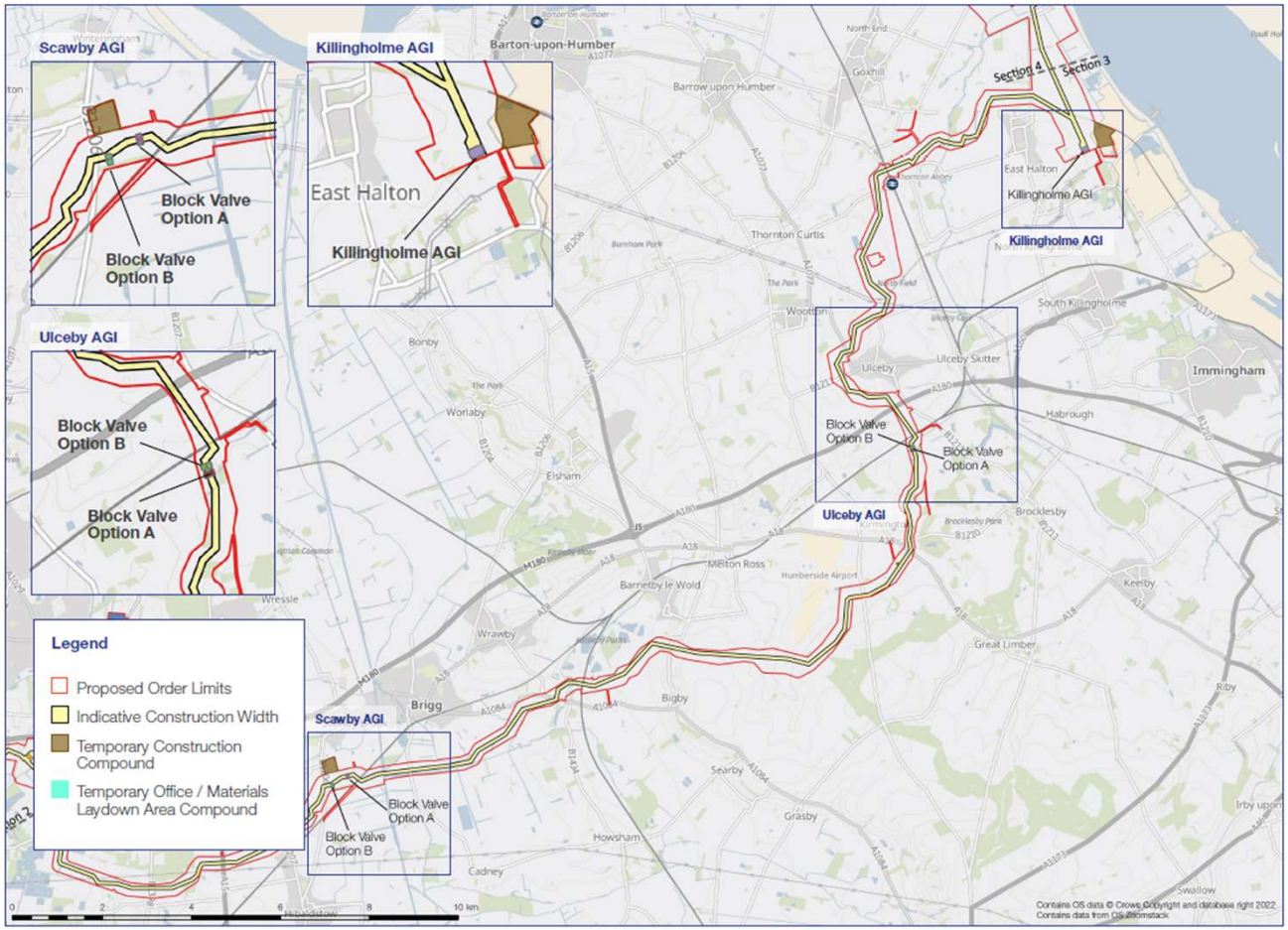
Ulceby AGI
(Block valve KP 75.1 / KP 75.2)
This AGI will include two block valves - one for hydrogen and one for carbon dioxide. Each block valve will be approximately 90m x 90m plus a natural planting strip to reduce visual effects. We are considering two different site options, A and B. Please note these site options are identified as block valves KP 75.1 (option A) and KP 75.2 (option B) in the PEIR.

Killingholme AGI (multi-junction)
This AGI will be a multi-junction installation of approximately 125m x 185m in size plus a natural planting strip to reduce visual effects. We have selected a single preferred site for this AGI.

The maximum building height would be approximately 8m with a temporary vent stack of up to approximately 5m.

For further information on the temporary construction compounds, including trenchless crossing compounds, please see the non-technical summary, Section 2.4; or the PEIR, Chapter 2 Project Description, Section 2.8.

Please use your feedback form to give us your views.



7. Back-Up Slides – HLCP

Section 4: Killingholme to Hedon

This section of the map shows the proposed route between Killingholme and Hedon. It includes:

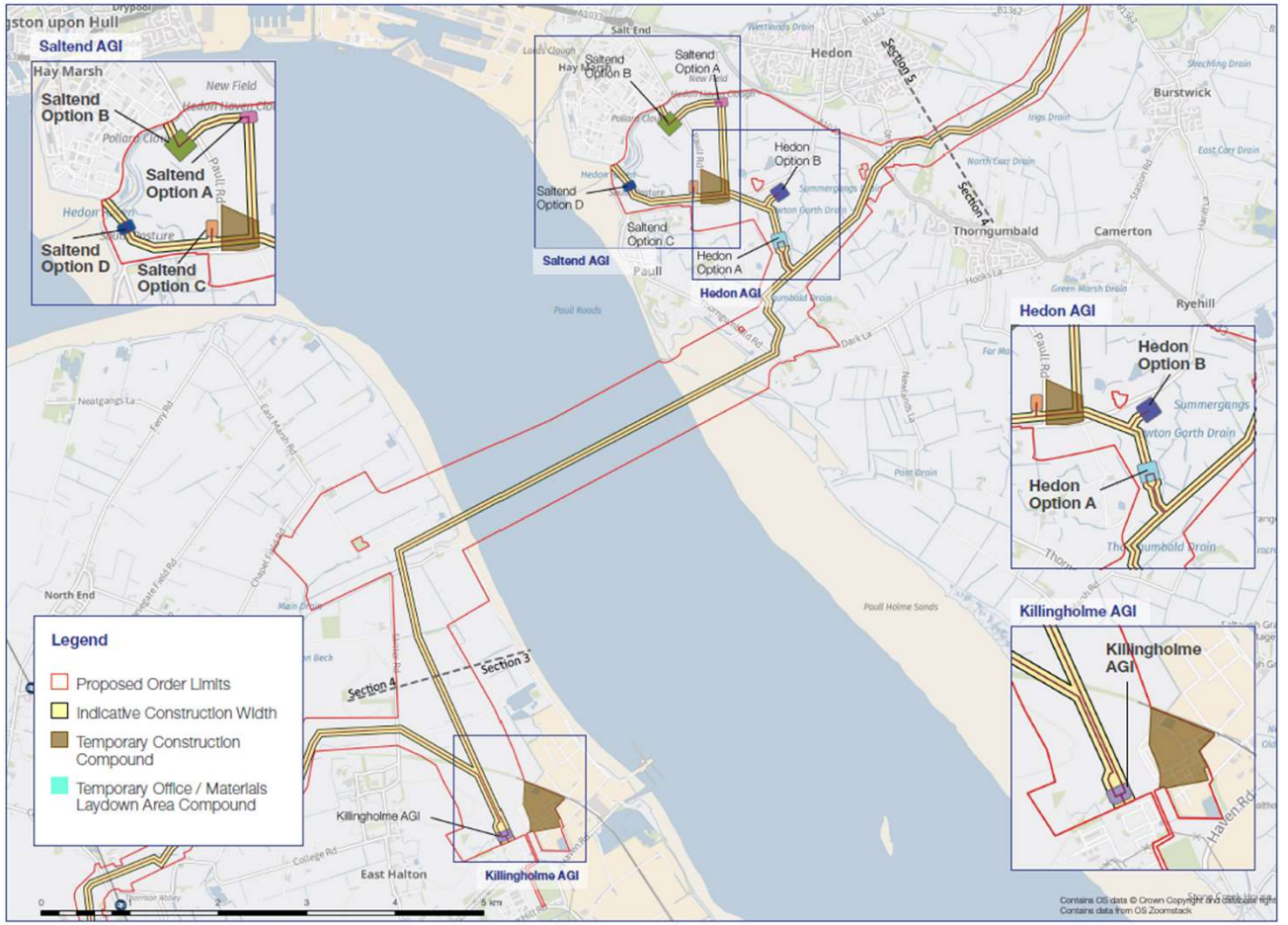
Saltend AGI (PIG Trap)
This Above Ground Installation (AGI) will be a PIG Trap of approximately 120m x 165m in size plus a natural planting strip to reduce visual effects. We are considering four different site options: A, B, C and D. Our current preference is option D.

Hedon AGI (multi-junction)
This AGI will be a multi-junction installation of approximately 180m x 180m in size plus a natural planting strip to reduce visual effects. The interconnecting pipeline from Saltend AGI connects into this installation. We are considering two different site options, A and B. Our current preference is Option A.

For all AGIs in this section, the maximum building height would be approximately 8m with a temporary vent stack of up to approximately 5m.

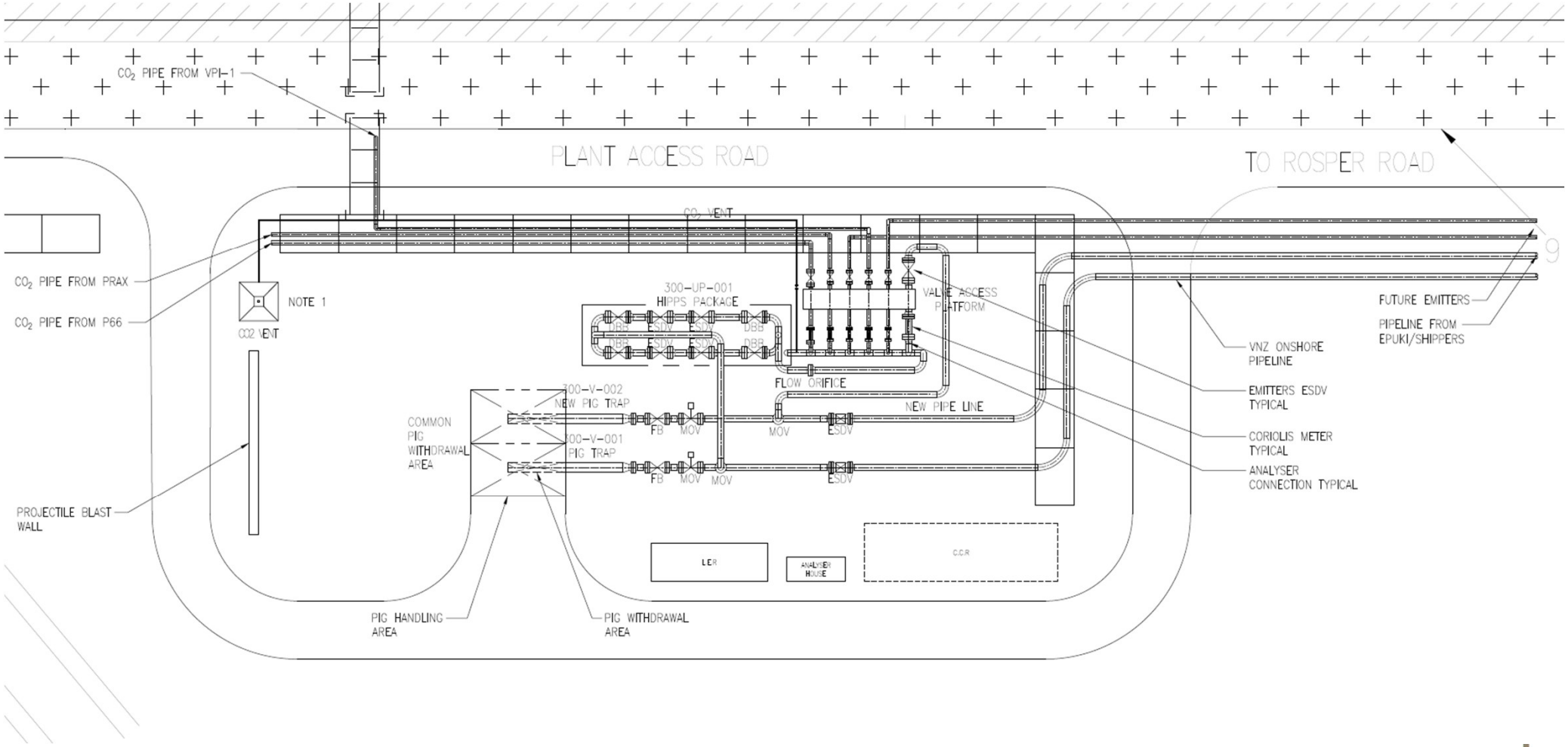
For further information on the temporary construction compounds, including trenchless crossing compounds, please see the non-technical summary, Section 2.4; or the PEIR, Chapter 2 Project Description, Section 2.8.

Please use your feedback form to give us your views.

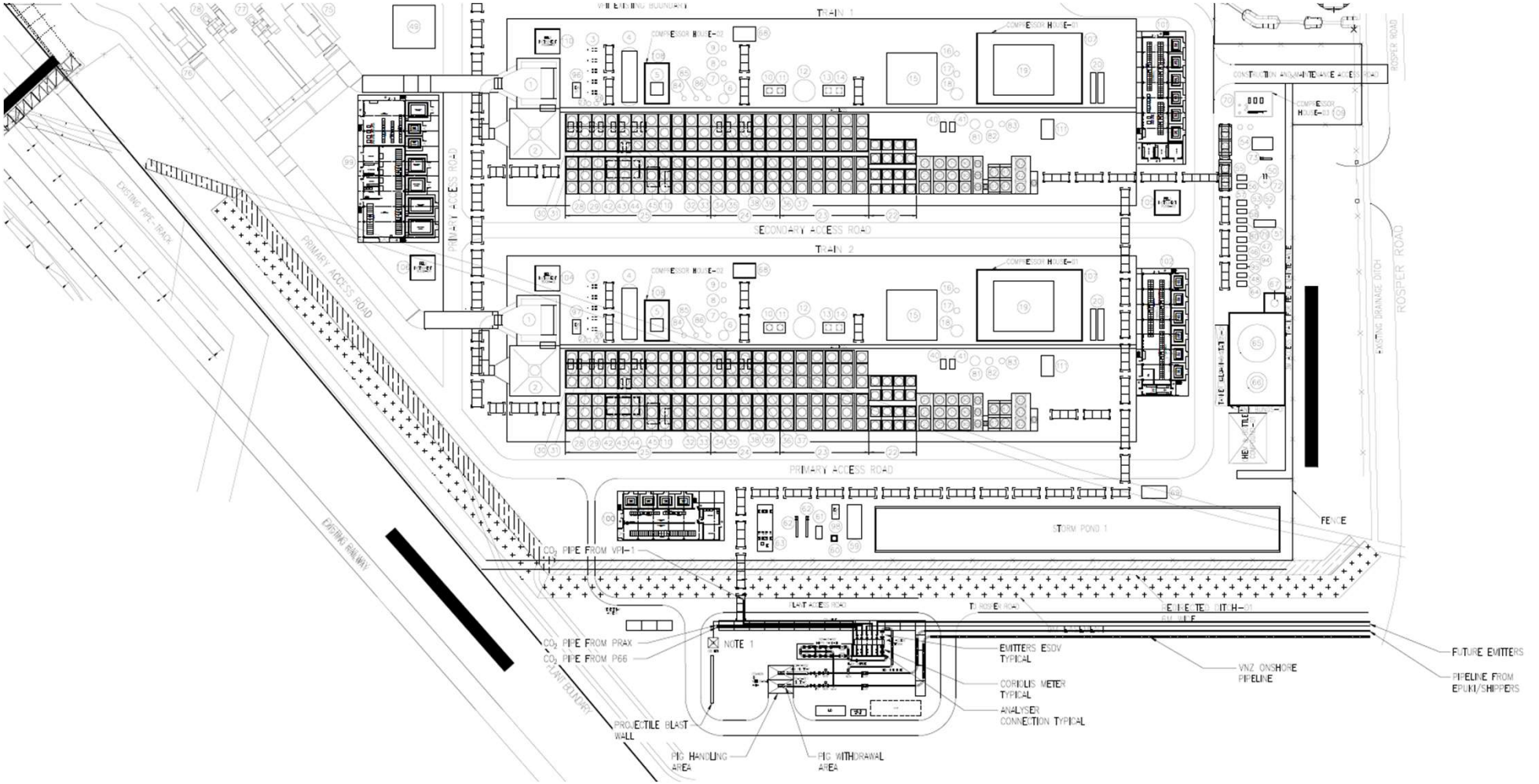


7. Back-Up Slides – HLCP

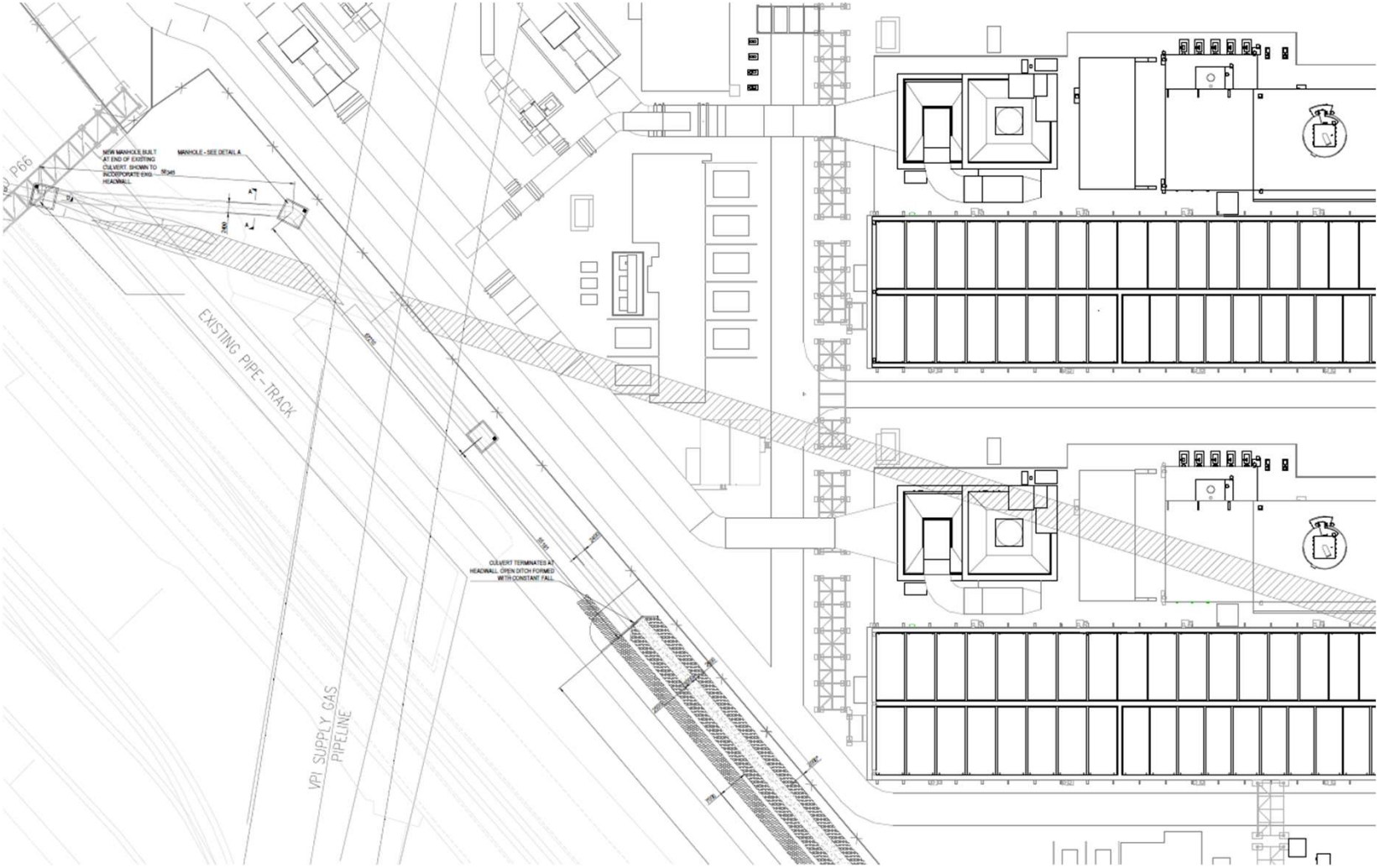
7. Back-Up Slides – Harbour Energy Viking CCS Proposed Layout



7. Back-Up Slides – Harbour Energy Viking CCS Proposed Layout



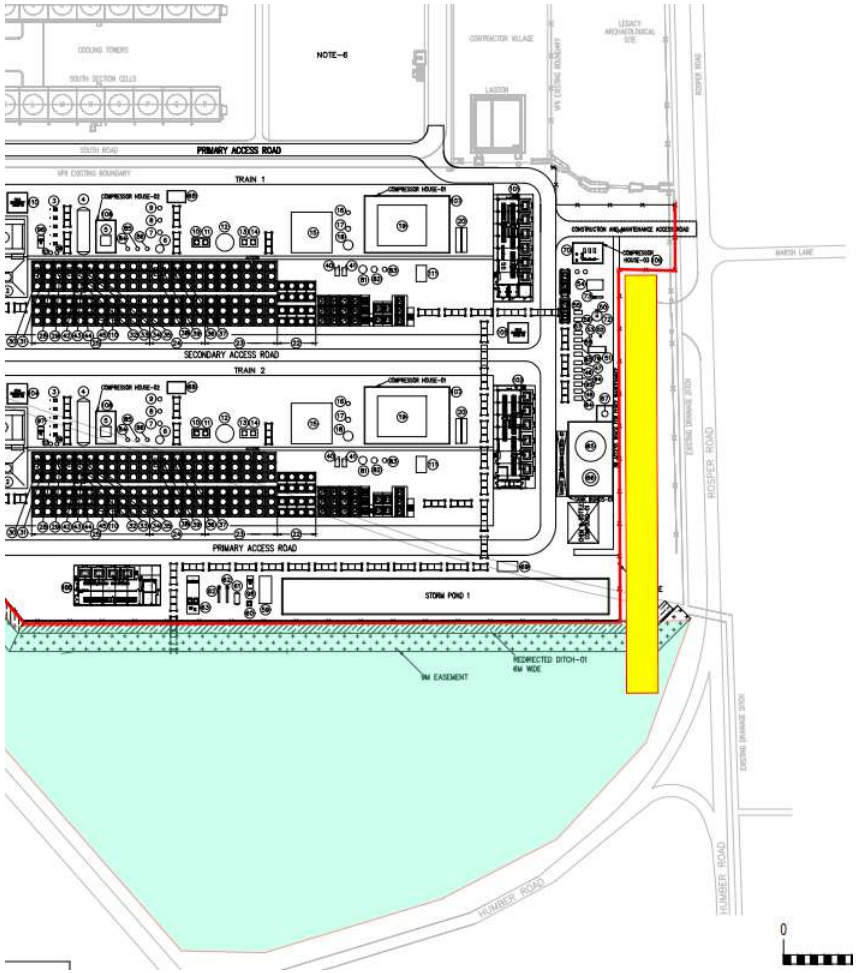
7. Back-Up Slides – VPI Ditch Diversion

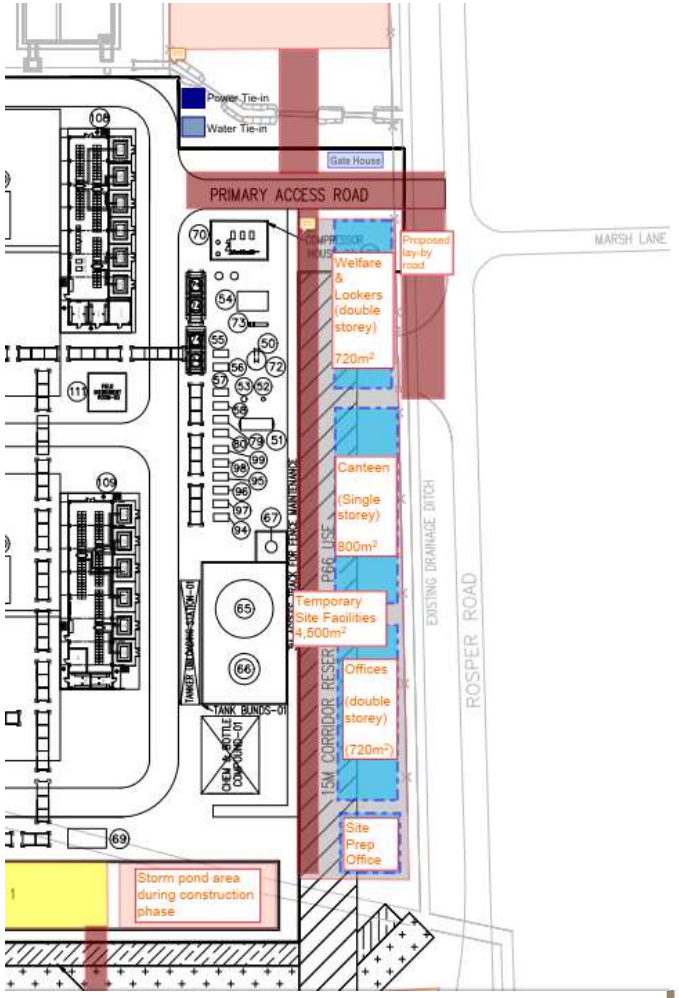


7. Back-Up Slides – VPI Ditch Diversion & Bridge

7. Back-Up Slides – VPI Temporary Works

- VPI-I PCC Project land lease boundary shown in Red
- Light blue area represents P66 land reserved for other related decarbonization projects
- Yellow corridor indicated to east to show space requirement for future pipelines “subject to consents”.
- Proposed new access to the site requiring culverted crossing of the existing IDB ditch.





APPENDIX 5

Two offshore wind-to-hydrogen projects withdraw from UK's first electrolytic allocation round

BUSINESS & FINANCE (HTTPS://WWW.OFFSHORE-ENERGY.BIZ/TOPIC/BUSINESS-FINANCE/)

August 18, 2023, by Adrijana Buljan

An Ørsted-Phillips 66 partnership and ERM have withdrawn their Gigastack and Dolphyn projects, respectively, from the UK's first electrolytic allocation round (HAR1). While ERM has made the move as it aims at securing alternative funding for a phased multi-unit larger development, Ørsted and Phillips 66 have now halted their Gigastack project. Both projects involve producing hydrogen by using electricity generated by offshore wind.

On 16 August, the UK's Department for Energy Security and Net Zero (DESNZ) said (https://www.gov.uk/government/publications/hydrogen-production-business-model-net-zero-hydrogen-fund-shortlisted-projects/hydrogen-business-model-net-zero-hydrogen-fund-negotiations-list-for-allocation-round-2022) that initial due diligence on the shortlisted projects had been completed and that 17 projects, totalling 262 MW were invited to negotiations, alongside continued due diligence.

Through the HAR1 round, which is scheduled to be concluded before the end of this year, the government expects to award contracts to hydrogen production projects totalling up to 250 MW in capacity, with the first projects from this round having an operation date in 2025.

While the government is now moving forward with 17 hydrogen proposals, three developers have decided to withdraw their projects from the competition, including two offshore wind-to-hydrogen projects: Gigastack, led by Phillips 66 and Ørsted, and Dolphyn Commercial Scale Demonstrator, led by ERM Dolphyn.

Phillips 66 and Ørsted, together with their Gigastack partners ITM Power and Element Energy, entered the HAR1 allocation round with the Gigastack Phase 2 project, at the centre of which is a 100 MW electrolyser system using renewable power from the Hornsea Two offshore wind farm (https://www.offshorewind.biz/2022/08/31/worlds-largest-offshore-wind-farm-goes-into-operation/) to produce green hydrogen. The hydrogen would then be delivered to the Phillips 66 Humber Refinery to replace hydrocarbon-based fuels (https://www.offshorewind.biz/2021/11/15/hornsea-two-to-power-industrial-scale-offshore-wind-to-hydrogen-plant-from-2025/) within industrial-scale fired heaters.

The Gigastack consortium aimed to reach a final investment decision by Q2 2023 and work towards a commercial operating date in 2025.

However, the partners are now pausing the project, saying further project maturation and supply chain development is needed.

"We have made a joint decision to withdraw our bid from the funding process and pause the Gigastack project. We're proud of the huge amount of work we have done to date to accelerate the deployment of green hydrogen, demonstrating both the potential to integrate with offshore wind energy, and the use of hydrogen to refuel critical national infrastructure", a spokesperson for Phillips 66 Ltd and Ørsted said.

"Phillips 66 Limited and Ørsted believe that further project maturation together with supply chain development is required to unlock maximum potential of this world-scale electrolytic hydrogen project. We will continue to work with the governments of the UK, industry and stakeholders to help realise the enormous potential of green hydrogen".

The other offshore wind-to-hydrogen project that was competing in HAR1 was a proposal involving Environmental Resources Management's (ERM) Dolphyn technology, which combines electrolysis, desalination, and hydrogen production on a floating wind platform.

Related Article

Business Developments & Projects

Principle Power wins FEED deal for Dolphyn floating wind-to-hydrogen project (https://www.offshore-energy.biz/principle-power-wins-feed-deal-for-dolphyn-floating-wind-to-hydrogen-project/)

→

ERM applied with a single-unit Dolphyn demonstrator and has now withdrawn from the funding allocation round saying it aims to secure alternative funding for a phased, multi-unit development.

"Dolphyn will focus now on an opportunity to advance the Dolphyn demonstrator within a larger commercial scale project, where the demonstrator forms phase 1 of the roll-out. To facilitate this accelerated approach, we will be moving the location of the demonstrator to a site that will allow expansion at a single location", Dolphyn Hydrogen, a business created by ERM to commercialise the Dolphyn Process Technology, stated in a press release.

"We are excited by the opportunity to progress earlier overall delivery of Dolphyn and to continue working in close collaboration with government, regulators, and wider stakeholders. We share their ambitions that larger scale delivery is required, and this decision allows us to accelerate our growth".

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BUSINESS DEVELOPMENTS & PROJECTS

MOL's zero-emission project utilizing offshore wind and hydrogen hits new milestone (https://www.offshore-energy.biz/mols-zero-emission-project-utilizing-offshore-wind-and-hydrogen-hits-new-milestone/)

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HydePoint joins forces with Nel to scale up offshore and nearshore hydrogen projects (https://www.offshore-energy.biz/hydepoint-joins-forces-with-nel-to-scale-up-offshore-and-nearshore-hydrogen-projects/)

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MARKET OUTLOOKS

BUSINESS DEVELOPMENTS & PROJECTS

Near-term investments, supportive policies to ensure bankability of green hydrogen projects, report finds (https://www.offshore-energy.biz/near-term-investments-supportive-policies-to-ensure-bankability-of-green-hydrogen-projects-report-finds/)

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Fincantieri, Viking launch 'world's first' hydrogen-powered (https://www.offshore-energy.biz/fincantieri-and-viking-launch-worlds-first-hydrogen-powered-cruise-ship-ink-deal-for-two-new-units/)

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TotalEnergies and AirLiquide shake hands on offshore wind-powered hydrogen production (https://www.offshore-energy.biz/totalenergies-and-airliquide-shake-hands-on-offshore-wind-powered-hydrogen-production/)

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Dutch Zeevonk offshore wind-to-hydrogen project gains ground (https://www.offshore-energy.biz/dutch-zeevonk-offshore-wind-to-hydrogen-project-gains-ground/)

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Hydrogen from H2Terminals' offshore energy island to run through East London pipeline (https://www.offshore-energy.biz/hydrogen-from-

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Management plan approved for Ørsted's Australian offshore wind farms (https://www.offshore-

h2terminals-offshore-energy-island-to-run-through-east-london-pipeline/)

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energy.biz/management-plan-approved-for-orsteds-australian-offshore-wind-farms/)

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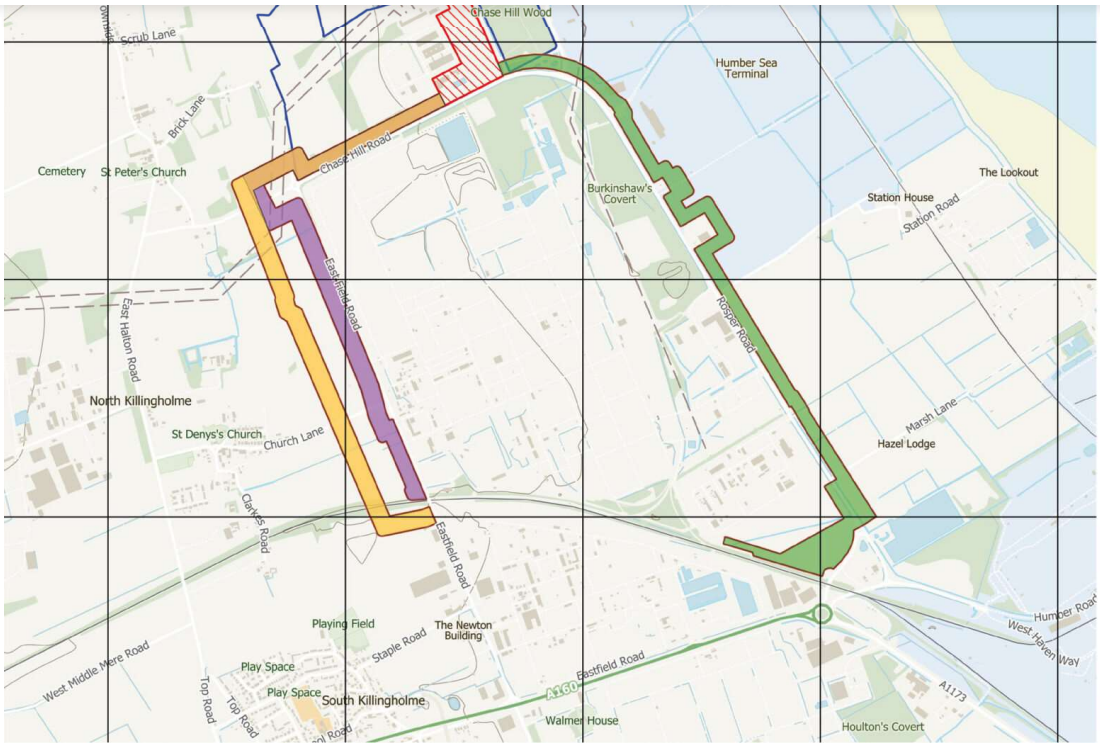
APPENDIX 6

Project plans

Uniper's Killingholme site has huge potential as an energy transformation hub, powering the Humber region and beyond, with the right combination of expertise and location to deliver low-carbon energy solutions, including hydrogen production and supply.



The Humber H_2ub® (Green) project is a proposed large scale, low-carbon hydrogen production facility at Uniper's Killingholme site. The proposed development would include green hydrogen production capability with a capacity of up to 120MW and the potential for future expansion of a further 200MW+. The hydrogen would be used to replace some refinery fuel gas in industrial scale fired heaters as part of Phillips 66 Limited's plans to reduce the Humber Refinery's scope 1 operational emissions.

Uniper's plans for its Humber H_2ub® (Green) project are to produce electrolytic (green) hydrogen which meets the UK Low Carbon Hydrogen Standard*. Electrolytic, or green hydrogen is hydrogen produced via a process of electrolysis, which is splitting water into oxygen and hydrogen using electricity from renewable and other low-carbon power sources.

The best solution for delivering the hydrogen produced at Uniper's Killingholme site to the Humber Refinery will be determined during Front End Engineering Design (FEED) studies, which are due to take place from 2025. However, it is anticipated that the hydrogen would be delivered via a dedicated pipeline as shown on the indicative route map.

If a regional hydrogen pipeline network is established, it is possible that the hydrogen produced at Killingholme could be fed into this network. In future, it may also be possible to blend hydrogen into the existing gas network.

Uniper has had a presence in the Humber for over 25 years – we are very proud of this and hope that through the development of the Humber H_2ub® (Green) project we can continue to support jobs and skills in the Humber region in the future.

The development of a low-carbon hydrogen production facility at Killingholme could help to maintain economic prosperity in the Humber region, by providing highly skilled jobs, as well as creating new opportunities during construction and through the wider supply chain.

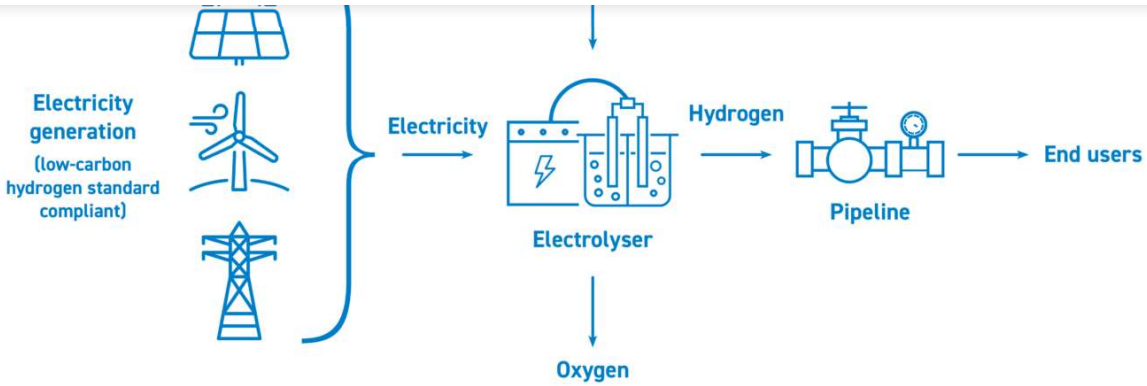
If consented and developed the Humber H_2ub® (Green) project could:

- Provide around 210 full time jobs once operational (direct and indirect)
- Create up to 440 UK jobs during construction
- Help to meet the UK's net zero targets
- Produce up to 120MW of green hydrogen
- Reduce Phillips 66 Limited's Humber Refinery emissions by around 100,000 tonnes per annum
- Add up to £10M to the regional economy per annum

Hydrogen as a fuel source

Hydrogen is a key fuel that can be used as a low-carbon alternative in heavy industry, transport and power generation. For this project, the hydrogen would be used as a replacement for some refinery fuel gas at Phillips 66 Limited's Humber Refinery.

The technology for producing hydrogen already exists and is proven. Once produced, hydrogen can also be refined into renewable liquid fuels – such as synthetic diesel and sustainable aviation fuel – providing a clean energy source for vehicles and whole industries that currently rely on carbon-intensive fuels.



Indicative process diagram

The site plan

The Humber H_2ub® (Green) project would be located at Uniper's Killingholme site, adjacent to the existing power station. The layout will be determined during Front End Engineering Design (FEED) studies, due to take place during 2025. This will help us decide the preferred location on the site for the plant.

Major equipment included directly within the hydrogen production facility would consist of:

- Electrolysers
- Hydrogen purification and drying units
- Air-cooling system
- Hydrogen and oxygen vent stacks
- Associated pipework, heat exchangers and other miscellaneous equipment
- Control room, office facilities, workshops and equipment stores
- Water treatment plant
- Additional equipment within the site substation

What will the new facility look like?

The proposed development lies within the existing power station site. A landscape and visual impact assessment will be carried out to show:

- Existing baseline conditions and landscape character
- Photomontages from agreed viewpoint locations
- Screening and landscaping features of the proposal
- Visual changes with and without the new facility in place

Computer generated image showing what the proposed development could look like.

Your questions

Frequently Asked Questions

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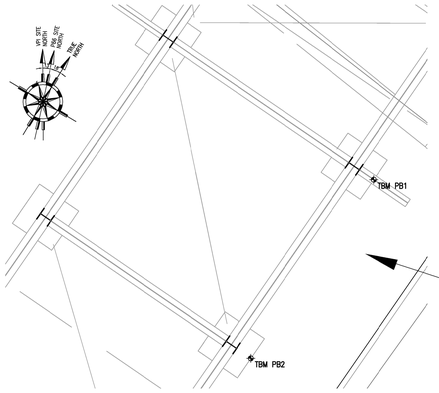
APPENDIX 7



DETAIL 1
SCALE 1:50

HOLD 2

VPI LAYOUT SITE BOUNDARY COORDINATES		
REFERENCE POINT	EASTING mm	NORTHING mm
A1	516854.457	416830.899
A2	516600.292	416916.440
A3	516594.212	416903.099
A4	516580.995	416925.883
A5	516962.172	417157.544
A6	516971.728	417141.821
A7	517021.718	417172.202
A8	517038.252	417144.808
A9	517014.913	417130.737
A10	517104.725	416983.058

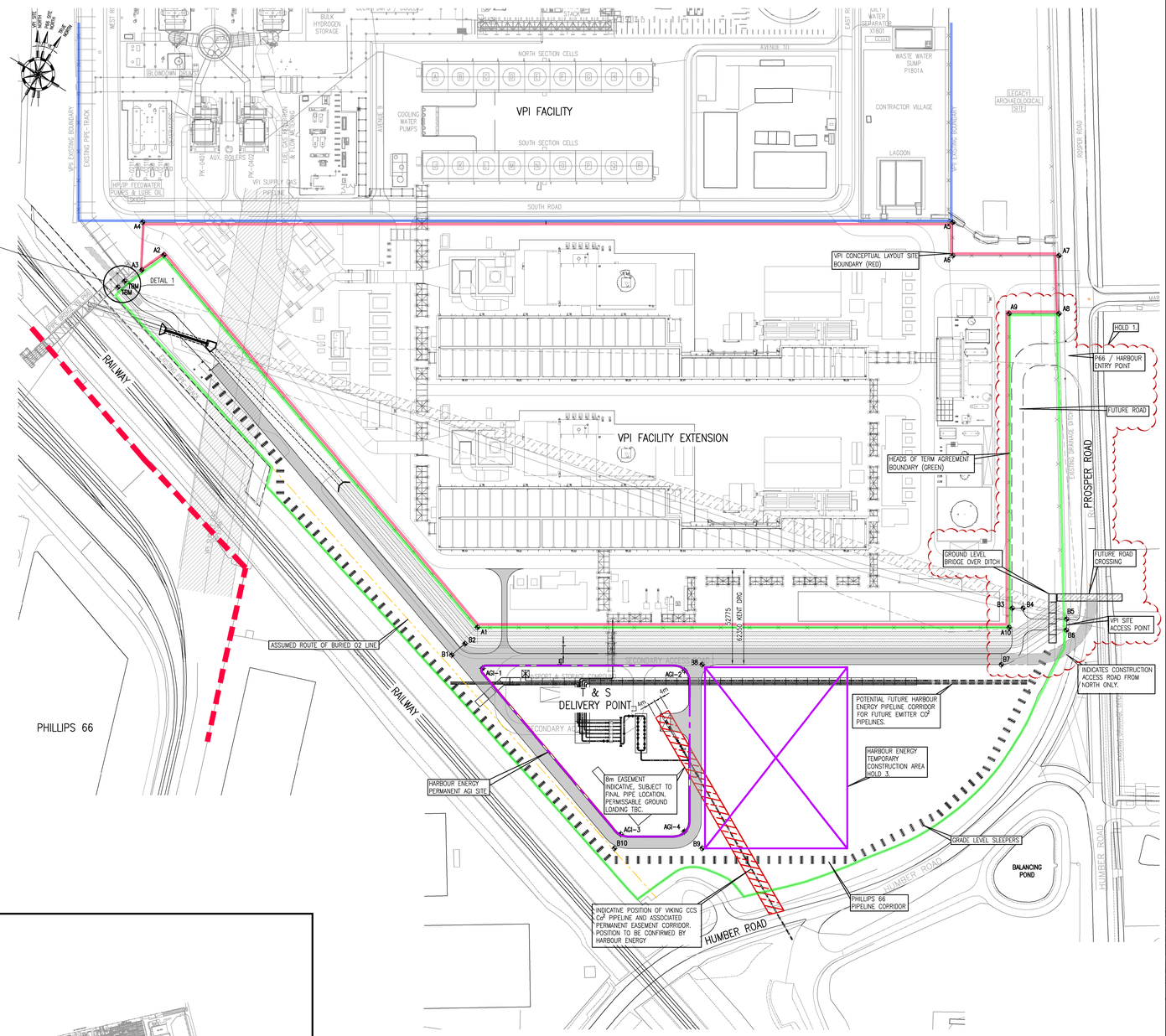
HARBOUR LAND BOUNDARY COORDINATES		
REFERENCE POINT	EASTING mm	NORTHING mm
B1	516850.097	416810.470
B2	516853.193	416819.682
B3	517100.693	416992.957
B4	517105.734	416996.020
B5	517129.328	417003.358
B6	517132.326	416998.140
B7	517111.593	416963.273
B8	516970.776	416877.692
B9	517023.349	416791.187
B10	516982.080	416766.106

AGI LAYOUT SITE BOUNDARY COORDINATES		
REFERENCE POINT	EASTING mm	NORTHING mm
AGI-1	516868.555	416813.042
AGI-2	516964.101	416869.723
AGI-3	516981.123	416774.594
AGI-4	517010.085	416794.059

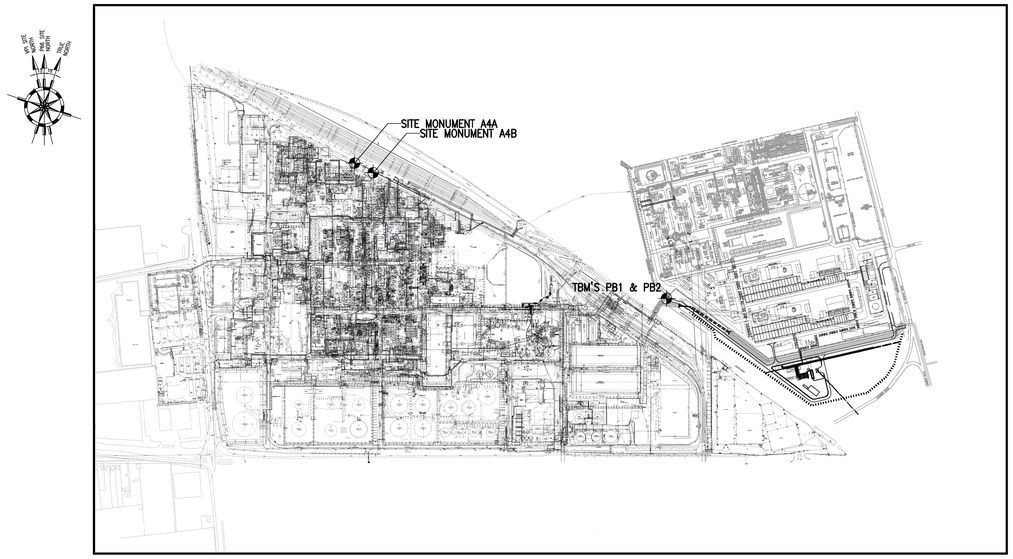
SITE MONUMENT COORDINATES		
REFERENCE POINT	EASTING mm	NORTHING mm
A4A	–	–
A4B	–	–

TEMPORARY BENCH MARK (TBM) COORDINATES		
REFERENCE POINT	EASTING mm	NORTHING mm
PB1	516589.293	416893.588
PB2	516587.923	416888.806

NOTE:
COORDINATES BASED ON ORDNANCE SURVEY COORDINATE SYSTEM



VPI SITE PLAN
SCALE 1:1000



PHILLIPS 66 SITE PLAN
SCALE 1:5000

NOTE:
SITE BOUNDARY COORDINATES ARE BASED ON ORDNANCE SURVEY COORDINATE SYSTEM TAKEN FROM MOST RECENT SURVEY DATA. THIS DATA HAS BEEN RELATED TO HISTORICAL DATA & COORDINATES OBTAINED SHOULD BE USED FOR REFERENCE PURPOSES ONLY

Notes

LEGEND

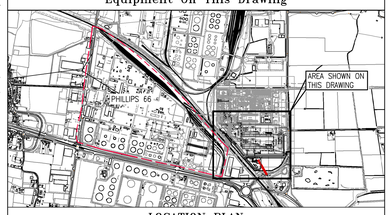
- VPI CONCEPTUAL LAYOUT SITE BOUNDARY
- HEADS OF TERM AGREEMENT BOUNDARY
- HARBOUR LAND LEASE FOR AGI AND BASE PIPELINE ROUTE
- ASSUMED ROUTE OF BURIED O2 LINE
- EXISTING VPI SITE BOUNDARY
- PHILLIPS 66 SITE BOUNDARY

HOLDS.

1. INTERNAL ROADS, KILLINGHOLME DITCH CROSSING, ENTRANCE AND EXIT POSITIONS FOR BOTH TEMPORARY CONSTRUCTION ACCESS AND PERMANENT ACCESS TO BE AGREED.
2. ALIGNMENT WITH PHILLIPS 66 AND VPI SITE COORDINATE SYSTEM.
3. SIZE OF HARBOUR ENERGY TEMPORARY CONSTRUCTION AREA

Reference Drawings

Equipment On This Drawing



LOCATION PLAN

Rev.	Date	Description	Drn	Chk.	App'd.
2	17/07/24	UPDATED FOLLOWING P66 REVIEW (LAND NEGOTIATION)	RG	BM	BM
1	08/07/24	ISSUED FOR INFORMATION (LAND NEGOTIATION)	PL	SDP	SDP
0	12/12/23	ISSUED FOR REVIEW (LAND NEGOTIATION)	RG	SDP	SDP

T.I.D. No.	-
Tech Memo/ eMOC No.	-
A.S.C.	-
Unit Description	-
Discipline	CIVIL
Drawn	PL
Date	DEC
Scale	1:1000

Humber Refinery HUMBERZERO

Title: HUMBER ZERO FCC FEL 2
CIVIL LAYOUT DRAWING
P66 HOR/VPI/HARBOUR INTERFACE
OVERALL SITE MASTERPLAN

Drg No. 215005-00703-00-CI-DPP-00013

Rev. 2

Cad File Ref. 00-CL-DPP-0013

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