Hornsea Project Three
Offshore Wind Farm

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Preliminary Environmental Information Report:
Annex 9.1 – Marine Archaeology Technical Report

Date: July 2017

Hornsea 3
Offshore Wind Farm

DONG energy

Environmental Impact Assessment

Preliminary Environmental Information Report

Volume 5

Annex 9.1 – Marine Archaeology Technical Report

Liability

This report has been prepared by RPS, with all reasonable skill, care and diligence within the terms of their contracts with DONG Energy Power (UK) Ltd.

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This report is also downloadable from the Hornsea Project Three offshore wind farm website at:
www.dongenergy.co.uk/hornseaproject3

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Front cover picture: Kite surfer near one of DONG Energy's UK offshore wind farms © DONG Energy Hornsea Project Three (UK) Ltd., 2016.

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Glossary

Term	Definition
Acheulian	Palaeolithic period stone tools characterised by distinctive oval and pear-shaped hand axes.
Before Present (BP)	An archaeological dating convention– the present assumed in this report to be 1950 (i.e. based on uncalibrated radiocarbon dates).
Decca System	Formerly a positioning system which allowed ships and aircraft to determine their position by receiving radio signals from fixed navigational beacons.
Ensonify	Used in sidescan sonar meaning 'fill with sound' – the seabed is flooded with an acoustic source and the intensity of the returning sound waves measured
Heritage	Historic or cultural associations.
Heritage asset	Those elements of the historic environment that hold value to this and future generations because of their historic, archaeological, architectural or artistic interest are called "heritage assets". A heritage asset may be any building, monument, site, place, area or landscape, or any combination of these (DECC, 2011).
Historic England	The Historic Buildings and Monuments Commission for England.
Levallois	Palaeollithic stone axe manufacturing technique/type named after 19th century finds of tools in the Parisian suburbs
Maritime archaeology	The physical remains of boats and ships that have been wrecked, sunk or have foundered, and may also be those artefacts which rest upon the seabed as the result of being jettisoned or lost overboard (for example, anchors, cannon or fishing gear).
Mousterian	Style of flints tools associated mostly with Neaderthals.
Prehistoric archaeology	In the British Isles the period from the earliest hominin occupation more than 780,000 years Before Present (BP) to the time of the Roman invasion of Britain in 43 AD.
Vibrocore	A technique used in offshore geotechnical surveys to recover cores generally up to 6 m deep when sampling soft seafloor sediments.

Acronyms

Acronym	Description
AOD	Above Ordnance Datum
BP	Before Present
C14	Carbon 14
CEA	Cumulative Effect Assessment
DCO	Development Consent Order
EIA	Environmental Impact Assessment
GPS	Global Positioning System
KP	Kilometre Post
LAT	Lowest Astronomical Tide
MBES	Multibeam Echo Sounder
MOD	Ministry of Defence
NL	Named Location
NPS	National Policy Statement
NSPP	North Sea Palaeolandscapes Project
PEIR	Preliminary Environmental Information Report
REC	Humber Regional Environmental Characterisation
RNAS	Royal Naval Air Service
RCZAS	Norfolk Rapid Coastal Zone Assessment Survey
ROV	Remotely Operated Vehicle
SAM	Scheduled Ancient Monument
SBP	Sub Bottom Profiler
SSS	Sidescan Sonar
UK	United Kingdom
USBL	Ultra-Short Base Line
UXO	Unexploded Ordnance

Units

Unit	Description
m	Metre
nm	Nautical Mile
nT	Nanotesla
km	Kilometre

1. Introduction

1.1 Project background

1.1.1.1 DONG Energy Power (UK) Ltd. (hereafter referred to as DONG Energy), on behalf of DONG Energy Hornsea Project Three (UK) Ltd. is promoting the development of the Hornsea Project Three Offshore Wind Farm (hereafter referred to as Hornsea Three). Hornsea Three is a proposed offshore wind farm project within the former Hornsea Zone, and includes the associated offshore cable corridor and onshore infrastructure. The proposal is for a wind farm with a total generating capacity of up to 2,400 MW which will be situated within the Hornsea Three array area in the east of the former Hornsea Zone. Hornsea Three is located in the central region of the southern North Sea, approximately 121 km from the UK coast (at Tringham, Norfolk) and approximately 10.1 km west of the median line between UK and Netherlands waters (Figure 2.1). All references to Hornsea Three in this technical report shall, for the purposes of the report, refer to the offshore infrastructure and activities only.

1.1.1.2 RPS was commissioned to undertake a marine archaeology baseline study of the regional marine archaeology study area to inform the marine archaeology Environmental Impact Assessment (EIA) for Hornsea Three. Accordingly, this technical report considers the known and potential archaeological records in Hornsea Three (within the Hornsea Three array area, the offshore cable corridor and landfall area) within its wider historical context. The three main areas considered in the Marine Archaeological Technical Report are:

- Submerged prehistoric archaeology;
- Maritime archaeology; and
- Aviation archaeology.

1.1.1.3 Available evidence for submerged prehistoric, maritime and aviation archaeology within the Hornsea Three array area, the offshore cable corridor and landfall area is presented and the potential for the presence of currently undiscovered archaeological sites and materials from all periods is discussed. The importance of the archaeological record and the likely impacts of the development of Hornsea Three on this record are assessed in volume 2, chapter 9: Marine Archaeology.

1.2 Aims and objectives

1.2.1.1 The aim of this Marine Archaeological Technical Report is to inform the Preliminary Environmental Information Report (PEIR) for Hornsea Three by providing an overview of the archaeological baseline against which the potential impacts of Hornsea Three on the archaeological record of the area can be assessed.

1.2.1.2 The objectives of this study are to:

- Summarise the potential for submerged prehistoric archaeology to be encountered within the Hornsea Three array area, the offshore cable corridor, including the landfall area, and to contribute to the understanding of the palaeoenvironment of the wider UK continental shelf;
- Highlight known maritime and aviation sites and, based on the maritime history of the regional marine archaeology study area, assess the potential for the existence of unknown sites and materials within Hornsea Three;
- Present site specific geophysical data from surveys across the Hornsea Three array area and the offshore cable corridor identifying anomalies of archaeological interest, characterise these anomalies and integrate the results with those of the desk-based work described above; and
- Review available relevant geotechnical data for sediments of archaeological and palaeoenvironmental interest and integrate the results with those of the desk-based work described above.

2. Methodology

2.1 Marine archaeology study area

2.1.1.1 For the purposes of the Hornsea Three marine archaeology characterisation, two study areas are defined as follows:

- The Hornsea Three marine archaeology study area - defined as the area which will encompass the offshore components of Hornsea Three (specifically the array area, offshore cable corridor (including the temporary working areas extending some 600 m on either side), and landfall area seaward of MHWS) as this area was considered to be directly affected by the proposed development; and
- The regional marine archaeology study area – defined as a 20 km buffer from the Hornsea Three array area and offshore cable corridor (including the temporary working areas), extended to include the Hornsea Project One and Hornsea Project Two array areas (see Figure 2.1). This regional marine archaeology study area is the area covered by the desktop review and therefore provides a wider context for the site-specific data, as well as the extent of the marine archaeology cumulative effect assessment (CEA).

2.2 Relevant legislation and guidance

2.2.1.1 This section outlines legislation and guidance relevant to offshore archaeological remains in the context of offshore renewable energy development. It is not an exhaustive list.

2.2.2 Legislation

Protection of Wrecks Act 1973

2.2.2.1 The Protection of Wrecks Act 1973 makes provision, within UK waters, for the protection of wrecks and any vessel or associated objects on account of its wreckage of historical, archaeological or artistic importance, by way of site designation. Each designated wreck is surrounded by an exclusion zone within which it is an offence to tamper with, damage or remove any objects or part of the vessel or to carry out any diving or salvage operation, except under the terms of a licence granted by the Secretary of State for Culture, Media and Sport.

2.2.2.2 Protected wrecks in both the regional marine archaeology study area and the Hornsea Three marine archaeology study area are outlined in section 3.5.1 below.

Protection of Military Remains Act 1986

2.2.2.3 The Protection of Military Remains Act 1986 makes it an offence to interfere with the wreckage of any crashed, sunken or stranded military aircraft or designated vessel without a licence. This is irrespective of whether there was loss of life associated with the wreck, or whether the loss of the aircraft or vessel occurred during peacetime or wartime.

2.2.2.4 All crashed military aircraft receive automatic protection under this Act, but vessels must be individually designated. There are two levels of protection offered by this Act: designation as a Protected Place or as a Controlled Site.

2.2.2.5 Protected Places include the remains of any aircraft which crashed while in military service or any vessel designated (by name, not location) which sank or stranded in military service after 4 August 1914. Although crashed military aircraft receive automatic status as a Protected Place, vessels need to be specifically designated by name. The location of the vessel does not need to be known for it to be designated as a Protected Place.

2.2.2.6 Controlled Sites are specifically designated areas which encompass the remains of a military aircraft or a vessel sunk or stranded in military service within the last two hundred years. Diving operations are effectively prohibited on these sites without a specific licence.

2.2.2.7 Sites designated under the Protection of Military Remains Act 1986 in both the regional marine archaeology study area and the Hornsea Three marine archaeology study area are outlined in section 3.5.1 below.

Ancient Monuments and Archaeological Areas Act 1979

2.2.2.8 This primarily land based Act may also be used to provide protection for underwater sites within the UK's territorial waters. Buildings, structures or works, caves or excavations, vehicles, vessels, aircraft or other movable structures of national importance may be scheduled as 'monuments'. It is an offence to demolish, destroy, remove, alter or, repair or make any alterations to a monument or carry out any flooding or tipping operations without scheduled monument consent. The Act is administered in England by Historic England, on behalf of the Secretary of State for Culture, Media and Sport.

2.2.2.9 There are no scheduled ancient monuments in the regional marine archaeology study area or the Hornsea Three marine archaeology study area.

Merchant Shipping Act 1995

2.2.2.10 All wrecks within the UK's territorial sea and any wreck which is landed in the UK from outside the UK territorial sea must, as stated in Section 236 of the Merchant Shipping Act 1995, be declared to the Receiver of Wreck, who acts on behalf of the Maritime and Coastguard Agency in administering this section of the Act. The Act defines 'wreck' as anything which is found in or on the sea or washed ashore from tidal water.

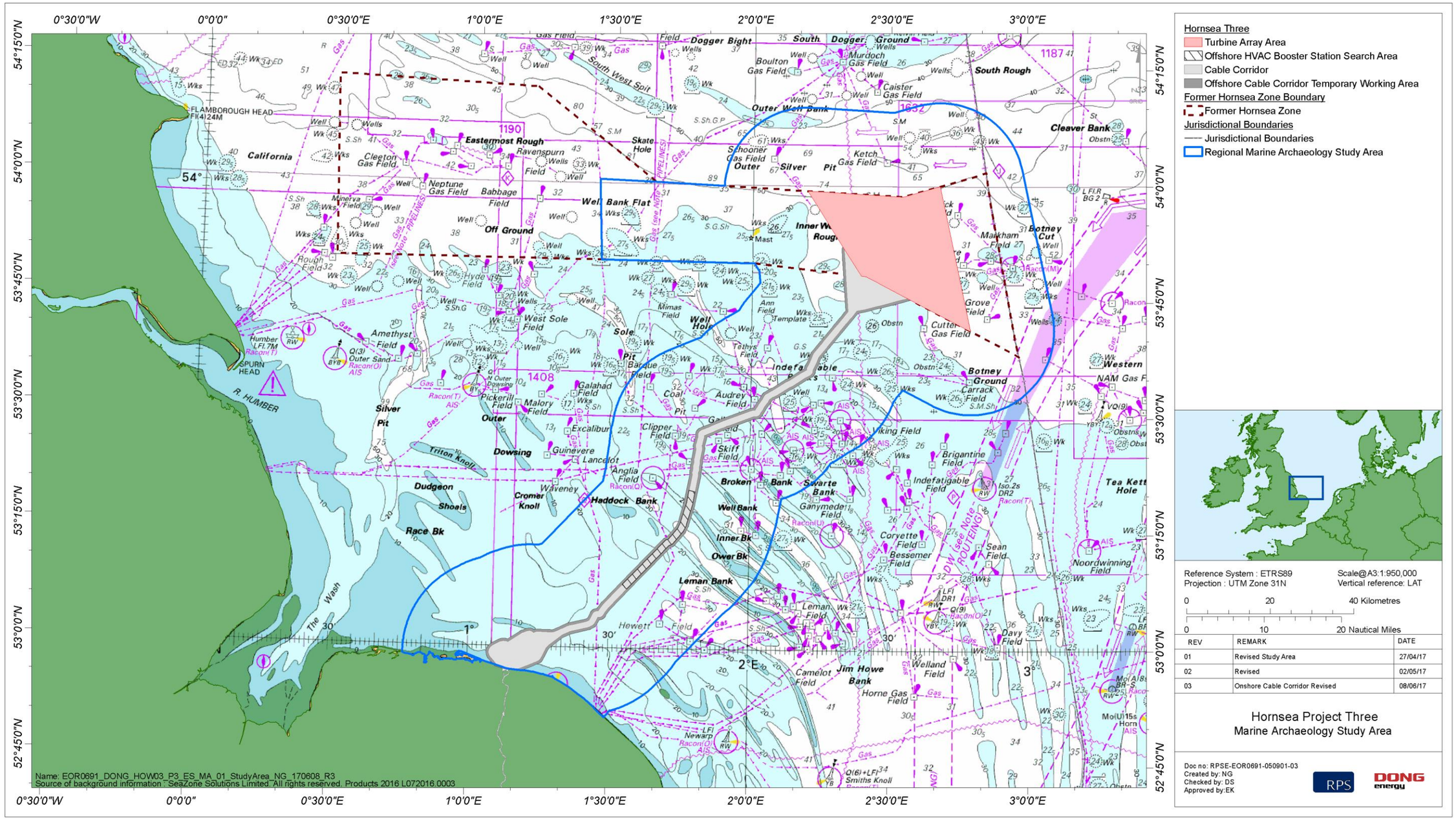

Figure 2.1: Location of Hornsea Three (the marine archaeology study area), the former Hornsea Zone and the regional marine archaeology study area.

2.2.2.11 All items which are raised from the seabed, regardless of age or importance, must be reported to the Receiver who will act to settle questions of ownership and salvage. Finders who report their finds to the Receiver have salvage rights.

Maritime Archaeology on the Continental Shelf

2.2.2.12 It should be noted that outside of the UK territorial sea (i.e. beyond 12 nm), the regulation and reporting of maritime archaeology is governed by international legislation and guidance. Activities, however, may be subject to EIA under the European Union EIA Directives 85/337/EEC and 97/11/EC and assessed by virtue of the Strategic Environmental Directive 2001/42/EC.

International law

2.2.2.13 Guidance is also provided by international law such as The United Nations Convention on the Law of the Sea 1982 (UNCLOS, 1982), the European Convention on the Protection of the Archaeological Heritage (Revised) 1992 (the Valletta Convention) and the UNESCO Convention on the Protection of the Underwater Cultural Heritage 2001 (UNESCO, 2001).

2.2.3 Guidance

2.2.3.1 Guidance which has been considered in the production of this Marine Archaeology Technical Report includes.

- Code of Conduct Chartered Institute for Archaeologists (2014);
- Standard and Guidance for Historic Environment Desk Based Assessment Chartered Institute for Archaeologists (2014);
- The Code of Practice for Seabed Developers (The Joint Nautical Archaeology Policy Committee 2008);
- Crown Estate Guidance (Crown Estate and Wessex Archaeology, 2010, Wessex Archaeology, 2010). The Crown Estate guidance includes:
    - Model Clauses for Archaeological Schemes of Investigation (Wessex Archaeology, 2010b); and
    - Protocol for Archaeological Discoveries (Crown Estate and Wessex Archaeology, 2010).
- COWRIE Guidance (2007, 2008 and 2010). The COWRIE guidance includes:
    - Historic Environment Guidance for the Offshore Renewable Energy Sector (COWRIE, 2007); and
    - Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (Gribble and Leather, 2010).
- Identifying and protecting palaeolithic remains; Archaeological Guidance for Planning Authorities and Developers (Historic England, 1998).

2.3 Methodology for defining the baseline environment

2.3.1 Desktop review

2.3.1.1 A detailed literature search was carried out to establish the baseline of information available in the regional marine archaeology study area. Information was sought on marine archaeology from the following principal primary sources:

- Records of United Kingdom Hydrographic Office (UKHO) wrecks and obstructions provided by SeaZone Ltd ("SeaZone");
- Records held by the National Record of the Historic Environment, held by Historic England, which include reports of finds recovered as a result of aggregate extraction and reported under the British Marine Aggregates Producers Association's (BMAPA) Protocol for Reporting Finds of Archaeological Interest (BMAPA and EH, 2003 and 2005) ("NRHE");
- Admiralty Charts 1187 (Outer Silver Pit) and 1503 (Outer Dowsing to Smiths Knoll including Indefatigable Banks);
- Geoarchaeological analysis of relevant interventions within both the Hornsea Three marine archaeology study area and the regional marine archaeology study area; and
- Aircraft Crash Sites at Sea: A Scoping Study (Wessex Archaeology, 2008b).

2.3.1.2 Information from following secondary sources related to the maritime history, submerged prehistory and the archaeology of the southern North Sea and the Norfolk Coast were also sought:

- The Humber REC (Tappin *et al.*, 2011);
- The North Sea Palaeolandscapes Project (Gaffney *et al.*, 2007); and
- The Norfolk Rapid Coastal Zone Assessment (Robertson *et al.*, 2005).

2.3.1.3 The SeaZone, NRHE and the geophysical data collected during field surveys (see section 2.3.2 below) were superimposed on a base map of the survey area in a project GIS workspace to plot the general distribution of known and recorded shipping casualties and geophysical anomalies with archaeological potential in the regional marine archaeology study area. Information drawn from secondary sources was used qualitatively, particularly to develop an understanding of the likelihood of unknown and unrecorded maritime archaeological sites and remains in the regional marine archaeology study area, which also includes the Hornsea Three marine archaeology study area.

2.3.1.4 Records of Second World War Air/Sea Rescue Operations cited by Wessex Archaeology in Aircraft Crash Sites at Sea (Wessex Archaeology, 2008b) were used with a documentary review of historic aviation activity in the region to understand the density and general distribution of wartime aircraft activity in the regional marine archaeology study area, and thus highlight the potential for the presence of aircraft crash sites within Hornsea Three marine archaeology study area.

2.3.1.5 The review of the potential for unknown and uncharted maritime and aviation archaeological sites in the regional marine archaeology study area was supplemented by an assessment of the conditions which can be expected to affect archaeological site survival and visibility within Hornsea Three marine archaeology study area. This was assessed specifically in relation to the nature of the archaeological material itself and the nature of the seabed environment.

2.3.2 Field surveys

Hornsea Three array area and offshore cable corridor

Geophysical surveys

2.3.2.1 The following data was collected of the Hornsea Three array area and offshore cable corridor :

- Multibeam bathymetry data collected during three surveys:
  - Hornsea Three array area: Multibeam echo sounder (MBES) with line spacing in the north-west of 500 by 1,000 m and in the south-east of 1,000 by 1,000 m;
  - Funnel between the Hornsea Three array area and offshore cable corridor (considered in this report as part of the Hornsea Three offshore cable corridor): MBES at 100% coverage; and
  - Hornsea Three offshore cable corridor: MBES with line spacing of 55 to 67 m at 100% coverage.
- Sidescan sonar data collected during three surveys:
  - Hornsea Three array area: Sidescan sonar with line spacing in the north-west of 500 by 1,000 m and the south-east of 1,000 by 1,000 m;
  - Funnel between the Hornsea Three array area and offshore cable corridor (considered in this report as part of the Hornsea Three offshore cable corridor): Sidescan sonar at 100% coverage; and
  - Hornsea Three offshore cable corridor: Sidescan sonar with line spacing of 55 to 67 m at 100% coverage.
- Magnetometer data collected during two surveys:
  - Hornsea Three array area: Magnetometer with line spacing in the north-west of 500 by 1,000 m and in the south-east of 1,000 by 1,000 m; and
  - Hornsea Three offshore cable corridor: Magnetometer at 55 to 67 m on lines.
- Sub bottom profiler (SBP) data were collected in three surveys:
  - Hornsea Three array area: SBP with line spacing in the north-west of 500 by 1,000 m and in the south-east of 1,000 by 1,000 m;
  - Funnel between the Hornsea Three array area and offshore cable corridor (considered in this report as part of the Hornsea Three offshore cable corridor): SBP at 100 m line spacing; and
  - Hornsea Three offshore cable corridor: SBP with line spacing at 55 to 67 m on lines.

2.3.2.2 Following data delivery, an initial review of the dataset was undertaken to gain an understanding of the geological and topographic makeup of the survey area. Within the extents of the survey area the potential for variations in the seabed are high and can affect the interpretation of contacts. Whilst some of the data extends beyond the constraints of the survey area the purpose of the assessment is to characterise the historic environment therefore all available data has been considered. This is with the exception of magnetometer data which was disregarded if it did not meet the following criteria designed to ensure that the data are reliable in terms of location and background noise:

- A grid cell size of 1.0 m;
- A blanking distance of 20.0 m;
- Magnetometer altitude of between 2 and 4.5 m; and
- Ultra-Short Base Line (USBL) positioning error greater than 2.5 m.

Archaeological review of geophysical data

2.3.2.3 Sidescan sonar is considered the best tool for the identification of anthropogenic contacts on the seabed through its ability to ensonify small features and so forms the basis of any archaeological assessment of data.

2.3.2.4 Magnetometer data indicates the presence of ferrous and thus usually anthropogenic material both on, and under the seabed and where line spacing allows. Data collection across the Hornsea Three survey area was intended to provide an overall understanding of the site. Line spacing varied from approximately 60 m in the Hornsea Three offshore cable corridor to 500 to 1000 m in the Hornsea Three array area. A magnetic anomaly position can only be determined from directly below the sensor, or where lines are run close together to position an anomaly seen on two, or more, lines. Where possible, significant magnetic anomalies were however correlated with contacts visible on the seabed.

2.3.2.5 Whilst SBP and MBES are useful tools for archaeological assessment, their primary use, outside of seabed and paleo-landscape characterisation, is in the corroboration of contacts identified in the sidescan sonar and magnetometer data. As such, all contacts equal to, or greater in size than, 1.0 m were assessed for archaeological potential primarily alongside the magnetometer data, however SBP and MBES data were used to corroborate identified contacts.

2.3.2.6 It should be noted that there may be instances where a contact may exist on the seabed but not be visible in the geophysical data. This may be due to it being covered by sediment or, being obscured from the line of sight of the sonar or poor quality data. Risks to heritage assets can be reduced thorough a series of measures such as further geophysical survey, for example for UXO, and ROV searches.

2.3.2.7 The archaeological potential was assigned to each contact based on the criteria outlined in Table 2.1 below. In addition, magnetic anomalies of greater than 500 nT have been provisionally identified as areas of archaeological potential. Where uncertainty existed as to the identification or archaeological potential of a contact the provided dataset was reviewed. Specifically, sidescan sonar and SBP data were imported into CODA Survey Engine or Chesapeake SonarWiz and reviewed on a line by line basis and MBES data was viewed in QINSy Cloud, Fledermaus or other point cloud visualisation software dependant on the requirement. Given the specification of the survey, and the quality of processing, the magnetometer data was not re-processed.

Table 2.1: Criteria for archaeological potential.

Archaeological Potential	Criteria
Low	A contact potentially of anthropogenic origin but that is unlikely to be of archaeological interest.
Medium	A contact believed to be of anthropogenic origin but that would require further investigation to establish its archaeological potential.
High	A contact almost certainly of anthropogenic origin and with a high potential of being of archaeological significance.

2.3.2.8 Contacts assessed as having low, medium and high archaeological potential were then compiled into a gazetteer and a shapefile created for further assessment alongside known features such as wrecks, mooring buoys, third party assets such as cables and pipelines and other seabed structures. The data was subsequently assessed to ensure no unnecessary identification of archaeological potential when the origination can be identified, to remove contacts of no archaeological importance.

2.3.2.9 Measurements where possible were taken in sidescan sonar, SBP and MBES processing software, and whilst largely accurate, discrepancies can be noted. Where there is uncertainty as to the potential or origin of a contact, a precautionary approach was always taken and the contact was taken forwards to the next stage of the assessment.

Hornsea Three landfall area

Walk-over survey

2.3.2.10 A site visit and walkover survey was undertaken across the Hornsea Three landfall area in February 2017. The aim of the walkover survey was to establish the presence of above ground archaeology, whether or not previously recorded and to verify the settings of heritage assets in the vicinity of the Hornsea Three landfall area.

2.3.2.11 The walkover was undertaken from a base at Weybourne gap, first along the public right of way on the landward side of the intertidal zone and then on the beach to the east and west of the car park (see Figure 3.7). The walkover covered the exposed part of the Hornsea Three landfall area.

Borehole survey

2.3.2.12 A borehole survey immediately south of the Hornsea Three landfall area has been undertaken in connection with Hornsea Three. Two groups of boreholes were undertaken, one group of four to the east of Weybourne Gap, with a group of three to its west.

Future surveys

2.3.2.13 A number of further surveys are proposed in connection with Hornsea Three. These are outlined in Table 2.2 below.

Table 2.2: Proposed Further Surveys.

Survey Title	Extent of Survey	Survey Overview	Proposed Date
Hornsea Three offshore cable corridor infill geophysical survey	Hornsea Three offshore cable corridor landward of 10 m contour.	Indicative scope: • MBES, sidescan sonar, magnetometer, sub bottom profiler and a number of ground truthing grabs.	2017
Hornsea Three array area and offshore cable corridor UXO geophysical survey	Hornsea Three array area and offshore cable corridor seaward of 10 m contour.	Indicative scope: • Survey of 20 by 20 m boxes to include MBES, sidescan sonar, magnetometer, sub bottom profiler and a number of ground truthing grabs.	2017
Hornsea Three array area and offshore cable corridor geotechnical survey	Hornsea Three array area and offshore cable corridor.	Indicative scope: • Hornsea Three array area: 65 CPTs/vibrocores and 10 boreholes; and • Hornsea Three offshore cable corridor: 30 shallow CPTs/vibrocores.	2017

3. Results

3.1 Seafloor topography

3.1.1.1 The depth of water and character of the regional marine archaeology study area varies considerably, from shallow intertidal and subtidal waters close to the proposed landfall area, to the ocean 'deeps', such as the Outer Silver Pit where depths are up to -73 m LAT (see Figure 2.1). The varying topography of the seafloor and its relationship with the adjacent coast has a direct relationship with the nature, density and character of the archaeological remains found on and under it.

3.1.2 Hornsea Three array area

3.1.2.1 Within the Hornsea Three array area, the water extends in depth from some -26 to some -73 m LAT in the northernmost part. The Hornsea Three array area is characterised by relatively shallow banks separated by two deeper channels and a consistently deeper area to the north, Outer Silver Pit.

3.1.2.2 Markhams Hole, located in the centre and east of the Hornsea Three array area, is a glacial tunnel valley, partly infilled. Gaffney *et al*. (2007) notes that the SBP data reveals that this feature is actually much deeper than the bathymetry reviewed for the NSPP suggests. BGS cross-sections for the area and 2D seismic data from sub bottom profiling made available to the NSPP, suggests the existence of significant deposits within this structure. These deposits can be directly related to the Late Pleistocene Botney Cut formation and are directly overlain by deposits of a recent origin. A channel system attached to the end of this tunnel valley, which is incised into the Late Pleistocene Boulders Bank formation, can be observed to terminate at the Early Holocene coastline (Gaffney *et al.,* 2007).

3.1.2.3 A second distinct channel is situated to the north of Markham's Hole, in the northern half of the Hornsea Three array area. This feature is narrower than Markham's Hole. The feature connects to Outer Silver Pit, is some 30 m deeper than the surrounding seabed and deepens from approximately -41 m LAT to a maximum depth of approximately -73 m LAT at its northern extent. The gradient is steeper over this area than at Markham's Hole. The feature is interpreted as being a marine inlet into the Outer Silver Pit (Gaffney *et al*., 2007).

3.1.2.4 The northern part of the Hornsea Three array area lies at the southern edge of the Outer Silver Pit. This feature was a lake during the Early Holocene. This large body of fresh water is likely to have been very attractive to hunter gathers. Although no clear dating evidence is available, isostatic models suggest that the coastline of the Outer Silver Pit was active at around 9,500BP (Gaffney *et al*., 2007). Within the Hornsea Three array area, the water extends in depth to some -73 m LAT in the northernmost part, at the edge of the Outer Silver Pit. Archaeological remains of the Mesolithic and perhaps Upper Palaeolithic periods are likely to survive.

3.1.3 Hornsea Three offshore cable corridor (including temporary working area)

3.1.3.1 The water depth along the Hornsea Three offshore cable corridor broadly shallows from the offshore terminus to the landfall area.

3.1.3.2 The site specific SBP data indicates that the shallow soils sequence of the Hornsea Three offshore cable corridor from the offshore terminus to the landfall area is comprised of the following (see Figure 3.2 for Kilometre Post (KP) locations):

- Holocene sediments overlying Bolders Bank Formation from the eastern end of the Hornsea Three offshore cable corridor to KP109.5;
- Holocene sediments overlying Botney Cut Formation from KP109.5 to KP104.5;
- Holocene sediments overlying Bolders Bank Formation from KP104.5 to KP77;
- Holocene sediments overlying Swarte Bank Formation from KP 77 to KP56.25;
- Holocene sediments overlying Egmond Ground Formation from KP56.25 to KP51.5;
- Holocene sediments overlying Bolders Bank Formation from KP51.5 to KP39.5;
- Holocene sediments overlying Swarte Bank Formation from KP 39.5 to KP33.25; and
- Shallow Chalk with isolated patches of Quaternary Sediments from KP33.25 to the landfall area.

3.1.3.3 A number of features have been identified within the Hornsea Three offshore cable corridor. These include:

- A deep channel crossing route between KP105.5 and KP107.5;
- A sandbank between KP77.5 and KP79.5;
- A shallow channel between KP70.25 and KP72.25;
- A large irregular depression in the seabed between KP45.25 and KP46.25;
- A large seabed mound between KP38.25 and KP41.25, where seabed levels rise to some -25 m and -28 m LAT;
- Sand waves between KP26.25 and KP38.25; and
- A channel running roughly northeast to southwest from approximately KP24.25 to KP 20.25. This feature merges with a further channel feature located at approximately KP 21.25 to KP 22.25.

3.1.4 Hornsea Three landfall area

3.1.4.1 The general topography of the Hornsea Three landfall area is low-lying cliffs to the east of Weybourne Gap, rising rapidly to some 30 m Above Ordnance Datum (AOD), with lower lying ground to the west.

3.1.4.2 The geology at the landfall area and the intertidal zone comprises chalk overlain by marine sands and gravels (BGS). Weybourne gap marks a change in the solid geology of the area, with steep chalk cliffs, apparently harder in nature than that to the west, which are being actively eroded by the sea to the east.

3.2 Submerged prehistoric archaeology

3.2.1.1 The prehistoric archaeological record of the British Isles covers the period from the earliest hominin occupation more than 780,000 BP to the Roman invasion of Britain in 43 AD. During this long span of time, sea level fluctuations caused by three major glaciations (the Anglian, Wolstonian and the Devensian) have shaped the submerged prehistoric landscape within the regional marine archaeology study area. The changes in sea level have at times exposed the floor of the southern North Sea, including within the regional marine archaeology study area, creating an inhabitable environment suitable for hominin occupation and exploitation. Table 3.1 below summarises the prehistoric archaeological record and the potential for remains of these periods to survive within the regional marine archaeology study area.

3.2.2 Pre-Devensian (>780,000 to approximately 73,000 BP)

The Cromerian Period (>780,000 to approximately 478,000 BP)

3.2.2.1 The earliest current evidence for a hominin presence in the UK comes from Cromer Forest-bed Formation sediments associated with the Bytham and Ancaster palaeo-rivers, which flowed from the Midlands across East Anglia and Norfolk and into the southern North Sea during the Cromerian interglacial.

3.2.2.2 The Cromer Forest-bed sediments contain a rich faunal assemblage and other palaeoenvironmental information which suggest that the period was characterised by a warm, almost Mediterranean climate and an environment rich in resources attractive to hominins (Parfitt *et al.*, 2005; 2010; Wymer, 1999).

3.2.2.3 This attractiveness to hominins is borne out by a site at Happisburgh on the north Norfolk coast, some 30 km southeast of the proposed landfall area and associated with the palaeo-Ancaster, which recently produced Lower Palaeolithic flint artefacts indicating a hominin presence in Britain more than 780,000 BP, and possibly as early as 990,000 BP (Parfitt *et al.*, 2010). Other early evidence for hominins in the UK about 500,000 years ago has been found at Boxgrove in West Sussex (Stringer, 2006) and at Waverley Wood in Warwickshire (Keen *et al.*, 2006). Together these finds suggest that a hominin presence in the regional marine archaeology study area was possible during the Cromerian.

3.2.2.4 The Hornsea Three array area and offshore cable corridor geophysical surveys have all identified Yarmouth Roads Formation sediment as a basal unit over much of the Hornsea Three marine archaeology study area (EGS, 2016; Walters, 2016). Largely contemporaneous with the Cromer Forest-bed Formation within which the Happisburgh archaeological material has been found, the Yarmouth Roads Formation is an accumulation of sediments deposited by a large delta fed by a number of river systems, including the proto-Rhine, -Maas, -Scheldt and -Thames (Gibbard, 1995). The Formation consists of sands, with interbedded silty clays and evidence of reworked peat (Cameron *et al.*, 1992), and represents a mixed lower estuarine, intertidal to marine environment with some potential for hominin exploitation and use.

Table 3.1: Prehistoric timeline summary.

Period	Dates	Subdivision	Dates	Notes
Pre-Devensian	>780,000 to approximately 73,000 BP	Cromerian Period	(>780,000 to approximately 478,000 BP)	Some potential for hominin exploitation and use.
		Anglian Glaciation	(approximately 478,000 to 424,000 BP)	Hominin presence in the regional marine archaeology study area for most of the Anglian glaciation is unlikely.
		Hoxnian Interglacial	approximately 424,000 to 380,000 BP)	Lower Palaeolithic material found in the UK.
		Post-Anglian/pre-Devensian (Wolstonian) Glaciation)	380,000 and 130,000 BP (widely referred to as the Wolstonian, although	Evidence for hominin activity in the UK during the warmer, interglacial periods within the Wolstonian.
		Ipswichian Interglacial	approximately 135,000 to 73,000 BP)	Middle Palaeolithic hominins known to have occupied northwestern Europe, but apparently no hominin presence in the UK.
Devensian to Late Glacial Maximum,	73,000 to 18,000 BP	-	-	Arrival in the UK of late Middle Palaeolithic Neanderthals, who were followed approximately 31,000 BP by Early Upper Palaeolithic, anatomically modern humans (Homo sapiens).
Post-Late Glacial Maximum and early Holocene,	18,000 to 6,000 BP	-	-	Coincides with the Late Upper Palaeolithic and the Mesolithic. Likely that much of the regional marine archaeology study area was occupied by Late Upper Palaeolithic and then Mesolithic people until the area was finally inundated.

The Anglian Glaciation (approximately 478,000 to 424,000 BP)

3.2.2.5 The Cromerian was followed by the first and most extensive of the late Pleistocene glaciations, the Anglian. For much of the Anglian, the regional marine archaeology study area lay behind the ice front which, at its maximum, reached as far south as the north Cornwall coast and the Thames Valley (Wymer, 1999). The ice sheet extensively modified the pre-Anglian landscape and pre-existing landscape features are assumed to have been either largely eroded, or buried under glacial till (Rose, 2008). The sedimentary signature of the Anglian glaciation is the Swarte Bank Formation which occurs in the regional marine archaeology study area and the wider area as infill in sub-glacial valleys incised into the Yarmouth Roads Formation and other underlying Quaternary sediments (EGS, 2016; Walters, 2016).

3.2.2.6 A hominin presence in the regional marine archaeology study area for most of the Anglian glaciation is unlikely, but should there be any archaeological remains from this period (perhaps following the glacial maximum as the climate ameliorated), they are likely to be have been heavily reworked by subsequent glaciations and will thus generally be encountered only in secondary contexts.

The Hoxnian and Ipswichian Interglacial's and the post-Anglian/pre-Devensian (Wolstonian) Glaciation

3.2.2.7 The temperate Hoxnian interglacial (approximately 424,000 to 380,000 BP) followed the Anglian. The UK appears to have remained a peninsula of northwestern Europe during the Hoxnian and there is archaeological evidence that hominins, probably early Homo neanderthalensis, returned to the UK as the climate ameliorated. Lower Palaeolithic archaeological material has been found at Hoxne in Suffolk (Wymer, 1999), with a number of other isolated finds known from that region, as well as a hominin skull from Thames gravel terraces at Swanscombe (Stringer, 2006). There is thus the potential that Hoxnian period hominins used or occupied the regional marine archaeology study area. The bulk of any surviving material is likely to derive from secondary contexts (having been reworked by subsequent glacial episodes) but the possibility of primary occupation surfaces being be found within the Hoxnian Swarte Bank Formation sediments, within the Anglian sub-glacial valleys noted in the Hornsea Three array area geophysical data (EGS, 2016) and in areas along the Hornsea Three offshore cable corridor (Walters, 2016) should not be discounted.

3.2.2.8 The onset of a series of post-Anglian/pre-Devensian glacial cycles between approximately 380,000 and 130,000 BP (widely referred to as the Wolstonian, although this designation as a single period is not universally agreed) saw a return to predominately glacial conditions across the regional marine archaeology study area (Sumbler, 1995; Gibbard *et al.*, 1992; Gibbard *et al.*, 2009; White *et al.*, 2010).

3.2.2.9 Global sea level fell by as much as 120 m during the post-Anglian/pre-Devensian glacial cycles and for some of the period the regional marine archaeology study area is likely to have been exposed as a peri-glacial terrestrial landscape (Allen and Sturdy, 1980) with a fauna dominated by cold species such as mammoth, woolly rhinoceros and reindeer (Wessex Archaeology, 2009).

3.2.2.10 The Anglian Glaciation period has a varying archaeological potential. During the cold cycles of the Wolstonian, the regional marine archaeology study area was covered by ice and a hominin presence was unlikely. However, there is archaeological evidence for hominin activity in the UK during the warmer, interglacial periods within the Wolstonian, the so-called Purfleet and Aveley interglacials, from sites like Purfleet (approximately 350,000 BP, Schreve *et al.*, 2002) and Stanton Harcourt (approximately 170,000 to 180,000 BP, Buckingham *et al.*, 1996). These finds comprise mainly late Acheulian and Levallois, or Mousterian flint tools, which reflect the transition from the Lower to the Middle Palaeolithic (approximately 300,000 BP). The Wolstonian period Egmond Ground formation, interpreted within the Hornsea Three offshore cable corridor, may have archaeological potential.

3.2.2.11 The Aveley interglacial was followed by a final Wolstonian glacial expression, from approximately 180,000 to 135,000 BP, during which the UK appears to have uninhabited by hominins. The nature and pattern of Wolstonian glacial phases will have affected whether material is likely to be preserved in a primary or secondary context.

3.2.2.12 The onset of the Ipswichian interglacial (approximately 135,000 to 73,000 BP) is marked by an abrupt climatic change. Sea level rose to 5 to 6 m above its current point, cutting the UK off from continental Europe and inundating the regional marine archaeology study area and much of the east coast of England. Ipswichian age Eemian Formation marine sands, evidence of this marine transgression, have been tentatively identified in the Hornsea Three array area geophysical data (EGS, 2016).

3.2.2.13 While the Ipswichian appears to have been similar to, or even slightly warmer than today (Barton, 2005; Stringer, 2006) and Middle Palaeolithic hominins are known to have occupied northwestern Europe, there appears to have been no hominin presence in the UK during this period (Wymer, 1999; Ashton and Lewis, 2002). The regional marine archaeology study area and the wider area appears to have been inundated for much of the period and the potential for recovering Ipswichian archaeological material in the regional marine archaeology study area is thus regarded as very low.

3.2.3 Devensian to Last Glacial Maximum (73,000 BP to 18,000 BP)

3.2.3.1 The Devensian glaciation (approximately 73,000 to 18,000 BP) was the last glacial stage to occur before the present, Holocene climatic amelioration. A gap in the archaeological record from the end of the Wolstonian to the middle of the Devensian (approximately 40,000 BP) suggests that the UK was uninhabited by hominins for nearly 100,000 years.

3.2.3.2 As sea level fell during the initial stages of the Devensian, the regional marine archaeology study area is likely to have been exposed subaerially once more. Prevailing cool, dry conditions encouraged the development of rich arid grasslands (mammoth steppe), which supported large mammals. The migration of these animals probably coincided with the arrival in the UK of late Middle Palaeolithic Neanderthals, who were followed in approximately 31,000 BP by Early Upper Palaeolithic, anatomically modern humans (Homo sapiens) (Barton, 2005). A hominin presence in the regional marine archaeology study area prior to the glacial maximum is thus entirely likely.

3.2.3.3 As the Devensian glacial maximum approached (approximately 18,000 BP), sea level fell to approximately 120 m below its current level and the southern edge of the glacial ice sheet extended as far south as the Severn and the Wash (Flemming, 2002). The entire regional marine archaeology study area would thus have been behind the ice front and effectively uninhabitable by hominins. At this time the UK seems to have been deserted by humans and is not thought to have been re-colonised until the Middle Upper Palaeolithic, approximately 13,000 to 12,500 BP, during the Windermere Interstadial.

3.2.3.4 The Hornsea Three array area geophysical survey (EGS, 2016) indicated that the Devensian Bolders Bank Formation, glacial till comprises the dominant shallow geological formation being identified across most of the Hornsea Three array area.

3.2.3.5 It is likely that early Devensian archaeological material will have been heavily impacted by the glacial ice, and should generally (though not exclusively) be expected to be found in secondary contexts within the Bolders Bank Formation.

3.2.4 Post-Last Glacial Maximum and Early Holocene (18,000 to 6,000 BP)

3.2.4.1 Environmental changes between the Devensian glacial maximum (approximately 18,000 BP) and the mid-Holocene marine transgression of the regional marine archaeology study area (approximately 6,000 BP) are much better understood than those during the preceding periods described above.

3.2.4.2 The regional marine archaeology study area is unlikely to have been free of glacial ice until approximately 13,000 BP and thus human occupation is unlikely until at least this date. Early indications of a human presence in the UK during the Late-glacial have been found at Creswell Crags in Nottinghamshire, dated to approximately 12,300 BP (Smith, 1992; Mithen, 2003).

3.2.4.3 At the start of the Holocene, sea level was approximately 65 m below its current stand across the southern North Sea and sea level curves generated by Shennan (2000; 2002) indicate that most of the area was an emergent terrestrial landscape from the beginning of the glacial retreat at approximately 16,000 BP (during the Late Upper Palaeolithic). From its post-glacial maximum the terrestrial extent of the regional marine archaeology study area would have begun to shrink due to rising sea level from around 8,000 BP, continuing until approximately 6,000 BP when the marine transgression of the North Sea basin was completed.

3.2.4.4 This early Holocene land bridge across the North Sea basin between the UK and Europe, often referred to as 'Doggerland' (Coles, 1998), is highly significant since human re-colonisation of the UK would have been via this emergent landscape, of which the regional marine archaeology study area is part. Archaeologically the period between the post-Last Glacial Maximum and the middle of the Holocene coincided with the Late Upper Palaeolithic and the Mesolithic, and it is possible that much of the regional marine archaeology study area was occupied by Late Upper Palaeolithic and then Mesolithic people until the area was finally inundated (Gaffney *et al.*, 2007: 1,).

3.2.4.5 The morphology of this palaeolandscape is comparatively well understood through the work of the North Sea Palaeolandscapes Project (NSPP) and Humber Regional Environmental Characterisation (REC) project (Gaffney *et al.*, 2007; Tappin *et al.*, 2011), which both partially overlap with the regional marine archaeology study area.

3.2.4.6 The Holocene landscape of the southern North Sea can be characterised as a low-lying plain, underlain across much of the regional marine archaeology study area by Bolders Bank till, and sloping gently upwards from the east to the modern coast of the UK. During the Late Upper Palaeolithic and Early Mesolithic most of the regional marine archaeology study area would have been relatively dry, containing a mixture of light birch woodland, which expanded with the climatic amelioration of the Holocene (Allen and Sturdy, 1980), grassy meadow and areas of wetland vegetation: all environments attractive for human exploitation and occupation.

3.2.4.7 However, throughout the Mesolithic the accelerating rate of sea level rise would have seen the gradual inundation of the lower lying parts of the regional marine archaeology study area and its severance from the UK mainland (Tappin *et al.*, 2011) leading to the development of saltmarsh in the north-eastern part of the Hornsea Three array area (Gaffney *et al.*, 2007: 82, Figure 7.2), with the fragmentation of the area into a series of low-lying, shrinking islands. By the end of the Mesolithic (approximately 6,500 BP) almost all of the regional marine archaeology study area would have been inundated.

3.2.4.8 The northern edge of the Hornsea Three array area is characterised by a gradual deepening towards the southern edge of the Outer Silver Pit, a major geological depression which formed a huge lake during this period (Gaffney *et al.*, 2007). By around 8,000 BP, the lake became a marine estuary as it connected to the sea at its north-western end. Throughout this period, it would have represented major focus for the human populations of the area, with its rich food resources. As sea level rose during the Holocene, the shore of Outer Silver Pit would have migrated south into, or further into, the regional marine archaeology study area and introduced tidal flat, saltmarsh and estuary environments which would have provided a rich resource package for Mesolithic human populations. The waterlogged nature of these features means that they may also preferentially preserve archaeological material and palaeoenvironmental data.

3.2.4.9 The likely regional importance of the Outer Silver Pit in the human occupation of the Early Mesolithic resides not only in the economic significance of the lake/estuary itself but also of the extensive drainage systems for which it acted as the focus. The esturine and fluvial features crossing the Hornsea Three array area and draining into the Outer Silver Pit and identified below the modern seabed sediments by both the NSPP (Gaffney *et al.*, 2007; see Figure 3.1 of this report) and the Hornsea Three array area geophysical survey (EGS, 2016) have been identified as belonging to the Botney Cut formation.

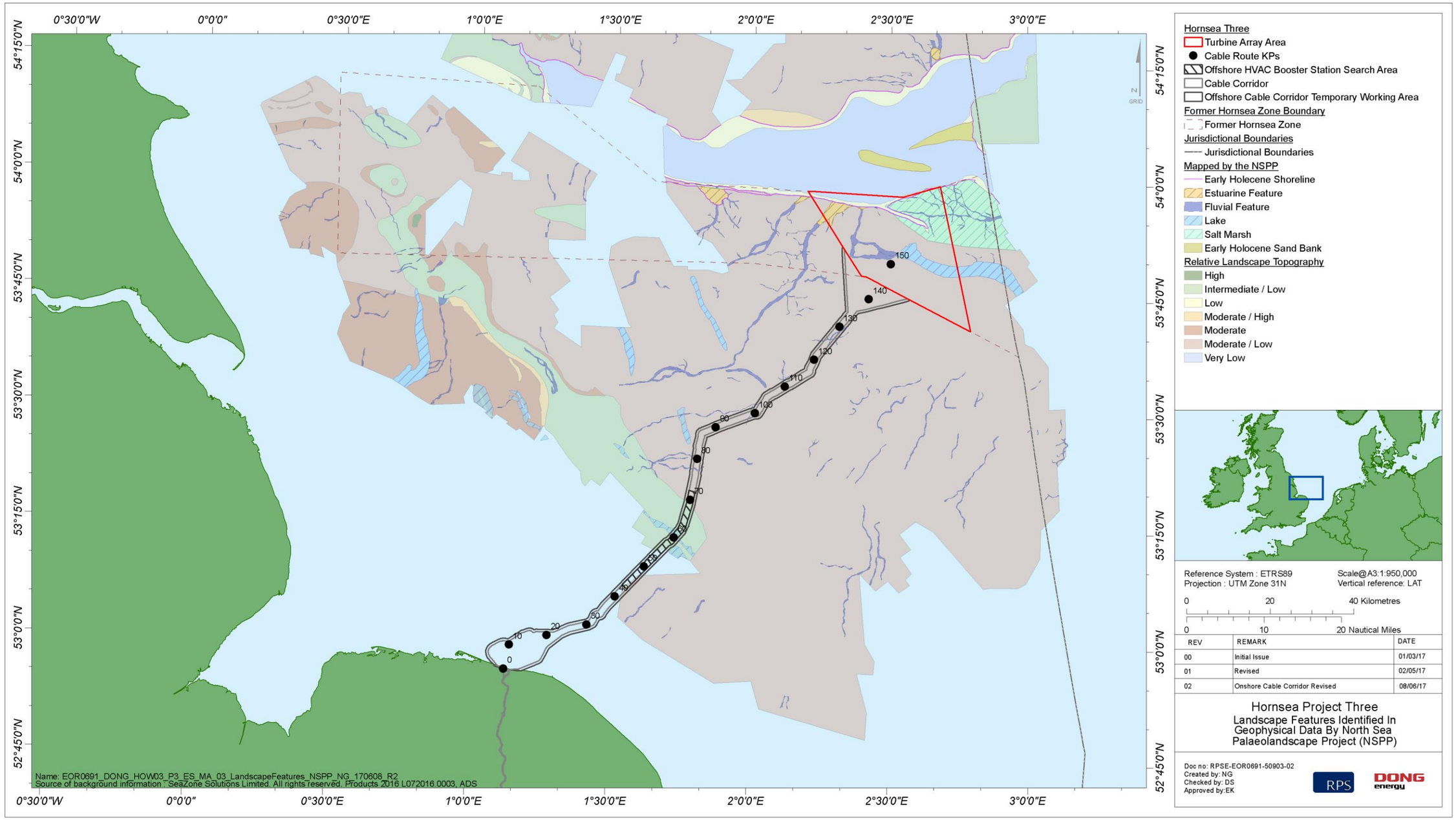

Figure 3.1: Landscape features identified in geophysical survey data from North Seas Palaeolandscapes Project (NSPP).

3.2.4.10 The upper fills of these channel systems appear to date from the late Upper Palaeolithic and Early Mesolithic periods. They are likely to have been important foci for human activity during the Early Mesolithic. Living in proximity to fluvial features has distinct advantages for human groups, not least of which is their potential to be used as routeways across the landscape (Tappin *et al.*, 2011). These palaeochannels are thus significant in the archaeological landscape. In addition, the incised nature of such features means that they may also preferentially preserve archaeological material and palaeoenvironmental data.

3.2.4.11 The palaeochannels in the regional marine archaeology study area appear to originate in the south and west and empty into the Outer Silver Pit through large estuaries at the north of the regional marine archaeology study area (Fitch *et al.*, 2005, Gaffney *et al.,* 2007). Known as the Botney Cut Formation, these channels are examples of an extensive system of partially or completely infilled glacial/glaciofluvial channels, ranging in width from 50 m to 2 km, and up to 50 m deep, formed during the late Devensian and early Holocene deglaciation of the southern North Sea basin. Their lower fills, the Lower Botney Cut, tend to comprise reworked glacial sediments of Devensian date that probably pre-date human resettlement of the region.

3.2.4.12 During the Holocene these sub-glacial channels are likely to have become deep meandering river systems within the vast terrestrial plain that was the southern North Sea, with sediment accumulation initially comprised of coarse gravel glacial outwash deposits, followed by glaciolacustrine and glaciomarine parallel bedded laminated clays and sands, indicative of rising sea level and the marine inundation of the area.

3.2.4.13 A number of vibrocores, including one located within the Hornsea Three array area (number 53/02/395, see Figure 3.2) taken from the west of the western end of Markham's hole, held by the British Geological Survey were examined as part of the NSPP (Gaffney *et al*., 2007). Six samples were taken from vibrocore number 53/02/395. These were mainly medium grained, light yellow-brown sands with a relative abundance of dis-articulated shell fragments. The samples were not considered suitable for radiocarbon dating.

3.2.4.14 Low counts of pollen were recovered which preclude detailed interpretation. Trees and shrubs are well represented (80%+ TLP), initially dominated by pine and oak and to a lesser extent by alder and birch. Hazel increases in abundance with height through the sequence, while there were traces of elm and willow. Herbs were recorded with wild grasses, sedges and fat hen. Bracken and sphagnum moss spores were also present, the former increasing after 9.13 m (Gaffney *et al*., 2007).

3.2.4.15 Two further cores taken from as far apart as 100 km to the north and south (numbers 54/02/80 and 81/50) were also examined in detail as part of the NSPP. While the generally low concentrations of pollen in all the sequences discussed preclude detailed interpretation the overall vegetation reflected is generally similar for the sequences from the three cores, although some differences are observed, such as slightly higher values for grasses and sedges in vibrocore 53/02/395. The dominance of tree and shrub taxa including pine, birch, oak and alder above may suggest a Holocene timeframe, probably early to middle Holocene, rather than later.

3.2.4.16 Sandy, nutrient poor contexts may be implied by the presence of bracken, low values for Ericaceae and also possibly by the presence of bogmoss spores recorded consistently across vibrocore 53/02/395. The presence of grasses and sedges also suggest more open habitats, although these could derive from wetter soils near to the sampling site rather than in the wider landscape.

3.2.4.17 Two further boreholes have been undertaken by the British Geological Survey (BGS) within the Hornsea Three array area. These are numbers HZ42 and HZ44. The logs which are available for these boreholes indicate that the sequence comprises clay and sand. This sand and clay sequence is further illustrated by the logs of the CPT interventions undertaken within the Hornsea Three array area. There is little evidence of organic matter in any of the logs. This may be a function of the locations of the boreholes and an indication that deeply stratified organic deposits are limited in extent outside the palaeochannels.

3.2.4.18 A number of features have been identified in the Hornsea Three offshore cable corridor geophysical data. These include a deep channel crossing the Hornsea Three offshore cable corridor between KP106 and KP108 and a shallow channel between KP71 and KP73. A large irregular depression in the seabed between KP46 and KP47 and a channel running roughly northeast to southwest from approximately KP28 to KP21. This feature merges with a further channel feature located at approximately KP20 to KP21.

3.2.4.19 Two phases of geotechnical survey were undertaken in the Hornsea Project One array area (see Figure 2.1 and Figure 3.2), some 46 boreholes were drilled in the western half of the area in 2011 followed by a further 11 in 2012. The mapping of the upper, Late Pleistocene and Early Holocene Botney Cut deposits by the NSPP had already demonstrated the presence of extensive relict river valley systems of this period in the area draining northwards into the lake/marine estuary of the Outer Silver Pit. Their high potential for the preservation of Early Mesolithic archaeology has been clearly defined (Gaffney *et al*., 2007). This was further reinforced by purposive archaeological cores drilled as part of the Humber REC that recovered organic fills from these channels with Early Mesolithic Carbon 14 (C14) dates (Tappin *et al.*, 2011).

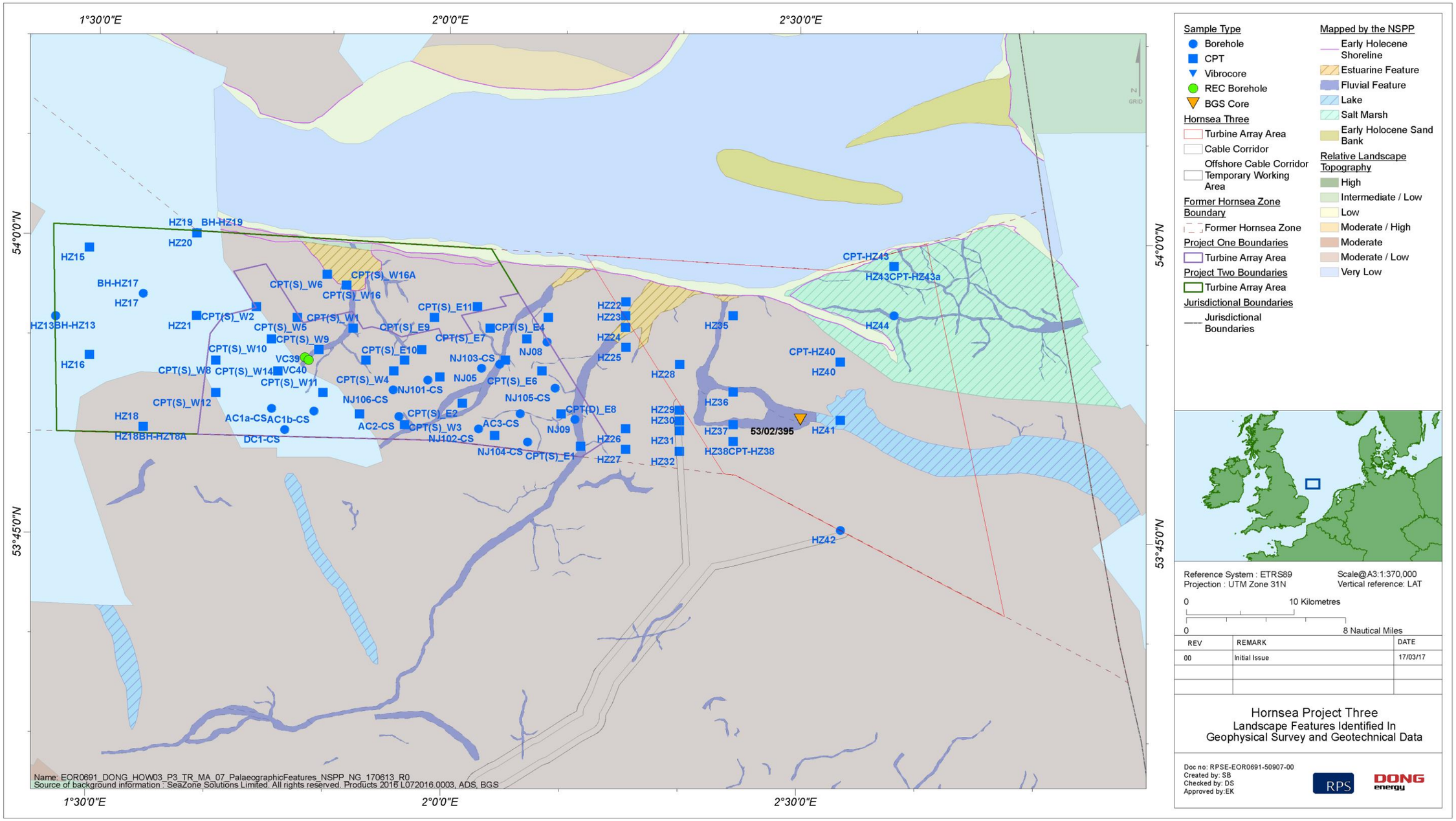

Figure 3.2: Landscape features identified in NSPP geophysical survey and geotechnical data.

3.2.4.20 Detailed logging of cores collected during the 2012 survey undertaken in the Hornsea Project One array area, which is located within the regional marine archaeology study area, allowed a deposit model of Quaternary sediments within the Hornsea Project One array area, located some 7 km west of the Hornsea Three array area at its nearest point (see Figure 2.1). The deposits encountered in the area were as follows:

- Yarmouth Roads formation of fluvial, marine and shallow marine origin at depths of 21.4 m to 80 m+ below the seabed;
- Swarte Bank formation, containing glacial, estuarine and marine sediments at depths of 15.8 m to 54.3 m below the seabed;
- Bolders Bank and Lower Botney Cut formation: glacial sediments, predominantly Late Devensian till, from immediately below the seabed sediment to depths of up to 19.75 m below the seabed; and
- Seabed Sediment.

3.2.4.21 Upper Botney Cut and Holocene alluvium were not observed in the 2012 core samples undertaken in Hornsea Project One, although a number of these boreholes were drilled close to known Botney Cut channels. It was concluded that this may be because the glacial till material within them may have derived from the lower fills of the channels, dating to the late glacial period.

3.2.4.22 Holocene material was identified in the more extensive 2011 sampling, where a number of the boreholes (for example HW5, HW27 and HW38) coincided with the main western channel mapped by the NSPP and the 2011 geophysical survey. It seems possible, based on seismic profiles of these channels that the Early Holocene channels, which seem generally to have been 6 to 15 m deep and up to 180 m wide, are cut into much wider and deeper channels cut by glacial meltwater in the preceding late glacial period. Some of these earlier channels reach depths of 40 m or more, cutting right through the Bolders Bank glacial till to the underlying Swarte Bank and Yarmouth Roads formations.

3.2.4.23 The fill of these Early Holocene channels, as documented by the Hornsea Project One geotechnical surveys, is largely grey-brown or olive-brown silty sands, sometimes with traces of organic material towards their base. Sometimes boreholes drilled through the lesser tributaries and fringes of these drainage systems (such as HW29A, HW61, HW73 and HW77), while the Holocene deposits are much shallower, tend to reveal a greater component of organic material and therefore, offer potentially the greatest amount of palaeoenvironmental data. They are likely also to be the areas where former land-surfaces and therefore Early Mesolithic archaeological remains are likely to be better preserved.

3.2.4.24 Cores drilled for archaeological research purposes by the Humber REC in the main western Holocene palaeochannel in the Hornsea Project One array area (which is located within the regional marine archaeology study area), very close to borehole HW27, (see Figure 3.2) produced C14 dates and OSL dates from the mid-eighth millennium BC from its upper fills (Tappin *et al.*, 2011). This strongly indicates that this was the date of the marine inundation of this area. They also demonstrate that deposits of considerable archaeological significance lie at or very close to the surface of the seafloor within and around these Early Holocene palaeochannels.

3.2.4.25 In addition to the assessments above, the Humber REC also demonstrated that in situ organic deposits dating to the early Holocene survive in sediments, particularly in palaeochannels in the region (Tappin *et al.*, 2011). Such deposits are highly significant as they preserve palaeoenvironmental information relating to the processes of environmental change during this period. In addition, the possibility exists that Mesolithic archaeological material will be preserved within the regional marine archaeology study area, in sediments associated with palaeolandscape features like these channels.

3.3 Maritime archaeology

3.3.1.1 By the end of the Mesolithic (approximately 6,000 BP) the regional marine archaeology study area had been inundated and was a fully marine environment. Any human activity in the regional marine archaeology study area post-dating the end of the Mesolithic can thus be expected to be of a maritime nature.

3.3.1.2 The maritime history of the UK is the product of a complex interplay of constantly evolving local coastal and marine activities, international links and patterns of shipping, and sea use since at least the Mesolithic.

3.3.1.3 Records of known wreck sites and losses in UK waters are biased towards the post-medieval and Modern periods. Although the existence and survival of Palaeolithic watercraft are highly speculative in the UK, Bronze and Iron Age, sea-going vessels are likely to have been lost during this time in in the regional marine archaeology study area.

3.3.1.4 The precise location of most wrecks in UK waters is not known. The majority of known and recorded wreck sites lie relatively close to the coast, in the area that is crossed by the Hornsea Three offshore cable corridor. The proximity of many historical sailing routes to the coast and the natural hazards of the southern North Sea can be expected to have been a determining factor in many maritime casualties in the past (Wessex Archaeology, 2004). Specific knowledge of maritime sites in terms of their location etc. is low, particularly deeper in the past.

3.3.1.5 The maritime archaeological record of the regional marine archaeology study area has been considered in terms of the following broad temporal phases, which are further sub-divided in the discussion below and which are based on the likely relative importance and special interest of archaeological sites and materials (Wessex Archaeology, 2008a).

3.3.2 Early Prehistoric (Palaeolithic to Mesolithic)

3.3.2.1 There is currently no evidence in the UK for maritime archaeological remains pre-dating the start of the Holocene. Examples from elsewhere in the world, however, suggest that early modern humans did undertake maritime activities (Johnstone, 1980), perhaps the best known being the suggestion that the colonization of Australia approximately 40,000 BP involved island-hopping in or on primitive watercraft (Lourandos, 1997).

3.3.2.2 Activities related to the exploitation of the marine environment may have taken place since at least the Middle Palaeolithic. There is evidence in archaeological deposits from around the Mediterranean Basin (Italy, Gibraltar, Morocco and Libya) for the exploitation of marine resources by Neanderthals from at least as early as 50,000 to 30,000 BP (Stringer *et al.*, 2008) In South Africa evidence suggests human coastal adaptation and marine resource exploitation from 160,000 BP (Marean *et al.*, 2007).

3.3.2.3 The Late Upper Palaeolithic re-population of the British Isles by modern humans (approximately 12,000 BP) perhaps saw simple watercraft, log boats or rafts, used for coastal journeys and fishing (McGrail, 1987; 2004, Dunkley 2016).

3.3.2.4 The effects of repeated glaciations, marine transgressions and associated fluvial activity across much of the Palaeolithic mean that the potential for the survival of any archaeology associated with the maritime environment from this period is unlikely.

3.3.2.5 The first archaeological for the use of watercraft in the UK dates to the Mesolithic (approximately 10,500 to 6,000 BP). Much of the evidence is circumstantial. Log boats from the period have been found in Denmark, with paddles known from Star Carr in Yorkshire and from Denmark (Van de Noort, 2011). The Star Carr evidence implies that these boats may have been confined to sheltered waterways. A late Mesolithic/early Neolithic burial in a partially burnt dugout canoe was found in St. Albans, Hertfordshire in 1988 (Dunkley 2016). Finds in Germany and Denmark suggest that logboats were used for coastal journeys.

3.3.2.6 The location of the regional marine archaeology study area in relation to Holocene marine transgression suggests that Mesolithic maritime activity was likely here. The earliest likely maritime remains will date to the late Mesolithic, prior to the last marine transgression. Watercraft may have been used in the rivers and estuaries of the regional marine archaeology study area, for coastal journeys, fishing expeditions and possibly longer journeys in favourable weather. They are likely to have become increasingly important to the Mesolithic inhabitants of the regional marine archaeology study area, with rising sea levels and the area fragmenting into a series of shrinking islands. Archaeological finds suggest that there is potential for the survival of such craft in sealed contexts (McGrail, 1987).

3.3.3 Neolithic and Bronze Age (approximately 4,000 to 700 BC)

3.3.3.1 The transition from the Mesolithic to the Neolithic in the UK is marked by a shift from a hunter-gatherer mode of life to an increased reliance on plant and animal husbandry, characterised by more permanent human settlements.

3.3.3.2 By the Neolithic the UK was again a series of islands separate from Europe. Direct archaeological evidence for the human exploitation of marine resources and maritime activity in the UK during the Neolithic is limited to a number of logboat finds (Johnstone, 1980; Wilkinson and Murphy, 1995; Bradley *et al.*, 1997). Evidence from shell middens at Neolithic sites containing the bones of deep water fish indicates the capability of journeying onto the open sea (Ellmers, 1996).

3.3.3.3 Indirect archaeological evidence also indicates the advent of Neolithic maritime trade. The discovery in the UK of stone axes made in Ireland implies sea transport (Breen and Forsythe, 2004). McGrail (2004) suggests Neolithic technology may have supported complex logboats: for use at sea and, possibly, simple plank boats for use in inland waters. No archaeological evidence for such craft has yet been found.

3.3.3.4 The Bronze Age (approximately 2,400 to 700 BC) was a period of technological innovation and of expansion of trade and exchange networks, facilitated by the introduction of new forms of boats both for ocean and coastal/riverine trade. Clear advances occurred in maritime technology during this period and an increasingly substantial maritime archaeological record allows a less speculative understanding of maritime culture than for earlier periods.

3.3.3.5 There is evidence that during the Bronze Age complex composite boats were in use and being developed. Hide boats are argued to have been a common vessel, and sewn plank boats were a new development (Van de Noort, 2011). The latter have been described as the most advanced form of early water transport and would have been readily adaptable for use in riverine, estuarine and possibly even sea-going environments (Lillie, 2005; McGrail, 1990). There have been several examples of these flat-bottomed sewn plank boats found, ranging from the Brigg 'raft' (dated to 825 to 760 BC) (Chapman and Chapman, 2005; McGrail, 1981) and North Ferriby boats (built between approximately 2,000 to 1,700 BC) from the Humber (Cunliffe, 2001; Van de Noort, 2003), to boat fragments found at Caldicot and Goldcliff in Gwent (McGrail and Parry, 1991) and Kilnsea (Van de Noort *et al.*, 1999) and the substantial remains of a boat from Dover in Kent (Clark, 2002).

3.3.3.6 It is clear from the examples above that the east coast of England has produced some of the earliest examples of Bronze Age ships and shipping in northwest Europe. There is a good deal of debate as to whether these boats were constructed for local voyages, for example within and across the Humber, (McGrail, 1987) or whether they were used for longer cross-channel voyages and therefore for international trade (Van de Noort, 2003).

3.3.3.7 Archaeological evidence from the Bronze Age suggests an established maritime trade and the transport of cargoes of prestige goods. For example, Scandinavian amber was being transported across the North Sea to the UK, and Whitby jet was being carried by boats to the south coast and the Continent (Needham, 2009). Other maritime finds from around the UK, such as the collection of continental Middle Bronze Age objects, found in Langdon Bay, Dover (Fenwick and Gale, 1998), and material found at Hengistbury Head in Dorset (Cunliffe, 1990) also suggest that sea-borne transport, trade and exchange were well-established by the Bronze Age.

3.3.3.8 The proximity of the regional marine archaeology study area to possible shipping routes across the North Sea and up and down the east coast suggests that, that during the Bronze Age vessels were passing through the regional marine archaeology study area. There is thus the potential for remains of such vessels to be present in the regional marine archaeology study area.

3.3.4 Iron Age and Roman (700 BC to 500 AD)

3.3.4.1 Extensive maritime activities in the North Sea during the Iron Age (approximately 700 BP to 43 AD) and during the Roman occupation of Britain (43 to 410 AD) are well documented, and there is good evidence of regular trade from the Continent, including Roman trade between Britain and the Rhine provinces (Milne, 1990).

3.3.4.2 Iron Age trading ports investigated at Mount Batten in Plymouth and at Hengistbury Head in Dorset (Cunliffe, 1990) have produced numerous artefacts of European origin, providing evidence of extensive pre-Roman cross-Channel contact. Later, Roman accounts of the Veneti people based in Brittany also indicate that the Iron Age people of the UK were using sea-going sailing ships.

3.3.4.3 Despite the (presumed) vast ship-borne movement of people and merchandise to and from the British Isles during the Roman period, the only Roman vessels discovered in England are three abandoned hulks from London (Dunkley 2016: 5).

3.3.4.4 A distinct tradition of substantial, sea-going vessel (known as the 'Romano-Celtic' type) was developed in north-western Europe during the later Iron Age (Marsden, 1994). Examples include the Blackfriars boat from London (Marsden, 1994; Dunkley 2016) and the Barlands Farm boat, from the Severn estuary in southeast Wales (Nayling and McGrail, 2004). Further vessels of this period have been found at New Guy's House, London (Marsden, 1994), St. Peter Port, Guernsey (Rule and Monaghan, 1993) and on the Continent.

3.3.4.5 Boats and ships originating in the Mediterranean and other parts of the empire were used in the Roman period in UK waters. 'Roman' vessels may also have been built in England, such as the County Hall Ship (Marsden, 1994), thought to have been built in southeast England by a shipwright experienced in Mediterranean techniques.

3.3.4.6 In the vicinity of the regional marine archaeology study area, evidence of trade across the southern North Sea during the Roman period is supported by finds of Roman pottery (mortaria) in aggregate licence Area 107 to the east of Lincs Offshore Wind Farm, off the coast of Lincolnshire and Roman Samian ware pottery recovered from the Kwinte Bank in Belgium waters (Wessex Archaeology, 2009; 2010a) as well as a 1st and 2nd century AD Spanish 'Dressel 20' amphora from the Dogger Bank (Wessex Archaeology, 2004).

3.3.4.7 There is strong documentary and archaeological evidence that Roman ports were developed along the eastern England to facilitate trade and protect the exposed eastern side of Roman-occupied Britain. The military establishment made extensive use of the region's coastal waters for transporting people and goods to and from garrisons as far north as the Firth of Forth (Larn and Larn, 1998; Rippon, 2008).

3.3.4.8 The scale of shipping during this period is poorly represented by the shipping remains in the archaeological record but discoveries of artefact concentrations on the seabed, such as the pottery from Pan Sand in the Thames and a number of other locations around the UK, point to the survival of lost cargoes and shipwrecks from the Roman period (Breen and Forsythe, 2004; Delgado, 1997).

3.3.4.9 Together with the evidence for substantial commercial trade this suggests that Iron Age and Roman maritime traffic passed through the regional marine archaeology study area. It is also likely that many more vessels of this period were lost than the available archaeological evidence suggests, increasing the potential that remains from this period are present in the regional marine archaeology study area.

3.3.5 Medieval (500 to 1508 AD)

3.3.5.1 Post-Roman Britain was characterised by a political, economic and cultural decline, with urban centres abandoned as populations moved to rural locations. The decline of the Roman navy (Classis Britannica) in the 5th century left the sea around Britain open for others to use. Maritime activity in the southern North Sea and in the vicinity of the regional marine archaeology study area increased during the early medieval period. This was due, in part, to Saxon and Viking raiding, the intensification of regional trade and migration that followed, and the growth of a number of major ports on the east coast of the UK (Hutchinson, 1997; Friel, 2003).

3.3.5.2 Viking maritime skills allowed significant cross-sea movement and their large clinker-built boats were a vital element in Scandinavian expansion and colonisation, with the establishment of new trade routes across much of Europe and as far afield as Greenland and America (Greenhill, 1976). The Viking presence and influence along the eastern seaboard of England would have demanded the control of rivers and estuaries, such as the Humber, which secured access to trade routes and passage across the North Sea as well as to the north and east coasts of Norfolk, where place-name evidence indicates Viking influence (Williamson 1993). Remains of seagoing vessels of this period are a possibility, as are remains of inshore vessels.

3.3.5.3 The level of shipping passing through the regional marine archaeology study area during this period is high enough to suggest that there is significant potential for archaeological remains to exist within the regional marine archaeology study area.

3.3.5.4 The medieval period in the UK saw the increase in overseas trade and the expansion of towns and villages into larger trading centres. With this came the development of new shipbuilding techniques and technologies; the emphasis changing from the multi-tasking vessels of the past towards more specialised cargo vessels designed around the requirements of the owner and cargo type.

3.3.5.5 The Norman conquest in 1066 established new international trade links, with an increasing trade in European wine, for example (Woodman, 1997). This trade continued throughout the medieval period, with Hull, located on the north bank of the River Humber, some 170 km west of the Hornsea Three array area, ranked second or third in England as an entrepot for this commodity, which was generally the return cargo in a two-way trade for cloth and food (Kermode, 1998). Cloth exports from Hull also grew rapidly during the mid to late 14th century as textile manufacturers in Yorkshire expanded their production to meet increasing demand (Kermode, 1998).

3.3.5.6 The Hanseatic League, established in Lubeck in 1169 protected traders against pirates and extortionate tariffs often levied on trade. This multinational economic alliance encouraged trade between north-western European nations, utilising seaborne links between the North Sea and the Baltic. At its height the League represented some 84 cities, including east coast ports, such as Newcastle, Hull, King's Lynn, Norwich and Great Yarmouth, all developing rapidly to facilitate the growing trade in coal, timber and wine (Hutchinson, 1997; Woodman, 1997).

3.3.5.7 There were a number of smaller ports located on the Norfolk Coast during the medieval period and later, including Wells-next-the-Sea, Weybourne, Brancaster Staithe, Burnham Overy Staithe, Ringstead, Heacham, Eccles and Caister-on-Sea. The Glaven ports (Blakeney, Cley-next-the-Sea and Wiverton) were perhaps the most important of these. In 1301 Blakeney sent ships to help Edward I's war efforts. Blakeney also had customs officials between the 14th and 16th centuries, the only Norfolk harbour beyond King's Lynn and Great Yarmouth to do so (Robertson *et al*., 2005: 11).

3.3.5.8 The level of medieval maritime activity along the east coast of England suggests that the potential presence of medieval period shipwrecks in the regional marine archaeology study area is high, particularly where anaerobic sediments which aid shipwreck preservation, characterise the seabed.

3.3.6 Post-medieval (1509 to 1815 AD)

3.3.6.1 The growth of commercial maritime trade beginning during the late medieval period continued and expanded in the post-medieval period, with particularly strong links with the Netherlands and a strong trade in corn, fish and cloth. From an early date, coal was one of the most important cargoes to pass through the regional marine archaeology study area, mostly en-route from Newcastle to London and the southeast, and the coal trade was perhaps the single largest contributor to the massive post-medieval expansion in British shipping (Tappin *et al.*, 2011). Alongside overseas ventures which were expanding rapidly, inland and local coasting trade continued to be important in the region in the post-medieval period.

3.3.6.2 Fishing was also an important component of post-medieval maritime activity in the regional marine archaeology study area. The discovery of fish stocks in the Great Silver Pit, just north of the Hornsea Three array area, helped develop this local industry into one of national importance. (Jackson, 1983; http://www.hulltrawler.net/).

3.3.6.3 The expansion in maritime trade also resulted in the redevelopment of other small harbours and ports and the construction of new ones, many of which became increasingly prosperous: a state of affairs driven by a thriving coastal and foreign trade which ranged from the Baltic Sea to the Iberian Peninsula (Williams, 1988).

3.3.6.4 Of the ports in the vicinity of the regional marine archaeology study area, Hull was one of the oldest, and by the end of the post-medieval period was becoming '*a place of the first mercantile importance*', rising to become the third port in the UK for foreign trade (North Sea Pilot, 1858; quoted in Tappin *et al.*, 2011). There was a roughly 18-fold increase in shipping tonnage entering the port between 1716 and 1793 and, by the end of the post-medieval period; the port had a volume of traffic around 40 times greater than the preceding century (Kirby and Hinkkanen, 2000).

3.3.6.5 The North Sea witnessed an increasing level of naval activity, particularly after the Tudor period and the establishment of forces such as the Royal Navy in the 16th century. The Anglo-Dutch Wars span a period between 1652 and 1784, during which a number of naval engagements took place in the vicinity of the regional marine archaeology study area, including the Battle of Dogger Bank in 1781 (Rodger, 2006).

3.3.6.6 During the post-medieval period, the number of vessels crossing the North Sea increased hugely, particularly after the Tudor period, and the regional marine archaeology study area was thus an area of concentrated commercial and military maritime activity. Concomitant with such an increase in shipping numbers is an increase in maritime casualties, and hence a greatly increased potential for post-medieval maritime archaeological sites and material in the regional marine archaeology study area.

3.3.6.7 A significant proportion of the recorded maritime casualties of this period date to the late 18th and early 19th centuries. Material from the earlier Tudor and Stuart periods is rare and discoveries of such sites are of potentially great significance.

3.3.7 Modern (post 1815)

3.3.7.1 During the 19th century, the UK reached the height of its global power, with the largest empire in the world. To service the needs of the empire a vast merchant and military shipping fleet was required.

3.3.7.2 At the start of the modern period, coastal and international maritime trade were dominated by wooden sailing vessels, while the zenith of sailing naval vessels was reached in the 'wooden walls' of the Nelsonian and other navies (Lavery, 1991).

3.3.7.3 Rapid industrialisation in the 18th and 19th centuries revolutionised shipbuilding, introducing technological innovation that precipitated fundamental changes in maritime technology. By the end of the 19th century the advent of the steam engine, the introduction of iron hulls and the development of the screw propeller had wrought major transformations on ships and shipping (Lambert, 2001). Together these technological changes encouraged the construction of larger vessels which were self-propelled and thus unconstrained in their movement.

3.3.7.4 Notwithstanding the above, the smaller local ports on the Norfolk coast were successful at different times, but all had declined by the early 20th century (Robertson *et al*., 2005).

3.3.7.5 Although steam and steel came to dominate shipping during the 19th century, there remained a strong local core of maritime activity around much of the coast of the UK which retained the more traditional, often wooden vessel types. For example, at the turn of the 20th century, much of the fishing in the North Sea was still conducted by fleets of sailing smacks.

3.3.7.6 A number of fishing vessel casualties are listed in the SeaZone and NRHE records, within the regional marine archaeology study area. These vessels highlight the importance of the regional marine archaeology study area as a fishing ground and are representative of the craft that fished the southern North Sea during the period from the late 19th century to the 1950s (Parham, 2010; Van de Noort, 2011).

3.3.7.7 The two World Wars also left traces in the regional marine archaeology study area. The Hornsea Three offshore cable corridor was crossed by designated civilian shipping routes close to the coast. Relatively early during the First World War it became clear that minesweeping operations could not cover the whole of the southern North Sea and so civilian shipping could not be adequately protected. On this basis, minesweeping was focussed on specific routes along the East Coast. These routes were called the War Channels and were again used from the start of the Second World War. The channels were marked with buoys and protected by defensive minefields. The concentration of shipping in the channels made them a target for enemy action (Firth, 2014). The east coast was protected by extensive minefields, including a number of inshore minefields from the Thames to the Humber. Further offshore large areas of the southern North Sea were mined. The Hornsea Three offshore cable corridor passes through these minefields.

3.3.7.8 It is noteworthy that two of the three named and dated Seazone wrecks in the Hornsea Three offshore cable corridor are dated to the Second World War and located at the shoreward end, close to or within the War Channels (Firth, 2014). It is important to be aware that military wrecks, even if not currently legally protected, are eligible for designation under the terms of the Protection of Military Remains Act 1986 and, once designated, the Protection of Military Remains Act 1986 would apply.

3.3.7.9 During the modern period there was thus a wider range than ever before of vessel types using the sea in Hornsea Three; from capital ships to coastal barges, trawlers, steamships and pleasure boats.

3.3.7.10 Shipping traffic across the southern North Sea increased exponentially during the modern period making the region one of the busiest shipping areas in the world (Parham, 2010). Much of the traffic was associated with local and international trade, but a good deal was linked to the commercial fishing industry and more recently, the result of oil and gas exploration.

3.3.7.11 The increase in maritime traffic around the UK resulted in a concomitant increase in shipping accidents and casualties. Our knowledge of the historical shipping casualties within the regional marine archaeology study area during this period is enhanced by the development of centralised recording of ship losses during the late post-medieval period. The Lloyds List, in particular, is a comprehensive record of maritime casualties quite unlike anything from earlier periods, and is a valuable indication of the number of wrecks from the modern period that are likely for any area of the UK's seabed.

3.3.7.12 The increasing incorporation of metal structural elements into vessel designs during this period means that wrecks for the 19th and early 20th centuries are also often more visible on the seabed than their wooden predecessors. They are visible to bathymetric and geophysical survey, and also generate strong magnetic anomalies, and this greater visibility is reflected in the increased number of known wrecks (i.e. those that have been located on the seabed) for the period under discussion, in contrast to the periods discussed previously.

3.3.7.13 On the basis of the information presented above, there is a high potential for modern maritime archaeological sites and material on the seabed of the regional marine archaeology study area, some of which are casualties of the two World Wars.

3.4 Aviation archaeology

3.4.1.1 Thousands of military and civilian aircraft casualties have occurred in UK waters since the advent of powered flight in the early 20th Century. The bulk of these are casualties of the Second World War, mostly concentrated off the south and southeast coasts of England. There is also evidence for substantial numbers of aircraft casualties for most of the east coast (Wessex Archaeology, 2008).

3.4.1.2 The aviation archaeology record is potentially very large, but the ephemeral nature of aircraft wrecks ensures that many sites remain unrecorded. Records of aircraft losses at sea are seldom tied to an accurate position, further complicating an assessment of the likelihood of aircraft wreckage on the seabed.

3.4.1.3 Crashed aircraft are notoriously difficult to identify in seabed surveys, but a number of archaeological reports (see Wessex Archaeology, 1997; 2003; 2006; 2008b) indicate that the identification of aircraft wrecks has become increasingly common in recent years, with a number located in the course of surveys in support of seabed development. Second World War airframes survive on the seabed and these sites are widespread, and can be identified in geophysical data.

3.4.1.4 National policy guidance, such as English Heritage's Military Aircraft Crash Sites (English Heritage, 2002) recognises the importance of 20th century wartime heritage and makes the case for recognising the importance of aircraft remains, with particular regard to the impact of planned development on any such remains (English Heritage, 2002).

3.4.2 First World War

3.4.2.1 Norfolk has a long association with military aviation, as does Lincolnshire, located to its north and west. By 1918 there were some 30 military airfields in Norfolk (http://www.heritage.norfolk.gov.uk/record-details?TNF405-Military-Airfields-in-Norfolk-(Article)) and some 37 military airfields in Lincolnshire (http://raf-lincolnshire.info/history.htm).

3.4.2.2 During the First World War these airfields served both Royal Naval Air Service (RNAS) and Royal Flying Corps (RFC) squadrons. These squadrons carried out fleet reconnaissance, patrolled the coast and provided defence against air-raids. In Norfolk RNAS stations were located on the east coast at Great Yarmouth, Hickling Broad and Lowestoft, with an airship station inland at Pulham and would have been used for operations over the sea (Firth 2014). From Lincolnshire at least, they also attacked enemy coastal territory (http://raf-lincolnshire.info/history.htm), indicating that aircraft were crossing the southern North Seal. However, only a small number of British and German aircraft and airships are recorded as being lost around the UK during the First World War (Wessex Archaeology, 2008b). Although it is possible that some of these losses occurred in the southern North Sea, no evidence for First World War aircraft casualties in the regional marine archaeology study area has been identified. The lightweight construction of these early airframes also means they are unlikely to survive unless buried in seabed sediments.

3.4.3 Second World War

3.4.3.1 According to Bédoyère (2001), during the Second World War an average of five aircraft were lost over the UK every day, many of these losses occurring over the sea. The location of Hornsea Three and the known patterns of Second World War aircraft activity suggest that there were numerous aircraft losses in the area. The significant levels of aircraft traffic over the southern North Sea from 1940 onwards fall into two broad categories. The first, offensive German operations is associated with bombing raids targeting Hull, the English Midlands and the north of England, and the associated, defensive British fighter response. The second, RAF, Allied and later American bombing operations against Germany took place from bases in the east of England, routed over the southern North Sea to the Dutch coast (Lyall, 1971).

3.4.3.2 Following the collapse of the League of Nations' Disarmament Conference in 1934, the Royal Air Force (RAF) underwent a period of rapid expansion and re-armament to ensure, in the words of the Prime Minister Stanley Baldwin, that "*in air strength and air power this country shall no longer be in a position inferior to any country within striking distance of our shores*" (http://www.raf.mod.uk/bombercommand/bc_devel2.html).

3.4.3.3 The first expansion phase saw the construction of Feltwell and the development of the First World War satellite base at Marham. Successive phases saw the development of Bircham Newton and the building of permanent stations at Coltishall, Horsham St Faith, Swanton Morley, Watton and West Raynham. At the end of the Second World War, Norfolk had some 37 major military airfields and numerous subsidiaries (http://www.heritage.norfolk.gov.uk/record-details?TNF405-Military-Airfields-in-Norfolk-(Article)). In addition, Lincolnshire's strategic location on the east coast and its topography lent itself to the development of aviation infrastructure, much of the RAF expansion went into the development of an offensive bomber capacity, and many of the new Lincolnshire airfields were designed for bomber operations. By the end of the Second World War there were 49 military airfields in Lincolnshire, more than any other county in England (http://raf-lincolnshire.info/history.htm).

3.4.3.4 In the vicinity of the regional marine archaeology study area, Lincolnshire's long coast and sweeping, flat landscape was a significant focus for aircraft activity. The area was an exit and entry point for Allied offensive bombing operations over continental Europe and the southern North Sea, with the RAF mainly flying at night and the USAF undertaking daylight raids over Germany. At the same time the Humber served as a navigational marker for German bombers which followed the river inland to bomb Hull, and the major industrial and manufacturing cities of the Midlands further inland. Next to London, Hull was the most bombed city in the UK during the Second World War (http://en.wikipedia.org/wiki/Hull_Blitz).

3.4.3.5 There were 118 RAF aircraft losses off the coast of Lincolnshire and 217 losses off the coast of Norfolk during the Second World War. RAF Second World War Air/Sea Rescue operation distribution maps record a large number of operations in and around the regional marine archaeology study area (Wessex Archaeology, 2008b). Whilst the mapped locations of these operations are not wholly reliable, they provide a useful general guide to these operations in the area and support the other evidence for a potentially substantial number of aircraft wrecks in the regional marine archaeology study area.

3.4.3.6 Losses on both sides were the result of damaged bombers crashing into the sea, aircraft of both sides shot down in aerial combat, and accidents. Many of these losses would have occurred well offshore, and may represent aircraft listed as 'missing' in the records. A selection of aircraft losses on the German side are recorded in Table 3.2 below in order to provide some indication of numbers of losses and types of aircraft involved (Storey, 2010). The numbers of allied aircraft are significantly greater and are noted in paragraph 3.4.3.6 above.

Table 3.2: Selected German aircraft losses of Norfolk during the Second World War.

Date	Aircraft type/identification	Notes
6 December 1939	Heinkel (He115 float plane (2081)	Aircraft from 3/Kustenfliergruppe (Maritime group) 506) on a mine laying mission flying across the wash to Sheringham. The Heinkel crashed onto the West beach a short distance from the lifeboat house at Sheringham.
30 July 1940	Junkers Ju88 2(F) /122	Ditched into the sea 30 miles off Happisburgh.
24 February 1941	Dornier Do 217E – 4 from Stab111/KG2	Crashed into sea off Cromer.
3 May 1941	Junkers Ju88A-5 (8180) of 1/KG30	Ditched offshore at Sparrow Gap Weybourne. Aircraft captured. A contemporary photograph shows the half submerged aircraft under guard.
26 May 1941	Junkers Ju88A-4 (0738) of 1/KG 506	Crashed into sea off Norfolk coast.
15 September 1941	Junkers Ju88A-5 (5247) from 2/KG 606	Crashed into sea off Happisburgh.
15 May 1942	Dornier Do 217E – 4 from 4/KG40	Crashed into sea off Happisburgh.
19 October 1942	Junkers Ju88D-1 (1342) from 3/(F)/33	Crashed into the sea 20 miles north of Cromer.

3.4.3.7 Since the Second World War there have been few aviation losses in the vicinity of Hornsea Three. Post-war aircraft remains are, therefore, unlikely to be discovered.

3.5 Designated, known and recorded wrecks

3.5.1 Designated heritage

Protection of Wrecks Act 1973

3.5.1.1 There are no designated wrecks within the regional marine archaeology study area or the Hornsea Three marine archaeology study area. The nearest such designated asset is the Dunwich Bank Wreck, probably a 16th or 17th century armed merchant vessel (list entry number 1000073), located approximately 0.5 km off the coast of Suffolk, some 5 km south of Dunwich and some 83 km south of the nearest point of the Hornsea Three marine archaeology study area .

Protection of Military Remains Act 1986

3.5.1.2 Within the regional maritime archaeology study area, the wreck of HMS Umpire, a British submarine sunk northwest of Cromer in 1941 is a designated vessel (a protected place) under the provisions of the Act. The wreck of HMS Umpire is located some 16.6 km from the Hornsea Three offshore cable corridor. There are no sites in the Hornsea Three marine archaeology study area currently designated under the Protection of Military Remains Act 1986.

3.5.2 Known and recorded wrecks

3.5.2.1 Data for known ship and aircraft wrecks and recorded shipping losses within the regional marine archaeology study area were obtained as appropriate from SeaZone and the NRHE. The SeaZone and NRHE datasets provide a general picture of maritime casualties in the regional marine archaeology study area in the last 150 to 200 years, but should also not be viewed as representing the totality of even the more recent potential maritime archaeological remains in the area.

SeaZone/UKHO

Overview

3.5.2.2 Wrecks and obstructions (some of which may represent wrecks or wreck material) listed by SeaZone are generally charted, although a small number lack accurate positional information. Although most of these wrecks and obstructions have at one time or another been located on the seabed, many were first identified before the advent of modern surveying techniques and may have been located using a positional system such as the Decca System, which was considerably less accurate than modern satellite navigation systems, such as the United States' Global Positioning System (GPS).

3.5.2.3 Previously charted wrecks or obstructions not located during subsequent surveys may have had their status amended by the UKHO to "dead". This may be the result of mistaken identification when first identified, inaccurate coordinates, the degradation/destruction of the wreck, or its burial by sediment. This cannot be taken to imply that the wreckage is no longer on the seabed.

3.5.2.4 All SeaZone records in the regional marine archaeology study area are thus discussed below, regardless of their current status. UKHO data, derived from SeaZone, within the Hornsea Three marine archaeology study area are shown at Appendix A.

Wrecks and obstructions with the regional marine archaeology study area

3.5.2.5 SeaZone data indicates that the UKHO holds data for a total of 182 live wrecks and 98 dead wrecks within the regional marine archaeology study area. Of these, a total of 35 SeaZone records lie within the Hornsea Three marine archaeology study area. Of these 12 (two live and two dead wrecks and one live and seven dead obstructions) lie within the Hornsea Three array area, seven (four live wrecks and two live and one dead obstructions) lie within the Hornsea Three offshore cable corridor, seven (four live and two dead wrecks and one dead obstruction) within the temporary working area to the west of the Hornsea Three offshore cable corridor and nine (six live and two dead wrecks and one live obstruction) lie within the temporary working area to the east of the Hornsea Three offshore cable corridor.

3.5.2.6 SeaZone wreck records are shown on Figure 3.3. The SeaZone records contain no references to aircraft crash sites within the Hornsea Three marine archaeology study area.

National Record of the Historic Environment (NRHE)

Overview

3.5.2.7 The marine component of the NRHE originally comprised just the UKHO Wreck Index, but this database has since been enhanced by the addition of substantial numbers of historical records of shipping and aircraft casualties, drawn from a range of principally documentary and archival sources. Positions given are often not precise.

3.5.2.8 In certain instances the NRHE has created Named Locations (NL) which are aggregations at a single, arbitrary position of one or more maritime records for which no other grid reference or position is available. These positions reflect general loss locations, usually drawn from descriptions in the documentary records, or the indicative positions of seabed finds and do not (except by chance) relate to the position of the physical remains of the sites on the seabed which they list.

3.5.2.9 The records from the NRHE include both recorded positions and NLs, mostly within 12 nm of the coast. There are therefore no NRHE records for either the Hornsea Three array area or the offshore terminus of the Hornsea Three offshore cable corridor. The lack of records in the Hornsea Three array area and the clustering of the Hornsea Three offshore cable corridor records close to the coast are a factor of the origins of the NRHE data described above. NRHE records are shown on Figure 3.3.

Recorded positions

3.5.2.10 The NRHE lists 118 recorded positions within the regional marine archaeology study area. All recorded positions lie within 45 km from the shoreline. Of these, 95 are or may be wrecks, 69 of which are named vessels. There are two records of aircraft remains.

3.5.2.11 The NRHE lists 36 recorded positions within the Hornsea Three marine archaeology study area, 16 of which lie within the Hornsea Three offshore cable corroder and ten within each of the temporary working areas to the west and east of the Hornsea Three offshore cable corridor. Of these, 12 are or may be wrecks, seven of which are named vessels. There are two records of aircraft remains. All recorded positions lie within 35 km from the shoreline.

Named Locations (NL)

3.5.2.12 The centre points of 24 NRHE NL polygons fall within the regional marine archaeology study area. Together these NLs contain records of 389 maritime casualties, of which some 50 are aircraft. The centre points of three NRHE Named Location polygons fall within the Hornsea Three offshore cable corridor, with a further record of concrete fragments probably representing a Second World War pillbox on the foreshore in the western temporary working area. Together these NLs contain records of 31 maritime casualties. The remains of none, some, or all of these ships and aircraft may be present within the limits of their respective NL polygons. It should be noted that material associated with records listed in some of the NL polygons which lie outside, but near the boundary of the Hornsea Three marine archaeology study area could also be encountered within the boundary of Hornsea Three.

3.5.2.13 As is to be expected, the bulk of the records in the NLs are of 19th and 20th century date. An interesting aspect of the NLs is the number of aircraft losses they record. Within the regional marine archaeology study area, a total of 39 aircraft are recorded. Of these, 28 are British, all from the Second World War, 10 are German, nine from the Second World War and one a First World War Zeppelin, while one is of unknown origin. Within the regional marine archaeology study area a total of nine records are of Queen Bees, a low-cost radio-controlled target aircraft used for realistic anti-aircraft gunnery training during and after the Second World War. These aircraft are likely to have been flown from RAF Weybourne, the location of which is some 700 m south of the Hornsea Three landfall area (http://www.rafweb.org/Stations/Stations-W.htm#Weybourne). A further loss, of a Tiger Moth aircraft, is also recorded from within the regional marine archaeology study area. The recorded aircraft losses all date from the early part of the Second World War, before 1943.

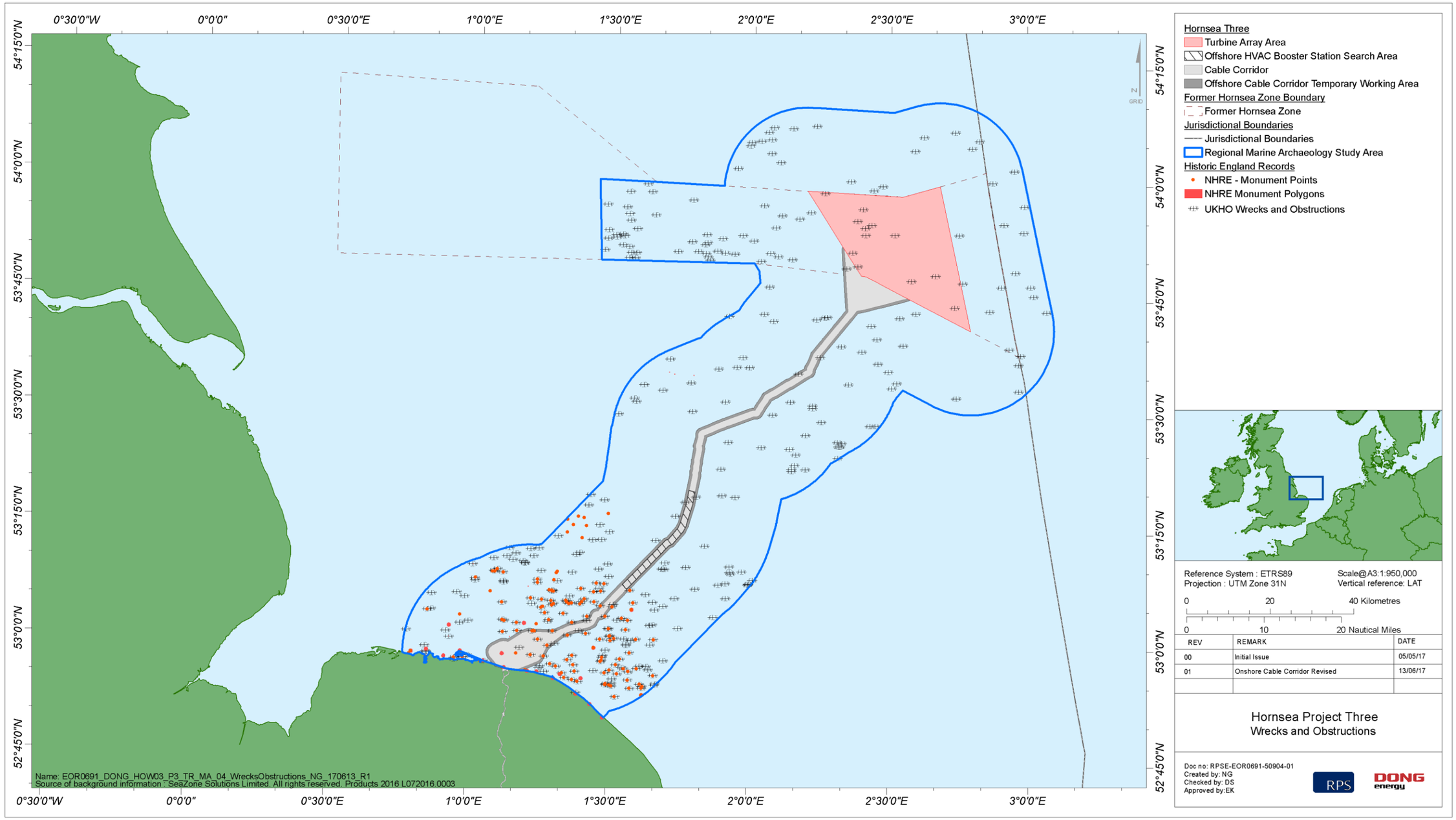

Figure 3.3: The positions of SeaZone and NRHE records within and adjacent to Hornsea Three.

3.6 Hornsea Three geophysical survey

3.6.1.1 A total of 263 contacts of both confirmed (where a contact is clearly of anthropogenic origin and is significant) and unconfirmed (where a contact may be of anthropogenic origin and requires further investigation to confirm) archaeological potential have been recognised within the Hornsea Three marine archaeology study area. Of these 123 were identified within the Hornsea Three array area. A further 140 contacts were identified within the Hornsea Three offshore cable corridor. No geophysical survey was undertaken within the temporary working area.

3.6.1.2 In all, four contacts were rated as being of confirmed high archaeological potential within the Hornsea Three marine archaeology study area, 20 of unconfirmed medium archaeological potential and 239 sites of low archaeological potential (see Table 2.1 for a description of the criteria for archaeological potential). The positions of these archaeological contacts are shown in Figure 3.4 below (and listed in Appendix B: gazetteer of potential archaeological anomalies, Appendix C: wreck sheets: high potential archaeological anomalies and Appendix D: information sheets: medium potential archaeological anomalies). These are summarised in Table 3.3 below.

Table 3.3: Distribution of anomalies by archaeological potential.

Archaeological potential	Survey area	Number of contacts	Anomalies per potential rating
High	Hornsea Three array area	1	4
	Hornsea Three offshore cable corridor	3	
Medium	Hornsea Three array area	10	20
	Hornsea Three offshore cable corridor	10	
Low	Hornsea Three array area	112	239
	Hornsea Three offshore cable corridor	127	
Total			263

3.6.1.3 In addition, a total of 189 magnetic anomalies with an intensity >100 nT with no strong correlating seabed contact were identified across the Hornsea Three marine archaeology study area. Of these, 29 lie within or immediately adjacent to the Hornsea Three array area and 157 lie within the Hornsea Three offshore cable corridor. There are 17 magnetic anomalies of greater than 500 nT which have been provisionally identified as areas of archaeological potential. Of these, four are located within the Hornsea Three array area and 13 within the Hornsea Three offshore cable corridor. The positions of these magnetic anomalies are shown in Figure 3.4 and listed in Appendix E.

3.6.1.4 This section discusses the confirmed geophysical contacts of high, medium and low archaeological potential in more detail, considers any potential correlations with the SeaZone and NRHE records and, where applicable, the results of the Humber REC are also included in the discussion. It is important to note that the wrecks of high archaeological potential may not correlate to the most important wrecks on the seabed. They may represent the most clearly identifiable and best-preserved wrecks, generally dating to the past two centuries, the age of steel-hulled shipping. It is likely that archaeologically the most significant, and older wrecks are to be found within the group of medium archaeological potential, given that they tend to have relatively little visibility in terms of sonar and often contain relatively little ferrous material.

3.6.2 Hornsea Three array area

3.6.2.1 The database of archaeological anomalies within the Hornsea Three array area produced by EGS Ltd (EGS, 2016) has been reviewed by MSDS Marine and incorporated into a single overarching gazetteer (see Appendix B).

High potential anomalies

3.6.2.2 There is one anomaly of anthropogenic origin and with a high potential of being of archaeological significance within the Hornsea Three array area (see Appendix C for further details).

Anomaly HOW03_ARCH_0122

3.6.2.3 HOW03_ARCH_0122 has been identified as being of potential high archaeological significance. The contact was identified in the sidescan dataset but falls outside the multibeam coverage and there was no associated magnetic anomaly. The visible extents of the contact measure 22.9 m by 13.5 m with a measurable height of 0.9 m. The contact lies towards the edge of the data extents and is partly cut off, although to what extent is not known.

3.6.2.4 Although largely obscured by shadow and incoherent, the visible elements are typical of that of a collapsed wreck. Prominent linear and angular features, consistent with wreck structure, are clearly visible to the southeast. Further curvilinear features and debris are also visible. Visible outlying debris is minimal with only one piece (HOW03_ARCH_0130) approximately 25 m to the northwest. The wreck is likely post 1900's and of steel construction.

3.6.2.5 The wreck is associated with a Seazone record (UKHO number 9598), where it is described as being in two parts and well collapsed.

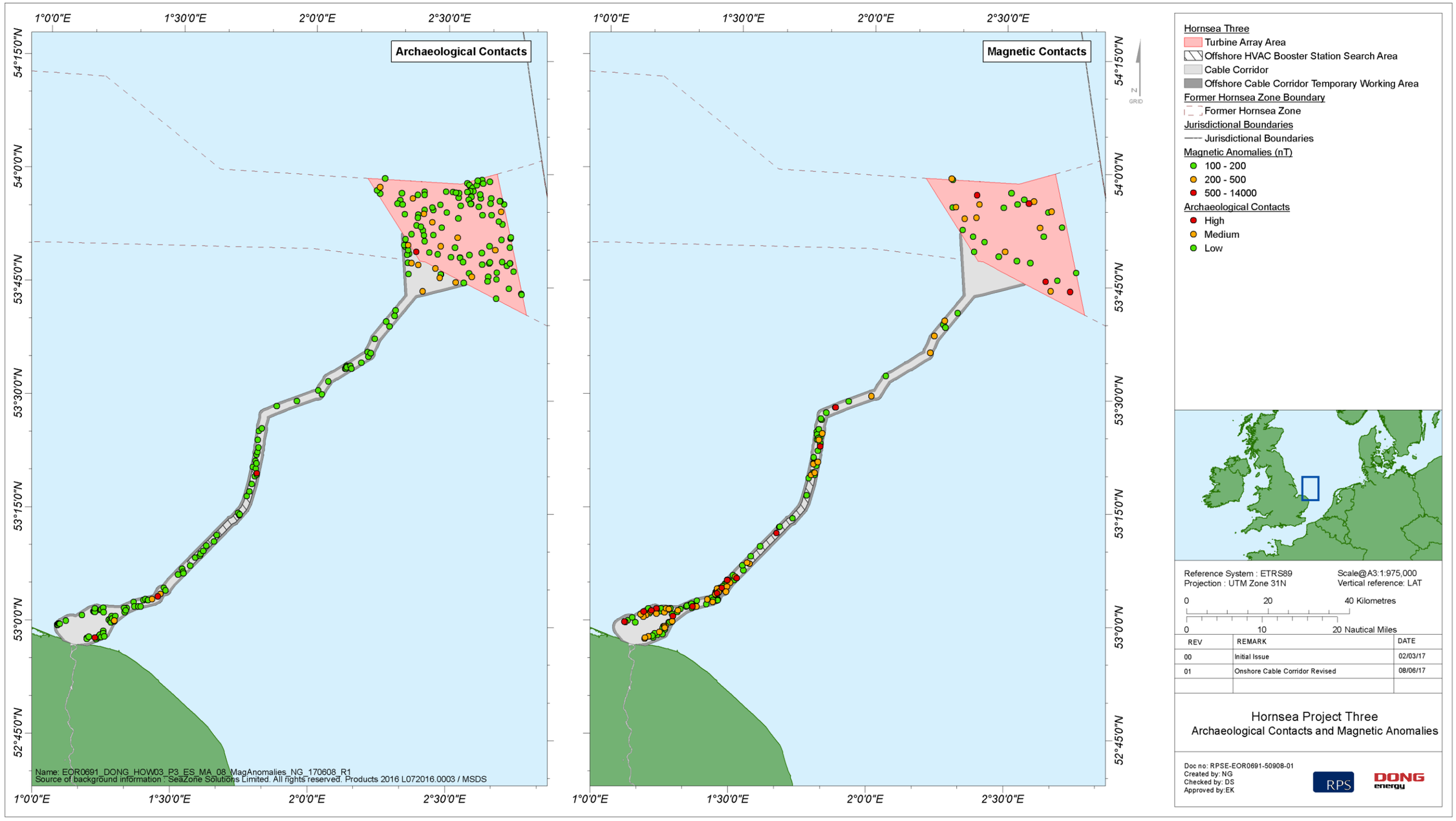

Figure 3.4: The positions of archaeological contacts and magnetic anomalies within Hornsea Three.

Medium potential anomalies

3.6.2.6 The distribution of medium potential anomalies across the Hornsea Three array area is shown in Figure 3.4, with further details in Appendix D. Unlike the high potential anomalies which comprise clearly recognisable anthropogenic objects (e.g. shipwrecks), medium potential anomalies represent objects or sites of likely anthropogenic origin that require further investigation in order to fully clarify their nature and establish their archaeological potential.

3.6.2.7 There are ten medium potential anomalies within the Hornsea Three array area (see Appendix D for further details). Further investigation would be required in order to establish the identity of these anomalies and any archaeological significance, once the final design of Hornsea Three is finalised and any direct interaction with these anomalies confirmed.

Low potential anomalies

3.6.2.8 The distribution of anomalies potentially of anthropogenic origin but unlikely to be of archaeological interest across the Hornsea Three array area is illustrated in Figure 3.4, with further details in Appendix B

3.6.2.9 Unlike high potential anomalies which comprise clearly recognisable anthropogenic objects (e.g. shipwrecks), low potential anomalies represent objects or sites of possible anthropogenic origin that are unlikely to be of archaeological significance.

3.6.2.10 A total of 112 contacts identified as being of low archaeological potential were identified within the Hornsea Three array area. These were a mixture of small contacts, often boulder like, or isolated linear features and modern debris such as rope, chain, fishing gear or lost equipment.

3.6.2.11 Low potential contacts have been assessed as being unlikely to be of archaeological significance and as such will not be discussed further. More information regarding the position and dimensions can be found in Appendix B.

Magnetic anomalies

3.6.2.12 A total of 29 magnetic anomalies with no obvious corresponding contacts are located within the Hornsea Three array area. Of these, four were greater than 500 nT and have been provisionally identified as areas of archaeological potential. Their locations are shown in Figure 3.4, with further details in Appendix E.

Recorded wrecks/obstructions

3.6.2.13 In addition to the identified wrecks, one recorded wreck and eight recorded obstruction are located within the Hornsea Three array area but were not identified within the geophysical datasets. These are considered as historic record of possible archaeological interest with no corresponding geophysical anomaly. There are a number of reasons why this could occur. Mobility of the loose sand and gravels on the seabed could cover features. There is also the possibility or poor recording so that the wrecks and obstructions are actually located elsewhere. Live records are shown below, with dead records listed in Appendix A.

UKHO number 9594, HOW03_UKHO_0003:

3.6.2.14 Described as CPT Ballast Section, an annulus of cast iron rings held together within two steel ring plates, lost from a vessel in 1977. The contact is at a depth of 35.0 m.

UKHO number 9624, HOW03_UKHO_0004:

3.6.2.15 An intact wreck measuring 20.0 m by 8.0 m in a depth of 64.0 m.

3.6.3 Hornsea Three offshore cable corridor

3.6.3.1 The database of archaeological anomalies within the Hornsea Three offshore cable corridor by Bibby Hydromap Ltd (Bibby 2016) and the funnel between the Hornsea Three array area and offshore cable corridor by Clinton Marine Survey Ltd (considered in this report as part of the Hornsea Three offshore cable corridor, Walters, 2016) has been reviewed by MSDS Marine and incorporated into a single overarching gazetteer (see Appendix B).

High potential anomalies

3.6.3.2 There are a total of three anomalies, all wrecks, of anthropogenic origin and with a high potential of being of archaeological significance within the Hornsea Three offshore cable corridor (see Figure 3.4 and Appendix C for further details).

Anomaly HOW03_ARCH_0001

3.6.3.3 HOW03_ARCH_0001 was identified as being of potential high archaeological significance. The contact was identified in the sidescan and multibeam datasets although there is no associated magnetic anomaly. The contact measures 19.7 m by 11.9 m, with a measurable height of 1.1 m.

3.6.3.4 The contact is coherent and identifiable as a wreck, or wreckage, within the sidescan dataset. Elements such as what appears to be the sides of the hull and other structural elements can be identified. Debris or superstructure is apparent lying to one side. The wreck is likely to be relatively modern in origin and likely of steel, or potentially composite, construction although there is no strongly correlating magnetic anomaly. The wreck signature is typical of a collapsed steel wreck and the lack of a magnetic anomaly is likely to be due to wide line spacing for the magnetometer.

3.6.3.5 Scour appears to be minimal and localised, mostly to the southeast of the wreck.

Anomaly HOW03_ARCH_0002

3.6.3.6 HOW03_ARCH_0002 has been identified as being of potential high archaeological significance. The contact was identified in the sidescan and multibeam datasets although there is no associated magnetic anomaly. The extents of the contact a measure 26.6 m by 5.6 m, with a measurable height of 1.0 m.

3.6.3.7 The contact is typical of that of a collapsed and fairly low lying wreck. The wreck is in three distinct parts suggesting the condition is poor. Outlying debris is minimal with only two small pieces lying 3.5 m and 9.1 m to the east. The wreck is likely post 1900's and of steel construction although there is no strongly corresponding magnetic anomaly.

3.6.3.8 There is no discernible evidence of scour, although the wreck bi-sects and is parallel with a sandwave.

Anomaly HOW03_ARCH_0003

3.6.3.9 HOW03_ARCH_0003 has been identified as being of potential high archaeological significance. The contact was identified in the sidescan, multibeam and magnetometer datasets. The extents of the contact measure 98.5 m by 75 m, with a measurable height of 0.8 m and a magnetic anomaly of 3,469.7 nT.

3.6.3.10 The contact is not immediately identifiable as a wreck and is made up of at least seven linear features measuring between 30.4 m and 9.6 m. Areas of seabed disturbance and mounds are visible within the area of the contact suggesting either further partially buried linear features or other debris.

3.6.3.11 It is not possible to identify the contact through the geophysical data, however it is almost certainly of anthropogenic origin and could represent lost cargo, debris from engineering works or less likely the remains of a dispersed vessel.

3.6.3.12 Scour is evident across the contact but is localised to individual features, or clusters of features.

Medium potential anomalies

3.6.3.13 The distribution of medium potential anomalies across the Hornsea Three offshore cable corridor is illustrated in Figure 3.4, with further details in Appendix D.

3.6.3.14 Unlike the high potential anomalies which comprise clearly recognisable anthropogenic objects (e.g. shipwrecks), medium potential anomalies represent objects or sites of likely anthropogenic origin that require further investigation in order to fully clarify their nature and establish their archaeological potential.

3.6.3.15 There are ten medium potential anomalies within the Hornsea Three offshore cable corridor (see Appendix D for further details). Further investigation would be required to establish the identity of these anomalies and any archaeological significance, once the final design of Hornsea Three is finalised and any direct interaction with these anomalies confirmed.

Low potential anomalies

3.6.3.16 The distribution of anomalies potentially of anthropogenic origin but unlikely to be of archaeological interest across the array is illustrated in Figure 3.4, with further details in Appendix B.

3.6.3.17 Unlike high potential anomalies which comprise clearly recognisable anthropogenic objects (e.g. shipwrecks), low potential anomalies represent objects or sites of possible anthropogenic origin that are unlikely to be of archaeological significance.

3.6.3.18 A total of 127 contacts identified as being of low archaeological potential were identified within the Hornsea Three offshore cable corridor survey data. These were a mixture of small contacts, often boulder like, or isolated linear features and modern debris such as rope, chain, fishing gear or lost equipment.

3.6.3.19 Low potential contacts have been assessed as being unlikely to be of archaeological significance and as such will not be discussed further.

Magnetic anomalies

3.6.3.20 A total of 157 magnetic anomalies with no obvious corresponding contacts are located are located within the Hornsea Three offshore cable corridor. Of these 13 are greater than 500 nT and have been provisionally identified as areas of archaeological potential. Their locations are shown in Figure 3.4, with further details in Appendix E.

Recorded wrecks/obstructions

3.6.3.21 In addition to the identified wrecks, four recorded wrecks and one recorded obstruction are located within the Hornsea Three offshore cable corridor, which were not identified within the geophysical datasets. These are considered as historic records of possible archaeological interest with no corresponding geophysical anomaly. There are a number of reasons why this could occur. Mobility of loose sand and gravels on the seabed could cover features. There is also the possibility of poor recording, so that the wrecks and obstructions are actually located elsewhere.

UKHO 81655, HOW03_UKHO_0001:

3.6.3.22 The remains of an unknown wreck within the Hornsea Three offshore cable corridor. The wreck was located in 2014 and is reported as having no discernible features.

UKHO 9190, HOW03_UKHO_0002:

3.6.3.23 Identified as the forepart of the Pontfield sunk by a mine in 1941 in the Hornsea Three offshore cable corridor. The vessels' stern was towed to Yarmouth.

UKHO 10616, HOW03_UKHO_0005:

3.6.3.24 Possibly the wreck of the Rosalie, a steamship which sank off Weybourne Beach in 1915. The wreck lies in the nearshore area of the Hornsea Three offshore cable corridor, in a general depth of 8.0 m however some structure is visible at low water.

UHKO 10639, HOW03_UKHO_0006:

3.6.3.25 The wreck of the Francois Trixier sunk in 1948 in the Hornsea Three offshore cable corridor. The vessel sank due to a shift in cargo following a leak.

UKHO 10817, HOW03_UKHO_0007:

3.6.3.26 Described as notable debris with small contacts in a line. The contacts lie in a general depth of 14.0 m within the Hornsea Three offshore cable corridor.

3.7 Hornsea Three landfall area

3.7.1.1 The Hornsea Three offshore cable corridor will make landfall to the north of the village of Weybourne, to the northeast of the former military camp at Muckleburgh.

3.7.1.2 The onshore heritage desk assessment (see volume 6, annex 5.1: Desk Based Assessment) revealed a concentration of material of Roman date around Weybourne. Weybourne was one of a number of small ports on the Norfolk coast.

3.7.1.3 Cartographic evidence indicates coastal erosion in the area since the mid-19th century. Specifically the Coastguard Station shown on the tithe and first edition OS maps, which was formerly location at Weybourne Gap, has been lost to the sea.

3.7.1.4 A photograph of the coastguard cottages located immediately adjacent to the coastguard station taken in approximately 1910 shows the shingle beach reaching as far as their yards (http://www.coastguardsofyesteryear.org/photogallery.php?photo_id=352).

3.7.2 Norfolk Rapid Coastal Zone Assessment Survey (RCZAS)

3.7.2.1 The Norfolk Rapid Coastal Zone Assessment Survey (Robertson *et al.*, 2005) comprised of a desk based assessment and archaeological fieldwork through a reconnaissance survey in the intertidal zone along the coastline of the county, providing baseline information. Within the intertidal area, some 120 separate finds or sites of material were observed during fieldwork. The material ranged widely in date from prehistoric flints to 20th century material.

3.7.2.2 Flint flakes were found by the Norfolk Rapid Coastal Zone Assessment Survey (RCZAS) embedded in cliff-wash deposits (not in situ) at the base of the cliff at the western end of the Hornsea Three landfall area (Robertson *et al.*, 2005), with a Romano-British copper alloy decorative strip/bracelet found loose on an eroded cliff ledge nearby (Robertson *et al*., 2005).

3.7.3 Hornsea Three landfall area walk-over survey

3.7.3.1 The landfall area walkover survey was undertaken in February 2017 (Figure 3.7).

3.7.3.2 At the time of the walkover survey the beach was shingle covered with a relatively steep slope towards the sea (see Figure 3.5 and Figure 3.6). The cliffs are eroding, with a number of ditch type features cut into the chalk cliffs to the east of Weybourne Gap. These features, where material was visible within them, were of relatively modern origin and may have been associated with the Second World War coastal defences located on the cliff tops. The walkover survey revealed no new archaeological sites or finds.

Figure 3.5: Weybourne Hope shingle ridge beach, with low cliffs in the background.

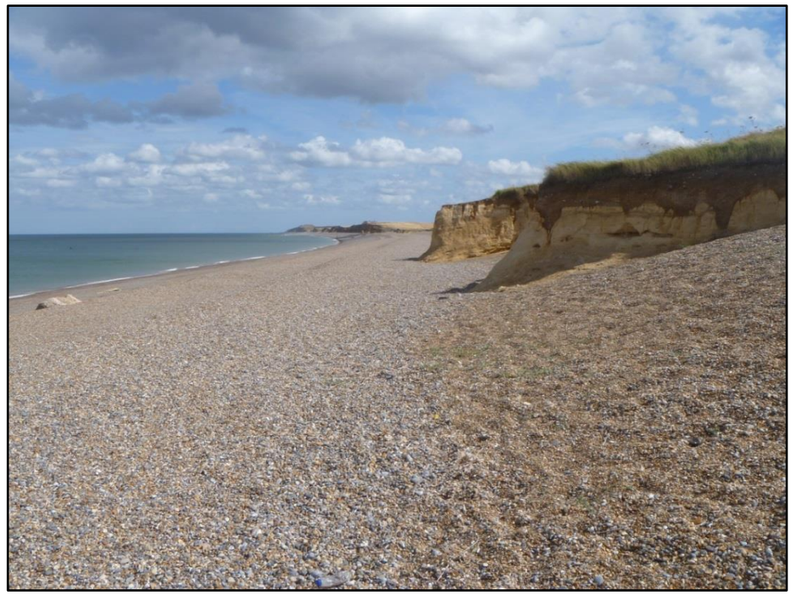

Figure 3.6: Eroding cliffs and steep shingle beach at the landfall.

3.7.4 Hornsea Three borehole survey

3.7.4.1 A borehole survey of the landfall area has been undertaken in connection with Hornsea Three (Figure 3.7). Boreholes were undertaken in two areas immediately south of the Hornsea Three landfall area, two boreholes to the east of Weybourne Gap, and one borehole to its west (as well as a number of boreholes further landward of MHWS, see volume 3, chapter 5: Historic Environment). At the site to the east of Weybourne Gap, one borehole was made through Head deposits, and the other borehole through Glacial Till. At the site to the west of Weybourne Gap, the borehole was made through Head deposits. At the site to the east of Weybourne Gap the sequence broadly comprised topsoil, sand, clay silt and natural chalk. At the site to the west of Weybourne Gap the sequence included made ground which may be associated with wartime defences.

3.7.4.2 BGS mapped the Hornsea Three landfall area and identified sequences of Anglian date and later (<480,000 years BP), which included glacio-fluvial sands and gravels, and glacial till. There is some potential for channel sediments to be preserved beneath these deposits. While no Holocene organic or peat deposits were noted beneath the modern beach shingle on the foreshore, such deposits are known to exist in the wider area. These deposits are sometimes associated with prehistoric artefact scatters and human remains.

Figure 3.7: Location of the Hornsea Three landfall area walkover and borehole surveys.

4. Conclusions

4.1 Prehistoric archaeological potential

4.1.1.1 It is clear that there is a substantial prehistoric archaeological potential within the regional marine archaeology study area, of great time depth, linked to the later Pleistocene and Holocene geo-chronology and sediment history of the southern North Sea. For long periods during the last 800,000 years the formerly terrestrial palaeolandscapes of the southern North Sea basin were probably inhabited by hominins, and although geological and other natural processes over this time span have affected the sediment horizons within which this record is preserved, prehistoric archaeological material can be expected to survive in some form within the seabed and buried sediments of the regional marine archaeology study area.

4.1.1.2 It is also clear that for the bulk of the UK's prehistoric period, the available archaeological record is relatively small and limited. This is particularly the case in the marine environment where the paucity of evidence is largely due to the difficulty in locating and identifying archaeological material, and should not be considered to indicate a lack of hominin activity within the formerly terrestrial study area. New finds of archaeological sites and material would be significant.

4.1.1.3 The survival of relict traces of the Early Holocene terrestrial landscape in the southern North Sea has been the subject of recent research, notably the NSPP and the Humber REC (Gaffney *et al.*, 2007; Tappin *et al.*, 2011). These sources draw attention to the high potential of the area, with its river valleys and rich coastal resources, for study of the Early Mesolithic. At the western end of Markham's Hole a combination of analysis of geophysical and geotechnical surveys have demonstrated elevated potential for remains of this period: The analysis has shown that the zones of highest potential for the survival of archaeological material are likely to be those on the edges of channels and floodplains, where old ground surfaces and organic remains are most likely to survive. These deposits often lie beneath relatively thin layers of seafloor sediment and may be vulnerable to exposure.

4.2 Maritime and aviation archaeological characterisation and site preservation potential

4.2.1.1 The southern North Sea has been identified as a region with historically high levels of shipping and military aviation activity and vessel/aircraft loss. The survival of ship and aircraft wrecks in the Hornsea Three marine archaeology study area depends on a range of factors, including the age and construction material of any wreck.

4.2.1.2 With respect to shipwrecks, there is a dearth of charted wrecks pre-dating the late 18th century in or near the regional marine archaeology study area. The majority of known shipwrecks are iron and steel vessels dating from the 19th and 20th centuries. As has been made clear above, this over-representation of more recent wrecks in the record of known and charted sites is the result not only of the nature of their construction, but also the method in which wrecks were recorded in the past.

4.2.1.3 The locations of pre-early 20th century offshore wrecks were often difficult to ascertain. Since the UKHO was given responsibility in 1913 for conducting routine seabed obstruction surveys, large numbers of wrecks have been located and charted offshore. The bulk of these date to within the last 150 years and have been located because of their size and iron or steel construction, which makes such wrecks more likely to be identified during remote sensing surveys (Parham, 2007).

4.2.1.4 The preponderance of iron and steel wrecks in the record probably masks the presence of earlier shipwrecks, which are of potentially great archaeological interest. Compared to iron and steel wrecks, wooden shipwrecks tend to be older, smaller and to have carried less ferrous material. They also tend to break up more quickly than iron and steel wrecks and are thus more likely to be scattered, dispersed and have a generally lower physical profile on the seabed. Consequently, they are less likely to be located by geophysical survey. As indicated above, some of the unconfirmed potential geophysical anomalies may represent such older shipwrecks.

4.2.1.5 These earlier wrecks are potentially the most archaeologically important and there should be an on-going recognition of the potential to encounter currently unknown or unrecorded shipwrecks, and mechanisms put in place to ensure the prompt reporting and avoidance of undue damage to any such discoveries.

4.2.1.6 No specific aircraft wrecks have been identified within the Hornsea Three marine archaeology study area, but from the evidence presented above it is clear that these wrecks should be expected. There are for example some high magnetic response anomalies within the Hornsea Three offshore cable corridor without associated wreck records, which may represent aircraft of this date.

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Appendix A UKHO data, derived from SeaZone, within the Hornsea Three Marine Archaeology Study Area

Table A.1: Gazetteer of UKHO records within Hornsea Three marine archaeology study area.

UKHO ID	Type	Status	Name	Position in Data	Visible in Data	Corresponding Contact	Area	Position
9190	Wreck	Live	PONTFIELD (FOREPART)	No	No	-	Hornsea Three offshore cable corridor	Surveyed
9196	Wreck	Live	KEYMUN	No	No	-	Hornsea Three offshore cable corridor temporary working area east	Surveyed
9200	Wreck	Dead	WELHOLME	No	No	-	Hornsea Three offshore cable corridor temporary working area east	Unreliable
9213	Wreck	Dead	Unknown	No	No	-	Hornsea Three offshore cable corridor temporary working area west	Surveyed
9215	Wreck	Dead	Unknown	No	No	-	Hornsea Three offshore cable corridor temporary working area west	Unreliable
9219	Wreck	Live	EFOS	No	No	-	Hornsea Three offshore cable corridor temporary working area east	Surveyed
9224	Wreck	Live	WESTERN MIST (POSSIBLY)	No	No	-	Hornsea Three offshore cable corridor temporary working area east	Surveyed
9227	Wreck	Live	HOMEFIRE	No	No	-	Hornsea Three offshore cable corridor temporary working area west	Surveyed
9229	Wreck	Live	GARDENIA	No	No	-	Hornsea Three offshore cable corridor temporary working area east	Surveyed
9321	Wreck	Dead	Unknown	No	No	-	Hornsea Three offshore cable corridor temporary working area east	
9399	Wreck	Live	Unknown	No	No	-	Hornsea Three offshore cable corridor temporary working area west	Surveyed
9408	Wreck	Dead	Unknown	No	No	-	Hornsea Three offshore cable corridor temporary working area west	Unreliable
9516	Wreck	Live	Unknown	No	No	-	Hornsea Three offshore cable corridor temporary working area west	Surveyed
9519	Obstruction	Live	Obstruction	Yes	Yes	HOW03_ARCH_0245	Hornsea Three offshore cable corridor	Surveyed
9585	Obstruction	Dead	Obstruction	No	No	-	Hornsea Three offshore cable corridor temporary working area west	Precisely known
9594	Obstruction	Live	Foul	No	No	-	Hornsea Three array area	Surveyed
9596	Obstruction	Dead	Obstruction	No	No	-	Hornsea Three array area	Precisely known
9598	Wreck	Live	Unknown	No	Partial	HOW03_ARCH_0122	Hornsea Three array area	Surveyed

UKHO ID	Type	Status	Name	Position in Data	Visible in Data	Corresponding Contact	Area	Position
9600	Wreck	Dead	Unknown	No	No	-	Hornsea Three array area	Precisely known
9601	Obstruction	Dead	Obstruction	Yes	No	-	Hornsea Three array area	Precisely known
9602	Obstruction	Dead	Obstruction	No	No	-	Hornsea Three array area	Precisely known
9605	Obstruction	Dead	Obstruction	No	No	-	Hornsea Three array area	Precisely known
9606	Wreck	Dead	SLASHER	No	No	-	Hornsea Three array area	Unreliable
9608	Obstruction	Dead	Obstruction	No	No	-	Hornsea Three array area	Precisely known
9612	Obstruction	Dead	Obstruction	No	No	-	Hornsea Three array area	Precisely known
9624	Wreck	Live	Unknown	No	Scour	-	Hornsea Three array area	Surveyed
9641	Wreck	Live	Unknown	No	No	-	Hornsea Three offshore cable corridor temporary working area east	Surveyed
9664	Obstruction	Dead	Obstruction	No	No	-	Hornsea Three array area	Approximate
10616	Wreck	Live	ROSALIE (POSSIBLY)	No	No	-	Hornsea Three offshore cable corridor	Precisely known
10633	Wreck	Live	EMPRESS	No	No	-	Hornsea Three offshore cable corridor temporary working area east	Surveyed
10639	Wreck	Live	FRANCOIS TRIXIER	No	No	-	Hornsea Three offshore cable corridor	Surveyed
10817	Obstruction	Live	Obstruction	No	No	-	Hornsea Three offshore cable corridor	Surveyed
67293	Obstruction	Dead	Foul	Yes	No	-	Hornsea Three offshore cable corridor	Unreliable
77985	Obstruction	Live	Foul	No	No	-	Hornsea Three offshore cable corridor temporary working area east	Precisely known
81655	Wreck	Live	Unknown	No	No	-	Hornsea Three offshore cable corridor	Surveyed

Appendix B Gazetteer of Potential Archaeological Anomalies

Table B.1: Gazetteer of potential archaeological – anomalies.

Identification number	Archaeological potential	Position coordinates (ETR89 31N)		Area	Length (m)	Width (m)	Height (m)	Magnetometer (nT)	Basic description
		Latitude	Longitude						
HOW03_ARCH_0001	High	52 57.8484 N	01 12.9543 E	Hornsea Three offshore cable corridor	19.7	11.9	1.1	0	Contact HOW03_ARCH_0001 has been identified as being of potential high archaeological significance. The contact was identified in the sidescan and multibeam datasets although there is no associated magnetic anomaly. The extents of the contact a measure 19.7 m by 11.9 m with a measurable height of 1.1 m. The contact is coherent and identifiable as a wreck, or wreckage, within the sidescan dataset. Elements such as what appears to be the sides of the hull and other structural elements can be identified. Debris, or superstructure is apparent lying to one side. The wreck is highly likely to be relatively modern in origin and likely of steel, or potentially composite, construction. Scour appears to be minimal and localised, predominately to the southeast of the wreck.
HOW03_ARCH_0002	High	53 20.0913 N	01 47.9507 E	Hornsea Three offshore cable corridor	29.6	5.6	1	0	Contact HOW03_ARCH_0002 has been identified as being of potential high archaeological significance. The contact was identified in the sidescan and multibeam datasets although there is no associated magnetic anomaly. The extents of the contact a measure 26.6 m by 5.6 m with a measurable height of 1.0 m. The contact is typical of that of a collapsed and fairly low lying wreck. The wreck is in three distinct parts suggesting the condition is poor. Outlying debris is minimal with only two small pieces lying 3.5 m and 9.1 m to the east. The wreck is likely post 1900's and of steel construction. There is no discernible evidence of scour, although the wreck bi-sects and is parallel with a sand wave.
HOW03_ARCH_0003	High	53 03.5136 N	01 26.6451 E	Hornsea Three offshore cable corridor	98.5	75	0.8	3469.7	Contact HOW03_ARCH_0003 has been identified as being of potential high archaeological significance. The contact was identified in the sidescan, multibeam and magnetometer datasets. The extents of the contact a measure 98.5 m by 75 m with a measurable height of 0.8 m and a magnetic anomaly of 3469.7 nT. The contact is not immediately identifiable as a wreck and is made up of at least seven linear features measuring between 30.4 m and 9.6 m. Areas of seabed disturbance and mounds are visible within the area of the contact suggesting either further partially buried linear features or other debris. It is not possible to identify the contact through the geophysical data, however it is almost certainly of anthropogenic origin and could represent lost cargo, debris from engineering works or less likely the remains of a dispersed vessel. Scour is evident across the contact but is localised to individual features, or clusters of features.
HOW03_ARCH_0004	Medium	53 03.1559 N	01 25.3322 E	Hornsea Three offshore cable corridor	15.1	8.5	0.4	99.8	Contact HOW03_ARCH_0004 is an area of incoherent seabed disturbance covering an area 15.1 m by 8.5 m and with a measurable height of 0.4 m. The presence of linear features, potential clusters of debris and an associated magnetic anomaly of 99.8 nT indicate the anthropogenic origin. Further investigation will be required in order to establish the contact and any potential archaeological significance.

Identification number	Archaeological potential	Position coordinates (ETR89 31N)		Area	Length (m)	Width (m)	Height (m)	Magnetometer (nT)	Basic description
		Latitude	Longitude						
HOW03_ARCH_0005	Medium	53 03.8337 N	01 27.2051 E	Hornsea Three offshore cable corridor	18.3	10.5	0.5	0	Contact HOW03_ARCH_0005 is a prominent mound with apparent linear features. The feature measures 18.5 m by 10.5 m with a measurable height of 0.5 m. Mounds, particularly when associated with linear features can indicate buried material of potential anthropogenic origin. No associated magnetic anomaly was identified. Further investigation will be required in order to establish the contact and any potential archaeological significance.
HOW03_ARCH_0006	Low	53 01.8986 N	01 19.7719 E	Hornsea Three offshore cable corridor	3.6	0.1	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0007	Low	52 59.4665 N	01 04.6078 E	Hornsea Three offshore cable corridor	1.3	0.5	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0008	Low	52 59.4684 N	01 04.6101 E	Hornsea Three offshore cable corridor	1.4	0.4	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0009	Low	52 59.4005 N	01 04.7265 E	Hornsea Three offshore cable corridor	1.6	0.8	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0010	Low	52 59.4078 N	01 04.7419 E	Hornsea Three offshore cable corridor	2	0.4	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0011	Low	52 59.6211 N	01 04.9281 E	Hornsea Three offshore cable corridor	0.9	0.4	0.4	101.7	Potential anthropogenic debris
HOW03_ARCH_0012	Low	52 59.6083 N	01 05.0326 E	Hornsea Three offshore cable corridor	2.2	0.7	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0013	Low	52 59.5923 N	01 05.2244 E	Hornsea Three offshore cable corridor	1.8	0.8	0.4	37.6	Potential anthropogenic debris
HOW03_ARCH_0014	Low	53 00.0463 N	01 06.4821 E	Hornsea Three offshore cable corridor	1.3	0.9	0.3	6.3	Potential anthropogenic debris
HOW03_ARCH_0015	Low	53 00.7936 N	01 10.0232 E	Hornsea Three offshore cable corridor	1.5	1.1	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0016	Low	52 57.8085 N	01 11.1438 E	Hornsea Three offshore cable corridor	0.5	0.2	0.5	22.5	Potential anthropogenic debris
HOW03_ARCH_0017	Low	52 57.6656 N	01 11.1900 E	Hornsea Three offshore cable corridor	2.7	0.4	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0018	Low	52 57.9737 N	01 11.6359 E	Hornsea Three offshore cable corridor	3.6	0.1	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0019	Low	53 01.3639 N	01 12.4910 E	Hornsea Three offshore cable corridor	1	0.7	0.4	35.4	Potential anthropogenic debris
HOW03_ARCH_0020	Low	53 01.3491 N	01 12.5585 E	Hornsea Three offshore cable corridor	1.8	0.8	0.3	55.3	Potential anthropogenic debris
HOW03_ARCH_0021	Low	53 01.3357 N	01 12.6251 E	Hornsea Three offshore cable corridor	1.1	0.4	0.6	0	Potential anthropogenic debris
HOW03_ARCH_0022	Low	53 01.3302 N	01 12.6450 E	Hornsea Three offshore cable corridor	1.7	1.3	0.4	30.1	Potential anthropogenic debris
HOW03_ARCH_0023	Low	53 01.3343 N	01 12.6662 E	Hornsea Three offshore cable corridor	1.3	0.9	0.3	22.8	Potential anthropogenic debris
HOW03_ARCH_0024	Low	53 01.2974 N	01 12.7949 E	Hornsea Three offshore cable corridor	1	0.9	0.4	11	Potential anthropogenic debris
HOW03_ARCH_0025	Low	53 01.7351 N	01 12.7938 E	Hornsea Three offshore cable corridor	8.1	0.1	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0026	Low	52 57.8131 N	01 13.1900 E	Hornsea Three offshore cable corridor	1.9	0.6	0.2	37.9	Potential anthropogenic debris
HOW03_ARCH_0027	Low	52 57.6345 N	01 13.2609 E	Hornsea Three offshore cable corridor	2	0.4	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0028	Low	52 57.9095 N	01 13.4433 E	Hornsea Three offshore cable corridor	2.4	0.1	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0029	Low	52 57.9748 N	01 13.6172 E	Hornsea Three offshore cable corridor	2.1	0.8	0.2	0	Potential anthropogenic debris

Identification number	Archaeological potential	Position coordinates (ETR89 31N)		Area	Length (m)	Width (m)	Height (m)	Magnetometer (nT)	Basic description
		Latitude	Longitude						
HOW03_ARCH_0030	Low	52 57.9637 N	01 13.6260 E	Hornsea Three offshore cable corridor	2.4	0.7	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0031	Low	52 57.9702 N	01 13.6273 E	Hornsea Three offshore cable corridor	1.5	0.7	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0032	Low	52 57.9511 N	01 13.6644 E	Hornsea Three offshore cable corridor	2	0.6	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0033	Low	52 58.2896 N	01 14.0158 E	Hornsea Three offshore cable corridor	2.4	1.6	1.3	0	Potential anthropogenic debris
HOW03_ARCH_0034	Low	53 01.5231 N	01 13.9668 E	Hornsea Three offshore cable corridor	6.6	2.2	0	0	Potential anthropogenic debris
HOW03_ARCH_0035	Low	53 01.5211 N	01 14.0676 E	Hornsea Three offshore cable corridor	5.8	2.3	0	0	Potential anthropogenic debris
HOW03_ARCH_0036	Low	52 57.9589 N	01 14.3159 E	Hornsea Three offshore cable corridor	1	0.7	0.3	20.5	Potential anthropogenic debris
HOW03_ARCH_0037	Low	53 01.6424 N	01 14.2271 E	Hornsea Three offshore cable corridor	1	0.8	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0038	Low	53 01.8355 N	01 14.6491 E	Hornsea Three offshore cable corridor	4.7	0.1	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0039	Low	52 58.8025 N	01 14.7730 E	Hornsea Three offshore cable corridor	9	0.1	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0040	Low	52 58.4631 N	01 14.7897 E	Hornsea Three offshore cable corridor	2.4	0.9	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0041	Low	53 01.2769 N	01 14.7102 E	Hornsea Three offshore cable corridor	8.1	0.1	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0042	Low	52 58.0814 N	01 14.9890 E	Hornsea Three offshore cable corridor	1.3	0.5	0.3	12	Potential anthropogenic debris
HOW03_ARCH_0043	Low	53 00.2916 N	01 15.9142 E	Hornsea Three offshore cable corridor	1.7	1	0.4	313.2	Potential anthropogenic debris
HOW03_ARCH_0044	Low	53 00.2870 N	01 15.9361 E	Hornsea Three offshore cable corridor	1	1	0.5	57.2	Potential anthropogenic debris
HOW03_ARCH_0045	Low	53 00.2071 N	01 16.3208 E	Hornsea Three offshore cable corridor	1.2	1	0.3	27.2	Potential anthropogenic debris
HOW03_ARCH_0046	Low	52 59.9261 N	01 16.4218 E	Hornsea Three offshore cable corridor	2.3	0.4	0.4	49	Potential anthropogenic debris
HOW03_ARCH_0047	Low	52 59.9246 N	01 16.4279 E	Hornsea Three offshore cable corridor	1.1	0.2	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0048	Low	52 59.9251 N	01 16.4305 E	Hornsea Three offshore cable corridor	1	0.2	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0049	Low	53 00.7572 N	01 16.4972 E	Hornsea Three offshore cable corridor	2.5	0.7	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0050	Low	53 00.4758 N	01 16.6843 E	Hornsea Three offshore cable corridor	1.2	0.5	0.8	56.5	Potential anthropogenic debris
HOW03_ARCH_0051	Low	53 00.0947 N	01 17.1036 E	Hornsea Three offshore cable corridor	1.1	0.2	0.4	78.7	Potential anthropogenic debris
HOW03_ARCH_0052	Low	53 00.0870 N	01 17.1231 E	Hornsea Three offshore cable corridor	2.9	0.8	0.5	0	Potential anthropogenic debris
HOW03_ARCH_0053	Low	53 00.7992 N	01 17.3116 E	Hornsea Three offshore cable corridor	2	0.6	0.2	341.7	Potential anthropogenic debris
HOW03_ARCH_0054	Low	53 01.8555 N	01 19.2044 E	Hornsea Three offshore cable corridor	1.2	0.5	0.1	46.5	Potential anthropogenic debris
HOW03_ARCH_0055	Low	53 01.3568 N	01 19.4081 E	Hornsea Three offshore cable corridor	5.8	0.1	0.2	278.6	Potential anthropogenic debris
HOW03_ARCH_0056	Low	53 01.5666 N	01 19.5606 E	Hornsea Three offshore cable corridor	9.5	0.1	0.1	0	Potential anthropogenic debris

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		Latitude	Longitude						
HOW03_ARCH_0057	Low	53 02.7042 N	01 21.3207 E	Hornsea Three offshore cable corridor	1.1	1	0.3	32.2	Potential anthropogenic debris
HOW03_ARCH_0058	Low	53 02.1253 N	01 21.4806 E	Hornsea Three offshore cable corridor	3.6	1.6	2.5	1425.3	Potential anthropogenic debris
HOW03_ARCH_0059	Low	53 02.1297 N	01 22.3537 E	Hornsea Three offshore cable corridor	5.6	3.1	0.5	237.4	Potential anthropogenic debris
HOW03_ARCH_0060	Low	53 02.1683 N	01 22.8554 E	Hornsea Three offshore cable corridor	2.1	0.5	0.1	65.7	Potential anthropogenic debris
HOW03_ARCH_0061	Low	53 02.9824 N	01 23.4727 E	Hornsea Three offshore cable corridor	2	0.1	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0062	Low	53 02.9815 N	01 23.4740 E	Hornsea Three offshore cable corridor	2.3	0.1	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0063	Low	53 03.1463 N	01 23.9117 E	Hornsea Three offshore cable corridor	3.7	0.3	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0064	Low	53 02.9581 N	01 24.4177 E	Hornsea Three offshore cable corridor	4.7	0.4	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0065	Low	53 03.0212 N	01 24.4482 E	Hornsea Three offshore cable corridor	0.9	0.8	0.4	9.3	Potential anthropogenic debris
HOW03_ARCH_0066	Low	53 04.6644 N	01 27.9266 E	Hornsea Three offshore cable corridor	5.5	0.1	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0067	Low	53 04.3776 N	01 28.2584 E	Hornsea Three offshore cable corridor	3.9	0.7	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0068	Low	53 06.4685 N	01 30.9123 E	Hornsea Three offshore cable corridor	2.4	1.5	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0069	Low	53 06.4695 N	01 30.9144 E	Hornsea Three offshore cable corridor	4.2	2.7	0.8	0	Potential anthropogenic debris
HOW03_ARCH_0070	Low	53 07.2394 N	01 31.7731 E	Hornsea Three offshore cable corridor	41.3	0.1	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0071	Low	53 06.8426 N	01 32.0273 E	Hornsea Three offshore cable corridor	1.8	0.7	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0072	Low	53 06.6369 N	01 32.1002 E	Hornsea Three offshore cable corridor	1.5	0.6	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0073	Low	53 07.6702 N	01 33.5456 E	Hornsea Three offshore cable corridor	1.4	0.9	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0074	Low	53 08.7393 N	01 34.6748 E	Hornsea Three offshore cable corridor	3.1	0.2	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0075	Low	53 09.0474 N	01 35.6482 E	Hornsea Three offshore cable corridor	6.1	0.1	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0076	Low	53 09.0469 N	01 35.6540 E	Hornsea Three offshore cable corridor	6	0.1	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0077	Low	53 09.3144 N	01 35.8084 E	Hornsea Three offshore cable corridor	2.6	0.6	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0078	Low	53 09.6774 N	01 36.3805 E	Hornsea Three offshore cable corridor	2.2	0.8	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0079	Low	53 10.3892 N	01 37.0517 E	Hornsea Three offshore cable corridor	2.7	1.2	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0080	Low	53 10.9411 N	01 38.7479 E	Hornsea Three offshore cable corridor	3.1	0.6	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0081	Low	53 11.7842 N	01 39.2912 E	Hornsea Three offshore cable corridor	1.9	0.6	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0082	Low	53 14.7663 N	01 43.9662 E	Hornsea Three offshore cable corridor	2.9	0.2	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0083	Low	53 14.5044 N	01 44.2753 E	Hornsea Three offshore cable corridor	1.7	0.4	0.3	0	Potential anthropogenic debris

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		Latitude	Longitude						
HOW03_ARCH_0084	Low	53 14.5877 N	01 44.3247 E	Hornsea Three offshore cable corridor	1.9	0.2	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0085	Low	53 17.0483 N	01 45.8017 E	Hornsea Three offshore cable corridor	2.1	0.7	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0086	Low	53 17.6785 N	01 46.3827 E	Hornsea Three offshore cable corridor	1.3	0.6	0.2	110.3	Potential anthropogenic debris
HOW03_ARCH_0087	Low	53 18.6586 N	01 46.8713 E	Hornsea Three offshore cable corridor	4	0.1	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0088	Low	53 20.9088 N	01 47.0568 E	Hornsea Three offshore cable corridor	1.1	0.3	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0089	Low	53 19.6660 N	01 47.5143 E	Hornsea Three offshore cable corridor	2.2	1.1	0.2	18.7	Potential anthropogenic debris
HOW03_ARCH_0090	Low	53 21.7273 N	01 47.5732 E	Hornsea Three offshore cable corridor	1.3	0.8	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0091	Low	53 20.6870 N	01 47.6887 E	Hornsea Three offshore cable corridor	1.7	0.5	0.1	13.9	Potential anthropogenic debris
HOW03_ARCH_0092	Low	53 21.4196 N	01 47.8502 E	Hornsea Three offshore cable corridor	1.6	1.5	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0093	Low	53 22.5803 N	01 47.8216 E	Hornsea Three offshore cable corridor	12.2	0.1	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0094	Low	53 19.9014 N	01 47.9402 E	Hornsea Three offshore cable corridor	10.2	6.3	1.8	144.3	Potential anthropogenic debris
HOW03_ARCH_0095	Low	53 22.9036 N	01 48.0210 E	Hornsea Three offshore cable corridor	2.9	2.3	0.5	42.4	Potential anthropogenic debris
HOW03_ARCH_0096	Low	53 24.5196 N	01 48.0672 E	Hornsea Three offshore cable corridor	1.9	0.9	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0097	Low	53 23.4883 N	01 48.2492 E	Hornsea Three offshore cable corridor	1.5	1.2	0.4	15.1	Potential anthropogenic debris
HOW03_ARCH_0098	Low	53 25.7052 N	01 48.2670 E	Hornsea Three offshore cable corridor	1	0.5	0.3	195.1	Potential anthropogenic debris
HOW03_ARCH_0099	Low	53 26.0301 N	01 48.8680 E	Hornsea Three offshore cable corridor	2.3	1.9	0.5	70.9	Potential anthropogenic debris
HOW03_ARCH_0100	Low	53 29.0208 N	01 52.0781 E	Hornsea Three offshore cable corridor	1.4	0.5	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0101	Low	53 29.7415 N	01 56.5811 E	Hornsea Three offshore cable corridor	1.4	0.7	0.7	0	Potential anthropogenic debris
HOW03_ARCH_0102	Low	53 31.1886 N	02 01.2991 E	Hornsea Three offshore cable corridor	1	0.9	0.4	10.8	Potential anthropogenic debris
HOW03_ARCH_0103	Low	53 30.6804 N	02 02.1369 E	Hornsea Three offshore cable corridor	1.6	0.4	0.4	6.4	Potential anthropogenic debris
HOW03_ARCH_0104	Low	53 32.4222 N	02 03.5491 E	Hornsea Three offshore cable corridor	1.6	0.6	0.2	7.1	Potential anthropogenic debris
HOW03_ARCH_0105	Low	53 34.1123 N	02 07.2510 E	Hornsea Three offshore cable corridor	1.5	1	0.5	10.3	Potential anthropogenic debris
HOW03_ARCH_0106	Low	53 34.1406 N	02 07.4429 E	Hornsea Three offshore cable corridor	1.8	1.1	0.2	5.4	Potential anthropogenic debris
HOW03_ARCH_0107	Low	53 34.4996 N	02 07.5166 E	Hornsea Three offshore cable corridor	1.3	1.1	0.6	19.8	Potential anthropogenic debris
HOW03_ARCH_0108	Low	53 34.3719 N	02 07.5856 E	Hornsea Three offshore cable corridor	1	0.9	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0109	Low	53 34.3132 N	02 07.5992 E	Hornsea Three offshore cable corridor	1.6	1	0.4	5.5	Potential anthropogenic debris
HOW03_ARCH_0110	Low	53 34.4840 N	02 08.4172 E	Hornsea Three offshore cable corridor	1.8	0.4	0.4	6.9	Potential anthropogenic debris

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HOW03_ARCH_0111	Low	53 34.1577 N	02 08.6517 E	Hornsea Three offshore cable corridor	1.2	1	0.3	9.6	Potential anthropogenic debris
HOW03_ARCH_0112	Low	53 34.9153 N	02 10.8193 E	Hornsea Three offshore cable corridor	3.1	2.3	0.9	10	Potential anthropogenic debris
HOW03_ARCH_0113	Low	53 36.3520 N	02 12.2001 E	Hornsea Three offshore cable corridor	4.7	0.5	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0114	Low	53 35.7160 N	02 12.3776 E	Hornsea Three offshore cable corridor	1.5	0.8	0.5	7.9	Potential anthropogenic debris
HOW03_ARCH_0115	Low	53 36.2167 N	02 12.8389 E	Hornsea Three offshore cable corridor	1.2	0.8	0.8	0	Potential anthropogenic debris
HOW03_ARCH_0116	Low	53 38.1135 N	02 13.7030 E	Hornsea Three offshore cable corridor	2.7	0.9	0.5	14.9	Potential anthropogenic debris
HOW03_ARCH_0117	Low	53 40.4267 N	02 16.2259 E	Hornsea Three offshore cable corridor	1.4	1.2	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0118	Low	53 39.7577 N	02 17.0049 E	Hornsea Three offshore cable corridor	1.5	0.7	0.6	7	Potential anthropogenic debris
HOW03_ARCH_0119	Low	53 41.2096 N	02 18.0930 E	Hornsea Three offshore cable corridor	1.4	0.4	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0120	Low	53 41.8938 N	02 18.3337 E	Hornsea Three offshore cable corridor	1.7	1.4	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0121	Low	53 41.8943 N	02 18.3354 E	Hornsea Three offshore cable corridor	1.6	1.1	0.6	0	Potential anthropogenic debris
HOW03_ARCH_0122	High	53 49.6822 N	02 22.8551 E	Hornsea Three array area	22.9	13.5	0.9	0	Contact HOW03_ARCH_0122 has been identified as being of potential high archaeological significance. The contact was identified in the sidescan dataset but falls outside the multibeam coverage, there is no associated magnetic anomaly. The visible extents of the contact a measure 22.9 m by 13.5 m with a measurable height of 0.9 m. The contact lies towards the edge of the data extents and is partly cut off, although to what extent is not known. Although largely obscured by shadow and incoherent the visible elements are typical of that of a collapsed wreck. Prominent linear and angular features, consistent with wreck structure, are clearly visible to the south east. Further curvilinear features and debris are also visible. Visible outlying debris is minimal with only one piece (HOW03_ARCH_0130) approximately 25 m to the northwest. The wreck is likely post 1900's and of steel construction.
HOW03_ARCH_0123	Medium	53 53.5975 N	02 26.4288 E	Hornsea Three array area	13.9	6.5	0.6	0	Contact HOW03_ARCH_0123 is a prominent linear, angular, feature measuring 13.9 m in length and with a measurable height of 0.6 m. To the north there is an area of possible seabed disturbance. The contact is potentially geological, however the form may indicate potential anthropogenic origin. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0124	Medium	53 54.7215 N	02 24.5295 E	Hornsea Three array area	7.9	7.4	1.7	0	Contact HOW03_ARCH_0124 is an incoherent area of potential seabed disturbance 7.9 m by 7.4 m with visible linear features. Seabed disturbances can indicate buried or partially buried material and the presence of linear features may indicate anthropogenic origin. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.

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		Latitude	Longitude						
HOW03_ARCH_0125	Medium	53 49.9768 N	02 40.5400 E	Hornsea Three array area	4.2	7.2	0.5	0	Contact HOW03_ARCH_0125 is a mound 4.2 m by 7.2 m with a measurable height of 0.5 m. The surface of the mound is irregular with possible partially buried material the form of which suggests anthropogenic debris. Mounds with visible potential debris can represent further buried material that may be of archaeological significance. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0126	Medium	53 46.4305 N	02 35.2794 E	Hornsea Three array area	11.9	3.7	0.7	0	Contact HOW04_ARCH_0126 is a prominent but incoherent feature 11.9 m by 3.7 m with a measurable height of 0.7 m. The contact is potentially geological, however the form and size may indicate potential anthropogenic origin. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0127	Medium	53 51.5920 N	02 32.0686 E	Hornsea Three array area	3.9	4.7	0.7	0	Contact HOW03_ARCH_0127 is a mound 3.9 m by 4.7 m with a measurable height of 0.7 m. The surface of the mound is irregular with possible partially buried material the form of which suggests anthropogenic debris. Mounds with visible potential debris can represent further buried material that may be of archaeological significance. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0128	Medium	53 55.0498 N	02 41.8624 E	Hornsea Three array area	7.3	4	0.9	0	Contact HOW03_ARCH_0128 is 7.3 m by 4.0 m contact with a measurable height of 0.9 m. The feature has a prominent linear element up to which a mound has formed to the southwest, to the north east the feature is irregular. Overall the form of the feature and the prominent linear element may indicate anthropogenic origin. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0129	Medium	53 50.4623 N	02 28.3049 E	Hornsea Three array area	13.8	7.9	1	0	Contact HOW03_ARCH_0129 is large mound 9.1 m by 5.9 m with a measurable height of 1.0 m. Associated with the mound are a number of curvilinear features, potentially indicative of anthropogenic debris. A long shadow is evident form the centre which usually indicates rope/chain in midwater. Potentially modern in origin such as snagged fishing gear but could be of archaeological interest. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0130	Medium	53 49.6963 N	02 22.8310 E	Hornsea Three array area	8.3	2.1	0.2	0	Contact HOW03_ARCH_0130 is a curvilinear feature 8.3 m in length with what appears to be a large piece of debris to one end. The contact lies approximately 25 m to the northwest of HOW_ARCH_0122 which is believed to be a steel wreck. It is likely the contact is outlying debris from the wreck. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0131	Medium	53 58.2142 N	02 14.5932 E	Hornsea Three array area	12.2	7.8	0.7	0	Contact HOW03_ARCH_0131 is an incoherent area 12.2 m by 7.8 m of seabed disturbance and what appears to be partially buried material. The presence of linear features and this size of the contact may indicate anthropogenic origin and potential archaeological interest. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.

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		Latitude	Longitude						
HOW03_ARCH_0132	Medium	53 56.7517 N	02 22.0206 E	Hornsea Three array area	9.3	7.1	0.5	0	Contact HOW03_ARCH_0132 is an incoherent contact predominantly made up of three interconnecting linear/curvilinear feature over an area 9.3 m by 7.1 m. The form of the contact suggests likely anthropogenic origin, the uniqueness and the size may indicate potential archaeological interest. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0133	Low	53 46.4307 N	02 38.9824 E	Hornsea Three array area	6.9	3.2	0.8	0	Potential anthropogenic debris
HOW03_ARCH_0134	Low	53 56.4941 N	02 19.0981 E	Hornsea Three array area	5.8	2.5	0.5	0	Potential anthropogenic debris
HOW03_ARCH_0135	Low	53 46.8704 N	02 34.7285 E	Hornsea Three array area	3.9	2.6	0.6	0	Potential anthropogenic debris
HOW03_ARCH_0136	Low	53 56.8214 N	02 37.2060 E	Hornsea Three array area	7.4	3.4	0.8	0	Potential anthropogenic debris
HOW03_ARCH_0137	Low	53 47.1334 N	02 44.6701 E	Hornsea Three array area	2.2	1.4	0.6	0	Potential anthropogenic debris
HOW03_ARCH_0138	Low	53 54.6106 N	02 23.2212 E	Hornsea Three array area	2.2	1.7	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0139	Low	53 47.8990 N	02 43.2134 E	Hornsea Three array area	4.4	1.1	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0140	Low	53 48.4179 N	02 42.1456 E	Hornsea Three array area	2.4	1.6	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0141	Low	53 50.3309 N	02 43.8628 E	Hornsea Three array area	4.5	1.7	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0142	Low	53 50.3299 N	02 43.8613 E	Hornsea Three array area	4	1.3	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0143	Low	53 51.3374 N	02 41.9236 E	Hornsea Three array area	3.7	3	0.7	0	Potential anthropogenic debris
HOW03_ARCH_0144	Low	53 57.6951 N	02 29.4239 E	Hornsea Three array area	1	0.8	0.1	15.9	Potential anthropogenic debris
HOW03_ARCH_0145	Low	53 57.6288 N	02 30.9627 E	Hornsea Three array area	2.7	1.2	0.9	0	Potential anthropogenic debris
HOW03_ARCH_0146	Low	53 56.9061 N	02 32.2683 E	Hornsea Three array area	6.6	2.5	0.7	0	Potential anthropogenic debris
HOW03_ARCH_0147	Low	53 53.7714 N	02 41.3127 E	Hornsea Three array area	8.1	2.4	0.7	0	Potential anthropogenic debris
HOW03_ARCH_0148	Low	53 58.8075 N	02 34.2089 E	Hornsea Three array area	3.8	2.3	0.7	0	Potential anthropogenic debris
HOW03_ARCH_0149	Low	53 58.5679 N	02 34.6235 E	Hornsea Three array area	1.2	0.9	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0150	Low	53 58.5706 N	02 34.6204 E	Hornsea Three array area	2.1	1.2	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0151	Low	53 58.2391 N	02 35.4122 E	Hornsea Three array area	1.7	0.9	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0152	Low	53 56.8184 N	02 39.6048 E	Hornsea Three array area	7.2	6.2	0.5	0	Potential anthropogenic debris
HOW03_ARCH_0153	Low	53 59.0551 N	02 39.2676 E	Hornsea Three array area	2.4	1.6	1	0	Potential anthropogenic debris
HOW03_ARCH_0154	Low	53 59.2723 N	02 37.5513 E	Hornsea Three array area	2.4	1.3	0.5	0	Potential anthropogenic debris
HOW03_ARCH_0155	Low	53 56.1247 N	02 34.9852 E	Hornsea Three array area	1.8	1.5	0.5	0	Potential anthropogenic debris
HOW03_ARCH_0156	Low	53 56.1030 N	02 34.9601 E	Hornsea Three array area	1.1	0.8	0.4	0	Potential anthropogenic debris

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		Latitude	Longitude						
HOW03_ARCH_0157	Low	53 54.1846 N	02 32.1941 E	Hornsea Three array area	3.3	0.7	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0158	Low	53 54.1835 N	02 32.1927 E	Hornsea Three array area	2	1	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0159	Low	53 57.0228 N	02 35.0855 E	Hornsea Three array area	4	2.7	0.9	0	Potential anthropogenic debris
HOW03_ARCH_0160	Low	53 56.6174 N	02 34.5375 E	Hornsea Three array area	2.1	2.1	0.7	0	Potential anthropogenic debris
HOW03_ARCH_0161	Low	53 58.7797 N	02 37.7674 E	Hornsea Three array area	2.4	1.2	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0162	Low	53 57.5289 N	02 32.3199 E	Hornsea Three array area	1.1	0.9	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0163	Low	53 54.9015 N	02 29.6413 E	Hornsea Three array area	2.5	1	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0164	Low	53 55.2846 N	02 26.5776 E	Hornsea Three array area	6.5	6.1	1	0	Potential anthropogenic debris
HOW03_ARCH_0165	Low	53 52.0289 N	02 21.7834 E	Hornsea Three array area	1.4	0.5	0.5	12.8	Potential anthropogenic debris
HOW03_ARCH_0166	Low	53 58.5686 N	02 36.2864 E	Hornsea Three array area	5.3	2.9	0.5	0	Potential anthropogenic debris
HOW03_ARCH_0167	Low	53 56.0857 N	02 18.5040 E	Hornsea Three array area	3.7	2.8	0.8	0	Potential anthropogenic debris
HOW03_ARCH_0168	Low	53 51.9468 N	02 26.6527 E	Hornsea Three array area	7.1	3.2	0.6	0	Potential anthropogenic debris
HOW03_ARCH_0169	Low	53 48.9641 N	02 32.6370 E	Hornsea Three array area	1.2	0.5	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0170	Low	53 48.9093 N	02 32.6734 E	Hornsea Three array area	1.8	0.9	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0171	Low	53 45.8191 N	02 38.8710 E	Hornsea Three array area	1	0.6	0.2	13916.2	Potential anthropogenic debris
HOW03_ARCH_0172	Low	53 44.2053 N	02 46.4430 E	Hornsea Three array area	7.4	2.8	0.6	0	Potential anthropogenic debris
HOW03_ARCH_0173	Low	53 43.5703 N	02 40.7958 E	Hornsea Three array area	4.1	0.8	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0174	Low	53 46.1201 N	02 40.8533 E	Hornsea Three array area	1.1	0.4	0.2	11.6	Potential anthropogenic debris
HOW03_ARCH_0175	Low	53 48.2259 N	02 43.8930 E	Hornsea Three array area	2.9	1.6	0.4	18.3	Potential anthropogenic debris
HOW03_ARCH_0176	Low	53 47.0035 N	02 40.9003 E	Hornsea Three array area	8.1	4.9	0.6	0	Potential anthropogenic debris
HOW03_ARCH_0177	Low	53 48.2292 N	02 39.2063 E	Hornsea Three array area	2.3	0.4	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0178	Low	53 48.3659 N	02 39.3485 E	Hornsea Three array area	5.5	3.4	2.7	0	Potential anthropogenic debris
HOW03_ARCH_0179	Low	53 51.5357 N	02 43.9869 E	Hornsea Three array area	3	2.6	0.8	0	Potential anthropogenic debris
HOW03_ARCH_0180	Low	53 49.5901 N	02 37.5108 E	Hornsea Three array area	2.7	1.8	0.7	0	Potential anthropogenic debris
HOW03_ARCH_0181	Low	53 48.0435 N	02 37.6114 E	Hornsea Three array area	2.7	0.4	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0182	Low	53 56.0399 N	02 42.5190 E	Hornsea Three array area	7.9	0.3	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0183	Low	53 56.4866 N	02 41.6472 E	Hornsea Three array area	3.4	0.4	0.3	0	Potential anthropogenic debris

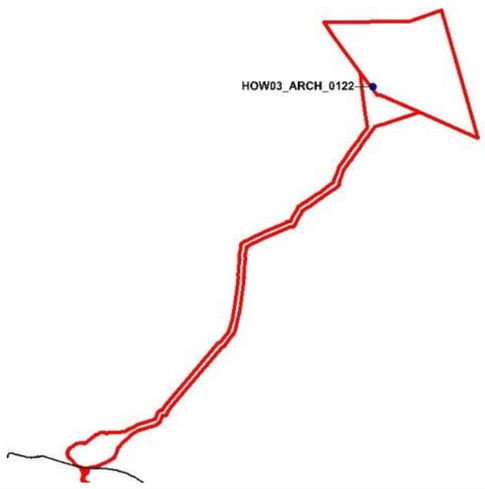
Identification number	Archaeological potential	Position coordinates (ETR89 31N)		Area	Length (m)	Width (m)	Height (m)	Magnetometer (nT)	Basic description
		Latitude	Longitude						
HOW03_ARCH_0184	Low	53 56.4895 N	02 41.6434 E	Hornsea Three array area	1.4	0.5	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0185	Low	53 56.4890 N	02 41.6463 E	Hornsea Three array area	1.1	0.7	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0186	Low	53 56.4848 N	02 41.6511 E	Hornsea Three array area	0.6	0.4	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0187	Low	53 56.4871 N	02 41.6494 E	Hornsea Three array area	1.5	0.3	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0188	Low	53 56.4860 N	02 41.6527 E	Hornsea Three array area	0.7	0.4	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0189	Low	53 56.4830 N	02 41.6565 E	Hornsea Three array area	1.1	0.3	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0190	Low	53 56.4823 N	02 41.6581 E	Hornsea Three array area	0.8	0.4	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0191	Low	53 56.4835 N	02 41.6520 E	Hornsea Three array area	1.3	0.4	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0192	Low	53 49.3274 N	02 34.7794 E	Hornsea Three array area	2.4	1.4	1.2	0	Potential anthropogenic debris
HOW03_ARCH_0193	Low	53 48.4033 N	02 33.3190 E	Hornsea Three array area	5.5	2.9	0.5	0	Potential anthropogenic debris
HOW03_ARCH_0194	Low	53 55.7069 N	02 36.8222 E	Hornsea Three array area	3.7	0.6	0.6	0	Potential anthropogenic debris
HOW03_ARCH_0195	Low	53 49.0125 N	02 30.5989 E	Hornsea Three array area	3.5	0.9	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0196	Low	53 56.4850 N	02 41.5495 E	Hornsea Three array area	4	2.1	0.8	0	Potential anthropogenic debris
HOW03_ARCH_0197	Low	53 54.5804 N	02 37.6579 E	Hornsea Three array area	1.3	0.7	0.5	0	Potential anthropogenic debris
HOW03_ARCH_0198	Low	53 57.2697 N	02 23.1214 E	Hornsea Three array area	2.2	0.6	0.8	0	Potential anthropogenic debris
HOW03_ARCH_0199	Low	53 44.8622 N	02 43.6146 E	Hornsea Three array area	8.9	4.2	0.5	0	Potential anthropogenic debris
HOW03_ARCH_0200	Low	53 57.3586 N	02 14.5799 E	Hornsea Three array area	2.2	0.8	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0201	Low	53 49.3707 N	02 27.6779 E	Hornsea Three array area	2.9	2.8	0.7	0	Potential anthropogenic debris
HOW03_ARCH_0202	Low	53 45.6288 N	02 33.5300 E	Hornsea Three array area	5.6	1	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0203	Low	53 49.5907 N	02 25.7806 E	Hornsea Three array area	2.1	0.9	1.3	0	Potential anthropogenic debris
HOW03_ARCH_0204	Low	53 50.2843 N	02 31.4740 E	Hornsea Three array area	0.9	0.4	0.2	13.4	Potential anthropogenic debris
HOW03_ARCH_0205	Low	53 44.0733 N	02 46.5183 E	Hornsea Three array area	3.4	1.9	0.8	0	Potential anthropogenic debris
HOW03_ARCH_0206	Low	53 48.3657 N	02 39.3476 E	Hornsea Three array area	4.4	2.1	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0207	Low	53 48.2262 N	02 43.8888 E	Hornsea Three array area	0.8	0.5	0.9	18.3	Potential anthropogenic debris
HOW03_ARCH_0208	Low	53 50.5136 N	02 39.2793 E	Hornsea Three array area	9.2	2.7	0.6	0	Potential anthropogenic debris
HOW03_ARCH_0209	Low	53 57.7577 N	02 13.8946 E	Hornsea Three array area	4	2.2	2.2	0	Potential anthropogenic debris
HOW03_ARCH_0210	Low	53 57.4590 N	02 19.5108 E	Hornsea Three array area	8.7	6.1	2.8	0	Potential anthropogenic debris

Identification number	Archaeological potential	Position coordinates (ETR89 31N)		Area	Length (m)	Width (m)	Height (m)	Magnetometer (nT)	Basic description
		Latitude	Longitude						
HOW03_ARCH_0211	Low	53 55.9378 N	02 19.6737 E	Hornsea Three array area	0.8	0.4	0.5	15.4	Potential anthropogenic debris
HOW03_ARCH_0212	Low	53 54.6667 N	02 20.2343 E	Hornsea Three array area	2.7	0.9	1.3	0	Potential anthropogenic debris
HOW03_ARCH_0213	Low	53 57.6535 N	02 24.6230 E	Hornsea Three array area	6.2	3.2	0.6	0	Potential anthropogenic debris
HOW03_ARCH_0214	Low	53 53.2114 N	02 22.8961 E	Hornsea Three array area	3.7	1.4	1	0	Potential anthropogenic debris
HOW03_ARCH_0215	Low	53 55.5792 N	02 26.3934 E	Hornsea Three array area	4.8	3.4	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0216	Low	53 54.2380 N	02 23.1692 E	Hornsea Three array area	1.2	0.8	0.1	429.8	Potential anthropogenic debris
HOW03_ARCH_0217	Low	53 55.2720 N	02 24.6876 E	Hornsea Three array area	5.9	2.5	0.7	0	Potential anthropogenic debris
HOW03_ARCH_0218	Low	53 52.5322 N	02 24.3012 E	Hornsea Three array area	1.6	0.4	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0219	Low	53 52.5318 N	02 24.3019 E	Hornsea Three array area	1.1	0.6	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0220	Low	53 57.5567 N	02 31.6633 E	Hornsea Three array area	3.6	0.9	0.6	36.5	Potential anthropogenic debris
HOW03_ARCH_0221	Low	53 57.5574 N	02 31.6596 E	Hornsea Three array area	1.5	0.9	1	36.5	Potential anthropogenic debris
HOW03_ARCH_0222	Low	53 55.9384 N	02 28.1537 E	Hornsea Three array area	4.6	3.5	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0223	Low	53 53.0214 N	02 23.8705 E	Hornsea Three array area	2.9	0.7	0.4	0	Potential anthropogenic debris
HOW03_ARCH_0224	Low	53 52.8985 N	02 28.5457 E	Hornsea Three array area	1.5	0.9	0.3	51.5	Potential anthropogenic debris
HOW03_ARCH_0225	Low	53 55.8094 N	02 32.7110 E	Hornsea Three array area	4.1	1	0.2	0	Potential anthropogenic debris
HOW03_ARCH_0226	Low	53 57.7308 N	02 35.5549 E	Hornsea Three array area	1.7	1	1.1	0	Potential anthropogenic debris
HOW03_ARCH_0227	Low	53 51.8552 N	02 24.5742 E	Hornsea Three array area	3.6	1.2	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0228	Low	53 56.1044 N	02 35.0590 E	Hornsea Three array area	1.3	0.7	0.1	2931.2	Potential anthropogenic debris
HOW03_ARCH_0229	Low	53 56.1229 N	02 34.9870 E	Hornsea Three array area	0.7	0.5	0.4	2931.2	Potential anthropogenic debris
HOW03_ARCH_0230	Low	53 56.1255 N	02 34.9622 E	Hornsea Three array area	1.1	0.4	0.3	2931.2	Potential anthropogenic debris
HOW03_ARCH_0231	Low	53 56.1015 N	02 34.9613 E	Hornsea Three array area	0.8	0.6	0.4	2931.2	Potential anthropogenic debris
HOW03_ARCH_0232	Low	53 51.1218 N	02 24.7219 E	Hornsea Three array area	5.8	3.5	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0233	Low	53 57.2706 N	02 24.6449 E	Hornsea Three array area	1	0.8	0.1	32	Potential anthropogenic debris
HOW03_ARCH_0234	Low	53 56.1773 N	02 39.4112 E	Hornsea Three array area	1.2	0.7	0.7	0	Potential anthropogenic debris
HOW03_ARCH_0235	Low	53 57.3724 N	02 37.0734 E	Hornsea Three array area	2.8	0.3	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0236	Low	53 54.6221 N	02 39.6528 E	Hornsea Three array area	1.2	0.3	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0237	Low	53 53.3877 N	02 42.1432 E	Hornsea Three array area	1.8	0.5	0.2	0	Potential anthropogenic debris

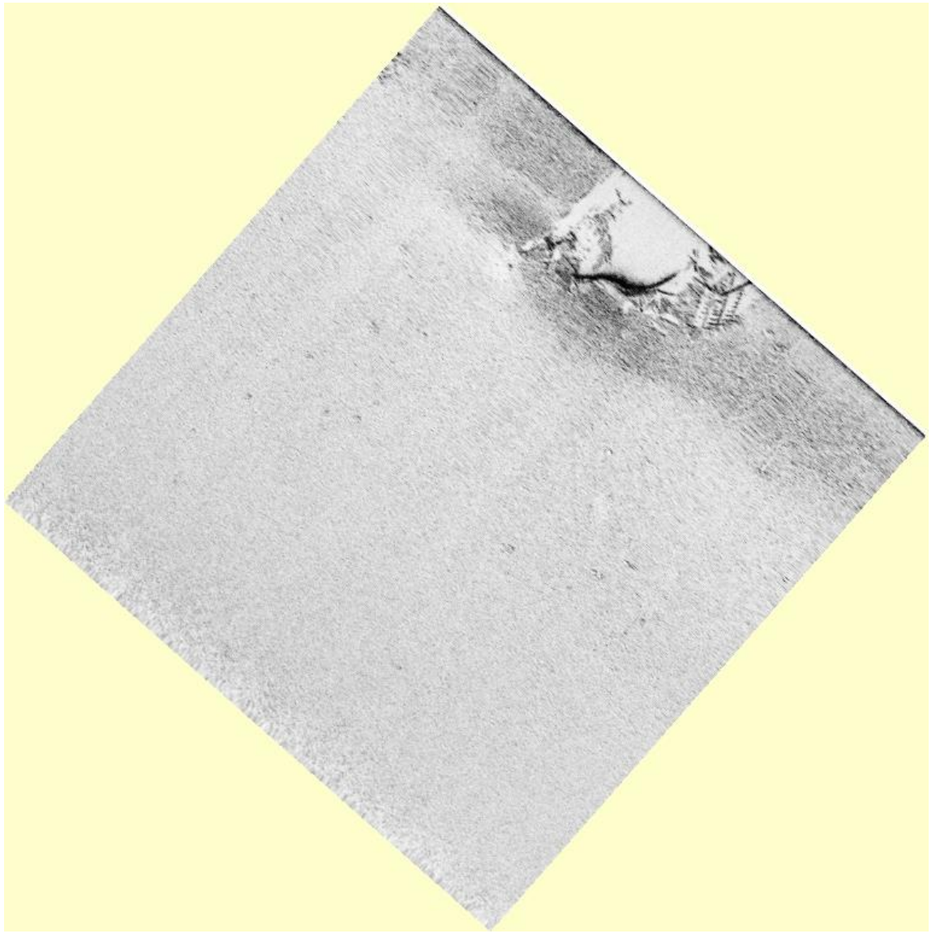
Identification number	Archaeological potential	Position coordinates (ETR89 31N)		Area	Length (m)	Width (m)	Height (m)	Magnetometer (nT)	Basic description
		Latitude	Longitude						
HOW03_ARCH_0238	Low	53 53.7732 N	02 41.3131 E	Hornsea Three array area	3	0.8	0.5	0	Potential anthropogenic debris
HOW03_ARCH_0239	Low	53 57.8041 N	02 34.8278 E	Hornsea Three array area	1.5	0.6	0.7	0	Potential anthropogenic debris
HOW03_ARCH_0240	Low	53 51.6440 N	02 44.0668 E	Hornsea Three array area	1.3	0.7	0.1	0	Potential anthropogenic debris
HOW03_ARCH_0241	Low	53 51.6604 N	02 44.0549 E	Hornsea Three array area	9.7	4.5	0.5	0	Potential anthropogenic debris
HOW03_ARCH_0242	Low	53 57.6348 N	02 34.2013 E	Hornsea Three array area	1	0.3	0.3	0	Potential anthropogenic debris
HOW03_ARCH_0243	Low	53 59.1574 N	02 36.5247 E	Hornsea Three array area	0.9	0.4	0.3	12	Potential anthropogenic debris
HOW03_ARCH_0244	Low	53 59.4013 N	02 15.6535 E	Hornsea Three array area	9	7.3	4.2	0	Potential anthropogenic debris
HOW03_ARCH_0245	Medium	53 00.1817 N	01 17.1006 E	Hornsea Three offshore cable corridor	12.9	6.5	0.6	0	Contact HOW03_ARCH_0245 is a prominent but incoherent feature, the form of which suggests a mound with associated debris. The feature measures 12.9 m by 6.5 m with a measurable height of 0.6 m. Mounds, particularly when associated with potential debris can indicate buried material of potential anthropogenic origin. No associated magnetic anomaly was identified. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0246	Low	53 46.7297 N	02 21.1443 E	Hornsea Three offshore cable corridor	3.2	3.1	0.59	N/A	Potential anthropogenic debris
HOW03_ARCH_0247	Low	53 48.2488 N	02 21.0093 E	Hornsea Three offshore cable corridor	5.9	4.1	1.39	N/A	Potential anthropogenic debris
HOW03_ARCH_0248	Medium	53 48.1882 N	02 21.8558 E	Hornsea Three offshore cable corridor	17.1	8.3	1.32	N/A	Contact HOW03_ARCH_0248 is a prominent round feature 6.0m by 5.6m with a measurable height of 1.3 m. To the south east is a 17.1 m by 5.7 m mound with scour, again to the south east. The prominent contact is potentially a boulder, however the presence of the mound could indicate buried anthropogenic material of archaeological interest. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0249	Low	53 49.4494 N	02 21.3064 E	Hornsea Three offshore cable corridor	3.4	22.2	0.74	N/A	Potential anthropogenic debris
HOW03_ARCH_0250	Low	53 50.3813 N	02 20.3679 E	Hornsea Three offshore cable corridor	7.3	5.2	1.18	N/A	Potential anthropogenic debris
HOW03_ARCH_0251	Medium	53 50.5393 N	02 21.0649 E	Hornsea Three offshore cable corridor	2.7	12.4	0.56	N/A	Contact HOW03_ARCH_0251 is a linear feature 12.4 m in length and up to 2.7 m wide, the measurable height is 0.56 m. The feature sits within a localised scour pit. The form of the contact likely represents anthropogenic material although the archaeological significance cannot be determined.
HOW03_ARCH_0252	Low	53 50.5400 N	02 20.6705 E	Hornsea Three offshore cable corridor	7.1	3.7	0.65	N/A	Potential anthropogenic debris
HOW03_ARCH_0253	Low	53 51.3797 N	02 20.4044 E	Hornsea Three offshore cable corridor	5.5	4.8	0.52	N/A	Potential anthropogenic debris
HOW03_ARCH_0254	Low	53 50.5687 N	02 20.1123 E	Hornsea Three offshore cable corridor	5.9	3.4	0.89	N/A	Potential anthropogenic debris
HOW03_ARCH_0255	Low	53 49.2998 N	02 20.8115 E	Hornsea Three offshore cable corridor	17.6	10.9	0.27	N/A	Potential anthropogenic debris
HOW03_ARCH_0256	Low	53 49.8908 N	02 21.0681 E	Hornsea Three offshore cable corridor	4.2	2.8	0.74	N/A	Potential anthropogenic debris

Identification number	Archaeological potential	Position coordinates (ETR89 31N)		Area	Length (m)	Width (m)	Height (m)	Magnetometer (nT)	Basic description
		Latitude	Longitude						
HOW03_ARCH_0257	Medium	53 47.9251 N	02 23.2928 E	Hornsea Three offshore cable corridor	17.8	9.4	0.4	N/A	Contact HOW03_ARCH_0257 is a small but prominent feature 2.8 m by 3.1 m within a localised area of scour. Running north east from the contact is a 13.7 m by 2.4 m ridge. The contact is likely to be a boulder however the presence of a linear mound may indicate buried anthropogenic material. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0258	Medium	53 44.4978 N	02 24.3892 E	Hornsea Three offshore cable corridor	11.8	7.9	0.43	N/A	Contact HOW03_ARCH_0258 is two adjacent features measuring 11.8 m by 7.9 m and with a measurable height of 0.4 m. The features are in an otherwise flat area of seabed and quite prominent. Potentially boulders however the size, form and the surrounding environment may indicate anthropogenic origin. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0259	Medium	53 47.5327 N	02 27.1537 E	Hornsea Three offshore cable corridor	14.5	3.5	0.38	N/A	Contact HOW03_ARCH_0259 is a prominent linear feature 14.5 m in length, 3.5 m wide and with a measurable height of 0.4 m. The prominence of the feature, the form and the size may indicate anthropogenic origin. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0260	Medium	53 46.2763 N	02 28.1355 E	Hornsea Three offshore cable corridor	22.1	14.6	0.24	N/A	Contact HOW03_ARCH_0260 covers an area 22.1 m by 14.6 m and has a measurable height of 0.2 m. The contact is made up of two parallel linear features approximately12 m in length. The features lie at 45° to other natural features. To the east is a smaller, boulder like feature. The overall form of the contact may indicate anthropogenic origin. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0261	Medium	53 45.6666 N	02 31.7193 E	Hornsea Three offshore cable corridor	13.1	2.9	0.3	N/A	Contact HOW03_ARCH_0261 is a crescent shaped feature 13.1 m in length and 2.9 m wide, the measurable height is 0.3 m. Potentially geological in origin, the unusual form may indicate material of anthropogenic origin. Further investigation will be required in order to establish the identity of the contact and any potential archaeological significance.
HOW03_ARCH_0262	Low	53 46.7218 N	02 28.4207 E	Hornsea Three offshore cable corridor	10.2	4.7	0.2	N/A	Potential anthropogenic debris
HOW03_ARCH_0263	Low	53 46.7246 N	02 28.3953 E	Hornsea Three offshore cable corridor	8.1	4.3	0.25	N/A	Potential anthropogenic debris

Appendix C Wreck Sheets: High Potential Archaeological Anomalies

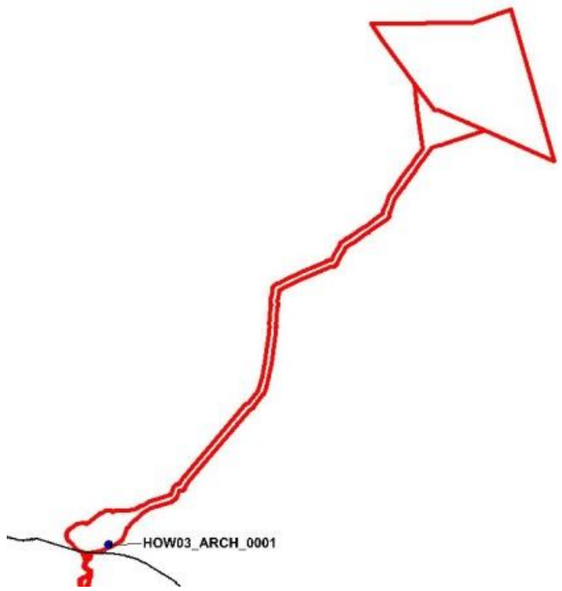
<table>
<tr><th colspan="5">High potential contact HOW03_ARCH_0122</th></tr>
<tr><td>Position coordinates (ETR89 31N)</td><td colspan="2">53 49.6822 N, 02 22.8551 E</td><td>Area</td><td>Hornsea Three array area</td></tr>
<tr><td>Archaeological potential</td><td colspan="4">High</td></tr>
<tr><td>Geophysical survey dimensions and notes</td><td colspan="4">Dimensions – 22.9 m by 13.5 m by 0. 9 m.
No associated magnetic anomaly. Contact was identified in the sidescan dataset but is outside the multibeam coverage.</td></tr>
<tr><td rowspan="4">Build</td><td>Type</td><td colspan="3">Unknown</td></tr>
<tr><td>Construction</td><td colspan="3">Unknown, but probably steel hull.</td></tr>
<tr><td>Dimensions</td><td colspan="3">Unknown</td></tr>
<tr><td>Shipyard</td><td colspan="3">Unknown</td></tr>
<tr><td>Loss</td><td>Cause</td><td colspan="3">Unknown</td></tr>
<tr><td>Extent of survival</td><td colspan="4">Largely obscured by shadow and incoherent. The visible elements are typical of a collapsed wreck.</td></tr>
<tr><td colspan="3"> 
</td><td colspan="2"> 

Legend</td></tr>
</table>



Sidescan sonar

High potential contact HOW03_ARCH_0001			
Position coordinates (ETR89 31N)	52 57.8484 N, 01 12.9543 E	***Area***	Hornsea Three offshore cable corridor
Archaeological potential	High		
Geophysical survey dimensions and notes	Dimensions – 19.7 m by 11.9 m by 1.1 m. No associated magnetic anomaly.		
Build	Type	Unknown	
	Construction	Unknown, but probably steel or composite hull.	
	Dimensions	Unknown	
	Shipyard	Unknown	
Loss	Cause	Unknown	
Extent of survival	Contact is coherent and identifiable as a wreck, or wreckage.		

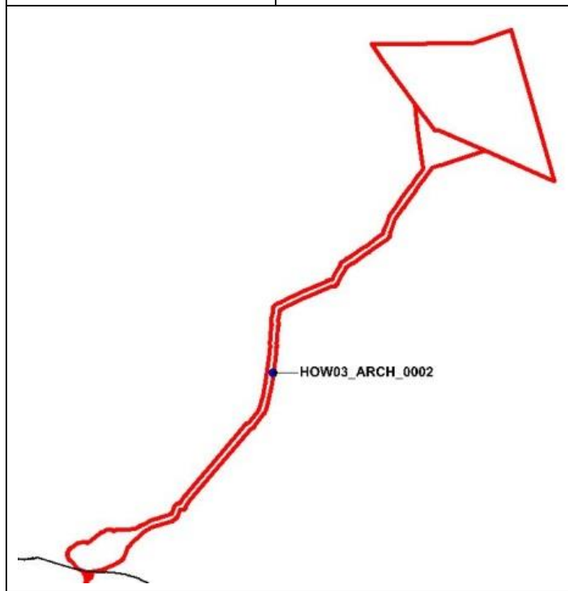


Legend

Sidescan sonar

Multibeam

High potential contact HOW03_ARCH_0002			
Position coordinates (ETR89 31N)	53 20.0913 N, 01 47.9507 E	***Area***	Hornsea Three offshore cable corridor
Archaeological potential	High		
Geophysical survey dimensions and notes	Dimensions – 25.6 m by 5.6 m by 1 m. No associated magnetic anomaly.		
Build	Type	Unknown	
	Construction	Unknown, but probably post 1900 steel hull.	
	Dimensions	Unknown	
	Shipyard	Unknown	
Loss	Cause	Unknown	
Extent of survival	Contact typical of that of a collapsed, fairly low lying wreck. In three distinct parts suggesting the condition is poor.		

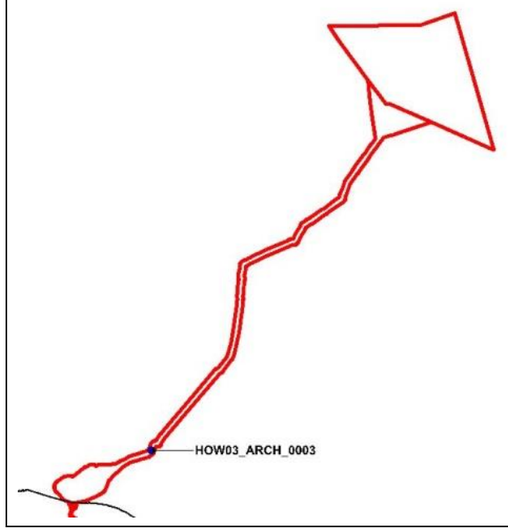


Legend

Sidescan sonar

Multibeam

High potential contact HOW03_ARCH_0003			
Position coordinates (ETR89 31N)	53 03.5136 N, 01 26.6451 E	***Area***	Hornsea Three offshore cable corridor
Archaeological [otential	High		
Geophysical survey dimensions and notes	Dimensions – 98.5 m by 75 m by 0.8 m Magnetic anomaly - 3469.7 nT Contact comprises at least seven linear features measuring between 9.5 m and 30.4 m, with further evidence of debris.		
Build	Type	Unknown	
	Construction	Unknown	
	Dimensions	Unknown	
	Shipyard	Unknown	
Loss	Cause	Unknown	
Extent of survival	Unclear – possibly a dispersed vessel but perhaps debris or cargo.		

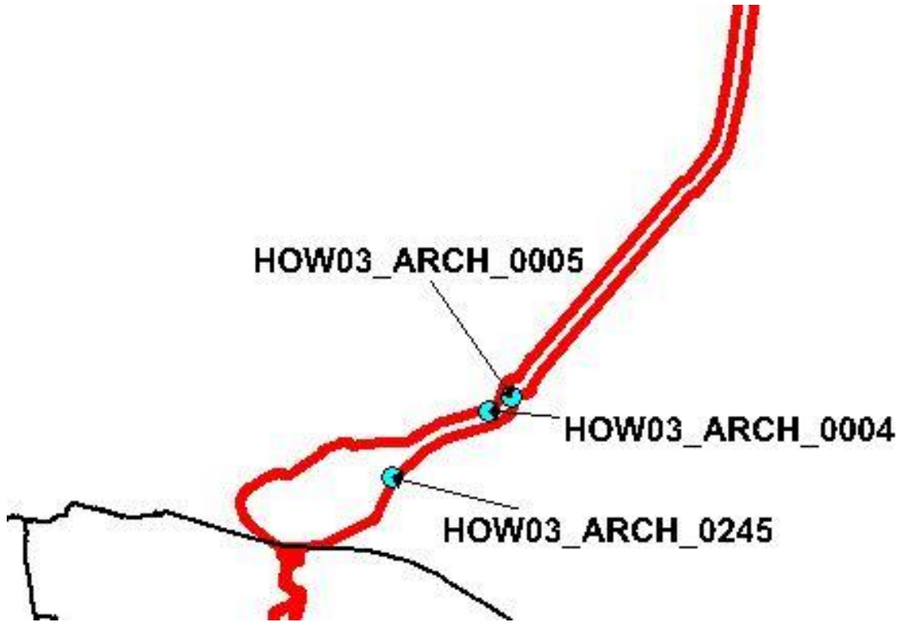
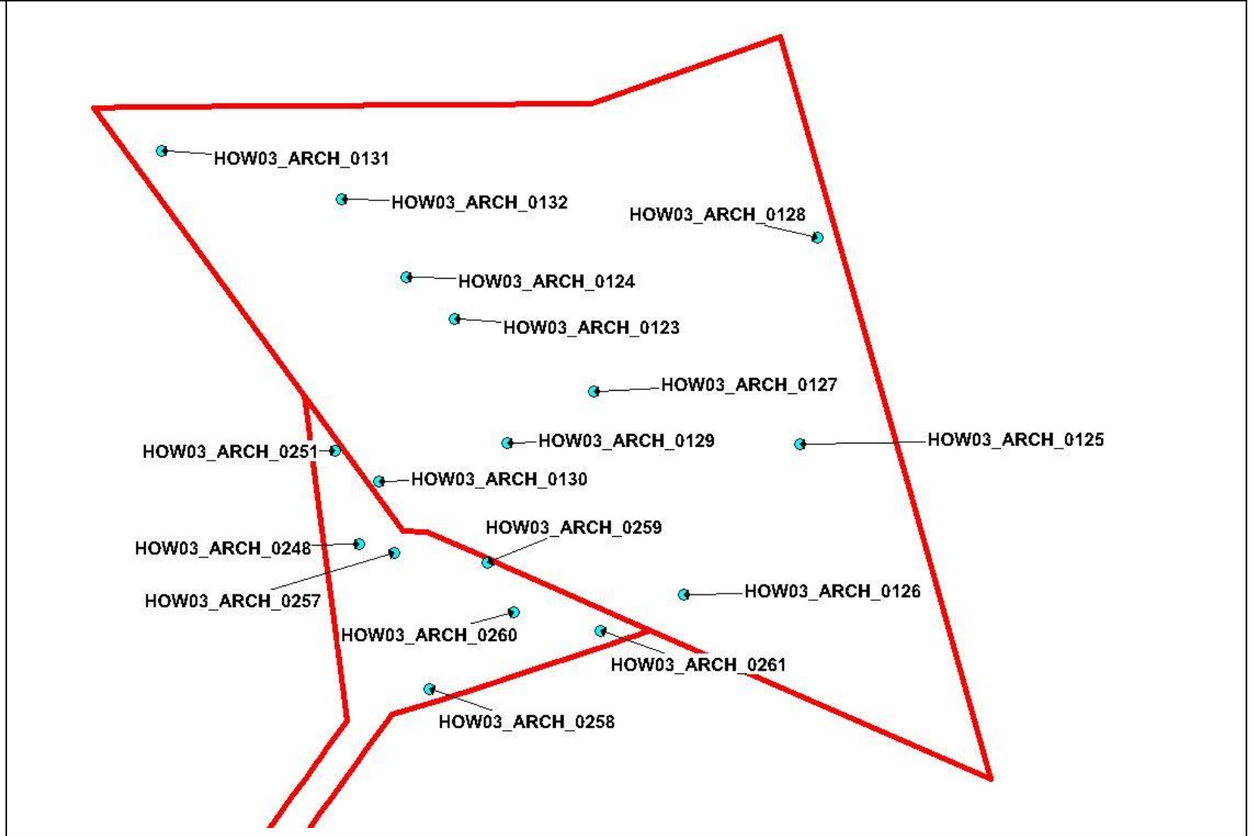


Legend

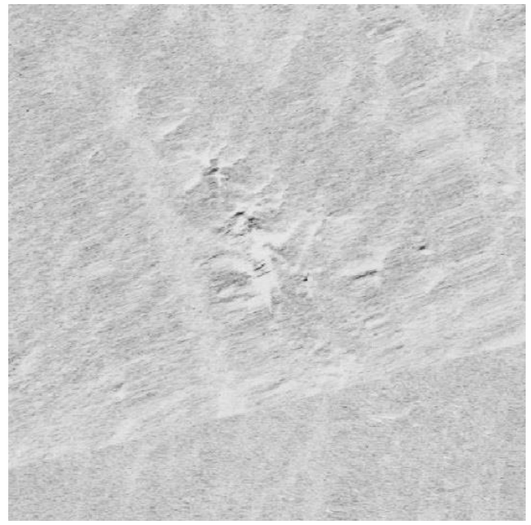
Sidescan sonar

Multibeam

Appendix D Information Sheets: Medium Potential Archaeological Anomalies

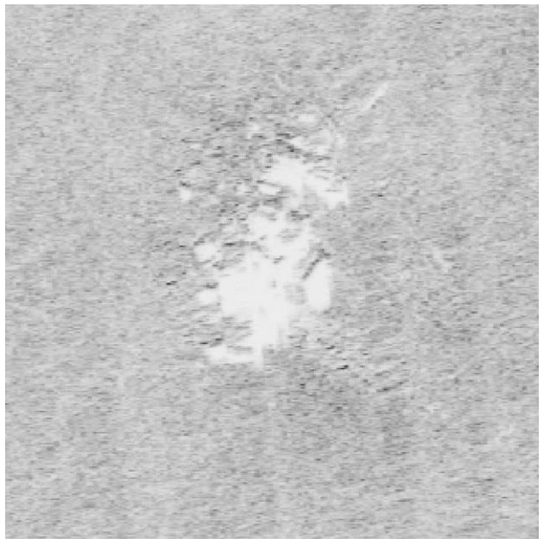
Medium potential contacts	
	
Locations of medium potential contacts – Hornsea Three offshore cable corridor	*Locations of medium potential contacts – north-eastern end of Hornsea Three offshore cable corridor and array area*

Medium potential contact HOW03_ARCH_0004	
Anomaly number	HOW03_ARCH_0004
Location	Hornsea Three offshore cable corridor
Position coordinates (ETR89 31N)	53 03.1559 N, 01 25.3322 E
Archaeological potential	Medium
Measurements (m) 15.1 by 8.5 by 0.4 Associated magnetic anomaly - 99.8 nT	



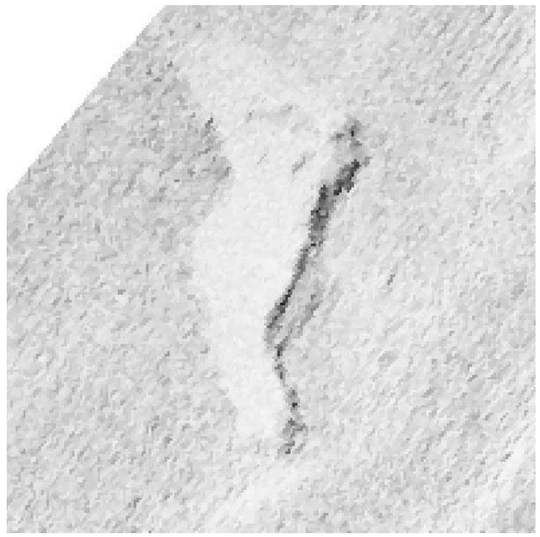
Sidescan

Medium potential contact HOW03_ARCH_0005	
Anomaly number	HOW03_ARCH_0005
Location	Hornsea Three offshore cable corridor
Position coordinates (ETR89 31N)	53 03.8337 N, 01 27.2051 E
Archaeological potential	Medium
Measurements (m) 18.3 by 10.5 by 0.5 No associated magnetic anomaly	



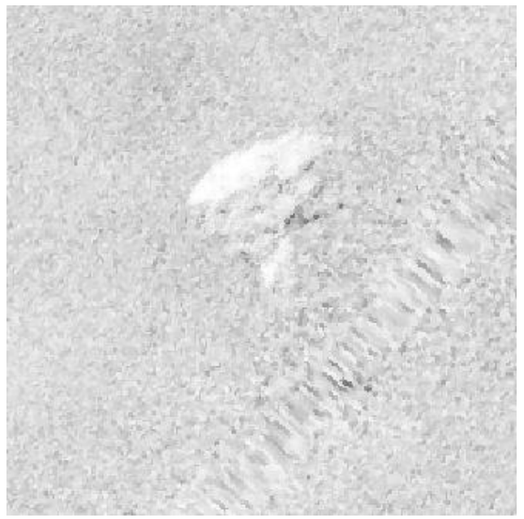
Sidescan

Medium potential contact HOW03_ARCH_0123	
Anomaly number	HOW03_ARCH_0123
Location	Hornsea Three array area
Position coordinates (ETR89 31N)	53 53.5975 N, 02 26.4288 E
Archaeological potential	Medium
Measurements (m) 13.9 by 6.5 by 0.6 No associated magnetic anomaly	



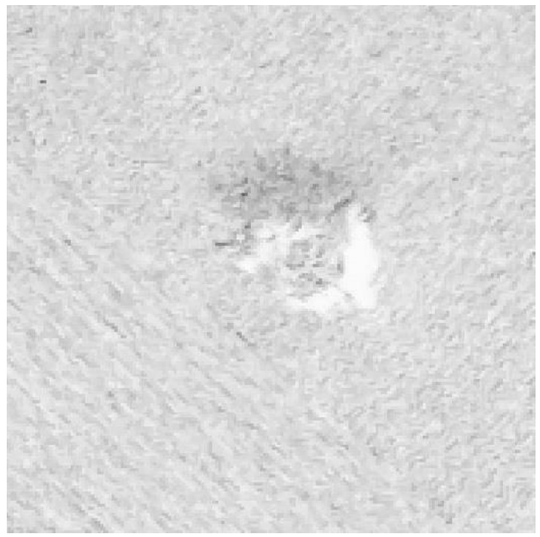
Sidescan

Medium potential contact HOW03_ARCH_0124	
Anomaly number	HOW03_ARCH_0124
Location	Hornsea Three array area
Position coordinates (ETR89 31N)	53 54.7215 N, 02 24.5295 E
Archaeological potential	Medium
Measurements (m) 7.9 by 7.4 by 1.7 No associated magnetic anomaly	



Sidescan

Medium potential contact HOW03_ARCH_0125	
Anomaly number	HOW03_ARCH_0125
Location	Hornsea Three array area
Position coordinates (ETR89 31N)	53 49.9768 N, 02 40.5400 E
Archaeological potential	Medium
Measurements (m) 4.2 by 7.2 by 0.5 No associated magnetic anomaly	

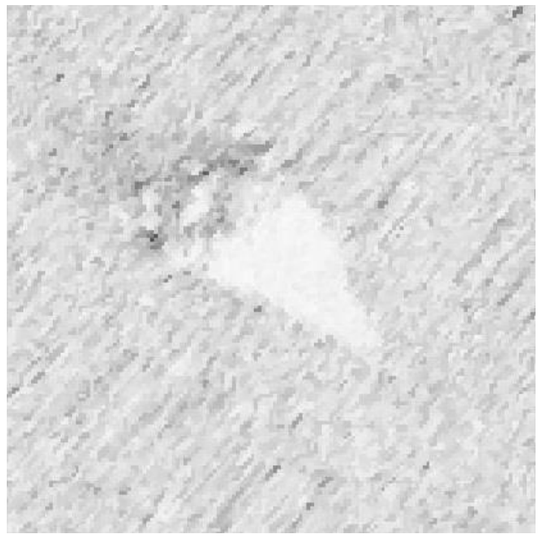


Sidescan

Medium potential contact HOW03_ARCH_0126	
Anomaly number	HOW03_ARCH_0126
Location	Hornsea Three array area
Position coordinates (ETR89 31N)	53 46.4305 N, 02 35.2794 E
Archaeological potential	Medium
Measurements (m) 11.9 by 3.7 by 0.7 No associated magnetic anomaly	

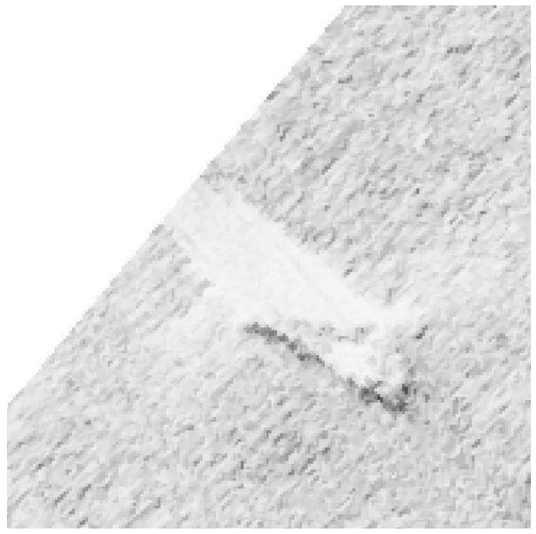
Sidescan

Medium potential contact HOW03_ARCH_0127	
Anomaly number	HOW03_ARCH_0127
Location	Hornsea Three array area
Position coordinates (ETR89 31N)	53 51.5920 N, 02 32.0686 E
Archaeological potential	Medium
Measurements (m) 3.9 by 4.7by 0.7 No associated magnetic anomaly	



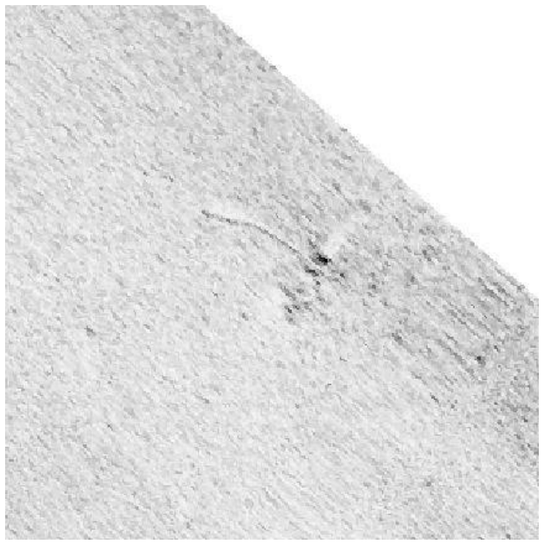
Sidescan

Medium potential contact HOW03_ARCH_0128	
Anomaly number	HOW03_ARCH_0128
Location	Hornsea Three array area
Position coordinates (ETR89 31N)	53 55.0498 N, 02 41.8624 E
Archaeological potential	Medium
Measurements (m) 7.3 by 4 by 0.9 No associated magnetic anomaly	



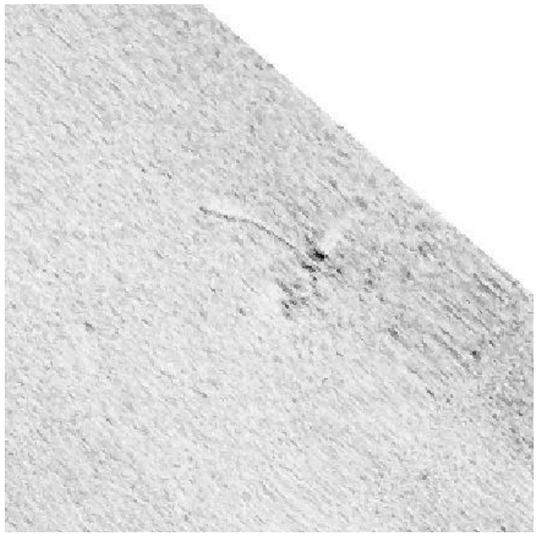
Sidescan

Medium potential contact HOW03_ARCH_0129	
Anomaly number	HOW03_ARCH_0129
Location	Hornsea Three array area
Position coordinates (ETR89 31N)	53 50.4623 N, 02 28.3049 E
Archaeological potential	Medium
Measurements (m) 13.8 by 7.9 by 1.0 No associated magnetic anomaly	



Sidescan

Medium potential contact HOW03_ARCH_0130	
Anomaly number	HOW03_ARCH_0130
Location	Hornsea Three array area
Position coordinates (ETR89 31N)	53 49.6963 N, 02 22.8310 E
Archaeological potential	Medium
Measurements (m) 8.3 by 2.1by 0.2 No associated magnetic anomaly	



Sidescan

Medium potential contact HOW03_ARCH_0131	
Anomaly number	HOW03_ARCH_0131
Location	Hornsea Three array area
Position coordinates (ETR89 31N)	53 58.2142 N, 02 14.5932 E
Archaeological potential	Medium
Measurements (m) 12.2 by 7.8 by 0.7 No associated magnetic anomaly	

Sidescan

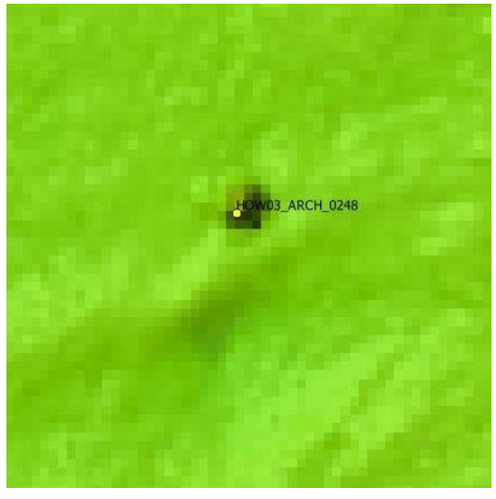
Medium potential contact HOW03_ARCH_0132	
Anomaly number	HOW03_ARCH_0132
Location	Hornsea Three array area
Position coordinates (ETR89 31N)	53 56.7517 N, 02 22.0206 E
Archaeological potential	Medium
Measurements (m) 9.3 by 7.1 by 0.5 No associated magnetic anomaly	

Sidescan

Medium potential contact HOW03_ARCH_0245	
Anomaly number	HOW03_ARCH_0245
Location	Hornsea Three offshore cable corridor
Position coordinates (ETR89 31N)	53 00.1817 N, 01 17.1006 E
Archaeological potential	Medium
Measurements (m) 12.9 by 6.5 by 0.6 No associated magnetic anomaly	

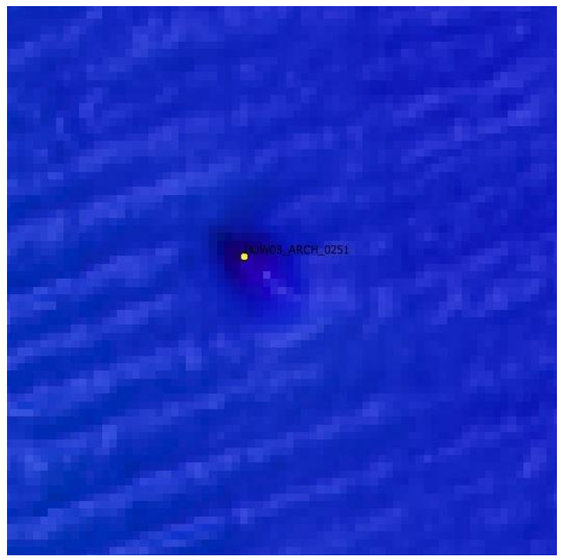
Sidescan

Medium potential contact HOW03_ARCH_0248	
Anomaly number	HOW03_ARCH_0248
Location	Hornsea Three offshore cable corridor
Position coordinates (ETR89 31N)	53 48.1882 N, 02 21.8558 E
Archaeological potential	Medium
Measurements (m) 17.1 by 8.3 by 1.32 No associated magnetic anomaly	



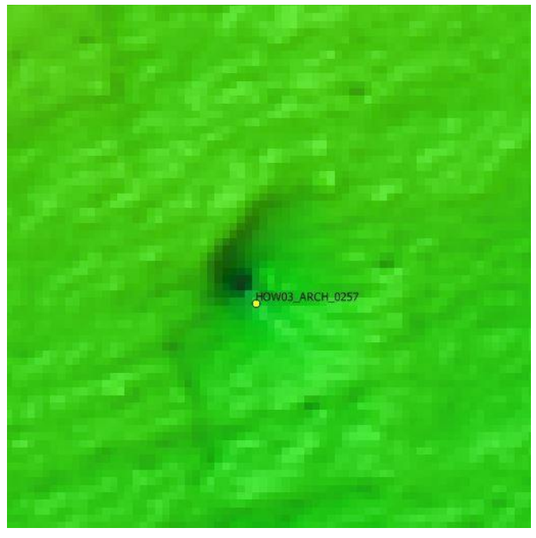
Multibeam

Medium potential contact HOW03_ARCH_0251	
Anomaly number	HOW03_ARCH_0251
Location	Hornsea Three offshore cable corridor
Position coordinates (ETR89 31N)	53 50.5393 N, 02 21.0649 E
Archaeological potential	Medium
Measurements (m) 2.7 by 12.4 by 0.56 No associated magnetic anomaly	



Multibeam

Medium potential contact HOW03_ARCH_0257	
Anomaly number	HOW03_ARCH_0257
Location	Hornsea Three offshore cable corridor
Position coordinates (ETR89 31N)	53 47.9251 N, 02 23.2928 E
Archaeological potential	Medium
Measurements (m) 17.8 by 9.4 by 0.4 No associated magnetic anomaly	



Multibeam

Medium potential contact HOW03_ARCH_0258	
Anomaly number	HOW03_ARCH_0258
Location	Hornsea Three offshore cable corridor
Position coordinates (ETR89 31N)	53 44.4978 N, 02 24.3892 E
Archaeological potential	Medium
Measurements (m) 11.8 by 7.9 by 0.43 No associated magnetic anomaly	

Multibeam

Medium potential contact HOW03_ARCH_0259	
Anomaly number	HOW03_ARCH_0259
Location	Hornsea Three offshore cable corridor
Position coordinates (ETR89 31N)	53 47.5327 N, 02 27.1537 E
Archaeological potential	Medium
Measurements (m) 14.5 by 3.5 by 0.38 No associated magnetic anomaly	

Multibeam

Medium potential contact HOW03_ARCH_0260	
Anomaly number	HOW03_ARCH_0260
Location	Hornsea Three offshore cable corridor
Position coordinates (ETR89 31N)	53 46.2763 N, 02 28.1355 E
Archaeological potential	Medium
Measurements (m) 22.1 by 14.6 by 0.24 No associated magnetic anomaly	

Multibeam

Medium potential contact HOW03_ARCH_0261	
Anomaly number	HOW03_ARCH_0261
Location	Hornsea Three offshore cable corridor
Position coordinates (ETR89 31N)	53 45.6666 N, 02 31.7193 E
Archaeological potential	Medium
Measurements (m) 13.1 by 2.9 by 0.3 No associated magnetic anomaly	

Multibeam

Appendix E Gazetteer of Magnetic Anomalies

Table E.1: Gazetteer of magnetic anomalies.

Identification number	Latitude	Longitude	Area	MAG (nT)	Basic description
HOW03_ARCH_MAG_0001 [a]	53 45.7962 N	02 38.8692 E	Hornsea Three array area	13916.2	Dipole
HOW03_ARCH_MAG_0002 [a]	53 01.7410 N	01 13.5310 E	Hornsea Three offshore cable corridor	3749.9	Negative monopole
HOW03_ARCH_MAG_0003 [a]	52 59.9191 N	01 06.5712 E	Hornsea Three offshore cable corridor	3634	Asymmetric dipole
HOW03_ARCH_MAG_0004 [a]	53 56.1258 N	02 35.0123 E	Hornsea Three array area	2931.2	Dipole
HOW03_ARCH_MAG_0005 [a]	53 28.8352 N	01 52.2368 E	Hornsea Three offshore cable corridor	2604.2	Asymmetric dipole
HOW03_ARCH_MAG_0006 [a]	53 02.1273 N	01 21.4802 E	Hornsea Three offshore cable corridor	1425.3	Negative monopole
HOW03_ARCH_MAG_0007 [a]	53 01.2906 N	01 10.7701 E	Hornsea Three offshore cable corridor	1072.9	Asymmetric dipole
HOW03_ARCH_MAG_0008 [a]	53 00.7724 N	01 17.1579 E	Hornsea Three offshore cable corridor	1062.6	Asymmetric dipole
HOW03_ARCH_MAG_0009 [a]	53 04.6664 N	01 27.8468 E	Hornsea Three offshore cable corridor	1039.3	Negative monopole
HOW03_ARCH_MAG_0010 [a]	53 01.4632 N	01 12.4591 E	Hornsea Three offshore cable corridor	915.2	Asymmetric dipole
HOW03_ARCH_MAG_0011 [a]	53 05.6993 N	01 28.9939 E	Hornsea Three offshore cable corridor	802.1	Positive monopole
HOW03_ARCH_MAG_0012 [a]	53 44.4678 N	02 44.3003 E	Hornsea Three array area	654.6	Dipole
HOW03_ARCH_MAG_0013 [a]	53 12.0687 N	01 39.6299 E	Hornsea Three offshore cable corridor	622.3	Asymmetric dipole
HOW03_ARCH_MAG_0014 [a]	53 03.9459 N	01 26.8122 E	Hornsea Three offshore cable corridor	598.8	Asymmetric dipole
HOW03_ARCH_MAG_0015 [a]	53 57.2040 N	02 23.3128 E	Hornsea Three array area	559.7	Negative monopole
HOW03_ARCH_MAG_0016 [a]	53 23.6270 N	01 48.9818 E	Hornsea Three offshore cable corridor	539.9	Positive monopole
HOW03_ARCH_MAG_0017 [a]	53 05.9859 N	01 31.0148 E	Hornsea Three offshore cable corridor	519.1	Positive monopole
HOW03_ARCH_MAG_0018	53 01.6040 N	01 13.6285 E	Hornsea Three offshore cable corridor	499.7	Asymmetric dipole
HOW03_ARCH_MAG_0019	53 05.3749 N	01 29.5463 E	Hornsea Three offshore cable corridor	475.1	Asymmetric dipole
HOW03_ARCH_MAG_0020	52 59.4736 N	01 15.7032 E	Hornsea Three offshore cable corridor	472.2	Asymmetric dipole
HOW03_ARCH_MAG_0021	53 03.7768 N	01 26.4554 E	Hornsea Three offshore cable corridor	470.7	Negative monopole
HOW03_ARCH_MAG_0022	53 59.3508 N	02 17.5930 E	Hornsea Three offshore cable corridor	461.6	Negative monopole
HOW03_ARCH_MAG_0023	53 01.5893 N	01 15.9709 E	Hornsea Three offshore cable corridor	437	Dipole
HOW03_ARCH_MAG_0024	53 54.2260 N	02 23.1983 E	Hornsea Three array area	429.8	Negative monopole
HOW03_ARCH_MAG_0025	53 38.4959 N	02 14.0242 E	Hornsea Three offshore cable corridor	418.2	Positive monopole
HOW03_ARCH_MAG_0026	53 07.9269 N	01 33.7566 E	Hornsea Three offshore cable corridor	402.5	Negative monopole

Identification number	Latitude	Longitude	Area	MAG (nT)	Basic description
HOW03_ARCH_MAG_0027	53 28.8510 N	01 52.2053 E	Hornsea Three offshore cable corridor	400.5	Negative monopole
HOW03_ARCH_MAG_0028	52 59.3949 N	01 15.3951 E	Hornsea Three offshore cable corridor	387.2	Dipole
HOW03_ARCH_MAG_0029	53 55.5956 N	02 18.5894 E	Hornsea Three array area	367.8	Dipole
HOW03_ARCH_MAG_0030	53 36.2860 N	02 13.1573 E	Hornsea Three offshore cable corridor	359.2	Asymmetric dipole
HOW03_ARCH_MAG_0031	53 52.8822 N	02 37.5172 E	Hornsea Three array area	356.1	Dipole
HOW03_ARCH_MAG_0032	52 59.2218 N	01 15.4955 E	Hornsea Three offshore cable corridor	354.4	Complex anomaly
HOW03_ARCH_MAG_0033	53 04.3046 N	01 27.1166 E	Hornsea Three offshore cable corridor	344.5	Dipole
HOW03_ARCH_MAG_0034	53 19.8587 N	01 47.0393 E	Hornsea Three offshore cable corridor	344.3	Dipole
HOW03_ARCH_MAG_0035	53 01.3222 N	01 12.2958 E	Hornsea Three offshore cable corridor	344	Negative monopole
HOW03_ARCH_MAG_0036	53 03.0913 N	01 24.7304 E	Hornsea Three offshore cable corridor	339.5	Positive monopole
HOW03_ARCH_MAG_0037	53 04.5405 N	01 26.8262 E	Hornsea Three offshore cable corridor	338.2	Dipole
HOW03_ARCH_MAG_0038	53 20.1787 N	01 47.9091 E	Hornsea Three offshore cable corridor	335.5	Asymmetric dipole
HOW03_ARCH_MAG_0039	53 00.8101 N	01 11.2974 E	Hornsea Three offshore cable corridor	335.2	Asymmetric dipole
HOW03_ARCH_MAG_0040	53 55.0939 N	02 40.1166 E	Hornsea Three array area	334	Negative monopole
HOW03_ARCH_MAG_0041	52 58.6297 N	01 14.2884 E	Hornsea Three offshore cable corridor	333.8	Dipole
HOW03_ARCH_MAG_0042	53 40.5021 N	02 16.2873 E	Hornsea Three offshore cable corridor	329.9	Asymmetric dipole
HOW03_ARCH_MAG_0043	53 00.8124 N	01 11.3034 E	Hornsea Three offshore cable corridor	321.4	Positive monopole
HOW03_ARCH_MAG_0044	53 01.3043 N	01 15.3111 E	Hornsea Three offshore cable corridor	317.9	Dipole
HOW03_ARCH_MAG_0045	53 05.9805 N	01 31.0066 E	Hornsea Three offshore cable corridor	316.7	Positive monopole
HOW03_ARCH_MAG_0046	53 55.9671 N	02 23.9057 E	Hornsea Three array area	308.6	Negative monopole
HOW03_ARCH_MAG_0047	53 00.5760 N	01 10.6982 E	Hornsea Three offshore cable corridor	306.6	Asymmetric dipole
HOW03_ARCH_MAG_0048	53 56.4181 N	02 36.1099 E	Hornsea Three array area	293.5	Dipole
HOW03_ARCH_MAG_0049	53 04.1651 N	01 27.2412 E	Hornsea Three offshore cable corridor	285.1	Asymmetric dipole
HOW03_ARCH_MAG_0050	53 49.7328 N	02 29.7310 E	Hornsea Three array area	284.7	Dipole
HOW03_ARCH_MAG_0051	53 30.4225 N	02 00.2013 E	Hornsea Three offshore cable corridor	280.6	Negative monopole
HOW03_ARCH_MAG_0052	53 02.7847 N	01 25.9198 E	Hornsea Three offshore cable corridor	279.9	Dipole
HOW03_ARCH_MAG_0053	53 54.0833 N	02 20.5996 E	Hornsea Three array area	279.5	Dipole
HOW03_ARCH_MAG_0054	53 04.1004 N	01 27.1803 E	Hornsea Three offshore cable corridor	279.2	Negative monopole
HOW03_ARCH_MAG_0055	52 58.0362 N	01 11.9323 E	Hornsea Three offshore cable corridor	271	Positive monopole
HOW03_ARCH_MAG_0056	53 06.1522 N	01 30.7580 E	Hornsea Three offshore cable corridor	270.9	Asymmetric dipole

Identification number	Latitude	Longitude	Area	MAG (nT)	Basic description
HOW03_ARCH_MAG_0057	53 01.0586 N	01 13.5392 E	Hornsea Three offshore cable corridor	266.8	Positive monopole
HOW03_ARCH_MAG_0058	52 59.8693 N	01 06.8393 E	Hornsea Three offshore cable corridor	265	Asymmetric dipole
HOW03_ARCH_MAG_0059	53 25.3772 N	01 49.3831 E	Hornsea Three offshore cable corridor	260.3	Positive monopole
HOW03_ARCH_MAG_0060	53 05.7227 N	01 29.0009 E	Hornsea Three offshore cable corridor	252.6	Asymmetric dipole
HOW03_ARCH_MAG_0061	53 00.0915 N	01 17.0998 E	Hornsea Three offshore cable corridor	242.6	Asymmetric dipole
HOW03_ARCH_MAG_0062	53 02.1301 N	01 22.3561 E	Hornsea Three offshore cable corridor	237.4	Asymmetric dipole
HOW03_ARCH_MAG_0063	53 24.5191 N	01 48.6242 E	Hornsea Three offshore cable corridor	232.6	Asymmetric dipole
HOW03_ARCH_MAG_0064	53 21.3230 N	01 47.5705 E	Hornsea Three offshore cable corridor	227.5	Asymmetric dipole
HOW03_ARCH_MAG_0065	53 21.6018 N	01 48.4708 E	Hornsea Three offshore cable corridor	221	Asymmetric dipole
HOW03_ARCH_MAG_0066	53 04.8746 N	01 28.9491 E	Hornsea Three offshore cable corridor	220.1	Positive monopole
HOW03_ARCH_MAG_0067	53 04.1934 N	01 28.7605 E	Hornsea Three offshore cable corridor	219.1	Complex anomaly
HOW03_ARCH_MAG_0068	52 57.6856 N	01 11.0755 E	Hornsea Three offshore cable corridor	217	Negative monopole
HOW03_ARCH_MAG_0069	53 01.7576 N	01 15.6973 E	Hornsea Three offshore cable corridor	215.4	Positive monopole
HOW03_ARCH_MAG_0070	53 44.5422 N	02 39.9459 E	Hornsea Three array area	207.3	Dipole
HOW03_ARCH_MAG_0071	53 01.6846 N	01 16.2329 E	Hornsea Three offshore cable corridor	206.8	Asymmetric dipole
HOW03_ARCH_MAG_0072	52 57.8183 N	01 11.1814 E	Hornsea Three offshore cable corridor	202.1	Asymmetric dipole
HOW03_ARCH_MAG_0073	53 01.5307 N	01 18.2418 E	Hornsea Three offshore cable corridor	201	Negative monopole
HOW03_ARCH_MAG_0074	53 00.9287 N	01 10.0729 E	Hornsea Three offshore cable corridor	200.8	Negative monopole
HOW03_ARCH_MAG_0075	53 08.0632 N	01 33.2936 E	Hornsea Three offshore cable corridor	200.2	Positive monopole
HOW03_ARCH_MAG_0076	53 05.5867 N	01 29.0063 E	Hornsea Three offshore cable corridor	197.6	Asymmetric dipole
HOW03_ARCH_MAG_0077	53 27.2081 N	01 49.1723 E	Hornsea Three offshore cable corridor	196.8	Asymmetric dipole
HOW03_ARCH_MAG_0078	52 59.2203 N	01 15.4925 E	Hornsea Three offshore cable corridor	193.4	Positive monopole
HOW03_ARCH_MAG_0079	52 59.9834 N	01 16.3386 E	Hornsea Three offshore cable corridor	193	Asymmetric dipole
HOW03_ARCH_MAG_0080	53 01.7305 N	01 18.8604 E	Hornsea Three offshore cable corridor	192	Asymmetric dipole
HOW03_ARCH_MAG_0081	53 27.3306 N	01 48.9897 E	Hornsea Three offshore cable corridor	187	Asymmetric dipole
HOW03_ARCH_MAG_0082	53 51.6910 N	02 22.5101 E	Hornsea Three array area	186.6	Dipole
HOW03_ARCH_MAG_0083	53 01.1222 N	01 12.0349 E	Hornsea Three offshore cable corridor	186.4	Complex anomaly
HOW03_ARCH_MAG_0084	53 52.9601 N	02 42.4574 E	Hornsea Three array area	185.9	Negative monopole
HOW03_ARCH_MAG_0085	53 54.9461 N	02 39.3559 E	Hornsea Three array area	183.4	Monopole
HOW03_ARCH_MAG_0086	52 57.8463 N	01 12.9535 E	Hornsea Three offshore cable corridor	177.2	Asymmetric dipole

Identification number	Latitude	Longitude	Area	MAG (nT)	Basic description
HOW03_ARCH_MAG_0087	53 03.4573 N	01 26.7906 E	Hornsea Three offshore cable corridor	177.1	Dipole
HOW03_ARCH_MAG_0088	53 56.6139 N	02 33.9498 E	Hornsea Three array area	175	Dipole
HOW03_ARCH_MAG_0089	53 21.0629 N	01 48.1405 E	Hornsea Three offshore cable corridor	174.9	Asymmetric dipole
HOW03_ARCH_MAG_0090	53 02.4597 N	01 24.5371 E	Hornsea Three offshore cable corridor	173.1	Dipole
HOW03_ARCH_MAG_0091	53 25.8921 N	01 48.5651 E	Hornsea Three offshore cable corridor	172.9	Asymmetric dipole
HOW03_ARCH_MAG_0092	53 12.8783 N	01 40.2237 E	Hornsea Three offshore cable corridor	171.3	Asymmetric dipole
HOW03_ARCH_MAG_0093	53 01.2453 N	01 10.9322 E	Hornsea Three offshore cable corridor	170.5	Dipole
HOW03_ARCH_MAG_0094	52 58.2816 N	01 13.8575 E	Hornsea Three offshore cable corridor	168.1	Asymmetric dipole
HOW03_ARCH_MAG_0095	53 29.6839 N	01 55.1800 E	Hornsea Three offshore cable corridor	167.6	Asymmetric dipole
HOW03_ARCH_MAG_0096	53 05.7014 N	01 30.4327 E	Hornsea Three offshore cable corridor	166.4	Negative monopole
HOW03_ARCH_MAG_0097	53 07.9285 N	01 33.7590 E	Hornsea Three offshore cable corridor	163.2	Asymmetric dipole
HOW03_ARCH_MAG_0098	53 00.0670 N	01 16.8764 E	Hornsea Three offshore cable corridor	160.4	Dipole
HOW03_ARCH_MAG_0099	53 04.2881 N	01 27.3803 E	Hornsea Three offshore cable corridor	160.4	Negative monopole
HOW03_ARCH_MAG_0100	52 59.1583 N	01 15.1581 E	Hornsea Three offshore cable corridor	160.3	Asymmetric dipole
HOW03_ARCH_MAG_0101	53 06.3821 N	01 30.2328 E	Hornsea Three offshore cable corridor	160.2	Positive monopole
HOW03_ARCH_MAG_0102	53 02.9484 N	01 26.8556 E	Hornsea Three offshore cable corridor	159.6	Positive monopole
HOW03_ARCH_MAG_0103	53 17.1602 N	01 46.1902 E	Hornsea Three offshore cable corridor	156.5	Negative monopole
HOW03_ARCH_MAG_0104	53 14.0394 N	01 43.1194 E	Hornsea Three offshore cable corridor	155.6	Asymmetric dipole
HOW03_ARCH_MAG_0105	53 39.9874 N	02 16.0521 E	Hornsea Three offshore cable corridor	155.5	Asymmetric dipole
HOW03_ARCH_MAG_0106	53 25.5970 N	01 48.1810 E	Hornsea Three offshore cable corridor	154.9	Asymmetric dipole
HOW03_ARCH_MAG_0107	53 07.0823 N	01 32.4881 E	Hornsea Three offshore cable corridor	154.6	Asymmetric dipole
HOW03_ARCH_MAG_0108	53 01.4220 N	01 14.4883 E	Hornsea Three offshore cable corridor	154.2	Positive monopole
HOW03_ARCH_MAG_0109	53 03.8939 N	01 26.4350 E	Hornsea Three offshore cable corridor	152.8	Negative monopole
HOW03_ARCH_MAG_0110	53 48.2831 N	02 35.3698 E	Hornsea Three array area	152.4	Dipole
HOW03_ARCH_MAG_0111	53 01.7824 N	01 14.5575 E	Hornsea Three offshore cable corridor	152.2	Positive monopole
HOW03_ARCH_MAG_0112	53 00.0916 N	01 07.3157 E	Hornsea Three offshore cable corridor	151.9	Asymmetric dipole
HOW03_ARCH_MAG_0113	53 02.3215 N	01 20.8642 E	Hornsea Three offshore cable corridor	151.3	Complex anomaly
HOW03_ARCH_MAG_0114	53 55.5154 N	02 17.8744 E	Hornsea Three array area	149.4	Negative monopole
HOW03_ARCH_MAG_0115	53 59.2201 N	02 17.8450 E	Approximately 50 m from the Hornsea Three array area	149.3	Dipole

Identification number	Latitude	Longitude	Area	MAG (nT)	Basic description
HOW03_ARCH_MAG_0116	53 19.8509 N	01 47.9012 E	Hornsea Three offshore cable corridor	147.1	Asymmetric dipole
HOW03_ARCH_MAG_0117	52 59.8376 N	01 08.9880 E	Hornsea Three offshore cable corridor	147	Dipole
HOW03_ARCH_MAG_0118	53 23.0856 N	01 48.4939 E	Hornsea Three offshore cable corridor	145.5	Asymmetric dipole
HOW03_ARCH_MAG_0119	53 02.9029 N	01 22.3836 E	Hornsea Three offshore cable corridor	144	Positive monopole
HOW03_ARCH_MAG_0120	53 01.0533 N	01 17.0501 E	Hornsea Three offshore cable corridor	142.7	Positive monopole
HOW03_ARCH_MAG_0121	53 03.1467 N	01 26.0877 E	Hornsea Three offshore cable corridor	141.8	Complex anomaly
HOW03_ARCH_MAG_0122	53 03.1058 N	01 27.0806 E	Hornsea Three offshore cable corridor	141.6	Positive monopole
HOW03_ARCH_MAG_0123	53 04.6758 N	01 27.3585 E	Hornsea Three offshore cable corridor	141.4	Positive monopole
HOW03_ARCH_MAG_0124	53 24.5762 N	01 48.2986 E	Hornsea Three offshore cable corridor	141.2	Asymmetric dipole
HOW03_ARCH_MAG_0125	52 59.4144 N	01 15.2054 E	Hornsea Three offshore cable corridor	140.9	Negative monopole
HOW03_ARCH_MAG_0126	53 07.7038 N	01 32.2174 E	Hornsea Three offshore cable corridor	138	Positive monopole
HOW03_ARCH_MAG_0127	53 08.9375 N	01 34.0091 E	Hornsea Three offshore cable corridor	136.4	Asymmetric dipole
HOW03_ARCH_MAG_0128	53 10.2751 N	01 36.0976 E	Hornsea Three offshore cable corridor	136	Asymmetric dipole
HOW03_ARCH_MAG_0129	53 21.5018 N	01 47.6288 E	Hornsea Three offshore cable corridor	133.6	Negative monopole
HOW03_ARCH_MAG_0130	52 58.4377 N	01 13.3003 E	Hornsea Three offshore cable corridor	133	Positive monopole
HOW03_ARCH_MAG_0131	53 51.7501 N	02 38.3585 E	Hornsea Three array area	132.9	Dipole
HOW03_ARCH_MAG_0132	52 59.0291 N	01 15.5048 E	Hornsea Three offshore cable corridor	131.9	Asymmetric dipole
HOW03_ARCH_MAG_0133	53 04.7328 N	01 27.8952 E	Hornsea Three offshore cable corridor	130.5	Negative monopole
HOW03_ARCH_MAG_0134	53 28.1788 N	01 50.2088 E	Hornsea Three offshore cable corridor	130.5	Asymmetric dipole
HOW03_ARCH_MAG_0135	53 24.1010 N	01 48.9665 E	Hornsea Three offshore cable corridor	129.5	Asymmetric dipole
HOW03_ARCH_MAG_0136	52 58.1310 N	01 12.7955 E	Hornsea Three offshore cable corridor	128.1	Dipole
HOW03_ARCH_MAG_0137	53 01.3195 N	01 11.0353 E	Hornsea Three offshore cable corridor	127.7	Dipole
HOW03_ARCH_MAG_0138	53 25.2367 N	01 48.2760 E	Hornsea Three offshore cable corridor	126.9	Asymmetric dipole
HOW03_ARCH_MAG_0139	53 02.1174 N	01 20.0527 E	Hornsea Three offshore cable corridor	125	Dipole
HOW03_ARCH_MAG_0140	53 46.9358 N	02 45.6818 E	Hornsea Three offshore cable corridor	124.8	Dipole
HOW03_ARCH_MAG_0141	53 39.6198 N	02 16.4627 E	Hornsea Three offshore cable corridor	124.5	Positive monopole
HOW03_ARCH_MAG_0142	53 20.2232 N	01 47.6551 E	Hornsea Three offshore cable corridor	123.9	Positive monopole
HOW03_ARCH_MAG_0143	53 25.9027 N	01 48.6259 E	Hornsea Three offshore cable corridor	123.3	Asymmetric dipole
HOW03_ARCH_MAG_0144	52 58.4060 N	01 14.9617 E	Hornsea Three offshore cable corridor	123	Asymmetric dipole
HOW03_ARCH_MAG_0145	53 03.3582 N	01 25.6217 E	Hornsea Three offshore cable corridor	122.5	Asymmetric dipole

Identification number	Latitude	Longitude	Area	MAG (nT)	Basic description
HOW03_ARCH_MAG_0146	52 59.1819 N	01 15.0415 E	Hornsea Three offshore cable corridor	122.4	Negative monopole
HOW03_ARCH_MAG_0147	53 41.5808 N	02 19.2504 E	Hornsea Three offshore cable corridor	121.2	Asymmetric dipole
HOW03_ARCH_MAG_0148	52 59.4758 N	01 15.7078 E	Hornsea Three offshore cable corridor	120.5	Positive monopole
HOW03_ARCH_MAG_0149	53 57.5089 N	02 31.0591 E	Hornsea Three array area	120.4	Complex
HOW03_ARCH_MAG_0150	53 24.8383 N	01 48.9034 E	Hornsea Three offshore cable corridor	120.1	Asymmetric dipole
HOW03_ARCH_MAG_0151	53 45.9037 N	02 41.4688 E	Hornsea Three array area	119.9	Dipole
HOW03_ARCH_MAG_0152	53 12.8963 N	01 40.3508 E	Hornsea Three offshore cable corridor	119.8	Asymmetric dipole
HOW03_ARCH_MAG_0153	53 05.2403 N	01 28.5164 E	Hornsea Three offshore cable corridor	119.4	Positive monopole
HOW03_ARCH_MAG_0154	53 01.7372 N	01 11.7178 E	Hornsea Three offshore cable corridor	118.9	Negative monopole
HOW03_ARCH_MAG_0155	53 55.5220 N	02 29.3250 E	Hornsea Three array area	118.2	Complex
HOW03_ARCH_MAG_0156	53 04.1071 N	01 26.5198 E	Hornsea Three offshore cable corridor	118.1	Positive monopole
HOW03_ARCH_MAG_0157	53 02.2195 N	01 20.2649 E	Hornsea Three offshore cable corridor	116.9	Asymmetric dipole
HOW03_ARCH_MAG_0158	53 49.0697 N	02 28.2953 E	Hornsea Three array area	116.9	Dipole
HOW03_ARCH_MAG_0159	53 01.9217 N	01 21.3312 E	Hornsea Three offshore cable corridor	116.5	Asymmetric dipole
HOW03_ARCH_MAG_0160	53 00.0207 N	01 16.8422 E	Hornsea Three offshore cable corridor	115.5	Dipole
HOW03_ARCH_MAG_0161	53 19.4279 N	01 46.5674 E	Hornsea Three offshore cable corridor	115.1	Asymmetric dipole
HOW03_ARCH_MAG_0162	53 04.0908 N	01 27.1520 E	Hornsea Three offshore cable corridor	115	Asymmetric dipole
HOW03_ARCH_MAG_0163	53 05.3005 N	01 28.9171 E	Hornsea Three offshore cable corridor	115	Positive monopole
HOW03_ARCH_MAG_0164	53 00.4649 N	01 08.2441 E	Hornsea Three offshore cable corridor	113.5	Asymmetric dipole
HOW03_ARCH_MAG_0165	53 04.0571 N	01 26.5810 E	Hornsea Three offshore cable corridor	112.9	Positive monopole
HOW03_ARCH_MAG_0166	53 48.5137 N	02 32.3525 E	Hornsea Three array area	112.4	Dipole
HOW03_ARCH_MAG_0167	53 24.7492 N	01 48.5432 E	Hornsea Three offshore cable corridor	111.5	Positive monopole
HOW03_ARCH_MAG_0168	53 02.8433 N	01 26.0219 E	Hornsea Three offshore cable corridor	111.1	Positive monopole
HOW03_ARCH_MAG_0169	53 22.1260 N	01 47.5855 E	Hornsea Three offshore cable corridor	110.6	Asymmetric dipole
HOW03_ARCH_MAG_0170	53 03.0087 N	01 26.9358 E	Hornsea Three offshore cable corridor	110.5	Complex anomaly
HOW03_ARCH_MAG_0171	53 03.0221 N	01 26.9739 E	Hornsea Three offshore cable corridor	110.5	Complex anomaly
HOW03_ARCH_MAG_0172	53 01.8076 N	01 16.6046 E	Hornsea Three offshore cable corridor	109.7	Asymmetric dipole
HOW03_ARCH_MAG_0173	53 04.2338 N	01 26.9060 E	Hornsea Three offshore cable corridor	108.7	Negative monopole
HOW03_ARCH_MAG_0174	52 59.9044 N	01 16.4527 E	Hornsea Three offshore cable corridor	108.2	Asymmetric dipole
HOW03_ARCH_MAG_0175	53 02.3841 N	01 21.4334 E	Hornsea Three offshore cable corridor	107.8	Positive monopole

Identification number	Latitude	Longitude	Area	MAG (nT)	Basic description
HOW03_ARCH_MAG_0176	53 50.9943 N	02 25.1099 E	Hornsea Three array area	107.5	Dipole
HOW03_ARCH_MAG_0177	53 01.0628 N	01 10.6068 E	Hornsea Three offshore cable corridor	107.2	Positive monopole
HOW03_ARCH_MAG_0178	53 05.7256 N	01 29.0051 E	Hornsea Three offshore cable corridor	106.5	Positive monopole
HOW03_ARCH_MAG_0179	53 04.8744 N	01 28.0763 E	Hornsea Three offshore cable corridor	105	Asymmetric dipole
HOW03_ARCH_MAG_0180	53 05.6721 N	01 29.2698 E	Hornsea Three offshore cable corridor	104.7	Asymmetric dipole
HOW03_ARCH_MAG_0181	53 22.1895 N	01 47.6056 E	Hornsea Three offshore cable corridor	104.2	Positive monopole
HOW03_ARCH_MAG_0182	53 56.0048 N	02 32.4345 E	Hornsea Three array area	103	Dipole
HOW03_ARCH_MAG_0183	53 01.3597 N	01 18.1423 E	Hornsea Three offshore cable corridor	102.6	Asymmetric dipole
HOW03_ARCH_MAG_0184	53 02.3585 N	01 21.4912 E	Hornsea Three offshore cable corridor	102.6	Asymmetric dipole
HOW03_ARCH_MAG_0185	53 33.1368 N	02 03.3866 E	Hornsea Three offshore cable corridor	102.2	Positive monopole
HOW03_ARCH_MAG_0186	53 02.4694 N	01 21.2342 E	Hornsea Three offshore cable corridor	101.6	Asymmetric dipole
HOW03_ARCH_MAG_0187	53 52.5398 N	02 20.1885 E	Hornsea Three array area	101.3	Negative monopole
HOW03_ARCH_MAG_0188	53 03.0180 N	01 25.9343 E	Hornsea Three offshore cable corridor	100.4	Dipole
HOW03_ARCH_MAG_0189	53 49.6919 N	02 22.7504 E	Hornsea Three array area	100.4	Dipole

a Denotes archaeological potential.