

# Humber Low Carbon Pipelines

Preliminary Environmental Information Report  
Volume III Appendix 10.3 Cultural Heritage  
October 2022

nationalgrid

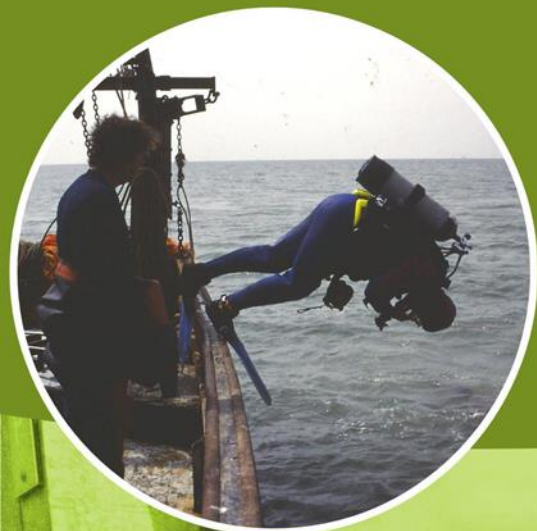
# Humber Low Carbon Pipelines project

*Archaeological desk-based  
assessment for the intertidal zone  
at Easington, Yorkshire*

for  
RSK  
on behalf of  
National Grid

CA ref: 220201

August 2022



## **Humber Low Carbon Pipelines project**

Archaeological desk-based assessment for the intertidal zone at  
Easington, Yorkshire

Coracle project number: 220201

Coracle report number: 220201.1

prepared by	Ryan Killion, Marine Archaeologist
date	August 2022
checked by	Dr Darren Glazier, Principal Archaeologist
date	August 2022
approved by	Dr Michael Walsh, Lead Marine Archaeologist
date	September 2022
issue	1.1

*This report is confidential to the client. Coracle Archaeology accepts no responsibility or liability to any third party to whom this report, or any part of it, is made known. Any such party relies upon this report entirely at their own risk. No part of this report may be reproduced by any means without permission.*

## SUMMARY

### **Project name: Humber Low Carbon Pipelines project**

Coracle Archaeology was commissioned by RSK, on behalf of National Grid, to undertake archaeological environmental assessments in the intertidal zone, including this desk-based assessment, for the Humber Low Carbon Pipelines project. This project aims to deliver a new onshore network of pipelines to transport captured carbon dioxide emissions from the Humber region's emitters for safe storage, and facilitate a switch from fossil fuels to low carbon hydrogen. The Humber Low Carbon Pipelines project will play a crucial role in helping the UK transition to a low carbon economy and forms the backbone of the Zero Carbon Humber vision.

This desk-based assessment of intertidal and coastal cultural heritage assets assesses the intertidal area of the preliminary environmental information report boundary at Easington Beach, East Riding of Yorkshire, UK, as well as a wider study area extending 500m either side of the boundary. The area below the mean low water mark and above the foreshore zone is beyond the remit of this report.

This desk-based assessment provides a baseline assessment of known sites and features of cultural heritage significance held within a c. 1.9km wide study area, along the foreshore and intertidal zone. This is wider than the preliminary environmental information report boundary itself, thus facilitating an assessment of the density of cultural heritage assets in the vicinity. This in turn provides an indication of the potential to encounter unknown and unexpected archaeological sites and features while undertaking project-specific activities. This assessment will be used:

- to assess the nature of the known cultural resource within the area;
- to outline the archaeological potential of the intertidal and coastal environment;  
and
- to aid in the identification of sites and features that may be detected during site-specific surveys and activities.

This assessment has established that there are 17 cultural heritage records located within the wider study area, including seven wrecks, eight monuments and two findspots. Of these, 10 are recorded within the project boundary, including three wrecks and seven monuments. None of the seven wrecks are designated or protected, and none of the eight monuments are scheduled.

Most of the recorded wrecks are reports of losses, and either do not have reliable locational information, or should not be seen as indicative of the presence (or otherwise) of physical remains. These records are included to highlight the potential for encountering wrecks which have been reported in the past, but for which there is presently no material evidence to substantiate their existence. The confirmation of the existence or otherwise of many of these sites is discussed in the report on the walkover and metal-detecting surveys undertaken at Easington, appended to this report.

Despite the small area being assessed, the relatively high number of recorded cultural heritage assets suggests that the potential to encounter both known and unknown cultural remains during works associated with the proposed development is moderate. Similarly, the proximity of the proposed development to the internationally significant Dimlington Stadial suggests that the potential to encounter deposits of geoarchaeological and palaeo-environmental interest must also be considered moderate. Exposed cliff sections located within the study area have the potential to enhance our understanding of the palaeo-geography of the region, and may provide the opportunity to obtain rare organic deposits suitable for palaeo-environmental reconstruction of the Late Devensian environment.

## TABLE OF CONTENTS

<b>SUMMARY .....</b>	<b>ii</b>
<b>LIST OF TABLES.....</b>	<b>v</b>
<b>LIST OF ILLUSTRATIONS.....</b>	<b>v</b>
<b>LIST OF ACRONYMS USED IN THE TEXT .....</b>	<b>v</b>
<b>1. Introduction .....</b>	<b>7</b>
Outline.....	7
Project background .....	8
<b>2. Aims and Objectives .....</b>	<b>8</b>
<b>3. Legislative Framework and Guidance .....</b>	<b>11</b>
<b>4. Methods and Data Sources.....</b>	<b>12</b>
Geographical scope .....	12
Sources .....	13
Consultation with statutory bodies .....	14
<b>5. Baseline Environment.....</b>	<b>14</b>
Palaeo-environment and historical landscape context.....	14
Intertidal cultural heritage .....	23
<b>6. CONCLUSION .....</b>	<b>32</b>
<b>7. References.....</b>	<b>34</b>
<b>APPENDIX I: Archaeological surveys in the intertidal zone at Easington, Yorkshire .....</b>	<b>40</b>

## LIST OF TABLES

TABLE 1 PROTECTED FEATURES BY THE HOLDERNESS INSHORE MCZ .....	15
TABLE 2 CULTURAL HERITAGE ASSETS WITHIN THE HLCP PEIR BOUNDARY AND IN PROXIMITY TO THE WSA .....	25
TABLE 3 CULTURAL HERITAGE ASSETS WITHIN THE HLCP PEIR BOUNDARY .....	27
TABLE 4 SITES OF CULTURAL HERITAGE INTEREST IN PROXIMITY TO THE HLCP WSA .....	31

## LIST OF ILLUSTRATIONS

FIGURE 1 PRELIMINARY ENVIRONMENTAL INFORMATION REPORT BOUNDARY .....	9
FIGURE 2 LANDFALL AT EASINGTON BEACH, EAST RIDING OF YORKSHIRE .....	10
FIGURE 3 LATE DEVENSIAN DEVELOPMENT OF LAKE HUMBER .....	17
FIGURE 4 OUTER HUMBER ESTUARY RELATIVE SEA LEVEL RECORD .....	19
FIGURE 5 COASTAL RETREAT FROM THE ROMAN PERIOD AT EASINGTON .....	22
FIGURE 6 INTERTIDAL CULTURAL HERITAGE ASSETS AT EASINGTON .....	26
FIGURE 7 DIMLINGTON GEOREFERENCED FROM 1910 OS SIX INCH MAP OF YORKSHIRE WITH IMAGE FROM GOOGLE EARTH.....	29

## LIST OF ACRONYMS USED IN THE TEXT

<b>ADS</b>	Archaeology Data Service
<b>BIIS</b>	British-Irish Ice Sheet
<b>CifA</b>	Chartered Institute for Archaeologists
<b>CITIZAN</b>	Coastal and Intertidal Zone Archaeological Network
<b>EMODnet</b>	European Marine Observation and Data Network
<b>EPSG</b>	European Petroleum Survey Group
<b>GIS</b>	Geographic Information System
<b>GPS</b>	Global Positioning System
<b>grt</b>	Gross registered tonnage
<b>HE</b>	Historic England
<b>HER</b>	Historic Environment Record
<b>HLCP</b>	Humber Low Carbon Pipelines
<b>ka</b>	Kilo annum
<b>LAT</b>	Lowest astronomical tide
<b>LGM</b>	Last glacial maximum

<b>MCZ</b>	Marine Conservation Zone
<b>MIS</b>	Marine isotope stage
<b>MLWM</b>	Mean low water mark
<b>NRHE</b>	National Record of the Historic Environment
<b>NLS</b>	National Library of Scotland
<b>NSL</b>	North Sea Lobe
<b>OD</b>	Ordnance datum
<b>OSL</b>	Optically stimulated luminescence
<b>OS</b>	Ordnance Survey
<b>OSGB</b>	Ordnance Survey Great Britain
<b>PEIR</b>	Preliminary environmental information report
<b>RCZA</b>	Rapid coastal zone assessment
<b>RAF</b>	Royal Air Force
<b>SEA</b>	Strategic environmental assessment
<b>UKHO</b>	United Kingdom Hydrographic Office
<b>UTM</b>	Universal Transverse Mercator
<b>VOYL</b>	Vale of York Lobe
<b>WGS</b>	World Geodetic System
<b>WSA</b>	Wider study area

## **1. INTRODUCTION**

### ***Outline***

- 1.1. Coracle Archaeology (CA) was commissioned by RSK, on behalf of National Grid, in May 2022 to undertake archaeological environmental assessments in the intertidal zone, including this desk-based assessment (DBA), for the Humber Low Carbon Pipelines project. This report includes an assessment of marine and coastal cultural heritage assets within the foreshore and intertidal zone at Easington Beach, East Riding of Yorkshire, UK.
- 1.2. The Humber Low Carbon Pipelines project (henceforth 'the proposed development'), aims to deliver a new onshore network of pipelines to transport hydrogen and captured carbon dioxide emissions. The Humber region is the UK's largest industrial cluster and responsible for the production of more than 12.4 million tonnes of carbon dioxide emissions per annum. It is anticipated that the proposed development will help the UK transition to a low carbon economy and achieve its net-zero target by 2050.
- 1.3. The proposed development would consist of two underground pipelines, one for carbon dioxide and one for hydrogen. The pipelines will connect the region's major industrial emitters, including the power stations at Drax and Keadby, British Steel in Scunthorpe, Uniper's Killingholme site and Equinor's proposed hydrogen production plant at Saltend. The pipelines will arrive at the coast at Easington; the carbon dioxide pipeline will then be connected to an onshore pumping facility for transportation via an additional pipeline to the offshore Endurance storage location.
- 1.4. This DBA is based on *Standard and Guidance for Historic Environment Desk-Based Assessment*, published by the Chartered Institute for Archaeologists (CIfA; 2014). It records known sites and features of cultural heritage significance within, and in proximity to, the project area that have the potential to be affected by the proposed development. A brief discussion of the significance of each asset is included here; both the significance of each asset and the potential impact of the proposed development upon them will be evaluated more fully in the Environmental Statement chapter.

**Project background**

- 1.5. The proposed development will run for approximately 120km between Long Drax, North Yorkshire and Easington (Figure 1). This DBA is nevertheless focused solely on the intertidal area at the Easington landfall; a separate assessment has been produced for the terrestrial element of the project. It assesses an area of the preliminary environmental information report (PEIR) boundary measuring approximately 0.5km<sup>2</sup>, from the base of the cliffs at Easington Beach, to just seaward of the mean low water mark (MLWM), and a wider study area (WSA) extending 500m from the edge of the PEIR boundary (Figure 2). This is larger than the PEIR boundary itself, thus ensuring continuity with the terrestrial assessments and facilitating the assessment of the density of cultural heritage assets located in the vicinity of the proposed development. This is especially significant at Easington, where the dynamic nature of the coastline suggests that the possibility of encountering cultural heritage assets located previously beyond the intertidal zone cannot be discounted.

**2. AIMS AND OBJECTIVES**

- 2.1. The aim of this DBA is to identify known and potential cultural heritage assets within the intertidal zone of the scoping route corridor at the Easington landfall. The objectives of this assessment are:
- to set out the statutory, planning and policy contexts relating to the historic environment for the UK;
  - to provide an overview of the historic environment within the study area, based on existing archaeological records and secondary sources; and
  - to highlight known maritime and coastal heritage assets that may be impacted by the proposed development, with particular reference to:
    - shipwrecks, crashed aircraft and wreck material;
    - submerged prehistoric sites and artefacts;
    - monuments at risk of coastal erosion; and
    - areas of archaeological potential

480000

500000

520000

540000

440000

420000

400000

380000

480000

500000

520000

540000



## Legend

 Humber Low Carbon Pipelines PEIR boundary

## GEODETTIC INFORMATION:

0 5 10  
Kilometres

Coordinate System: British National Grid  
Projection: Transverse Mercator  
Datum: OSGB 1936  
False Easting: 400,000.0000  
False Northing: -100,000.0000  
Central Meridian: -2.0000  
Scale Factor: 0.9996  
Latitude Of Origin: 49.0000  
Units: Meter



 Coracle  
Archaeology

+44 (0) 1985 620430  
enquiries@coracle.co.uk  
www.coracle.co.uk

## PROJECT TITLE:

Humber Low Carbon Pipelines project

## FIGURE TITLE:

Humber Low Carbon Pipelines project

DRAWN BY: RK  
CHECKED BY: DG  
APPROVED BY: MW

PROJECT NO.  
220201

FIGURE NO.  
1

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community



### Legend

- PEIR boundary (study area for inter-tidal assessment)
- Wider study area

### GEODETTIC INFORMATION:

0 250 500 Metres

Coordinate System: British National Grid  
Projection: Transverse Mercator  
Datum: OSGB 1936  
False Easting: 400,000.0000  
False Northing: -100,000.0000  
Central Meridian: -2.0000  
Scale Factor: 0.9996  
Latitude Of Origin: 49.0000  
Units: Meter



 Coracle  
Archaeology

+44 (0) 1985 620430  
enquiries@coracle.co.uk  
www.coracle.co.uk

### PROJECT TITLE:

Humber Low Carbon Pipelines project

### FIGURE TITLE:

Easington Beach, East Riding of Yorkshire

DRAWN BY: RK  
CHECKED BY: DG  
APPROVED BY: MW

PROJECT NO.  
220201

FIGURE NO.  
2

Source Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

### **3. LEGISLATIVE FRAMEWORK AND GUIDANCE**

3.1. This assessment takes account of the following national and international legislative procedures and guidelines:

#### ***UK***

- Protection of Wrecks Act, 1973;
- Protection of Military Remains Act, 1986;
- National Heritage Act, 2002;
- Marine and Coastal Access Act, 2009;
- Merchant Shipping Act, 1995;
- Burial Act, 1857;
- Ancient Monuments and Archaeological Areas Act, 1979;
- UK Marine Policy Statement (HM Government, 2011); and
- Yorkshire Archaeological Research Framework: Research agenda (2007).

#### ***International***

- The European Convention on the Protection of the Archaeological Heritage (Revised; Valetta) 1992;
- UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001);
- United Nations Convention on the Law of the Sea (UNCLOS) 1982;
- International Council of Monuments and Sites (ICOMOS) Charter on the Protection and Management of Underwater Cultural Heritage (1996; the Sofia Charter); and
- The World Heritage Convention.

3.2. This DBA has been compiled in line with industry best practice and the relevant offshore renewables and marine historic environment guidance. These include:

- Chartered Institute for Archaeologists (CIfA) guidelines: Standard & guidance for archaeological desk-based assessment (2014);
- Joint Nautical Archaeology Policy Committee (JNAPC) code of practice for seabed development (1998);
- COWRIE Historic environment guidance for the offshore renewable energy sector (2007);
- COWRIE Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy (2008);
- COWRIE Guidance for offshore geotechnical investigations and historic environment analysis: guidance for the renewable energy sector (2011);
- The Crown Estate (2021). Archaeological written schemes of investigation for offshore wind farm projects; and
- The Crown Estate (2014). Offshore renewables protocol for archaeological discoveries.

#### 4. METHODS AND DATA SOURCES

- 4.1. The following section sets out the methods followed for this DBA, including the geographical scope and the sources utilised for the collation of data.

##### ***Geographical scope***

- 4.2. This DBA tidal assesses a 0.5km<sup>2</sup> area of the PEIR boundary, focused on the foreshore and intertidal area at the Easington landfall, and a WSA that extends a further 500m either side of the PEIR boundary (see figure 2). The inclusion of a WSA enables the assessment of the archaeological potential of the area, whilst highlighting notable sites in the vicinity of the proposed development. The purpose of this DBA is to identify known and potential cultural heritage assets within the intertidal zone of the PEIR boundary that have the potential to be affected by the proposed development.

### **Sources**

- 4.3. This DBA includes a documentary and cartographic search utilising a variety of sources to locate all known cultural heritage assets within the CSC, and to identify the archaeological potential of the area. Sources utilised for this assessment include:

#### ***UK-wide***

- Humber Historic Environment Records (HER);
- Historic England, National Record of the Historic Environment (NRHE);
- United Kingdom Hydrographic Office (UKHO) review of cartography, historic charts and sailing directions;
- Records held by the Archaeology Data Service (ADS);
- Marine Environment Data Information Network (MEDIN);
- British Geological Survey regional guide and previous work in the area;
- Rapid coastal zone assessment (RCZA) survey reports;
- Coastal and Intertidal Zone Archaeological Network (CITiZAN);
- Historic maps and charts as held by the National Library of Scotland (NLS);
- Readily accessible published sources and grey literature (e.g. results from previous studies); and
- Relevant strategic environmental assessment (SEA) reports (e.g. UK Continental Shelf SEA archaeological baseline) and coastal survey assessment reports.

#### ***International***

- UKHO Global Wrecks and Obstructions database (Admiralty Marine Data Portal);
- European Marine Observation and Data Network (EMODnet); and
- Wrecksite.eu website

- 4.4. This DBA includes all known and potential maritime cultural heritage assets identified during this assessment as detailed in the tables and figures below. Records located

along the cable route have been assigned a unique Coracle Archaeology number using the abbreviation (CA) for ease of identification.

#### ***Consultation with statutory bodies***

- 4.5. All consultations for this project were undertaken in collaboration with Arcadis. This included consultations with Historic England, Humber Archaeology, archaeological advisors to East Riding of Yorkshire, and with the offices of the Humber HER.

### **5. BASELINE ENVIRONMENT**

- 5.1. The following sections outline the nature of the existing environment, including a discussion of the palaeo-environment and recorded intertidal cultural heritage.

#### ***Palaeo-environment and historical landscape context***

- 5.2. The aim of this section is to provide a brief assessment of the palaeo-environmental potential of sediments potentially impacted by the proposed development, and to place the proposed development within a wider historical landscape context.

#### ***Humber and Holderness***

- 5.3. The area of Holderness is located on the north-east coast of England, bordered to the north and west by the Yorkshire Wolds, the south by the Humber estuary and the east by the North Sea. The area is underlain by Upper Cretaceous Chalk, which dips gently eastwards and forms the extension of the Lincolnshire and Yorkshire Wolds escarpment.
- 5.4. The intertidal area of the PEIR boundary is located within the Holderness Inshore Marine Conservation Zone (MCZ), which covers an area of approximately 309km<sup>2</sup> and includes geological features associated with Spurn Head. MCZs are marine areas designed to protect a range of nationally important habitats, species and geological features; those features protected by the MCZ are outlined in Table 1.

#### ***Pleistocene deposits and pre-Devensian glaciation***

- 5.5. Pleistocene deposits are known to exist across the wider area. These can be traced to the Anglian glaciation (Marine Isotope Stage [MIS] 12, c. 500 kilo annum [ka]), when ice sheets are known to have entered the Humber region for the first time. Following a probable glaciation during MIS 8 (c. 300-243 ka), marine transgression is known to have occurred over much of the Holderness area during the subsequent interglacial period,

when sea levels were higher. Straw (2018) has proposed that during the Aveley Interglacial (MIS 7; c. 243-191 ka) the eastern margins of the Yorkshire and Lincolnshire Wolds were eroded to form a cliff, with reactivation of the cliff and deposition of both a raised beach and the Lincolnshire March Platform during the subsequent Ipswichian Interglacial (MIS 5e; c. 123-109 ka). Borehole evidence from Rawcliffe, west of Goole, in the Humber Basin (the drainage basin of the Humber River and its tributaries) suggests that marine conditions penetrated deep into the Humber Basin during the Ipswichian Interglacial (Gaunt *et al.* 1974).

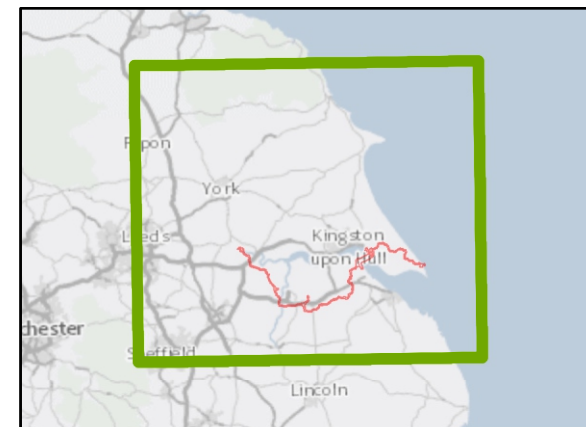
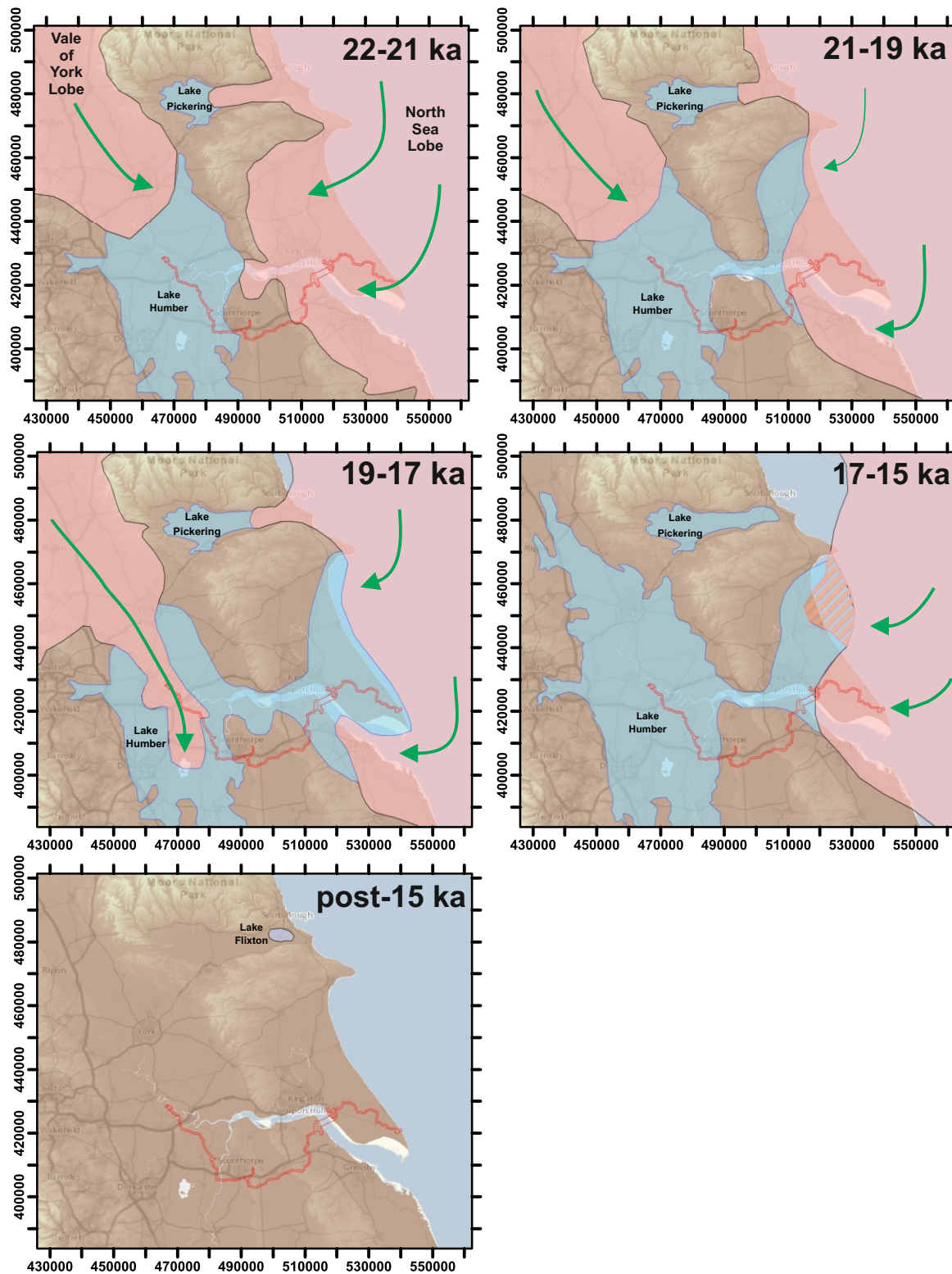
**Table 1 Protected features by the Holderness Inshore MCZ**

Protected Feature	General Management Approach
Intertidal sand and muddy sand	Maintain in favourable condition
Moderate energy circalittoral rock	Maintain in favourable condition
High energy circalittoral rock	Maintain in favourable condition
Subtidal coarse sediment	Maintain in favourable condition
Subtidal mixed sediments	Maintain in favourable condition
Subtidal sand	Maintain in favourable condition
Subtidal mud	Maintain in favourable condition
Spurn head (subtidal)	Maintain in favourable condition

#### *Late Devensian glaciation and Lake Humber*

- 5.6. The most extensive evidence for ice sheets within this area is nevertheless associated with the more recent Devensian glaciation (MIS 2; c. 29-11.7 ka; Clark *et al.* 2012; Bateman *et al.* 2017; see below). The pattern of the Late Devensian glaciation is now well understood, although the timing of events has been constantly revised in light of new research (e.g. Bateman *et al.* 2008, 2015, 2017; Bateman and Buckland 2001; Fairburn and Bateman 2016; Clark *et al.* 2004, 2012; Evans *et al.* 2017).
- 5.7. The maximum extent of the Devensian Glaciation in Britain (known as the British-Irish Ice Sheet; BIIS) occurred during MIS 2 (c. 27 ka); a period commonly referred to as the Last Glacial Maximum (LGM) (Clark *et al.* 2012). Little is known, however, about the nature of the glaciation in the Holderness area until c. 22 ka, though periglacial river deposits found at Finningley (dated 40-35 ka [MIS 3]) indicates tundra conditions, including dwarf-shrubs, heath and bare ground (Buckland *et al.* 2019).

- 5.8. By 22 ka, a number of proglacial lakes had been formed in the region as a result of drainage being blocked by ice sheets (Clark *et al.* 2012). The single most prominent of these was the Lake Humber (Figure 3), which formed to the south of the Vale of York Lobe (VOYL) and to the west of the North Sea Lobe (NSL). At its maximum extent, Lake Humber covered an area of c. 4500km<sup>2</sup> (Clark *et al.* 2004; 2012; Bateman *et al.* 2008; 2017).
- 5.9. The earliest onshore advance of the NSL led to the deposition of the Skipsea Till between c. 21.6 ka and c. 18 ka. At the foot of the Dimlington Cliff, c. 600m north of the proposed development, a series of organic silts are found overlying an earlier Basement Till, but stratigraphically below both the Skipsea and later Withernsea Till. This deposit is of international significance, helping to date the onshore advance of the NSL and providing the name for the Dimlington Stadial – a British chronostratigraphic term identifying the main part of the Late Devensian (c. 26-13 ka; Rose 1985; Penny *et al.* 1969; Bateman *et al.* 2011). The advance of the NSL into the Humber Gap (the gap between the line of hills formed by the Yorkshire Wolds and Lincolnshire Wolds, through which the Humber Estuary flows) and the northern end of the Ancholme Valley not only impounded Lake Humber but also created moraine ridges at both North and South Ferriby and Horkstow, and two indistinct moraine ridge complexes located close to Brough-Elmington, c. 3km to the west of North Ferriby. At the same time, the NSL advanced up the Vale of Pickering to form Lake Pickering, with the VOYL advancing southward to a position at or near the Escrick moraine, south of York.
- 5.10. The proglacial Lake Humber persisted between 21-17 ka, expanding eastward as the NSL ice retreated from the Humber Gap (see figure 3). The NSL eastward retreat was stochastic, leaving moraine ridges at Halton to Waltham (and its equivalent north of Hull) and at St Andrew's Docks (Bateman *et al.* 2017; Rees *et al.* 2000). While the exact timing of this retreat is not fully understood, optically stimulated luminescence (OSL) dating of an englacial laminated silt and sand deposit overlying the Skipsea Till at both Dimlington and Skipsea indicate that the NSL had retreated offshore before 17 ka, possibly as early as 18 ka. Any remaining onshore extension of the NSL is therefore likely to have been limited to the margin of the outer Humber Estuary at this time. At the same time as the NSL retreated, the VOYL advanced south as far as Wroot, North Lincolnshire (Friend *et*



- HLCP PEIR boundary
- Lake
- Ice
- Ice flow vectors

Contains OS data © Crown Copyright and database right 2020  
Modified from Bateman et al. 2017

#### GEODETTIC INFORMATION:

Coordinate System: British National Grid  
Projection: Transverse Mercator  
Datum: OSGB 1936  
False Easting: 400,000,000  
False Northing: -100,000,000  
Central Meridian: -2,0000  
Scale Factor: 0.9996  
Latitude Of Origin: 49,0000  
Units: Meter



01985 620430  
enquiries@coracle.co.uk  
www.coracle.co.uk

**PROJECT TITLE:**  
Humber Low Carbon Pipelines Project

**FIGURE TITLE:**  
Late Devensian Development of Lake Humber

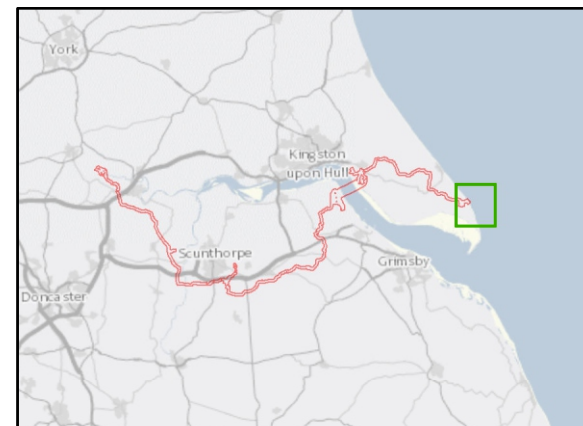
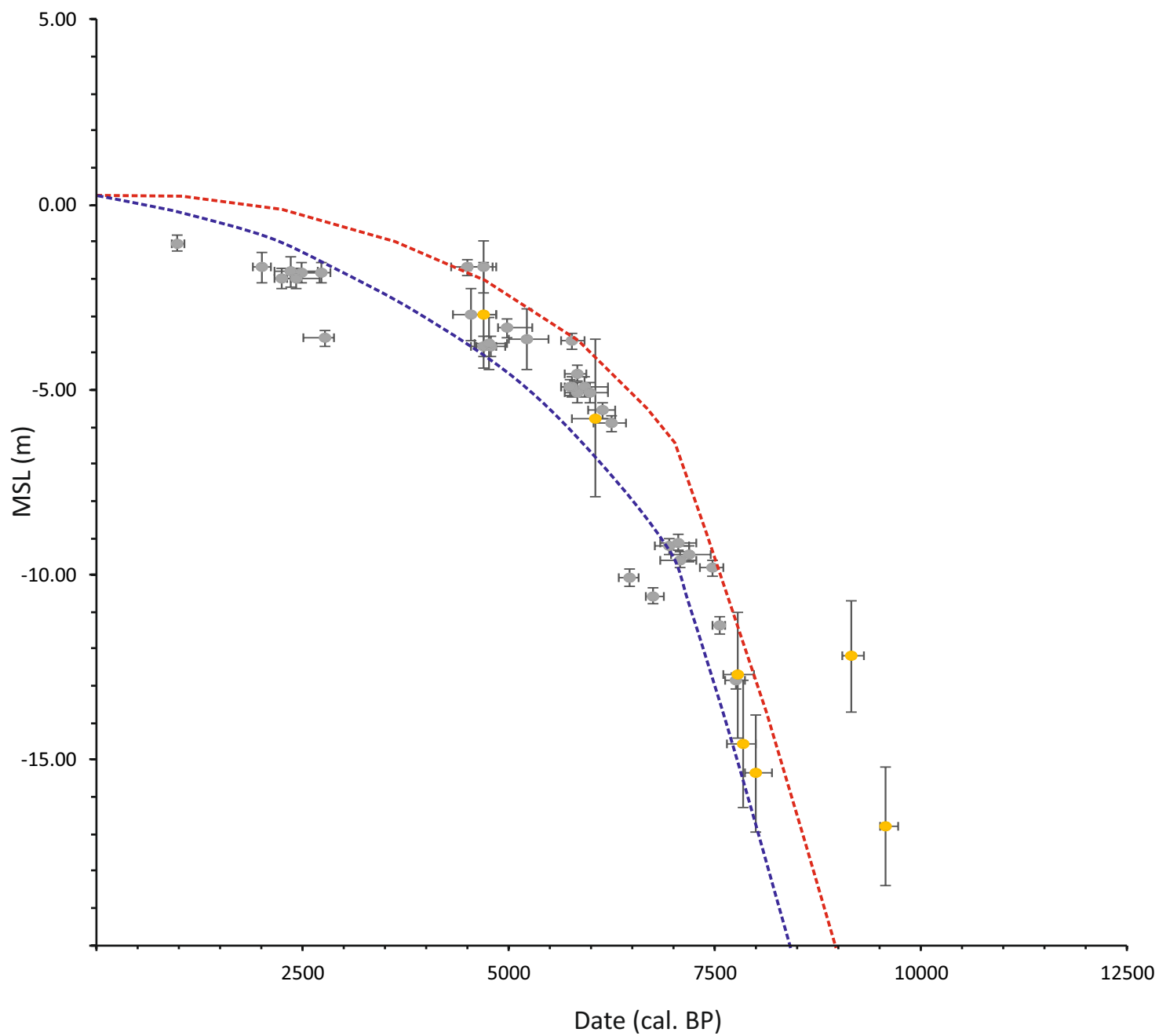
**DRAWN BY:** MJG  
**CHECKED BY:** DG  
**APPROVED BY:** MW

**PROJECT NO.**  
220201

**FIGURE NO.**  
3

*al.* 2016), before receding back to the York and Escrick moraines. During this period, Lake Humber is believed to have attained its highest elevation (approximately 33m ordnance datum [OD]; Bateman *et al.* 2017).

- 5.11. Between c. 17-15 ka, re-advances of the NSL are recorded at Skipsea and Dimlington with the deposition of the Withernsea Till (see figure 3). Deposition of the Kelsey Hill Gravels (Mill Hill Member; Lewis 1999) also occurred during this period, generally believed to be a product of glacier margin fluctuations, with Catt and Penny (1966) suggesting that they have a typical esker-like form, implying an englacial origin (i.e. formed within the glacier). At approximately the same time, the VOYL retreated northwards, with Lake Humber levels dropping to 25m, 20m and 15m OD, and lake waters perhaps becoming continuous with those at Holderness (Bateman *et al.* 2017). There is no evidence for the existence of either glacier ice or Lake Humber beyond 15ka, with the NSL having receded from the Holderness coastline to permit free drainage into the North Sea.
- 5.12. The retreat of the ice sheets left both esker-like formations and a series of depressions on the surface, including kettleholes and / or collapsed pingos (dome shaped hills), in the hummocky, poorly draining, till-dominated surface. During the late glacial and Holocene periods, these depressions became meres, containing a series of lacustrine and mire deposits and a rich palaeo-environmental record (see Dinnin 1995). Sheppard (1956) suggests that seventy or more meres once existed in Holderness, with some lost or drained as a result of coastal erosion, including Withernsea Mere and Milnemar (south of Easington). Others were deliberately drained, with only three major meres still in existence by the early eighteenth century (Sheppard 1957). British Geological Survey (BGS) mapping shows a series of small lacustrine deposits, likely the remains of former meres, c. 2km north of Easington, though it is recognised that the extent and distribution of many meres in Holderness remains uncertain (Dinnin 1995: 29). Indeed, meres in the Withernsea and Easington areas were not investigated as part of the Humber Wetlands Project (van der Noort and Ellis 1995), so there remains the potential for previously unmapped mere deposits to be located within the Easington area.



- HLCP PEIR boundary
- Index Point
- Freshwater Limiting Date
- Bradley 2011 / 2017 GIA
- Kuchar 2012 GIA

Contains OS data © Crown Copyright and database right 2020  
Data from Shennan et al (2012)

#### GEODETIC INFORMATION:

0 0.5 1 Kilometres

Coordinate System: WGS 1984 UTM Zone 30N  
Projection: Transverse Mercator  
Datum: WGS 1984  
False Easting: 500,000,000  
False Northing: 0,0000  
Central Meridian: -3,0000  
Scale Factor: 0,9996  
Latitude Of Origin: 0,0000  
Units: Meter



01985 620430  
enquiries@coracle.co.uk  
www.coracle.co.uk

**PROJECT TITLE:**  
Humber Low Carbon Pipelines Project

**FIGURE TITLE:**  
Outer Humber Estuary Relative Sea Level record

**DRAWN BY:** MJG  
**CHECKED BY:** DG  
**APPROVED BY:** MW

**PROJECT NO.**  
220201

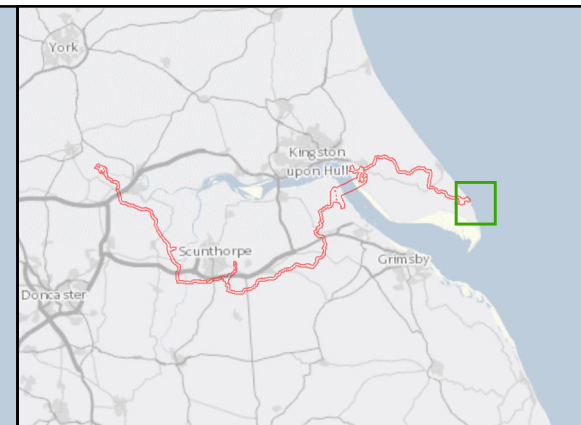
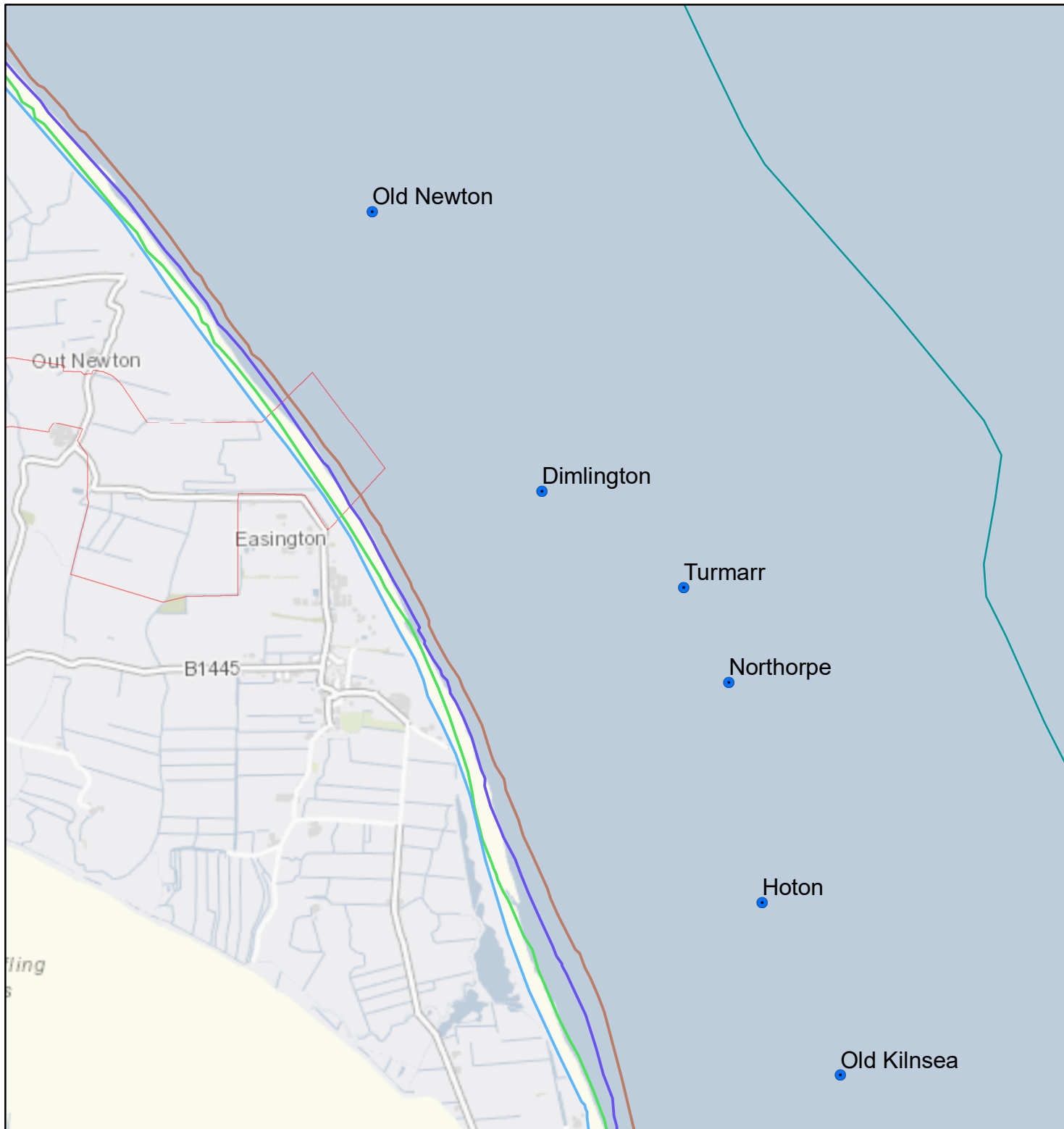
**FIGURE NO.**  
4

*Holocene sea level change*

- 5.13. Estuarine conditions existed in the Outer Humber Estuary by c. 8000 calibrated (cal) before present (BP), with sea level at approximately 17m below OD (Figure 4). Lower sea levels resulted in the lower reaches of many rivers being fluvial during the Early Holocene, with channels incised down to depths as low as 15m below OD. Relative sea level rose quickly between c. 8000 and 6000 cal BP, with many sites in the Outer and Middle Estuary recording the arrival of marine conditions (see for example Gaunt and Tooley 1974; Long *et al.* 1998; Metcalfe *et al.* 2000). From c. 6000 cal. BP, marine transgression progressed into the lower valleys of the Inner Estuary, and the rate of sea level rise began to slow (Kirby 1999; Metcalfe *et al.* 2000).
- 5.14. Important changes in the palaeo-tidal regime also occurred during the Early to Middle Holocene in the Humber and east coast area, with spring tidal range only 63 per cent of its present magnitude at c. 8000 cal BP (Plater *et al.* 2000; Shennan *et al.* 2000a; 2000b). Predictive modelling suggests that tidal range increased by 60 cm between c. 8000 and 6000 cal. BP in response to variations in tidal prism and estuary configuration, with only minor changes occurring since (Shennan *et al.* 2000b).
- 5.15. From c. 4000 cal. BP many areas in the region were inundated as estuarine conditions expanded to their maximum extent (Smith 1958a; 1958b; Fletcher 1981; Smith *et al.* 1981; Long *et al.* 1998; Neumann 1998; Kirby 1999; Metcalfe *et al.* 2000). This expansion occurred during a period of positive sea-level change between c. 4000-1900 cal. BP, followed by a phase of negative sea-level tendency (Long *et al.* 1998). Evidence for a retraction of intertidal conditions and period of shoreline advance within the estuary dates from after c. 3000 cal. BP (Long *et al.* 1998; Kirby 1999; Metcalfe *et al.* 2000), with the development of surface peats providing further evidence for estuarine contraction (Smith 1958a; Fletcher 1981; Dinnin and Lillie 1995; Long *et al.* 1998). The maximum extent of estuarine conditions in southern Holderness is demonstrated by the relict storm beach found between Keyingham and Patrington Haven, now 6km inland (close to the village of Sunk Island). This would appear to be indicative of the former coastline at c. 3210-1960 BP (see Berridge and Pattison 1994). It is likely that alluvial surfaces within the Hull valley were habitable by the Roman period, though it is suggested (Sheppard 1966) that the estuarine alluvium of southern Holderness and the Hull valley remained largely

unexploited until the Anglo-Saxon period. Later prehistoric activity on alleviated areas is nevertheless highlighted by Didsbury (see 1988, 1990).

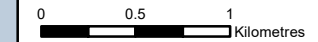
- 5.16. In contrast to the pattern of coastal change within the Humber estuary, the eastern Holderness coastline was characterised by erosion and realignment from the Middle Holocene period until present. Berridge and Pattison (1994) postulate that around c. 7.5ka dryland, composed mainly of the Late Devensian tills, extended over 10km eastwards from the current coastline. Increases in relative sea level and violent storm action resulted in the dramatic erosion of this coastline, which had retracted to c. 4km east of the modern coastline by the Roman period (Figure 5). During this period, spit formation is likely to have begun at the south-eastern tip of Holderness (south of the Easington landfall), which continued to extend to both the south and the west over subsequent millennia until it reached its current form as Spurn Head during the 17th century AD (Bateman *et al.* 2020). As the coastline eroded, c. 30 recorded medieval settlements along the Holderness coastline were lost to the sea, including four c. 1km east of Easington: Old Newton, Dimlington, Urmarr and Northorpe (Figure 5).
- 5.17. Within the more recent past, analysis of Ordnance Survey maps dated between AD 1850 and 2022 show that the coastline at Easington has retreated c. 225m since the 19th century (see Figure 5). The eroding Holderness coastline has resulted in deposits such as peats and estuarine clays, typically found along the Humber Estuary and instrumental for sea level reconstruction studies, no longer being present along the Holderness coastline. Instead, the eroding till cliffs provide the opportunity to reveal organic deposits associated with the Dimlington Stadial at the base of the Skipsea Till, or laminated silts and sands associated with Lake Humber between the Skipsea and Withernsea Tills (as identified at the Dimlington Cliff, immediately north of Easington). These cliff sections (and the non-eroded tills behind them) have the potential to further enhance our understanding of the timing and palaeo-geography of the NSL advance and retreat and provide the opportunity to obtain rare organic deposits suitable for palaeo-environmental reconstruction of the Late Devensian environment. It is noteworthy that the North East Regional Research Framework highlights the archaeology of the post-glacial coastline as a key research theme (theme M1, *Archaeology of the early post-glacial coastline: hunter-gatherers and the North Sea littoral*; see Petts and Gerrard 2006:122).



- HLCP PEIR boundary
- Roman Coastline
- 1850
- 1890
- 1950
- 2020
- Lost Medieval Villages

Contains OS data © Crown Copyright and database right 2020

**GEODETTIC INFORMATION:**



Coordinate System: WGS 1984 UTM Zone 30N  
Projection: Transverse Mercator  
Datum: WGS 1984  
False Easting: 500,000.0000  
False Northing: 0.0000  
Central Meridian: -3.0000  
Scale Factor: 0.9996  
Latitude Of Origin: 0.0000  
Units: Meter



01985 620430  
enquiries@coracle.co.uk  
www.coracle.co.uk

**PROJECT TITLE:**  
Humber Low Carbon Pipelines Project

**FIGURE TITLE:**  
Coastal retreat since the Roman period at Easington

**DRAWN BY:** MJG  
**CHECKED BY:** DG  
**APPROVED BY:** MW

**PROJECT NO.**  
220201

**FIGURE NO.**  
5

- 5.18. The eroding coastline also means that any encountered archaeology on the foreshore is likely to be *ex-situ*, delivered to the beach either through erosion of the cliffs or longshore drift. Offshore and in the intertidal zone, remains of lost medieval settlements (such as any remains of stone-built structures) might also be present on, or buried beneath, the seabed in the form of debris mounds. Discovery of such sites would aid our understanding of the nature of these settlements and assist in accurately locating their positions.

### ***Intertidal cultural heritage***

- 5.19. The aim of this section is to provide an assessment of the previously recorded intertidal cultural heritage potentially impacted by the proposed development.

### ***Limitations of data***

- 5.20. One of the greatest limitations when researching known and potential marine and intertidal cultural heritage is the difficulty of locating recorded maritime losses. For many losses, the location of the sinking of the vessel comprises a general area description, such as 'driven ashore on the Holderness coast' or 'foundered near Dimlington', which is not useful practically for the purposes of accurate assessment, except to indicate that potential exists to encounter unrecorded maritime cultural remains. This is particularly true of ships that ran aground on the foreshore, where salvage and poor survival of remains in such a high-impact environment makes locating losses especially problematic.
- 5.21. Recorded maritime losses are also heavily biased towards the 19th and 20th centuries when more comprehensive records of losses began to be compiled.
- 5.22. Many wrecks have been identified through sonar survey, but this too presents difficulties as the location of many of these wrecks were recorded using GPS, which until relatively recently was accurate to only 100m (Baird 2009; Satchell 2012); or by DECCA which could provide accuracy to just one kilometre.
- 5.23. The details for cultural heritage assets recorded in proximity to the PEIR boundary were acquired from the sources cited above. These databases are each derived, in turn, from a variety of sources including various published lists of marine losses, aerial photographs

and marine surveys. Consequently, there are both overlaps and discrepancies between the datasets.

- 5.24. The project GIS used Ordnance Survey Great Britain 1936 (OSGB36); European Petroleum Survey Group (EPSG) projection 27700). Geospatial data for the PEIR boundary were supplied by the client in British National Grid (BNG), as was data from the Humber HER and NRHE. Data from these three sources were projected into the GIS without transformation.
- 5.25. Geospatial data from the UKHO (Admiralty Marine Data Portal) were transformed from World Geodetic System 1984 (WGS84; EPSG projection 4326) into OSGB (EPSG projection 27700), using the transformation OSGB 1936 to WGS 1984 Petroleum (EPSG transformation 1314), which has a stated accuracy of  $\pm 2\text{m}$ .
- 5.26. Wrecks discussed below are referred to using the UKHO designations of 'live' and 'dead'. 'Live' refers to those where a location is known, which has been verified by recent surveys. 'Dead' refers to those that have been recorded as lost in a certain location, but which have not been detected by repeated, or the most recent, surveys.
- 5.27. The tables and discussion below include all HER, NRHE, CITiZAN and UKHO (as held by the Admiralty Marine Data Portal) entries. Records of dead wrecks are also included; although they may not have been detected in recent surveys, the recorded locations may still contain remains of cultural heritage interest. Given locational discrepancies, there is also a possibility that wrecks lie beyond previous search areas.
- 5.28. The old archaeological adage that absence of evidence is not evidence of absence is pertinent here. In other cases, however, it is clear from the details of an entry that there is no reason to believe that there are now or ever have been archaeological remains in a particular location. This is particularly true of wrecks classified here as 'reported loss'; these are wrecks evidenced solely by documentary sources, for which there is currently no material evidence to substantiate their existence. These entries have also been included in the text and illustrations and are discussed on a case-by-case basis below.

- 5.29. The various datasets used in the compilation of this DBA have been cross-referenced to remove duplicate entries and are presented in the table below. For those mentioned in multiple datasets, the reference to each source is provided.

*Sites of cultural heritage interest within the PEIR boundary and WSA*

- 5.30. There are 15 cultural heritage assets recorded within the PEIR boundary and WSA, including five wrecks, eight monuments and two findspots. Two additional wrecks, located just to the north of the WSA, are also included in this assessment (see Table 2; Figure 6). Their proximity to the WSA (both are located within 100m of the WSA boundary), the exceptionally dynamic nature of the coastline in this area and their location in relatively shallow water means that the possibility that wreckage associated with these assets may be encountered during works associated with the proposed development cannot be discounted. It is noteworthy that the next nearest wreck is located c. 2km north of the WSA.

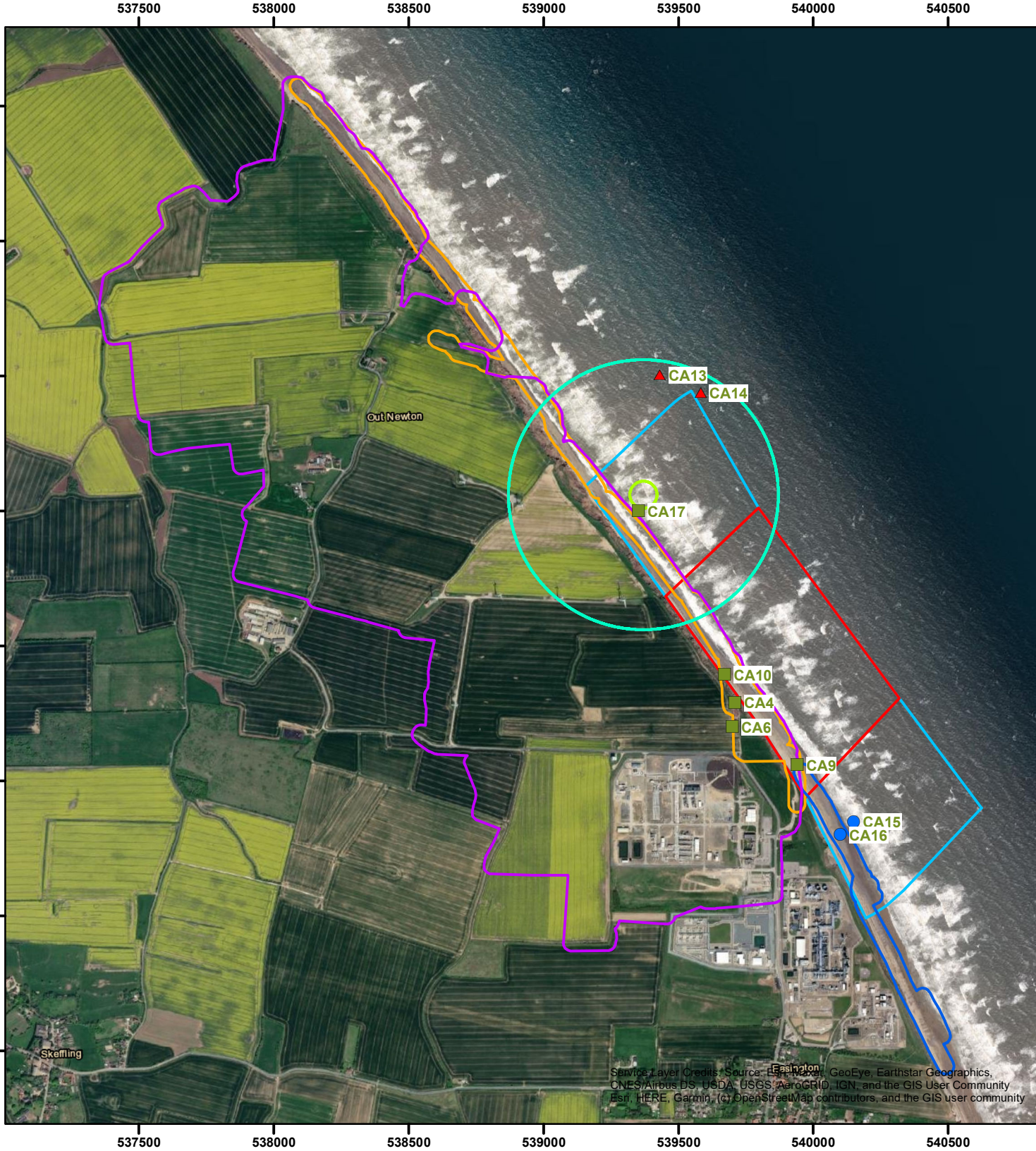
**Table 2 Cultural heritage assets within the HLCP PEIR boundary and in proximity to the WSA**

Type	PEIR	WSA	Total
Wreck	3	4	7
Monument	7	1	8
Findspot	0	2	2
<b>Total</b>	<b>10</b>	<b>7</b>	<b>17</b>

- 5.31. It is important to emphasise that many of the wrecks discussed below are reports of wreck events, and either do not have reliable locational information or should not be seen as indicative of the presence (or otherwise) of physical remains. These are included to highlight the potential for encountering heritage assets which have been reported in the past, but for which there is currently no material evidence to substantiate their existence.

*Sites of cultural heritage interest within the HLCP PEIR boundary*

- 5.32. A total of 10 assets are recorded within the PEIR boundary at the Easington landfall, including three wrecks and seven monuments (Table 3; Figure 6).



## Legend

  PEIR boundary (study area for inter-tidal assessment)

  Wider study area

### Cultural heritage assets

▲ Wreck

● Findspot

■ Monument

### SRC wreck polygons

  CA1-3

### SRC monument polygons

  CA5

  CA7

  CA8

### WSA wreck polygons

  CA11-12

### GEODETTIC INFORMATION:

0 500 1,000 Metres

Coordinate System: British National Grid  
Projection: Transverse Mercator  
Datum: OSGB 1936  
False Easting: 400,000.0000  
False Northing: -100,000.0000  
Central Meridian: -2.0000  
Scale Factor: 0.9996  
Latitude Of Origin: 49.0000  
Units: Meter



+44 (0) 1985 620430  
enquiries@coracle.co.uk  
www.coracle.co.uk

### PROJECT TITLE:

Humber Low Carbon Pipelines project

### FIGURE TITLE:

Cultural heritage assets

**DRAWN BY:** RK  
**CHECKED BY:** DG  
**APPROVED BY:** MW

**PROJECT NO.**  
220201

**FIGURE NO.**  
6

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

5.33. Three wrecks are recorded within a 1 km-wide circle that only partially encroaches the PEIR boundary (**CA1-3**). These wrecks have no recorded status, and have not been detected by recent surveys. They appear therefore to be reports of wreck events, rather than the physical locations of individual wrecks. These include:

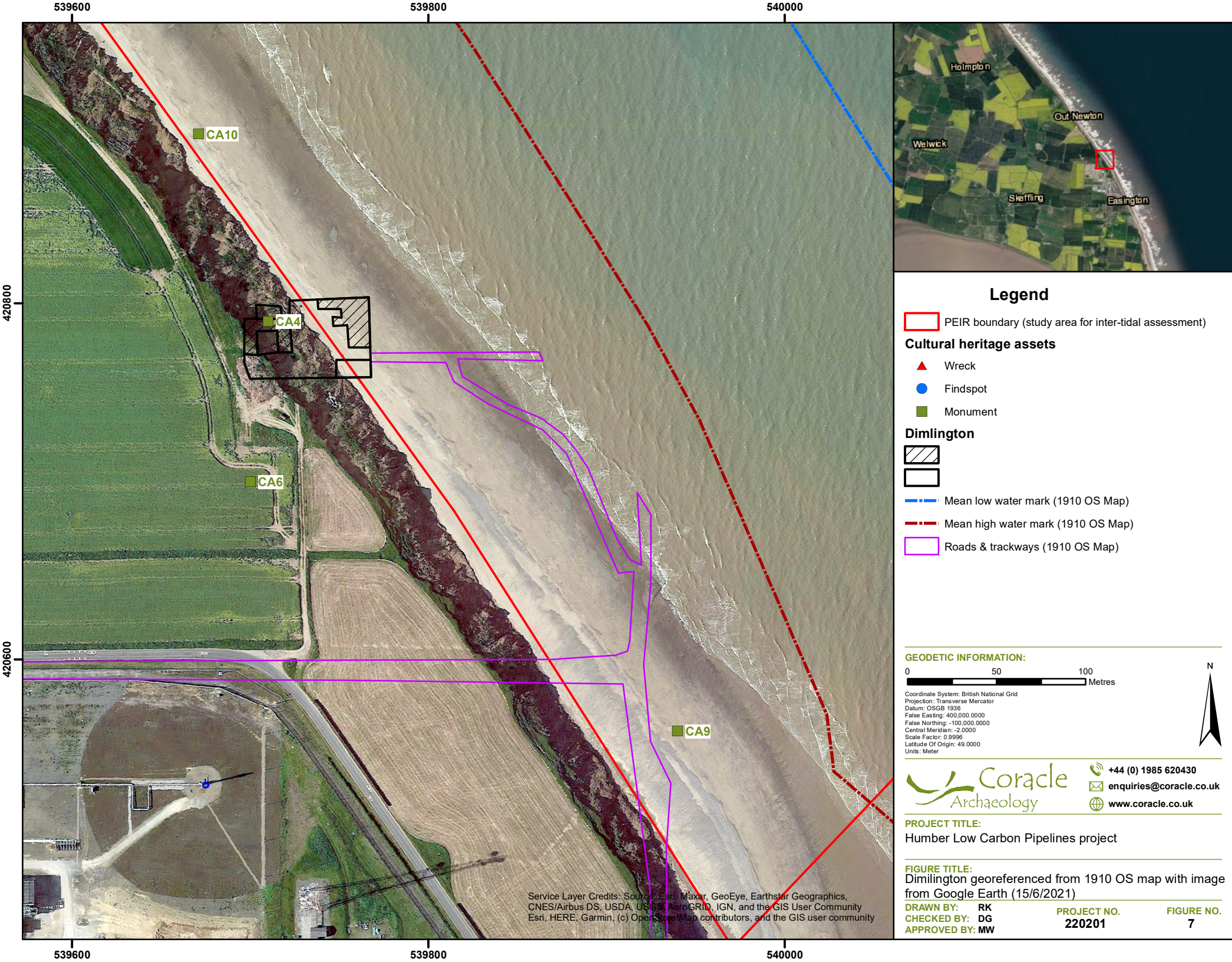
- the *Thomas* (**CA1**), an English craft that foundered near Dimlington in 1816. The crew were saved by a fishing smack (NRHE ref. 1344682);
- the *Jane & Ann* (**CA2**), a Scottish cargo vessel reportedly driven ashore on the Holderness coast in January 1831 (1357100); and
- the *Mary* (**CA3**), a wooden British sailing vessel abandoned on 23 December 1831 after springing a leak and foundering off Dimlington (1357091).

Table 3 Cultural heritage assets within the HLCP PEIR boundary

CA no.	Name	Type	Date	Status	Easting (BNG)	Northing (BNG)	Source & reference no.
<b>CA1*</b>	<i>Thomas</i>	Wreck	1816	Reported loss	539370	421560	NRHE AR/134215
<b>CA2*</b>	<i>Jane &amp; Ann</i>	Wreck	1831	Reported loss	539370	421560	NRHE AR/134215
<b>CA3*</b>	<i>Mary</i>	Wreck	1831	Reported loss	539370	421560	NRHE AR/134215
<b>CA4</b>	Dimlington	Monument	Medieval	n/a	539710	420790	Humber HER - CHU29213; NRHE AR/134215; CITIZAN
<b>CA5*</b>	Ridge and Furrow	Monument	Post-medieval	n/a	538682	421414	NRHE AR/134215
<b>CA6</b>	Beach defences	Monument	WWII	n/a	539700	420700	Humber HER - CHU29213; NRHE AR/134215; CITIZAN
<b>CA7*</b>	Beach defences	Monument	WWII	n/a	539142	421652	NRHE AR/134215
<b>CA8*</b>	Beach defences	Monument	WWII	n/a	540250	419961	NRHE AR/134215
<b>CA9</b>	Observation post	Monument	1951	n/a	539940	420560	Humber HER - CHU29213; NRHE AR/134215; CITIZAN
<b>CA10</b>	Ditch	Monument	Unknown	n/a	539671	420895	Humber HER - CHU29216

\*Co-ordinates for these entries represent the centre point of an area

- 5.34. The village of Dimlington (**CA4**) was originally recorded in *Domesday Book*. Most of the village has been lost subsequently to coastal erosion, and is now represented within the HER by a single farmstead on the cliff-top at Easington (Brigham *et al.* 2008; Humber HER ref. MHU11559). This was originally located outside of the intertidal zone; it is likely it has now been lost to the cliff. Aerial photographs acquired by the Royal Air Force (RAF) in 1941 appear to show a modified farm building located on the cliff edge ([https://historicengland.org.uk/images-books/archive/collections/aerial-photos/record/RAF\\_613E\\_BR174\\_VF\\_0036](https://historicengland.org.uk/images-books/archive/collections/aerial-photos/record/RAF_613E_BR174_VF_0036)), while an aerial photograph captured in 2014 shows a derelict farm building succumbing to erosion (see [https://historicengland.org.uk/images-books/archive/collections/aerial-photos/record/28503\\_023](https://historicengland.org.uk/images-books/archive/collections/aerial-photos/record/28503_023)). The building is not visible on the cliff-top in recent Google Earth imagery (see Figure 7), and was encountered solely as an area of hard-standing and a hay-pile during walkover surveys conducted to support terrestrial archaeological assessments (Dan Evans, *pers. comm.*). It is therefore possible that remnants of this asset are now located in the intertidal zone.
- 5.35. The original village of Dimlington was located c. 1km east of the present coastline (see figure 5 and paragraph 5.15, above); four other medieval villages are also recorded in proximity to Dimlington, including Old Newton to the north and Turmarr, Northope and Hoton to the south. These too have been lost to catastrophic erosion. It is possible that *ex-situ* remains from these settlements may be encountered on the foreshore and in the intertidal zone, brought ashore by wave action and longshore drift. It is also possible that *in-situ* remains may be located in the intertidal zone, buried beneath the beach sediments, or encountered through cliff erosion. Indeed, it is interesting to note that the 1910 OS map of the area appears to show structures, enclosures, trackways and roads associated with the settlement, located across the cliffs and foreshore zone (see Figure 7).
- 5.36. Post-medieval ridge and furrow (**CA5**) are visible as earthworks and cropmarks on RAF aerial photographs from 1941. Little was visible in the 1984 and 1994 OS vertical photography (1448115), and it is unlikely to be encountered in the intertidal zone.



5.37. A number of WWII coastal defences (**CA6-8**) were identified in aerial photographs but have since have been lost to coastal erosion. These appear to be common to the region (<https://researchframeworks.org/nerf/20th-century/#section-6>) and include:

- fortified farm buildings, military buildings of unknown function, two weapons pits, a trench and barbed wire fences (**CA6**; MHU21485).
- trackways and barbed wires (**CA7**; 1448116); and
- a minefield, trackway and pillbox / gun emplacement (**CA8**; 1448169).

It is likely that the fortified farm (**CA6**) represents the re-use of the farmstead described above (**CA4**; see paragraph 5.34).

5.38. An observation post (**CA9**; Post 18/K.2) was built in 1951 for the Royal Observer Corps. The post was made of brick reinforced with concrete, and served to monitor and report aircraft movements. The monument was identified as an upstanding structure from aerial photography examined as part of the RCZA, though it was not visible in aerial photographs from 1992 (see Brigham *et al.* 2008). In 2009, however, an underground concrete structure with access shaft was exposed on the cliff edge, below a grassed mound. This is presumed to be a part of the structure (MHU19256).

5.39. A small ditch / gully filled with light coloured silt (**CA10**) was identified on the cliff face at Easington during the RCZA (see Brigham *et al.* 2008; MHU21588). The monument is of an unknown date, and no further information is available.

#### *Sites of cultural heritage interest in proximity to the HLCP WSA*

5.40. A total of seven cultural heritage assets are located within, or in close proximity to, the HLCP intertidal zone WSA. These include four wrecks, one monument and two findspots (see figure 6; table 4).

5.41. Two wrecks are recorded on the foreshore in both the HEA and CITiZAN data. These wrecks have no recorded status, and little or no further information is available. They appear therefore to be indicative of loss reports, rather than the physical location of recorded wrecks. These include:

- the *Elbe* (**CA11**), an English snow that stranded at Out Newton in 1825 during a gale. The vessel was *en route* from St Petersburg to London with a cargo of tallow and wool (NRHE ref. 984086); and
- the *George* (**CA12**), an English cargo vessel reported as ‘lost off Dunington’ in 1831. It is likely that this is a mis-transcription of ‘Dimlington’ (104773).

**Table 4 Sites of cultural heritage interest in proximity to the HLCP WSA**

CA no.	Name	Type	Date	Status	Easting (BNG)	Northing (BNG)	Source & reference no.
<b>CA11*</b>	<i>Elbe</i>	Wreck	1825	Reported loss	539370	421560	NRHE AR/134215; CITIZAN
<b>CA12*</b>	<i>George</i>	Wreck	1831	Reported loss	539370	421560	NRHE AR/134215; CITIZAN
<b>CA13</b>	<i>Francis</i>	Wreck	1872	Live	539431	422005	UKHO Global Wrecks & Obstructions
<b>CA14</b>	<i>Torwood</i>	Wreck	1925	Dead	539582	421939	UKHO Global Wrecks & Obstructions
<b>CA15</b>	Enclosure	Findspot	Medieval	n/a	540150	420350	CITIZAN; NRHE AR/134215
<b>CA16</b>	Enclosure	Findspot	Medieval	n/a	540150	420350	CITIZAN; NRHE AR/134215
<b>CA17</b>	Beacon	Monument	1588	n/a	539352	421500	CITIZAN; NRHE AR/134215

\*Co-ordinates for these entries represent the centre point of an area

5.42. Two further wrecks (**CA13-14**) are recorded just to the north of the WSA boundary (see figure 6). Both wrecks are located within the 1km wide circle containing **CA1-3**. Their proximity to the WSA boundary (both are located within 100m of the WSA), the exceptionally dynamic nature of the coastline in this area and their location in relatively shallow water means that the possibility that wreckage associated with these assets may have moved southward, into the PEIR boundary, cannot be discounted. It is noteworthy that the next nearest wreck is located c. 2km north of the WSA. They are therefore included in this assessment.

- 5.43. The SS *Francis* (**CA13**) was a British cargo ship built in Amsterdam in 1856. The vessel was driven ashore and wrecked in 1872, while *en route* from London to Gothenburg with a cargo of grain and wood. The wreck is considered live and is lying at a depth of c. 2m below lowest astronomical tide (LAT; wrecksite.eu).
- 5.44. One dead wreck is recorded close to the given locations of **CA1-3** and **CA13**. The *FV Torwood* (**CA14**) was a small British fishing boat that struck the sunken remains of the *Francis* (**CA13**) on 11 April 1925, and subsequently foundered. The wreck was last detected in 2011 lying at a depth of c. 2m LAT (wrecksite.eu).
- 5.45. Two findspots are recorded within the WSA (**CA15-16**). Both are associated with the medieval settlement of Dimlington; both are classified as medieval enclosures with pottery (MHU refs 8988; 3377).
- 5.46. One monument is located within the WSA (**CA17**). Three beacons were originally recorded at Dimlington in 1588; one remained until c. 1840 (10861).

## 6. CONCLUSION

- 6.1. This assessment has established that there are no designated or protected wrecks, nor any scheduled monuments, within the intertidal zone of the HLCP PEIR boundary at Easington.
- 6.2. A total of 10 cultural heritage assets are recorded within the PEIR boundary, including three wrecks and seven monuments. All three wrecks are reported losses and their locations should be considered tentative at best; the recorded locations are therefore of minimal archaeological potential, so their significance is considered negligible. It is nevertheless important to recognise that assessment of significance is an iterative process. It will therefore be re-assessed in the Environmental Statement chapter, following the comparison of the results outlined here with the landfall surveys (see Appendix A).
- 6.3. All seven monuments have been subject to severe coastal erosion and are likely to be either *ex-situ*, at high-risk of alteration, buried within the intertidal zone or already lost predominantly to the sea. These too are therefore considered to be of negligible value.

- 6.4. A further seven cultural heritage assets are located in, or in immediate proximity to, the WSA, including four wrecks, one monument and two findspots. Only one of the wrecks is considered live; the remaining wrecks are included only to highlight the archaeological potential of the area. Given the location of the one monument and two findspots in the intertidal zone, it is unlikely that any trace of these heritage assets remain. These too are included for information only. The medieval pottery finds associated with the village of Dimlington nevertheless highlights the possibility for similar finds to be made during works associated with the proposed development.
- 6.5. Despite the small area being assessed, the relatively high number of recorded cultural heritage assets combined with the high impact environment of the Holderness coast suggests that the potential to encounter both known and unknown cultural remains during works associated with the proposed development is moderate. This will be reassessed following landfall surveys.
- 6.6. The proximity of the proposed development to the internationally significant Dimlington Stadial suggests that the potential to encounter deposits of geoarchaeological and palaeo-environmental interest must also be considered moderate. Exposed cliff sections (and the non-eroded tills behind them) have the potential to further enhance our understanding of the timing and palaeo-geography of the advance and retreat of the North Sea Lobe, and provide the opportunity to obtain rare organic deposits suitable for palaeo-environmental reconstruction of the Late Devensian environment. It is noteworthy that the North East Regional Research Framework highlighted the archaeology of the post-glacial coastline as a key research theme; the significance of these deposits (if present) must therefore be considered high. This will be explored more fully as the project progresses.

## 7. REFERENCES

- Baird, B. 2009. *Shipwrecks of the Forth and Tay*. Dunbeath, Scotland: Whittles.
- Bateman, MD and Buckland, PC, 2001. Non Glacial and Post Glacial History. In MD Bateman, PC Buckland, CD Frederick and NJ Whitehouse, (eds), *The Quaternary of East Yorkshire and North Lincolnshire*. Field Guide. Quaternary Research Association, London, 13-19.
- Bateman, MD, Buckland, PC, Chase, B, Frederick, CD, and Gaunt, GD, 2008. The Late-Devensian proglacial Lake Humber: New evidence from littoral deposits at Ferrybridge, Yorkshire, England. *Boreas*, 37, 195–210.
- Bateman, MD, Buckland, P, Whyte, M, Ashurst, T, Boulter, C and Panagiotakopulu, E, 2011. Re-evaluation of the Last Glacial Maximum type-site at Dimlington, UK. *Boreas*, 40, 573–584.
- Bateman, MD, Evans, DJA, Buckland, PC, Connell, ER, Friend, RJ, Hartmann, D, Moxon, H, Fairburn, WA, Panagiotakopulu, E and Ashurst, RA, 2015. Last Glacial dynamics of the Vale of York and North Sea Lobes of the British and Irish Ice Sheet. *Proceedings of the Geologists' Association*, 126, 712– 730.
- Bateman, MD, Evans, DJA, Roberts, DH, Medialdea, A, Ely, J and Clarke, CD, 2017. The timing and consequences of the blockage of the Humber Gap by the last British–Irish Ice Sheet. *Boreas*, 47, 41-61.
- Bateman, M.D., McHale, K., Bayntun, H.J. and Williams, N. 2020. Understanding historical coastal spit evolution: A case study from Spurn, East Yorkshire, UK. *Earth Surface Processes and Landforms* 45, 3670-3686.
- Berridge, NG and Pattison, J, 1994. *Geology of the country around Grimsby and Patrington: memoir for 1:50000 geological sheets 90 and 91 and 81 and 82 (England & Wales)*. London: HMSO [online]. Available at: <https://www.bgs.ac.uk/data/publications/pubs.cfc?method=viewRecord&publId=19864974> (accessed 15 June 2022).
- Brigham, T., Buglass, J. and Geoarge, R. 2008: *Rapid Coastal Zone Assessment Survey. North Yorkshire. Bempton to Donna Nook*. Historic England Project Number 3729. Humber Field Archaeology Report No. 235.

- Buckland, PC, Bateman, MD, Bennike, O, Buckland, PC, Chase, BM, Frederick, C, Greenwood, M, Murton, J, Murton, D and Panagiotakopulu, E, 2019. Mid-Devensian climate and landscape in England: new data from Finningley, South Yorkshire. Royal Society Open Science, doi: 10.1098/rsos.190577.
- Catt, JA and Penny, LF, 1966. The Pleistocene deposits of Holderness, East Yorkshire. Proceedings of the Yorkshire Geological Society, 35, 375-420.
- Chartered Institute for Archaeologists, 2014. *Standard and Guidance for Historic Environment Desk-Based Assessment*.
- Clark, CD, Evans, DJA, Khatwa, A, Bradwell, T, Jordan, C J, Marsh, SH, Mitchell, WA and Bateman, MD, 2004. Map and GIS database of glacial landforms and features related to the last British ice sheet. Boreas, 33, 359–375.
- Clark, CD, Hughes, ALC, Greenwood, SL, Jordan, C and Sejrup, HP, 2012. Pattern and timing of retreat of the last British-Irish Ice Sheet. Quaternary Science Reviews 44, 112-146.
- COWRIE, 2011. *Guidance for Offshore Geotechnical Investigations and Historic Environment Analysis: guidance for the renewable energy sector*.
- COWRIE, 2008. *Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy*.
- COWRIE, 2007. *Historic Environment Guidance for the Offshore Renewable Energy Sector*. Wessex Archaeology.
- Didsbury, P. 1988. Evidence for Romano-British settlement in Hill and the lower Hull Valley. In J. Price and P.R. Wilson (eds). Recent research in Roman Yorkshire. Oxford, British Archaeological Reports, British Series 88, 21-35.
- Didsbury, P. 1990. Explanation of the lower Hull valley in the Roman period. In S. Ellis, and D.R. Crowther (eds)., Humber perspectives: a region through the ages. Hull, Hull University Press, 199-210.
- Dinnin, M, 1995. Introduction to the Palaeoenvironmental Survey in R Van de Noort and S Ellis, (eds), Wetland Heritage of Holderness; an Archaeological Survey, 27-48. Hull: University of Hull.

- Dinnin, M and Lillie, M, 1995. The Palaeoenvironmental Survey of southern Holderness and evidence for sea-level change in R Van de Noort and S Ellis, (eds), *Wetland Heritage of Holderness; an Archaeological Survey*, 87-120. Hull: University of Hull
- Evans, DJA, Bateman, MD, Roberts, DH, Medialdea, A, Hayes, L and Clark, CD, 2017. Glacial Lake Pickering: stratigraphy and chronology of a proglacial lake dammed by the North Sea Lobe of the British-Irish Ice Sheet. *Journal of Quaternary Science*, 32, 295–310.
- Fairburn, WA and Bateman, MD, 2016. A new multi-stage recession model for Proglacial Lake Humber during the retreat of the Last British and Irish Ice sheet. *Boreas*, 45, 133–151. Fletcher 1981
- Friend, R, Buckland, PC, Bateman, MD and Panagiotakopulu, E, 2016. The ‘Lindholme Advance’ and the extent of the Last Glacial Maximum in the Vale of York. *Mercian Geologist*, 19, 18–25.
- Gaunt, GD and Tooley, MJ, 1974. Evidence for Flandrian sea-level changes in the Humber Estuary and adjacent areas. *Bulletin of the Institute of Geological Sciences*, 48, 25-41.
- Gaunt, GD, Bartley, DD and Harland, R 1974. Two interglacial deposits proved in boreholes in the southern part of the Vale of York and their bearing on contemporaneous sea levels. *Bulletin of the Geological Survey of Great Britain*, 48, 1-23.
- HM Government. 2011. *UK Marine Policy Statement*. HM Government, Northern Ireland Executive, Scottish Government, Welsh Assembly Government. London: The Stationery Office.
- Jecock, M. 2017. Slipping Away: Coastal Erosion and Archaeology. [online] The Historic England Blog. Available at: <<https://heritagecalling.com/2017/07/13/slipping-away-coastal-erosion-and-archaeology/#comments>> [Accessed May 2022].
- Joint Nautical Archaeology Policy Committee, 1998. Code of Practice for Seabed Development (second edition). *JNAPC*.
- Kirby, JR, 1999. Holocene floodplain vegetation dynamics and sea-level change in the lower Aire valley, Yorkshire. Unpublished PhD Thesis, University of Hull.
- Lewis, SG, 1999. Eastern England. In DQ Bowen, (ed), *A revised correlation of Quaternary deposits in the British Isles*. Geological Society Special Report, 23, 10-27.

- Long, AJ, Innes, JB, Kirby, JR, Lloyd, JM, Rutherford, MM, Shennan, I and Tooley, MJ, 1998. Holocene sea-level change and coastal evolution in the Humber estuary, eastern England: an assessment of rapid coastal change. *The Holocene*, 8, 229-247.
- Metcalfe, SE, Ellis, S, Horton, BP, Innes, JB, McArthur, J, Mitlehner, A, Parkes, A, Pethick, JS, Rees, J, Ridgway, J, Rutherford, MM, Shennan, I and Tooley, MJ, 2000. The Holocene evolution of the Humber Estuary: reconstructing change in a dynamic environment in I Shennan and J Andrews, (eds), *Holocene Land-Ocean Interaction and Environmental Change around the North Sea*. London: Geological Society, Special Publications, 166, 97-118.
- Neumann, H, 1998. The palaeoenvironmental survey of the Ancholme Marsh in R Van de Noort and S Ellis, (eds), *Wetland Heritage of the Ancholme and Lower Trent Valleys*. Hull: University of Hull.
- Penny, L.F., Coope, G.R. and Catt, J.A. 1969. Age and insectfauna of the Dimlington Silts, East Yorkshire. *Nature* 224,65–67.
- Plater, AJ, Ridgway, J, Rayner, B, Shennan, I, Horton, BP, Haworth, EY, Wright, MR, Rutherford, MM and Wintle, AG, 2000. Sediment provenance and flux in the Tees Estuary: the record from the Late Devensian to the present in I Shennan and JE Andrews, (eds), *Holocene Land-Ocean Interaction and environmental change around the North Sea*. Geological Society Special Publication, 166, London, 171-195.
- Rees, JG, Ridgway, J, Ellis, S, Knox, RWO, Newsham, R and Parkes, A, 2000. Holocene sediment storage in the Humber Estuary in I Shennan and JE Andrews, (eds), *Holocene Land-Ocean Interaction and environmental change around the North Sea*. Geological Society Special Publication, 166, London, 119-143.
- Rose, J, 1985. The Dimlington Stadial/Dimlington Chronozone: a proposal for naming the main glacial episode of the Late Devensian in Britain. *Boreas*, 14, 225–230.
- Roskams, S., and Whyman, M. 2007. *Yorkshire Archaeological Research Framework: research agenda*. A report prepared for the Yorkshire Archaeological Research Framework Forum and for Historic England – project number 2936 RFRA. Department of Archaeology, University of York.
- Satchell, J., 2012. *Maritime Archives and the Crown Estate Project Report*.

- Shennan, I, Lambeck, K, Horton, BP, Innes, JB, Lloyd, JM, McArthur, JJ and Rutherford, MM, 2000a. Holocene isostasy and relative sea-level on the east coast of England in I Shennan and JE Andrews, (eds), Holocene Land-Ocean Interaction and environmental change around the North Sea. Geological Society Special Publication, 166, 275-298.
- Shennan, I, Lambeck, K, Flather, R, Horton, BP, Innes, JB, McArthur, JJ, Lloyd, JM, Rutherford, MM and Wingfield, R, 2000b. Modelling western North Sea palaeogeographies and tidal changes during the Holocene in I Shennan and JE Andrews, (eds), Holocene Land-Ocean Interaction and environmental change around the North Sea. Geological Society Special Publication, 166, 299-319.
- Sheppard, J.A. 1956. The draining of the marshlands of East Yorkshire. Unpublished PhD Thesis, University of Hull
- Sheppard, J.A. 1957. The Medieval meres of Holderness. *Transactions of the Institute of British Geographers* 23, 75-86.
- Sheppard, J, 1966. The Draining of the Marshlands of South Holderness and the Vale of York. E Yorks Loc His Soc Series 20.
- Smith, AG, 1958a. Post-glacial deposits in South Yorkshire and North Lincolnshire. *New Phytologist*, 57, 19-49.
- Smith, AG, 1958b. The context of some late Bronze Age and early Iron Age remains from Lincolnshire. *Proceedings of the Prehistoric Society*, 224, 78-84.
- Smith, AG, Brown, EA and Green, CA, 1981. Environmental evidence from pollen analysis and stratigraphy in S McGrail, (ed), The 'Brigg' Raft and her prehistoric environment. British Archaeological Series 89. National Maritime Museum Archaeological Series 6, Oxford, 135-145.
- Straw, A, 2018. Geomorphology of the Kirmington interglacial deposits and the Immingham channel, north Lincolnshire. *Mercian Geologist*, 19, 133-140.
- The Crown Estate & Wessex Archaeology, 2021. *Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects*. The Crown Estate.
- The Crown Estate, 2014. *Offshore renewables protocol for archaeological discoveries*. The Crown Estate.

Van de Noort, R and Ellis, S, (eds), 1995. Wetland Heritage of Holderness - An Archaeological Survey. Hull: University of Hull, Humber Wetlands Project.

### **Online Resources**

Admiralty Marine Data Portal (UKHO Global Wrecks and Obstructions) [accessed May 2022]

<https://data.admiralty.co.uk/portal/apps/sites/#/marine-data-portal>

Historic England archive of aerial photography [accessed July 2022]

<https://historicengland.org.uk/images-books/archive/collections/aerial-photos/>

National Library of Scotland [accessed July 2022]

<https://maps.nls.uk>

Wreck Site [accessed May 2022]

<https://www.wrecksite.eu>

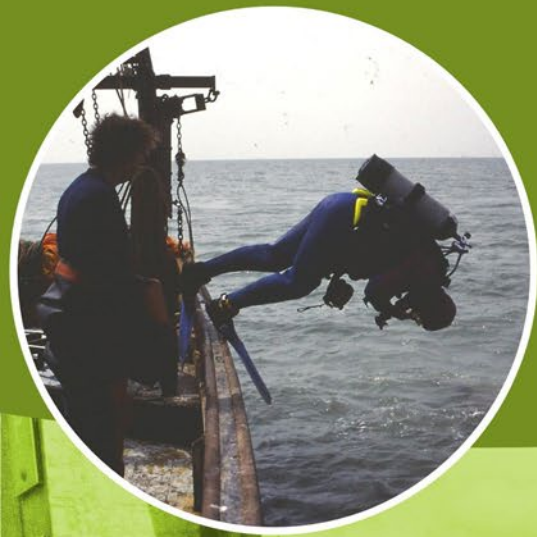
# Humber Low Carbon Pipelines project

*Archaeological surveys in the  
intertidal zone at Easington,  
Yorkshire*

*for  
RSK  
on behalf of  
National Grid*

CA ref: 220201

September 2022



## **Humber Low Carbon Pipelines project**

*Archaeological surveys in the intertidal zone  
at Easington, Yorkshire*

Coracle project no.: 220201

Coracle report no.: 220201.2

prepared by	Dr Michael Walsh, Lead Marine Archaeologist and Rory Joyce, Trainee Archaeologist
date	August 2022
checked and approved by	Dr Darren Glazier, Principal Archaeologist
date	September 2022
issue	1.0

*This report is confidential to the client. Coracle Archaeology accepts no responsibility or liability to any third party to whom this report, or any part of it, is made known. Any such party relies upon this report entirely at their own risk. No part of this report may be reproduced by any means without permission.*

## **SUMMARY**

### **Project name: Humber Low Carbon Pipelines project**

Coracle Archaeology was commissioned by RSK, on behalf of National Grid, to undertake archaeological environmental assessments in the intertidal zone, including this archaeological survey at the proposed landfall location at Easington, for the Humber Low Carbon Pipelines project. This project aims to deliver a new onshore network of pipelines to transport captured carbon dioxide emissions from the Humber region's emitters for safe storage, and to facilitate a switch from fossil fuels to low carbon hydrogen. The Humber Low Carbon Pipelines project will play a crucial role in helping the UK transition to a low carbon economy and forms the backbone of the Zero Carbon Humber vision.

This report presents the results of walkover and hand-held metal detector surveys in the intertidal zone and on the foreshore, from low water to the base of the cliffs at Easington, East Riding of Yorkshire. It follows a desk-based assessment of intertidal and coastal cultural heritage assets located within the preliminary environmental information report boundary, and a wider study area extending 500m either side of the boundary (Coracle Archaeology 2022). Ten cultural heritage assets were recorded within the boundary, including three wrecks and seven monuments. None of the three wrecks are designated or protected, and none of the seven monuments are scheduled.

Despite the small area being assessed, the relatively high number of recorded cultural heritage assets, combined with the high-impact environment of the Holderness coast, suggests that the potential to encounter both known and unknown cultural remains during works associated with the proposed development is moderate. Little other than redeposited building materials, however, were found during these archaeological surveys.

Exposed cliff sections located within the project area nevertheless have the potential to enhance our understanding of the palaeo-geography of the region, and may provide the opportunity to obtain rare organic deposits suitable for palaeo-environmental reconstruction of the Late Devensian environment. This will require further geotechnical investigation.

## Table of contents

<b>SUMMARY .....</b>	<b>ii</b>
<b>LIST OF TABLES .....</b>	<b>iv</b>
<b>LIST OF ILLUSTRATIONS.....</b>	<b>iv</b>
<b>INTRODUCTION .....</b>	<b>5</b>
<b>2. AIMS AND OBJECTIVES .....</b>	<b>5</b>
<b>3. SURVEY SPECIFICATION AND DATA ACQUISITION.....</b>	<b>9</b>
<b>4. METHODOLOGY.....</b>	<b>9</b>
<b>5. RESULTS.....</b>	<b>10</b>
<b>6. CONCLUSIONS .....</b>	<b>22</b>
<b>7. REFERENCES .....</b>	<b>22</b>

## LIST OF TABLES

TABLE 1 CULTURAL HERITAGE ASSETS RECORDED WITHIN THE HLCP PEIR BOUNDARY.....	11
--	----

## LIST OF ILLUSTRATIONS

FIGURE 1 EASINGTON BEACH, EAST RIDING OF YORKSHIRE.....	6
FIGURE 2 A VIEW OF THE SURVEY AREA.....	7
FIGURE 3 EXPOSED MUD ON ERODING CLIFFS .....	7
FIGURE 4 SAND OVERLYING EXPOSED MUD ON THE CLIFF FACE.....	8
FIGURE 5 EVIDENCE OF RECENT CLIFF EROSION (LUMPS OF MUD) ON THE BEACH.....	8
FIGURE 6 METAL DETECTOR SURVEY IN PROGRESS WITH THE HUMBER GATEWAY OFFSHORE WINDFARM ON THE HORIZON .....	10
FIGURE 7 HERITAGE ASSETS IDENTIFIED IN THE DESK-BASED ASSESSMENT (CORACLE ARCHAEOLOGY 2022).....	12
FIGURE 8 RED STOCK BRICKS IN A CEMENT-BASED MORTAR.....	15
FIGURE 9 WELL-ROUNDED LUMPS OF CONCRETE SCATTERED ON THE BEACH.....	15
FIGURE 10 A LARGE, WELL-ROUNDED LUMP OF CONCRETE. NOTE THE FRAGMENT OF CURVED ROOF TILE.....	16
FIGURE 11 EX-SITU CONCRETE FOUNDATION PAD WITH REMAINS OF A ROLLED STEEL JOIST (RSJ).....	16
FIGURE 12 A METAL SPIKE SIMILAR TO THOSE USED FOR BARBED WIRE FENCES.....	18
FIGURE 13 CBM EXPOSED ON THE CURRENT CLIFF-FACE.....	18
FIGURE 14 SEMI-BURIED REMAINS OF A METAL PIPE .....	19
FIGURE 15 A LENGTH OF GAS BARREL WITH TEE FITTING ON ONE END .....	20
FIGURE 16 PART OF A WEIGHT FROM A SASH WINDOW .....	20
FIGURE 17 ENGINE PARTS.....	20
FIGURE 18 RESULTS OF THE METAL-DETECTING SURVEY ON THE BEACH.....	21

## **INTRODUCTION**


- 1.1. Coracle Archaeology was commissioned by RSK, on behalf of National Grid, to undertake archaeological environmental assessments in the intertidal zone, including this archaeological survey at the proposed landfall location, for the Humber Low Carbon Pipelines project. This project aims to deliver a new onshore network of pipelines to transport captured carbon dioxide emissions from the Humber region's emitters for safe storage, and to facilitate a switch from fossil fuels to low carbon hydrogen. The Humber Low Carbon Pipelines project (HLCP; henceforth 'the proposed development') will play a crucial role in helping the UK transition to a low carbon economy and forms the backbone of the Zero Carbon Humber vision.
- 1.2. This report presents the results of landfall walkover and hand-held metal detector surveys conducted on a public beach at Easington, East Riding of Yorkshire, by Coracle Archaeology staff (Figure 1). These surveys assessed the foreshore and intertidal zone of the HLCP preliminary environmental information report (PEIR) boundary, from low water to the base of the cliffs (Figure 2).
- 1.3. The east-facing beach, with two offshore wind farms (Humber Gateway [north] and Triton Knoll [south]) on the horizon, was accessed from the Centrica gas terminal on Dimlington Road, Easington. It is a narrow, gently-shelving, sandy beach, strewn with well-rounded rocks and boulders (<20cm in diameter) in the intertidal zone and backed by heavily eroded cliffs (Figures 3 & 4), varying in height from c. 3-4m to c. 10-15m. Large fissures on the tops of the cliffs and large lumps of mud (<70cm across - possibly glacial till) on the beach (Figure 5) indicate recent erosion and cliff instability.

## **2. AIMS AND OBJECTIVES**

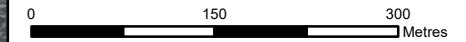
- 2.1. The aim of these surveys was to identify features and anomalies of archaeological potential at the landfall location. This will be achieved through the identification of sites and features of archaeological potential, through walkover and metal detector surveys.



### Legend

-  PEIR boundary (study area for intertidal assessment)

### GEODETTIC INFORMATION:



Coordinate System: British National Grid  
Projection: Transverse Mercator  
Datum: OSGB 1936  
False Easting: 400,000.0000  
False Northing: -100,000.0000  
Central Meridian: -2.0000  
Scale Factor: 0.9996  
Latitude Of Origin: 49.0000  
Units: Meter



+44 (0) 1985 620430  
enquiries@coracle.co.uk  
www.coracle.co.uk

**PROJECT TITLE:**  
Humber Low Carbon Pipelines project

**FIGURE TITLE:**  
Easington Beach, East Riding of Yorkshire

**DRAWN BY:** RK  
**CHECKED BY:** DG  
**APPROVED BY:** MW

**PROJECT NO.**  
220201

**FIGURE NO.**  
1

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community



**Figure 2 A view of the survey area**



**Figure 3 Exposed mud on eroding cliffs**



**Figure 4 Sand overlying exposed mud on the cliff face**



**Figure 5 Evidence of recent cliff erosion (lumps of mud) on the beach**

- 2.2. The purpose of these archaeological surveys is to identify known and potential sites and features of archaeological interest at the landfall location that might be impacted by the proposed development. Any impacts will then be limited through the adoption of appropriate mitigation measures. Archaeological potential is evaluated through the assessment of the nature and density of known and identified sites in the vicinity of the proposed development.

### **3. SURVEY SPECIFICATION AND DATA ACQUISITION**

- 3.1. The survey was conducted in August 2022 at the proposed landfall location on the beach at Easington, East Riding of Yorkshire. The surveys were conducted on the foreshore and in the intertidal zone, from low water up to the base of the cliffs.
- 3.2. A Minelab X-Terra 705 instrument was used to conduct the metal detector survey (Figure 6). The metal detector was set to detect all metal, but the sensitivity was adjusted to compensate for the high salt environment. All finds locations were recorded using a hand-held Global Positioning System (GPS) device, while features of archaeological potential were recorded with digital photography, using a Nikon Coolpix B500 digital camera.

### **4. METHODOLOGY**

- 4.1. A survey grid was established within the PEIR boundary on Easington beach and subdivided into 5m transects, using a GPS system with an accuracy of 1-2m. The surveys were then conducted along these transects, parallel to the waterline (Figure 6).
- 4.2. All identified features and detected visible finds spots were recorded photographically with a brief description, if required. Locations were recorded using a hand-held Garmin GPS and plotted into an ArcGIS basemap. As the surveys were non-intrusive, no finds spots were excavated.



**Figure 6 Metal detector survey in progress with the Humber Gateway offshore windfarm on the horizon**

- 4.3. The visual discrimination indicators (VDI) displayed on the detector were recorded. These are numeric values that have the potential to assist in the identification of the type of metal detected, with higher values more likely to be indicative of non-ferrous metals (Minelab 2017: 11).

## **5. RESULTS**

- 5.1. The desk-based assessment (Coracle Archaeology 2022) recorded ten cultural heritage assets within the PEIR boundary, including three wrecks and seven monuments (Figure

7; Table 1). None of the three wrecks are designated or protected, and none of the seven monuments are scheduled. A further seven cultural heritage assets were identified within the wider study area, including four wrecks, one monument and two findspots. These are located beyond the HLCP PEIR boundary and they will not be considered further here (see Coracle Archaeology 2022 for a full gazetteer).

**Table 1 Cultural heritage assets recorded within the HLCP PEIR boundary**

CA no.	Name	Type	Date	Status	Easting (BNG)	Northing (BNG)	Source & reference no.
<b>CA1*</b>	<i>Thomas</i>	Wreck	1816	Reported loss	539370	421560	NRHE AR/134215
<b>CA2*</b>	<i>Jane &amp; Ann</i>	Wreck	1831	Reported loss	539370	421560	NRHE AR/134215
<b>CA3*</b>	<i>Mary</i>	Wreck	1831	Reported loss	539370	421560	NRHE AR/134215
<b>CA4</b>	Dimlington	Monument	Medieval	n/a	539710	420790	Humber HER - CHU29213; NRHE AR/134215; CITiZAN
<b>CA5*</b>	Ridge and Furrow	Monument	Post-medieval	n/a	538682	421414	NRHE AR/134215
<b>CA6</b>	Beach defences	Monument	WWII	n/a	539700	420700	Humber HER - CHU29213; NRHE AR/134215; CITiZAN
<b>CA7*</b>	Beach defences	Monument	WWII	n/a	539142	421652	NRHE AR/134215
<b>CA8*</b>	Beach defences	Monument	WWII	n/a	540250	419961	NRHE AR/134215
<b>CA9</b>	Observation post	Monument	1951	n/a	539940	420560	Humber HER - CHU29213; NRHE AR/134215; CITiZAN
<b>CA10</b>	Ditch	Monument	Unknown	n/a	539671	420895	Humber HER - CHU29216

\*Co-ordinates represent the centre point of an area

5.2. Three wrecks are recorded within a 1 km-wide circle that only partially encroaches the PEIR boundary (**CA1-3**; see Figure 7). Little or no further information is available, and they appear to be reports of wreck events, rather than the physical location of individual



### Legend

PEIR boundary (study area for intertidal assessment )

#### Cultural heritage assets

Monument

#### Wreck polygons

CA1-3

#### Monument polygons

CA5

CA7

CA8

#### GEODETIC INFORMATION:

0 500 1,000 Metres

Coordinate System: British National Grid  
Projection: Transverse Mercator  
Datum: OSGB 1936  
False Easting: 400,000.0000  
False Northing: -100,000.0000  
Central Meridian: -2.0000  
Scale Factor: 0.9996  
Latitude Of Origin: 49.0000  
Units: Meter



+44 (0) 1985 620430  
enquiries@coracle.co.uk  
www.coracle.co.uk

#### PROJECT TITLE:

Humber Low Carbon Pipelines project

#### FIGURE TITLE:

Heritage assets within the PEIR boundary

**DRAWN BY:** RK  
**CHECKED BY:** DG  
**APPROVED BY:** MW

**PROJECT NO.**  
220201

**FIGURE NO.**  
7

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

wrecks (see Coracle Archaeology 2022 for further discussion). These records should not therefore be seen as indicative of the presence (or otherwise) of physical remains, and no material evidence to substantiate their existence was found during the survey.

5.3. Seven monuments were identified within the PEIR boundary in the DBA. These include:

- the medieval village of Dimlington (**CA4**);
- a post-medieval ridge and furrow system (**CA5**);
- a series of World War 2 (WWII) beach defences (**CA6-CA8**);
- a post-war observation post (**CA9**); and
- a ditch on the cliff face of unknown date (**CA10**).

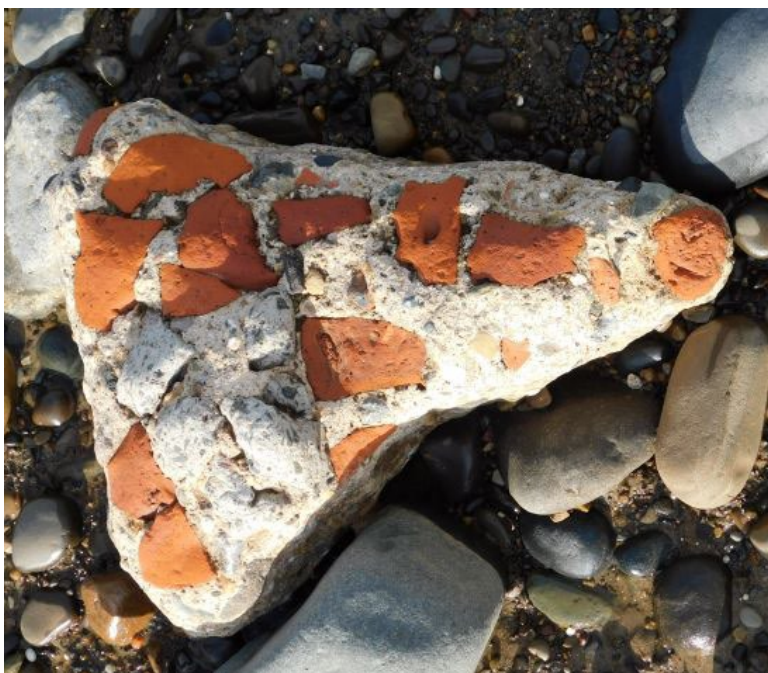
5.4. The village of Dimlington (**CA4**) was originally located c. 1km east of the present coastline, but has since been lost to coastal erosion (see Coracle Archaeology 2022). It is represented in the Humber Historic Environment Record (HER; ref. MHU11559) by a single farmstead on the cliff-top at Easington. The asset was originally recorded outside of the intertidal zone study area, though it is likely that it has now been lost to the cliff; aerial photographs acquired by the Royal Air Force (RAF) in 1941 appear to show a modified farm building located on the cliff edge ([https://historicengland.org.uk/images-books/archive/collections/aerial-photos/record/RAF\\_613E\\_BR174\\_VF\\_0036](https://historicengland.org.uk/images-books/archive/collections/aerial-photos/record/RAF_613E_BR174_VF_0036)), while an aerial photograph captured in 2014 shows a derelict farm building succumbing to erosion (see [https://historicengland.org.uk/images-books/archive/collections/aerial-photos/record/28503\\_023](https://historicengland.org.uk/images-books/archive/collections/aerial-photos/record/28503_023)). The building is not visible on recent Google Earth imagery, and was encountered solely as an area of hard-standing and a hay-pile during walkover surveys conducted to support terrestrial archaeological assessments (Dan Evans, *pers. comm.*; see also Coracle Archaeology 2022).

5.5. Although the beach was strewn liberally with ceramic building material (CBM), including sparse curved roof tiles and stock bricks, these were often bonded with cement-based

mortar (Figure 8), and were associated with moderate concentrations of reinforced concrete, some pieces as large as 1m across (Figures 9 - 11). Interestingly, the use of cement was not a common construction technique until the latter half of the twentieth century (<https://www.nachi.org/history-of-concrete.htm> [accessed 18 August 2022]); it is unlikely therefore that the CBM debris on the beach is related to either the medieval village, or the farmstead itself.

- 5.6. It is nevertheless possible that the building described in **CA6** represents the re-use of the farmstead (**CA4**). The former is described in the HER as a fortified farm building associated with military buildings of unknown function, two weapons pits, a trench and barbed wire fences (MHU21485). All date to the Second World War (WWII). The prevalence of cement-based mortar in the CBM identified on the beach would suggest that this is unlikely to be related to the fortified farm building, if it is originally medieval in date, though the possibility that they are *ex-situ* remains of the military buildings cannot be entirely discounted.
- 5.7. Remains of the post-medieval ridge and furrow system (**CA5**) were unlikely to survive on this highly dynamic coastline, and particularly in the foreshore area. As expected, no evidence of the system was found during the walkover surveys.
- 5.8. Two further WWII coastal defences (**CA7-8**) were identified in aerial photos but have since have been lost to coastal erosion (see Coracle Archaeology 2022). These appear to be common to the region (<https://researchframeworks.org/nerf/20th-century/#section-6>) and included:
- trackways and barbed wires (**CA7**; 1448116); and
  - a minefield, trackway and pillbox / gun emplacement (**CA8**; 1448169).

No structures relating to **CA7-8** were identified during the surveys, though the remains of a metal spike (c. 80cm long), commonly used in the construction of barbed wire fences, was recorded lying on the beach (Figure 12).



**Figure 8 Red stock bricks in a cement-based mortar**



**Figure 9 Well-rounded lumps of concrete scattered on the beach**

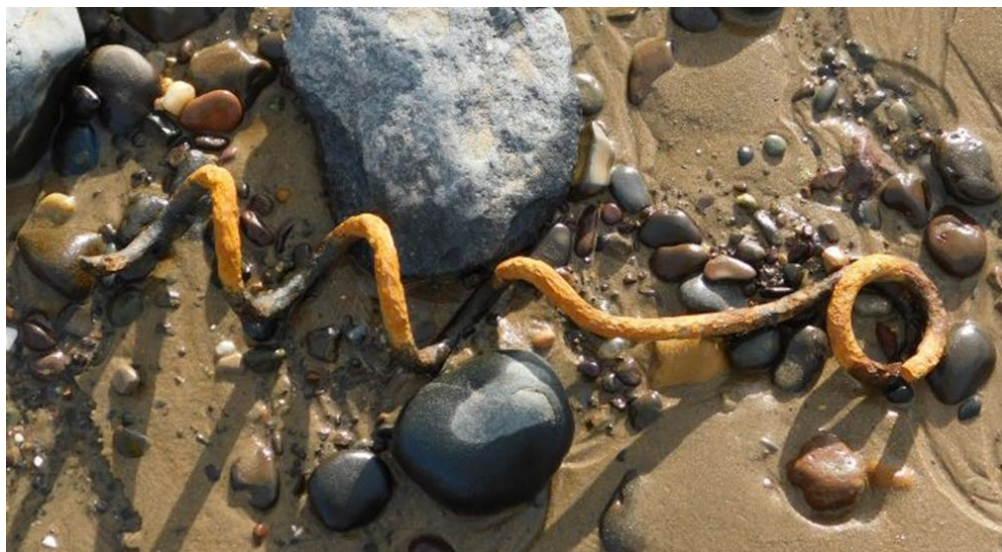


Figure 10 A large, well-rounded lump of concrete. Note the fragment of curved roof tile



Figure 11 Ex-situ concrete foundation pad with remains of a rolled steel joist (RSJ)

- 5.9. An observation post (**CA9**) was recorded in the DBA (Coracle Archaeology 2022). The post was built in 1951 for the Royal Observer Corps, and was made of brick reinforced with concrete. This was not visible in aerial photographs from 1992, although possibly related structures, including an access shaft and an underground concrete structure, were exposed in 2009. Although several sections of reinforced concrete were found on the beach (see Figures 9 - 11), these were well rounded and are likely to have been rolled in the surf. They are not therefore considered to be *in-situ*.
- 5.10. There is nevertheless evidence of building structures lost to coastal erosion in the form of exposed CBM on the current cliff face (Figure 13). These remains include cement-based elements, which suggests that they date from the 20th century, and more probably the latter half.
- 5.11. The small ditch / gully (**CA10**) identified in the cliff face in 2008 (see Coracle Archaeology 2022) was no longer visible. Given the levels of erosion evident on the cliffs, this was unsurprising.
- 5.12. A number of metal pipes were identified on the beach. One of these measured 2m in length (Figure 14) and could be misinterpreted as the remains of *in-situ* scaffolding, used in other locations on the East coast to combat coastal erosion. The pipe is not, however, standard scaffolding gauge (it measures 75mm [3"] in diameter), it has a (buckled) plate welded to one end and an elbow fitted at the other. It is likely therefore to be *ex-situ*, modern detritus.
- 5.13. Other metal objects identified during the walkover survey represent building detritus. These include a 2m length of 15mm (1/2") iron gas barrel (Figure 15), and a weight from a sash window (Figure 16). Parts from engines (probably vessel engines) were also encountered (Figure 17).



**Figure 12 A metal spike similar to those used for barbed wire fences**



**Figure 13 CBM exposed on the current cliff-face**



**Figure 14 Semi-buried remains of a metal pipe**

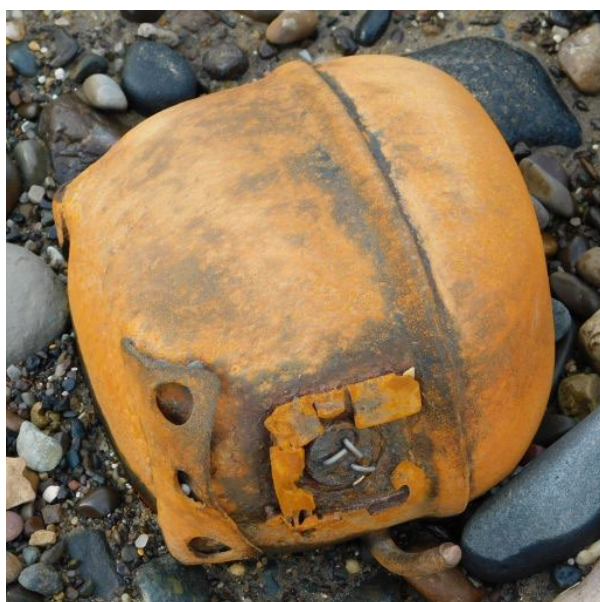
- 5.14. The metal detecting survey detected a considerable amount of buried metal on the beach (Figure 18). Given the amount of discarded metal and reinforced concrete that was observed littering the surface of the beach, this is unsurprising. There is no obvious patterning in the detections, and it is likely that they represent an accumulation of building material and other structures that have collapsed onto the beach following coastal erosion.



**Figure 15** A length of gas barrel with tee fitting on one end



**Figure 16** Part of a weight from a sash window



**Figure 17** Engine parts



## Legend

— Survey area

### Metal detector readings (visual discrimination indicator)

- 28 - 30
- 30 - 34
- 34 - 38
- 38 - 42
- 42 - 46

### GEODETTIC INFORMATION:

0 40 80  
Meters

Coordinate System: British National Grid  
Projection: Transverse Mercator  
Datum: OSGB 1936  
False Easting: 400,000.0000  
False Northing: -100,000.0000  
Central Meridian: -2.0000  
Scale Factor: 0.9996  
Latitude Of Origin: 49.0000  
Units: Meter



01985 620430  
enquiries@coracle.co.uk  
www.coracle.co.uk

### PROJECT TITLE:

Humber Low Carbon Pipelines project

### FIGURE TITLE:

Metal detector survey results

DRAWN BY: MJ  
CHECKED BY: DG  
APPROVED BY: MW

PROJECT NO.  
220201

FIGURE NO.  
18

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

## 6. CONCLUSIONS

- 6.1. Although, the metal detecting and walkover surveys conducted on the beach at Easington identified numerous items of anthropogenic origin, none are believed to be indicative of the *in-situ* remains of the ten known heritage assets recorded in the DBA (Coracle Archaeology 2022), or to have any archaeological potential. This is a result of the predominance of modern building materials identified in the survey. In addition, no anomalies of archaeological potential were identified in the non-intrusive survey data.
- 6.2. Exposed cliff sections, however, located within the project boundary, have the potential to enhance our understanding of the palaeo-geography of the region, and may provide the opportunity to obtain rare organic deposits suitable for palaeo-environmental reconstruction of the Late Devensian environment. We would therefore recommend geoarchaeological input into any project-specific geotechnical investigations, thus ensuring that the most promising locations are targeted and the most effective collection methods are used. It is noteworthy that the North East Regional Research Framework, highlights the archaeology of the post-glacial coastline as a key research theme (theme M1, Archaeology of the early post-glacial coastline: hunter-gatherers and the North Sea littoral; see Petts and Gerrard 2006:122).

## 7. REFERENCES

- Coracle Archaeology 2022. Humber Low Carbon Pipelines Project: Archaeological desk-based assessment for the intertidal zone at Easington, Yorkshire. Coracle Archaeology report No. 220201.1
- Minelab International Ltd. 2017. *X-Terra 705 Instruction manual*. Minelab.
- Petts, D. and Gerrard, C. 2006. *Shared visions: the North-East regional research framework for the historic environment*. Durham: Durham County Council.

### **Online resources**

Historic England archive of aerial photography [accessed July 2022]

<https://historicengland.org.uk/images-books/archive/collections/aerial-photos/>

History of concrete [accessed August 2022]

<https://www.nachi.org/history-of-concrete.htm>

North East regional research framework [accessed July 2022]

<https://researchframeworks.org/nerf/20th-century/#section-6>